THE

JOURNAL OF MALACOLOGY.

ESTABLISHED IN 1890 AS "THE CONCHOLOGIST, A JOURNAL OF MALACOLOGY."

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VOLUME VII.

1898—1900.

Authors alone are responsible for the statements in their respective papers.

LONDON:

DULAU AND CO., 37, SOHO SQUARE, W.

1900.

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No. 1. DECEMBER 2nd, 1898. VOL. VII.

INTRODUCTION.

ON resuming the editorship of the "Journal of Malacology," from which I retired in 1895, I beg to express my thanks to the many malacologists, in all parts of the world, who have again promised to give the paper their support.

While dealing largely with the slug and slug-like genera of molluscs, papers treating of *all branches of the Mollusca* will be included, as well as short notes upon the same.

The Bibliography will be restricted to books and papers sent in by their respective authors, and those of special interest in the current magazines, etc.

Without boasting, it may be fairly claimed for the "Journal," that it has now the largest and widest circulation of any publication devoted solely to the Mollusca.

I have agreed to publish in the pages of the "Journal," free of any cost to the Society, the "Proceedings of the Midland Malacological Society."

I hope in the present volume to improve the illustrations and to increase their number, but this can only be done by considerably increasing the cost of the "Journal." I trust, therefore, that I may count upon the same kind and generous support which malacologists have given me in the past, so that the "Journal of Malacology" may continue to be, as it was described in 1895, "the leading English Journal and Review of its specific subject."

W. E. C.

DESCRIPTION OF A NEW SPECIES OF CRYPTOSOMA (C. AUSTENI).

By WALTER E. COLLINGE, F.Z.S.,

Mason University College, Birmingham.

(Plate I.)

(Read before the Midland Malacological Society, Aug. 12th, 1898.)

The following description is from a single specimen sent to me from Calcutta as a species of *Helicarion*. On referring to Godwin-Austen's account of *Cryptosoma præstans*, Gould,[1] and the figures which accompany the same, also specimens of the shell of *C. præstans*, Gould, in the Theobald Collection in the Museum of Mason University College, and others in my own collection, it was at once evident that this was a species referable to the genus *Cryptosoma*, Theobald,[2] the *differences, however, externally*, and those in the form of the generative organs, necessitate its separation from *C. præstans*, Gould, I have therefore associated with it the name of Lieut-Col. H. H. Godwin-Austen, F.R.S.

Cryptosoma austeni, n. sp.

Animal (Pl. 1, figs. 2—4) a light yellowish-brown, darker on the head and posterior dorsum, which latter is sharply keeled. Right shell-lobe moderately well developed, left shell-lobe very large. Right dorsal lobe somewhat triangular in shape. Left dorsal lobe broad and narrow, and rather darker than the right one, being finely spotted with black. *Caudal mucous pore large, with no overhanging lobe.* Rugæ large. Peripodial groove distinct, terminating at the dorsal margin of the mucous pore. Foot-fringe same colour as the body, with fine closely set lineoles, extending to dorsal margin of the mucous pore (Pl. i, fig. 2). Foot-sole divided into median and lateral planes, the former smoother and rather lighter in colour than the rest of the body, the latter are transversely marked and similar in colour to the rest of the body (Pl. i, fig. 3). Extremity of foot-sole rounded (Pl. i, fig. 3).

Length (in alcohol) 22·5 mm.; breadth of foot-sole in widest portion, 4·5 mm.

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1 Land and Freshwater Molluscs of India, 1882, pt. 1, p. 14, pl. iv, figs. 1—1*b*.

2 Journ. Asiat. Soc. Bengal, 1857, p. 255.

Shell (Pl. i, fig. 1) apex depressed, thin, striæ definite, brownish or horn colour.

Hab. Calcutta (Coll. of W. E. C.).

I have given in figure 5 a part of the generative organs of *C. præstans*, Gould, built up from the three figures given by Godwin-Austen (*t. c.*) for comparison with those in this species (Pl. i, fig. 4).

In *C. austeni* the vagina is a long straight tube, from the top of which the elongated sessile receptaculum seminis opens. The free-oviduct is a wide tube gradually expanding as with the vas deferens it gives place to the oviduct proper and prostate. The penis is a short, broad tube, constricted on its inner surface (Pl. i, fig. 4, *p*). In *C. præstans*, Gould, Godwin-Austen describes the penis as being "much convoluted and closely folded together," which feature is shown in fig. 9 (*t. c.*, pl. iv). In *C. austeni* the penis lies ventral to, and at the outer side of, the vagina and free-oviduct. At the distal extremity and on its dorsal side, there is a small kalc-sac given off, unfortunately this was damaged in dissection. I believe it was a somewhat ovoid-shaped body and a little larger than the receptaculum seminis, but as I am not quite certain, I have left it incomplete in figure 4. From the inner and dorsal side of the penis, at a point almost exactly opposite to the origin of the kalc-sac, the vas deferens arises, the retractor muscle of the penis being inserted above and between the two (Pl. i, fig. 4, *r. m.*). The dart-sac is a wide muscular tube, narrowing slightly as it approaches the U-shaped bend towards the distal end (Pl. i, fig. 4, *d. s.*). The distal extremity is rather narrower and pointed. There was no dart present.

A comparison of the terminal ducts of the generative organs of *C. austeni*, with those of *C. præstans*, Gould, shows many striking differences. The peculiar-shaped dart-sac in this latter species with its bulbous proximal end, is very distinct from that organ in *C. austeni*, while in the form of the penis and receptaculum seminis, the differences are still more striking.

Externally there are also a few interesting points of difference from *C. præstans*, in the shape and size of the mantle and shell-lobes. The left shell-lobe and left dorsal lobe of *C. austeni* are considerably smaller than in the former species, while the right shell-lobe and the right dorsal lobe are much larger (*cp.* Godwin-Austen, *t. c.*, pl. iv, figs. 2—5). In life the right shell-lobe of *C. austeni* must extend a considerable distance over the surface of the shell, much more so than is shown in Stoliczka's beautiful figure of *C. præstans*, given by Godwin-Austen (*t. c.* pl. iv, fig. 1). Finally the shell of *C. austeni* is smaller, thinner, and much more fragile than that of *C. præstans*, Gould.

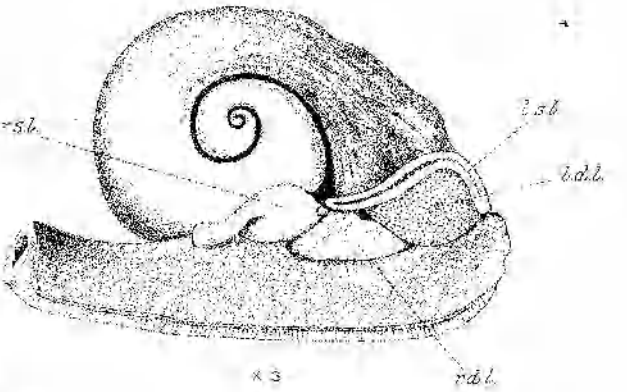
Fig. 1.

× 5

Fig. 3.

× 3·5

Fig. 2



× 3

Fig. 4.

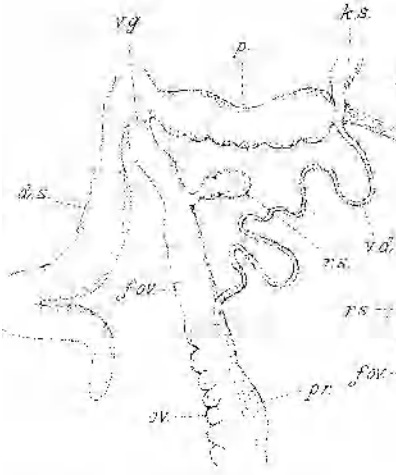
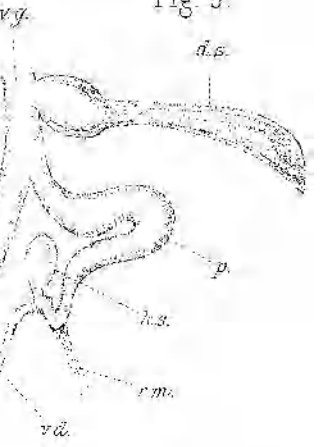


Fig. 5.



EXPLANATION OF PLATE I.

Fig. 1.—*Cryptosoma austeni*, *n. sp.* Shell. × ½.
Fig. 2.— ,, ,, View of the animal from the right side, after the removal of the shell, × 3.
Fig. 3.— ,, ,, Portion of foot-sole, showing median and lateral planes and extremity of foot-sole, × 3·5.
Fig. 4 — ,, ,, Terminal ducts of the generative organs.
Fig. 5.—*Cryptosoma præstans*, Gould. Terminal ducts of the generative organs (after Godwin-Austen).

Reference Letters.

d. s. Dart-sac.
f. ov. Free-oviduct.
k. s. Kalc-sac.
l. d. l. Left dorsal lobe of the mantle.
l. p. Lateral plane of the foot-sole.
l. s. l. Left shell-lobe.
m. p. Median plane of the foot-sole.
ov. Oviduct.
p. Penis.
pr. Prostate.
r. s. Receptaculum seminis.
r. d. l. Right dorsal lobe of the mantle.
r. m. Retractor muscle of the penis.
r. s. l. Right shell-lobe.
v. d. Vas deferens.
vg. Vagina.

IN MEMORIAM: M. H. CROSSE.

By the Rev. A. H. COOKE, M.A., F.Z.S.,

Fellow and Tutor of King's College, Cambridge.

The scientific world in general, and malacologists in particular, will have learned with profound regret the news of the death of M. Joseph Charles Hippolyte Crosse, which took place on August 7, 1898, at his country residence, the Château d' Argeville, at Vernou, near Paris. No man of his time has done more, few have done as much, to promote the study of the Mollusca, and in him France has lost one of her most distinguished men of science. It was one of those strange coincidences that sometimes occur to us all, that I should have been walking down the Rue Tronchet in Paris, and wondering whether I should call at No. 25, only the day before I returned home to hear of his death, and receive the request to write this obituary notice.

Born in 1827, it was in 1851 that Crosse contributed his first paper *(Notice sur l'habitat du Panopaea Aldrovandi, de Sicile)* to the *Journal de Conchyliologie*, which was then in the second year of its existence, edited by M. Petit de la Saussaye. It gives us some idea of the strides which the science has made since those days to learn that then malacology was still governed by the systems of Lamarck and of Cuvier. Reeve, Sowerby, and Küster had but recently commenced their iconographies, Kiener had suspended his, the Adams' *Genera*, Philippi's *Handbuch*, Gray's *Guide*, Woodward's and Chenu's *Manuals* were yet to appear. Geographical distribution, as a serious study, was absolutely unknown.

It is with the *Journal de Conchyliologie* that Crosse's memory will be for ever associated. His name first appears on the titlepage of that periodical in 1861, and it is not too much to say that to him and his distinguished colleague, Dr. P. Fischer, who, considerably the younger man, predeceased him by nearly half a decade, is due the entire credit of carrying on for more than thirty years a publication which has consistently maintained the highest standard of excellence in the articles which have appeared in its pages. Not to speak of innumerable minor notices and reviews of books, Crosse contributed, from his own pen alone, 249 articles, 86 in conjunction with P. Fischer, and 13 more in conjunction with A. C. Bernardi, T. Bland, O. Debeaux, E. Marie, and Dr. Souverbie, making a grand total of 348. He was singularly faithful to his own Journal, for the only contributions he ever appears to have made to any other recognised scientific paper were six articles which appeared in the years 1855-59 in the *Revue et Magasin de Zoologie*.

Crosse's knowledge of the Mollusca was not confined to any special group or groups, but was far-reaching and comprehensive. Naturally, his acquaintance with anatomical details was subordinate to his familiarity with other portions of the study. The Land Mollusca of New Caledonia and of Mexico are perhaps the two fields on which he will be found to have left the most permanent traces of his ability. The former he dealt with in the columns of the *Journal* alone, the latter, in collaboration with Dr. P. Fischer, in the *Études sur les Mollusques terrestres et fluviatiles du Mexique et du Guatemala*, which formed, with an Atlas of 71 Plates, the two large quarto volumes making up Part VII of the *Recherches Zoologiques*, compiled by the *Mission Scientifique au Mexique et dans l'Amérique Centrale*, and published by order of the Minister of Public Instruction in France (1870–1893). He also began, in conjunction with the same author, the *Histoire Naturelle des Mollusques terrestres et fluviatiles de*

Madagascar (1889), but this work does not appear to have been completed.

He was especially fond of cataloguing the Molluscan fauna of islands. Some of his lists, thus compiled, are invaluable to the student of geographical distribution, remarks upon which generally accompanied the lists. Among the islands thus treated are Rodriguez, Kerguelin, Socotra, Prince's and St. Thomas Is. (W. Africa), Nossi-Bé and Nossi-Comba, Trinidad, Cuba (177 pp.), San Domingo (143 pp.), Porto Rico, and New Caledonia (315 pp.). His sympathy with problems of geographical distribution is further shown by such articles as the following: *Distribution géographique et synonymie des Bulimes auriculiformes de l'Archipel Viti; Catalogue des Mollusques qui vivent dans le Détroit de Behring et dans les parties voisines de l'Océan Arctique; Faune malacologique du Lac Tanganyika, du Lac Baikal.*

Another marked feature of his writings is the cataloguing of all the known species of certain genera, often with synonymy and geographical distribution appended. Among the genera thus treated are *Cancellaria*, *Conus*, *Holospira*, *Hybocystis*, *Lyria*, *Meroe*, *Opisthostoma*, *Parmacella*, *Pirena*, *Placobranchus*, *Pleurotomaria*, *Pomatias*, *Rapa*, *Rhodea*, *Risella*, and *Voluta*.

It naturally befel one who had the handling of vast masses of material, to found new genera, as well as innumerable new species. Yet he was no sympathiser with the "splitting" school, and discountenanced, rather by example than by rebuke, the folly of those who reduce the science to confusion by manufacturing a new species for every second specimen. To Crosse are due, either singly or in conjunction with P. Fischer, the following amongst other genera:—*Acroptychia*, *Berendtia*, *Diplomphalus*, *Eucalodium*, *Geostilbia*, *Guestieria*, *Pereiraea*, *Strebelia*, and *Xanthonyx*.

I believe Crosse possessed a special sympathy for England and English workers. Certainly his encouragement of young contributors was charming, and his courtesy never failed. His knowledge of English was remarkable, and he was capable of translating articles from that language into French without missing the smallest point or losing the most delicate shade of meaning. Besides possessing numerous other titles of honour, he was a Corresponding Member of the Zoological Society of London, and a Member of the Malacological Society of London. All English Malacologists will unite in a respectful testimony to his great distinctions. And perhaps no better epilogue could be framed for him than the words with which he closed his own exhaustive treatise on the Mollusca of New Caledonia, words of characteristic modesty:—"Nous terminons ici notre travail,

dont nous ne nous dissimulons nullement les imperfections, mais qui aura, nous l'espérons du moins, l'avantage de faire connaître aux naturalistes, que ces sortes d'études intéressent, l'état actuel de la science . . . . et de leur servir de point de départ pour de nouvelles recherches . . . . où il doit y avoir encore bien de découvertes à faire pour les explorateurs."

SPECIES OF PLECTOPYLIS RECENTLY DESCRIBED IN "SCIENCE GOSSIP."[1]

By G. K. GUDE, F.Z.S.,

London.

Plectopylis muspratti, Gude.

Shell sinistral, discoid, widely and deeply umbilicated, pale corneous, streaked transversely with dull brown; finely striated and decussated with spiral lines, which are very distinct on the upper surface, but less so below. Suture impressed, spire a little conical. Whorls six and a half, scarcely convex, slowly increasing, the last widening towards the aperture, slightly angular above, descending suddenly in front, and a little constricted behind the peristome. Aperture roundly lunate, peristome white, thickened and reflexed, margins converging. Parietal callus with a strongly raised flexuous ridge, which is separated from both margins by a little notch. Umbilicus wide and deep. Parietal wall with a short entering flexuous fold united to the ridge at the aperture, becoming attenuated inwardly, and at one-third of the circumference from the aperture, with a strong, crescent-shaped vertical plate, which is suddenly deflected posteriorly at the lower extremity; below this, on the anterior side, occurs a very short, horizontal fold. Palatal folds six, horizontal, short; the first free, with a small denticle posteriorly; the second, third, fourth, and fifth connected with each other by a vertical ridge, which deflects below the fifth fold posteriorly and terminates in a small, oblique denticle; the sixth again free.—Major diameter, 13 millimetres; minor diameter, 11 millimetres; axis, 6 millimetres.

Habitat, Naga Hills, Assam.—Type in Colonel Beddome's collection.

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[1] Reprinted from "Science Gossip," N.S. vol. iv. 1897-1898. By kind permission of the Editor.

With a number of *Plectopylis* kindly sent to me by Colonel Beddome for inspection, were three shells which he thought would

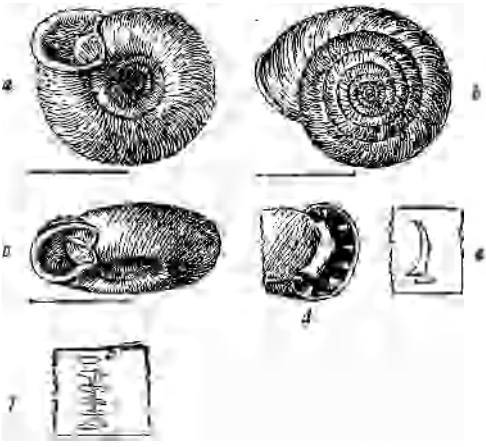

Fig. 5.—*Plectopylis muspratti*, GUDE.

prove to be new. Upon examination I found them to differ from all the described species, and now, therefore, publish this form as a new species under the above name, which was suggested by Colonel Beddome. *Plectopylis muspratti* in outward appearance somewhat resembles *Plectopylis nagaensis* ("Science Gossip," N.S., vol. iii, p. 206, fig. 33), but the armature is quite different. The parietal armature (see figs. *e* and *d*) consists of a strong, vertical lunate plate, strongly deflected posteriorly below, the convex side towards the aperture; below, on the anterior side, is a very short horizontal fold; a short, entering, flexuous, horizontal fold occurs at the aperture and is joined to the flexuous raised ridge which unites the two margins of the peristome. The palatal armature consists of: first, a free, short, horizontal fold with a small denticle posteriorly; next, four short, horizontal folds connected by a slight vertical ridge about their middle; the posterior halves of the folds being thinner and slighter than the anterior halves; the vertical ridge is continued below the fifth fold, where it suddenly deflects posteriorly and terminates in a small oblique denticle; below the fifth fold, a little nearer to the aperture, is found a sixth fold, which, like the first, is quite free (see fig. 5*f*, which shows the inner side of part of the outer wall with its palatal folds, and fig. 5*d*, which gives the posterior view of the parietal and palatal armatures).—"Science Gossip," iv, p. 10.

Plectopylis stenochlia, var. basilia, Gude.

Differs from the type in the more conical spire, the more flattened whorls and the acutely keeled periphery.— Diam., 6-7 millimetres.

Habitat, Badung, Province Hoo-Pé, China.

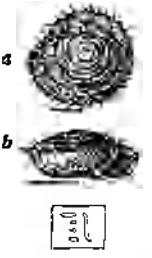

Fig. 6.—*Plectopylis stenochila*, var. *basilia*, Gude.

Plectopylis stenochila, var. *basilia*, from Badung, Province of Hoo-Pé, was sent to me by Professor Oscar Boettger, of Frankfort. It has a more conical spire and the whorls are more flattened than in the type (see "Science Gossip," N.S., vol. iii., p. 204, f. 29); the periphery is acutely keeled, while in the type it is rounded. The parietal armature differs in having only four simple denticles anteriorly to the vertical plate, the second denticle being very minute (see fig. *b*); the palatal armature is identical with that of the type.—Ibid. p. 36.

Plectopylis magna, Gude.

Shell sinistral, solid, discoid, widely and deeply umbilicated, horny brown, finely and regularly ribbed. Suture slightly impressed, spire depressed, apex scarcely raised. Whorls 7½, a little rounded above, tumid below, increasing very slowly, the last widening a little towards the aperture, descending somewhat slowly in front, and a little constricted behind the peristome. Aperture elliptical, peristome white, thickened and reflexed, margins scarcely converging. Parietal callus with a raised flexuous ridge, separated from both margins of the peristome by a little notch. Umbilicus wide and deep. Parietal wall with a short, entering, flexuous, horizontal fold, which terminates at a distance of two millimetres from the parietal ridge at the aperture, and having at one-third of the circumference from the aperture two strong transverse plates; the

posterior one the longest, vertical, and a little flexuous, giving off a short, obliquely raised ridge posteriorly above, and a short, strong, obliquely deflexed ridge posteriorly below; the anterior one oblique, the upper extremity converging towards the posterior plate, where it gives off posteriorly a short, strong ridge, and anteriorly a strong, longer ridge, which becomes attenuated; at the lower extremity it *gives off two short, strong ridges, one posteriorly and one anteriorly*; below these plates occurs a thin fold, close to the lower suture, revolving as far as the aperture, where it unites with the flexuous ridge. Palatal folds, 5: the three upper horizontal; the first straight and having an elongated denticle below it at about the middle; the second a little deflected posteriorly; the third short, crescent-shaped; the fourth vertical, flexuous; the fifth horizontal, abruptly deflexed anteriorly above and posteriorly below. Posteriorly between the first and fifth folds occur six denticles, placed vertically in a row, the first in a line with the elongated denticle below the first fold, the second a little above and the third a little below the second fold, the fourth in a line with the upper extremity, the fifth near the middle, and the sixth a little below the lower extremity of the vertical fold.—Major diameter, 22·5-25 millimetres; minor diameter, 18·5-21 millimetres; axis, 8 millimetres.

Habitat, Burma.—Type in my collection.

Fig. 7.—*Plectopylis magna*, GUDE.

With a miscellaneous collection of *Plectopylis*, from Burma, kindly sent to me by Miss Linter, Arragon Close, Twickenham, were two

forms which appear to be undescribed, and, although closely allied to each other and to *Plectopylis ponsonbyi* ("Science Gossip" N.S., vol. iii, page 178), they present sufficient differences to warrant their being regarded as distinct. Three of the specimens in question belong to the form which I now publish as a new species under the name of *Plectopylis magna*. A shell in the collection of Mr. E. R. Sykes, which had been labelled *P. achatina*, I also refer to this species. This new form differs from *P. ponsonbyi* in being much larger, more solid, and darker in colour, in having one whorl more, in the last whorl descending less abruptly, and in the whorls being more rounded. There are also differences in the armature, *i. e.* the two parietal vertical plates are convergent above, and the posterior one is considerably longer than the anterior one (see fig. 7*e*), while in *Plectopylis ponsonbyi* they are almost equal and parallel; the anterior plate gives off anteriorly, below a short, stout ridge, not a distinct fold as in *P. ponsonbyi*, and the thin fold near the suture is distinctly continued to the ridge at the aperture, without becoming attenuated; the two upper palatal horizontal folds are much thinner, the third is short and crescent-shaped, and the vertical fold is not bilobed, while there are several more denticles posteriorly (see fig. 7*f*, which shows the inside of the outer wall). The specimen figured, received from Miss Lintel, as above mentioned, is in my collection, and measures 25 millimetres in diameter. A second specimen measures 22·5 millimetres in diameter. The third specimen is not quite mature, the ridge on the parietal callus at the aperture not being formed, but the armature is quite identical with that of the mature shells. Figs. 7 *a*, *b*, *c*, and *e* are natural size, figs. 7 *d* and *f* are magnified.—(Ibid., p. 70.)

Plectopylis lissochlamys, Gude.

Shell sinistral, solid, discoid, widely and deeply umbilicated, polished, corneous, finely and regularly ribbed, decussated with minute spiral sculpture above. Suture impressed, apex a little raised, spire depressed. Whorls 7, rounded, increasing slowly, the last twice as wide as the penultimate, widening towards the aperture, but not constricted behind the peristome. Aperture rounded, elliptical; peristome white, rather thin, reflexed; margins a little converging. Parietal callus with a raised flexuous ridge separated from both margins of the peristome by a little notch. Umbilicus wide and deep. Parietal wall with a short, entering, flexuous horizontal fold, which runs close up to the ridge at the aperture, and at one third of the circumference from the mouth there are two rather thin

transverse parallel plates, descending obliquely backwards, the posterior one longest and with a short ridge posteriorly both at the upper and the lower extremities; the anterior one with a longer ridge anteriorly at the upper extremity, and two short but stouter ridges at the lower extremity, one anteriorly and one posteriorly; below these plates occurs a thin horizontal fold close to the lower suture, becoming attenuated but distinctly perceptible at the aperture, where it unites with the flexuous ridge. Palatal folds, 5; the three upper horizontal, thin, the first and second with a denticle posteriorly; the third deflected posteriorly; the fourth vertical, the upper part deflexed anteriorly, the lower part deflexed posteriorly, with two denticles posteriorly, one about the middle and one near the lower extremity; the fifth short, horizontal, indented at the middle, with a slight curved denticle posteriorly.—Major diameter, 19-20 millimetres; minor diameter, 16-17 millimetres; axis, 6-7 millimetres.

Habitat, Burma.—Type in my collection.

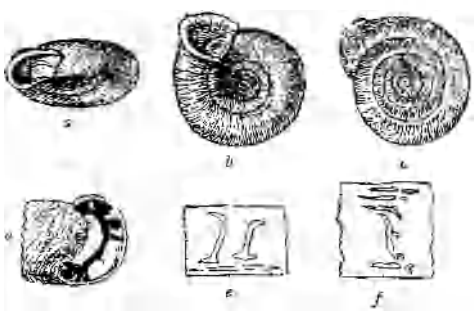

Fig. 8.—*Plectopylis lissochlamys*, GUDE.

The form received with *P. magna*, as above mentioned, I propose to distinguish as *Plectopylis lissochlamys*. Two specimens were sent to me by Miss Linter. Dr. von Möllendorff, the German Consul in Manila, Luzon, however, has obligingly sent me for inspection several specimens of *Plectopylis*, amongst which are two (labelled *Plectopylis refuga*) which I refer to this new species. *Plectopylis lissochlamys* differs from *P. magna* in being much smaller and shining, as well as paler in colour; the shell in shape and texture resembling *Plectopylis pulvinaris*, which, however, is a dextral shell ("Science Gossip," N. S., vol. iii, page 180, fig. 25). It is more solid and darker in colour than *P. ponsonbyi* and it is more coarsely ribbed; the two last whorls increase more suddenly, and the last is not constricted behind the peristome as is the case in *P. ponsonbyi*. The two parietal plates (see

fig. 8 *e*) are much thinner, and the anterior ridges of the anterior plate much shorter and slighter than those of *P. ponsonbyi*; they are parallel instead of convergent as in *P. magna*. A comparison of the figures will indicate differences in the palatal armature. The specimen figured is in my collection and measures 19 millimetres in diameter. Figs. 8 *a-c* are natural size, while figs. 8 *d-f* are magnified. Fig. 8 *d* shows the parietal and palatal armature from the posterior side; fig. 8 *e* a part of the parietal wall with its plates; and fig. 8 *f* the inside of the outer wall with its folds and denticles.—(Ibid., p. 70–71.)

Plectopylis leucochila, Gude.

Shell sinistral, rather solid, discoid, deeply and perspectively umbilicated, pale yellowish-corneous, finely and regularly ribbed, ornamented with minute spiral sculpture. Suture almost linear, spire depressed, apex scarcely raised. Whorls seven to seven and a half, a little rounded above, rather tumid below, increasing slowly and regularly, the last descending abruptly and rather deeply in front. Aperture roundly oval; peristome white, a little thickened and strongly reflexed, the margins a little converging; parietal callus with a slightly raised flexuous ridge, separated from both margins of the peristome by a little notch. Umbilicus deep, widely perspective. Parietal wall with two transverse oblique plates converging upwards, the posterior one rather thin, slightly sinuous, and having a short ridge posteriorly at the upper and lower extremities, the anterior one shorter, but much stronger and stouter, having an ascending ridge posteriorly above and a short stout support posteriorly below; on the anterior side are found two strong horizontal folds, the lower stout and short and becoming suddenly attenuated; the upper fold long, rather thinner, following the deflection of the last whorl and terminating close to the ridge at the aperture, but not being united to it; a very thin horizontal fold rises below the transverse plates close to the lower suture, runs parallel with it, and terminates at the ridge at the aperture. Palatal folds, five: the first near the suture, straight and nearly horizontal; the second a little more oblique and deflected posteriorly; the third nearly horizontal, but more deflected posteriorly; *all three have a slight indentation near the posterior extremity forming* a bead-like termination; the fourth is vertical deflected a little anteriorly above and posteriorly below, having posteriorly a small denticle near the lower extremity and another about the middle; the fifth is near the lower suture, horizontal and deflected at both extremities.—Major diameter, 15-17 millimetres; minor diameter, 12-14 millimetres; altitude, 6-7 millimetres.

Habitat, Burma.—Type in my collection.

Five shells, labelled "Burma," without further indication of locality, received by the writer, from Mr. Hugh Fulton, under the name of *Plectopylis leiophis*, proved upon examination to be distinct, and to belong, in fact, to a different group of *Plectopylis*. They represent a

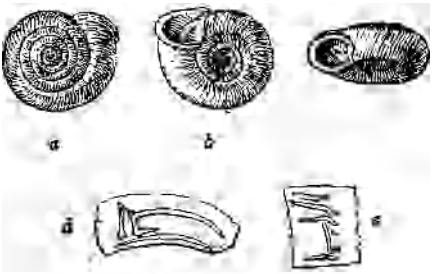

Fig. 9.—*Plectopylis leucochila*, GUDE.

species—for which I propose the name *Plectopylis leucochila*—allied to *P. ponsonbyi*, but differing from it in the more raised spire and in having a deeper and more perspective umbilicus. In the armature this new species differs from the other members of the group of *P. ponsonbyi* in having the upper parietal fold uninterrupted. Figs. 9 *a-c* show the shell in three different aspects, natural size, while figs. 9 *d* and *e* are enlarged; the former shows the parietal wall with its plates and folds, and the latter the inside of the outer wall with the folds and denticles.

Plectopylis perrierae, Gude.

Shell sinistral, discoid, widely and deeply umbilicated, pale corneous, very finely and regularly striated, and decussated by spiral lines. Suture slightly impressed, spire flattened, apex a little raised, whorls six to seven, increasing slowly and regularly, flattened above, rounded below, the last angulated above the periphery and round the umbilicus, and decending shortly and abruptly in front. Aperture heart-shaped; peristome white, scarcely thickened, a little reflected; the margins united by an elevated sinuous ridge on the parietal callus, notched at the lower junction. Umbilicus wide and deep. Parietal wall with a thin vertical plate, strongly deflected posteriorly below, and giving off a short horizontal ridge at the upper extremity on each side; a long horizontal flexuous fold rises close to the upper extremity of this plate on the anterior side, decending suddenly at first, then ascending gradually, and afterwards gradually descending, following the deflection of the last whorl, becoming united to the ridge at the

aperture; a second, shorter, horizontal fold occurs below this one, rising close to the lower extremity of the vertical plate, proceeding horizontally at first, and then ascending a little; another very thin fold rises below the vertical plate, running parallel to the lower suture as far as the aperture, where it unites with the ridge. Palatal folds, five: the first rather long and thin, near to and parallel with the suture, with a deep indentation near the posterior extremity, dividing it into two unequal parts; the second, horizontal, a little deflected posteriorly, with an elongated denticle posteriorly, and a second, smaller, one above the first; the third fold much shorter, strongly curved downwards posteriorly, with a minute denticle posteriorly; the fourth fold vertical with an obliquely descending ridge posteriorly at the upper extremity, and bifurcated at the lower extremity, the anterior arm of the bifurcated the shorter; a minute denticle occurs near the ridge at the upper extremity and a second one near the middle, both on the posterior side; the fifth fold is thin, horizontal, and strongly deflected on both sides.—Major diameter, 15 millimetres; minor diameter, 12 millimetres; altitude, 5 millimetres.

Habitat, Thayet-Mayo, Pegu, Burma.—Type in my collection.

Two specimens of an undescribed *Plectopylis* have been obligingly placed in my hands by Miss Linter, at whose request I name it after her friend, Mrs. Lumley Perrier. In contour this new species resembles *Plectopylis perarcta*, but the shell is much larger. The

Fig. 10.—*Plectopylis perrierae*, GUDE.

palatal armature further connects it with the species named, but the palatal armature is more like that of *P. leiophis*. The two specimens of the new species are stated by Miss Linter to be from Thayet-Mayo, Pegu, Burma; a third specimen, which is in Miss Linter's collection,

is accompanied by a label bearing the locality, Niningo (Burma?), but I have failed to trace this name in any of the maps and gazetteers to which I have access.

The specimen figured, and the one in Miss Linter's collection, have the measurements given in the diagnosis, but my second specimen measures only 12·5 millimetres in diameter. Figs. 10*a-c* show the shell in three different aspects, natural size; figs. 10*d-f* are enlarged; *d*, shows the parietal and palatal armatures from the posterior side; *e*, the inside of the outer wall with the palatal folds and denticles; and *f*, the parietal wall with its plate and folds.—(Ibid., iv, p. 231.)

NOTES.

Literature on the Anatomy of the Solenidæ.

I should be extremely obliged for any information or references to the literature treating of, or touching upon, the anatomy of the *Solenidæ*.—H. HOWARD BLOOMER, 35, Paradise Street, Birmingham.

On the dimensions of some Arion empiricorum, Fér.

In May last I collected near Sutton Coldfield two exceedingly large specimens of a black *Arion*. Feeling doubtful, from the size and prominent peripodial groove, if these were examples of *A. empiricorum*, Fér., I submitted one to Mr. W. E. Collinge, who has very kindly made a dissection of the same and pronounced it to be a large example of that species. The rugæ are large and prominent, the peripodial groove well marked by elongate rugæ, and the foot-sole has a sepia-coloured median plane, with rather lighter coloured lateral planes, with alternating broad and narrow transverse stripes. The measurements, taken when alive, were: length 22·5 cm.; foot-sole 3 cm. broad.—GUY BREEDEN, 304, St. Vincent Street, Ladywood, Birmingham.

New Locality for Hygromia revelata.

Mr. Howard Fox, of Falmouth, informs me that he has recently taken a living specimen of *Hygromia revelata* at St. Columb Minor, near Newquay, Cornwall. This is, I think, a new locality for the species.—B. B. WOODWARD.

Limax variegatus, Drap., var. rufescens, Moq., in Warwickshire.

A specimen of this somewhat uncommon variety was brought to me some few weeks ago from the cellar of a house in Edgbaston, Birmingham. On being placed in alcohol most of the red colour on the dorsum disappeared leaving only a small patch on the posterior end of the body.—WALTER E. COLLINGE (*Read before the M. M. S., August 12th, 1898*).

Slugs from North Devon.

I have recently received, through the kindness of Mr. F. J. Partridge, fifty-six specimens of *Amalia sowerbii*, Fér., from different localities in Nth. Devon, which are of interest as affording some idea of the great variation that exists in the external colouring of this species.

The following well-marked varieties were found:—

Var. *fuscocarinata*, Cklt., two specimens from Barnstaple. Var. *nigrescens*, Cklt., one specimen from the same locality, also a specimen of the var. *bicolor*, Cklt. There are numerous intermediate stages between the two last mentioned varieties, and a form similar in colouring to the Irish bocagei-like variety of *Arion empiricorum*, Fér.

The following seem to be new :—

Nigrocarinata, var. nov. Animal a very dark grey, with a deep black line running the whole length of the keel; foot-sole yellowish-white. Hab. Lynton, Nth. Devon. (Coll. of W.E.C.)

Plumbea, var. nov. Whole of dorsum and mantle a dark leaden grey, slightly lighter on the sides of the body; foot-sole ashy-grey. Hab. Barnstaple, Nth. Devon. (Coll. of W.E.C.)

Flavescens, var. nov. Sides of body yellowish, with light grey dorsally; foot-sole yellow. Hab. Lynton and Barnstaple. (Coll. of W.E.C.)

Mr. Partridge observed a specimen of v. *flavescens* pairing with v. *plumbea*.

With the above specimens there was also a very fine example of the var. *bicolor*, Moq., of *Arion empiricorum*, Fér., collected near Clovelly.—WALTER E. COLLINGE *(Read before the M. M. S., October 14th, 1898)*.

PROCEEDINGS OF THE MIDLAND MALACOLOGICAL SOCIETY.

A Meeting of a number of Malacologists was held on July 7th, 1898, in Mason University College, Birmingham, Mr. Walter E. Collinge, F.Z.S., in the chair, when the following resolutions were passed :—

1.—That a Midland Malacological Society be formed to foster a taste for the study of the Mollusca, which it will endeavour to carry out by means of

(*a*) meetings for the reading and discussion of papers, exhibition of specimens, &c. ;

(*b*) the formation of a library and collection ;

(*c*) the publication and circulation of such communications as are of permanent value.

2.—That Mr. H. Howard Bloomer be elected Secretary *pro tem.*

1ST MEETING, JULY 15TH, 1898.

Walter E. Collinge, F.Z.S., in the chair.

The Rules drawn up by the gentlemen present on July 7th were submitted, and after a few slight alterations were adopted as the Rules of the Society.

The following resolutions were passed :—

1.—That those who have signified to Mr. Bloomer their desire to join the Society, shall constitute the original Members.

2.—That the following constitute the first Council :—

President—Walter E. Collinge, F.Z.S.

Treasurer—Guy Breeden.

Secretary—H. Howard Bloomer.

Other Members of Council—H. Willoughby Ellis, F. J. Partridge, Bromley Peebles, and G. Sheriff Tye.

3.—That the subscription for 1898 be 2s. 6d.

The Secretary read a letter from Mr. Geo. H. Morley, intimating that the Council of Mason University College had given their permission for the meetings of the Society to be held in the Zoological Department.

PAPERS READ.

"Notes on Formalin as a preservative fluid for Mollusca," by H. H. Bloomer.

EXHIBITS.

By Mr. Collinge: Specimens of *Parmarion pupillaris*, Humb., *P. weberi*, Simr., and *Microparmarion gedeanus*, Simr., from Java; also a series of shells (*Anodonta Unio*, etc.) from China and Pegu.

By Mr. Guy Breeden: Two large specimens of *Arion empiricorum*, Fér., from Sutton Coldfield.

By Mr. H. H. Bloomer: Specimens of *Helix aspersa*, *H. nemoralis*, *H. hortensis*, etc., preserved in formalin.

By Mr. F. J. Partridge: Specimens of *Anodonta anatina*, with a series of varities, from Sutton Coldfield; also from the same locality some large specimens of *Sphærium corneum*.

2ND MEETING, AUGUST 12TH, 1898.

The President in the chair.

The following nominations for membership were read:—
Messrs. E. R. Sykes, B.A., F.Z.S., and Robert Birbeck.

PAPERS READ.

"Description of a new Species of *Cryptosoma*," by Walter E. Collinge, F.Z.S.

"Preliminary List of the Land and Freshwater Mollusca in a twelve mile radius of Birmingham," by F. J. Partridge.

"*Limax variegatus*, Drap., var. *rufescens*, Moq., in Warwickshire," by Walter E. Collinge.

EXHIBITS.

By Mr. Collinge: A specimen of *Cryptosoma austeni*, and *Limax variegatus*, Drap., var. *rufescens*, Moq.

By Mr. F. J. Partridge: Specimens of *Helix aspersa*, and *H. nemoralis*, from Dorchester.

Mr. Guy Breeden made some remarks upon a collection of Canadian shells recently received.

3RD MEETING, SEPTEMBER 9TH, 1898.

The President in the chair.

The following were elected members of the Society:—
Messrs. E. R. Sykes, B.A., F.Z.S., and Robert Birbeck.

The following nominations for membership were read:
Messrs. Bromley Peebles, J. W. Morton, W. Harrison, and J. E. Titley.

EXHIBITS.

By Mr. Guy Breeden: *Pisidium nitidum*, Jen., var. *lateralis*, Coles.

By Mr. Titley: A series of Canadian Freshwater Shells.

By Mr. Peebles: Two specimens of *Amalia gagates*, Drap., one approaching the var. *nigrescens*, Ckll., the other var. *fusiocarinata*, Ckll., both collected in a garden in Edgbaston, Birmingham.

By Mr. Bloomer: A series of molluscs preserved in 5 % formalin.

By Mr. Collinge: The following varities of *Agriolimax agrestis*, L., *rufescens*, L. and P., *nigra*, Mor., *albida*, Pic., *sylvatica*, Moq., *lilacina*, Moq., and *reticulata*, Moq.

4TH MEETING, OCTOBER 14TH, 1898.

The President in the chair.

The following were elected members of the Society:—
Messrs. Bromley Peebles, J. W. Morton, W. Harrison, and J. E. Titley.

PAPERS READ.

"Slugs from North Devon," by Walter E. Collinge, F.Z.S.

"Further notes on Formalin as a preservative fluid for Molluscs," by H. Howard Bloomer.

Mr. Bloomer exhibited a large number of land and marine molluscs preserved in a 5 per cent. solution of Formalin, and stated that so far as tested it showed a decided advantage over alcohol as a preservative for museum specimens, nearly all of those exhibited being in as perfect a condition as when first put up three years ago. It was also to be observed that considerably less decolouration had taken place than in those preserved in alcohol.

Mr. H. Willoughby Ellis made some remarks upon the occurrence of *Helix rufescens*, Penn., in Warwickshire.

EXHIBITS.

By Mr. Collinge: A large collection of British *Sphæriidæ*, including all the known species and most of the varieties; also specimens of *Amalia sowerbii*, Fér., var. *nigrocarinata*, Cllge., var. *flavescens*, Cllge., both from Lynton, Nth. Devon, and var. *plumbea*, Cllge., from Barnstable, Nth. Devon, all collected by Mr. Partridge.

By Mr. Bloomer: Numerous land and marine molluscs preserved in a 5 per cent. solution of Formalin.

By Mr. F. J. Partridge: The following shells and molluscs recently collected in North Devon. *Helix virgata* with vars. *albicans*, Grat., *subalbida*, Poir., *hyalinoa*, Taylor, *depressa*, Req., *minor*, Taylor, m. *sinistrorsum*, Taylor; *H. caperata* and vars. *ornata*, Pic., *fulva*, Moq., *obliterata*, Pic., *lutescens*, Pas., m. *subfuriforme*; *H. hortensis* and vars. *lutea*, Moq., *lilacina*, Taylor; *Hy. diaphana*, *Testacella maugei*, *Amalia sowerbii* and vars. *fuscocarinata*, Ckll., *nigrescens*, Ckll., *bicolor*, Ckll., *plumbea*, Cllge., all from Barnstable.

From Braunton Marshes and "Burrows," *Succinea putris*, *S. elegans*, *Vitrina pellucida*, *Hyalinia crystallina*, *H. fulva*, *H. cellarius*, *Helix aspersa*, *H. hortensis*, *H. virgata* and vars., *albicans*, Grat., *radiata*, Hldr., *H. caperata* and v. *ornata*, Pic., *H. hispida*, *H. rotundata*, *H. pulchella* and v. *costata*, Müll., *H. acuta* and vars. *alba*, Req., and *strigata*, Menke, *Pupa marginata*, *Vertigo antivertigo*, *V. moulinsiana*, *Cochlicopa lubrica*, and *Carychium minimum*.

From Lynton, *Amalia gagates*, *A. sowerbii* and vars. *nigrocarinata*, Cllge., *flavescens*, Cllge, and *plumbea*, Cllge., *Arion empiricorum* v. *bicolor*, Moq., *Limax maximus*, *L. marginatus*, *Helix arbustorum* v. *fuscescens*, D. & M., *H. nemoralis* and vars., *rubella*, Moq., and *castanea*, Moq., *H. hortensis*, *H. lapicida* v. *albina*, Menke., *H. rotundata* and v. *alba*, Moq., *H. hispida* v. *albida*, Jeff., *H. rufescens* and v. *alba*, Moq., *Balea perversa*, *Clausilia rugosa*, *C. laminata*.

CURRENT LITERATURE.

Acloque, A.—Faune de France. Tome iii. Paris, 1899 (1898). Des Mollusques. pp. 334-453, pls. 166-275.

M. Acloque's work is intended for students of general zoology rather than the specialist. Covering as it does the whole field of invertebrate zoology, it is not to be expected that it is free from errors, still in the pages treating of the Molluscs, these are remarkably few. The illustrations leave much to be desired, those of *Haliotis*, nd. 161, p. 344, *Limnæa glabra*, pl. 195, p. 386, *Ancylus*, pl. 197, p. 387, and *Dendronotus*, pl. 223, p. 416, being very poor. The classification adopted is one we must dissent from, as it tends to hide the affinities between the different groups.—W. E. C.

Adams, L. E.—Observations on the pairing of *Limax maximus*, L. Journ. Conch., 1897, vol. ix, pp. 92-95, pl. 3.

A very interesting article, well illustrated.

Adams, L. E.—*Arion ater* var. *rubra*, Bard., new to Britain. Journ. Conch., 1897, vol. ix, pp. 112.

This is nothing more than the var. *lamarckii*, Kal., 1851, of *A. empiricorum*, Fér. Mr. Adams seems to like setting the law of priority at defiance.

André, E.—Organes de défense tégumentaires chez le *Zonites (Hyalinia) cellarius*, Gray. Zool. Anz., 1898, pp. 436-38.

André, E.—La fossette triangulaire caudate des Arions. Rev. Suisse de Zool., 1898, T. 5, pp. 179-81, fig. 1.

[Anon.]—Slugs. Nat. Science, 1898, vol. xiii, pp. 83-85.

A carefully written review of recent papers by W. E. Collinge. Malacology would make greater headway if all differences of opinion were as courteously expressed as here.

Burton, F. M.—*Testacella haliotidea* at Gainsborough. Nat., 1898, p. 320.

Cockerell, T. D. A.—Revision of the North American Slugs. Naut., 1898, pp. 47-48.

A short review of Messrs. Pilsbry and Vanatta's paper.

Collinge, Walter E.—Note on a new variety of *Testacella maugei*. Fér. Journ. Conch., 1898, vol. ix, p. 95.

"Var. nov. *nigra*, whole of body, foot-fringe, and foot-sole a deep black. Loc. Tenby, 1892 (A. H. Cooke), (Mus. Zool. Univ. Camb.).

Dall, W. H.—Note on the Anatomy of *Resania*, Gray, and *Zenatia*, Gray. Proc. Malac. Soc. Lond., 1898, vol. iii, pp. 85-86.

Godwin-Austen, H. H.—On *Philalanka*, a new sub-genus of *Endodonta*, with descriptions of two new species from the Indian region. Ibid., pp. 11-13, pl. 1.

The new species are *P. secessa* and *P. bolampatteensis*.

Goodrich, E. S.—On the Reno-pericardial Canals in *Patella*. Quart. Journ. Micro. Sci., 1898, vol. xli, pp. 323-28, pl. 24.

After reviewing the work of previous writers the author describes the results obtained from an examination of a complete series of transverse sections, which show that in *P. vulgata* and *P. cærulea* "there are two reno-pericardial canals, opening by means of projecting ciliated funnels from the pericardium into the right and left kidneys respectively."

Hedley, C.—Further notes on Australasian Shipworms. Proc. Linn. Soc., N.S.W., 1898, pp. 91-96, figs. 1-9.

A new freshwater species is described and illustrated, under the name of *Calobates fluviatilis* (Coll. of Aust. Mus.). *C. saulii*, Wright, is also dealt with, and there are some critical remarks on the generic status of these forms.

Hedley, C.—Descriptions of new Mollusca, chiefly from New Caledonia. Ibid., 1898, pp. 97-105, figs. 1-12.

The author describes a remarkable new species of *Placostylus (P. remotus)* from Dr. Cox's collection, abberrant both structurally and geographically, with some further observations on the range of the genus. The following new species are also described: *Ischnochiton araucarianus, Teinostoma oppletum, Diplommatina obesa, Rivoina angusta*, all in the collection of the Australian Museum.

Hedley, C.—Description of a new Bivalve, *Lima alata*, from Santa Cruz. Records Aust. Mus., 1898, vol. iii, pp. 84-85, fig.

Heynemann, D. F.—Zur Geschichte der Gattungen *Aspidoporus*. Fitzinger. Nachr. d. d. Malak. Gesell, 1898, pp. 108-11.

Joubin, L.—Note sur une nouvelle famille de Céphalopodes. Ann. de Sci. Nat., 1898 (ser. 8), T. vi, pp. 279-92, figs. 1-9.

The specimen here described—*Galiteuthis armata*, gen. et sp. nov.—is a pelagic form purchased in the Nice market. It is placed in a new family—*Cranchionychiæ* in the Œgopsida division of the Decapoda.

Joubin, L.—Observations sur divers Céphalopodes. Bull. Soc. Zool. France, 1898, T. xxiii, pp. 101-13, 2 figs.

Prof. Joubin gives a very useful diagnostic key of the *Taonioteuthidæ* and describes *Grimalditeuthis richardi*, gen. et sp. nov.

Joubin, L.—Sur quelques Céphalopodes du Musée Royal de Leyde et description de trois espèces nouvelles. Notes Leyden Mus., 1898, vol. xx, pp. 21-28.

The three new species are *Octopus horsti*, *O. hoeki*, and *Sepiotheuthis sieboldi*.

M'Intosh, W. C.—On the Larval Stages of *Clione limacina*, Phips. Ann. and Mag. N. H., 1898 (7), vol. ii, pp. 103-5, pt. of pl. 2.

Mason, Geo. E.—*Agriolimax lævis*, new variety. Sci. Goss., 1898, p. 157.

Mr. Mason describes a form much resembling the type in size and colour, with the mantle "very minutely mottled with rich dark red-brown, the colour being denser and more closely set in the centre and anterior portion. The sides in some examples are almost without trace of the mottling." [I have long had this interesting variation under the MS. name *rufrapunctatus*. It occurs in Warwickshire sparingly. I have also examples from Surrey.—W. E. C.]

Moore, J. E. S.—The Mollusca of the Great African Lakes. I. Distribution. Quart. Journ. Micro. Sci., 1898, vol. xli, pp. 159-80.

Moore, J. E. S.—The Anatomy of the Typhobias, etc. Ibid., pp. 181-204, pls. 11-14.

The anatomy of *Typhobia*, "probably the most remarkable freshwater Gasteropod at present known," is here described for the first time. A new family *Typhobiidæ* is proposed for the two known forms—*T. horei*, E. A. Sm., and *Bathanalia howesii*,, Moore.

Typhobia is at once separated from any freshwater type, by the almost unique character of its nervous system. The gills are similar to those in *Strombus* and *Pterocera*, while in the characters of the alimentary system a similar relationship is indicated. Although the Typhobias can scarcely be termed archaic forms, they do possess undoubtedly archaic characters, such, for instance, as in the character of the otocysts and nervous system, in all other respects they appear to be allied to *Strombus* and *Pterocera*, retaining a more generalised type of foot and mantle. "They certainly possess none of those characters which would suggest that they can by any possibility be regarded as the persistent representatives of an old freshwater stock. They do, however, simulate and retain the characters of the nerves of the *Solarium* and the Scalarids, and they probably indicate the road by which the more modern marine genera of the *Strombidæ* and their associates have been evolved."

The paper is an exceedingly interesting one, and beautifully illustrated.—W. E. C.

Moore, J. E. S.—On the Hypothesis that Lake Tanganyika represents an Old Jurasic Sea. Ibid., pp. 303-21, pl. 23.

Moore, J. E. S.—The Marine Fauna in Lake Tanganyika and the advisability of further exploration in the great African Lakes. Nature, 1898, Aug. 25, pp. 404-8.

Oldham, C.—Abnormal example of *Limax flavus*. Naturalist, 1898, p. 240.

Refers to *L. variegatus*, Drap.

Paravicini, G.—Organi genitali anomali nell' *Helix pomatia*. Boll. Scient. Maggi, 1898, An. 20, pp. 39-44, T. 1.

Pfeiffer, W.—Über anatomische und histologische Bemerkungen über *Tribonio-phorus graeffei*. Humbert. Sitz. Gesell. naturf. Freunde Berlin, 1898, pp. 33-38.

Pilsbry, H. A. & Vanatta, E. G.—Revision of the North American Slugs. Proc. Acad. Nat. Sci. Phila., 1898, pp. 219-61, pls. ix-xvi.

This is the second part of a really valuable piece of work. It treats of the genera *Binneya*, *Hemphillia*, *Hesperarion*, *Prophysaon*, and *Anadenulus*. The paper is divided into the following parts:—1, Notes on the comparative anatomy of *Arionidæ*; 2, Classification; 3, Description of the genera and species; 4, Brief directions for collecting and preparing slugs.

The first part gives a clear and valuable account of the general anatomy of the different genera. We pointed out that in the earlier publication the authors used only the term "vagina" for the portion of the generative organs immediately preceeding the vestibule, in this part we are pleased to note they have discriminated between the true vagina and the free-oviduct of Coltinge.

Messrs. Pilsbry and Vanatta seem to have suddenly become aware of the fact, long known to European malacologists, that the pallial organs and muscular system are important factors in generic distinction. Seeing the first part of the "Revision" contains little or no mention of these parts, and that the senior author has contented himself with "oral armature" and even a shell without the animal in the past, the force of their remarks about "those who starve their souls on a mere study of the genitalia and oral armature, miss the best part of the feast," is somewhat lost. "Half a loaf is better than none," and in the *Arionidæ* the generative organs are likely to remain a very prominent feature for *specific* distinction. We quite agree with the remarks that it is upon the aggregate characters and not any single system that *generic* distinctions should be made. We miss in this first part, as throughout the whole paper, the references, so carefully given by European workers. We lay some stress upon this serious defect, as not a few American malacologists are rather fond of using and repeating the well known facts of German and English malacologists without giving any credit to the original describers.

Of part 2 we cannot speak too highly, it is thoroughly and carefully done, and must for some time remain the best classification that has yet been given of the *Arionidæ*. The family is divided into three sub-families, viz.: *Binneyinæ*, Ckll., *Ariolimacinæ*, P. and V. *nov.*, and *Arioninæ*, W. G. Binney. Here again the authorities are not mentioned. There are eight genera recognised, the genus *Phenacarion*, Ckll., 1890, being rightly omitted.

The descriptions of the genera and species in part 3 is characterized by the same care and thoroughness so evident in part 2. Want of space only forbids us to direct attention to the numerous points of interest in the same. Messrs. Pilsbry and Vanatta have in the two published parts of the "Revision" given to malacologists an admirable guide to the American slugs, far and away the most important yet published. We trust it will serve as an impetus to American students, and be the means of training a series of broad and open minded malacologists, ever ready to welcome and acknowledge the work of others, and upon disputed points to agree to differ in all friendliness.—W. E. C.

Pilsbry, H. A.—Phylogeny of the Genera of *Arionidæ*. Proc. Mal. Soc. Lond., 1898, vol. iii, pp. 94-104, pl. vii.

We are indebted in this paper to Professor Pilsbry for a careful description, with figures, of the anatomy of *Anadenus altivagus*, Theob., which corrects and amplifies the earlier description of Godwin-Austen; and also for a most interesting account of the phylogeny of the different genera of *Arionidæ*.

As affording the most fundamental characters for the primary division of the *Arionidæ*, Professor Pilsbry selects the modifications of the free muscles. These myological features in the different genera are carefully described and compared. From a study of the anatomy the author concludes that the genus *Anadenus* is a much more primitive one than any of the European *Arionidæ*. In the form and

position of the muscles and intestine it resembles the American genus *Prophysaon*, but differs in possessing a penis, showing an affinity in this character with *Hesperarion*. In the more primitive genera of *Arionidæ* e.g. *Ariolimax*, the pharyngeal and ocular retractors approach the condition found in the *Limacidæ*.

Prof. Pilsbry is of opinion that the *Arionidæ* "not only do not possess the characters of primitive shell-less forms, but the series of recent genera unmistakably indicate their descent from a group with well-developed spiral shell," in fact we must look to the *Endodontidæ* for the ancestral root of the *Arionidæ*.

Although there will be much difference of opinion as to the conclusions reached by Prof. Pilsbry, the paper is an important one, and full of points of interest, which are worth working out in greater detail than has here been attempted.—W. E. C.

Pilsbry, H. A. & Vanatta, E. G.—Materials toward a natural Classification of the Cylindrelloid Snails. Proc. Acad. Nat. Sci. Phila., 1898, pp. 264-86, pls. 17-18.

Rath, O. vom.—Fehlen den Sexual zellen der Zwitterdrüse von *Helix pomatia* die Centralkörper? Zool. Anz., 1898, Bd. 21, pp. 395-6, 413-15.

Dr. vom Rath describes in the sex-cells of *H. pomatia* distinct central corpuscles which are clearly visible in the quiescent stage and also in mitosis.

Rawitz, B.—Die Fussdrüse von *Gasteropteron meckelii*, Kosse. Internat. Monatschr. f. Anat. u. Phys., 1898, Bd. 15, pp. 199-205, 2 figs.

Rolle, H.—Eine neue *Pomatia*. Nachr. d. d. Mal. Gesell, 1898, pp. 91-92. [*P. pelagonesica.*]

Simroth, H.—Ueber muthmassliche Mimicry beim japonischen *Philomycus*. Ber. d. Naturf. Gesell. Leipz., 1897 (1898), pp. 3-7.

Simroth, H.—Ueber die Gattung *Limax* in Russland. L'Ann. du Mus. Zool. d. l'Acad. Imp. of Sc. St. Petersb., 1898, pp. 52-67.

Short descriptions of the following new species of Russian Limaces are given:—*L. turkestanus*, *L. daghestanus*, *L. ananewi*, *L. caucasicus*, *L. ovaliformis*, *L. colchicus*, *L. simplex*, *L. valentini*, *L. baeri*, and *L. retowskii*.

Standen, R.—Mollusca. Irish Field Club Union. Kenmare Conference. Irish Nat., 1868, pp. 218-29, 1 pl.

Unlike the majority of lists of shells, this contains much interesting information on the habitats and distribution of various species.

Suter, H.—Revision of the New Zealand *Rissoidæ*. Proc. Malac. Soc. Lond., 1898, vol. iii, pp. 1-8, figs. 1-5.

R. hamiltoni, *R. funata*, *R. lubrica*, *R. forcauxiana*, and *Barleeia neozelanica*, are new (Coll. of H. Suter).

Sykes, E. R.—Description of two new species of *Clausilia* from the Province of Che-kiang, China. Proc. Malac. Soc. Lond., 1898, vol. iii, pp. 63-64, figs. 1-2.

C. timalthea and *C. labyrinthoides*, both from Kiu-chau.

Sykes, E. R.—List of the Species *Cataulus* found in Ceylon, with descriptions of some new land-shells from that island. Ibid., pp. 65-75, pl. v.

Sykes, E. R.—The Zoological Record, London, 1898. Record vii, Mollusca pp. 1-78.

Mr. Sykes, assisted by Messrs. E. A. Smith and G. C. Crick succeeds Mr. B. B. Woodward, one of the most able recorders that has been connected with this invaluable publication.

The classification adopted is that so carefully planned by Mr. Woodward, with this deviation, the groups of the *Helicidæ* have been suppressed, thereby making

reference much easier. Further the full titles of Palæontological papers are given and the new Fossil genera and sub-genera are noticed in the systematic portion. If in future volumes the year of publication of various papers, etc., were given, in addition to the volume, it would greatly add to the value of the work which has been well and carefully done, and must, as hitherto, prove of the greatest value to every student of the Mollusca.

EDITOR'S NOTES.

It has been suggested to us that the addition of an American Malacologist to our list of Editorial colleagues would be very agreeable to workers in the United States. We need scarcely say we should heartily welcome the addition.

During the past year an active and vigorous society has been founded in Birmingham, under the title of "The Midland Malacological Society," full particulars of which will be found in its "Proceedings," published in the present number of this Journal.

There are now in Great Britain three distinct societies devoted to the study of the Mollusca. The first, "The Conchological Society," founded in 1876, with its head-quarters first at Leeds, and now at Manchester, has branches at Leeds and London, and publishes its "Proceedings" in the "Journal of Conchology."

"The Malacological Society of London," founded in 1893, has rapidly risen to be one of the most important and successful of the Learned Societies. Its admirable "Proceedings," and the general success which has attended it, being very largely due to the untiring and devoted efforts of Messrs. B. B. Woodward and E. R. Sykes.

"The Midland Malacological Society," which has just completed its first year of existence, bids fair to become a strong provincial society. Its "Proceedings" will be published in this Journal.

It is to be sincerely hoped that these societies and their various branches may all work together amicably, and that no spirit of unfriendliness or little-minded jealousy may ever be fostered. Each has its own sphere of usefulness and tends to increase and diffuse our knowledge of the Mollusca.

Some little time ago Mr. John Grant, the well known publisher of Edinburgh, offered to reprint a limited number of copies of volume I of this Journal in demy octavo, in order that the set of volumes should be uniform in size. To this generous proposal we readily agreed, and we have now great pleasure in directing attention to the fact.

Mr. Grant has the whole of the remainder of all the published parts from volume I (1891) to volume VI (1897). The number of these complete sets is limited and will, no doubt, be eagerly sought after by Librarians and others.

We regret to have to record the death of Félix Bernard, at the early age of 35. Bernard was well known to all students of the Mollusca by his series of papers on the hinge of bivalved molluscs. By his decease the Paris Museum loses a zoologist of great promise.

At a meeting of the Midland Malacological Society, held on November 11th, 1898, Professor W. C. M'Intosh, M.D., LL.D., F.R.S., Mr. Edgar A. Smith, F.Z.S., and Professor Heinrich Simroth were, on the unanimous recommendation of the Council, elected Honorary Members of the Society.

THE

JOURNAL OF MALACOLOGY.

No. 2. MAY 1ST, 1899. VOL. VII.

THE SPECIFIC POSITION OF THE REPUTED BRITISH HYALINIA GLABRA, STUDER.

BY W. MOSS, F.C.A.,

Ashton-under-Lyne.

THIS British species was on the authority of the late Gwyn Jeffreys in 1870 separated from *Hy. alliaria* and declared to be identical with the continental *Hy. glabra* of Studer. Its identity with the continental species has been frequently disputed, and Mr. L. E. Adams in his last edition of "*British Land and Freshwater Shells*" discards "*glabra*" and substitutes *helvetica*, Blum., as the name of the species, stating as his reason for so doing that—"Investigation has at last settled the dispute as to what the species we have been accustomed to call *glaber* was called on the continent. It appears to be the *helvetica* of Draparnaud, as Mr. Taylor had suspected many years ago."

Unfortunately Mr. Adams does not tell us where the reputed British *glabra* differs from its continental namesake, nor what the characters are which agree with the continental *helvetica*.

Recently, through the kindness of Professor Simroth, the writer has had the opportunity of examining a single specimen of *Hy. glabra*, Studer, and two specimens of the same species kindly forwarded by Dr. Babor of Prague. After comparing the radulæ and generative organs of these three specimens, with those of a very large series of the British form, there can be no question that whatever the reputed British *glabra* may ultimately prove to be, it is quite distinct from the *glabra* of Studer. The reasons for this conclusion will be set forth in a later contribution.

NOTES ON THE SPECIES OF ENNEA AND LEPTOPOMA RECORDED FROM CEYLON, WITH DESCRIPTIONS OF SOME NEW LAND-SHELLS FROM THAT ISLAND.

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

(Plate II.)

The only two forms of *Ennea* recorded from Ceylon are *E. bicolor* (Hutton) and *E. ceylanica* (Pfr.). These are, I think, one and the same species, for which the former name has precedence. The species was collected at Galle and Trincomalie by Mr. Preston; at the latter locality he also found a single specimen which I was unable for some time to identify. Mr. Blanford kindly examined it and suggested that it might be a form of *E. stenostoma* (Bedd. MS.) Blfd., described from Madras. I have compared the single shell with the specimens of that species in the British Museum, and except for the Ceylon specimen being a trifle larger, I am unable to arrive at any distinguishing characteristic.[1]

Leptopoma.

The species already recorded from Ceylon, belonging to the *Leptopoma* group are the following:—

Leptopoma elatum (Pfr.).

Cyclostoma elatum, Pfr.: Proc. Zool. Soc., 1852 [1854], p. 159; Conch. Cab., 1853, *Cyclostomacea*, p. 246, pl. xxxii, figs. 16, 17.

Leptopoma elatum, Pfr.: Mon. Pneum. Viv., 1852 [?1853], p. 117; Reeve, Conch. Icon., *Leptopoma*, sp. 3; Hanley and Theobald, Conch. Ind., pl. cxlii, fig. 2.

Hab.—Ceylon.

Only known to me from the original series in the British Museum: it is a somewhat carinate shell, of a "Philippine form," belonging to the group of *L. atricapillum*, Sby., and *L. regulare*, Pfr.

Leptopoma semiclausum (Pfr.).

Cyclostoma (*Leptopoma*) *semiclausum*, Pfr.: Prof. Zool. Soc., 1854 [1855], p. 302.

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1 Since the above was written, Mr. Blanford has informed me that *E. stenostoma* is probably identical with *Pupa planguncula* of Benson.

Leptopoma semiclausum, Pfr.: Reeve, Conch. Icon., *Leptopoma*, sp. 35; Hanley and Theobald, Conch. Ind., pl. vi, fig. 2.

Hab.—Ceylon (Thwaites).

Leptopoma apicatum, Benson.

Leptopoma apicatum, Bens.: Ann. Nat. Hist., 1856, (2) xviii, p. 95; Reeve, Conch. Icon., *Leptopoma*, sp. 33; Hanley and Theobald, Conch. Ind., pl. cxlii, fig. 1.

Hab.—Ceylon (Layard).

The single specimen in the British Museum, apparently correctly identified, and figured as above mentioned, is a very dead shell: it may possibly prove to be only a form of the last species.

Leptopoma (Leptopomatoides) halophilum (Bens.).

Cyclostoma halophilum, Bens.: Ann. Nat. Hist., 1851, (2) vii, p. 265; Pfeiffer, Conch. Cab., *Cyclostomacea*, p. 241, pl. xxxi, figs. 29—31.

Leptopoma halophilum, Bens.: Reeve, Conch. Icon., *Leptopoma*, sp. 49; Henley and Theobald, Conch. Ind., pl. vi, fig. 3.

Hab.—Galle (Benson); Colombo (Templeton); Maturata (Jousseaume); Galle, Colombo, Trincomalie, Ratnapura at 1000 feet (Preston).

A single specimen, kindly lent me by Col. Beddome, which I am unable to separate from this species, was found "on Pedro."

I have elsewhere[1] dealt with the history of the subgenus *Leptopomatoides*: since writing I have discovered that Prof. von Martens[2] appears to have been the author who first put the name forward as a subgenus and therefore it should stand as *Leptopomatoides*, Martens. It may prove useful as a name for this compact little Ceylon group, and appears to also include a few outlying species from China, etc.

Leptopoma (Leptopomatoides) orophilum (Bens.).

Cyclostoma orophilum, Bens.: Ann. Nat. Hist., 1853, (2) xi, p. 106.

Leptopoma orophilum, Bens.: Reeve, Conch. Icon., *Leptopoma*, sp. 51; Hanley and Theobald, Conch. Ind., pl. cxlii, fig. 4.

Cyclostoma (*Leptopoma*) *pœcilum*, Pfeiffer: Proc. Zool. Soc., 1854 [1855], p. 302.

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1 Proc. Malac. Soc., vol. iii, p. 66. 2 Zool. Rec., 1878, Moll., p. 78.

Leptopoma pœcilum, Pfeiffer: Reeve, Conch. Icon., *Leptopoma*, sp. 46.

Hab.—Monahagalla (Layard); Rupaha, Uda Pussellawa (Preston); Ambagamuwa (Collett).

Leptopoma (Leptopomatoides) flammeum (Pfr.).

Cyclostoma (*Leptopoma*) *flammeum*, Pfeiffer: Proc. Zool. Soc., 1854 [1855], p. 127.

Leptopoma flammeum, Pfeiffer: Reeve, Conch. Icon., *Leptopoma*, sp. 47; Hanley and Theobald, Conch. Ind., pl. cxlii, fig. 3.

Hab.—Ceylon (Layard).

The specimens constituting the original series are not in good condition and this species may prove to be a variety of the last.

Craspedotropis conulus (Pfr.).

Cyclostoma (*Leptopoma*) *conulus*, Pfeiffer: Proc. Zool. Soc., 1854 [1855], p. 127.

Leptopoma conulus, Pfeiffer: Reeve, Conch. Icon., *Leptopoma*, sp. 45; Hanley and Theobald, Conch. Ind., pl. cv, fig. 1.

Hab.—Ceylon (Thwaites); Ambagamuwa (Collett).

I have placed this in *Craspedotropis*,[3] as it appears to be akin to the type species *C. cuspidatus*, Bens.: the name was proposed as a subgenus of *Cyclophorus*, but has recently been raised to the position of a distinct genus by Kobelt and Moellendorff.

The following names appear in Nevill's "*Enum. Helic. et Pneum. Ceylon*," but no descriptions were published; *Leptopoma alticolum*, *L. radicicolum*, *L. setiferum*. In Reeve's monograph of *Leptopoma* the habitat of *L. conicum*, Pfr., is given as "Ceylon (Thwaites)": when first published[4] no locality was given, subsequently Pfeiffer gave "Cochin-China," and probably this is more correct, and Reeve's localization was due to an error.

Lagochilus occultus, n. sp. Pl. ii, fig. 6.

Testa mediocriter et perspective umbilicata, elate turbinata, tenuiuscula, brunneo-cornea, spira bene elevata; anfr. $4\frac{1}{2}$—5 convexi, sutura profunde impressa, periostraco bene induti, lineis spiralibus (ultimus sex approx.) et transversis, et setis sparsim notati, basi usque in umbilicum leviter lirati; apertura subcircularis, peristomate leviter incrassato, superne leviter exciso. Alt. 2·5, diam. 4 mm.

Hab.—Ambagamuwa (Collett).

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3 Blanford: Ann. Nat. Hist., 1864, (3) xiii, p. 454.

4 Proc. Zool. Soc., 1859, p. 27.

This, the first species of the genus recorded from Ceylon, is an interesting little shell, clothed with a dense periostracum, which forms transverse and spiral lines, the latter having a few hairs scattered along them. Neither of my specimens—though otherwise in good condition—has the operculum. The notch is small but distinct. Col. Beddome has lent me a series of specimens which I am unable to separate from this form and which were collected "on Pedro, at 6000 feet."

Cyclophorus vescus, n. sp. Pl. ii, fig. 3.

Testa mediocriter umbilicata, depresso-turbinata, solidula, brunneo-cornea, ad suturam et usque ad peripheriam maculis castaneis picta, periostraco levissime induta, apice obtusulo, sutura valde impressa; anfr. $4\frac{1}{2}$—5, sat rapide accrescentes, convexi, primi fere laeves, reliqui spiraliter striati, lineis incrementibus leviter notati; Apertura subcircularis, superne angulata, peristomate leviter incrassato, reflexiusculo; operculeum corneum, tenue, multispirale. Alt. 5·75, diam. 10·5 mm.

Hab.—Ambagamuwa (Collett).

Var. *a.* Minor, pallidior. Alt. 4, diam. 8 mm.

Hab.—Uda Pussellawa (Preston).

Though a small species, I find it impossible to remove this from the typical group of *Cyclophorus*, to any of the sections and genera which have been gradually separated. The shell is of the ordinary turbinate form, marked with spiral lines which become less conspicuous on the last whorl. A specimen in the collection of Col. Beddome measures 12 mm. in diameter.

Cyclophorus binoyæ, n. sp. Pl. ii, fig. 4.

Closely related to *C. vescus*, but the spiral striation is very much finer, the lines being more numerous and closely set, the periostracum much stronger, being almost scabrous; the shell is also more closely coiled, a specimen of $4\frac{1}{2}$ whorls measuring only: alt. 3, diam. 5 mm.

Hab.—*Binoya, Ambagamuwa (Collett).*

Cyathopoma innocens, n. sp. Pl. ii, fig. 2.

Testa turrita, elongato-pyramidalis, perspective umbilicata, apice obtusulo; anfr. $4\frac{1}{2}$—5, lente accrescentes, valde convexi, sub lente lineis incrementibus parvis notati, sutura valde impressa; apertura circularis; operculum multispirale, medio concavum. Alt. 1·65, diam. 1·2 mm.

Hab.—Eton Estate, Punduloya, at 4000 feet (Collett).

This minute speck, which appears to be adult, has no salient

NEW LAND SHELLS FROM CEYLON

characters. The periostracum seems absent and there is no sculpture beyond the lines of growth; the suture is very deep and the whorls very convex. It belongs to the group of *C. turbinatum*, Sykes, but is much smaller, and more elevated in proportion to its breadth; the umbilicus is also narrower.

Cataulus greeni, n. sp. Pl. ii, fig. 5.

Testa conspicue sed anguste rimata, elongato-pyramidalis, solidula, eleganter costulato-striata, apud suturas crenulata, pallide straminea, spira producta, apice obtusiusculo; sutura valde impressa; anfr. 8, plano-convexi; carina umbilicalis valida, acuta; periomphalum magnum, costulato-striatum; apertura subcircularis; peristoma album, continuum, duplex, externum incrassatum et valde reflexum, internum productum, margine dextro apud medium sinu exciso notatum basi productum, canali mediocri perforatum. Alt. 17, diam. 6 mm.

Hab.—Pundwloya, at 4000 feet (coll. E. C. Green, dedit Collett).

A very remarkable form, differing from all other known Ceylon species of the genus in having a sinus or notch in the upper dextral margin, in addition to the usual perforation at the base. I have much pleasure in dedicating it to Mr. Green, through whose energy it was discovered.

Kaliella colletti, n. sp. Pl. ii, fig. 1.

Testa elongato-pyramidalis, subperforata, cornea, nitidula, apice flavido, acutulo, basi subimpresso regione umbilicali; anfr. 8, planiusculi, primi rapide, reliqui lente accrescentes, sub lente obscure longitudinaliter striati; sutura impressa; apertura quadrata, margine dextro acuto, columellari subreflexo. Alt. 3·85, diam. 2·1 mm.

Hab.—On bamboo, orange, and mango trees, Binoya, at 3600 feet, Ambagamuwa (Collett).

The breadth increases rapidly in the earlier whorls, but slowly in the later whorls, thus giving an elongated appearance to the shell. It is a much more slender shell than *K. salicensis*, G.-Austen, which Mr. Collett found with it, and is not so sharply keeled as that species. From *K. delectabilis* and *Sitala operiens*, it is similarly distinct in form and may be severed from the last-named also by the absence of spiral sculpture.

EXPLANATION OF PLATE II.

Fig. 1. *Kaliella colletti.*
,, 2. *Cyathopoma innocens.*
,, 3. *Cyclophorus vescus.*
Fig. 4. *Cyclophorus binoyæ.*
,, 5. *Cataulus greeni.*
,, 6. *Lagochilus occultus.*

Since the size-lines marked in the figures (except fig. 5) differ from the dimensions given, it may be remarked that the latter are taken from the apex to the umbilical area.

PHASIANELLA "PULLA" OR "PULLUS"?

By the Rev. A. H. COOKE, M.A., F.Z.S.,

Fellow and Tutor of King's College, Cambridge.

Some uncertainty appears to prevail with regard to the meaning of the specific name *pullus*, as applied by Linné to a common British shell, which he regarded as a *Turbo*, but which is now universally classified as *Phasianella*. Thus Forbes and Hanley, regarding the specific name as a substantive (and meaning "chicken"), write *Ph. pullus*, while Jeffreys on the other hand regards it as an adjective, writes *Ph. pulla*, and translates "dark-coloured" (*Brit. Conch.*, iii, p. 338).

An examination of the "*Systema Naturae*" appears to set this vexed question at rest. If we turn to the tenth edition—which is now recognised as the authority for nomenclature—a very short examination of the specific names at the left-hand side of the text leads to the conclusion that it was the habit of Linné, when he designated a species by the name of a substantive in the nominative singular, to print it with a capital letter.[1] Thus we have on page 706 *Mytilus Modiolus* and *M. Hirundo*; on p. 757 we have *T. rochus Magus* and *T. Modulus*; on p. 765 we have *Turbo Clathrus*, *T. Uva*, and *T. Lincina*, etc., etc.

On the other hand, when he designated a species by an adjective in the nominative case, he printed it with a small initial letter. Thus on the pages already referred to we have (on p. 706) *Mytilus cygneus*, *anatinus*, *viridis* and *ruber*, (on p. 757) *Trochus perspectivus*, *hybridus*, *cruciatus* and *pharaonius*, (on p. 765) *Turbo crenatus*, *lacteus*, *striatulus*, *carneus* and *reflexus*. And what he printed in this particular case was not *Turbo pullus*, but *Turbo Pullus* (p. 761).

No one can have studied the text of the "*Systema*" without discovering that Linné was not distinguished for extreme accuracy, either in his references to other authors or in adherence to his own rules. Thus we should expect to find exceptions to the rule above indicated. As a matter of fact we do so, and in several cases these exceptions are the result of mere carelessness, thus tending to confirm rather than contradict our conclusion. We find, for instance, a few substantival specific names written with a small initial letter, e. g. *Nautilus fascia* (p. 711), *Strombus urceus* (p. 745), but in the twelfth

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1 Probably following the custom of the Germans and nations allied to the Germans of writing all nouns substantive with a capital.

edition these are corrected to *Fascia*, *Urceus*. Conversely we have *Turbo Scalaris* (p. 764), *Bulla Fontinalis* (p. 727), and *Helix Citrina* (p. 771), in edition 10, corrected to *scalaris*, *fontinalis*, and *citrina* in edition 12. Occasionally these mistakes escape detection in edition 12, and are not corrected till Gmelin's edition, known as the thirteenth.[2] Such are *Strombus Lentiginosus* (ed. 10, p. 743) *Turbo auriscalpium* (p. 767), *Helix Vivipara* (p. 772), *Dentalium Elephantinum* (p. 785), *Patella unguis* (p. 783). Sometimes, e. g. *Helix Auricularia*, they escape Gmelin as well.

It is remarkable that when the substantive is in the genitive plural, Linné writes it with a small initial, e. g. *Turbo muscorum* (p. 767), *Mya pictorum* (p. 671), *Helix arbustorum* (p. 771), *H. lucorum* (p. 773). When however in these cases the substantive is itself used as a scientific term he writes it with a capital, e. g. *Bulla Hypnorum* (p. 727). So to with adjectives he writes *Buccinum Neriteum* (p. 738), *Turbo Neritoides* (p. 761), *Patella Neritoidea* (p. 781), *Helix Haliotoidea* (p. 775), but *Helix itala*, *balthica*, *hispana*, *Patella chinensis*, *ungarica*, *graeca*, *Conus ebraeus*, etc.

One more point might be added, in confirmation of the view that *pullus* is a noun substantive. Linné frequently repeats his specific names, thus he uses *Nucleus* to designate an *Arca* (p. 695) and a *Cypraea* (p. 724), *Hirundo* to designate a *Mytilus* (p. 706) and a *Cypraea* (p. 722), *Legumen* for a *Solen* (p. 672), and a *Nautilus* (p. 711), *Erinaceus* for a *Buccinum* (p. 736) and a Murex (p. 748). It so happens that he uses *Pullus* once again to designate a mollusc, for on page 737 we find *Buccinum Pullus*. It is obvious that, if he had intended the word to be used as an adjective, he would have written *Buccinum pullum*.

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2 Linné writes *Conus Minimus* and *Rusticus* in both ed. 10 and 12, possibly regarding the names as nouns substantive. Gmelin thought otherwise with regard to the first, and writes *minimus*, but keeps *Rusticus*.

ON THE OCCURRENCE IN IRELAND OF ARION EMPIRICORUM, FÉR., VAR. BOCAGEI, SIMR.

By WALTER E. COLLINGE, F.Z.S.,

Mason University College, Birmingham.

The interesting variety of *Arion empiricorum*, Fér., known as *bocagei*, was described by Simroth in 1891.[1] It is a Portugese form, and differs from any recorded variety occurring in the British Isles, in having a pale yellowish dorsum with sepia coloured sides. I have placed on record a series of forms, found in the British Isles, closely approaching it[2], viz.—

"Subvar. nov.—Sides blackish, back grey; margin of sole light-yellow. Ireland (Scharff.).

Subvar. nov.—Sides blackish, back light bluish grey; foot whitish, margin of sole white. Yorkshire (Collinge.).

Subvar. nov.—Sides blackish, back greyish; margin of sole light-brown. Yorkshire (Collinge.).

Subvar. nov.—Animal drab colour; foot deep yellow, margin bright orange. Guernsey (Roebuck.)."

Since the above descriptions were published, similar variations have been sent to me from various parts of the British Isles, and I have made careful examinations of many hundreds of specimens in connection with the variation of this species, but not until a few weeks ago have I seen any form more closely approaching those figured and described by Simroth. Through the kindness of my Irish friends I have been favoured with large quantities of this species from the south and south-west of Ireland, and in a recent consignment of some forty examples collected near Cork, there was one specimen identical in all external features with the var. *bocagei*, Simr. A dissection of the generative organs showed no variation from the typical black forms. Nearly all the remaining specimens were normal, excepting two, which agree very closely with the example figured by Dr. Scharff,[3] and a single specimen of the var. *hibernus*, Mab.

The occurrence of the variety *bocagei* in the south of Ireland and in Portugal, relegates it, so far as distribution is concerned, to the same category as that of *Geomalacus maculosus*, Allm. Of course it would be unwise to draw any conclusions from the occurrence of a single specimen, but the same seemed worthy of recording in the hope that Irish malacologists would keep a look out for any similar forms in the future.

1 Nova Acta, 1891, Ed. lvi. p. 347, T. xiii, figs. 12, 16.

2 Ann. and Mag. N. H., 1892, vol. 9 (ser. 6), pp. 307-8.

3 Trans. Roy. Dublin Soc., 1891, vol. iv (ser. ii), p. 560, pl. lvi, fig. 16.

SPECIES OF PLECTOPYLIS RECENTLY DESCRIBED IN "SCIENCE GOSSIP."[1]

By G. K. GUDE, F.Z.S.,

London.

Plectopylis blanda, Gude.

Shell sinistral, depressed conical, widely and deeply umbilicated, whitish-corneous, finely and regularly ribbed. Spire conical, apex prominent, suture distinctly impressed. Whorls six, tumid above, rounded below, increasing very slowly and regularly, the last not descending in front, angulated above the periphery and round the wide perspective umbilicus. The cuticle is produced into deciduous hairs on the ribs, forming spiral rows. Aperture oblique, lunate, a little flattened on the upper, outer margin. Peristome white, a little thickened and reflexed, the margins united by a slight, flexuous ridge on the parietal callus. Parietal wall with a strong, vertical plate, slightly deflected anteriorly and having two minute denticles posteriorly, the upper vertically the lower horizontally elongated. A very thin horizontal fold occurs below the vertical plate and a very short fold above it. Palatal folds in two series; the anterior consisting of six thin horizontal folds, the first and sixth a little shorter and placed a little further back than the other four; the posterior series consists of four very short folds or denticles.—Major diameter, 6 mm.; minor diameter, 5 mm.; altitude, 3 mm.

Hab.—Naga Hills, Assam. Type in my collection.

A single specimen received by the writer under the name of *Plectopylis minor*, from the Naga Hills, was sent to Lieut.-Col. Godwin-Austen for examination, and was found by him to be a new species.

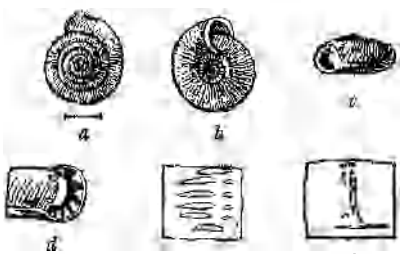

Fig. 11.—*Plectopylis blanda*, Gude.

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1 Reprinted from "Science Gossip," N.S. vol. iv. 1897-1898. By kind permission of the Editor.

It differs from *Plectopylis minor* in being larger and more elevated, and having a wider and deeper umbilicus. The parietal armature differs in having an additional fold above the vertical plate, and the anterior denticles are almost united to this fold. The palatal armature differs in the posterior folds being very short and almost reduced to denticles. Figs. 11 *a-c* show the shell in three different aspects. Fig. 11 *d* gives the posterior view of the two armatures; *e*, the inside of the outer wall; and *f*, a portion of the parietal wall, with its plate and folds. All the figures are enlarged.—("Science Gossip," iv, p. 264.)

Plectopylis trochospira var. boholensis, Gude,

differs from the type in being smaller and having a narrower umbilicus. Major diameter, 3·25 mm.; minor diameter, 3 mm.; altitude, 1·75 mm.

Hab.—Bohol Island, Philippine Islands. Type in Mr. Ponsonby's collection.

Two specimens kindly lent to me by Mr. Ponsonby, labelled with the manuscript name, "*Plectopylis trochospira* var. *boholensis* (Möllendorff)," certainly represent a distinct variety. They are smaller than the type, and the umbilicus is narrower. The

Fig. 12.—*Plectopylis trochospira* var. *boholensis*, Gude.

armature is nearly identical, but the palatal folds are connected at their posterior terminations by a very slight transverse sinuous ridge, plainly discernible externally through the shell-wall.—(Ibid., p. 285.)

Plectopylis achatina var. obesa, Gude.

Differs from the type in being more compressed and higher in proportion to the diameter; in the last whorl not widening suddenly at the aperture, and in the lower side sloping from the periphery to the umbilical angulation; the right margin of the peristome is depressed;

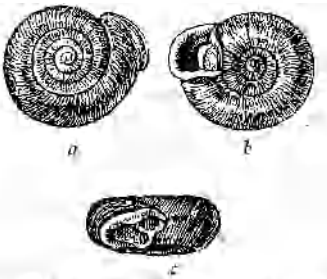


Fig. 13.—*Plectopylis achatina* var. *obesa*, Gude.

the umbilicus is deeper, and the horizontal median parietal fold does not quite reach the apertural ridge. The shell is darker in colour and more strongly ribbed.—Major diameter, 19 mm.; minor diameter, 15 mm.; altitude, 7 mm.

Hab.—Moulmain, Burma. Type in my collection.

Is darker in colour than the type, being of a fuscous chestnut. It is more compressed and distinctly ribbed; the shell is higher in proportion to the diameter, and the umbilicus is deeper; the last whorl does not widen suddenly, and the right margin of the peristome is depressed, the aperture being consequently somewhat ear-shaped; the lower side slopes from the peripherial region to the umbilical angulation. The armature does not differ materially from that of the type, except that the median horizontal parietal fold does not quite reach the apertural ridge. Six specimens were received by me from Miss Linter, five of these being more or less decorticated.—(Ibid., v, p. 115.)

Plectopylis achatina var. infrafasciata, Gude.

Differs from the type in being more rounded in contour, and in the last whorl not widening at the aperture; the umbilicus is more shallow and the peristome more flattened and reflexed; the right margin is a little depressed; the shell is blackish or purplish brown above, with a white or bluish white band below, reaching from the umbilical angulation to the lower suture; the peristome is purplish brown, the left margin being paler.—Major diameter, 22 mm.; minor diameter, 18 mm.; altitude, 8 mm.

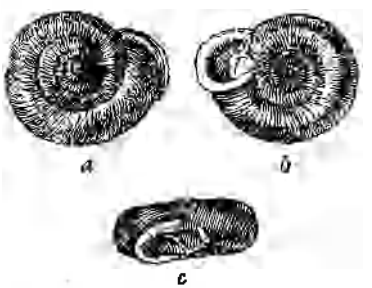


Fig. 14.—*Plectopylis achatina* var. *infrafasciata*, Gude.

Hab.—Limestone Rocks, Moulmain, Burma. Type in my collection.

Is still darker than the variety *obesa*, being of a blackish or purplish brown. Like that variety it is rounded in contour, but it is larger and more flattened; while the umbilicus is a little more shallow and

the peristome more flattened and reflexed than in the type. The peristome is livid purplish in colour, the left margin being paler and the right margin a little inflected. A whitish or bluish-white band below reaches from the umbilical angulation to the lower suture. The armature is similar to that of the type, but the horizontal parietal fold near the lower suture is visible from the aperture and terminates close to the ridge. The specimen figured was received by me from Mr. Robert Cairns. Four specimens in the collection of Mr. E. L. Layard and one specimen in the McAndrew collection (the latter labelled "*Plectopylis refuga*") all belong to this form. The shell figured in Hanley and Theobald's "*Conchologia Indica*," t. 57, f. 8 and 9, and Martini und Chemnitz "*Conchylien Cabinet*" (2) i. t. 66, f. 28-30 (from Mergui, Burma), I also refer to this variety. A specimen measuring 21 mm. in diameter is in the collection of Mr. Cairns, who also possesses four immature shells in various stages of growth, all showing sets of barriers similar to that of the immature *P. achatina* shown in fig. 81 *a*. "*Sci. Gos.*" v, p. 114.—(Ibid., p. 138.)

Plectopylis achatina var. venusta, Gude.

Differs from the type and the other varieties in being smaller. It resembles the variety *obesa* in the deeper umbilicus, in the sloping underside, in the comparative height of the shell, and in the median parietal fold not reaching the apertural ridge, but the last whorl widens more, as in the type. In colour it is pale yellowish-white, flammulated with chestnut above and at the side. The peristome is livid brown, the left margin paler, the right margin a little depressed.—Major diameter, 17 mm.; minor diameter, 14 mm.; altitude, 7 mm.

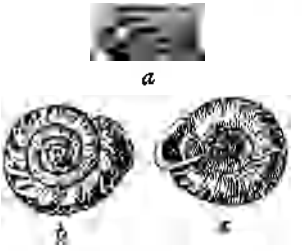


Fig. 15.—*Plectopylis achatina* var. *venusta*, Gude.

Hab.—Burma. Type in my collection.

Is smaller than any form of *P. achatina* I have seen. It is pale yellowish-white in colour, flammulated with chestnut above and at the sides. It resembles the variety *obesa* in the deeper umbilicus, the

sloping underside and in the comparative height of the shell; the median parietal fold does not quite reach the apertural ridge as in that variety, and the lower horizontal parietal fold is not visible from the aperture; it resembles the type in the sudden widening of the last whorl. The peristome is livid brown, the right margin being a little depressed; the left margin is paler. The specimen figured was received by me as *Plectopylis pachystoma*, Theobald; but as I am not aware that this name was ever published, and as I have seen other shells so labelled, I consider it expedient to discard the name altogether. A specimen in the collection of Dr. von Möllendorff, likewise labelled *P. pachystoma*, I am unable to separate from the present variety, although it shows no flammulation and the peristome is white; in other respects it is identical.—(Ibid., p. 134.)

NOTES.

Mollusca of Grange-over-Sands, Lancashire.

In the "*Journal of Conchology*" for October last, Mr. R. Standen, records a number of land mollusca from the district of Grange-over-Sands, Lancashire, a very interesting list—in spite of certain errors in nomenclature. To this list I can make the following additions, which were obtained when I was in England during the early part of 1897, viz. *Arion empiricorum*, Fér., var. *johnstoni*, Kal.; *A. subfuscus*, Drap., var. *griseus*, Cllge.; and *Agriolimax agrestis*, L.—H. V. Fowler, M.A.

Note on some Slugs from Teneriffe.

We have recently received from Mr. W. Moss, two slugs collected by Lieut. Col. G. S. Parry, at Teneriffe, these and some sent by the latter conchologist in 1895, enable us to add three well known species, not hitherto recorded we believe, to the Canary Isles.

Lieut. Col. Parry sent one of us six young specimens of *Limax maximus*, L., three of which were collected at Orotava, Teneriffe, and three at Galdar, Grand Canary; also four specimens of *Agriolimax agrestis*, L., from Santa Cruz.

The two specimens sent by Mr. Moss, are *Limax marginatus*, Müll., and *Agr. agrestis*, L., both from Orotava, Teneriffe.

After carefully examining d'Orbigny's figure and description of *L. canariensis*, we have no doubt in our own minds that it was a specimen of *Agr. agrestis*, L. Wollaston in 1878 was inclined to regard it as such, although subsequent writers have referred it to *L. variegatus*, Drp.—Walter E. Collinge and F. J. Partridge.

PROCEEDINGS OF THE MIDLAND MALACOLOGICAL SOCIETY.

5TH MEETING, NOVEMBER 11TH, 1898.

The President in the chair.

The following were elected honorary members of the Society:—

Professor W. C. M'Intosh, M.D., LL.D., F.R.S., Edgar A. Smith, F.Z.S., and Professor Dr. Heinrich Simroth.

EXHIBITS.

By Mr. Collinge: A specimen of *Limax maximus*, L., with a strongly marked white keel.

By Mr. H. H. Bloomer: A series of Indian shells chiefly of the following genera, *Vivipara*, *Bythinia*, and *Bulimus*.

By Mr. F. J. Partridge: A series of collections made in October in the district between Birdlip and Nailsworth, Gloucestershire, records of all of which were placed upon the Society's lists.

By Mr. Guy Breeden: Abnormal specimens of *Limnæa auricularia* from Harborne, Worcestershire.

6TH (ANNUAL) MEETING, DECEMBER 9TH. 1898.

The President in the Chair.

The Annual Report of the Council and the Treasurer's Statement were presented and adopted.

The Secretary reported that as no amendments had been received to the Council's nominations, the following would constitute the Council and Officers for 1899.

President—Walter E. Collinge, F.Z.S.

Treasurer—Guy Breeden.

Secretary—H. Howard Bloomer.

Other Members of Council—Messrs. H. Willoughby Ellis, F. J. Partridge, Bromley Peebles, and G. Sheriff Tye.

The President then delivered his Address, the subject being "The Morphology of the Pulmonata."

ANNUAL REPORT, 1898.

In presenting their First Annual Report your Council have to congratulate the Society upon the steady progress it has made since its foundation in July last.

Since the Inaugural Meeting six new ordinary members and three honorary members have been elected.

The financial condition of the Society is satisfactory. After payment of all liabilities there remains a balance of 19s. 9d. in hand, which includes 5s. for a subscription paid in advance.

During the year five meetings have been held, at which six papers have been read, and numerous specimens exhibited.

Your President has agreed to publish, free of all cost to the Society, its "Proceedings" in the "*Journal of Malacology*," and your Council have made very advantageous terms whereby the Journal will be supplied to all members. One part has already been issued and distributed to the members.

In order to illustrate papers read before the Society, a "Publication Fund" has been opened, and a number of contributions promised; further donations are earnestly desired.

The nucleus of a Library has been received and it is hoped to add to this in the coming year.

Your thanks are due to the President and Council of Mason University College and Prof. T. W. Bridge, for the facilities they have so kindly given in permitting our meetings to be held in the Zoological Department of the College.

7TH MEETING, FEBRUARY 10TH, 1899.

The President in the Chair.

The following nominations for membership were read:—

Messrs. F. W. Carpenter, and William Moss, F.C.A.

PAPER READ.

"Note on some Slugs from Teneriffe," by Walter E. Collinge, F.Z.S., and F. J. Partridge.

EXHIBITS.

By Mr. Guy Breeden: Shells of the British species of *Hyalinia*.

By Mr. F. J. Partridge: Two sinistrose monstrosities of *Buccinum undatum*, also a specimen showing strong carination of the whorls, and a collection of *Clausilia* comprising all the British species and many varieties.

By the President: Specimens of *Omalonyx felina*, Guppy, in alcohol. The radula of various species of *Limax*, *Arion*, *Amalia*, *Testacella*, *Vitrina*. *Hyalinia*, *Zonites*, *Helix*, *Clausilia*, *Limnæa*, *Vivipara*, *Physa*, *Ampullaria*, *Chiton*, *Conus*, *Purpura*, etc. A series of preparations of the integument of various Pulmonates.

CURRENT LITERATURE.

Pilsbry, H. A.—Tryon's Manual of Conchology, ser. i, vol. xvii, (pts. 65A, 68), pp. xxxii + 225-348, pls. xxxviii-xlviii; ser. ii, vol. xi, (pt. 44), pp. 209-339, pls. xlii-li. Philadelphia: Academy of Natural Sciences.

In the Marine, or first, series of this work Mr. Pilsbry, with the assistance of Dr. Sharp, issues the concluding portion of the bibliographical catalogue of fossil Scaphopoda, and he also gives an outline account of the Aplacophora, following mainly the system of Simroth in Bronn's "*Klassen und Ordnungen des Thierreichs.*" We may note *Tesseracme*, a new section of *Dentalium* for the group of *D. apicale*; *D. bednalli*, n. sp., from S. Australia; and revisions of nomenclature on pp. 253, 255. The bibliographical list will also prove of great service.

In that little known group, the Aplacophora, Mr. Pilsbry proposes *Simrothiella*—a well-deserved compliment—as a subgenus of *Proneomenia*, and he also suggests *Ichthyomenia* as a new name for *Ismenia*, Pruvot *non* King.

In chronicling the completion of this series, we welcome the announcement that it is proposed to undertake a monograph of the "Marine Bivalves," and trust it will prove as successful as the recent volumes of the first series have been.

In the second series Mr. Pilsbry continues that exceedingly difficult genus *Drymaeus*, and completes his review of the South American species. We may chronicle as new species *D. subsimilaris*, loc. incert., *D. blandi*, Columbia, and *D. fremoensis*, Columbia; also interesting rectifications of nomenclature on pp. 219, 291, 297, and 301.—E. R. S.

Crick, G. C.—List of the Types and Figured Specimens of Fossil Cephalopoda in the British Museum (Natural History). 8vo, pp. 103. London : 1898.

The desirability and utility of lists which record the original names and references of type specimens cannot be overestimated. The one before us contains a record of all the types and figured specimens of both British and foreign Fossil Cephalopoda, which are preserved in the British Museum.

The names follow in alphabetical order, each specimen being entered under the name first given to it, with a reference to the work in which the same was either described or figured, then follow the formation and locality with the registered number in the collection, together with short notes correcting localities or relating to the condition of the specimen.

All praise is due to Mr. Crick for the very careful manner in which he has carried out this useful piece of work, invaluable alike to the specialist and malacologist in general.—W. E. C.

Crick, G. C.—On the muscular attachment of the Animal to its shell in some fossil Cephalopoda (Ammonoidea). Trans. Linn. Soc. Lond (2nd ser. Zool.), 1898. vol. vii, pp. 71-113, pls. 17-20.

Le mode d'attachement du corps à la paroi de la grande chambre qui termine la coquille est connu chez un certain nombre de Céphalopodes de la famille des Nautiloides ; mais il ne l'est que chez très peu d'Ammonoides. L'auteur s'attache à montrer que l'animal de l'Ammonoide était fixé à la portion dorsale de la coquille, probablement de la même façon que le Nautile actuel, c'est à dire au dessus du bord de la dernière cloison, par deux muscles coquillers plus ou moins écartés l'un de l'autre et par un muscle annulaire. Dans ce premier mémoire Mr. Crick décrit la forme et la position de ces impressions dans les divers types d'Ammonoides.

Dans le Nautile actuel les deux traces musculaires sont réunies dorsalement et ventralement par une étroite bandelette, l'anneau (annulus). Les fibres musculaires sont insérées, non pas directement sur la substance calcaire de la coquille, mais sur une mince couche de conchyoline. Ordinairement il ne reste à l'interieur de la coquille, pour indiquer ces insertions, qu'une ligne étroite généralement en relief, qui correspond à la limite antérieure de ces impressions musculaire et annulaire. La limite postérieure, au contraire, se voit très rarement. Sur un moulage interne cette ligne apparait comme un sillon linéaire ; c'est à cet état que l'on peut l'observer sur les moulages naturels de la chambre antérieure des fossiles. L'auteur a mis ces lignes en évidence dans le *Nautilus pompilius* en remplissant la chambre antérieure de paraffine, et en dissolvant ensuite le calcaire par l'acide chlorhydrique.

L'auteur décrit d'abord les deux types fossiles chez lesquels il a trouve ces indications le plus clairement marquées. C'est d'abord chez un *Cryoceras quadratum*, n. sp., provenant du Speeton clay of Yorkshire qu'il a vu les impressions musculaires les plus nettes ; elles se touchent presques ; elles sont très peu au dessus du dernier septum ; leur surface est grenue, leur limite antérieure est nette tandis que la postérieure est beaucoup plus floue. Il n'y a pas trace d'anneau. Dans le petit espace triangulaire séparant les deux impressions il y a deux petites taches doubles, longitudinales, probablement en relation avec les attaches musculaires de l'animal.

Les traces de l'anneau ont été relevées sur divers échantillons mais surtout sur un *Cardioceras excavatum*, J. Sowerby, de l'Oxford Clay, conservé au British Museum. On y voit distinctement deux lignes flexueuses, à peu près parallèles, écartées l'une de l'autre de 1·5 mm. qui vont du bord ombilical au bord périphérique et qui suivent vaguement les sinuosités des lobes du dernier septum.

Ces premières indications étant posées, l'auteur recherche dans une importante série d'Ammonoides les traces qui peuvent correspondre à celles qu'il a relevées dans les deux types précédents. Il en a trouvé chez un grand nombre d'entre eux coincidant avec l'anneau et les muscles coquillers. It est impossible, dans ce court résumé, de donner la liste des espèces, genres et familles, où ces vestiges ont été

relevés. On les trouvera parfaitement exposés et accompagnés de très beaux dessins, probants et démonstratifs, dans les quatre planches de cet important mémoire.

Un certain nombre de caractères anatomiques ont conduit divers auteurs à ranger les Ammonoides parmi les Céphalopodes Dibranches; mais les constatations de Mr. Crick montrent clairement que l'animal des Ammonoides possédait une musculature de fixation tout à fait analogue à celle du Nautile, seul representant actuel des Tétrabranches. On trouve en effet, dans les deux cas, un anneau en plus des muscles coquillers: cet anneau devait servir au manteau de surface de fixation sur la coquille.—L. JOUBIN.

Martens, E. von. und Wiegmann, Fr.—Land-und Süsswasser-Mollusken der Seychellen. Mitteil. Zool. Samml. Berlin, 1898, Bd. 1, pp. 1-94, Tf. i-iv.

Dr. E. von Martens here describes and figures the following new species and varieties:—*Ennea erinaceus*, and var. *uniscriata*, *Streptaxis constans*, and var. *silhouettæ*, *S. violascens*, *S. perelegans*, *S. braueri*, *Helix præumida*, Morel., vars. *mahesiana* and *silhouetta*, *Buliminus ornatus*, Dufo, var. *biornatus*, *B. aldabræ*, and *Hapalus braueri*. A new genus (*Priodiscus*) is constituted for the *Trochomorpha? serrata*, Nev.

In the second part (pp. 37-94) by Herr Wiegmann, a beautifully illustrated account is given of the anatomy of most of the above new forms, and also the following:—*Ennea dussumieri*, Fér., *Streptaxis souleyetianus*, Petit, *Streptostele nevilli*, H. Ad., and its var. *dubia*, Wgm., *Priodiscus serratus*, H. Ad., *Kaliella subterritula*, Nev., *Helix similaris*, Fér., *H. unidentata*, Chemn., and *H. studeriana*, Fér., *Buliminus ornatus*, Dufo, var. *fulvicans*, *Pfr.*, *Achatina panthera*, Fer., *Subulina octona*, Chemn., and *Succinea mascarena*, Nev.

In addition to plates 3 and 4 illustrating the anatomy, there are some 40 figures in the text.—W. E. C.

Wiegmann, F.—Ergebnisse einer zoologischen Forschungsreise in den Molukken und Borneo. Landmollusken (Stylommatophoren). Abhandl. d. Senckenb. naturf. Gesell., 1898, Bd. xxiv, pp. 289-557, Tf. xxi-xxxi.

In the space at our disposal it is quite impossible to do more than enumerate the species which the author has anatomically described in this beautiful and valuable memoir. To those malacologists who regard the slug-fauna of Borneo, Java, etc., as worked out, we would commend a perusal of Herr Wiegmann's description of the anatomy of two new species of *Parmarion*, illustrated by 37 figures.

A word must be said in praise of the number and execution of the illustrations, accompanying the 268 pages of letterpress, there are 11 folio plates of 378 figures, all of which are excellent.

The species described are as follows:—*Rhysota brookei*, Ad. and Reeve; *Parmarion maculosus*, n. sp.; *P.* (?) *dubius*, n. sp.; *Helicarion kukenthali*, Kob.; *H. halmahericus*, Kob.; *H. minahassae*, Kob.; *Medyla viridis*, Q. and G.; *Everettia jucunda*, Pfr.; *E. möllendorffi*, Kob.: *E.* (?) *fulvocarnea*, Mrts; *Dendrotrochus conicoides*, Metc.; *Hemiplecta densa*, Ad. and R.; *Xesta cincta*, Lea.; *X. halmahérica*, Strub.; *Dyakia hugonis*, Pfr.; *Trochomorpha lardea*, Mrts.; *T. bicolor*, Mrts.; *T. planorbis*, Less., *T. timorensis*, Mrts.; *Plunispira exceptiuncula*, Fér.; *P. expansa*, Pfr.; *P. scheepmakeri*, Pfr., v. *halmaherica*, Kob.; *P. surrecta*, Bttgr. and Strub.; *P. zonalis*, Fér.; *P. loxotropis*, Pfr.; *Pseudobba quoyi*, Desh.; *Phania kukenthali*, Kob.; *Albersia pubicepa*, Mrts.; *Papuina vitrea*, Fér.; *Amphidromus porcellanus*, Mouss.; *A. sinistrals*, Reeve.—W. E. C.

Viguier, C.—Contributions a l'étude du développement de la *Tethys fimbriata*. Arch. de Zool. exp. et gen., 1898, (S. 3) vol. vi, pp. 37-62, pls. vii-ix.

Dr. Camille Viguier in the 5th of his series of "*Recherches sur les Animaux inférieurs de la Baie d'Alger*" gives an interesting account of the development of the large Opisthobranch *Tethys fimbriata*. He compares and contrasts the early

stages with the account given by Heymons (*Zeitschr. f. wiss. Zool. 1893*) of the development of the allied mollusc *Umbrella mediterranea*, and also with Conklin's account of *Crepidula*, from which it appears that on the whole *Tethys* has a much more regular segmentation.

There have have been difficulties in the research. The animals are apparently not easy to obtain, and the spawn is difficult to keep alive and normal. This last spring (1898) none was obtainable.

For the rest—the segmentation is unequal, and of the spiral type known in various molluscs; but for the exact "cell-lineage" of the micromeres and macromeres we must refer to the full description and the figures. The three plates in execution and clearness of shading certainly leave much to be desired, but we gather from a "Note" at the end of the paper that this has not been altogether the author's fault.

Of the later embryonic and larval stages the account is brief. Dr. Viguier has evidently, on account of the difficulty of rearing, not had quite enough material in these older periods at his disposal. We concur entirely in his remarks as to the great interest and importance attaching to careful studies of the later transformation of the larval Opisthobranchs.—W. A. HERDMAN.

Sturany, R.—Catalog der bisher bekannt gewordenen Südafrikanischen Land-und Süsswasser-Mollusken. Denk. K. Akad. Wiss. Wien, 1898, Bd. lxvii, pp. 537-642, 3 pls [Jan. 1899.]

Melvill, J. Cosmo. and Ponsonby, J. H.—A Contribution towards a Check-list of the Non-marine Molluscan Fauna of South Africa. Proc. Malac. Soc. Lond., 1898 (Dec.), vol. iii, pp. 166-184.

The faunal regions dealt with in these two papers vary somewhat, for while Dr. Sturany includes the country up to the Zambesi, Messrs. Melvill and Ponsonby draw the line at the Tropic of Capricorn. Unfortunately the former author appears —though he gives a lithographed supplement dated November—to have been unaware of the latter authors' paper (*Ann. Mag. N.H.*, August 1898, (7) vol. ii, pp. 125-30, pl. vii), as also Sowerby's "*Appendix to the Marine Mollusca.*"

The most striking feature is the great abundance of the genus *Ennea*. No less than 73 are quoted by Dr. Sturany and 75 by Messrs. Melvill and Ponsonby. One species (*E. obovata*) quoted by these latter authors appears to be omitted from Dr. Sturany's list: it would also be of interest to know his authority for quoting *E. zanguebarica* as S. African. Morelet, when describing it, appears not to have properly stated its locality, but the very name is a note of warning. Dr. Sturany criticises, and with some show of reason, the figures given by the English authors, but when he complains (p. 542) that the basal tooth in *E. perspicua* is not shown in the original drawings, he seems a little hypercritical, as it is described as "*interna.*"

The classification of the Helicoid and Zonitoid land shells appears to vary greatly in the two lists: perhaps it will be long before this is properly cleared up, as the anatomy is unknown in most cases. While Dr. Sturany gives 118 species, Messrs. Melvill and Ponsonby give 105 for their more restricted region.

It may be pointed out that *Pella*, used by Dr. Sturany, is preoccupied in Coleoptera: many other points of difference as to the value of certain names arise, too elaborate in their nature to be dealt with here, but it may be remarked that *Helix fanulus* (Sturany, p. 588) is the young of a species of *Ennea*.

The slugs do not appear to be very numerous, less than a dozen species in all; while Dr. Sturany quotes *Agriolimax lævis*, the English authors quote *A. agrestis*, and appear to have overlooked *Urocyclus kirkii* and *Oncidium peronii*.

The *Achatinidæ* are, as would be expected, fairly numerous; we note that in the English authors paper *A. schencki* does not appear. *Buliminus* is well represented as are the *Pupidæ*. *Buliminus vitellinus* appears to have escaped the notice

of Messrs. Melvill and Ponsonby; while on the other hand *B. picturatus* was described, not from Natal as Dr. Sturany quotes, but from "Mogadoxo, Zanzibar." Further this author complains that the original describer does not state whether *Pupa luyardi* is dextral or not, but this may be gathered from the description, which refers to the right, as opposed to the columellar, lip.

The *Succineidæ* are moderately represented as are the *Limnæidæ*. The *Auriculidæ* are few; we do not notice in Dr. Sturany's paper *Auricula pusilla, Melampus granifera*, or *Alexia myosotis*.

In the land operculata the lists differ widely. My attention has been called to the exceeding similarity of *Cyclotus natalensis*, Pfr., and *Cycloph. klobukowskii*, Morlet; comparing the two I am entirely unable to find any distinction and, as Pfeiffer's locality has never been confirmed, I regard it as erroneous. Dr. Sturany omits *Pomatias* (=*Cyclostoma*, auct.) *harlvigianum, lineatum*, and *sarcodes*, while he gives *parvispirum* and *goudoteanum*, not mentioned in the other list. Of these last two species the former may come really from Zanzibar, as Morlet was erroneous in several references in the paper quoted, and the latter is also uncertain in S. Africa and may belong to Madagascar.

There are also a few species of such genera as *Cleopatra, Hydrocena*, etc.; and about 14 species of Pelecypoda.

We give below a summary of Dr. Sturany's list to show the distribution in the various families.

Testacellidæ .	2	*Bulimin idæ* . .	24	*Melaniidæ* . .	4
Streptaxidæ .	73	*Pupidæ* . . .	34	*Hydrobiidæ* . .	6
Rhytididæ . .	16	*Succineidæ* . .	9	*Paludinidæ* . .	2
Vitrinidæ . .	13	*Vaginulidæ* . .	4	*Ampullaridæ* .	5
Limacidæ . .	1	*Onchidiidæ* . .	1	*Assimineidæ* .	4
Urocyclidæ . .	5	*Limnæidæ* . .	24	*Hydrocenidæ* .	1
Zonitidæ . .	11	*Auriculidæ* . .	9	*Neritidæ* . . .	3
Helicidæ . .	78	*Truncatellidæ* .	2	*Cyrenidæ* . .	7
Achatinidæ . .	49	*Cyclophoridæ* .	14	*Unionidæ* . .	7

Total 408 species.

Messrs. Melvill and Ponsonby's list includes between 360 and 370 species.

A study of the two lists leads to the idea that while one author has specially devoted himself to bibliographical research, the others have dealt mainly with named specimens. The two lists will stimulate research in South Africa, where, doubtless, many species still await the collector.—E. R. Sykes.

Sarasin, P. and F.—Die Süsswasser-Mollusken von Celebes. Demy 4to, Bd. I, pp. viii+104, Tf. i-xiii. Wiesbaden: 1898, C. W. Kreidel.

In this beautiful volume the brothers Sarasin describe a large series of freshwater molluscs from the Celebes, most of which are new. The work is prefaced by a short account of the operculum and radula of the *Melaniidæ* of the Celebes, the remaining pages being occupied by the descriptions of the undermentioned new genera and species:—*Melania toradjarum, paliolarum, patriarchalis*, and var. *towutensis, gemmifera, monacha, scalariopsis, molesta, carota, testudinaria*, v. d. Busch., var. *perconica, zeamais, insulæ sacræ, tomoriensis, kuli, centaurus, asperata*, Lam., var. *celebicola*. *Tylomelania*, nov. gen. *T. neritiformis, carbo, porcellanica* and var. *connectens*. *Vivipara crassibucca, persculpta, lutulenta, rudipellis*. A new genus of *Limnæidæ—Miratesta*—is described with a short account of the anatomy: containing *M. celebensis*, and the vars. *robusta, ampullacea* and *gracilis*. *Isidora callosa*. An interesting new genus—*Protancylus*—is described with two species *adhaerens* and *pileolus*, anatomical details are given of the latter. Of the Lamellibranchiata, *Corbicula manlannensis* and *possoënsis*.

The work is illustrated by 6 not particularly clear Meisenbach plates, and 7 lithographic plates by Werner and Winter which leave nothing to be desired. The

work is beautifully printed and reflects the greatest credit on all concerned in its production.—W. E. C.

Posselt, H. J.—Conspectus Faunæ Groenlandicæ. Brachiopoda et Mollusca. 8vo, pp. xix + 298, T. i-ii and map. Kjobenhavn: 1898.

This beautifully illustrated work may be regarded as a contribution from the Malacological Department of the Zoological Museum of the University of Copenhagen, under the able directorship of Dr. Jenson. It describes no less than 249 species and varieties of molluscs, excluding a dozen or more doubtful ones. The distribution has been worked out in great detail. The original descriptions are in many cases reproduced, and much information respecting points of nomenclature and classification is given.

The following species and varieties are new :—

Pecten imbrifer, Lov., var. n. *lamellosa*, *Nucula groenlandica*, n. sp., *Bela woodiana*, Moll., var. n. *tumida*, *B. decussata*, Couth, var. n. *inflata*, *Sipho* (*Siphonorbis*) *lindahli*, n. sp., *S* (*Tritonofusus?*) *costiferus*, n. sp., *Buccinum undulatum*, Moll., var. n. *percrassa*, *B. groenlandicum*, Chem., var. n. *major*, *B. perdix*, (Beck) Morch, vars. n. *lutea*, *persulcata*, *wandeli* and *carinata*, *B. hydrophanum*, Hancock, vars. n. *tumidosa*, *percrassa* and *texturata*.—W. E. C.

Bergh, R.—Die Opisthobranchier der Sammlung Plate. Zool. Jahrb. (Suppl. iv.) 1898, pp. 481-582, T. 28-33.

Professor Bergh here describes and figures a series of Opisthobranchs collected by Dr. Plate on the west coast of South America. Most of the species are new, some forming the types of new genera, whilst a few species originally described by d'Orbigny in 1847 are dealt with. Of the Tectibranchia there are 2 new species, *Aplysiopsis juanina*, n. gen., n. sp., a form allied to *Aplysia*, and *Pleurobranchus platei*. Amongst the Nudibranchia the following are new: *Archidoris rubescens*, *A? incerta*, *Anisodoris*, a new genus which is distinguished from the true *Archidoris* by the presence of a large prostate, as in *Homoiodoris*, but distinguished from the latter by the absence of an armour to the otherwise very strong vagina. It includes the *Doris punctuolata*, d'Orb., and *D. variolata*, d'Orb., in addition to *A. marmorata* and *A. tesellata*, which are new. *Platydoris punctatella* is an interesting new species, while *Tyrinna nobilis* forms the type of a new genus distinguished by its peculiar tentacles, which are furnished on the inner side with a series of folds, the penis is unarmed. The remaining new species are *Chromodoris juvenca*, *Euplocamus maculatus*, *Candiella australis*, *Cratena cavanca* and *pusilla*, *Phidiana exigua*.

A supplement describes 2 species of *Marseina* (*perspicua*, L., and *pacifica* Bgh.), of the former the following varieties are new, *incerta*, *maculosa*, and *marginata*.

W. E. C.

Howe, J. L.—Variation in the shell of *Helix nemoralis* in the Lexington, Va., Colony. Amer. Nat., 1898, vol. xxxii, pp. 913-23, 2 figs.

This is an interesting paper, bristling with statistics, on what appears to be the only successful colony of *H. nemoralis* in the United States. It seems strange that this attractive species should not have been more widely transplanted either accidentally or by design. Attempts to colonise it from the Lexington source in other parts of the United States have apparently proved a failure, with the possible exception of Blairstown, Pa.

Mr. Howe finds, as the result of very careful study, that the tendency to variation in this colony proceeds along definite lines, and is not the same in all localities of the colony, which now extends over an area of about 1¼ miles by half a mile. He also finds that a considerable destruction of individuals does not materially modify this tendency. The lines of variation are much the same as with us, with one exception, viz., that there is a great development of supplemental bands, either by split-

ting off from the normal five, or by the appearance of bands altogether additional to these. About 4 per cent. of the shells collected show this tendency. In the ground colours and their relative frequency there appears to be little departure from European types. It is difficult to judge of the value of the percentage tables in which Mr. Howe elaborates the frequency of a number of the band-formulæ, without knowing whether the series of shells, on which they are based, were the result of collecting *every nemoralis* procurable at the time, or only of a judicious selection. The former is quite possibly the case, as we read of considerably more than 2000 specimens being taken in two consecutive summers from an area 200 feet square, and that a garden !—B. TOMLIN.

Babor, J. F.—Note on *Ariunculus austriacus*, n. sp., from the Alps in Austria. Proc. Malac. Soc. Lond., 1898, vol. iii, pp. 156-8, fig. 1.

Dr. Babor describes as a new species a specimen of *Ariunculus* from Schneeberg near Vienna (Coll. of Dr. A. Wagner). It approaches most closely the Sardinian species *A. isselii*, Bgt.—W. E. C.

Newbigin, Marion J.—Colour in Nature, a study in Biology. 8vo, pp. 344, London: 1898, John Murray.

The parts relating to the coloration of the Mollusca occupy pp. 184-95 and pp. 203-4. So much has been written in recent years respecting colour variation, chæmalonic colour changes, and changes which take place in a life time, in the Mollusca, which find no mention here, that the malacologist will be greatly disappointed with this chapter. On p. 203 it is stated "In the Mollusca colour-patterns are, except in the cuttles, confined to the shells," the writer is evidently unaware of the colour-patterns exhibited by *Limax maximus*, *Tebennophorus striatus* and many other molluscs. Next to the Insecta few animals show so favourably, protective colouring, rapid colour changes, etc., as the mollusca, and some reference to these would have proved interesting.

In other parts of the work there is much that is new and interesting.—W. E. C.

Crick, G. C.—Descriptions of new or imperfectly known species of *Nautilus* from the Inferior Oolite. Proc. Malac. Soc. Lond., 1898, vol. iii, pp. 117-39, figs. 1-15.

The admirable work that Mr. Crick has of recent years been carrying out in the collections of Fossil Cephalopoda in the British Museum, merits the best thanks and appreciation of all malacologists. The present paper describes and figures a series of new or imperfectly known species of *Nautilus*, and is in every way a piece of useful and careful work. The new species are: *N. bradfordensis*, *fuscus*, *crassinuatus*, *impendens*, *enterebratus*, *rotundus*, *subrotundus*, *semiornatus*, and *exiguus*, all in the collection of the British Museum.—W. E. C.

Webb, W. M.—On the Anatomy and Synonymy of the Genus *Mariælla*, Gray. Proc. Malac. Soc. Lond., 1898, vol. iii, pp. 147-55, pl. ix.

Two species are described and figured viz. *M. dussumieri*, Gray, and *M. beddomei*, G.-A. Mr. Webb accepts the views of previous writers respecting *Tennentia thwaitesii*, Humb., and *Vega nordenskioldi*, Westr., regarding them as synonymous with the former species.—W. E. C.

Mollendorff, O. v.—*Mariælla*, Gray. Nachr. Deutsch. Malak. Gesell., 1899, pp. 20-22.

Philippinella, gen. nov. is proposed for *Tennentia quadrasi*, Mlldff., and *T. carinata*; also *T. philippinensis*, Semper.

Simroth, H.—Über die Gattung *Parmacella*. L'Ann. du Mus. Zool. l'Acad. d. l'Acad. Imp. Sc. St. Petersb., 1898, pp. 1-12.

Smith, Edgar A.—On the Land-Shells of Curaçoa and the neighbouring islands. Proc. Malac. Soc. Lond., 1898, pp. 113-16, figs. 1-11.

Pilsbry, H. A.—Remarks on the American species of *Conulus*. Naut., 1899, pp. 113-17.

Sterki, V.—Some studies on the Morphology of the *Cycladidæ*. Ibid., pp. 117-19.

Vayssière, A.—Monographie de la famille des Pleurobranchidés. Ann. d. Sci. Nat., 1898, T. viii. (8th ser.) pp. 209-402, pls. 13-28.

Prof. Vayssière has here given a most valuable account of the *Pleurobranchidæ*. After a short history of the work of previous writers, an admirable account of the general anatomy is given, followed by the systematic portion, where the individual anatomical characters of most of the species are set forth in detail. The following genera are recognised: *Berthella*, Blainv., with 7 species, one of which is new (*B. brocki*). Cuvier's genus *Pleurobranchus* is divided into three sub-genera, viz.: *Bouvieri*, Vays., with 6 species, *Pleurobranchus* (*sens. prop.*), Cuv., with 35 species, and *Susania*, Gray, with 6 species; and *Oscanius*, Leach, with 1 species.

The anatomical characters of the above sub-genera seem sufficiently well marked and important to rank as genera.—W. E. C.

Johnstone, J.—The Spawning of the Mussel (*Mytilus edulis*). Rpt. for 1898, Lancashire Sea-Fisheries Lab. Liverpool: 1899, pp. 36-53, pls. i-ii.

From an extensive series of observations made during 1898, the author has been able to arrive at some definite conclusions respecting the date of spawning of this species. Briefly summarised the results arrived at are as follows: the maximum spawning period occurs about June or July, during which there is a rapid and complete extrusion of the genital products, accompanied by a series of histological changes in the visceral mass and mantle; then follows a short period of rest during part of August and September. The reformation of the germinal epithelium next commences to take place, followed by a slow proliferation of ova and spermatozoa, which occupies the rest of the year. The genital products are formed less rapidly in the spring, during which period a slow emission of these takes place, continuing on until the maximum spawning period occurs.

The different histological changes in the gonads at the various stages are described and figured.—W. E. C.

Herdman, W. A.—Oysters and Disease. Ibid., pp. 62-67.

Kohn, C. A.—Note on Occurrence of Iron and Copper in Oysters. Ibid., pp. 67-79.

Asheroft, R. L.—Mussel-beds and Mud-banks. Ibid., pp. 79-81.

Amaudrut, Alex.—La Partie Antérieure du Tube digestif et la torsion chez les Mollusques Gastéropodes. Ann. d. Sci. Nat., 1898, T. vii (8th ser.) pp. 1-291, pls. i-x.

Pilsbry, H. A.—New American Land Shells. Naut., 1899, vol. xii, pp. 101-104.

Pilsbry, H. A.—*Potamolithus jacuhyensis*, n. sp. Ibid., p. 113.

Sterki, V.—New *Pupidæ*. Ibid., pp. 127-29.

Dall, Wm. H.—On a new species of *Drillia* from California. Ibid., p. 127.

Cockerell, T. D. A.—Another new snail from New Mexico. Ibid., p. 131.

Crosse, H.—Études Malacologiques sur des Genres nouveaux ou peu connus. Journ. de Conchyl., 1898, vol. xlvi, pp. 205-8, pl. x, figs. 1-2.

Hervier, R. P. J.—Descriptions d'espèces de mollusques, provenant de l'Archipel de la Nouvelle-Calédonie. Ibid., pp. 209-13, pl. x, figs. 3-4.

Fischer, H.—Description d'une nouvelle de *Plectopylis*. Ibid., pp. 214-18, figs. 1-6.

Dautzenberg, Ph. et Fischer, H.—Note sur le *Pleurotomaria beyrichi*. Ibid., pp. 218-24, pl. xi.

Mayer-Eymar, C.—Description de Coquilles fossiles des terrains tertiaires inférieurs. Ibid., pp. 225-37, pls. xii-xiv.

Wohlberedt, O.—Molluskenfauna des Königreichs Sachsen. Nachr. Deutsch. Malak. Gesell., 1899, pp. 1-20.

Möllendorff, O. von.—Die Phenacoheliciden. Ibid., pp. 22-25.

Kobelt, W.—Die Fauna der Cocosinsel. Ibid., pp. 26-28.

Naegele, G.—Eine neue *Pomatia* aus Persien. Ibid., pp. 28-29.

Helix (*Pomatia*) *salomonica*, Naeg.

Koch, V. von.—Ein neuer Fundort von *Helix caperata*, Mtg. Ibid., p. 29.

Crick, G. C.—On a Deformed Example of *Hoplites tuberculatus*, J. Sowerby, sp., from the Gault of Folkestone. Geol. Mag., 1898, vol. v, pp. 541-2, figs, *a. b. c.*

Herdman, W. A.—The Twelfth Annual Report of the Liverpool Marine Biology Committee, etc. Liverpool: 1898, pp. 1-56, figs. 1-5.

Standen, R.—Notes on the Land Mollusca of Grange-over-Sands, Lancashire. Journ. Conch., 1898, vol. ix, pp. 113-14.

Pallary, P.—Deuxième contribution à l'étude de la Faune malacologique du Nord-Ouest de l'Afrique. Journ. de Conchyl., 1898, vol. xlvi, pp. 49-170, pl. v-ix.

Reviews of a number of important papers received, are for want of space, compelled to stand over until the next issue.

EDITOR'S NOTES.

Professor Wm. Healey Dall of the Smithsonian Institute, has recently been elected an Honorary Member of the Conchological Society of Gt. Britain and Ireland.

The recently issued volume for 1898 of the Palaeontographical Society, contains amongst other memoirs:—The Carboniferous Lamellibranchiata, pt. 3. by Dr. Wheelton Hind; the Inferior Oolite Ammonites, pt. 10, by Mr. S. S. Buckman; and the Carboniferous Cephalopoda of Ireland, pt. 2, by Dr. A. H. Foord.

In the "Naturalists' Journal"—an interesting and practical monthly—beginners will find many useful papers and notes dealing with British Land and Freshwater molluscs.

We regret to have to record the deaths of A. H. Everett, in June last; Giovanni Michellotti, on December 21st, 1898, aged 84; and E. W. Roper, on December 31st, 1898, aged 39.

THE

JOURNAL OF MALACOLOGY.

No. 3. OCTOBER 4TH, 1899. VOL. VII.

MALACOLOGICAL COMMUNICATIONS FROM NEW ZEALAND.

BY HENRY SUTER,

Christchurch, N.Z.

1.—On the Carnivorous Genera Paryphanta and Rhytida.

(Plate iii, figs. 1, 1a.)

IN Fischer's "*Manuel de Conchyliologie*" it is stated, that *Rhytida* is ovoviviparous, the assertion being no doubt based on the observations made by E. Marie and H. Crosse on *Rhytida inaequalis* from New Caledonia. This at once led me to place the New Zealand *R. meesoni* in the genus *Paryphanta*, having ascertained that it also laid calcareous eggs. The shell however is quite characteristic of *Rhytida*, being malleated, containing more carbonate of lime, and being therefore in the living animal not so pliable as the shells of *Paryphanta*, and the periostracum not overlapping the inner layer of the shell at the peristome. Besides this species, the type of the genus, *R. greenwoodi*, is now also known to lay calcareous eggs,[1] and it is to be surmised that all our species of *Rhytida* are ovoviviparous, which is also the case with *Paryphanta bushyi, hochstetteri, urnula, edwardi* and *Schizoglossa novoseelandica*, the latter being evidently a *Paryphanta* in which the shell has become rudimentary.

The composition of the shell of Paryphanta is almost unique, inasmuch as the periostracal layer, consisting chiefly of conchin, is predominant, and very little calcareous matter is deposited on its inner

[1] E. Hutchinson, Jun., Trans. New Zeal. Inst., xxx, p. 335.

side. In *P. urnula* only about the first two whorls are calcareous, the remainder consisting simply of conchin. I found this out in the following way. Having received a specimen of that mollusc preserved, unfortunately, in strong alcohol, I was unable to remove the hardened animal without destroying the shell, and the idea struck me (also unfortunate!) of removing the animal by immersing the whole specimen in a solution of caustic potash. The result was a dark brown solution; the first two calcareous whorls intact, the radula, and a fine, brown membrane from the periostracum swimming in the liquid!

The situation of the eyes in *Paryphanta* and *Rhytida* differs somewhat from that in the *Helicidae*. In the latter the eyes are not quite at the top of the ommatophores, but on their upper side; in our two genera of carnivorous snails however they are still much more removed backward, as fig. 1*a* shows. This is most likely due to a great development of the olfactory bulb, as these molluscs have to hunt for their food under moss, in loose mould, etc., where eyes cannot be of much use. I give here a figure of *R. greenwoodi* (Pl. iii, fig. 1) drawn from life, which shows the presence of small buccal papillae.

The food of Paryphanta and Rhytida consists no doubt chiefly of earthworms, at least in captivity they readily feed on them. They extend the odontophore, hook the worm with the long sharp teeth on the former, and by withdrawing the tongue the worm passes slowly down into the stomach. During that operation all the tentacles are retracted, no trace of them can be seen. Occasionally they also feed on other molluscs, and it is significant that in the same situations where *Paryphanta* shelters during the winter months *Athoracophorus* is also found. To a specimen of *R. greenwoodi* I gave two living *Flammulina thaisa;* the following day I found the latter shells quite empty, not a trace of the animals left, one specimen with one large, the other with two smaller holes rasped out at the base, through which the tongue of *Rhytida* could be passed to extract those parts of the animal lying behind the columellar muscle. They do not touch introduced slugs, such as *Limax agrestis*, the sticky slime is probably not to their liking.

It is not difficult to keep *Paryphanta* and *Rhytida* in captivity for a considerable time if they are provided with sufficient moisture, a good quantity of fresh moss and earthworms for food, but I have never observed them copulate or even lay eggs.

The radula.—It is not always easy to say whether any given species has a rhachidian tooth on its radula or not. This tooth is certainly the first worn or broken off, and I have seen many odontophores on which for the whole length only a few central teeth could be made

out. Thus Mr. Moss has found a central tooth on the radula of *R. greenwoodi*, and there is no doubt about it, as he kindly sent me a photo showing that tooth distinctly. But neither Capt. Hutton nor myself have come across a radula of that species with a rhachidian tooth. *Rhytida* has a smaller number of teeth in a transverse row, and they only vary from 9 to 18 on each side from the mesial; the central tooth is usually wanting. It may be of some interest to give here the formulæ of the species that have been examined:—

Rhytida greenwoodi, Gray. 9—0—9 to 11—0—11 (Hutt.).
„ „ 11—1—11 (Moss.).
„ *patula*, Hutt. 18—0—18 (Hutt.).
„ *citrina*, Hutt. 17—0—17 (Hutt.).
„ *australis*, Hutt. 16—0—16 (Hutt.).
„ *meesoni*, Sut. 12—0—12 (Sut.).

Species of *Paryphanta* have as a rule a much larger number of teeth on a transverse row, which of course corresponds in some measure with the much larger size of the animal and the radula, and the number of teeth on each side from the middle varies from 14 to 67. A rhachidian tooth is nearly always present. Here follow the formulæ of some of the species:—

Paryphanta busbyi, Gray. 50—0—50 (Hutt.).
„ *hochstetteri*, Pfr. 67—1—67 (Godwin-Austen.).
„ *urnula*, Pfr. 14—1—14 (Sut.).
„ *edwardi*, Sut. 26—1—27 (Sut.).
„ *atramentaria*, Shuttl. 50—1—50 (Sut.).(1 from Victoria).

I also examined the radula of *P. busbyi*, and saw no trace of a central tooth. When describing the dentition of *P. urnula* I stated that there was no rhachidian tooth, but I examined the odontophore again and found a central tooth in several places, though the greater part is without it.

Again *Schizoglossa novoseelandica*, Pfr., has according to Hedley no central tooth, the formula being 24—0—24, but in a photo taken by Mr. Moss there is a central tooth distinctly visible.

2.—Abnormities in the Teeth of the Radula of Land Shells.

(Plate iii, figs. 2, 3.)

The first time I came across a very remarkable abnormity in the teeth of the radula was in 1891, in *Endodonta varicosa*, Pfr., which was figured in "*Trans. N. Zeal. Inst.*" xxiv, pl. xxii, fig. 29. Since then two more cases came under my notice, one in *Phacussa hypopolia*, Pfr. (fig. 2), where the central tooth is unicuspid instead of tricuspid,

and the laterals, normally also tricuspid, offer various distorted shapes, but the transition teeth, 9—12, are nearer the normal form.

The other case occurred in *Charopa bianca*, Hutt. (fig. 3), where the laterals 1–4 have about the same shape as the transition tooth 5 in the normal radula.

The same form of abnormal teeth is repeated through the whole length of the radula.

The normal radula of *P. hypopolia* is figured in "*Trans. N. Zeal. Inst.*," xxiv. pl. xx, fig. 4, and "*Man. Conch.*" (2), ix, pl. ii, fig. 1, and that of *Ch. bianca* in "*Trans. N. Zeal. Inst.*," xxiv, pl. xxi, fig. 21.

3.—Endodonta (Charopa) egesta (Gray).

(Plate iii, figs. 4—6.)

The peculiar sculpture of this species, resembling slightly that of *E. (Acanthoptyx) acanthinula*, Crosse, from N. Caledonia, and also *Flammulina (Suterla) ide*, Gray, from New Zealand, made me somewhat suspicious whether this shell was really correctly classed, its anatomy being hitherto unknown. When in Auckland I found a few living specimens, and these I used for studying part of their anatomy.

The jaw (fig. 4) is thin and transparent, yellowish, arcuate, tapering at both ends, with a sharp concave cutting edge without median projection, vertically distantly and faintly striated.

The radula (fig. 5) is tongue-shaped, with the formula 9—5—1—5—9. Marginals low and wide, with longer entocone and mesocone, which are united at their base; the ectocone appears first as a small cusp, then multiplies to 2 and 3 cusps, which are reduced to a single cusp again. The transitian teeth become more elevated, the long mesocone separates from the equally long entocone, the ectocone still remaining small. The laterals are tricuspid, the mesodont extends beyond the posterior end of the base, and the endodont has a longer and stouter cusp than the ectodont. The tricuspid central tooth has a short mesodont, which does not extend to the posterior end of the base, and minute side-cusps.

Reproductive organs (fig. 6). The albumen gland is small, the free oviduct slightly contracted behind its middle, and the receptaculum seminis is inserted very little in front of the place where the vas deferens diverges from the common ducts. The penis sac is stout and rather short, the vas deferens enters in front of the posterior end, where the retractor muscle is attached, and the penis sac is contracted.

Foot without a caudal pore.

There can be no doubt now that the species is in its right place.

4.—Endodonta (Ptychodon) ureweraensis, n. sp.

(Plate iii, figs. 7—10.)

Shell minute, depressed globose, perforated, irregularly and zigzag banded with rufous on a yellowish-white ground, closely-ribbed, about 15 riblets per mill.; spire low conical. Whorls $5\frac{1}{2}$, flatly rounded, periphery regularly convex; the volutions first slowly, then a little more rapidly increasing, protoconch smooth, consisting of $1\frac{1}{2}$ whorls, suture impressed. Aperture subvertical, lunate, peristome straight, acute, margins distant. Mouth with 11 lamellae, two on the penultimate whorl, a high, rather stout and long lamella below the middle, and a second threadlike lamella half way between the first and the upper margin, far back in the aperture in adult specimens, but easily visible in young shells, not shown in the figures; a third lamella on the very slowly descending columellar lip, forming a long, sharply pointed tooth; on the parietal wall there are eight long, narrow, subequidistant threadlike folds. Base convex, perforation minute, open, no reflection of the columellar lip.

Diam. maj. 2·8, min. 2·6; height 1·5 mm.

Hab.—Ngaputahi, Urewera Country, New Zealand, where it was found by Mr. A. Hamilton of Dunedin, to whom I am indebted for so many new forms of New Zealand mollusca. *Type* in my collection.

This species may at once be distinguished from all the other species of *Ptychodon* by the character and situation of the lamellae; it is the eighth species of that subgenus.

5.—Lagochilus lignarius (Pfr.).

It is about one year since I was favoured with the rare opportunity of examining the living animal of the above species, when I was able to state that there is a very *distinct notch* visible on the upper surface of the tail, just behind the operculum. This being characteristic of the genus it confirms Dr. von Möllendorff's opinion on the generic position of this and allied species. Well preserved specimens of the shell show longitudinal, membranaceous plaits, which however are very easily rubbed off.

6. On Clessin's New Species of Scalaria from New Zealand.

Having ascertained from the "*Zoological Record*" for 1897 that Clessin had described several new species of *Scalaria* from New Zealand, I requested Mr. E. R. Sykes to send me copies of the diagnoses and tracings of the figures, and I am very grateful to him for having so kindly attended to my wishes, and I am now in a position to give my opinion on Clessin's new species.

1.—Scalaria novoseelandiae, Clessin.

In Martini and Chemnitz, *Scalariidae*, p. 57, pl. xv, fig. 4, 1897. Had Clessin taken the trouble to look up the species already described from New Zealand he could have ascertained that this species was known a long time ago, for it is in reality nothing else but *Scalaria tenella*, Hutton, P. L. S. N. S. Wales, (1) vol. ix, p. 943, 1885 = *lineata*, Hutton, Cat. Mar. Moll. N. Zeal., p. 22, 1873. *non* Kiener; = *lyra*, Hutton, Man. N. Zeal. Moll., p. 70 (1880), *non* Sowerby.

2.—Scalaria reevei, Clessin.

In Martini and Chemnitz, *Scalariidae*, p. 63, pl. xv, fig. 9, 1897.

From the description, and partly from the figure (the spiral ridge round the umbilical region being omitted) it is evident that this species is *Scalaria (Opalia) zelebori*, Frauenfeld, Reise der Novara, Zool., vol. ii, pt. 3, p. 7, pl. i, fig. 6, 1868 = *intermedia*, Hutton, Cat. Mar. Moll. N. Zeal., p. 10, 1873.

Clessin seems not to be aware of the fact that Frauenfeld has described and figured this species, as he enumerates it (l. c. p. 50) thus: "*S. zelebori*, Frauenfeldt, in coll."! Well preserved specimens show the costae of the lower whorls all winged a little below the suture, as is indicated in the figure given by Clessin. This species is also found in the Pliocene of New Zealand. Frauenfeld and Clessin mention 10 whorls, a specimen in my collection has 12, and its height is 24 mm.

The first of the above species is found in the Hauraki Gulf, the second also, and at Tauranga and Stewart Island besides.

It is very much to be regretted that such careless work in founding new species should be done, especially in a monograph of Martini and Chemnitz.

At the present day the following five species of *Scalaria* are known to occur in New Zealand waters:

1.—*Scalaria (s. str.) tenella*, Hutton, 1885. (*lineata*, Hutt., non Kiener; *lyra*, Hutt., non Sow.; *novoseelandiae*, Cless.)

2.—*Scalaria (Clathrus) philippinarum*, Sowerby, 1844.

3.—*Scalaria (Clathrus) fukeriana*, Forbes, 1852. (*wellingtonensis*, T. W. Kirk, 1882.)

4.—*Scalaria (Opalia) australis*, Lamarck, 1840.

5.—*Scalaria (Opalia) zelebori*, Frauenfeld, 1868. (*intermedia*, Hutt.; *reevei*, Cless.)

S. australis is a recent addition to the New Zealand fauna; specimens were collected and brought to Capt. Hutton from the Kermadec Islands by Miss Robinson of Christchurch.

7.—Purpura scobina, Q. & G., var. rutila, n. v.

Differs from the typical form, in which the interior is brown or blackish-brown, by having this part of the shell coloured orange or brownish-orange, the columella fulvous, and the epidermis of the shell light-brown or cinereous, with a hue of yellow. This colour-variety was first discovered by Mr. C. Spencer near Auckland, and later on I found it in one place only at Te Onepoto, South Island. The Auckland specimens are much larger, height up to 33 mill., and of a brighter colour, whilst the smaller South Island shells have a maximum height of 17 mill. The outer lip has always an inner white margin. *Type* in my collection.

Capt. Hutton mentions a similarly yellow variety of *P. haustrum* from Dunedin, which however I have not seen.

8.—On some New Zealand Species of Trophon.

(Plate iii, figs. 11—14.)

Our species of *Trophon* may conveniently be brought into three groups:

A.—Group of *T. stangeri*, Gray, with *T. ambiguus*, Phil.
B.— „ *T. patens*, H. and J., with *cheesemani*, Hutt.
C.— „ *T. duodecimus*, Gray (genus *Kalydon*, Hutt., including *T. paivae*, Crosse, *T. plebejus*, Hutt., and *T. inferus*, Hutt.).

The species of each of these groups are closely allied to one another, and the question arises whether some of them should not take the rank of a variety only. This, however, I do not attempt just now, as the soft parts have to be examined and compared, and it is better left to a future revision of our *Muricidae*.

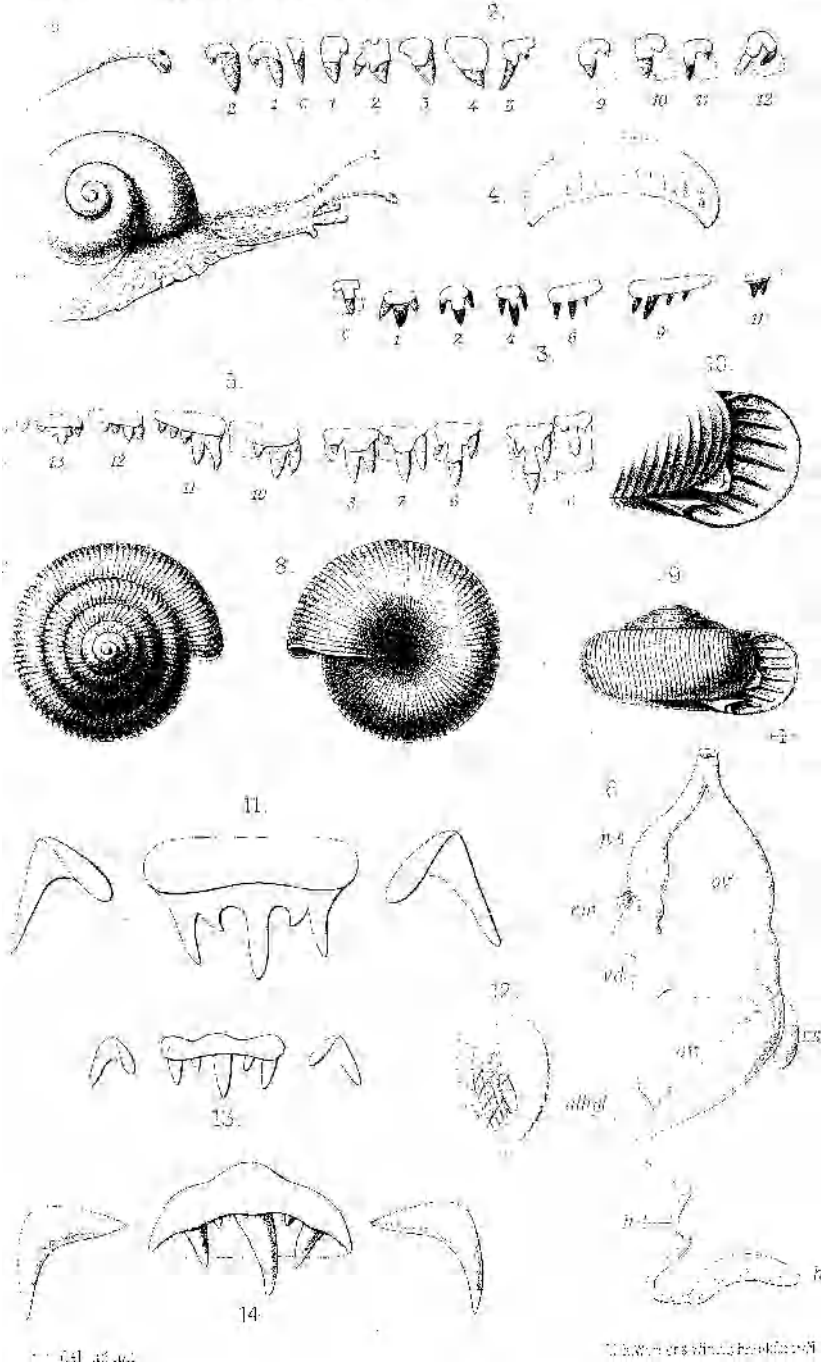
The dentition of *T. stangeri* has been described by Capt. Hutton[2] but the radula of *Trophon ambiguus* (Phil.), has remained unknown. Fig. 11 represents the teeth of the radula of the latter species, very much resembling those figured by Capt. Hutton. The central tooth transverse with 5 cusps of which the median and the externals are much larger, but all five are united at the base. The laterals angled and unicuspid.

Fig. 12 illustrates the Muricoid operculum with subapical nucleus.

Trophon ambiguus (Phil.) var. **pumila**, n. v.

This variety is best described as a very elegant dwarf. It is smaller and more slender, the anterior canal a little shorter, but otherwise it

2 Trans. N. Zeal. Inst., xx, p. 121, pl. xiii, fig. Q (*T. quoyi*, Reeve).



NEW ZEALAND MOLLUSCA

shows all the characters of the typical form. My largest specimen has 8 whorls, the height is 25, and the diam. 12 mill., but the specimens usually obtained have only 6 whorls and a height of 14 mill.

The teeth of the radula are shown in fig. 13. The central tooth has cusps of the same number and size as the species, but they are not united at the base. This however *may* be due to the young age of the specimen.

Hab.—Dredged with oysters in Foveaux Strait. *Type* in my collection.

The usual dimensions of *T. ambiguus* for adult specimens are 40 × 20 mm., but sometimes real giants are met with; in Lyttelton Harbour I dredged in two fathoms a specimen measuring 55 × 34 mm., which is the largest I have seen.

Trophon patens (H. & J.).

This species was provisionally removed from *Purpura* to *Trophon* by Mr. E. A. Smith[3] on account of the Muricoid operculum. Having found a living specimen I thought it to be of some interest to examine the dentition, which is represented in fig. 14. The central tooth has 5 cusps, the mesial one is long and stout, the two distal cusps are about half as large, and between the distal and mesial cup is a minute denticle on each side; the cusps are not united at the base.

Thus the dentition also bears out the correctness of Mr. E. A. Smith's classification of this species. The shell is generally smooth, but extreme forms occur which have the same narrow grooves as *T. cheesemani*, Hutt.

EXPLANATION OF PLATE III.

Fig. 1. *Rhytida greenwoodi*, Gray, drawn from life, nat. size.
,, *1a.* ,, ,, ,, ommatophore, enlarged.
,, *2.* *Phacussa hypopolia*, Pfr., abnormal teeth of radula, much magnified.
,, *3.* *Charopa bianca*, Hutt., ,, ,, ,, ,, ,,
,, *4.* *Charopa egesta*, Gray, jaw, much magnified.
,, *5.* ,, ,, ,, teeth of radula, greatly magnified.
,, *6.* ,, ,, ,, reproductive organs, much magnified.
,, *7—9.* *Plychodon ureweraensis*, Sut., shell. × 10.
,, *10.* ,, ,, ,, aperture with lamellae, magnified.
,, *11.* *Trophon ambiguus*, Phil., teeth of radula, much magnified.
,, *12.* ,, ,, ,, operculum, magnified.
,, *13.* ,, ,, ,, *var. pumila*, Sut., teeth of radula, much magnified.
,, *14.* ,, *patens*, H. & J., teeth of radula, much magnified.

3 Proc. Mal. Soc. Lond., i, p. 57.

ON SOME LAND SHELLS FROM SOMALILAND.

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

British Museum (Natural History), London.

A few shells collected in Somaliland by Dr. Donaldson Smith have recently been presented to the British Museum by His Highness the Gwaekwar of Baroda. They include two new forms and an interesting series of *Buliminus revoili* and *Otopoma poirieri*.

1.—Buliminus revoili (Bourguignat).

Limicolaria revoili, Bourguignat in Revoil's Faune et Flore des pays Comalis, p. 42, pl. ii, figs. 24—26.

Buliminus (Rachis) moreletianus, Ancey: Naturalist. Sicil., 1882, vol. i, p. 206.

Hab.—Lugat, 4300 feet.

This species is very closely related to the Arabian *B. albatus*, Fér., indeed it is chiefly distinguished by a difference in the colour-markings, being longitudinally striped with light and dark brown, whereas *albatus* usually exhibits two transverse interrupted brown bands round the middle of the body-whorl. Three specimens of the latter species in the Museum, however, lack these bands, having instead the lower part of the body-whorl faintly streaked with brown longitudinally, otherwise being pure white throughout. M. Bourguignat describes this species as "*valide costata*," whilst M. Ancey characterises the whorls as "*subobliquis confertisque striis sculptis*." The latter description is certainly the more applicable to the majority of specimens, indeed I have only seen two collected by Messrs. T. L. and W. D. James in the interior of the country and by them presented to the Museum, which might be said to be costate.

These two examples are also almost exactly similar in shape to *B. albatus*, the whorls being, however, perhaps in the slightest degree more convex.

M. Ancey appears to have rejected the specific name suggested by Bourguignat merely because the latter placed it in *Limicolaria*, a generic position which, as pointed out by Ancey, is evidently incorrect.

2.—Otopoma (Georgia) poirieri, Bourguignat.

Otopoma poirieri, Bourguignat: Moll. Afrique, 1881, p. 6.

Georgia poirieri, id. in Revoil's Faune et Flore des Pays Comalis, p. 74, pl. iii, figs. 54—56.

Hab.—Ogardair, Central Somaliland (F. L. and W. D. James and E. Lort Phillips in Brit. Mus.); Morobyeh, Megag, Shake Abacodley, and Lugat (D. Smith).

The colour of this species, described by Bourguignat as "*candido-sublutescens*," is variable. Some specimens are pure white, but the majority are transversely lineated with brown upon the upper surface, two of the lines at the periphery being of a darker tint and thicker than the rest. The apical whorls are often yellowish or livid, having a dark line just above the suture. One specimen has the upper surface of an almost uniform brownish colour, becoming gradually paler beneath. A little variation in form is noticeable, some examples having the spire more elevated than others and the body-whorl higher or more ventricose. The umbilicus in adult shells is nearly always concealed by a callus, but in one specimen which has the appearance of maturity, it is only partly covered. There is not much variation in the sculpture, but considerable difference in size is observable, the largest specimen being 25 millim. in its greatest diameter, whilst the smallest example, evidently adult, is only 16.

With regard to the specific distinctness of this so-called species, I must confess that it is scarcely separable from *O. guillaini*, Petit, also a Somali form. The latter is somewhat larger and has a more elevated spire, but otherwise is very similar. The supposed *specific differences* in M. Bourguignat's *Georgia natiropsis*, *G. perrieri*, and *G. revoili* are far beyond the ken of such an ordinary person as the writer, and, I may add, beneath the notice of such experts as Kobelt and Moellendorff who entirely disregard these names in their "*Catalog der gegenwärtig lebend bekannten Pneumonopomen.*"

3.—Ennea somaliensis, n. sp.

Testa cylindracea, alba, anguste rimata, oblique tenuissime confertim lirata, lirs supra ad suturam denticulatis; spira cylindrica, superne obtusa, vix conoidea; anfractus 8, lente accrescentes, duo supremi pellucidi, læves, duo sequentes convexiusculi, cæteri minus convexi, sutura vix obliqua sejuncti, ultimus penultimo angustior, pone labrum bi-scrobiculatus vel indentatus; apertura sex-dentata; peristoma album, expansum, reflexum, marginibus callo tenui junctis; dens unicus parietalis lamelliformis, concavus, ad insertionem labri situs, dentes duo inæquales in margine dextro, unicus basalis, alius minimus ad basin columellæ, sextus columellaris validus. Longit. $8\frac{1}{2}$ millim., diam. $3\frac{3}{4}$. Apertura cum perist. 3 longa, $2\frac{1}{2}$ lata.

Hab.—Ganlibah Goles Range, 5900 feet.

A very delicately costulate species, the upper ends of the fine closely packed costulæ forming a very pretty minutely denticulate suture. In one specimen, rather more slender than the type, the second tooth within the outer lip is almost obsolete.

4.—Buliminus (Petræus) somaliensis, n. sp.

Testa ovata, supra acuminata, umbilicata, tenuis, subpellucida, fusco-cornea, sericata, costellis tenuibus obliquis arcuatis *confertis sculpta; spira convexe conica, ad apicem* haud acuta; anfractus 7 convexiusculi, supremus lævis, cæteri mediocriter convexi, regulariter crescentes, ultimus elongatus, antice oblique lente descendens; apertura inverse auriformis, longit. totuis $\frac{1}{2}$ fere æquans; peristoma tenue, marginibus vix conniventibus, calle tenuissimo junctis, dextro vix incrassato, anguste expanso, columellari late reflexo, intus subplicato. Longit. 18 millim., diam. $9\frac{1}{2}$. Apertura 8 longa, 5 lata.

Hab.—Ganlibah Goles Range, 5900 feet.

Remarkable for its thin texture and the delicate unthickened lip. *The costulæ are very fine, and gradually become more numerous* as the shell increases. The obsolete fold on the columella is only seen when the aperture is viewed in a particular position with the outer lip towards the eye.

NOTES ON THE NOMENCLATURE OF THE BRITISH NUDIBRANCHIATA, WITH A DETAILED CLASSIFICATION OF THE GROUP.

By the Rev. A. H. COOKE, M.A., F.Z.S.,

Fellow and Tutor of King's College, Cambridge.

The descriptive catalogue of the British Nudibranchiata given by Jeffreys, *British Conch*, vol. v, pp. 28—94, was prepared for him by Alder (ibid. p. 27), Jeffreys himself not having made a special study of the group. I have recently had occasion to examine the references for the authorship of the names of the various species, as given in those pages. It appeared possible that the results might be of more than private interest, since it is exactly 30 years since that volume appeared, and the researches of Herdman, Garstang, and many others have done much to call attention to a branch of our Mollusca which has been strangely neglected, and which is of surpassing interest, from more than one point of view, to the practical zoologist. They have therefore been put into a tabular form, following the pages in "*British Conchology*," vol. v, with which they should be read.

I have ventured to append a revised classification of the whole group, based upon Bergh.[2] Dr. Norman, in his "*Revision of British Mollusca*,"[3] which unfortunately still remains incomplete, has drawn up a classification of our Nudibranchiata, on somewhat, but by no means entirely similar lines to this.

P. 33. ALDERIA MODESTA, Lovén.—The reference to an article by Allman is beside the point. Read *Stiliger modestus*, Lovén, Oefv. K. Vetensk. Akad. Förh., i (1844), p. 49. *Alderia* sp. Allman, Rep. Brit. Ass., 1844, p. 65. Not *Stiliger modestus*, Ehrenberg.

P. 35. FIONA NOBILIS, A. and H.—Substitute *Fiona marina*, Forsk. — *Limax marinus*, Forskäl, Descr. Anim. (1775), p. 99; Icon. Rev. Nat. (1776), pl. 26, f. G.

P. 36. EMBLETONIA MINUTA, Forbes and Goodsir.—The reference to Rep. Brit. Assoc., 1839, is altogether inadequate. That Report (Trans. of Sections, p. 80) contains no description whatever, only short mention of species. The species in question was described by Forbes and Goodsir in "*Athenæum*," 1839, p. 647, not however as "*Eolidia minuta*," but as "*Eolida minima*." The paper is entitled "*Notes on zoological researches in Orkney and Shetland during the month of June, 1839, by Ed. Forbes and John Goodsir.*" The mistake, started by Forbes and Hanley and continued by Alder and Hancock in their monograph, has been current ever since.

P. 37. EOLIS PAPILLOSA, Linné.—This is one of the few British Mollusca which were described by Linné in the 12th, but not in the 10th, edition of the "*Systema*." He described it also in the 2nd edition of the "*Fauna Suecica*," the date of which is intermediate between the two above-mentioned editions of the "*Systema*." The reference therefore should read: Fauna Suec. (1761), p. 508, no. 2093.

P. 39. EOLIS CORONATA, Forbes.—For "Forbes" *read* "Forbes and Goodsir." The article in the "*Athenæum*" is that in which *Embletonia minima* (referred to above) was described, and it is a curious accident which has attached the name of both authors to one of the species therein described, and the name of one of them only to another.

P. 40. EOLIS ELEGANS, A. and H.—For "p. 315" *read* "p. 316."

P. 41. EOLIS LINEATA, Lovén.—For "*E. lineata*, Lov., Ind.

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2 Semper, Reisen im Archipel. der Philippinen, vols. i. 2 and Suppl.

3 Ann. Mag. Nat. Hist., 1859, 6 ser. vi. pp. 70–93.

Moll. Scand., p. 8," *read* "*Aeolis lineata*, Loven, Oefv. K. Vetensk. Akad. Förh., iii (1846), p. 140."

P. 43. EOLIS LANDSBURGI, A. and H.—The original spelling *Landsbergii* (a latinising of Mr. Landsborough's name) must be kept, since it is not incorrect in form.

P. 44. EOLIS CARNEA, A. and H.—For "Brit. Nud. Moll. App. (24), p. ix," *read* "Brit. Nud. Moll., p. 50 (1855)."

P. 45. EOLIS PEACHII, A. and H.—For "p. 19" *read* "p. 191."

P. 46. EOLIS ANGULATA, A. and H.—Probably *E. paradoxa*, Quatref. takes precedence. The reference is Quatrefages, Ann. Sci. Nat., 2 s. xix (1843), p. 274, pl. xi.

P. 48. EOLIS AURANTIACA, A. and H.—Read *aurantia*, under which name the species was described in the reference given, but altered, without any reason being given, to *aurantiaca* in the monograph. There is nothing to choose, linguistically, between the two forms, both being equally bad Latin.

P. 49. EOLIS PUSTULATA, A. and H.—For "pl. 46" *read* "pl. 45."

P. 50. EOLIS AMOENA, A. and H.—For "pl. 20" *read* "pl. 30."

P. 51. EOLIS ARENICOLA, Forbes.—For "Forbes" *read* "A. and H.," who in the monograph adopted Forbes' MS. name, as is correctly stated in the next line.

P. 51. EOLIS GLOTTENSIS, A. and H.—Read *glotensis*. The species was originally described as *Glotensis*, and altered, without explanation, to *Glottensis* in the monograph. *Glota* or *Glotta* (for both spellings are current) is the Roman name for the Clyde, and is often spelt *Clota* as well.

P. 52. EOLIS VIRIDIS, Forbes.—For "pl. 2, f. 12" *read* "pl. 2, f. 18."

P. 52.—EOLIS PURPURASCENS, Fleming.—If this very doubtful species is to be kept in our lists at all, it would be well to add the reference to Fleming's British Animals, ii (1828), p. 285, no. 150. In the reference given it was figured without description.

P. 54. EOLIS TRICOLOR, Forbes.—After "p. 5" *add* "pl. 1, f. 1."

P. 56. EOLIS EXIGUA, A. and H.—For "p. 292" *read* "p. 192."

P. 57. PROCTONOTUS MUCRONIFERUS, A. and H.—For "xviii, p. 161" *read* "xiii, p. 161, pl. 2."

P. 58. ANTIOPA CRISTATA, Delle Chiaje.—For "Descr. Stor. An. Nap., pl. 88" *read* "Descriz. Notom. Invert. Sicil. Cit. (1841), pl. 88, f. 1—12."

P. 62. DENDRONOTUS ARBORESCENS, Müller.—Substitute for

arborescens (as pointed out by Dr. Norman) *frondosus*, Ascanius. The reference is: *Amphitrite frondosa*, Ascanius, Kon. Norsk. Vid. Selsk. Skr., v (1774), p. 155, pl. 5, f. 2.

P. 63. HERO FORMOSA, Lovén.—After "1844" *insert* "p. 49" and dele the remainder.

P. 64. LOMANOTUS MARMORATUS, A. and H.—The reference has been omitted. It is: *Eumenis marmorata*, A. and H., Ann. Mag. Nat. Hist., xvi (1845), p. 311.

P. 66. SCYLLAEA PELAGICA, Linné.—The reference to the 10th ed. of 1756 (p. 656) takes the place of that to the 12th (1766—68).

P. 67. TRITONIA HOMBERGII, Cuvier.—For "Mém. du Mus., i, p. 483, pl. 31, f. 1, 2" *read* "Ann. Mus. Hist. Nat. Paris, i (1802), p. 483, pl. 31, 32."

P. 69. AEGIRUS, Lovén.—Read "*Aegires*," sec Lovén, Oefv. K. Vetensk. Akad. Förh., i, 1844, p. 49.

P. 70. AEGIRUS PUNCTILUCENS, d'Orb.—The reference to d'Orbigny, to be correct, should read "Mag. de Zool., vii (1837), Classe v, p. 7 of memoir."

P. 71. TRIOPA CLAVIGER, Müller.—No reference to any description by Müller is given, while that to an article by Johnston is unnecessary. O. F. Müller described the species in Zool. Dan. Prodr. (1776), p. 229, pl. 17, f. 1—3. Johnston's original description of *Tergipes pulcher* (the identity of which with Müller's species he afterwards recognised) was in Mag. Nat. Hist., vii (1834), p. 490, f. 59.

P. 73. THECACERA VIRESCENS, A. and H.—The original description was not, as here given, in the monograph, but in Ann. Mag. Nat. Hist., 2 s. viii (1851), p. 290. The reference to A. and H.'s appendix should be "p. iv" *not* "p. iii."

P. 76. POLYCERA LESSONI, d'Orb.—For "p. 5" *read* "Classe v, p. 5, of memoir," and for "Lessoni" *read* "Lessonii."

P. 80. IDALIA PULCHELLA, A. and H.—For "p. 19" *read* "p. 46."

P. 83. DORIS TUBERCULATA, Cuvier.—The reference is incorrect. *Read* Ann. Mus. Hist. Nat. Paris, iv (1804), p. 469, pl. 74 (*Doris* pl. 2), f. 4.

P. 85. DORIS TESTUDINARIA, Risso.—For "p. 33, f. 15" *read* "p. 33, pl. 2, f. 15." Bergh, perhaps rashly, identifies this species with *Argo*, Linné.

P. 86. DORIS COCCINEA (Forbes), A. and H.—By "Rep. Ægean Invert. B. A., 1843," is meant Rep. Brit. Ass., 1843, p. 133

where, however, no description is given, but only the name. Alder and Hancock described the species in Brit. Nud. Moll, p. 42; Fam. 1, pl. 7.

P. 86. DORIS REPANDA, A. and H.—This species is, I believe, to be identified with *Doris obvelata*, O. F. Müller, as has already been held by Lovén and others. As, however, this view does not yet appear to have received acceptance in this country, the question may be examined in detail. Müller gave the usual brief description in his Prodromus, p. 229. no. 2769 (1776), and followed this up by a more detailed account in the Zoologia Danica, *ii*, p. 8, tab. xlvii, *f.* 1, 2 (1788). The important parts of this account are subjoined, together with Alder and Hancock's description of their *repanda*; the figures of both authors should also be compared with the descriptions throughout.

Body above an inch long [L. 1 inch. Brit. Conch., v. p. 87], of a pure, waxy, transparent white

Cloak widely expanded, covered with small, distant, obtuse and rather inconspicuous opaque white tubercles . . . . An irregular row of opaque white or sulphur yellow angular spots runs down each side at a short distance from the margin of the cloak, which is thin and broad, extending much beyond the foot, and marked on the under side with slender white nerve-like lines towards the margin.

Branchiae small in proportion to the size of the animal, consisting of five imperfectly tripinnate transparent white plumes; the three anterior ones elegantly formed and distinct, the posterior deeply divided and irregular, making it difficult to determine their number. They are retractile within a single cavity.

Mouth small, with two flat tentacular appendages, united above so as to form a subquadrangular veil [oral tentacles flattened and broadly angulated; Brit. Conch., v. 87.]

[Müller's fig. 2, of pl. xlvii measures exactly one inch.]

Corpus elongatum subtus glabrum album, supra lamina repanda obtectum; et corpus et lamina aliquantum pellucent.

Lamina supra convexis inaequalibus, papillulas simulantibus, ac in sulphureum vergentibus, subtus vero venulis creberrimis non in omnibus aeque conspicuis exornatum est.

In medio versus postica punctum maius laminae concolor; exhoc lobus confuse serratus, *ani* ornamentum, protruditur.

In ipso corpore nec os, nec caput diu detegere potui; antica demum corporis pars in orbiculum porrigebatur; hic *caput* medio rima longitudinali seu ore notatum, loboque auriculari utrinque iuxta basin adauctum obtulit.

The coincidences in these two descriptions are remarkable. Both note the transparency of the body, the wide expansion of the notaeum or "cloak," Müller actually describing it as *repanda*, the sulphur-yellow of the tubercles, the remarkable distinctness of the veining underneath the notacum, and the confused nature of the serrations of the branchial plumes. Alder and Hancock do not state that the

tubercles are "inaequales," but they make them very distinctly so in their illustration, while the comparatively inconspicuous nature of the branchiae comes out equally in the pictures by both authors. There appears to be some contradiction in the two descriptions of the rhinophores, Müller stating that the *tentaculum* is "simplex," while Alder and Hancock observe that it is "beautifully laminated." The explanation appears to lie in the fact that Müller was not able to see more than the apex or nipple of the rhinophore, which, as commonly in the *Doridæ*, is bare of lamellae. He expressly says "raro exseritur *tentaculum* simplex, at vix ultra lineam." The coincidence of description with regard to the mouth and head lobes is very remarkable, for there is no other English *Doris* which in the least resembles *repanda* in this respect.

P. 88. DORIS PROXIMA, A. and H.—Dr. Jeffreys adds, in square brackets, "Bornholm Isle, in the Baltic (Meyer and Möbius)." The addition is unfortunate. All that M. and M. state (*Fauna der Kieler Bucht*, i, p. 70) is, that they placed specimens of *D. proxima* in a tank reserved for animals found on the coast of Bornholm, and that they did not seem to mind the diminished salinity of the water.

P. 88. DORIS MURICATA, Müll.—The reference to O. F. Müller's *Zoologia Danica* should be replaced by the earlier description in Zool. Dan. Prod., p. 229.

P. 89. DORIS ULIDIANA, Thomps.—It does not appear to have been stated by the author of the species, or by any subsequent writer, that *Ulidia* is an old Latin name for Ulster, *Ultonia* being its more usual form.

P. 90. DORIS BILAMELLATA, L.—The reference to the 12th edition of the "*Systema*" must be replaced by the following: *Limax bilamellatus*, Linné, Fauna Succ., ed. 2 (1761), p. 508, no. 2094.

P. 92. DORIS SPARSA, A. and H.—For "xviii, p. 294" *read* "xviii (1846), p. 293."

P. 93. DORIS PILOSA, Müll.—For "Müll. Zool. Dan., iii, p. 85, f. 5–8" *read* "O. F. Müller, Zool. Dan., iii (1789), p. 7, pl. 85, f. 5–8." The date is important, since there is an earlier edition (1779—84) of the Zoologia Danica.

P. 93. DORIS QUADRANGULATA, A. and H.—This is a most remarkable blunder. In both the references given, A. and H. describe *Doris subquadrata*. No such species as *quadrangulata* was ever described by them.

BRITISH NUDIBRANCHIATA.

Sub-order ASCOGLOSSA.
Family 1 **HERMAEIDAE.**
Genus **Hermaea.** Lovén.
H. bifida (Mont.).
H. dendritica (A. and H.).
Genus **Stiliger.** Ehrenberg.
S. bellulus (d'Orb.).
Genus **Alderia,** Allman.
A. modesta (Lovén).
Family 2 **ELYSIIDAE.**
Genus **Elysia** (Risso) auctt.
E. viridis (Mont.).
Family 3 **LIMAPONTIIDAE.**
Genus **Limapontia,** Johnston.
L. capitata (O. F. Muller).
L. depressa, A. and H.
Genus **Acteonia,** Quatrefages.
A. corrugata, A. and H.
Genus **Cenia,** A. and H.
C. cocksii, A. and H.

Sub-order NUDIBRANCHIATA.
Sect. I. **Nudibranchiata Kladohepatica.**
Family 1 **AEOLIDIIDAE.**
Sub-family 1 **Aeolidiidae proper.**
Genus **Aeolidia,** Cuvier.
A. papillosa (L.).
Genus **Aeolidiella,** Bergh.
A. glauca (A. and H.).
A. alderi (Cocks).
A. sanguinea (Norman).
Genus **Berghia,** Trinchese.
B. coerulescens (Guérin Mén.).
Sub-family 2 **Cratenidae.**
Genus **Cuthona,** A. and H.
C. nana (A. and H.).
? C. aurantia (A. and H.).
Genus **Cratena,** Bergh.
C. pustulata (A. and H.).
C. amoena (A. and H.).
C. viridis (Forbes).
[includes *arenicola*, A. and H. + *glotensis*, A. & H.]
C. olivacea (A. and H.).
C. concinna (A. and H.).
? C. peachii (A. and H.).
? C. stipata (A. and H.).
? C. couchii (Cocks).
? C. paradoxa (Quatref.).
[otherwise *angulata* A. and H.[1]]
Sub-family 3 **Tergipedinae.**
Genus **Tergipes,** A. and H.
T. despectus (Johnst.).
Genus **Embletonia,** A. and H.
E. pulchra (A. and H.).
E. minima (Forbes and Goodsir).
E. pallida (A. and H.).
Genus **Amphorina,** Quatrefages.
A. coerulea (Mont.).
A. molios (Herdm.).
Genus **Galvina,** A. and H.
G. exigua (A. and H.).
G. tricolor (Forbes).
[including *farrani*, A. and H. + *amethystina*, A. and H. + *adelaidae*, Thomps.]
G. picta (A. and H.).
G. cingulata (A. and H.).
[including var. *vittata*, A. and H.]
Sub-family 4 **Coryphellidae.**
Genus **Coryphella,** Gray.
C. rufibranchialis (Johnst.).
[including *pellucida*, A. and H. + *gracilis*, A. and H. + *smaragdina*, A. and H.]
C. landsbergii (A. and H.).
C. lineata (Lovén).
Sub-family 5 **Favorinidae.**
Genus **Favorinus,** Gray.
F. albus (A. and H.).
[probably including *carneus*, A. and H.]
Sub-family 6 **Facelinidae.**
Genus **Facelina,** A. and H.
F. drummondi (Thomps.).
F. coronata (Forbes and Goodsir).
F. punctata (A. and H.).
Sub-family 7 **Flabellinidae.**
Genus **Calma,** A. and H.
C. glaucoides, A. and H.
Sub-family 8 **Fionidae.**
Genus **Fiona,** Hancock and Embleton.
F. marina (Forsk.).
Sub-family 9 **Antiopidae.**
Genus **Antiopa,** A. and H.
A. cristata (delle Chiaje).
A. hyalina (A. and H.).
Genus **Proctonotus,** A. and H.
P. mucroniferus, A. and H.
Sub-family 10 **Heroidae.**
Genus **Hero,** Lovén.
H. formosa (Lovén).
Family **LOMANOTIDAE.**

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1 Bergh, by a clerical error, over and over again prints this species as *cingulata*.

Genus **Lomanotus**, Verany.
L. genei, Ver.
[including *marmoratus*, A. and H. + *flavidus*, A. and H. + *portlandicus*, Thomps. + *varians*, Garst. + *hancocki*, Norman.]

Family **DOTONIDAE.**
Genus **Doto**, Oken.
D. coronata (Gmel.).
D. fragilis, Forbes.
D. pinnatifida (Mont.).
D. cuspidata (A. and H.).
? Genus **Hancockia**, Gosse.
H. eudactylota Gosse.

Family **DENDRONOTIDAE.**
Genus **Dendronotus**, A. and H.
D. frondosus (Ascanius).

Family **SCYLLAEIDAE.**
Genus **Scyllaea**, Linné.
S. pelagica, L.

Family **PLEUROPHYLLIDIDIDAE.**
Genus **Pleurophyllidia**, Meckel.
P. loveni, Bergh.

Family **TRITONIIDAE.**
Genus **Tritonia**, Cuvier.
(Sub-genus **Tritonia proper.**)
T. hombergii, Cuv.
(Sub-genus **Candiella**, Gray.)
T. plebeia, Johnst.
T. lineata, A. and H.
T. alba, A. and H.

Doubtful or insufficiently characterised species.
Eolida purpurascens, Fleming.
Eolis inornata, A. and H.

Sect. II. **Nudibranchiata Holohepatica.**
Doridae Cryptobranchiatae.

Sub-family 1 **Archidoridae.**
Genus **Archidoris**, Bergh.
A. tuberculata (Cuv.).
A. flammea (A. and H.)

Sub-family 2 **Discodoridae.**
Genus **Rostanga**, Bergh.
R. coccinea (A. and H.).

Sub-family 3 **Diaululidae.**
Genus **Aldisa**, Bergh.
A. zetlandica (A. and H.).
? A. millegrana (A. and H.).

Sub-family 4 **Cadlinidae.**
Genus **Cadlina**, Bergh.
C. obvelata (O. F. Müll.).

Sub-family 5 **Kentrodoridae.**
Genus **Jorunna**, Bergh.
J. johnstoni (A. and H.).

Sub-family 6 **Platydoridae.**
Genus **Platydoris**, Bergh.
P. testudinaria (Risso).

Doridae Phanerobranchiatae.

Sub-family 1 **Polyceridae.**
Genus **Aegires**, Lovén.
A. punctilucens (d'Orb.).
Genus **Triopa**, Johnston.
T. claviger (O. F. Müll.).
Genus **Crimora**, A. and H.
C. papillata, A. and H.
Genus **Thecacera**, Fleming.
T. pennigera (Mont.).
T. virescens, A. and H.
T. capitata, A. and H.
Genus **Palio**, Gray.
P. lessonii (d'Orb.).
[including var. *ocellata*, A. and H.]
Genus **Polycera**, Cuvier.
P. quadrilineata (O. F. Müll.).

Sub-family 2 **Goniodoridae.**
Genus **Acanthodoris**, Gray.
A. pilosa (O. F. Müll.).
A. subquadrata (A. and H.).
Genus **Adalaria**, Bergh.
A. proxima (A. and H.).
A. loveni (A. and H.).
Genus **Lamellidoris**, A. and H.
L. bilamellata (L.).
L. muricata (O. F. Müll.).
[including *aspera*, A. & H.]
L. diaphana (A. and H.).
L. sparsa (A. and H.).
L. depressa (A. and H.).
L. inconspicua (A. and H.).
L. oblonga (A. and H.).
L. pusilla (A. and H.).
? L. ulidiana (Thomps.).
? L. maculata (Garst.).
Genus **Goniodoris**, Forbes.
G. nodosa (Mont.).
G. castanea (A. and H.).
Genus **Idalina**, F. S. Leuckart.
(Sub-genus **Idalina proper.**)
I. elegans, F. S. Leuck.
I. leachii, A. and H.
(Sub-genus **Idaliella**, Bergh.)
I. aspersa, A. and H.
I. pulchella, A. and H.
I. inaequalis, Forbes.
I. quadricornis (Mont.).
Genus **Ancula**, Lovén.
A. cristata (Alder).

DESCRIPTION OF A NEW SPECIES OF MITRA (M. BALDWINII) FROM THE HAWAIIAN ISLANDS.

By JAMES COSMO MELVILL, M.A., F.L.S.

Mitra (Strigatella) baldwinii, n. sp.

M. testa ovato-fusiformi, nitida, perlævi albida, solidiuscula, anfractibus ad decem, in speciminibus nostris decollatis, gradatulis, apud suturas impressis, supernis arcté longitudinaliter, lævicostatis, interstitiis obscuré spiraliter striatis, tribus ultimis lævibus, flaminis longitudinalibus brunneo-castaneis conspicuis depictis, ultimo anfractu cæteros magnoperé superante versus basim spiraliter multilivato, apertura oblonga, intus striata, cinerea, labro incrassato, sinuoso, lævi, columella albescente, quadriplicata.

Long. 24. Lat. 11 mm.

Hab.—Ad insulas Hawaiienses (Baldwin.).

This very elegant *Mitra* is conspicuous amongst its congeners for its extremely smooth surface, delicate apppearance, longitudinal chestnut flame-like markings on a white ground, and for its neatly graduated whorls, the uppermost four or five being very closely and smoothly longitudinally ribbed, the narrow interstices between the costæ also smooth.

A member of the typical section of the subgenus *Strigatella*, its nearest affinities lie with *paupercula*, L., *retusa*, Lam., and *zebra*, Lam. (= *virgata*, Reeve), but all these are coarse shells, and will be seen at once to differ widely when compared with the description given of *M. baldwinii*, in many salient points, notably in the sculpture of the upper whorls.

Four examples alone, so far, would appear to have reached this country. Of these, one has been for a considerable period housed in our National Collection at South Kensington, unnamed, but this is in very imperfect condition.

A second was presented by Mr. Baldwin to Mr. Thomas Rogers of Manchester, some little time back from Honolulu Harbour, also being in an uncharacteristic state, but this was followed, quite recently, by two beautiful and almost perfect examples, precisely similar both in size and colouration, consigned also to Mr. Rogers, who kindly handed them to me for identification. It is curious that both these

specimens, otherwise so perfect, should have an identical fracture towards the upper portion of the outer lip, also slight decollation of the apical whorls.

It is with much pleasure that I connect the name of its discoverer. Mr. D. D. Baldwin, of Haiku, Maui, Hawaiian Islands, with so interesting a shell.

PROCEEDINGS OF THE MIDLAND MALACOLOGICAL SOCIETY.

8TH MEETING, MARCH 10TH, 1899.

The President in the chair.

The following were elected members of the Society:—

Messrs. F. W. Carpenter, and William Moss, F.C.A.

The following nomination for membership was read:

Mrs. Walter E. Collinge.

EXHIBITS.

On behalf of Mr. E. R. Sykes the following specimens were exhibited: *Helix virgata* var. *nigrescens*, Grat., from quarry on top of Portland; monstrosities of *Planorbis complanatus* from Belgium; *Pisidium lovéni*, Cless., interesting from the fact that they were collected on the Zermatt at an altitude of 8400 feet; and specimens of the animal and shell of *Ephippodonta macdougalli*, Tate, from South Australia.

On behalf of Mr. F. W. Carpenter a specimen of the shell of *Paryphanta busbyi*, Gray, from New Zealand.

By the President: Specimens of *Paryphanta hochstetteri*, Pfr., from New Zealand, in alcohol.

By Mr. Guy Breeden: Light and dark coloured varieties of the shells of *Helix lapicida* from North Devon; also shells of *Pupa umbilicata* from Braunton, North Devon, *P. anglica* from Co. Down, Ireland, *P. secale* from Birdlip Woods, near Cheltenham, and *P. marginata* from Sutton Park.

By Mr. J. F. Partridge: Shells of *Helix virgata* including a very fine series of varieties, from North Devon.

9TH MEETING, APRIL 14TH, 1899.

The President in the chair.

New Member elected:—

Mrs. Walter E. Collinge.

The following nominations for membership were read:—

Messrs. W. Weaver Jones and L. C. Parsons.

The following gentlemen were nominated by the Council for election as honorary members:—

Dr. Henry Fischer and Prof. H. A. Pilsbry.

EXHIBITS.

By the President: Specimens of *Limax transylvanicus*, Heyn., *L. schwabi*, Brancnf., and *Arion empiricorum* var. *bicolor*.

By Mr. F. J. Partridge: Specimens of *Limnæa peregra* which had left their shells; also *Pholas dactylus*, *P. candida*, *P. parva*, and *Tapes pullustra*, all from Exmouth.

By Mr. W. J. Harrison, Jun.: A large series of shells from the Upper and Lower Lias, Chalk, and Oxford Clay.

By Mr. H. H. Bloomer: A large series of shells from the Middle Lias, Napton on the Hill, which included some very fine specimens of *Modiola scalprum*, shewing various stages of growth.

10TH MEETING, MAY 12TH, 1899.

The President in the chair.

The following were elected members of the Society:—

Messrs. W. Weaver Jones and L. G. Parsons.

The following were elected honorary members of the Society:—

Dr. Henry Fischer and Professor H. A. Pilsbry.

The Secretary announced the addition to the Library of thirteen pamphlets presented by the President.

EXHIBITS.

By Mr. Guy Breeden: A very large collection of land shells from Devonshire records of all of which were placed on the Society's list.

By Mr. H. H. Bloomer: A collection of marine shells from Rhyl.

By the President: Animal and shell of *Borus ovatus*.

11TH MEETING, JUNE 9TH, 1899.

The President in the chair.

PAPER READ.

"Some notes on the Anatomy of *Chitonellus fasciatus*," by Walter E. Collinge, F.Z.S.

In an interesting discussion which followed, Messrs. G. Breeden and Weaver Jones took part.

EXHIBITS.

By the President: *Chitonellus fasciatus*.

By Mr. Breeden: Varieties of the shells of *Helix aspersa* from various localities. Extremely thin shells of *H. nemoralis*, from St. Austell, Cornwall, also a series of darts of British *Helicidæ*.

By Mr. Bloomer: *Helix aspersa*, *nemoralis*, *hortensis*, *itala*, *pisana*, *acuta*, and *Cyclostoma elegans*, all from Tenby; also from Knowle, Warwickshire, *Succinea putris* and *elegans*, *Limnæa auricularia* and *stagnalis*, and *Planorbis carinatus* and *umbilicatus*.

The Secretary will be pleased to receive, for the Library, copies of any papers on the Mollusca.

CURRENT LITERATURE.

Owing to the large number of papers awaiting review, the Editor is compelled, for want of space, to restrict the notices of Current Literature to papers actually received.

Pilsbry, H. A. -Tryon's Manual of Conchology, ser. ii, vol. xii (pts. 45, 46), pp. i--112, pls. i-- xxviii (except xxvi, issued with last volume).

Continuing his study of *Drymæus*, Mr. Pilsbry first deals with the species of the West Indies, Trinidad, and Florida, which, he points out, are "undoubtedly derived from the group of allied forms in Venezuela and the adjacent region." He next passes to the species of Mexico and Central America, and concludes his review of this very difficult genus by a survey of the subgenus *Leiostracus*, which he restricts to "a natural group of tree snails prominent in the province of Bahia, Brazil." We feel, however, considerable doubt whether, there being a prior *Liostraca* "of the same derivation and significance," two such names can be in use at the same time in Zoology.

We then pass to the subfamily *Orthalicinæ* which he divides into two main groups; (1) early whorls pitted, (2) early whorls smooth or nearly so. Of the genera, *Orthalicus* belongs to the first, and *Liguus*, *Oxystyla*, and *Porphyrobaphe* to the second group. The study of *Oxystyla* is then commenced and the present portion concludes with the species of the Antilles and Florida.

We note *Drymæus sallei*, n. sp. from Haiti (p. 11), and new varieties of *D. virginalis*, *D. multifasciatus*, *D. vincentinus*, and *Oxystyla undata*.—E. R. SYKES.

Greppin, Ed.—Description des Fossiles du Bajocien supérieur des environs de Bâle. Mém. Soc. Paléont. Suisse, Genève, 1898, vol. xxv, pp. 1—52, pls. i—v.

This is a good and interesting work, illustrated by some capital plates. The author deals only with Cephalopods and Gastropods; and he says that the scope of his work is "to give an exact description of species which appear to be new and to complete the diagnosis of those which are little known." The manner in which the author has accomplished his task is excellent, though we may make certain remarks: they are not intended as fault finding, but merely as suggestions.

In the necessary stratigraphical introduction the author notes that, following the example of Oppel, he has divided the Inferior Oolite into six zones. But much greater perfection in the matter of the subdivision of the Inferior Oolite has been attained within the last seven or eight years in other countries with considerable advantage to palæontology. It is reasonable to suppose that the fifty-eight beds which the author enumerates could be subdivided with similar detail.

The palæontographical portion of the work opens with descriptions of *Belemnites*, though no figures are given. It is satisfactory to see that the author partially recognises the desirability of generic subdivision of *Belemnites*; though he only puts such a title as *Megateuthis* in brackets. It is obvious enough that such species as *giganteus*, *gingensis*, and *blainvillei* belong to three distinct genera: they differ from each other in more than specific characters, and it is time that this was fully recognised in the nomenclature. But though the sulcate *blainvillei* is generically distinct from its non-sulcate contemporaries, it is obviously descended from non-sulcate ancestors; and this is a point which the generic nomenclature should recognise. The difficulty here indicated consists mainly in the choice of a suitable generic distinction.

Of the Ammonites the author figures a *Lioceras* sp., with a colour band. It may be suggested that the species is not of the family to which *Lioceras* belongs, but is one of the *Sonnininæ*. He gives an excellent series of figures of *Sphæroceras polyschides* with a long description. But why does he speak therein of "*Sp. Brooki*" when he means *brocchii*? And when he says "that *Brooki* approaches *Steph.*

Humphriesi in a way, and forms the passage between that species and *Sp. polyschides*, and at the same time the passage between the genera *Stephanoceras* and *Sphaeroceras*" he shows great misapprehension as to Ammonite characteristics, and particularly as to the genetic development of these particular forms.

Many species of Gastropods are figured and described. Among them are six new species belonging to the genera *Turnatellaea*, *Pseudocerithium*, *Trochus* (*Ziziphinus*), *Ampullaria* and *Littorina*. By the name *Ziziphinus* the author seems to indicate that the genus *Trochus* requires subdivision, and there can be no doubt that the Jurassic Gastropods assigned to the genera *Trochus* and *Turbo* are much in need of generic rearrangement.

In his synonymy of *Amberleya ornata* the author makes a small slip. He credits Sowerby with naming the shell *Littorina ornata*, but he called it *Turbo ornatus*. Other details in the synonymy might call for criticism. For instance *Belemnites blainvillei*, d'Orbigny, and Phillips, are not the same species; nor are *Am. braikenridgii* of Sowerby, and d'Orbigny. In fact Sowerby's *braikenridgii* has not yet been satisfactorily identified.—S. S. BUCKMAN.

Kobelt, W.—Studien zur Zoogeographie. II Die Fauna der Meridionalen Subregion. 8vo. pp. x+368, Wiesbaden: 1898, C. W. Kreidel.

As a wide and comprehensive review of the Mollusca in this particular region Dr. Kobelt's "Studies" leave little to be desired. In addition to the Mollusca, which occupy a large portion of this volume, the author treats of the Amphibia, Reptilia, and Mammalia also.

The region dealt with, which is divided up into a series of faunistic divisions, includes the Pontic countries, the Caucasus, Mesopotamia, Persia, Arabia, the Mediterranean, the Tyrrhenian Province, Italy, the Balkan Peninsula, Asia Minor, Syria, Palestine, and Egypt. In arriving at the boundaries of the faunistic provinces, particular stress is laid upon the geology and configuration of land and water, as it appears at the present time, and the condition which obtained in previous periods.

So far as the recent Molluscan fauna is concerned, Dr. Kobelt finds that in its salient features there is a greater agreement with the flora, than with either the Reptilia or Mammalia, though more so with the former group than the latter. The present fauna shows evidence of having arisen from pre-tertiary and new tertiary faunas, especially the latter, in which the influence of separate centres of evolution is clearly discernible, these giving rise to the different characters of the local faunas of the present time.—W. E. C.

Appellöf, A.—Uber das Vorkommen innerer Schalen bei den achtarmigen Cephalopoden. (Octopoda). Bergens Museums Aarbog, 1898, No. xii, pp. 1—15, Tf. 1—2.

The absence of any internal shell in the Octopoda has hitherto been regarded as one of the chief points of difference from the *Decapoda*. In the paper before us the author describes the presence of two narrow chitinous rods in *Octopus*, *Eledone*, and *Cirroteuthis*, which are situated in a cavity on the dorsal surface of the mantle, the cavity being lined by epithelium which secretes these concentrically laminated rods.—W. E. C.

Choffat, P.—Les Ammonées du Bellasien, des Couches à Neolobites Vibrayeanus, du Turonien et du Sénonien. Recueil d'etudes paleontol. sur la Faune Cretacique d. Portugal, 1898, vol. i (s. 2), pp. 41—86, pls. iii—xxii.

The interest attached to the present paper lies mainly in the description and figures of a new genus of Turonian Ammonites to which the name *Vascoceras* is given. Unfortunately in Portugal the members of this genus are not well preserved, and we venture to think that not a few palaeontologists will regard many of the "new species" as undeterminable from their bad state of preservation. Even the

author at times is in doubt as to the distinctness of certain "species," whilst in other cases the generic position is a matter of doubt. All the specimens have been excellently described and figured, although in yet a few instances reliance has had to be placed upon very secondary characters.—W. E. C.

Namias, J.—Collezione di Molluschi Pliocenici di Castellarquato esistenti nel Museo di Mineralogia e Geologia dell' Università di Modena. 8vo, pp. 214. Modena: 1898. Reprinted from the Atti Soc. Naturalisti Modena (s. iii), vol. xv.)

This is a copiously annotated synonymic catalogue of such of the species of mollusca from the Pliocene beds near Castellarquato as are preserved in the Geological Museum attached to the University of Modena.

Castellarquato, which lies between Parma and Piacenza, is a classical spot to the Italian geologist, not much quoted in manuals it is true, though Issel has created the group Piacenzian for the reception of the deposits there. The present collection is the result of the labours of Doderlein, Prof. Pantanelli, and the author, who states that the beds appear to have accumulated in a littoral sea, or one of moderate depth.

The molluscan remains are as abundant as in our own Crags if not more so, and we have counted (unfortunately they are not numbered) 573 species enumerated in the catalogue, whilst there is a further list of 291 species which have been cited as occurring at Castellarquato, but which are not represented in the museum at Modena. By an oversight *Tapes bronni*. Mayer, occurs in both, and one would wish that the same classification had been followed in the two lists; but these are minor matters. It is more instructive to compare in certain cases the number of species known and reported for a given genus: thus 2 species of *Pecten* occur in the Modena Museum, whilst 20 others have been recorded. *Murex* appears to be the genus best represented, 10 species being in the collection, whilst *Rhaphitoma* possibly comes next with 14; on the other hand but two land-shells appear, an indeterminate species of *Glandina* and *Helix brocchii*.

Our author describes 6 new species: *Admete triplicata* (p. 39), *Mitra postumia*, and *M. pantanelli* (p. 43). *Dosinia placentina* (p. 169), *Tapes intermedius* (p. 175) and *Gastrana filiosa* (p. 195). Seeing that now-a-days the soundness of conchological work on the continent may generally be reckoned to be in inverse proportion to the percentage of new species founded, this small number is strong evidence of the good quality of Prof. Namias' work. By a clerical error four species of *Scalaridæ* have "De Boury n. sp." after them; but, as the synonymy shows, these were described by that author in 1890, and are therefore hardly new.

Unfortunately our author's new species are not accompanied by figures, and there is no index of any sort to the monograph; but apart from these drawbacks, the work is a solid contribution to palæontological literature, and Prof. Namias is much to be thanked for, and congratulated on, its production.—B. B. Woodward.

Siemiradzki, J. von.—Monographische Beschreibung der Ammonitengattung Perisphinctes. Palæontographica, 1899, Bd. xlv, pp. 69—352, T. xx—xxvii.

For some time past Dr. J. v. Siemiradzki has been working at the descent of the Upper Jurassic Ammonites, and this work has led him to a revision of the genus *Perisphinctes* which is so numerously represented in the Upper Jurassic rocks. Founded by Waagen in 1869 as a subgenus of *Stephanoceras* and shortly afterwards raised to generic rank by Neumayr, Zittel and Waagen himself, this genus has now become so large that any attempt to classify the forms that have been included in it is not only a very difficult task, but entails a vast amount of labour and research. For the present monograph the author therefore deserves our best thanks. He tells us that in the preparation of the work he has consulted 128 separate publications in German, French, English, Italian, Spanish, Polish, and Russian; and besides his own collection which contains several hundred examples of the genus, he has examined the collections of several private individuals as well as those of various continental

museums. The author has in many cases examined the type-specimens and in some cases when it was not possible for him to do this, he obtained plaster casts of them in order to gain a correct idea of the species. One great difficulty in dealing with this genus is due to the very vague manner in which several specific names, such as *biplex*, *plicatilis*, *polyplocus*, and *polygyratus*, have been used, owing in some cases to the inadequate description or figure of the type-specimen. The author concludes that a precise limitation of the genus from allied genera is not possible and that its limits must be drawn somewhat artificially. Thus *Parkinsonia* is distinguished from *Perisphinctes* by the presence of a median ventral furrow, but as this character occurs in some *Perisphinctes* it cannot be regarded as of generic value, and only those forms must be referred to *Parkinsonia* which combine this character with others, such as the presence of lateral or of ventral tubercles. In other characters *Parkinsonia* resembles *Perisphinctes* and supports Teisseyre's view that *Parkinsonia* is the ancestral form of many of the *Perisphinctes*. This is indirectly confirmed by their geological age, for whilst *Parkinsonia* commences, according to the author, in the Upper Lias, attains its maximum development in the Inferior Oolite, and dies out in the zone of *Oppelia fusca*, true *Perisphinctes* commence in this same zone. Again Neumayr's *Simoceras* is distinguished from *Perisphinctes* by the presence of a smooth band on the peripheral area, but the author includes in that genus only such forms as possess that character in combination with others, namely the presence of tubercles and the gradually diminishing number of the bifurcating ribs. To the genus *Perisphinctes*, however, the author refers certain species which have frequently been placed in the genus *Hoplites*, reserving for that genus only those forms which in addition to the ventral furrow possess marginal or lateral tubercles; and he transfers to *Olcostephanus* the groups of *stephanoides*, *desmonotus*, *polyptychus* and *virgatus* which some authors have placed in *Perisphinctes*.

There is a short but interesting chapter on the morphology of the shell. Whilst admitting the importance of the character of the remains of former apertures which are preserved on the shell the author does not consider them to possess the taxonomic value that has sometimes been ascribed to them, in fact he considers, and rightly so, that any classification founded upon a single morphological character is arbitrary and unnatural. The author bases his classification upon the principle that the inner whorls of an individual reproduce the morphological characters of the adult of its direct ancestor occurring in the preceding geological stage; but in framing such a classification he has experienced great difficulty owing to the fact that many species of *Perisphinctes* have been hitherto inadequately described, that is to say, all their important morphological characters, such as the character of the inner whorls and of the body-chamber, the details of the suture-line and the precise form of the aperture, have not been given.

The author naturally first paid special attention to the geologically oldest forms of *Perisphinctes*, namely those found in the zone of *Oppelia fusca*, and having carefully differentiated these, sought for their nearest relatives in the next higher geological stage, and so on through each successive stage of the Jurassic rocks. In this way he has grouped the 267 species of *Perisphinctes* which he has recognized, into a number of "Formenreihe" or groups of coherent-related species, and these again into a number of "Mutationsreihe" or developmental series; these are arranged in six sections and grouped into five subgenera thus: I. *Grossouvria*, n. subgen. (including II. *Biplices*, Sutner), III. *Ataxioceras*, Fontannes, IV. *Perisphinctes*, s. str., V. *Procerites*, n. subgen., and VI. *Choffatia*, n. subgen.

The author gives a description of each species, lateral views of the new forms and of some others are given on the eight photographic plates accompanying the work, an outline of the transverse section of the whorl, a drawing of the suture line of many of the species, and in some cases also of the form of the aperture, being given in the illustrations included in the text.

As defined by the author the genus is exclusively Jurassic, the oldest types appearing in the Inferior Oolite, and only a few species reaching to the Neocomian. He considers that the four principal types, viz., *Grossouvria*, *Perisphinctes*,

Procerites, and *Chaffatia*, appear simultaneously in the Inferior Oolite, and therefore that the genus must be polyphyletic. Judging by the character of the inner whorls, *Grossouvria* appears to be derived from *Parkinsonia*, and *Perisphinctes*, s. str., perhaps from the genus *Morphoceras*; *Procerites* undoubtedly from *Stephanoceras* [or *Stephoceras* as has been proposed], s. str., and *Chaffatia* probably from many Upper Liassic species of *Coeloceras*, while *Ataxioceras* and the group of the Biplices are directly descended from *Grossouvria*.

In a monograph of this kind a good index is most important, and it is therefore to be regretted that the index to the present work is somewhat incomplete and imperfect. In the synonymy the references are not always so full as could be desired, and although there is a list of works at the end of the Monograph, this does not always give the required information; the expression *loc. cit.* occurs more frequently than is desirable and sometimes even when quite unnecessary. But notwithstanding these imperfections the author deserves our best thanks for this valuable monograph of a most difficult genus.—G. C. CRICK.

Baker, F. C.—The Mollusca of the Chicago Area. The Pelecypoda. Bull. Chicago Ac. Sci., 1898, pp. 1—130, pls. i—xxvii, figs. 1—10.

The present paper forms the first part of the "Bulletin of the Natural History Survey of the Chicago Academy of Sciences," dealing with the Mollusca, and treats of the Pelecypoda. A second part, to be issued shortly, will report on the Gastropoda.

The area embraced in the survey is about 1800 square miles of land surface, and much useful information is given on the "Topography of the Area," "Localities of special interest," Geographical and Geological distribution, and comparisons instituted between the molluscan fauna of this area and others.

Mr. Baker records in the present report 50 species distributed as below:—

Anodonta,	3.	*Anodontoides*,	2.	*Lampsilis*,	11.
Alasmodonta,	5.	*Quadrula*,	8.	*Sphærium*,	6.
Strophitus,	2.	*Obliquaria*,	1.	*Calyculina*,	4.
Unio,	2.	*Plagiola*,	2.	*Pisidium*,	4.

Free use has been made of the writings of Call, Prime, Pilsbry, Simpson, Tryon, Haldeman, and Stimpson, which is duly acknowledged.

The report is illustrated by 27 plates, which, with the exception of the last, are very clear.—W. E. C.

Drew, Gilman A.—Some observations on the Habits, Anatomy and Embryology of Members of the Protobranchia. Anat. Anz., 1899, Bd. xv, pp. 493—519, 21 figs.

This short pamphlet is in the main an abstract of a paper on *Yoldia*, now being published in the "*Memoirs of the Johns Hopkins University*," supplemented by references to two species of *Nucula*. In consequence it suffers from the usual drawbacks of preliminary papers, being interesting enough in matter but curt and aggravating in manner. The paper is divided into two parts. The first describes the coarse anatomy illustrated by a study of the living animal—a combination of anatomy with natural history that one would gladly see more often than one does. In this part several interesting points may be noted (for instance, the food conducting function of the long palp appendages and the pump-like action of the gills), but the feature that stands out in the highest relief is the remarkable variation among the members of the group, a fact that brings home to one the great antiquity and generalized character of their common ancestor. We find for example all the three relations between heart and intestine possible for a Lamellibranch—double and single cerebro-pedal connectives, open and closed oto-cyst, and so on.

The second part deals with a subject hitherto untouched, the embryology of the group. It is largely given up to the description of a curious ectodermic ciliated test, which may possibly represent the velum of other molluscan embryos. The test is formed early, and almost entirely surrounds the embryo, while within it a new ectoderm arises probably "from cells that have wandered in from the surface" (a somewhat vague expression). After some time—100 hours or so—the test with a large part of the stomodœum is shed.

The development of the other organs is little more than touched upon, a fault that will no doubt be remedied in the larger publication. But even in this preliminary paper one would have liked to hear more of the development of the nervous system. Is there, for instance, any sign of duplicity in the early development of the cerebral ganglia, suggestive of fused cerebral and pleural in the adult? A word of praise must be given to the 21 illustrations, which are both clear and artistic.

R. H. BURNE.

Kennard, A. S. and Woodward, B. B.—A Revision of the Pliocene non-marine Mollusca of England. Proc. Malac. Soc. Lond., 1899, vol. iii, pp. 187—204, figs. 1—4.

A useful and much needed revision. 38 species are enumerated and 12 of the previously recorded species are rejected. *Paludestrina reevei* is a new species, while *Pisidium fontinale*, Drp., and *P. pusillum*, Gml., are new records.—W. E. C.

Melvill, J. Cosmo, and Sykes, E. R.—Notes on a third collection of Marine Shells from the Andaman Islands, with descriptions of three new species of *Mitra*. Proc. Malac. Soc. Lond., 1899, vol. iii, pp. 220—29, figs. i—vi.

The new species and varieties are: *Mitra (Chrysame) buryi*, *M. (Costellaria) dilectissima*, *M. (Costellaria) georgii*, *Nassa (Phrontis) zaileusis*, Sby., var. n. *andamanica*, *Natica strongyla*, Melv., var. n. *andamanica*.

Snow, Chas. H.—Marine Wood-Borers. Proc. Amer. Soc. Civil Engineers, 1898, vol. xxiv, pp. 399—430, pls. xx—xxi.

An excellent and well illustrated paper, written from an engineer's standpoint. Much useful information on the amount and rapidity of the destruction wrought on American coasts by *Teredo*, will be found of interest to malacologists.—C. H.

Fischer, H.—Liste des Mollusques Marins recueillis a Guéthary et a Saint-Jean-de-Luz. Trav. d. Lab. Soc. sci. et Stat. Zool. d'Arcachon, 1899, pp. 1—12.

Collett, O.—Contributions to Ceylon Malacology. (2) Description of a new Helicoid Land Shell from the Southern Province. Journ. R. Asiatic Soc. Ceylon Branch, 1898, vol. xv, No. 49, pp. 1—2, 1 pl.

Acavus (Oligospira) poleii, n. sp. is closely applied to *A. waltoni*, Rve., differing however in its somewhat narrower and more solid shell, and by a pure white peristome; further *A. poleii* is restricted to the forests of the Southern Province, a district in which *A. waltoni* is not known to occur.—W. E. C.

Meli, R.—Sulla *Eastonia rugosa*, Chemn. (*Mactra*) ritrovata vivente e fossile nel littorale di Anzio e Nettuno. Boll. d. Soc. Malac. Ital., 1897, vol. xx, pp. 45-64, 1899, vol. xx, pp. 65-73, T. ii, pr.

Meli, R.—Sul *Typhis (Typhinellus) tetrapterus*, Bronn (*Murex*) etc. Ibid. 1899, pp. 74-96, T. ii, pl.

Audenino, L.—I Pteropodi Miocenici del Monte dei Cappuccini in Torino. Ibid., pp. 97-114, T. v.

Meli, R.—Ancora poche parole sugli esemplari di *Neptunea sinistrorsa*, Desh. (*Fusus*), pescati nella parte australe del bacino occidentale del Mediterraneo (Algeri). Ibid., pp. 115-24, T. iv.

Meisenheimer, J. — Zur Morphologie der Urniere der Pulmonaten. Zeit. f. wiss. Zool., 1899, Bd. lxv, pp. 709—724, T. xxxiii, u. 4 figs.

Dr. Meisenheimer here describes the results of an investigation upon the morphology of the primitive kidney of the Pulmonata; briefly these may be summarised as follows: Although differing widely in the Basommatophora and Stylommatophora, the nephridium may be reduced in both cases to a common type, which consists essentially of a simple tube, with an internal, terminal, ciliated cell. Regarding this as the typical form the author finds that in the Basommatophora there are only four cells, one of which, the giant cell, is the true excretory cell; whilst in the Stylommatophora there are a large number of cells all of which are excretory in function. In the former sub-order the ciliated cell retains its excretory function, but in the latter there are a number of these ciliated cells, all of which almost entirely lose their excretory function.

The similarity of this nephridium with the end cells of the nephridial system of the Turbellaria is quite surprising, and sufficiently clear, in the author's opinion, to confirm the view that the ancestor of the mollusc was a Turbellarian-like animal.

W. E. C.

Dall, W. H.—Synopsis of the recent and tertiary *Leptonacea* of N. America and the West Indies. Proc. U. S. Nat. Mus., 1899, vol. xxi, pp. 873–97, pls. 87—88.

Professor Dall here gives a most valuable synoptical review of the *Leptonacea*, the fuller details of which are promised in a volume of the "*Transactions of the Wagner Inst. of Science*" (vol. v, pt. 5). The group is a most perplexing one and malacologists will welcome an attempt at revision. The synopsis and classification of the American species we leave for more lengthy consideration, confining our remarks to the author's introduction in particular.

Anatomically we know very little of the various genera which go to form the *Leptonacea*. Although they cannot be regarded as prototypes, they exhibit many supposed prototypic characters. Commensalism, or parasitism has here probably "produced degeneration accompanied by a revival of atavistic primary characters." Hitherto the "dentition" of the hinge has played an all too important feature in the classification, and we are glad to find that the value of this character is considerably lessened by the author's researches. Dr. Dall finds that often it is indistinctly developed and liable to many variations, due to the dynamic reactions of one tooth upon another, and to inherited tendencies of form. Further, a part or the whole of the hinge may become obsolete, so that to assume, as Bernard has sometimes done, that the position of a dental lamina is in itself sufficient to settle homology, is, in the author's opinion, certainly unsafe.

Eighteen new species are described, of these 9 are founded upon single valves!

W. E. C.

EDITOR'S NOTES.

We regret to have to record the deaths of Sylvanus Charles Throp Hanley on April 5th, 1899, age 80; Franz von Hauer, Director of the Vienna Museum, on March 21st, 1899, age 77, and H. T. Soppitt, on April 1st, 1899, age 40.

At a meeting of the Midland Malacological Society, held on May 12th, 1899, Dr. Henry Fischer and Professor H. A. Pilsbry, were, on the unanimous recommendation of the Council, elected Honorary Members of the Society.

Professor Dr. E. von Martens has recently been elected a Foreign Member of the Linnean Society of London.

The University of Iowa has recently conferred the degree of Doctor of Science upon Professor H. A. Pilsbry.

THE

JOURNAL OF MALACOLOGY.

No. 4. DECEMBER 20TH, 1899. VOL. VII.

ON THE ANATOMY AND SYSTEMATIC POSITION OF SOME RECENT ADDITIONS TO THE BRITISH MUSEUM COLLECTION OF SLUGS.

By WALTER E. COLLINGE, F.Z.S.,

Mason University College, Birmingham.

(Plates iv—v.)

THE specimens enumerated in the following pages are some I have recently received from Mr. Edgar A. Smith of the British Museum, to whom my best thanks are due for his kindness in placing the same in my hands, and also for the facilities he has given me for examining the collections under his charge. I also wish to express my best thanks to Dr. Ad. S. Jenson, the able Director of the Malacological Section of the Zoological Museum of the University of Copenhagen, for his kindness in permitting me to examine the type specimens and dissections of *Telennophorus australis*, Bergh, and for the duplicate specimens he has so generously sent me for purposes of dissection.

ATOXON, Simr.

Atoxon lineatum, Simr.

Hab.—Somaliland, East Africa. Two specimens collected by E. Lort Phillips, Esq.

These are both immature examples of this species. The reproductive organs were not developed, but a comparison of the two individuals with the description and figures given by Simroth (15) leaves little doubt as to their identity.

Length (in alcohol) 36.5 mm.

ANADENUS, Heyn.

A. sechuenensis, n. sp. Pl. iv, figs. 1, 2, 6, 7, pl. v, figs. 8—13.

Animal olive brown with a faint, dark, mid-dorsal band and darker lateral bands. Mantle ovoid, large, marked with a postero-median diamond-shaped, light space, with dark bordering, a few indistinct black spots laterally. Respiratory orifice slightly behind the middle of the mantle. Generative orifice below and behind the right lower tentacle. Rugæ small, irregular in outline, in groups divided by deep black sulci. Peripodial groove small but distinct. Foot-fringe same colour as the body, lineoles almost black. Foot-sole divided into lateral and median planes, the former being dark ashy-grey or blackish, the latter olive brown.

Length (in alcohol) 74 mm.; length of mantle 34.5 mm.; breadth of foot-sole 23.5 mm.

Shell a thin, flat, calcareous plate with no periostracum. Length 12 mm.; breadth 5.5 mm.

Hab.—Sung pan, N. W. Sechuen, China.

ANATOMY.

Digestive System.—This agrees in the main with the description and figure of *A. altivagus*, Theob., given by Pilsbry (14), differing however in a few points. The buccal cavity leads into a short œsophagus, at the point of junction of these two the salivary glands open by their ducts on the dorsal surface. Both of the glands are folded upon themselves and, in the specimen dissected, were partly ventral to the buccal cavity and œsophagus. There is a wide crop which narrows posteriorly and opens into an ill-defined stomach, which is divided into two parts, the hepatic ducts entering posteriorly between the two, here terminates the first loop of the digestive tract; the second loop passes forwards beneath the crop, anteriorly appearing above it, and bending backwards forms the third loop, this is continued backwards beyond the stomach and making a single revolution, returns forwards beneath the stomach as the fourth loop, and passing across the middle of the crop as the rectum it terminates at the anus on the right side (Pl. iv, fig. 6).

The Jaw.—I have to thank the Rev. Professor H. M. Gwatkin, M.A., of Cambridge, for very kindly examining this and the radula. It corresponds exactly with the description given by Pilsbry (14) of that in *A. altivagus*, Theob.

The Radula ($\frac{4.0-4-5.6}{131} = 14803$) differs from that in *A. altivagus* in the smaller size of the cusps of the central teeth.

The Retractor Muscles (Pl. iv, fig. 7).—Godwin-Austen (9) and Pilsbry (14) differ from one another in their account of the retractor muscles in *A. altivagus*, Theob. In the main features I can confirm Pilsbry's account, though there are here some slight differences in position from the condition which obtains in the above mentioned species, which the figure (Pl. iv, fig. 7) sufficiently well explains.

Pedal Gland (Pl. v, figs. 8—9).—Lying free in the body cavity, above the musculature of the foot-sole is a long, tongue-shaped gland 17 mm. long and 2.5 mm. broad. At its commencement there is a rounded glandular mass, situated on the dorsal side of the gland and slightly embracing it laterally. I was unable, in the specimen dissected, to satisfy myself of its relation, if any, to the pedal gland.

In transverse section (Pl. v, fig. 9) the lumen appears somewhat triangular in shape bounded by a thick glandular wall. The upper side of the lumen is lined with columnar epithelium cells, the lower with cuboid shaped cells. A transverse section was made through the anterior portion of the gland through the rounded glandular mass mentioned above, but particulars of its structure and its exact relations to the pedal gland must be deferred until more material has been examined.

Pallial Organs (Pl. iv, fig. 7).—These agree in the main with the description given by Godwin-Austen (9) of those in *A. altivagus*. Here, however, the kidney is larger and slightly different in shape. The pyriform shaped ventricle is situated posteriorly, the auricle being directed forwards and slightly towards the right side.

The Generative Organs (Pl. v, figs. 10—13).—The vestibule is small. The vagina is a wide tube with a series of longitudinal ridges on its internal wall (Pl. v, fig. 11). At the commencement of the vagina these parallel ridges are joined by a series of transverse ridges. At about the lower third the thick lip-like opening of the free-oviduct is noticeable, and in front of it the ridges are more pronounced, forming a tongue-like body. The penis is small, 10.5 mm. long in the specimen examined, and somewhat pyriform in shape. The rectractor muscle is divided into two parts, the larger division being attached to the distal end of the penis, the smaller passes over the vas deferens and is inserted into the wall of the penis at about its middle (Pl. v, fig 10). Internally the walls of the penis are seen to consist of a dense muscular coat, covered by a glandular epithelial lining, which form a series of longitudinal ridges proximally, distally the whole of the inner surface is studded with a series of minute fleshy rugosities, and at the extreme distal portion is a thick muscular ring, the penis papilla, also covered with these (Pl. v, fig. 12);

this muscular ring forms the boundary of the opening of the vas deferens into the lumen of the penis. There were no calcareous spicules. The vas deferens is a long, densely coiled tube and at the point where it opens into the common duct it is thrown into a series of convolutions, similar to those which have been described in *Paryphanta busbyi*, Gray, by Godwin-Austen (10) and in *Testacella maugei*, Fér., by myself (6). The receptaculum seminis is a wide sac-like body, the whole of its internal wall being more or less folded. Just before the opening into the vagina the folds have a dense arborescent form, becoming less and less marked distally (Pl. v, fig. 11). There is no receptacular duct. The free oviduct is fairly long and shows a slight constriction just in front of the point where the oviduct ceases. The common duct is thrown into three well defined loops. The albumen gland is small. There is a long hermaphrodite duct and a very large hermaphrodite gland, measuring 23.5 mm. in length.

Affinities.

A. sechuenensis differs from *A. altivagus*, Theob. in the general form of the generative organs, particularly in the smaller size of the penis and receptaculum seminis and the larger hermaphrodite gland; other differences are seen in the points of insertion of the retractor muscle of the penis, the convolutions of the common duct, the shape of the crop, and in the larger size and shape of the kidney.

Anatomical details of most of the described species of this genus are still wanting.

TEBENNOPHORUS, Binn.

Tebennophorus billneatus, Bens., 1842.

From Chekiang, China, Messrs. J. J. Walker and Basset Smith have collected three specimens of *Tebennophorus*. Both externally and internally these are identical with some I examined from Oahu and Honolulu, Hawaiian Isles, in 1895 (7) and 1896 (8) and which were referred to *T. australis*, Bergh.* The original description of this latter species (2) is not a good one, and unfortunately no figures were given of the external appearance or anatomy, the lingual ribbon only being figured. In 1871 (16) this was supplemented by a figure of the jaw.

Through the kindness of Dr. Ad. S. Jenson I have been allowed to examine the type and dissected specimens of *T. australis*, Bergh, from the Zoological Museum of the University of Copenhagen, also

* The specimens recorded on p. 955, Proc. Malac. Soc. Lond. 1896, vol. ii, as *T. striatus*, Hasselt, should be *T. australis*, Bergh.

some of the duplicate specimens which were collected on the "Galatea Expedition" in 1846, and I have here given two figures of the same (Pl. iv, figs. 4 and 5).

A comparison of the "Galatea" specimens with those from Chekiang, and those from the Hawaiian Isles, shows many external points of difference, thus in the "Galatea" specimens the ground colour is a yellowish-brown and there are three distinct lines of a deeper brown, one in the mid-dorsal line and a lateral one on each side of this. In the British Museum specimens from Chekiang, and in those from the Hawaiian Isles, the median line is absent, or only very faintly represented, while the lateral ones are very irregular, broad, lines with numerous spots and blotches on a yellowish ground. In all three cases the jaw is ribbed and anatomically they are practically identical. This being so, the description given by Bergh is quite inadequate for the species, for so far as external colouring and markings are concerned, it is a most variable one.

Although differing externally as shown above, all three agree so closely anatomically, that at first I was inclined to group them all under *T. australis*, Bergh. A later examination, however, of the external characters of the specimens above mentioned, suggested to me the possibility of certain specimens in the British Museum Collection being also referable to *T. australis*, Bergh, thus I was led to make a very careful examination of what at first appeared to be a series of closely allied species.

The results of this examination leave no doubt in my own mind that they must all be referred to the *T. bilineatus*, Bens., (1) which was described in 1842, and its anatomy described and figured by Keferstein in 1866 (12).

The specimens in the British Museum collection which were examined are as follows:

T. bilineatus, Bens.

Benson's original description is very brief but sufficient to identify the species. There are two examples in the Collection, one from Chusan, the other from Yokohama, Japan, from the "Challenger" collection. Cockerell (5) has named this latter *T. confusus* from the fact that it differs from Benson's species in possessing a jaw which is not ribbed. At the same time he admits that it is like von Martens' figure of *T. bilineatus* (13), and also like Keferstein's figure (*op. cit.* T. i, fig. 5). Now Keferstein's account of the internal structure agrees in the main with that I have given here in rather greater detail, so I think, there can be no question as to Cockerell's *T. confusus* and Keferstein's *T. bilineatus* being identical, and I shall show that the

internal structure of Bergh's *T. australis* and the specimens from the Hawaiian Isles and from Chekiang all agree internally with the description given by Keferstein. The only difference externally in the "Challenger" specimens from any others I have seen of *T. bilineatus*, is the presence of a number of black markings on the dorsum which tend "to form oblique lines running centrally backwards," this, however, I think is only a variation.

T. formosensis, Ckll.

Two specimens in the British Museum from Formosa, have been termed by Cockerell *T. formosensis*, but until structural differences are given these must be referred to *T. bilineatus*, Bens. Heynemann (11) has recorded this last mentioned species from Formosa. I fail entirely to see why these Formosa specimens have been separated from Benson's species, for Cockerell himself states that compared with the Chusan specimen they "do not seem specifically different so far as external characters go." At first, he states, he was inclined to regard it as a geographical race of *T. confusus*, but not having examined the jaw he could not be certain, further seeing that *T. bilineatus*, Bens., has been found in the Chusan Islands it is "highly probable that the Formosa form has a ribbed jaw and is allied thereto" (5, p. 385).

T. campestris, Godwin-Austen.

Five specimens in the British Museum from Dukhun have been referred by Cockerell to this species. Godwin-Austen's original figure is not very clear.* but if these five specimens are the same as his *T. campestris*, I can only, in the absence of any account of the internal structure of *campestris*, regard it as another synonym of *T. bilineatus*, Bens.

T. chinensis, Ckll..

A specimen in the Museum taken 1300 miles up the Yang-tse River, China, has been named by Cockerell *T. chinensis*. It is very like one of the small specimens of *T. australis*, sent me by Dr. Jenson.

T. bilineatus, Benson. Pl. iv, figs. 3—5, pl. v, fig. 14.

Incillaria bilineata, Bens., 1842, Ann. and Mag. N. H., vol. ix, p. 486.

Philomycus (Incillaria) bilineatus, Kef., 1866, Mal. Blatt., Bd. 13, p, 64, T. i, figs. 5—9.

Philomycus australis, Bergh, 1870, Verhandl. Zool. Bot. Gesell., Wien, Bd. xx, p. 863.

* Journ. Asia. Soc. Bengal. 1876. vol. xlv, pl. viii, fig. 3.

Philomycus campestris, Godwin-Austen, 1876, Journ. Asia. Soc. Bengal, vol. xlv, p. 315, pl. viii, fig. 3.

Limacella confusa, Ckll., 1893, Ann. and Mag. N. H. (s. 6), vol. vi, p. 384.

Limacella formosensis, Ckll., 1890, Ibid., p. 384.

Limacella chinensis, Ckll., 1890, Ibid., p. 386.

Hab.—Chekiang, China. Three specimens collected by Messrs. J. J. Walker and Basset Smith.

Animal (Pl. iv, fig. 4) globose anteriorly, tapering posteriorly, ground colour yellow or yellowish-brown, varying to a deep brown, usually with a faint median and two irregular lateral bands, sides of body marked with brownish spots or blotches; colour subject to much variation. Mantle covers the whole of the dorsum. Peripodial groove distinct. Foot-fringe yellowish with brownish lineoles. Foot-sole yellow, not divided into median and lateral planes.

Length (in alcohol) 39 mm., foot-sole 12 mm. broad.

Anatomy.

The Generative Organs (Pl. v, fig. 14).—The vestibule is a large globose sac, on the inner (left) side of which the penis opens, this organ is a wide muscular tube twisted and folded upon itself, its distal end is expanded and on the under side of this the vas deferens joins the penis (Pl. v, fig. 14, *v. d.*). In all the specimens dissected, the form of the penis was constant, always being expanded at its distal extremity and folded upon itself. The vas deferens is a short convoluted tube lying dorsal to the free-oviduct. The receptaculum seminis is a large somewhat triangular shaped sac, it has a long duct which becomes slightly larger just before opening into the vestibule. The common duct is folded upon itself twice, the oviducal portion being much convoluted. The albumen gland calls for no special mention. There is a long convoluted hermaphrodite duct, and a large hermaphrodite gland divided into a series of lobules.

Affinities.

Respecting the affinities of *T. bilineatus*, I am able to say very little, owing to the lack of any details respecting the anatomy of the majority of species of this genus. In the form and structure of the digestive and generative organs it is related distantly to *T. striatus*, Hass. It is very distinct from *T. carolinensis*, Bosc.

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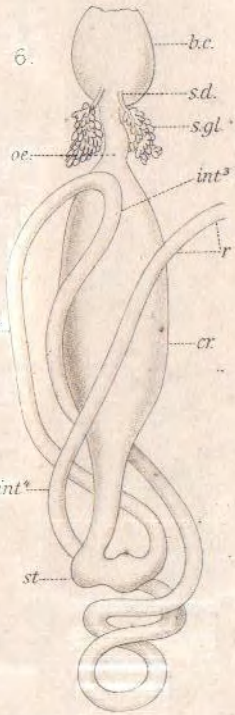
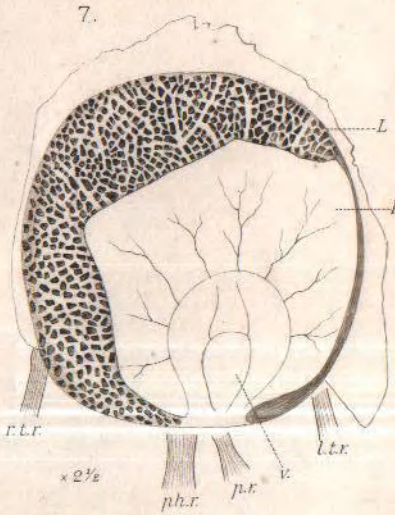
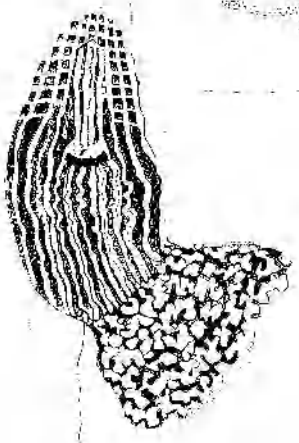
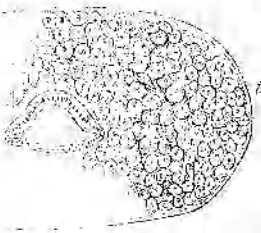


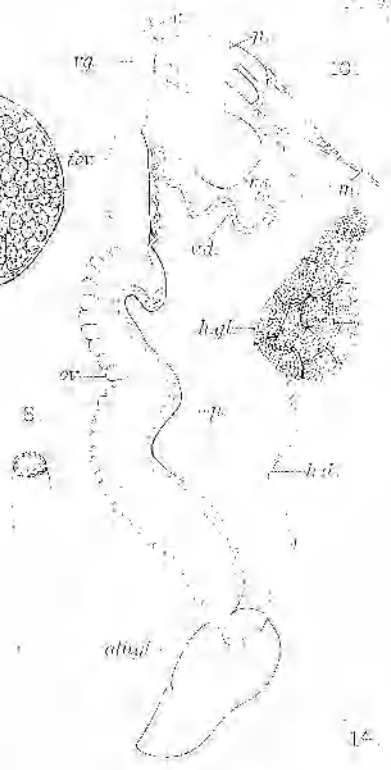


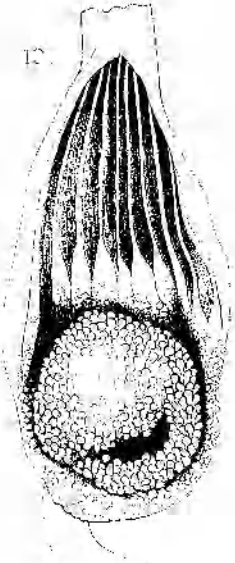
Figs. 1-2 F.J.P. del. ad nat.
„ 3-7 W.E.C. „ „

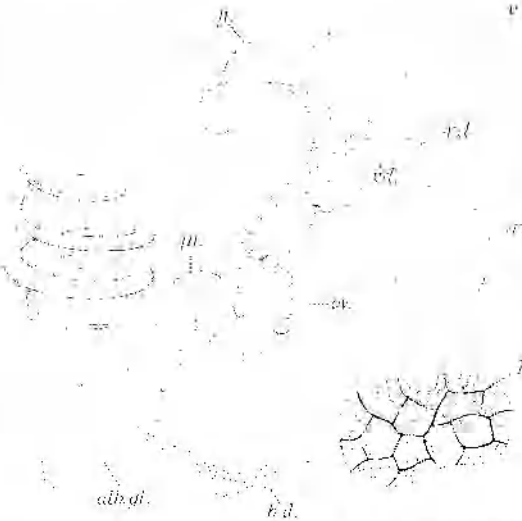
Lith. Werner & Winter Frankfort/M











BRITISH MUSEUM SLUGS

EXPLANATION OF PLATES IV—V.

Fig. 1. *Anadenus sechuenensis*, n. sp. View from the right side. × 1.
Fig. 2. ,, ,, Dorsal view of the same. × 1.
Fig. 3. *Tebennophorus bilineatus*, Bens. View from the right side.
Figs. 4—5. Lateral and dorsal views of specimens named *T. australis* by Bergh.
Fig. 6. *Anadenus sechuenensis*, n. sp. Alimentary canal.
Fig. 7. ,, ,, Pallial complex seen from below. × 2½.
Fig. 8. ,, ,, *Pedal Gland.* × 2.
Fig. 9. ,, ,, Transverse section of the pedal gland.
Fig. 10. ,, ,, Generative organs.
Fig. 11. ,, ,, Vagina and receptaculum seminis cut open to show the structure of the internal wall.
Fig. 12. ,, ,, Penis cut open to show the structure of the internal wall.
Fig. 13. ,, ,, Spermatophore.
Fig. 14. *Tebennophorus bilineatus*, Bens. Generative organs.

Reference Letters.

a.	Auricle.	*ov.*	Oviduct.
alb. gl.	Albumen gland.	*p.*	Penis.
b. c.	Buccal cavity.	*p. r.*	Retractor muscle of the penis.
cr.	Crop.	*ph. r.*	Pharyngeal retractor muscle.
d.	Dart.	*pr.*	Prostate.
d. s.	Dart-sac.	*r. m.*	Retractor muscle.
f. ov.	Free oviduct.	*r. s.*	Receptaculum seminis.
h. d.	Hermaphrodite duct.	*r. t. r.*	Right tentacular retractor muscle.
h. gl.	Hermaphrodite gland.	*s. d.*	Duct of salivary gland.
int. 1-4	Intestine.	*s. gl.*	Salivary gland.
k.	Kidney.	*st.*	Stomach.
l.	Lung.	*v.*	Ventricle.
l. t. r.	Left tentacular retractor muscle.	*v. d.*	Vas deferens.
œ.	Œsophagus.	*vg.*	Vagina.

ON TWO NEW VARIETIES OF CATAULUS NIETNERI, G. & H. NEV., FROM CEYLON.

By OLIVER COLLETT, F.R.M.S.,

Rinoya, Watawala, Ceylon.

Cataulus nietneri, from Ceylon, was described by G. and H. Nevill in the "*Journal of the Asiatic Society of Bengal*" (1871, vol. xxxix, p. 7), and the shell is figured in that Journal (Pl. 1, fig. 7, 7a), and also in the "*Conchologia Indica*" of Theobald and Hanley (Pl. 146, fig. 4).

As the figures are in each case somewhat poor and indistinct, I have thought that it might serve a useful purpose to give a new figure of the species (Fig. A), together with figures of two new varieties which have occurred to me in the hill-forests of the Island.

The whereabouts of the late Mr. Hugh Nevill's collection being apparently unknown, I have selected for the figure the species of a shell which corresponds as nearly as possible to the original description. This, together with the types of the two varieties figured, has been deposited in the British Museum (Natural History).

C. nietneri, G. & H. Nev., var. **unicolor**, n. v. Fig. B.

Shell larger and more elongated than the type. Whorls more solid, more densely striated and more roughened. Apex golden and horny. The rest of the shell very pale yellow throughout. The conspicuous white flames which ornament the typical form and var. *caperata*, are entirely absent in the present variety, which is rare. Operculum normal.

Alt. 17, diam. max. 6.5 mm.

Hab. — Amongst ferns and forest undergrowth. Ambegamoa, 3000 feet.

A B C

Fig. A. *Cataulus nietneri*, G. and H. Nevill.
Fig. B. ,, ,, var. *unicolor*, Collett.
Fig. C. ,, ,, var. *caperata*, Collett.

Cataulus nietneri, G. & H. Nev., var. **caperata**, n. v. Fig. C.

Shell larger and more solid than the type. Whorls more rounded and sutures deeper. Apex smooth and horny. The rest of the shell closely and strongly wrinkled all over, excepting the small flattened portion of the last whorl immediately above the peristome. Operculum as in the type.

Alt. 18, diam. max. 7 mm.

Hab.—Amongst ferns and scrub in marshy places. Fairly common in Ambegamoa, 2000 feet, and Balangoda, 2200 feet.

HELIX (EPIPRAGMOPHORA) KELLETTI, FORBES, AND ITS HABITAT.

By Mrs. M. BURTON WILLIAMSON,

Los Angeles, Cal., U.S.A.

The usual habitat of North American land molluscs is in moist, shady places under layers of fallen leaves, dead trunks of trees, or under stones; but in Southern California, where forests are rare, they must be sought for in other places. The time to obtain the best results in collecting is in the winter after the annual rain has set in, not in the summer time as in the North Eastern States. In little cañons on the south side of low foot hills under loose rocks a few *Epipragmophora traskii* may occasionally be collected, these are more rarely found on the under side of a cactus, but the former habitat is usually the home of this species. There is, however, a species that is invariably found on and under cacti; this species, *E. kellettii*, Forbes, is found on Santa Catalina Island, a little island about twenty-three miles off the coast, west of San Pedro Bay, California. The island is mountainous with but little vegetation, and on some of the hills the prickly pear cactus (*Opuntia vulgaris*) grows wild: here *E. kellettii* may be found.

The presence of these molluscs are heralded by the sight of a chalk-white shell on the ground, or at the roots of the cactus partly hidden from sight. Summer and winter the cactus bed is the home of this mollusc, sometimes they may be found attached to the under surface of dead branches or on the under side of green branches, which is their favourite habitat in winter. Of all collecting probably there is none that is so likely to keep down any tendency to enthusiasm as snail collecting in a bed of cacti. In the first place the number of living specimens is limited; in the second place they are difficult to capture, a stout stick being necessary in order to bring the plant near enough—not an easy thing to do—to dislodge the shell. This must be done with caution or even gloved hands feel the effect; then there must be constant alertness and caution or shoes and feet are pierced with the sharp prickles and bristles.

How anything so soft and sensitive as the foot and body of a snail can choose its home on the prickly pear cactus is a puzzle. Of course the snail covers its passage with a slime that is a protection, but when we consider that tufts of barbed bristles and long prickles run out in every direction the *Opuntia* is not the kind of plant we would have

selected for its habitat. Probably the scarcity of moisture elsewhere has been the reason why the snail at first sought such a habitat, for, however dry and parched vegetation may seem the prickly pear cactus has abundance of moisture, this is noticeable even in dead branches where the brown sap may be seen oozing out when the decaying mass has been punctured.

E. kellettii is described by Forbes as having a "shell narrowly umbilicated, depressed-globose, wrinkled, granulated, fulvous; spire subturbinated, with dirty reddish blotches and one red revolving band, whorls 6, rather convex, the last with a white band at its periphery and inflated on its under surface; aperture roundly lunate, light red and banded within; peristome somewhat reflected, its columellar portion dilated, reflected, covering the umbilicus. Greater diameter 22, lesser 19 mm.; height 19 mm." The shells vary so much from the type that Mr. Henry Hemphill has named several varieties, such as *castanea*, *nitidus*, *multilineata*, *bicolor*, *tricolor*, *albida*, etc. A shell that is collected from San Diego southward on the mainland known as *E. stearnsiana*, Gabb, is now considered only a variety of *E. kellettii*. The animal of *E. kelletti* is described as of a "bluish slate-colour," but the animals I have seen are nearer a drab, or *café au lait* colour. I have seen none on Santa Catalina Island that might be termed "slate-coloured," so evidently I have not collected the typical form, so far as the animal is concerned.

ON THE RELATIVE CLAIM TO PRIORITY OF PAPUINA WIEGMANNI AND P. TUOMENSIS.

By G. K. GUDE, F.Z.S.

Papuina wiegmanni, v. Mts., from Tuom Island between Kaiser Wilhelmsland and New Britain (Neu-Pommern), having been described by two authors under different names, it is necessary to decide which of the two names has priority.

The circumstances of publication of the work containing the earliest name and description are somewhat peculiar. The third part of volume iii of "*Conchologische Mittheilungen*" in which Professor von Martens first described the shell, was published in 1894, but the part was directly after withdrawn from publication. I was unable to obtain a copy, but Prof. von Martens was kind enough to lend me his,

at the same time giving the following information with reference to it. The publisher, Mr. Theodor Fischer, of Cassel, issued this part with only two plates (43 and 44) instead of six (43—48) as indicated in the text. Under the description of *P. wiegmanni* occurs a reference to plate 46, which is one of the missing ones. A copy of this part (the only other which I have seen) is in the Natural History Museum, Cromwell Road, a fact which indicates that copies were distributed, and the part must therefore be considered as having been duly published. The Museum copy is identical with that sent me by Prof. von Martens.

Mr. C. F. Ancey published the same shell in 1895[1] as a new species under Dr. Boettger's MS. name *Papuina tuomensis*, which name must be discarded, since under the circumstances just mentioned *P. wiegmanni* has priority.

Prof. von Martens afterwards published the species under the same name[2], giving a literal transcription of his earlier description, but without making mention of it.

The shell was distributed by Mr. Staudinger under Dr. Boettger's MS. name. It belongs to the group of *Papuina tayloriana*, Ad. and Rve., and should be placed next to *P. louisiadensis*.

The synonymy should read as follows:

1894.—*Helix (Geotrochus) wiegmanni*, v. Mts.: Conch. Mitth., iii, 3, p. 10.

1895.—*Papuina tuomensis*, Ancey: Proc. Linn. Soc. N. S. W. (2), x, p. 374, t. 26, f. 3. Var. *heterochroa*, Ancey: ibid., f. 4.

1897.—*Helix (Geotrochus) wiegmanni*, v. Mts.: Arch. f. Naturg., lxiii, p. 41, t. 8, figs. 1—4.

1899.—*Papuina wiegmanni, supra.*

Other species of Mollusca affected by the above mentioned circumstances are:

Aërope beyrichi, v. Mts.: Conch. Mitth., 1894, iii, 3, p. 1. Reference in text to pl. 43, figs. 1 and 2 is erroneous, the figures cited representing *Achatina nitida*, *q. v.* Arch. f. Naturg., 1897, lxiii, 1, p. 35, t. 6, figs. 1—3. Pondo-Land.

Helix cernua, v. Mts.: S. B. Ges. Naturf. Fr. Berlin, 1889, p. 161; Conch. Mitth., 1894, iii, 3, p. 2. Reference in text to pl. 44 is erroneous, the plate cited containing only a figure of *Spatha wissmanni*, *q. v.* Arch. f. Naturg., 1897, lxiii, 1, p. 36, t. 7, figs. 8—10. Great Namaqua Land.

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1 Proc. Linn. Soc. N.S.W., 1895 (2), x, p. 374.

2 Archiv für Naturgeschichte, 1897, lxiii, p. 41.

Helix coagulum, v. Mts.: S.B.Ges. Naturf. Fr. Berlin, 1899, p. 160; Conch. Mitth., 1894, iii, 3, p. 3. Reference in text to pl. 44 is erroneous, *vide supra*. Arch. f. Naturg., 1897, lxiii, i, p. 37. t. 7, figs. 11—14. Great Namaqua Land.

Helix namaquana, v. Mts.: S. B. Ges. Naturf. Fr. Berlin, 1889, p. 161; Conch. Mitth., 1894, iii, 3, p. 4. Reference in text to pl. 44 is erroneous, *vide supra*. Arch. f. Naturg., 1897, lxiii, i, p. 38, t. 7, figs. 1—4. Little Namaqua Land.

Helix retisculpta, v. Mts.: Nachr. D. Malak. Ges., 1889, p. 154; Conch. Mitth., 1894, iii, 3, p. 5. Reference in text to pl. 44 erroneous, *vide supra*. Arch. f. Naturg., 1897, lxiii, i, p. 38, t. 7, figs. 5—7. Damara Land.

Achatina nitida, v. Mts.: Conch. Mitth., 1894, iii, 3, p. 7, t. 43, figs. 1—2. Erroneously cited in text as pl. 45, Usambara.

Achatina schrenchi, v. Mts.: Conch. Mitth., 1894. iii, 3, p. 8, t. 43, f. 3. Erroneously cited in text as pl. 45. Transvaal.

Limicolaria flammea var. *dimidiata*, v. Mts.: Conch. Mitth., 1894, iii, 3, p. 9, t. 43, figs. 6—7. Erroneously cited in text as pl. 45. Kilima-Njaro.

Spatha wissmanni, v. Mts.: Conch. Mitth., 1894, iii, 3, p. 9, t. 44. Erroneously cited in text as pl. 47. Congo.

Helix hettneriana, v. Mts.: Conch. Mitth., 1894, iii, 3, p. 10. Reference in text to pl. 44, erroneous, *vide supra*. Arch. f. Naturg., 1897, lxiii, i, p. 40, t. 7, figs. 15—17. Peru.

Helix naso, v. Mts.: Jahrb. D. Mal. Ges., 1883, x, p. 82; Conch Mitth., 1894, iii, 3, p. 12. Pl. 46 cited in text not published. Arch. f. Naturg., 1897, lxiii, p. 42, t. 8, figs. 7—8. E. New Guinea.

Cochlostyla finschi, v. Mts.: Conch. Mitth., iii, 3, p. 12. Pl. 46 cited in text not published.

Helix (Geotrochus) heinburgi var. *finschi*, v. Mts.: Arch. f. Naturg., 1897, lxiii, i, p. 43, t. 8, figs. 5—6. New Britain.

Calycia crystallina, Rve.: v. Mts. Conch. Mitth., 1894, iii, 3, p. 13. Pl. 48 cited in text not published. Arch. f. Naturg., 1897, lxiii, i, p. 43, t. 9. New Guinea.

NOTES.

Subulina octona, Chemn. in Kew Gardens.—Recently I have had sent to me, through the kindness of Mr. I. H. Burkill, living examples of this species found in Kew Gardens. They were found by Mr. G. Nicholson in one of the tropical forcing pits, and there are said to be plenty of young ones, but few adults. A West Indian moth was recently found in a similar pit.

Mr. Cockerell (*Sci. Gossip*, 1893, p 26) has recorded the species, on the authority of Mr. J. R. Hardy, from hothouses at Manchester.—E. R. SYKES.

Notes on some Specimens of Pleetopylis.—Mr. Collinge has been so kind as to send me for inspection the specimens of *Plectopylis* contained in the Theobald collection in the Zoological Museum of Mason University College, Birmingham, with a request that I should make a note of them for this journal.

There are eight shells, of which two pertain to a species recently described by me as new.

1.—*Plectopylis repercussa*, Gould: Proc. Boston Soc. Nat. Hist., 1856, vi, p. 11; Gude: Sci. Goss., 1898, n.s. v, p. 74. f. 78. Two typical specimens measuring: *a*. major diam. 28, min. diam. 23, alt. 10 mm.; *b*. major diam. 29, min. diam. 23·5, alt. 10 mm.

2.—*Plectopylis achatina* var. *repercussoides*, Gude: Sci. Goss., 1899, n.s. v, p. 333. Three specimens measuring: *a*. major diam. 26·75, min. diam. 21·5, alt. 10 mm; *b*. major diam. 26·25, min. diam. 20·5, alt. 9·5 mm.; *c*. major diam. 24·75, min. diam. 19·75, alt. 9 mm.

3.—*Plectopylis andersoni*, W. T. Blanf.: Proc. Zool. Soc., 1869, p. 448; Hanley and Theobald: Conch. Ind., 1875, t. 112, figs. 8-9; Godwin-Austen: Proc. Zool. Soc., 1874, p. 612, t. 74, f. 9; Tryon: Man. Conch., 1887 (2), iii, p. 161, t. 34, f. 71, t. 35, figs. 74-75; Gude: Sci. Goss., 1896, n.s. iii, p. 154, f. 17. One specimen measuring: major diam. 24, min. diam. 21, alt. 9·5 mm.

4.—*Plectopylis magna*, Gude: Sci. Goss., 1897, n.s. iv, p. 70, f. 52. Two specimens measuring: *a*. major diam. 25, min. diam. 20, alt. 8·25 mm.; *b*. major diam. 23·75, min. diam. 20, alt. 9 mm.—G. K. GUDE.

Additional Records to the Mollusca of Carnarvonshire and Merionethshire.—The following land molluscs, recently collected at Nevin, are additions to the county fauna I believe:—*Helix hortensis*, *H. itala* and v. *leucozona*, *H. arbustorum* v. *conoidea*, *H. acuta* and vars. *strigata*, *articulata*, and *alba*. I am also able to add the following species and varieties to Merionethshire, all of which were collected at Aberdovey:—*Helix virgata* and v. *alba*, *H. caperata* v. *fulva*.—H. H. BLOOMER.

PROCEEDINGS OF THE MIDLAND MALACOLOGICAL SOCIETY.

12TH MEETING, SEPTEMBER 12TH, 1899.

The President in the chair.

The following nomination for membership was read:—

Miss A. Litchfield.

PAPER READ.

"On the Anatomical characters of the subgenus *Limacopsis*, Simr.," by Walter E. Collinge, F.Z.S.

EXHIBITS.

By the President: Specimens and drawings illustrating his paper, also specimens of *Apera burnupi*, E. A. Sm., and *Oopelta nigropunctata*, Mörch.

By Mr. F. J. Partridge: *Arion rufus*, L., from Brussels, *Oncidiella celtica*, Cuv., *Otina otis* and *Vertigo moulinsiana*, all from North Devon.

13TH MEETING, OCTOBER 13TH, 1899.

The President in the chair.

New member elected:—Miss A. Litchfield.

The President directed attention to a very interesting account of the Mollusca of Herefordshire, by Messrs. Boycott and Bowell. A discussion followed upon the nomenclature used, and it was decided to ask the Council to take into consideration the desirability of approaching the Council of the London Malacological Society, with a view to the formation of a thoroughly representative committee, to consider the publication of an authoritative list of the British Mollusca.

EXHIBITS.

By Mr. Bloomer: Shells of *Ampullaria globosa*, Swain., from Jubbulpore, *Planorbis exustus*, Desh., from Bengal, *Cyclophorus indicus*, Desh., and *Ariophanta laevipes*, Müll., from Bombay.

By Mr. Guy Breeden: Varieties of the shells of *Helix virgata* and *H. cartusiana*, from various localities.

By the President: The shells of *Ampullaria theobaldi*. *A. glauca*, L., *A. ampullacea*, L., *A. globosa*, Swain., *Vivipara filosa*, Hanley, *V. malleata*, Rve., *V. vivipara*, L., *V. contecta*, Müll., *V. doliaris*, Gld., *V. angularis*, Müll., *V. bengalensis*, Lam., *Paludomus dilatatus*, Rve., *P. loricatus*, Rve., *P. chilinoides*, Rve., also specimens of *Scarabus trigonus*, Tros., and *S. plicatus*, Fér.

14TH MEETING, NOVEMBER 17TH, 1899.

The President in the chair.

The following additions to the Library were announced, for which thanks were voted: 24 pamphlets from Prof. H. A. Pilsbry, and 1 from the President.

The following nomination for membership was read:—

Mr. H. Overton.

PAPER READ.

"Additional Records to the Mollusca of Carnarvonshire and Merionethshire," by H. H. Bloomer.

EXHIBITS.

By Mr. Bloomer: Shells of *Helix hortensis*, *H. itala* and v. *leucozona*, *H. arbustorum* v. *conoidea*, and one approaching *flavescens*, *H. acuta* and vars. *strigata*, *articulata*, and *alba*, from Nevin, Carnarvonshire. Also from Aberdovey, *Helix virgata* and v. *alba*, and *H. caperata* v. *fulva*.

By the President: A collection of slugs from Australia, Tasmania, and New Zealand, also specimens of *Xesta novarae*, Pfr.

By Mr. Overton: *Arion fasciatus*, Nils., *Limax maximus*, and the var. *cinereoniger*, Wolf, from Sutton Coldfield.

By Mr. Breeden: Shells of *Petricola pholadiformis*, from the Kentish coast.

By Mr. Partridge: Shells of *Melampus bidentatus*, from the River Taw, Barnstaple.

CURRENT LITERATURE.

Pilsbry, H. A.—Tryon's Manual of Conchology, ser. ii, vol. xii (pt. 47), pp. 113—176, pls. xxix—xlvi, and xxxvia.

Mr. Pilsbry continues his account of the species of *Oxystyla* from Mexico, &c., and then passes to the South American species, of which latter he gives a useful conchological table. He then deals with *Porphyrobaphe* which, he points out, is mainly to be distinguished from *Oxystyla* by the peristome being "thick and blunt or reflexed" and not "thin and acute." So far as known the anatomical differences appear to be unimportant. The concluding portion of the present part deals with *Liguus*, in which genus—apart from *Liguus*, s.s.—he admits as subgenera *Hemihulimus* and *Corona*. The typical forms are Antillean, those of the first subgenus Colombian, the residue being South American. He points out that *Liguus* may be separated from *Orthalicus* and *Oxystyla* by the sculpture of the protoconch. His very careful study of the variation of the shell in the species of *Liguus* will be of great service to the systematist.

We note new varieties of *Oxystyla princeps*, *O. pulchella*, and *O. zebra*.—E.R.S.

Drew, G. A.—The Anatomy, Habits, and Embryology of *Yoldia limatula*, Say. Mem. Biol. Lab. Johns Hopkins Univ., Baltimore, 1899, vol. iv, pp. 1—37, pls. i—v.

In one of our recent numbers we noticed a preliminary paper by Dr. Drew, upon certain members of the *Protobranchia*; now we have before us the finished memoir, in which the life, habits, anatomy, and embryology of *Yoldia limatula* are dealt with at considerable length. As we have already drawn attention to the chief descriptive matter of the preliminary paper, it will perhaps be more advantageous here to take a somewhat broader view, and offer a few remarks upon the general inferences to be drawn from the detailed facts.

It will be remembered that Pelseneer—the author to whom we owe our most comprehensive account of the anatomy of the *Nuculidæ*—was particularly struck by the close similarity of structure and primitive characteristics of the group as a whole. Now the predominant note of Dr. Drew's paper is in direct opposition to this, for he lays stress throughout upon the specialised character of certain organs and the striking divergence in important features between the several members of the family. In fact one gathers from his researches that the *Nuculidæ*, far from forming an extremely primitive homogeneous group, are primitive indeed to a certain extent, as evidenced by the structure of their gills, but have diverged so far from one another in various particulars as to form a decidedly scattered assemblage, with a common ancestor in the dim past, of very generalised structure.

Apart from this general opposition to our previous ideas of the family, it must be noticed that, in dealing with the same species, the accounts of anatomical structure given by our author and Pelseneer are in many cases incompatible with each other, and this too in features by no means trivial, such as the presence or absence of a distinct pleural ganglion, of a posterior aorta, of an external opening to the otocyst, and so forth. Have we here a remarkable instance of individual variation or some error of observation? If the latter be the case it seems probable that the error does not lie with Dr. Drew, for in the first place his material was fresh and plentiful, and in the second his general conclusions with regard to the heterogeneous character of the family have been just lately supported by Stempell's study of *Leda*.

With reference to the primitive nature of *Yoldia*, kept somewhat in the background throughout the paper, we should like to draw attention to a curious and surely primitive condition of the nervous system. The cerebral and visceral commissures are *ganglionic*, and pass imperceptibly into the cerebral and visceral ganglia.

It is interesting to note in the embryological section, which as in the preliminary paper is mainly devoted to the ectodermic test, that the otoliths are formed while

the creature is still within the test, and cannot therefore be foreign bodies. The paper is illustrated by five excellent plates.—R. H. BURNE.

Meisenheimer, J.—Entwicklungsgeschichte von Dreissensia polymorpha Pall. I. Bis zur Ausbildung der jungen Trochophoralarve, pp. 44, 2 folding plates. Marburg: 1895.

The author points out that amongst the freshwater mussels *Dreissensia polymorpha* occupies a remarkably isolated position, inasmuch as in structure and development it clearly shows the characters of a marine form. He traces the history of its distribution in Europe from before the ice-age, when it was apparently widely distributed throughout North Germany, to the present day when it has spread over the greater part of Europe north of the Alps and the Pyrenees. It seems to have entered England in 1824.

While in some freshwater Pelecypoda the original free-swimming larval form has undergone suppression, and in others a new form (such as the Glochidium of *Unio*) has been acquired, in *Dreissensia* the larva is still a typical Trochophore. The present part of Dr. Meisenheimer's memoir traces the cell changes from the ovum up to that important larval stage.

The eggs are laid free in the water, where therefore the development takes place. The segmentation is of the spiral type, and our author describes it very fully and compares the stages with those described for *Crepidula* by Conklin, and for the *Unionidæ* by Lillie. In addition to outline figures of the segmentation stages the cell-lineage is illustrated by a folding plate representing the descent of each cell graphically up to about the sixtieth generation of the blastomeres. These and the other details given in the paper cannot be abstracted or understood apart from the figures, so we must refer those interested to Dr. Meisenheimer's paper itself for further information.

In conclusion, we welcome this paper not only for its own sake but also as evidence of the good work now being done at the freshwater biological station of Plön in Holstein, an institution of the kind that we certainly ought to have in England before long, either on the Westmoreland Lakes or the Norfolk Broads, or better still one in each of these interesting districts.—W. A. HERDMAN.

Appellöf, A.—Cephalopodon von Ternate. 1. Verzeichnis der von Professor Kükenthal gesammelten Arten. 2. Untersuchungen über *Idiosepius*, *Sepiadarium* und verwandte Formen, ein Beitrag zur Beleuchtung der Hektokotylisation und ihrer systematischen Bedeutung. Abhandl. der Senckenberg. Nat. Gesell., 1898, Bd. xxiv. pp. 561—637, Tfn. xxxii—xxxiv.

This memoir opens with an enumeration of the Cephalopoda collected by Dr. Kükenthal; no new forms are described, but three species (*Octopus vitiensis*, *Octopus mollis*, and *Octopus pictus*) are recorded for the first time from the Indo-Malayan region. The second and much more important section contains an elaborate discussion of the relationships of *Sepiadarium* and *Idiosepius*. The late Professor Steenstrup maintained that the hectocotylisation, if rightly regarded, might always be trusted to lead to a natural classification of the Cephalopoda; and, more especially, that those forms in which the modification affects the dorsal arm or arms would always prove to be more nearly related to each other than to those in which the modification affected the ventral pair. Now in the genera *Idiosepius*, *Sepiadarium*, and *Sepioloidea*, the ventral pair is affected, and hence Steenstrup united them with *Sepia* and *Loligo* rather than with *Sepiola* and *Rossia*, to which they bear a strong external resemblance. The late Dr. Brock adduced grounds for doubting this affinity in the case of *Sepioloidea*, but Steenstrup replied to him, maintaining his original thesis. Dr. Appellöf has now in a masterly fashion reinvestigated the whole question. He finds that the peculiar rudimentary shell believed to exist in *Idiosepius* was based on an error of observation; that a functional mantle-connection is absent in all three genera, though present in a rudimentary form as in

Sepiola, whilst the curious Mediterranean *Heteroteuthis* furnishes a connecting link between them and *Rossia*. Several characters of *Idiosepius* and *Sepiadarium*, such as the presence of median and lateral adductor muscles to the mantle, the constitution of the liver-capsule by an undifferentiated muscle layer, and its connection with the mantle, the structure of the testes and liver and arrangement of the salivary glands, are also common to the *Sepiolidae*. Other characters again, such as the structure of the radula, the undivided pallial nerve, and the presence of an accessory median mantle adductor, are most easily understood as modifications of the arrangement found in the *Sepiolidae*. An anatomical character quite peculiar to *Idiosepius* is the presence of an incomplete right oviduct; the glandular terminal part is as well developed as in the left side, but the internal aperture appears to be absent, so that only the left oviduct is functional; this is probably an inheritance from the oegopsid stem. Hence it appears that the whole anatomy of these forms, except the position of the hectocotylus, indicates a relationship with *Sepiola* and its allies, rather than with *Sepia* and *Loligo*, and the hectocotylisation cannot be regarded as invariably a safe standard of affinity. In conclusion, Dr. Appellöf proposes the erection of a new family for *Idiosepius*, and would arrange the forms in question as follows:—

Family *Idiosepiidae:—Idiosepius.*
Family *Sepiolidae.*
Subfamily *Sepiadarii:—Sepioloidea, Sepiadarium.*
Subfamily *Sepiolini:—Sepiola, Inioteuthis, Stoloteuthis.*
Subfamily *Heteroteuthinae:—Heteroteuthis, Nectoteuthis.*—W. E. H.

Heath, H.—The Development of *Ischnochiton*. Zool. Jahrb. (Abth. f. Morph.), 1899, Bd. xii, pp. 567—656. T. 31—35, and 5 figs

Professor Heath is to be congratulated on the completion of this beautifully illustrated and really excellent piece of work.

Ischnochiton (Stenoradsia) magdalensis, Hinds, which forms the subject of this research, occurs in great numbers on the Californian coast. During the day it is found either half buried in the sand or concealed under loose stones. It is exceedingly sensitive to light and comes out only at night to feed on the vegetation. The eggs are laid in May and June, and unlike any Chiton yet described, it deposits these in the form of "jelly masses," which are strings 3—4 mm. in diameter and about 77 cm. long. As the eggs pass out from the ovary they are surrounded by albumen and become moulded into strings by the lower end of the oviduct. On one side of the string there is a strip of albumen in which the eggs are absent, it is therefore not in a state of tension like the remaining portion which is full of ova, consequently the strings assume a spiral form. A specimen kept in the laboratory showed that about 7 inches of the egg-string was laid per hour. Although a very large number of eggs are deposited—the author estimates the minimum for each individual at 101,804, the average 115,940, and the maximum 193,564—very few develope into adults.

Development proceeds rapidly. The embryo escapes from the egg about the seventh day, and in another ten or twelve days takes on the external characters of the adult. Particular attention has been paid "to the cell lineage, and the external features of the development through the formation of the trochophore and its metamorphosis, up to the assumption of the adult form." The development of the various internal organs is only incidentally referred to in connection with its bearing upon the complete understanding of the external structures, but we are promised a further study of these at a later date.

Not the least interesting part of Professor Heath's work is the chapter devoted to "General Considerations." Of recent years there has been a growing tendency to regard "the early cleavage stages as something more than a mere manifestation of simple mechanical forces." In the origin and position of the various quartettes

in *Ischnochiton* there are many resemblances to the conditions which obtain in certain Annelids, indeed in the early cleavages in many cases they are cell for cell the same, and although in the later stages these cell homologies disappear, in the behaviour of the cell groups and in the structures they give rise to, development proceeds in both cases much along the same path. From these and other considerations the author is of opinion that the resemblances between *Ischnochiton* and the Annelids are more fundamental and closer than are the differences. Discussing the ancestral form of the trochophore, Prof. Heath advances the theory that it "was a quadriradially symmetrical organism whose principal axis corresponds to that of the grastula, and that the shifting of this axis is secondary." This helps us considerably to understand many of the transformations which the developing Chiton undergoes, and also indicates that both the Chiton and Annelid trochophore are constructed upon essentially the same type. Numerous other points of great interest to the student of molluscan embryology are dealt with, all of which are admirably illustrated.—W. E. C.

Moss, W.—The Genitalia and Radulæ of the British *Hyalinia*. Trans. Manchester Micro. Soc., 1898 [1899], pp. 24—28, pls. iv—v.

This interesting paper records the results of a careful examination of a series of dissections of the terminal ducts of the generative organs of seven species of *Hyalinia*. Five of these species belong to the subgenus *Polita*, Held., viz., *draparnaldi*, *cellaria*, *glabra*, *alliaria*, and *nitidula*, and two to *Zonitoides*, Lehm., viz., *nitida* and *excavata*. Of the *Polita* group, *nitidula* differs widely from the remaining four, which, so far as the principal features are concerned, resemble each other very closely and are classed by the author as the *Cellaria* group. On the other hand *nitidula* is, both as regards its radula and generative organs, strongly differentiated from the *cellaria* type.

Some interesting variations in the terminal ducts of *glabra* are figured and described.

A note on the terminal ducts of *nitida* and *excavata* is reprinted from the "*Journ. of Conchology*," and the curious calcareous penis sheath, present in these two species, is figured for the first time.

The figures, which are reproductions by photo-lithography from photo-micrographs, leave much to be desired, good drawings would, in our opinion, have added greatly to the value of the paper.—W. E. C.

Scharff, R. F.—The History of the European Fauna. 8vo, pp. vii + 364, 21 figs. London: 1899, Walter Scott, Ltd.

This work is the outcome of a paper published in 1897 in the "*Proceedings of the Royal Irish Academy*" (3 ser. vol. iv). The original paper has been amplified and improved upon, and certain alterations made. The book opens with a somewhat lengthy introduction, followed by a chapter of Preliminary Considerations, and then follow in order, the Fauna of Britain, the Arctic Fauna, the Siberian Migration, the Oriental Migration, the Lusitanian Fauna, and the Alpine Fauna.

Selecting the British Isles for study, its fauna, broadly speaking, is made up of the following elements: a southern or Lusitanian, which is regarded as the oldest portion, next the Alpine and Oriental migrations, then the Arctic, and finally the Eastern or Siberian. The author endeavours to trace the original home of the different elements of our fauna and the path by which dispersal has been effected.

It is not within our scope to discuss the author's views generally, but we cannot refrain from pointing out one or two points which mark an advance in the discussion of such problems as are here dealt with. Firstly then Dr. Scharff no longer regards the various zoological regions and subregions as immutable, but rather as convenient terms for the time being. The exterminating severity of the Glacial period he

thinks has probably been overestimated, though we cannot agree, as is here done, to overestimating the mildness of the same. Throughout the work there is an enthusiasm which is quite refreshing, and full as it is of pregnant suggestions, it cannot fail to give an impulse to the study of geographical distribution.

In no spirit of fault-finding, but rather as suggestions for a second edition, we would point out that apart from certain overdrawn conclusions, the book suffers from over-wordiness and too much repetition, as a result of which the author's meaning is often obscure. The term "migration" is used in a very loose manner, in not a few instances the term "dispersal" would be better. Finally the Bibliography and Index have been carelessly compiled.

Turning our attention to the Mollusca, which form an important class in dealing with problems of distribution, the author has availed himself largely of Dr. Kobelt's recent work. Not a few of the various references to the molluscs contain inaccuracies, most of which might, with a little more care have been avoided; thus referring to the genus *Arion* on p. 49, it is stated that 6 or 7 species are met with in France, in Spain and Portugal about 10, rough guesses of this character are inadmissible in a work written for the general scientific public. Recent work shows that there are about a dozen French species, and 7 or 8 occurring in Spain and Portugal. Again, on page 299 we learn that "the same number of species [of *Arion*], viz. five, occur in Germany and in England." Now there are certainly 7 English species, probably 8, whilst Ireland adds an additional one; of these 9, all occur in Germany excepting 2, but Germany has in addition at least 3 species which are not known to occur in the British Isles. Over and over again Dr. Scharff dwells upon the distribution of *Geomalacus maculosus* (pp. 5, 49, 99, 102, 115, 298, 299), but we fail to find any reference to a peculiar form of *Arion empiricorum* (var. *bocagei*, Simr.), which has precisely the same distribution. Further instances might be cited did space permit. In conclusion let us freely acknowledge that, in spite of many little imperfections, Dr. Scharff has produced a most interesting and suggestive book, which every zoologist should read.—W. E. C.

Hedley, Charles.—The Mollusca of Funafuti. Pt. I. Gasteropoda, Pt. II. Pelecypoda and Brachiopoda. Mem. Aust. Mus., 1899, vol. iii, pts. 17—18, pp. 397—510, figs. 1—58.

Mr. Hedley opens this valuable account of the Mollusca of Funafuti with some very strong remarks on the "London School" of conchologists, some of which are undoubtedly well deserved. The great wealth of anatomical material which has been, and is still being, cast aside by London and other conchologists is greatly to be deplored. If "the fascinating studies of structure, affinities, higher classification," etc., has no charm for them, they might at least pass on the material to other workers. This is done by the British Museum authorities to a certain extent, as is evidenced in papers by Plate, Godwin-Austen, Collinge, and others.

In pt. I. 287 species and 18 varieties are enumerated, of these 39 species and 4 varieties are new. Three new genera are described, viz., *Obtortio*, *Conturnax*, and *Thetidos*.

In part II. 70 species and 5 varieties are enumerated, 5 of the species being new. A new species of Brachiopoda, *Thecidea maxilla*, is also described.

All the new species are figured, in addition to many others.—W. E. C.

Tryon, Henry.—Plant Pests. Vaginula Slugs (*Vaginula hedleyi* and *V. leydigi*). Queensland Agricul. Journ., 1899, vol. v, pp. 1—7, pl.

The Government Entomologist describes how these two slugs have of late increased in numbers round Brisbane. Much damage is done by them in vegetable gardens. The writer suggests that they are importations from some country at present unknown.—C. H.

Buchner, O.—*Helix pomatia*, L. Revision ihrer Spielarten und Abnormitäten mit Hervorhebung württembergischer Vorkommnisse nebst Bemerkungen über falsche Anwendung des Begriffes "Varietät." Jahr. d. Vereins f. vaterl. Nat. in Württ., 1899, pp. 232—79, T. i—iv.

This paper is divided into two parts. The first part consists of a discussion as to the use of the term "variety," and does not seem to reach a more satisfactory conclusion than previous discussions of the same point. Usage has given to the term "variety" a very wide and a very loose signification: and any accurate definition or classification is practically impossible till more is known about the causes and conditions of production of the various deviations from the "typical" form. The ideal classification of varieties must depend on a knowledge of their physiological causation. The author adopts the satisfactory plan of calling the deviations usually classed as "varieties" by the less committal term of "forms."

The second part of the paper consists of an examination of the described varieties of *H. pomatia*: the following is a summary of the author's results: (1) forma *normalis* s. *vulgaris*; last whorl more than two-thirds of and nearly three-quarters of the total altitude; diam. 40 to 50 mm.: (2) forma *inflata*, Hartmann; much bigger and often thinner-shelled than the type, whorls more swollen and more depressed, so that the last whorl is four-fifths to five-sixths of the total height: (3) forma *sphaeralis*, Hartmann; larger and as a rule thicker-shelled than the type, more conical, apex rounded, last whorl about two-thirds of total altitude: (4) forma *plagiostoma*, Buchner; nearly always smaller than the type, fairly high-spired, generally light brown with narrow bands, owing to a downward deviation of the last whorl the mouth is more obliquely elliptical than in the type: (5) forma *turrita*, auctt.: very variable in size, thick-shelled, cone-shaped with a produced spire, last whorl one-half or even one-third of total altitude: (6) forma *grandis*, auctt.; diam. 60 to 68 mm.: (7) forma *parva*, Buchner; diam. 30 to 34. The last two forms coexist with one of the others; besides which we may have specimens of a *sphaeralis-turrita* character: (8) aberratio *sinistrorsa* Rossm.: (9) degeneratio *albescens*; the author admits the existence of genuinely albino specimens; they are as a rule thinner-shelled than normal and the periostracum is usually decayed to some extent, these characters being expressions of the generally pathological state of the animal which is most obviously exhibited in the absence of pigment. If such is really the case, the condition is scarcely aptly described as a "degeneration:" (10) deformatio *scalaris*, Müller. The illustrations (29 in number) are very good.—ARTHUR E. BOYCOTT.

Crick, G. C.—On some new or little-known *Goniatites* from the Carboniferous Limestone of Ireland. Ann. and Mag. N. H., 1899 (s. 7), vol. iii, pp. 429—54, figs. 1—15.

The author here redescribes de Koninck's type specimens of *Goniatites* [= *Pericyclus*] *plicatilis* and *G.* [*Brancoceras*] *ornatissimus*, which he was fortunate enough to identify during a visit to the Museum of the Geological Survey of Ireland. In addition he describes the following new species: *Pericyclus foordi*, *P. trapezoidalis*, *P. rotuliformis*, *P. clanensis*, *P. bartlyi*, *P. subplicatilis*, *Glyphioceras cordatum*, *G. corpulentum*, *G. ellipsoidale*, and *Prolecanites leesoni*.—W. E. C.

Crick, G. C.—Note on *Ammonites euomphalus*, Sharpe. Geol. Mag., 1899, vol. vi, pp. 251—56, figs. 1—2.

Mr. Crick has recently examined a specimen of this interesting fossil from the hard Cenomanian Limestone close to Whitlands, west of Lyme Regis, which is carefully described and compared with the specimens described by Sharpe (1854) and Jukes-Browne (1896). Its affinities are briefly described, and for the present it is placed in the genus *Douvilléiceras*.—W. E. C.

Pilsbry, H. A. and Cockerell, T. D. A.—*Ashmunella*, a new genus of Helices. Proc. Acad. Nat. Sci. Phil., 1899, pp. 188—94, figs. 1—3

Externally there are no characters to separate the members of this genus from *Polygyra*. It is founded upon the characters of the generative organs and lung and kidney. The only species of which the internal anatomy is known is *A. miorhyssa*, Ball. The generative organs resemble those of the *Epiphallogona* or of *Belogona*, "which have undergone degeneration of the dart sack and associated mucous glands." The kidney in *Polygyra*, with few exceptions, is very long, whilst that in *A. miorhyssa* is short, like that of *Epiphragmophora*. A list of species which probably belong to the genus is given, and a key for the determination of known forms, by each author.—W. E. C.

Melvill, J. Cosmo.—Notes on the Mollusca of the Arabian Sea, Persian Gulf, and Gulf of Oman, mostly dredged by Mr. F. W. Townsend, with Descriptions of Twenty-seven Species. Ann. and Mag. N. H., 1899 (s. 7), vol. iv, pp. 81—101, pls. i—ii.

Melvill, J. Cosmo, and Standen, R. — Report on the Marine Mollusca obtained during the First Expedition of Prof. A. C. Haddon to the Torres Straits, in 1888-89. Linn. Soc. Journ. Zool., 1899, vol. xxvii, pp. 150—206, pls. 10—11.

The authors review previous work which has been done in this region. In all they record 449 species, of which 24 are new. A new genus of *Neritidæ (Magadis)* is described, the type *M. eumerintha* showing a superficial resemblance to *Vanikoro*, Quoy. A new subgenus of *Phaladomus*, Sby. *(Parilimya)* is described for a shell possessing almost equilateral valves, and the paper concludes with some interesting remarks on the recent species of this genus.—W. E. C.

Melvill, J. Cosmo, and Ponsonby, J. H.—Further Contribution towards a Check-list of the non-Marine Molluscan Fauna of South Africa, with Descriptions of Fourteen new Species. Ann. and Mag. N. H., 1899 (s. 7), vol. iv, pp. 192—200, pl. iii.

Messrs. Melvill and Ponsonby give a series of interesting "Addenda et Corrigenda" to their Check-list recently reviewed in this journal (p. 43). The 14 new species belong to the following genera: *Ennea* 2, *Zingis* 3, *Trachycystis* 3, *Trochomorpha* 1, *Balea* 1, *Pupa* 1, *Curvella* 1, and *Auricula* 2.—W. E. C.

Smith, Edgar A.—On a Collection of Land-Shells from British Central Africa. Proc. Zool. Soc., 1899, pp. 579—592, pls. xxxiii—xxxv.

This is a welcome addition to the literature of the Mollusca of Central Africa. As the author had previously surmised, interesting intermediate links connecting some of the larger species of *Achatina* have been found. In reference to the *Achatinæ* Mr. Smith has experienced much difficulty in determining the same. There seems to be a gradual gradation of one species into another. "Each district seems to produce its special race, a modification of some neighbouring form; so that the separation of species becomes more and more difficult through the discovery of intermediate links from every fresh locality." It is much to be regretted that in a case of this character that no attention is paid to the animal and its internal structure.

Forty-four species are enumerated of which 25 are new, these latter are as follows: *Ennea* 2, *Streptaxis* 1, *Helicarion* 2, *Thapsia* 6, *Zingis* 1, *Martensia* 1, *Phasis* 2, *Trochozonites* 1, *Buliminus* 3, *Curvella* 2, *Subulina* 1, *Achatina* 2, and *Pomatias* 1.
W. E. C.

Sykes, E. R.—The Zoological Record, London: 1899. Record vii, Mollusca, pp. 1—79.

Assisted by Messrs. E. A. Smith and G. C. Crick, Mr. Sykes fully maintains the high standard reached in previous numbers of this invaluable publication. We notice that certain papers are quoted under the "Systematic" portion which do not appear in the "Titles," which is somewhat unfortunate. It is interesting, to the systematist, to know the year in which a new species has been described, but such a

reference as "Univ. Geol. Surv. Kansas, iv, p. 497," leaves those who cannot consult the original paper in doubt as to whether the new species there mentioned were described in 1896—7 or 8, for papers published in all these years find mention in the present record. As we have previously pointed out, the addition of the year of publication would greatly add to the value of the record, so also, it would be better to state the actual numbers of the plates in a paper e.g. x—xxi, instead of "twelve plates." Having ourselves found these omissions a disadvantage, we draw attention to the same believing that their inclusion would add greatly to the value of a work which no student of the Mollusca can afford to be without.—W. E. C.

Blanford, W. T.—Note on the Land Mollusca of Bombay. Journ. Bombay N. H. Soc., 1899, vol. xii, pp. 326—28.

Dr. Blanford calls attention to the occurrence, in Mr. Peile's recent list of mollusca found in Bombay Island, of *Nanina (Microcystina) perrotteti*, Pfr. The *Helix perrotteti* of Pfeiffer is a species inhabiting the Nilgiri Hills, and has been collected there by Dr. Blanford, but it is not the same as the Bombay species, for which, in 1880, he proposed the name *Macrochlamys* (?) *platychlamys*. A specimen of the animal has recently been dissected by Lt.-Col. Godwin-Austen, who finds several differences from the typical *Macrochlamys*, which are of such a nature as to warrant its removal to a separate subgenus. *M. pedina* is also another species which differs from the typical forms of *Macrochlamys*.—W. E. C.

Blanford, W. T.—On *Ariophanta dalyi*, n. subsp., from Mysore, with a note on *Mariella dussumieri* (Val.). Proc. Malac. Soc. Lond., 1899, vol. iii, pp. 280—83, 2 figs.

This is evidently allied to *A. cysis*, Bs., but the shell exhibits so many peculiarities that the author thinks it desirable to give a description of the same and a subspecific name. According to Lt.-Col. Godwin-Austen, who has examined the animal, the generative organs are like those of *A. lævipes*, Mull. The paper concludes with a list of the typical sinistrorse species of *Ariophanta* known to occur in the Indian Peninsula.—W. E. C.

Blanford, W. T.—On some Species of Shells of the Genera *Streptaxis* and *Ennea* from India, Ceylon, and Burma. Proc. Zool. Soc. Lond., 1899, pp. 764—770, pl. L.

The new species are: *Streptaxis lanis*, *S. scalptus*, *S. subarcuatus*, *S. curvatus*, *Ennea turricula*, and *E. brevicallis*. Some notes and figures are given of *S. beddomii*, Nev. MS., *E. nagaensis*, G.-A. MS., *E. molarina*, G.-A., *E. canarica*, Bedd., and *E. beddomii*, Bll.—W. E. C.

EDITOR'S NOTES.

Mr. E. R. Sykes, B.A., F.Z.S., F.L.S., has recently been elected President of the Conchological Society.

The Library and Collections of the late M. H. Crosse have recently been sold by auction in Paris. The sale commenced on November 20th and concluded on the 30th.

We regret to have to record the death of Dr. W. D. Hartman which occurred on August 16th, at West Chester, Pennsylvania, at the age of 81. He is perhaps best known by his work on the genus *Partula*, Fér., and his "*Conchologia Cestrica*," treating of the mollusca of Chester county, Pa., U.S.A.

A portrait and full account of his life is given in the October issue of the "*Nautilus*."

THE

JOURNAL OF MALACOLOGY.

No. 5. MARCH 24TH, 1900. VOL. VII.

THE LAND SHELLS OF THE CAROLINE ISLANDS.

BY O. F. VON MOELLENDORFF, PH.D.

VERY little has hitherto been done for the exploration of the Carolines which, being by no means mere coral atolls but including several islands of comparatively large size and elevated basaltic hills, might be supposed to contain a much more extensive and varied molluscan fauna than the meagre result of the investigations as yet made would lead us to believe. We had an analogous case in the neighbouring group of the *Mariannes*, of which Kobelt gave in 1879 a list of 14 species of land shells. My friend Quadras collected there for a couple of months and the result was that we know now of 74 species, 47 being new to science. He did not go beyond the island of Guam, whilst the northern islands of the groups, Tinian, Saypan, etc., if smaller, present elevations of considerable altitude. In the same way we may expect rich results from a thorough exploration of the Carolines by a specialist. What we know of them at present, is due to the French expeditions of the "Coquille" and "Astrolabe," and some collections made by American missionaries, Captain Brenchley and Mr. Finsch. A German trader, Mr. Etscheid, was kind enough to collect for me in the neighbourhood of the Spanish settlement on Ponape, and especially sent me some bags of vegetable mould from the bush, in which I found a number of minute shells. In 1895 Mr. Kubary returned from New Guinea to his old residence at Ponape and at once began conchological researches. He was the first to collect in the more elevated parts of the islands and although he did not get much higher than about 100 metres, he met at once with a number of novelties of which *Flammulina* and a *Quadrasiella* are the most remarkable. Unfortunately he died in 1896.

On the localities in which Kubary collected he wrote me the following notes: In the North of the island are situated *Mpomp* and *Meitsik*, not far from the sea, and opposite to them the small island of *Djokoits*. The soil consists of yellow clay which has been formed by decomposed basalt, and is covered by dense bush. The ground gradually rises to the chain of the hills in the interior. The soil in the bush is covered by a thick layer of mouldering leaves in which the *Partulae* and bigger *Trochomorphae* are very common. *Trochomorpha nigritella* and its sub-species *contigua* were found on trees and shrubs, the *Pupinae* and *Helicinae* partly in the mould and on *Pandanus* and tree-ferns.

Fam. **NANINIDAE.**

1.—Lamprocystis palaënsis (O. Semp.).

Microcystis palaënsis, O. Semp. MS.; C. Semper, Reisen Phil., iii, p. 45, t. 2, f. 16.—*Helix palaënsis*, Pfr., Mon. Hel., vii, p. 94.—*Nanina (Microcystis) palaënsis*, Tryon, Man. Conch., ii, p. 120, t. 40, f. 37.

Hab.—Pelew Islands (Semper), Yap (Kubary).

An intermediate form between *L. misella*, Fér., of the Marianne and *pseudosuccinea*, m., of the Philippine Islands.

2.—Lamprocystis frivola (Pse.).

Helix frivola, Pease in Tryon, Amer. Journ. Conch., 1866, ii, p. 290, t. 21, f. 3.—Pfr., Mon. Hel., vii, p. 72.—*Helicopsis frivola*, Pse., P.Z.S., 1871, p. 475.—*Nanina (Microcystis) frivola*, Pfr., Nomencl., p. 37.—Tryon, Man. Conch., ii, p. 118, t. 38, figs. 62—64.

Hab.—Ualan (Pease).

Pfeiffer writes Owalao, Tryon Oualau, but I am sure Pease obtained this species from Ualan or Kusaye, one of the Caroline Islands, from whence he described other species. I do not think Ovalu of the Viti group was meant.

3.—Kaliella tenuiseulpta, Mlldff.

Kaliella tenuiseulpta, Mlldff., Jahresb. Senck. Nat. Ges., 1893, p. 69.

Hab.—Ponape (Kubary).

Most probably introduced from Manila, where it is common in gardens.

4.—Kaliella doliolum (Pfr.).

Helix doliolum, Pfr., Mon. Hel., i, p. 50.—*Vitrinoconus doliolum*, Semp., l.c., p. 93.—Tryon, Man. Pulm., i, p. 160, t. 30.

f. 23.— *Kaliella doliolum*, Mlldff., J. D. M. G., xiv, p. 268, Verz. Phil., 1898, no. 150.

Hab.—Ponape (Kubary).

Here, as well as at Guam, Mariannes, most probably introduced from the Philippine Islands, on which it is widely distributed.

5.—Hemiplecta sowerbyana (Pfr.).

Helix sowerbyana, Pfr., Symb., i, p. 36.—Phil. Icon. i, 2, p. 2, t. 2, f. 1.—Chemn., ed. ii, Helix, no. 157, t. 25, figs. 5—6.—Mon. Hel., i, p. 68.—Reeve, Conch. Icon., Hel., no. 386, t. 74.— *Nanina (Rhysota) sowerbyana*, Alb., Hel., p. 61.—Alb.-Marts., Hel., p. 54.—Ad., Gen., p. 224.—Pfr., Nomencl., p. 53.—Martens, Conch. Mitth., 1881, i, p. 93.—Tryon, Man. Conch., ii, p. 29, t. 8, f. 25.—*Helix pachistoma*, Hombr. et Jacq., Voy. Pol. Sud. Atl., t. 3, figs. 10—12.—*Helix hogoleuensis*, Le Guill., Rev. Zool., 1845, p. 187.—Pfr., Mon. Hel., i, p. 329.—*Macrocyclis hogoleuensis*, Ad., Gen., p. 203.

Hab.—Hogolu = Ruk (Hombron et Jacquinot, Kubary).

Prof. v. Martens cites O. Finsch as the collector of this species, but as the late Mr. Kubary told me, he gave the shells collected by him at Ruk to Mr. Finsch, who himself did not collect on that island.

The soft parts of this mollusc have not been studied, but the sculpture of the shell agrees with that of *Hemiplecta* rather than that of *Rhysota*.

Fam. **TROCHOMORPHIDAE.**

6.—Trochomorpha (Nigritella) approximata (Le Guill.).

Helix approximata, Le Guill., Rev. Zool., 1842, p. 139.—Pfr., Mon. Hel., i, p. 206, iii, p. 160.— Chemn., ed. ii, Hel., no. 773, t. 125, figs. 5—6.— *Helix (Trochomorpha) approximata*, Albers, Hel., p. 116.— *Nanina (Discus) approximata*, Alb.-Marts., Hel., p. 255.— *Trochomorpha approximata*, Pease, P. Z. S., 1871, p. 474.—*Tr. (Videna) approximata*, Tryon, Man. Conch., iii, p. 90, t. 18, figs. 64—65.— *Helix marmorosa*, Hombr. et Jacq., Voy. Pol. Sud. Atl., t. 7, figs. 5—8.—*Helix approximata* var. *marmorosa*, Pfr., Mon. Hel., iii, p. 160.— Chemn. ed. ii, t. 125, figs. 7—8.— *Tr. approximata* var. *marmorosa*, Tryon, l.c., t. 18, figs. 66—67.

Hab.—Hogolu = Ruk (Hombron et Jacquinot, Kubary).

The habitats Ternate and Sandwich Islands, as given by Le Guillou and Pfeiffer, are certainly erroneous.

There are no differences to justify the separation of *marmorosa* even as a variety. The distinguishing characters mentioned by Pfeiffer are quite within the range of individual variation.

7.—Trochomorpha (Nigritella) entomostoma (Hombr. et Jacq.).

Helix entomostoma, Hombr. et Jacq., Voy. Pol. Sud, Atl., t. 7, figs. 22—25.—Pfr., Mon. Hel., iv, p. 113.—*Tr. entomostoma*, Pse., P. Z. S., 1871.—Tryon, Man. Conch., iii, p. 79, t. 15, figs. 43—45.

Hab.—Hogolu = Ruk (Hombron et Jacquinot, Kubary).

8.—Trochomorpha (Nigritella) kuesteri (Pfr.)

T. peranguste perforata, orbiculato-convexa, solida, confertim plicato-striatula, fulvo-castanea aut atrofusca, subopaca. Spira plus minusve elevata, lateribus convexis apice obtuso pallidiore. Anfr. 7 lentissime accrescentes, sutura filari disjuncti, convexiusculi, ultimus non descendens, ad peripheriam subacute carinatus, basi convexiusculus, medio subplanatus, circa perforationem subexcavatus, confuse angulatus. Apertura diagonalis, rotundato-triangularis, parum excisa, peristoma rectum, margine supero simplice retrorsum arcuato, saepe deflexo, basali strictiusculo, valde calloso-incrassato, columellari brevissimo, tenui, subexciso.

Diam. maj. 22, alt. 13·5 mm.	Diam. maj. 18·5, alt. 11·5 mm.
,, ,, 20, ,, 13·5 mm.	,, ,, 18, ,, 9·5 mm. (Pfr.).
,, ,, 19, ,, 12·5 mm.	

Helix kuesteri, Pfr., Z. f. Mal, 1845.—Chemn., ed. ii, Hel., no. 586, t. 92, figs. 14—15.—Mon. Hel., i, p. 215.—*Tr. kuesteri*, Pease, P. Z. S., 1871, p. 474.—Tryon, Man. Conch., iii, p. 80, t. 15, figs. 48—49.

Var. nov. ex colore: *fulvizona*. Ad carinam taenia fulva cincta.

Hab.—Ponape (Finsch, Etscheid, Kubary).

8a.—Trochomorpha kuesteri sub-sp. **transitans,** nov.

T. umbilico paullo majore, anfr. paullo minus convexis, basi paullo magis applanata.

Hab.—Ponape (Etscheid, Kubary).

8b.—Trochomorpha kuesteri sub-sp. **goniomphala,** Pfr.

T. umbilico magis aperto, carina acutiore, anfr. subplanis aut fere planis, angulo circa umbilicum magis distincto, basi planiore, colore pallidiore (corneo-fulvo).

Diam. 20·5, alt. 9·5 mm. (Pfr.)	Diam. 21·5, alt. 14 mm.
,, 20·5, ,, 12·5 mm.	,, 22, ,, 11·5—12 mm.
,, 21, ,, 11·5 mm.	

Helix goniomphala, Pfr., P. Z. S., 1854, p. 147.—Mon. Hel., iv, p. 184.—*Tr. (Nigritella) goniomphala*, Marts., Ostas., p. 247.—Tryon, Man. Conch., iii, p. 78, t. 15, f. 34.

Hab.—Ponape (Tryon, Etscheid, Kubary).

Pfeiffer mentioned no habitat at first, later he gave Viti as such on Thomson's authority, which must be erroneous. Tryon states Ponape to be the true locality, but does not mention the collector. I received the form abundantly from Ponape.

8c.—Trochomorpha kuesteri sub-sp. **intermedia**, nov.

T. *umbilico sat aperto (ut goniomphala) sed* minus distincte angulato, anfr. 6½ magis convexis quam in sub-sp. goniomphala sed minus quam in typo, sutura minus distincte marginata, carina minus exserta.

Hab.—Ponape (Etscheid, Kubary).

The abundant material which I received of all these forms from my friends at Ponape has taught me that *T. kuesteri* and *goniomphala* cannot be separated specifically, but at most as sub-species. Unfortunately the collections, made at different localities in the islands, were not always separated, so that it cannot even be determined whether the different forms are local races connected by transitory varieties or whether they occur promiscuously at the same locality. In the latter case they could not be regarded as sub-species, but would appear to be individual variations. I believe, however, that we have here one of those interesting series of forms, for which Messrs. Sarasin, in their splendid work on the land shells of the Celebes, have introduced the new appelation of "Formenkette," i.e. a chain of forms, the different developments of the type occurring either at horizontally or vertically different localities, being linked by transitory stages on intermediate areas. Among the forms which I name *transitans* and *intermedia* we find specimens which may with equal right be referred to *kuesteri* or to *goniomphala*.

9.—Trochomorpha (Nigritella) alta (Pease).

T. imperforata, elate trochiformis, solida, transverse curvatim plicato-striatula, fusca aut brunnea, rarius flavida, opaca. Spira valde elevata lateribus convexiusculis apice obtuso. Anfr. 6½ planulati, sutura per carinam subexsertam marginata disjuncti, ultimus acute carinatus, basi fere planus, medio excavatus. Apertura maxime obliqua, trapezoidea, peristoma rectum, obtusum, margine supero medio valde protracto, basali sigmoideo, intus calloso-labiato, columella valde calloso-incrassata.

Diam. 14·75, alt. 9·5 mm.
,, 15·5, ,, 10 mm.
,, 15·7, ,, 11 mm.

Diam. 16, alt. 9·5 mm.
,, 16, ,, 10·5 mm.

Helix alta, Pease, Am. Journ. Conch., 1868, iv, p. 153, t. 12, f. 1.—Pfr., Mon. Hel., vii, p. 69.—*Tr. alta*, Pse., P.Z.S., 1871, p. 474.—Tryon, Man. Conch., iii, p. 73, t. 14, f. 91.

Hab.—Ponape (Pease, Etscheid, Kubary).

Pease's description and figure were evidently based on an imperfect specimen, not fully grown. He gives the dimensions as 10·9 mm., with only 6 whorls, and does not describe the peristome. I received adult examples in great numbers and have thought it advisable to publish a new diagnosis. By the absence of perforation, the sigmoid shape of the basal margin of the peristome, and the elevated conical spire, somewhat resembles certain species of *Dendrotrachus* (*Trochonanina*, auctt.), but there can be no doubt that it belongs to the group of *Trochomorpha kuesteri* and must be referred to the same genus as that species. Unfortunately I have not received living examples of either.

10.—Trochomorpha (Nigritella) nigritella (Pfr.).

T. modice sed pervie umbilicata, conoideo-depressa, solidiuscula, plicato-striatula, et lineis spiralibus rugulosis microscopice decussata, aut concolor atrofusca aut basi fusca, taenia angusta infra, altera latione supra peripheriam flavescentibus ornata. Spira conoidea lateribus convexis, plus minusve elevata. Anfr. 6 convexiusculi, sutura submarginata crenulata disjuncti, ultimus acute carinatus, basi convexiusculus, ad umbilicum declivis. Apertura maxime obliqua, securiformis, peristoma simplex, margine supero antrorsum arcuato, valde deflexo, infero bene curvato, sublabiato, reflexo.

Diam. 14·5, alt. 8 mm.
,, 13 ,, 8·5 mm.

Helix nigritella, Pfr., in Phil. Icon., ii, 9, p. 4, t. 6, f. 8.—Chemn., ed. ii, Helix no. 602, t. 94, figs. 1—4.—Mon. Hel., i, p. 205.—*Tr. nigritella*, Pease, J. de Conchyl., 1870, xviii, p. 400.—P.Z.S., 1871, p. 457 (cum var. *oppressa*).—Tryon, Man. Conch., iii, p. 78, t. 15, figs. 35—37.

Hab.—Ponape (Hochstetter, Pease, Etscheid, Kubary).

The variety *oppressa*, Pse., is merely one of the many individual forms of this variable species. There are more or less elevated variations both of the plain brown and of the banded forms. The convexity of the base changes occasionally to flatness.

10a.—Trochomorpha nigritella sub-sp. **contigua,** Pease.

Spira plerumque magis elevata, anfr. 6—7 minus convexi, ultimus basi planulatus aut subconcavus.

Diam. 9, alt. 10 mm. (Pease).
,, 9·5, ,, 8 mm.
,, 10, ,, 10 mm.
,, 10·5, ,, 9·25 mm.
,, 10·5, ,, 9·75 mm.
,, 11, ,, 8 mm. (Pease).
,, 11, ,, 9 mm.
,, 11·5, ,, 10·5 mm.

Diam. 12, alt. 8·5 mm.
,, 13, ,, 8·5 mm.
,, 13, ,, 7·5 mm.
,, 13·5, ,, 10 mm.
,, 14, ,, 10 mm.
,, 14·5, ,, 8·5 mm.
,, 15, ,, 9·5 mm.

Helix congrua, Pease, Am. Journ. Conch., 1868, iv, p. 154, t. 12, figs. 3—4.—*Tr. contigua*, Pease, P.Z.S., 1871, p. 457.—Tryon, Man. Conch., iii, p. 78, t. 15, figs. 38—39.—*Helix contigua*, Pfr., Mon. Hel., vii, p. 289.

Hab.—Ponape (Pease, Etscheid, Kubary).

Pfeiffer has already doubted the validity of Pease's species ("nonne varietatibus H. nigritellae, speciei forma pervariabilis, adnumeranda?") and I can only admit it as a sub-species after examination of many hundred examples. The spire is higher on an average, but *T. nigritella* varies likewise in that respect, so that the highest forms of the latter are higher than the lower ones of *contigua*. The base is flat instead of slightly convex, and sometimes even excavated, but there are transitory forms of *nigritella* with almost flattened base. The two races do not seem to live promiscuously in the same locality inasmuch as I received in one box only *contigua*, in another only *nigritella*.

There are more colour varieties of the sub-species than of the type, viz., *atrofusca*, *castanea*, *taeniata*, *brunnea*, *fulva* and *flava*.

Fam. **PHENACOHELICIDAE**, Suter.

(= **Endodontidae**, Pilsbry, ex parte.)

As I have said elsewhere[1] I consider Pilsbry's arrangement of including the well-defined family of *Phenacohelicidae*, Suter (= *Charopidae*, Hutton) within his *Endodontidae* as a regrettable step backwards. The two families are not only conchologically well distinguished, but have different types of jaw and radula and the *Phenacohelicidae* possess a mucous pore.

11.—**Flammulina (Calymna) nigrescens**, n. sp.

T. anguste perforata, discoidea, tenuis, subpellucida, confertim costulato-striata, lineis spiralibus microscopicis decussata, cuticula nigrescente costulata ad peripheriam subfimbriata obducta, opaca, fusca. Spira plana aut paullum immersa. Anfr. 3½ rapide accrescentes, convexiusculi, sutura profunda disjuncti, ultimus subangulatus,

1 N. Pl. D. M. G., 1898, p. 157 and 1899, p. 78

basi convexior. Apertura valde obliqua, ampla, late cordiformis, peristoma rectum, acutum, margo columellaris paullum dilatatus.

Diam. maj. 4·5, min. 3·25, alt. 2 mm.

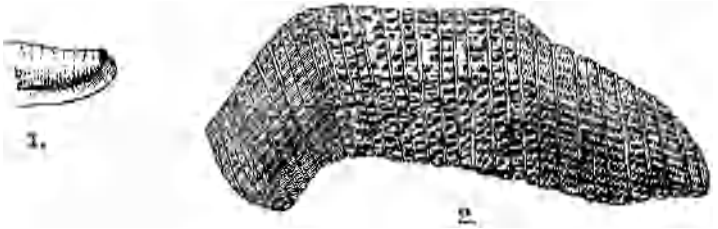
Hab.—Nampilo on Ponape, at about 100 m. altitude (Kubary).

When I received this curious little shell, I felt convinced that it belonged to *Flammulina*, but in order to make sure, I sent it to Mr. Suter who sends me the following as the result of his investigations.

"*Flammulina* (s. str.) *nigrescens*, Mildff., from Ponape, Carolines.

"Two specimens, containing the dried-up animals, of this very interesting mollusc were kindly sent to me by Dr. O. F. von Moellendorff, suggesting that the species might prove to belong to *Flammulina*, as it resembles very much some New Zealand species with ribbed whorls.

"After immersion in dilute caustic potash the foot of one of the specimens became wholly extended, and I was able to ascertain with certainty the presence of a peripodial groove, a broad pallial margin, and a *caudal gland* (fig. 1).



1.

2.

R. 1. 6. 8. 9. 11. 12. 13. 14. 15.

3.

Flammulina (s. str.) **nigrescens**, Mildff.

Fig. 1.—Posterior part of foot after immersion in dilute caustic potash, magnified.
Fig. 2.—Jaw. × 240. Drawn with camera lucida.
Fig. 3.—Teeth of radula. × 480.

"The *jaw* (fig 2) is regularly arcuate, but became somewhat distorted in mounting, hence the different form as shown in my drawing. It consists of numerous, partly unequal, separate vertical lamellae, which are distinctly reticulated by numerous and close transverse striae, a feature sometimes observed in *Gerontia* and *Phasis*, though much less conspicuous.

"The *radula* (fig. 3) has the formula 10-5-1-5-10 and there are about 110 transverse rows of these teeth. The last marginal tooth consists of a minute plate only, the following has a low mesocone, the 13th a small entocone besides the mesocone, on the 12th the entocone is bifid, but there is still no ectocone. The 11th marginal has a minute ectocone, a mesocone and a (not always) bifid entocone. The 10th to 8th marginals become higher and narrower, the ectocone is rudimentary, but the mesocone and entocone are longer, the latter no more bifid. The 7th and 6th tooth may be considered to form the transition to the laterals; the plate is becoming higher, the mesodont longer, with its cutting point reaching beyond the posterior margin of the base, the endodont is better developed than the ectodont. The five laterals have a long mesodont, its cusp extending beyond the base, whilst the side-cusps remain small, the entocone however being a trifle larger.

"The rhachidian tooth, also tricuspid, is narrower, the mesodont more slender and shorter, not reaching to the posterior margin of the plate, and the side-cusps are minute.

"The foregoing shows that it is not only the shell that resembles certain forms of New Zealand *Flammulina*; the presence of a peripodial groove, a caudal pore, the plaited jaw and the radula clearly indicate that it must be classed under *Flammulina*."—HENRY SUTER.

This confirmation of my classification is interesting for two reasons. Firstly it proves that shell characters are not by any means so unimportant as modern malacology tends to consider them, and secondly that the *Phenacohelicidae* extend much more to the North than hitherto known, the most northern habitat observed being New Caledonia.

Fam. **PATULIDAE**, Mildff.

(Endodontidae, Pilsbry, ex parte.)

If we expunge *Flammulina* from Pilsbry's ill-assorted family, there remains no reason to change the name published long before his.

12.—Charopa ualanensis (Pease.) em.

Helix oualanensis, Pease, Amer. Journ. Conch., 1866, ii, t. 21, f. i.—*Helix (Punctum) oualanensis*, Tryon, Man. Conch., iii., p.

41, t. 8, figs. 62—64.—*Endodonta (Charopa) oualanensis*, Pilsbry in Tryon, Man. Conch., ix, p. 35.

Hab.—Kusaye, Ualan (Pease).

I have not seen this species.

13.—Charopa kubaryi, n. sp.

T. modice sed aperte et subcylindrice umbilicata, discina, solidula, confertim costulata, brunnea. Spira immersa, leviter concava. Anfr. 4 convexiusculi, sutura profunde impressa disjuncti, ultimus bene convexus. Apertura parum obliqua, ovalis, modice excisa, peristoma rectum, acutum, supra ad insertionem recedens, medio protractum.

Diam. 4, alt. 1·75 mm.

Hab.—Ponape (Kubary).

14.—Charopa ponapica, n. sp.

T. mediocriter umbilicata, discoidea, tenuis, costulis bene exsertis acutis flexuosis sat distantibus sculpta, fusca. Spira fere plana, vix prominula. Anfr. 3½ convexiusculi, sutura profunda subcanaliculata disjuncti, ultimus bene convexus, prope suturam subangulatus. Apertura subcircularis, modice excisa, peristoma rectum, acutum.

Diam. 2, alt. 0·9 mm.

Hab.—Ponape (Etscheid).

15.—Endodonta (Thaumatodon) callizona, n. sp.

T. aperte umbilicata, discoidea, solidula, confertim costulata, sericina, superne et basi fusca, ad peripheriam zona lata flavida picta. Spira plana. Anfr. 5 lentissime accrescentes, sutura profunde impressa disjuncti, ultimus lateraliter compressus. Apertura fere verticalis, angusta, peristoma rectum, acutum. Lamellae parietales 3 sat tenues, longe intrantes, intus altiores, palatales 6—7 validae, profundae.

Diam. 2·2, alt. 0·9 mm.

Hab.—Ponape (Etscheid).

Young examples of this pretty little shell possess lamellae which are dissolved in the course of growing. There are some colour variations, the yellow girdle is sometimes divided by a narrow brown band or (rarely) disappears altogether.

Var. nov. *tumidula*. A little higher and more narrowly umbilicated; 2·4 : 1·3 mm.

Hab.—Mpomp and Naupilo, Ponape (Kubary).

Fam. **EULOTIDAE.**

16.—Eulota (Eulotella) micronesica, n. sp.

T. angustissime perforata, depresso-subtrochiformis, tenuiuscula, subpellucida, subtiliter plicato-striatula, lineis spiralibus microscopicis

decussatula, nitidula, corneo-lutescens. Spira mediocriter elevata, lateribus fere strictis. Anfr. fere 3 convexiusculi, sutura per carinam subexsertam filiformi disjuncti, ultimus ad peripheriam subacute carinatus, antice dilatatus. Apertura sat ampla, fere diagonalis, oblique elliptica, sat excisa, peristoma paullum expansum.

Diam. maj. 13·5, min. 11, alt. 9·2; apert. lat. 7·5, long. 7, alt. 5·5 mm.

Hab.—Ponape, in the hills (Etscheid).

The discovery of this shell was a great surprise, especially as the locality renders the introduction with cultivated plants highly improbable. Also I do not know of any species of *Fulotella* nearly related to it.

Fam. **HELICIDAE.**

17.—Pupisoma philippinicum, Mlldff.

N. Bl. D. M. G., 1888, p. 108; Jahrb. Senck. Nat. Ges., 1890, p. 223, t. 8, f. 4.—Tryon, Man. Conch., ix, p. 52, t. 14, figs. 43—44.

Hab.—Ponape (Kubary). Most probably introduced from the Philippine Islands, like the *Kalliellae*.

Pilsbry includes this curious genus in the *Patulidae*, but I still believe its nearest allies are *Acanthinula* and *Zoogenites*.

Fam. **PLECTOPYLIDAE.**

18.—Brazieria velata (Hombr. et Jacq.).

Helix velata, H. and J., Voy. Pol. Sud. Atl., t. 6, figs. 29—32 (absque descriptione). — Pfr., Mon. Hel., iv, p. 155.—*Trochomorpha velata*, Pease, P. Z. S., 1871, p. 474.—*Helix (Endodonta) velata*, Tryon, Man. Conch., iii, p. 61, t. ii, figs. 89—91.—*Brazieria velata*, Ancey, Conch. Exch., 1887, ii, p. 22. — *Endodonta (Brazieria) velata*, Pilsbry in Tryon, Man. Conch., ix, p. 29, t. 5, figs. 49—51.

Hab.—Hogolu (Hombr. et Jacq., Brazier), Lukunor or Mortlock (Brazier).

As Pilsbry justly says, we cannot regard the generic relationship of this mollusc as established until the soft parts are investigated. However, the conchological characters alone, especially the thickened lip and the parietal callus elevated into a lamella, seem to preclude any relation to *Endodonta* or *Charopa*. I am all but sure that it will prove to be nearly related to *Plectopylis*. We discovered a similar, but much smaller species, in the Philippine Archipelago which I described at first as *Plectopylis*, later as *Brazieria coarctata*.[1]

1 N. Bl. D. M. G., 1894, p. 113; 1895, p. 159.

Fam. **BULIMIDAE.**

19.—Partula rufa (Lesson).

Partula rufa, Less., Voy. Coqu. Zool., 1830, ii, 2, p. 324.—Pfr., Mon. Hel., iii, p. 449.—Marts., Conch. Mitth., 1881, i, p. 94.—*Bulimus rufus*, Pfr., Mon. Hel., ii, p. 229.

Hab.—Kusaye, Ualan (Lesson).

Prof. v. Martens declares this species to be identical with the *Partula* of Ponape, which is well known by the name of *P. guamensis*. Lesson's description gives, however, the dimensions as 4:8 lin. or about 9:18 mm. If these measurements were correct, then the *Partula* of Ualan must be a much smaller and more slender shell than *guamensis*. I therefore treat the Ponape races as sub-species.

19a.—Partula rufa, sub-sp. **montana**, nov.

Bulimus guamensis, Pfr., Phil. Abb., ii, p. 113, Bul. t. 4, f. 9.—Mon. Hel., ii, p. 13.—*Partula guamensis*, Pfr., Mon. Hel., iii, p. 446.—*P. rufa*, Marts., Conch. Mitth., 1881, i, p. 95, t. 17, figs. 12—16.

Hab.—Ponape, ruins of Nanmatal (Finsch), in the hills (Etscheid, Kubary).

Whorls 5, very distinctly spirally striate, rather solid. Diam. 15, alt. 26 mm. (Pfr.), 16·26 (Marts.), 18·26 (the broadest of my own specimens).

The name *guamensis* cannot be retained inasmuch as this mollusc does certainly not live on the island of Guam, where my friend Quadras collected more than two months without finding it.

19b.—Partula rufa, sub-sp. **grandis** nov.

Much larger, diam. 19, alt. 30·5 mm., less solid, spiral sculpture somewhat less marked, peristome more expanded, less labiate, $5\frac{3}{4}$ to nearly 6 whorls.

Hab.—Ponape, coast region (Etscheid, Kubary).

There are three colour variations, viz., dark purple-brown with violet lip (typical), *castanea*, pale chestnut coloured with white lip, and *flavescens*, pale greenish yellow. The last-named albino is rather rare.

Fam. **PUPIDAE.**

20.—Vertigo (Ptychochilus) eapensis (Bttgr.) (rectius yapensis).

Pupa (Ptychochilus) eapensis, Bttgr., in Marts. Conch. Mitth., 1881, i, p. 56, t. 11, f. 11.

Hab.—Yap (Boettger), Palao or Pelew Islands (Kubary).

21.—Vertigo (Ptychochilus) ponapica, n. sp.

T. perforato-rimata, ovato-oblonga, tenuiter et distanter costulata, sericina, brunnea. Spira subtus sub-cylindrica, sursum conoidea, apice obtuso. Anfr. 5 modice convexi, ultimus basi sub-compressus, extus pone aperturam profunde et longe scrobiculato-impressus. Apertura fere verticalis, rotundato-trapezoidalis, peristoma modice expansum, rufo-labiatum, extus distincte sinuatum, marginibus callo tenuissimo junctis. Dentes 6, columellaris recedens; palatales 3, inferi 2 profundi, breves, tertius longus, validus; angularis validus, longe intrans, parietalis a margine remotus, angulari approximatus.

Diam. 1, alt. 1·75 mm.

Hab.—Mpomp, Ponape (Kubary).

This minute shell belongs to the group of *V. tantilla*, Gld., and might be considered, like the preceding form, to be merely a representative sub-species of that species widely distributed over Polynesia.

22.—Leucochilus pediculus (Shuttl.).

See Bttgr. in Marts., Conch. Mitth., i, p. 65.

Hab.—Yap (Kubary).

Found, according to Boettger, on the Marquesas, Society, Hervey, Samoa, Tonga, Viti, Ellice, Hapai and Marshall Islands, New Caledonia and Hawaii, to which I can add the Mariannes and Philippine Islands. It seems to be easily introduced with cultivated plants.

Fam. **STENOGYRIDAE.**

23.—Prosopeas carolinum (Marts.).

Stenogyra carolina, Marts., Conch. Mitth., 1881, i, p. 93, t. 17, figs. 6—8.

Hab.—Hogolu = Ruk (Kubary).

A rather large species, $5\frac{1}{2}$: 22 mm., related to the Philippine *Prosopeas* like *pagoda*, Semp., and quite isolated in the Micronesian fauna.

24.—Opeas gracile (Hutt.).

Hab.—Yap, Ponape (Kubary).

25.—Opeas tuckeri (Pfr.).

See Garrett, P. Z. S., 1887, p. 185.

Hab.—Yap, Ponape (Kubary).

Garrett justly includes *Bulimus junceus*, Gld., *walli*, Cox, *diaphanus*, Gass., *souverbieanus*, Gass., *artensis*, Gass., *Stenogyra upolensis* Mouss., and *novemgyrata*, Mouss., in the synonymy of this widely distributed mollusc, but I doubt very much that *O. panayense*, Pfr.,

is the same species. I consider the Philippine form to be identical with *O. gracile*, Hutt.

26.—Opeas pruinosum, n.sp.

T. vix rimata, ventricosulo-turrita, tenuis, confertim costulato-striata, squamulis membranaceis brevissimis valde deciduis obtecta, sericina, pallide griseo-straminea. Spira turrita lateribus convexiusculis, apice obtusulo. Anfr. 9 convexiusculi sutura sat profunda disjuncti. Apertura verticalis, subrhomboidalis, peristoma rectum, acutum, margine externo antrorsum arcuato, columellari reflexo appresso.

Diam. 4·75, alt. 12·75 mm.

Hab.— Ponape (Etscheid, Kubary).

This species belongs to the group of *O. clavulinum*, Pot. et Mich., but is well characterised by the curious sculpture which gives it a somewhat hoary aspect.

27.—Tornatellina ovatula, n. sp.

T. imperforata, conoideo-ovata, tenuis, pellucida, subtilissime striatula, nitidula, pallide lutescens. Spira brevis, conoidea, apice obtuso. Anfr. 4 convexiusculi, sutura crenulata disjuncti, celeriter accrescentes, ultimus magnus, tumidulus. Apertura valde obliqua, ovalis, peristoma rectum, acutum, margine columellari brevissime reflexo, appresso. Lamella parietalis sat elevata, longe spiraliter intrans, columella valde torta, basi profunde excisa bidentata.

Diam. 2, alt. 3 mm.

Hab.—Ponape (Etscheid).

28.—Tornatellina pusilla, n. sp.

T. imperforata, elongate ovato-conica, tenuis, pellucida, subtiliter striatula, nitidula, pallide luteocornea. Spira sat elevata, apice obtusulo. Anfr. $4\frac{3}{4}$ convexiusculi, ultimus spiram aequans. Apertura sat obliqua, anguste ovalis, peristoma simplex, acutum. Lamella parietalis sat valida, alta, longe spiraliter recedens, columella subtruncata, valde torta, lamella humili spiraliter recendente munita.

Diam. 1·5, alt. 2·5 mm.

Hab.—Ponape (Etscheid).

29.—Tornatellina gigas, Marts.

Conch. Mitth., 1881, i, p. 92, t. 17, figs. 1—5.

Hab.—Hogolu = Ruk (Kubary).

Mr. C. F. Aneey has constituted a separate sub-genus for this aberrant form, viz., *Ochroderma* (Le Natural., 1885, p. 93).

Fam. **SUCCINEIDAE.**

30.—Succinea (Brachyspira) guamensis, Pfr.

Mon. Hel., iv, p. 805.

Hab.—Ponape (Etscheid).

Pfeiffer states Guam as the habitat of this species, but Quadras found no *Brachyspira* on that island. My specimens from Ponape, and from Corror of the Pelew islands are smaller, but otherwise agree well with Pfeiffer's description.

Fam. **AURICULIDAE.**

31.—Pythia acuta (Hombr. et Jacq.).

Scarabus acutus, H. et J., Voy. Pol. Sud. Zool., iv, p. 39, t. 10, figs. 1—3.—*Pythia acuta*, Pfr., Aur., p. 98.

Hab.—Hogolu = Ruk (H. et J.), Ponape (Kubary).

32.—Cassidula philippinarum, Hidalgo.

J. de Conchyl., 1888, p. 53, t. vi, f. 7.

Hab.—Ponape (Kubary).

Fam. **DIPLOMMATINIDAE.**

33.—Palaina (Eupalaina) dollolum (Mouss.).

Mousson in sched., Mlldff., N. Bl. D. M. G., 1897, p. 41.—Kob. et Mlldff., Cat. Pneum., ibid., 1898, p. 132.

Hab.—Ponape (Mousson, Etscheid, Kubary).

This pretty little shell I received first from Mousson, who never published a description of it; he did not state who collected it. It was found in the bush on Ponape by my collectors in great numbers. By the pale band on the last whorl it resembles *P. taeniolata*, Q. and Mlldff., from Guam. As in that species, young specimens are white, the secretion of colour commencing when the shell is nearly adult. There are some rare colour varieties; uniform reddish or yellow.

34.—Palaina (Eupalaina) kubaryi, Mlldff.

N. Bl., 1897, p. 42.—Kob. et Mlldff., ibid., 1898, p. 132.

Hab.—Ponape, in the hills (Kubary).

Longer than the preceding species, the costulation much narrower, no band, peristome duplicate, not triplicate.

35.—Palaina (Eupalaina) ovatula, Mlldff.

N. Bl., 1897, p. 42.—Kob. et Mlldff., ibid., 1898, p. 132.

Hab.—Ponape (Etscheid, Kubary).

Much smaller, costulate-striate, pale horn-coloured, only 5 whorls.

36.—Palaina (Macropalaina) scalarina (Mouss.).

Mouss. in sched., Mlldff., N. Bl., 1897, p. 43.—Kob. et Mlldff., ibid., 1898, p. 134.

Hab.—Ponape (Mousson, Etscheid, Kubary).

37.—Palaina (Macropalaina) xiphidium, Mlldff.

N. Bl., 1897, p. 44.—Kob. et Mlldff., ibid., 1898, p. 134.

Hab.—Ponape, in the hills (Etscheid, Kubary).

These two species belong to my new section *Macropalaina*, which I proposed for some elongate and acuminate species like *P. pomatiaeformis*, Mouss. They both have, at the outer and at the columellar margin of the peristome, a wing-like process, which is much larger on the columella. *P. xiphidium* is longer and has a more slender spire, ½ whorl more, the whorls are more convex, the ribs more distant, the colour darker, and the excision of the columellar margin deeper. I think, however, that intermediate forms may still be found and that *xiphidium* will prove to be merely a sub-species of *scalarina*.

Fam. **PUPINIDAE.**

38.—Pupina difficilis, O. Semp.

P.Z.S., 1864, p. 252.—J. de Conchyl., 1865, xiii, p. 407, t. 12, f. 8.—Pfr., Mon. Pneum., suppl. iii., p. 150.—Kob. et Mlldff., N. Bl., 1897, p. 145.

Hab.—Yap (Kubary), Pelew Islands (C. Semper).

39.—Pupina complanata (Pease).

Registoma complanatum, Pease, P.Z.S., 1860, p. 440.—Pfr., Mon. Pneum., suppl. ii, p. 98.—*Rhegistoma complanata*, Marts. et Langkavel, Don. Bism., p. 58.—*Pupina (Registoma) complanata*, Pfr., Pneum., suppl. iii, p. 152.—*Pupina* (*Pupina* s. str.) *complanata*, Kob. et Mlldff., N. Bl., 1897, p. 145.

Hab.—Ponape (Etscheid, Kubary), Ebon (Pease), Jaluit (Dr. Steinbach), Marshall Islands.

I believe that Ponape is the original habitat of this species and that it was introduced on the different atolls of the Marshall group with cultivated plants (*Pandanus* or *Musa*). It is certainly not a *Registoma* (= *Moulinsia*), but a true *Pupina* of the typical group of *P. keraudreni*, Vign., the upper "canal" being somewhat obsolete by the slight development of the parietal callus.

40.—Pupina brenchleyi, Smith.

P.Z.S., 1891, t. 40, f. 8. (N. Bl. D. M. G., 1892, p. 176).

Hab.—Lugunor (Smith).

I have not seen this species nor have I been able to compare the description. I suspect it to be but a variety of one of the preceding species which differ very little from each other.

Fam. **REALIIDAE.**

41.—Omphalotropis (Eurytropis) bulimoides (Hombr. et Jacq.).

Cyclostoma bulimoides, H. et J., Voy. Pol. Sud. Zool., v, p. 57, t. 12, figs. 37—39.—*Hydrocena bul.*, Pfr., Mon. Pneum. suppl., i, p. 162 (ex parte).—*Omphalotropis bul.*, Pfr., ibid. suppl., ii, p. 176.—Pease, J. de Conchyl., 1869, p. 144.—*Realia bul.*, Pfr., Pneum. suppl. iii, p. 220 (ex parte).—*Omphalotropis (Eurytropis) bul.*, Kob. et Mlldff., N. Bl., 1898, p. 149.—*Assiminea bul.*, Marts., Ann. Mag. N. H. (3), xvii, p. 206, cf. Boettger, J. D. M. G., 1887, xiv, p. 215.—Marts., Sitz. Ber. Berlin Akad. Wiss., 1887, p. 264.—*Omphalotropis elongatula* var. *contracta*, Quadr. et Mlldff., N. Bl., 1894, p. 20.

Hab.—Hogolu = Ruk (Hombr. et Jacq.), Yap (Kubary), Guam, Marianne (Quadras).

The true *O. bulimoides* was described from the island of Hogolu (= Ruk) and the localities Solomon Islands and New Ireland, as given by Pfeiffer and other authors are very doubtful. My specimens from Yap, which island is situated not very far from Ruk, agree very well with the original description, also with the *Omphalotropis* of Guam, which Quadras and myself published as var. *contracta* of our *O. elongatula*. If my identification is correct, then *O. elongatula* will have to be considered a sub-species of *bulimoides* and its varieties *brunnescens* and *chrysostoma* (l. c., p. 19) as colour varieties of that sub-species. The forms quoted as *O. bulimoides* from the Solomon Islands and New Ireland most probably belong to other species or are at least to be distinguished sub-specifically; I have not seen them as yet.

42.—Omphalotropis (Eurytropis) coronata, Mlldff.

N. Bl., 1897, p. 165.—Kob. et Mlldff., ibid., 1898, p. 149.

Hab.—Yap (Kubary).

Easily distinguished by the series of white callosities or minute knobs along the suture.

43.—Omphalotropis carolinensis, Smith.

P.Z.S., 1891, t. 40, f. 9 (N. Bl. D. M. G., 1892, p. 176).

Hab.—Lugunor (Smith).

44.—Omphalotropis angulosa, Ancey.

Le Natur., 1890, xii, no. 68, p. 11.
Hab.—Ponape (Ancey).

45.—Omphalotropis (Stenotropis) laevis (Pease).

Realia laevis, Pease, Amer. Journ. Conch., 1865, i, p. 289, ii, t. 5, f. 5.—Pfr., Mon., Pneum. suppl., iii, p. 227.—*Omphalotropis laevis*, Pease, J. de Conchyl., 1869, p. 148.—Kob. et Mlldff., N. Bl., 1898, p. 151.

Hab.—Ualan (Pease), Ponape (Pease, Etscheid, Kubary).

The name *laevis* is rather a misnomer, there is vertical and spiral striation. The angulation of the last whorl is sometimes developed into an obtuse keel. The colour, which Pease calls "fusco-cornea," varies a good deal from yellowish-horn colour to reddish brown. I count $5\frac{1}{6}$, not 5 whorls, which are not "convexi," but at most "convexiusculi." The preceding species, described by Ancey, is perhaps identical with *laevis*.

46.—Omphalotropis (Stenotropis) tumidula, Mlldff.

N. Bl., 1897, p. 168.—Kob. et Mlldff., ibid., 1898, p. 152.
Hab.—Naupilo, Ponape (Kubary).

47.—Garrettia carolinarum (Mlldff.).

Diadema carolinarum, Mlldff., N. Bl., 1897, p. 168.—Kob. et Mlldff., ibid., 1898, p. 156.

Hab.—Ponape (Etscheid, Kubary).

The name *Diadema*, Pse., cannot stand, being forstalled by Schumacher 1817 (Crust.), Gray 1825 (Echinod.), Boisd. 1832 (Lepidopt.). Paetel mentions *Garrettia*, Pease, as a synonym of *Diadema*, but I have not been able to find out whether that name was ever published or not. The genus, which was hitherto known from the Society, Harvey, Cook and Viti Islands, has according to Thiele[1] a radula of the type of *Omphalotropis* and belongs, therefore, to the *Realiidae*. The Caroline species agrees well with the Polynesian forms in the general outline and the corneous, multispiral operculum with raised ridges.

47a.—Garrettia carolinarum sub-sp. **pyramis,** Mlldff.

Diadema carolinarum var. *pyramis*, Mlldff., N. Bl., 1897, p. 168.

Hab.—Naupilo, Ponape, about 100 m. altitude (Kubary).

Higher, 7 whorls instead of 6, the keel of the last whorl more or less evanescent.

1 N. Bl., 1894, p. 24.

47b.—Garrettia carolinarum sub-sp. **turrita,** Mlldff.

Diadema carolinarum var. *turrita,* Mlldff., l. c., p. 168.

Hab.—Meitik, Ponape (Kubary).

Still higher, $7\frac{1}{2}$ whorls, the last without any indication of the perispherical keel.

Without the knowledge of the preceding subspecies I should not have hesitated to describe this form as a separate species. But *pyramis* is exactly intermediate between it and the type and there can be no doubt that *turrita* is merely an extreme development of *carolinarum*.

48.—Garrettia soluta (Mlldff.).

Diadema solutum, Mlldff., N. Bl., 1897, p. 169.—Kob. et Mlldff., ibid., 1898, p. 156.

Hab.—Ponape (Etscheid, Kubary).

By its shape and sculpture this remarkable little shell resembles some species of *Heteropoma* (Mariannes and Philippines), but it possesses a corneous multispiral operculum and must, therefore, be classed with *Garrettia*. It is well characterised by the free body whorl, disconnected for about $\frac{2}{3}$ of its length.

49.—Quadrasiella ammonitella, n. sp.

T. late et aperte umbilicata, discoidea, sat tenuis, confertim spiraliter lineata, costis crassiusculis distantibus sculpta, opaca, corneolutea. Spira parum emersa, apice mucronato glabrato. Anfr. 4 convexi, sutura profunde impressa, disjuncti, ultimus ad peripheriam nec non infra et supra illam distincte angulatus. Apertura vix obliqua, fere circularis, peristoma rectum, obtusum. Operculum intus corneum, multispirale, extus lamella cartilaginea plicatula, peristoma superante praeditum.

Diam. 3·2, alt. 1·5.

Hab.—Ponape, in the hills (Kubary).

The genus *Quadrasiella* was established by myself for two species discovered by Quadras on the island of Guam,[1] its chief characteristic being the operculum. This consists of an inner corneous lamella which overlaps the peristome somewhat in the manner of *Aulopoma*, and an outer calcareous one which is elongated above and below into a wing-like process. This outer calcareous lamella is wanting in the Caroline species, but the operculum is exactly like the inner lamella of that of *Quadrasiella*. It is possible that the outer lamella, which is easily broken off in the typical species, has fallen off from my two examples

1 N. Bl., 1894, p. 28.

or that they are not quite full grown. The general shape of the shell, the sculpture and the mucronate apex agree very well with the species of Guam, and I have but little doubt that I am right in ascribing the shell of Ponape to *Quadrasiella*.

50.—Gonatorhaphe incisa (Hombr. et Jacq.).

Cyclostoma incisa, H. et J., Voy. Pol. Sud. Zool., v, p. 49, t. 12, figs. 11—15.—*Cyclophorus incisus*, Pfr., Mon. Pneum. suppl., i, p. 54.—*Gonatorhaphe incisa*, Kob. et Mlldff., N. Bl., 1898, p. 155.

Hab.—Hogolu = Ruk (Hombron et Jacquinot).

From the meagre description which Pfeiffer made "ex icone," I can only conclude that this species belongs to my genus *Gonatorhaphe*, constituted for certain operculate shells of Melanesia and Polynesia, type *G. recluziana*, Pfr. They have the general outline of *Cyclotus*, sharp spiral ribs, a more or less canaliculate suture, marginate by a keel or elevated line, and an operculum somewhat like that of *Cyclotus* but without the marginal channel. It has nothing to do either with *Cyclophorus* or *Cyclotus*, but belongs to the *Realiidae*.

Fam. **TRUNCATELLIDAE.**

51.—Truncatella pacifica, Pease.

Am. Journ. Conch., 1867, iii, p. 230, t. 15, f. 27.—Pfr., Mon. Pneum. suppl., iii, p. 15.

Hab.—Ualan (Pease), Ponape (Etscheid).

Closely related to *Tr. valida*, Pfr., and perhaps only a subspecies of that widely distributed species.

Fam. **HELICINIDAE.**

52.—Helicina (Pleuropoma) humilis, Hombr. et Jacq.

H. et J., Voy. Pol. Sud. Zool., v, p. 45, t. 11, figs. 27—31.—Pfr., Mon. Pneum. suppl., i, p. 189.

Hab.—Hogolu = Ruk (H. et J.), Ponape (Etscheid, Kubary).

Fresh examples show some spiral, elevated, membranaceous lines, which are easily rubbed off. The operculum is typical of my subgenus *Pleuropoma*.

53.—Helicina (Pleuropoma) zigzag, Pse.

Am. Journ. Conch., 1867, iii, p. 229, t. 15, f. 26.—Pfr., Mon. Pneum. supppl., iii, p. 280.

Hab.—Ualan (Pease), Ponape (Etscheid, Kubary).

My examples from Ponape agree in part with Pease's description, but some are larger, up to $9\frac{1}{4} : 5\frac{2}{3}$ mm., thinner and less sharply keeled.

I cannot ascertain whether the latter variety lives with the type or forms a local race on a different part of the island.

54.—Helicina (Sulfurina) carolinarum, n. sp.

T. depresse globosa, tenuiuscula, subtilissime striatula, parum nitens, flava, interdum taenia lata ignea ornata. Anfr. $4\frac{1}{2}$ planulati, sutura appressa, submarginata, disjuncti, ultimus ad peripheriam confuse subangulatus. Apertura sat obliqua, rotundato-triangularis, peristoma superne rectum, acutum, basi subexpansum, obtusum, columella brevis, crassiuscula, callum latum, granulosum, emittens.

Diam. 4, alt. 2·75 mm.

Hab.—Ponape (Kubary).

55.—Helicina zonata, Less.

Lesson, Voy. Coqu. Zool., ii, 1, p. 350.—Pfr., Mon. Pneum., p. 358.

Hab.—Ualan (Lesson).

Probably a *Pleuropoma* and perhaps identical with or nearly related to *H. zigzag*, Pse.

Fam. **HYDROCAENIDAE.**

56.—Georissa rufula, n. sp.

T. rimata, ovato-conica, solidiuscula, transverse subtiliter striatula, sculptura spirali, sub lente fortiori, haud discernenda, nitidiuscula, rufo-fulva. Anfr. $4\frac{1}{2}$ bene convexi, sutura profunde impressa disjuncti, ultimus paulisper descendens. Apertura sat obliqua, ovalis, peristoma simplex, rectum, obtusum, marginibus callo validiusculo junctis, columella reflexa, valde dilatata, late appressa.

Diam. 1·5, alt. 2·1 mm.

Hab.—Ponape (Etscheid).

These lists are naturally very incomplete and if Ponape appears to possess a much richer fauna than the rest of the islands, the reason is certainly not only its greater size and the higher altitude of its hills, but chiefly the fact that it has been better explored than the other atolls. I am convinced that even Ponape will still yield a number of additional species, when a thorough investigation of the hills has been made. My lamented friend Kubary had only just begun to collect in the higher regions when he died. It seems to me that it is too early yet to base geographical conclusions on the scant material now at our disposal. It will be useful, however, to give a comparative list of the species hitherto known from the three groups of *Micronesia*.

Genera and Subgenera.	Mariannes.	Pelews.	Carolines.
Ennea	*bicolor*		
Coneuplecta		*pagodula*	
Lamprocystis	*miselia*, ? *succinulata*	*palaënsis*, *wilsoni*, *margaritacea*, *straminea*	*palaensis*, *frivola*
Microcystina	*denticulata*		
Kaliella	*doliolum*		*doliolum*, *tenuisculpta*
Hemiplecta			*souverbyana*
Trochomorpha		*oleacina*, *electra*, ? *swainsoni*	*approximata*, *entomostoma*, *kuesteri*, *alta*, *nigritella*
Flammulina			*nigrescens*
Charopa	*fusca*, *rotula*, *quadrasi*		*ualanensis*, *kubaryi*, *ponapica*
Endodonta	*mariannarum*, *heptaptychia*	*constricta*, *irregularis*, *lacerata*, *kororensis*, *fuscozonata*	*callizona*
Ealida			*micronesica*
Chloraea		? *pelewiana*	
Pupisoma			*philippinicum*
Brazieria			*velata*
Partula	*radiolata*, *gibba*, *bicolor*, *mastersi*, *fragilis*, *quadrasi*	*calypso*, *thetis*, *leucothoe*	*rufa*
Vertigo (*Ptychachilus*)	*quadrasi*		*capensis*, *ponapica*
Leucochilus	*pediculus*		*pediculus*
Prosopeas			*carolinum*
Opeas	*gracile*, *tuckeri*		*gracile*, *tuckeri*
Tornatellina	*quadrasi*		*ovatula*, *pusilla*
,, (*Lamellina*)	*microstoma*		
,, (*Ochroderma*)	*subcylindrica*		*gigas*
Geostilbia	*philippinica*		
Succinea	*guamensis*, *quadrasi*, *piratarum*		*guamensis*

GENERA AND SUBGENERA.	MARIANNES.	PELEWS.	CAROLINES.
Pythia	*lecithostoma*, *pyramidata*		*acuta*
Cassidula		*philippinarum*, *quadrasi*, *compacta*	*philippinarum*
Auricula	*auricella*		
Blauneria	*gracilis*		
Melampus	*luteus*, *quadrasi*, *caffer*, *triticeus*, *fasciatus*		
Pupina		*difficilis*	*difficilis*, *brenchleyi*, *complanata*
Palaina	*taeniolata*	*alata*, *aurea*, *dimorpha*, *moussoni*, *patula*, *platychilus*, *rubella*, *strigata*, *striolata*, *wilsoni*	*dolium*, *kubaryi*, *ovatula*
,, (*Cylindropalaina*, ,, (*Macropalaina*)		*pupa*	*scalarina*, *xiphidium*
Hungerfordia		*peleuensis*	
Diplommatina (*Pseudopalaina*)		*albata*, *crassilabris*, *gibboni*, *inflatula*, *lamellata*, *lutea*, *polymorpha*, *pyramis*, *ringens*	
Omphalotropis (*Eurytropis*)	*bulimoides*, *elongatula*, *eleyans*, *erosa*, *guamensis*, *planicosta*, *latilabris*, *ochtogyra*, *picta*, *quadrasi*	*calenata*, *cheynei*, *mutica*, *striatipila*	*bulimoides*, *carolinensis*, *cornuata*
,, (*Stenotropis*)	*submaritima*, *suturalis*		*laevis*, ? *angulosa*, *tumidula*
,, (*Scalinella*)	*gracilis*, *pilosa*, *pilosella*		
,, (*Chalicopoma*)	*laevigata*, *semicostulata*		

Genera and Subgenera.	Mariannes.	Pelews.	Carolines.
Acmella (*Solenomphala*)	*canica*		
Heteropoma	*fulvum*, *glabratum*, *pyramis*, *quadrasi*, *tuberculatum*, *turritum*		
Gonatorhaphe			*incisa*
Quadrasiella	*clathrata*, *muronata*		*ammonitella*
Garrettia			*carolinarum*, *solutum*
Taheitia	*alata*, *lamellicosta*, *parvula* *latiosa-robusta* *expansilabris*		
Truncatella	*mariannarum* *subauriculata*, *vitiana*		*pacifica*
Helicina (*Pleuropoma*)			*humilis*, *zigzag*, *zonata*, *carolinarum*
,, (*Sulfurina*)			
Georissa	*elegans*, *bicingulata*, *laevigata*		*rufula*

The Land Shells as enumerated above are distributed on the different islands as follows:

Genus.	Yap.	Ruk. (Hogolu).	Lukunor. (Mortlock).	Ponape.	Ualan.
Lamprocystis	*palaensis*	—	—	—	*[illegible]*
Kaliella		—	—	*[illegible]*	—
"	—	—	—	*semisculpta*	—
Hemiplecta	—	*amerlyana*	—	—	—
Trochomorpha	—	*approximata*	—	*kuesteri*	—
"	—	*entomostoma*	—	" *transitans*	—
"	—	—	—	" *goniomphala*	—
"	—	—	—	" *intermedia*	—
"	—	—	—	*alta*	—
"	—	—	—	*nigritella*	—
"	—	—	—	" *contigua*	—
Flammulina	—	—	—	*nigrescens*	—
Charopa	—	—	—	*kubaryi*	*ualanensis*
"	—	—	—	*p[illegible]ea*	—
Endodonta	—	—	—	*a[illegible]*	—
"	—	—	—	" *tumidula*	—
Endota	—	—	—	*micronesica*	—
Pupisoma	—	—	—	*philippinicum*	—
Braziera	—	*velata*	*velata*	—	—
Partula	—	—	—	—	*rufa*
"	—	—	—	*rufa montana*	—
"	—	—	—	" *gracilis*	—
Vertigo	*[illegible]ensis*	—	—	*ponapica*	—
Leucocheilus	*pollicatus*	—	—	—	—
Prosopeas	—	*carolinum*	—	—	—
Opeas	*gracile*	—	—	*gracile*	—
"	*tuckeri*	—	—	*tuckeri*	—
"	—	—	—	—	*pro[illegible]*

Genus.	Yap.	Ruk. (Hogolu).	Luguor. (Mortlock).	Ponape.	Ualan.
Tornatellina	—	—	—	*ovatula*	—
,,	—	—	—	*pusilla*	—
,,	—	*gigas*	—	—	—
Succinea	—	—	—	*guamensis*	—
Pythia	—	*acuta*	—	*acuta*	—
Cassidula	—	—	—	[illegible]	—
Palaina	—	—	—	*doliolum*	—
,,	—	—	—	*kubaryi*	—
,,	—	—	—	*ovatula*	—
,,	—	—	—	*scalarina*	—
,,	—	—	—	*xiphidium*	—
Pupina	*difficilis*	—	*brazieri*	*complanata*	—
Omphalotropis	*bulimoides*	*bulimoides*	*carolinensis*	—	—
,,	*coronata*	—	—	—	—
,,	—	—	—	[illegible]	*laevis*
,,	—	—	—	*annulosa*	—
,,	—	—	—	*tumidula*	—
Garrettia	—	—	—	*carolinarum*	—
,,	—	—	—	,, *pyramis*	—
,,	—	—	—	,, *turrita*	—
Quadrasiella	—	—	—	*ammonitella*	—
Gonatorhaphe	—	*incisa*	—	—	—
Truncatella	—	—	—	*pacifica*	*pacifica*
Helicina	—	*humilis*	—	*humilis*	—
,,	—	—	—	*zigzag*	*zigzag*
,,	—	—	—	—	[illegible]
,,	—	—	—	*carolinarum*	—
Georissa	—	—	—	*rufula*	—

NOTES.

Note on Helicoid Land Shells from the Canary Islands.—Mr. Jules Mabille, in a paper on the Mollusca collected by Mr. Buchet in the Canary Islands[1], appears to have overlooked an article by the present writer.[2] Mr. Mabille states that *Hyalinia cellaria*, has hitherto only been found in Tenerife, Grand Canary, and Hierro, whereas I recorded this species as having been collected also in the island of Palma by Colonel Parry. *Hygromia multigranosa* is stated to have been collected in the living state by Mr. Buchet, the species having previously only been known in the sub-fossil condition. Colonel Parry, however, forestalled this discovery, as recorded by me in the introductory remarks to the same article.—G. K. Gude.

Note on the Asiatic Species of Philomycus.—From an interesting letter recently received from Professor Cockerell we quote the following, with the writer's permission:—"Your treatment of the Asiatic *Philomycus* [see this Journal, p. 80], is very interesting, but not really conclusive for lack of material. . . . The *original bilineatus* was from Chusan, nobody has ever seen the anatomy of it, and the only way to be sure of *bilineatus* is to dissect a Chusan example. Of course the Keferstein slug was *confusa*. I so stated in my paper. It is *possible* that the Japanese slug with ribless jaw (always?) is not distinct, but on the face of things one would suppose it to be a good species. Cannot you get leave to open the Chusan and Japanese examples in the British Museum? Also the Formosa one? I accept your view that *australis* is the Chinese slug very willingly, as it is virtually out of the question for it to be a native of the Sandwich Isles, and nothing is more natural than it should have been introduced from China."—T. D. A. Cockerell.

PROCEEDINGS OF THE MIDLAND MALACOLOGICAL SOCIETY.

15TH (ANNUAL) MEETING, DECEMBER 8TH, 1899.

The President in the chair.

New member elected:—Mr. H. Overton.

The Annual Report of the Council and the Treasurer's Statement were read and adopted.

The Secretary reported that as no amendments had been received to the Council's nominations, the following would constitute the Council and Officers for 1900:—

President—Walter E. Collinge.

Treasurer—H. Howard Bloomer.

Secretary—Guy Breeden.

Other Members of Council—Messrs. H. Willoughby Ellis, F. J. Partridge, Bromley Peebles, and G. Sherriff Tye.

The President's Address was postponed until the February meeting.

Exhibits.

By the President: Specimens of *Onchidium tumidium*, Semp., and *Onchidina australis*, Semp., from Queensland, *Onchidiella reticulatum*, Semp., and *Onchidium dameli*, Semp., from Sydney, also *Onchidium ambiguum*, Semp., from Ponape.

By Mr. Bloomer: Shells of Indian and South Tasmanian species of *Cassis*.

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1 Bull. Soc. Philom. Paris, 1897 (8), ix., p. 91.

2 Proc. Malac. Soc. Lond., 1896, ii., p. 15.

ANNUAL REPORT, 1899.

Your Council in presenting their Second Annual Report have to record a year's work of an exceedingly satisfactory character, and note with pleasure the continued steady progress of the Society.

During 1899 seven new ordinary and two honorary members have been elected. Your Council regret to have lost through continued ill-health an enthusiastic member, Mr. F. W. Carpenter.

During the year eight meetings have been held, at which five papers have been read. The exhibits have been numerous, and often more than could be dealt with at a single meeting.

The financial condition of the Society remains satisfactory.

Additions to the Library include some fifty pamphlets by various authors, presented by Professor H. A. Pilsbry and the President. It is hoped that all members will present copies of their writings to the Society's Library.

Your thanks are due to the President and Council of Mason University College and to Professor T. W. Bridge, for the facilities they have so kindly given in permitting our meetings to be held in the Zoological Department of the College.

CURRENT LITERATURE.

Pilsbry, H. A.—Tryon's Manual of Conchology, ser. ii. vol. xii (pt. 48). pp. 178—258, pl. xlvii—lxiv.

After completing his survey of the genus *Liguus*, Dr. Pilsbry deals with the genus *Orthalicus*, and proposes (p. 192) *Metorthalicus* as a new sub-genus for *O. fraseri* and others. He then passes to the *Amphibulimince*, in which he admits as genera *Simpulopsis*, *Gœotis*, *Peltella* and *Amphibulima*. *Bulimulopsis* is proposed (p. 220) to replace *Eudioptus*, Albers non Hübner, as a sub-genus of *Simpulopsis*.

The following are described as new species: *Simpulopsis tryoni*, Brazil (p. 218); *Gœotis malleata*, Porto Rico (p. 230); *Amphibulima browni*, Dominica (p. 239).

This part concludes the study of the American *Bulimulidæ*, except a few toothed genera (e.g. *Odontostomus*) which, with the Australian and Oriental *Bulimulidæ*, are to be dealt with in the next volume.—E. R. SYKES.

Clarke, J. M.—The Naples Fauna (Fauna with *Manticoceras intumescens*) in Western New York. 16th Ann. Rpt. N.Y. State Geologist, 1898, pp. 31—165, pls. i—ix.

The Naples Fauna is the fauna which in the western part of the State of New York is associated with the Cephalopod *Goniatites intumescens*, Beyrich, a species usually regarded as characterizing a zone at the lower part of the Upper Devonian. According to the author this fauna presents affinities to the developments of the same zone as found in "Devon, Belgium, the Rhine, the Hartz, and on the west and east slopes of the Urals. In none of these, however, are its individual, specific and generic features so fully reproduced as in the association described by Holzapfel as occurring at Martenberg, near Adorf, in Westphalia."

This fauna occurs in the typical section of the formation known as the Portage Group, but as it differs considerably from the contemporaneous faunas of adjacent regions the author calls it the 'Naples Fauna,' and not the 'Portage Fauna,' a term which would include the fauna of the Portage sediments wherever found. The fauna, however, makes its first appearance in the Styliola limestone, which is found near the middle of the Genesee slates occurring immediately below the Portage group.

The portion of the fauna described in the present work includes the Goniatites, and the genera *Bactrites* and *Clymenia*, and in its description "an effort is made to elucidate the actual values of species of given or allied genera in a single fauna, and to express these values in terms of one another. . . . The purpose throughout has been less to seek phylogenic clues than to present ontogenic values." In each genus, therefore, the author describes very fully all the stages—embryonic, neplonic, neanic, ephebic and gerontic—of a typical species, and then compares the rest of *the species of the genus with that species.*

The Goniatites belong to the families *Primordialidæ*, *Prolecanitidæ*, and *Magnovillaridæ* of Hyatt. The greater number belong to the *Primordialidæ* and are referred to one genus for which the author uses Hyatt's name *Manticoceras*, and maintains that *Goniatites intumescens* must be regarded as its typical species. The name *Gephyroceras* is restricted to the discoidal, widely-umbilicated forms with a rounded periphery which Hyatt placed in that genus; but in his revision of the Nautiloids and Ammonoids that appears in the English translation of Zittel's Text Book of Palaeontology we notice that Prof. Hyatt retains both *Manticoceras* and *Gephyroceras*, and that the figured example of *intumescens* is referred to the genus *Gephyroceras;* doubtless, however, that author will discuss these genera very fully in his forthcoming Monograph on Fossil Cephalopods. *Manticoceras pattersoni* being regarded as the "normal expression of the specific type" all its stages of growth are described in great detail, and the other species—mostly new—of the same genus are then compared with it. Some new species of *Gephyroceras*, as restricted by the author, are also described. The *Prolecanitidæ* are represented by the genera *Beloceras*, *Sandbergeroceras* and a new genus *Probeloceras*, the type-species of which is *Goniatites luther*i, Clarke. The forms belonging to the *Magnovillaridæ* are referred to the genus *Tornoceras*, the type-species of which the author considers to be Conrad's *Goniatites uniangularis*. While some authors have united Hyatt's genera *Tornoceras* and *Parodiceras*, Prof. Clarke considers them to be distinct. *Tornoceras uniangulare* is described in great detail, the author's observations confirming Beecher's admirable account of the early stages of this species.

The *Bactritidæ* include the genus *Bactrites;* the early stages of this genus were described by the author in 1894, but they are somewhat more fully described in the present work. We note also that the protoconch, which the author had previously described as belonging to the genus *Orthoceras*, is now somewhat doubtfully referred to that genus.

The *Clymeninæ* are represented by one species belonging to the section of *Clymenia* for which Gümbel proposed the name *Cyrtoclymenia.*

We fully agree with the author's opinion that the Ammonoids of the Naples beds actually lived and died in these sediments, whilst the fauna of the Styliola limestone was transported from an adjoining province not yet known to us.

In conclusion, the author is to be heartily congratulated on his very careful description of this fauna which is so admirably illustrated on the nine lithographic plates accompanying the work.—GEO. C. CRICK.

Clarke, J. M.—Notes on the early stages of certain Goniatites. Ibid., pp. 165–169, figs.

The author first describes "Some Points in the Development of *Anarcestes plebeiformis*, Hall, sp.," a rare and hitherto imperfectly known species found only at a single locality, Cox's Falls, near Charey Valley, N.Y., in a thin layer of limestone belonging to the epoch of the Marcellus Shales (lowest Middle Devonian). The general form of the shell, the character of the whorls, and the shape of the septa show that the species is a typical *Anarcestes*. The inner whorls are very rarely preserved. "Some etchings of the rock, have however, offered solid barite replacements of the inner whorls," and upon these the author has based his observations. The protoconch is very large, transversely elongate or obtusely

fusiform in shape, and ornamented with distinct transverse lines almost to its distal surface. The transverse ornaments do not exhibit any trace of the hyponomic sinus, or backwardly directed curve in the centre of the periphery, until near the end of the third whorl. The nepionic shell is in contact with the protoconch, whereas in some species of *Anarcestes* that have been described the nepionic shell is free for about half a whorl. The author gives figures of the protoconch, and of the nepionic shell, and a drawing of the suture-line of the seventh volution, the precise form of the earliest suture-lines not having been made out. He concludes that the immense size of the protoconch when compared with that of other ammonoids indicates a closer approach to the stock whence the *Goniatitinæ* have been derived.

He then describes and figures the protoconch of the species which was first described by Vanuxem as *Goniatites expansus*, and afterwards by Hall as *Goniatites vanuxemi*, Vanuxem's name being pre-occupied. This species is a typical form of the genus which was named by Meek *Agoniatites* and by Mojsisovics *Aphyllites*. The protoconch, although large, is less than that of *Anarcestes plebeiformis;* it is "rather stoutly ellipsoidal, projecting a little at each side beyond the edge of the first whorl," and its "surface is finely and sharply striated horizontally from the distal extremity"; it is in complete contact with the nepionic whorl. In the example which the author has figured (on an enlarged scale) a portion of the striated test is broken away and shows the long and distinct scar of the siphonal cæcum.

Finally, the author figures a vertical section of the first three chambers of the Cretaceous species *Nautilus* (*Eutrephoceras*) *Dekayi*. Morton, showing the continuous but irregularly curved course of the "siphe."—Geo. C. Crick.

Kennard, A. S., and Woodward, B. B.—Notes on *Paludestrina jenkinsi* (Smith) and *P. confusa* (Frauenf.) Proc. Malac. Soc. Lond., 1899, vol. iii, pp. 297—300.

The authors have had specimens of *P. jenkinsi* compared with two shells in the Jeffreys' Collection labelled "*Hydrobia ferrusina*, Hampshire, Sowerby," with which they agree in every respect. *P. confusa*, Frauenf., for which a number of localities are given, was last collected by the writers in 1895, but owing to extensive building and draining operations, it no longer exists in any of these, and they conclude that it must now be considered extinct in England.—W. E. C.

Gude, G. K.—Armature of Helicoid Landshells. Sci. Goss., 1899, vol. vi, pp. 75—77, 147—149, 174—177. figs. 100—105, and map.

The species treated of are *P. caliginosa*, Sykes, *P. clathratula* v. *compressa*, Sykes, and *P. françoisi*, H. Fisch. A very useful synopsis of the genus is given, notes on the geographical distribution and a key to the species. This series of papers is brought to a termination and an index given to those previously published.—W. E. C.

Hedley, Charles.—The Mollusca of Funafuti. (Supplement.) Mem. Aust. Mus., 1899, vol. iii, pt. 9, pp. 549—565, figs. 59—80.

The author records in this appendix the mollusca obtained on the second and third expedition to the Atoll of Funafuti. In all 56 species are enumerated, of which 16 are new. A new genus (*Mecolinia*) of the *Lichidæ* is also described.—W. E. C.

Walker, Bryant.—The Terrestrial Mollusca of Michigan. 8vo., pp. 27, 1 map. Detroit, Mich.: 1899.

This is a very carefully prepared annotated catalogue and particular attention has been devoted to the authentication of the various species, of which 75 are enumerated. Since the issue of a similar catalogue in 1895, *Polygyra clausa*, Say, has been authenticated, while *Omphalina inornata*, Say, *Zonitoides limatulus*, Ward, and *Succinea aurea*, Lea, are shown to be doubtful or have been cited in

error, as well as the two following varieties: *Polygyra thyroides*, Say, v. *buccolenta*, Gld., *P. palliata*, Say, v. *alba*, Currier. The following six species and two varieties are additions to the fauna: *Strobilops affinis*, Pils., *Vitrea wheatleyi*, Bld., *Gastrodonta intertexta*, Binn., *G. demissa*, Binn., *Agriolimax agrestis*, L., *Polygyra albolabris*, Say, v. *minor*, Sterki, *Conulus fulvus*, Müll. v. *mortoni*, Jeffr., *C. chersinus* v. *polygyratus*, Pils.

Many interesting notes are given on the distribution.—W. E. C.

Suter, Henry.—Descriptions of a new Variety and five new species of New Zealand Land Mollusca. Proc. Malac. Soc. Lond., 1899, vol. iii, pp. 286—291, pl. xv.

Mr. Suter here describes and figures the following: *Endodonta (Charopa) otagoensis*, and *subinfecta*, *Flammulina (Pyrrha) virescens*, *F. (Phaeussa) fulminata*, Hutt., var. *costata*, *F. (P.) henryi* and *Paryphanta edwardi*. Figures of the terminal ducts of the generative organs of *F. virescens* and *F. henryi* are given in addition to figures of the shells, jaw, and radula.—W. E. C.

Suter, Henry.—Anatomical notes on *Medyla inculpta* (Pfr.). Ibid., pp. 530—532, figs. i—iv.

From an examination of the generative organs, jaw and radula of this species, the author finds that it is closely related to *Sitala anthropophagorum*, and is of opinion that its proper place is in the genus *Medyla*, Albers, sect. *Euplecta*, Semper.—W. E. C.

Suter, Henry.—New Zealand *Polyplacophora*: Keys to Genera and Species. Trans. N.Z. Inst., 1899, vol. xxxi, pp. 59—64.

Suter, Henry.—Revision of the New Zealand *Pleurotomidæ*, with descriptions of Six new Species. Ibid., pp. 64—77, pl. iii.

Mr. Suter's synopsis of the New Zealand Polyplacophora will prove very useful, as also his revised classification of the New Zealand *Pleurotomidæ*. This latter, being based entirely upon the characters of the shells, is, as the author states, open to amendment. Twenty-six species are enumerated, of which the following are new: *Sureula verrucosa*, *Mangilia subaustralis*, *M. flexicostata*, *Clathurella subabnormis*, *C. nodicincta*, and *Daphnella substriata*. Figures are given of the new species. *In all cases the location of the type is given* and the reference to the original description and figures.—W. E. C.

Harris, G. D.—The Lignitic Stage. Pt. ii. Scaphopoda, Gastropoda, Pteropoda, and Cephalopoda. Bull. Amer. Paleont., Ithaca, N.Y., 1899, pp. 1—128, pls. 1—12.

This paper fully maintains the high standard set up in part I. Twenty-seven new species and five new varieties are described and figured, and many valuable critical notes are given on the various species dealt with. Not a few palæontologists will differ from the author in uniting *Athleta tuomeyi*, Conrad, with *Volutilithes petrosus*, Conrad: even supposing there are not sufficient characters of importance to warrant sub-generic distinction, the specific characters are very pronounced, on the other hand *Syrnola insignifica*, Ald., is very rightly regarded as synonymous with *S. trapaquara*, Har., which species seems very different from Cossmann's *propeacicula*.

Of the new species, *Lorifusus indentus* is an interesting form somewhat approaching forms of *L. pagoda*, Heip., but very properly separated from that species. No doubt future work will bring to light other forms of this new species which will, we think, further separate it from *L. pagoda*, and clearly mark it off from any of the many varieties of *Fulgur spiniger*.

Not the least valuable part of Mr. Harris' work is to be found in the careful reproduction of the original descriptions of the various species enumerated.—W. E. C.

GENERAL REVIEWS.

A Manual of Zoology.—By the late T. Jeffery Parker and William A. Haswell. 8 vo., pp. xvi + 550, and 300 figs. London: 1899, Macmillan & Co., Ltd.

This manual forms an admirable introduction to zoology for a class of students who deserve something more than the modern cram book. Owing to the restrictions of space many "groups of rare occurrence and uncertain relationships" have been wisely omitted and greater space devoted to the more familar forms. In cases of this kind it is always difficult to decide just what to omit and what not, and the authors here seem to have been very happy in their selection. The Brachiopoda might perhaps have received a little more attention.

We note with pleasure that in the author's opinion laboratory and museum work should be supplemented by work in the field and on the seashore.

The types are all well chosen and excellently illustrated, particularly the Coelenterata. Amongst so many modern illustrations it seems a pity to include such figures as fig. 170 (a proglottis of *Taenia*), and fig. 81 (Starfish, vertical section of an arm).

Chapter xi dealing with the Mollusca is well written, and there are some very useful figures illustrating the anatomy of the Cephalopoda.

We heartily welcome this work, which must prove of great value to junior students.—W.E.C.

Statistical Methods with special reference to Biological Variation.—By C. B. Davenport. 16 mo., pp. vii + 148, and 28 figs. New York: 1899, John Wiley & Sons.

This work is intended for those who are interested in the quantitative study of species and of organic variation, and must prove very useful to all biologists engaged in such work. It is clearly and concisely written and remarkably free from errors. The method of using the various tables is carefully explained and fully illustrated. All who are interested in the methods elaborated by Galton and Pearson will welcome Dr. Davenport's handbook.—W.E.C.

EDITOR'S NOTES.

It is with feelings of great pleasure that we have to record the receipt of 50 francs from a "French malacologist" towards the deficit on the Journal during 1899. We take this, our only means, of tendering our sincere thanks to the donor for his generous gift and good wishes.

We cannot refrain from quoting a short paragraph from the letter accompanying the above donation "If," says the writer, "English students of the Mollusca were less shell-collectors and more malacologists your journal would have a balance not a deficit."

We regret to have to record the deaths of Edgar Leopold Layard on January 1st, 1900, in his seventy-fifth year, and G. Sherriff Tye on February 4th, 1900. A portrait and notice of the latter will appear in our next number.

We have received from Mr. H. B. Preston his price lists of South African Marine and Land and Freshwater Shells, also Australian L. and F. Shells. Mr. Walter F. Webb (Albion, N.Y., U.S.A.) sends us a very useful and carefully prepared priced check-list of Land Shells of the United States and Canada.

THE

JOURNAL OF MALACOLOGY.

No. 6. JUNE 1ST, 1900. VOL. VII.

DESCRIPTION OF A NEW SPECIES OF ANADENUS FROM CHINA.

BY WALTER E. COLLINGE,

Mason University College, Birmingham.

(Plate vi.)

SOME short time ago M. Ph. Dautzenberg very kindly sent me four examples of a species of slug, collected at Qua Toun, Fo Kien, China, which on examination I find belong to the genus *Anadenus*, Heyn. There are two immature specimens and two which appear to be adult. It is interesting to find that this genus is distributed much further eastward than was generally supposed[1]. Last year I described[2] a very handsome species from Sechuen, and Dr. Möllendorff[3] has more recently described another species from the same province[4].

To M. Dautzenberg I wish to express my best thanks for these interesting molluscs, with which I have much pleasure in associating his name, and to the Council of the Birmingham Natural History and Philosophical Society for defraying the artist's charges.

1 Cockerell, Proc. Zool. Soc., 1891, p. 221.

2 Journ. of Malac., 1899, vol. vii, p. 78.

3 Ann. Mus. Zool. l'Acad. Imp. d. Sci. St. Petersb., 1899, p. 4.

4 Dr. Möllendorff wrote me expressing the opinion that possibly his species (*A. sinensis*) might be identical with the one I described, viz., *A. sechuenensis*. Since the above was written he has very kindly favoured me with an opportunity of examining the type of *A. sinensis*, and from an external examination I am of opinion that it is a distinct species.

Anadenus dautzenbergi, n. sp. Pl. vi., figs. 1—8.

Animal (Pl. vi, figs. 1—3) yellowish-grey, with a yellowish-brown dorsum, which is bounded laterally by a dark line, with short, lateral branches. Head yellowish. Mantle almost circular, reddish-brown, with irregular, brownish-black mottling. Respiratory orifice slightly behind the middle of the mantle. Generative orifice below, and some little distance behind, the right lower tentacle. Rugæ small, irregular in outline, in somewhat diamond shaped groups, divided by deep black sulci. Peripodial groove small but distinct. Foot-fringe same colour as the body, excepting in the tail region, where it is similar to the ground colour of the mantle; lineoles nearly black. Foot-sole shows ill defined median and lateral planes, of a brownish-yellow colour, median plane faintly marked by transverse wrinkles.

Length (in alcohol) 37·5 mm.; length of mantle 14·5 mm.; breadth of foot-sole 11·5 mm.

Shell (Pl. vi, figs. 4a, 4b), almost circular, thick, convex above, concave below, apical portion well defined, faint excentric lines of growth. Ventrally there is a thick, lip-like infolding.

Maj. diam. 5 mm., min. diam. 4·9 mm.

Hab.—Qua Toun, mountains (3,500 ft.) due S.E., Fo Kien, China. *Type* in my collection.

ANATOMY.

The Jaw (Pl. vi, fig. 5) is arcuate and consists of twenty-one, partly unequal, separate, vertical lamellæ, each bearing closely set transverse striæ. In *A. altivagus*, Theob., and *A. sechuenensis*, Cllge., the vertical lamellæ average ten in number, and they are about twice the breadth of those in this species.

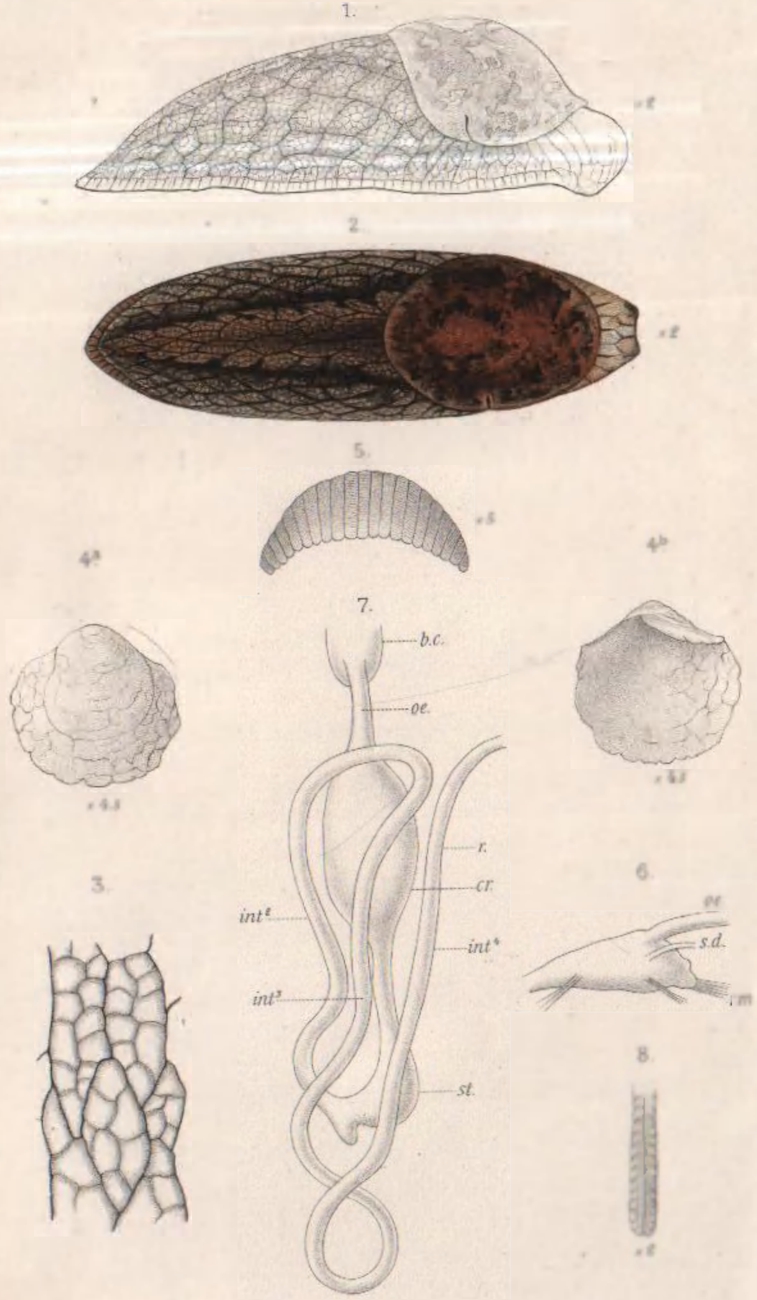
The Radula agrees very closely with that figured by Pilsbry[1] for *A. altivagus*, excepting that here the mesocones are shorter and blunter.

The Alimentary System (Pl. vi, figs. 6, 7).—This is much simpler than in either *A. altivagus*, Theob., or *A. sechuenensis*, Cllge. It reminds one somewhat of the condition which is found in the American genus *Anadenulus*, Ckll.,[2] which seems to form an intermediate stage between *Anadenus*, Heyn., and *Prophysaon*, Bld. and Binn. (cf. Pilsbry, *op. cit.* pl. xi, figs. 32, 35).

The buccal cavity is slightly produced backwards, and measures 9·5 mm. in length, from the dorsal side there is a short œsophagus

1 Proc. Malac. Soc. Lond., 1898, vol. iii, p. 96, pl. viii, fig. 2.

2 Proc. Acad. Nat. Sci. Phila., 1898, p. 254.



J. Partridge del. ad nat.

Lith Werner & Winter, Frankfurt a/M

ANADENUS DAUTZENBERGI

leading into a short, wide crop, which, with the narrow tube-like portion immediately beyond, forms the first loop of the intestinal tract. Posterior to this is the bilobed stomach which is situated on the right side of the "liver." The second loop of the intestine passes to the left side, slightly ventrally, and proceeding forwards makes a turn to the right, at the anterior end of the crop; passing backwards again on the left side, as loop number three, it becomes sharply folded upon itself, forming loop four, which, as the rectum, leads to the anus.

It will be noticed that loops 3, 4 and 5 all lie dorsally to the crop and stomach, excepting the sharp folded portion at the junction of loops 3 and 4.

Pedal Gland (Pl. vi, fig. 8).—This is a small lobulated organ, 10 mm. in length. The figure sufficiently explains the general appearance.

The Generative Organs.—Owing to some unknown cause these were not in a fit condition either to dissect or figure, the different parts broke away as lifted by the forceps, or even when moved with a needle. The penis and free oviduct were in a slightly better condition but still unsatisfactory. Had I been able to figure and describe the whole of the generative system, I expect they would have shown some striking differences from those in the two above mentioned species of *Anadenus*. If this had been so, I should not have hesitated to place *A. dautzenbergi* in either a new genus or subgenus. In quite a number of characters it differs considerably from *Anadenus*, as at present known, particularly in the form and disposition of the alimentary canal, the shell, jaw, and pedal gland.

EXPLANATION OF PLATE VI.

Anadenus dautzenbergi, n. sp.

Fig. 1. View from the right side. ×2.
Fig. 2. Dorsal view. ×2.
Fig. 3. Rugæ enlarged.
Fig. 4. Shell. *a* Viewed from above, *b*. Viewed from below. ×4·5.
Fig. 5. Jaw. ×8.
Fig. 6. Lateral view of the buccal cavity.
Fig. 7. Alimentary Canal.
Fig. 8. Pedal Gland. ×2.

REFERENCE LETTERS.

b.c.	Buccal cavity.	*r.*	Rectum.
cr.	Crop.	*r.m.*	Retractor muscle
int. 1-4.	Intestine.	*s.d.*	Duct of salivary gland.
oe.	Œsophagus.	*st.*	Stomach.

ON SOME MALFORMED SPECIMENS OF ANODONTA CYGNEA, L.

By H. H. BLOOMER.

(Plate vii.)

In the number of cases recording malformations of the shells of the *Unionidæ*, I have been unable to trace any account of the effect, if any, these have had upon the soft parts of the animal. It may, therefore, be of interest to give the results of the examination of three specimens of *Anodonta cygnea*, collected by Mr. S. P. Bolton from Bracebridge Pool, Sutton Coldfield.

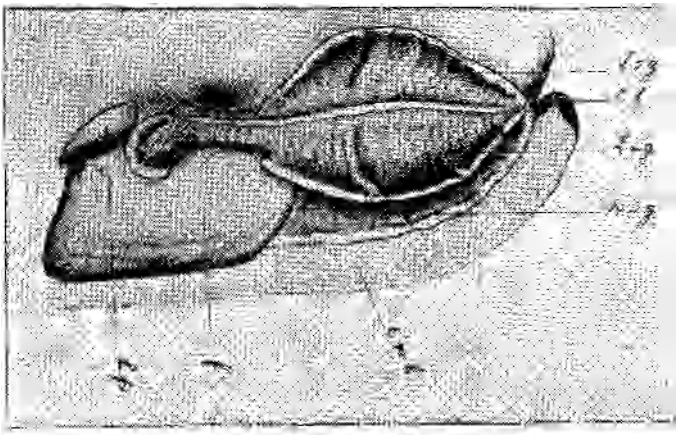
For convenience sake these specimens will be referred to as A, B, and C, respectively. Specimen A was collected in February last. The left valve (Pl. vii, fig. A1.) of the shell shows the scars of two fractures. The first commencing below the umbo, proceeds in a transverse direction, but is only of a slight nature; the second, which is nearly in the centre of the valve, is situated posterior to the first one, and pursues a course converging upon it. It was from this second fracture, which not only destroyed a portion of the shell, but also lacerated the left mantle-lobe, that the malformation arose. Evidently the tendency of the mantle-lobe was then to form the valve in a semicircular direction, while the posterior portion followed a normal course. This apparent attempt to maintain a continuous growth in two gradually diverging directions, resulted in the overlapping or folding of the two adjacent parts of the valve. This folding continued, and in all probability eventually caused the posterior portion of the mantle-lobe to turn inwards, by which means a curious in-growth of the shell was formed (Pl. vii, fig. A2.). The mantle-lobe when examined covered the whole of the inner side of the valve and was much thicker near the line of fracture. There was also a lateral process of the mantle, arising from the outer side, which filled the anterior part of the cavity produced by the overlapping mentioned above.

The right valve also shows an abnormal growth, with a slight inclination to follow a similar course, but does not exhibit any sign of having been fractured.

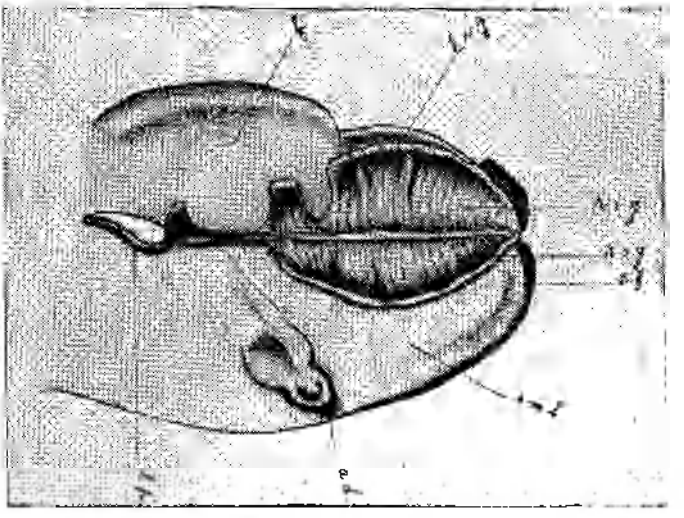
In addition to the laceration of the mantle-lobe, which the animal was able to renew, the left pair of gills were permanently injured (fig. 1). The inhalent and exhalent canals are somewhat constricted

along these injured portions, otherwise the remaining parts of the viscera are normal.

1.



2.



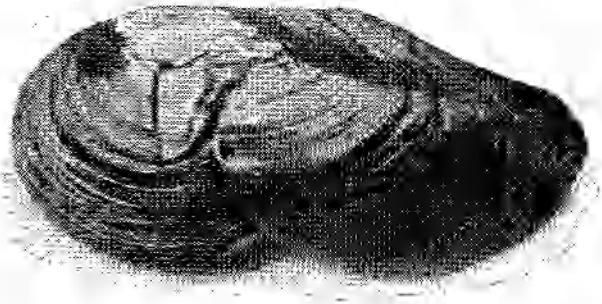
Anodonta cygnea, L.

Fig. 1.—View of part of the animal of specimen A.

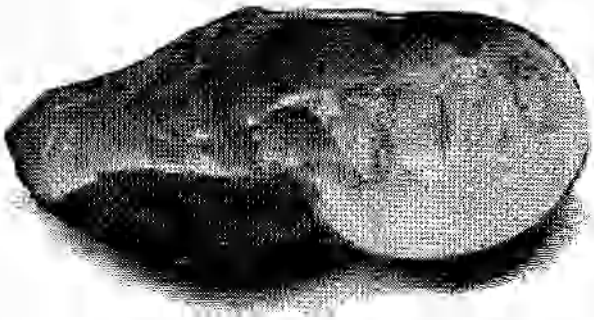
Fig. 2.—View of part of the animal of specimen B.

a. d. thickened growth and tentacular fringe of mantle-lobe. f. foot. l. i. g. left inner gill. l. o. g. left outer gill. l. p. labial palp. r. m. l. right mantle-lobe. r. i. g. right inner gill. t. f. tentacular fringe.

A1.



A2.



B1.

B2.

ANODONTA CYGNEA. L.

Specimen B was collected in March and exhibits only a slight indentation across nearly the whole of both valves. Both of the gills on the right side are deformed, and the outer gill of the left side (fig. 2). The mantle-lobes are complete, but the left one shows a thickened growth on the inner side. Commencing near the median line and close to the base of the gills, it continues in a slightly postero-ventral direction towards the edge; as it proceeds it narrows and increases in thickness until near its termination, where it becomes circular, is deeply pigmented, and has a well developed tentacular fringe, differing only in size from that bordering the inhalent aperture of the branchial chamber (fig. 2. *a. d.*).

Specimen C (Pl. vii, figs. B1, B2) was collected about three years ago. Though not exhibiting any signs of fracture it is a very deformed shell, and when viewed from the end the valves are seen to be greatly contorted. The left valve is deeply indentated, but the lines of growth are normal. The right valve shows a transverse malformation and externally has two parts with semicircular lines of growth, which later have assumed a normal course, while on the inside there are two inverted cup-like growths.

The contorted form of the shell has given rise to great deformity in the animal; thus the larger portion of the viscera was in the anterior portion of the left valve, which gave rise to a displacement of the pericardium, heart, and rectum. The outer gills of both sides were deformed, and the foot was enlarged and forced into a more anterior position than is usual. The left mantle-lobe was penetrated by the shell.

The results of the examination of these three interesting specimens tend to point to the following facts:

a. that the animal is able to repair even extensive damage to the mantle-lobes, but is not able to make good injuries to the gills.

b. the gills are the first organs to be affected.

c. the animal is capable of living and thriving with very much aborted respiratory organs, and with considerable displacement of the various internal organs.

EXPLANATION OF PLATE VII.

Anodonta cygnea, L.

Fig. A1. Left valve of shell of specimen A.
Fig. A2. Inner side of same.
Fig. B1. Right valve of specimen C.
Fig. B2. Left valve of same.
All the figures are reduced one third.

NOTES ON THE GENUS SESARA, ALB., WITH DESCRIPTIONS OF TWO NEW FORMS.

By G. K. GUDE, F.Z.S.,

London.

Sesara harmeri, n. sp. Figs. 1, 2.

Shell subperforate, conical, thin, pellucid, pale corneous, finely striulate, decussated by microscopic spiral lines. Spire conoidal; suture linear, margined; apex obtuse. Whorls 7, increasing slowly, slightly convex, with an acute, compressed keel; the last whorl descending very shortly in front; base flattened, a little tumid towards the umbilicus. Aperture oblique, trapezoid. Peristome white, margins distant; right margin a little expanded; basal margin slightly thickened, horizontal; columellar margin shortly reflected over the narrow perforation of the umbilicus. Within the aperture are two teeth, one on the columellar margin, conical; the other on the basal margin, curved, triangular, its apex *curved towards the umbilicus.*

Diam. maj. 6·75, min. 6·25, alt. 5 mm. Eight specimens.

Hab.—Khasi Hills, Assam. *Type* in my collection.

1. 2. 3. 4.

Figs. 1 and 2.—*Sesara harmeri*, n. sp.

Figs. 3 and 4.—*Sesara diplodon*, Benson.

From *Sesara diplodon*, its nearest ally, this new species differs in the more elevated spire, the more flattened base, and the narrower perforation of the umbilicus. In *S. diplodon* the base near the mouth slopes more decidedly towards the umbilicus, and the elongated scrobiculation behind the mouth, so conspicuous in that species, is absent in *S. harmeri*. The basal tooth, moreover, is simple, while in *S. diplodon* it is double and sinuate, the anterior tooth in *S. diplodon*

has the apex *curved towards the periphery*, and the posterior one *towards the umbilicus*; the basal margin instead of being horizontal as in *S. harmeri*, descends obliquely and forms an obtuse angle with the columellar margin. *S. harmeri* is further separated from *S. diplodon* in having the keel more acute and compressed: and finally the last whorl of the latter shell is not deflected in front.

S. diplodon (figs 3, 4) was described by Benson in 1859[1]. As the double nature of the tooth on the basal margin is *not* mentioned in the original description, I was at first uncertain which of the two forms to refer to Benson's species. Mr. Harmer, however, obligingly forwarded to me for inspection the three type specimens from the Cambridge Museum of Zoology, and although these are not mature—a trace of a tooth, being shown only by one specimen—the distinctive character of the base of the shell leaves no doubt that the form with the double basal tooth is Benson's species. That the difference in the character of the teeth of the two species, and the scrobiculation of *S. diplodon*, are not dependent on age is amply demonstrated by my examination of immature specimens of both in my collection.

Twelve specimens of *S. diplodon*, together with the new species, were received from a native collector, these former measure:

Diam. 8·5, alt. 6 mm. Diam. 7, alt. 5 mm. Diam. 6, alt. 4·5 mm.

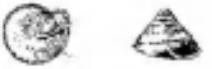
S. diplodon is known to be of fairly wide distribution. Mr. Nevill[2] having recorded the following habitats: Preparis Island, Little Cocos Island, Thyet Myo, Ponsee and Bhamo, Arakan Hills, Naga Hills, Sylhet, Chittagong, Khasi Hills, Dafla Hills.

Sesara harmeri v. **anodonta**, n. var. Figs. 5, 6.

In this variety, which to some extent connects the two forementioned species, the spiral lines are more distinct, and the base broader than in the type. There are no teeth in the aperture.

Diam. maj. 8·5, minor 7·75, alt. 6 mm. One specimen.

Hab.—That of the type.



5. 6.

Figs. 5 and 6.—*Sesara harmeri* v. *anodonta*, n. var.

As the species and varieties of *Sesara* have not hitherto been

1 Ann. and Mag. N. H., 1859 (ser. 3), vol. iii, p. 182.

2 Hand-List Moll. Ind. Mus. Calcutta, 1878, i, p. 53.

arranged, it has occurred to me that a synopsis, with bibliographical references, may be useful; and for convenient identification I have added a key.

1.—*S. episema*, Pons., Proc. Mal. Soc, 1894, i, p. 56, *cum icon.* Khasi Hills.

2.—*S. infrendens*, Gould, Journ. N. H. Soc., Boston, 1844, iv, p. 453, pl. 24, f. 6.—Pfeiffer, Mon. Helic., 1848, i, p. 152.—Reeve, Conch. Icon., 1852, pl. 128, f. 770.—Conch. Ind., 1870, pl. 15, f. 2.—Stoliczka, Journ. Asiat. Soc., Bengal, 1871, xl, p. 244.—Conch. Cab., (2), ii, p. 187, t. 99, figs. 1—3.—Tryon, Man. Conch., 1889 (2), ii, p. 132, pl. 43, figs. 39—41. Tavoy.

3.—*S. infrendens* var *capessens*, Bens., Ann. and Mag. N. H., 1856 (2), xviii, p. 250.—Pfeiffer, Mon. Helic., 1859, iv, p. 194.—Novit. Conch., 1860, i, p. 133, t. 36, f. 17—20.—Conch. Ind., 1870, pl. 60, f. 5.—Tryon, Man. Conch., 1886, (2), ii, p. 132, pl. 44, figs. 58—60. Moulmain.

4.—*S. infrendens* var. *tickelli*, Theobald, Journ. Asiat. Soc., Bengal, 1859, xxviii. p. 306.—Pfeiffer, Mon. Helic., 1868, v, p. 267.—Conch. Ind., 1870, pl. 15, f. 3.—Tryon, Man. Conch., 1886 (2), ii, p. 132, pl. 44, f. 51. Moulmain.

5.—*S. pylaica*, Bens., Ann. and Mag. N. H., 1856 (2), xviii, p. 249.—Pfeiffer, Mon. Helic., 1859, iv, p. 164.—Conch. Ind., 1870, pl. 15, f. 2.—Stol., Journ. Asiat. Soc., Bengal, 1871, xl, p, 245.—Tryon, Man. Conch., 1886 (2), ii, p. 132, pl. 43, f. 44. Moulmain.

6.—*S. ataranensis*, Theob., Jour. Asiat. Soc., Bengal, 1870, xxxix, p. 401, pl. 18, f. 7.—Conch. Ind., 1872, pl. 84, figs. 5, 6.—Pfeiffer, Mon. Helic., 1876, vii, p. 578.—Tryon, Man. Conch., 1886 (2), ii, p. 132, pl. 44, figs. 54, 55. Ataran Valley, Prov. Martaban.

7.—*S. hungerfordiana*, Theob., Journ. Asiat. Soc., Bengal, 1876, xlv, p, 184, pl. 14. f. 1.—Tryon, Man. Conch., 1886 (2), ii, p. 133, pl. 44, figs. 63, 64. Salween Valley, Prov. Martaban.

8.—*S. inermis*, Theob., Journ. Asiat. Soc., Bengal, 1876, xlv, p. 184, pl. 14, figs. 2.—Tryon, Man. Conch., 1886 (2), ii, p. 133, pl. 44, figs. 56, 57. Moulmain.

9.—*S. ingrami*, W. T. Blanf., Conch. Ind., 1870, pl. 60, figs. 9, 10.—Journ. Asiat. Soc.. Bengal, 1880, xlix, p. 193.—Tryon, Man. Conch., 1887 (2), iii, p. 69, pl. 13, figs. 62, 63. Pegu.

10.—*S. diplodon*, Bens., Ann. and Mag. N. H., 1859 (3), iii, p. 187.—Pfeiffer, Mon. Helic., 1868, v, p. 256.—Conch. Ind., 1870, pl. 60, f. 8.—Tryon, Man. Conch., 1887 (2), iii, p. 69, pl. 13, f. 61.—Morlet, Journ. de Conchyl., 1891, p. 232. *Supra* p. 139, figs. 3, 4. Preparis Island; Little Cocos Island; Thyet Myo; Ponsee and Bhamo; Arakan Hills; Naga Hills; Sythet; Chittagong; Dafla Hills; Teria Ghat; Khasi Hills; Mount Soutem, West Laos.

11.—*S. harmeri*, *supra* p. 139, figs. 1, 2. Khasi Hills.

12.—*S. harmeri* var. *anodonta*, *supra* p. 140, figs. 5, 6.

13.—*S. galea*, Bens., Ann. and Mag. N. H., 1859 (3), iii, p. 388.—Pfeiffer, Mon. Helic., 1868, v, p. 264.—Conch. Ind., 1870, pl. 54, f. 7.—Tryon, Man. Conch., 1887 (2), iii, p. 75, pl. 14, f. 4. Teria Ghat, Khasi Hills; Naga Hills.

14.—*S. bidenticulata*, Bens., Ann. and Mag. N. H, 1852 (2), ix. p. 405.—Pfeiffer, Mon. Helic., 1853, iii, p. 165.—Reeve, Conch. Icon., 1853, pl. 174, f. 1184.—Conch. Ind., 1870, pl. 60, f. 6.—Tryon, Man. Conch., 1887 (2), iii, p. 69, pl. 13, f. 59. Nilgherries.

15.—*S. pirrieana*, Pfeiffer, Proc. Zool. Soc., 1854, p. 55.—Reeve, Conch. Icon., 1854, pl. 191, f. 1341.—Pfeiffer, Mon. Helic., 1859, iv, p. 154.—Conch. Ind., 1872, pl. 87, figs. 5, 6.—Tryon, Man. Conch., 1887 (2), iii, p. 68, pl. 13, f. 58. Walaghat, Koondah Mountains, near Calicut.

16.—*S. daghoba*, W. T. Blanf., Journ. Asiat. Soc., Bengal, 1861, xxx, p. 356, pl. 2, f. 2.—Pfeiffer, Mon. Helic., 1868, v, p. 219.—Conch. Ind., 1875, pl. 150, f. 10.—Tryon, Man. Conch., 1887 (2) iii, p. 69, pl. 13, f. 60. Patchamullies and Kalryenmullies Mountains, India.

Key to Species and Varieties.

A. Aperture without palatal teeth.
  a. With one transverse parietal plate. *pylaica.*
  b. Without parietal plate.
    α. Shell depressed; diam. 11·5, alt. 4·75 mm. *inermis.*
    β. Shell conoid; last whorl deflexed in front; diam. 8·5, alt. 7·75 mm. *anodonta.*
    γ. Shell conoid; last whorl not deflexed in front; diam. 9, alt. 5·5 mm. *galea.*

B. Aperture with *one* conical palatal tooth on basal margin. *episema.*

C. Aperture with *two* palatal teeth.

a. Teeth deeply seated: outer conical transverse, inner horse-shoe-shaped. *alaranensis.*

b. Teeth on peristome,

α. One on basal, one on columellar margin.

*Basal margin horizontal; base of shell flattened. *harmeri.*

**Basal margin descending, rounded; base of shell convex. *pirrieana.*

β. Both teeth on basal margin.

*Shell 6 mm. diam. *daghoba.*

**Shell 3 mm. diam. *bidenticulata.*

D. Aperture with *three* palatal teeth; one on columellar margin, two on basal margin.

a. Teeth conical in a transverse row.

α. All on peristome.

*Two on basal margin close together. *infrendens.*

**Two on basal margin almost united. *tickelli.*

***Three teeth sub-equal, equidistant. *capessens.*

β. Inner tooth on peristome horizontal; outer two a little more deeply seated; middle one oblique, outer transverse. *hungerfordiana.*

b. Two teeth on basal margin behind one another.

α. Both horizontal. *diplodon.*

β. Anterior tooth horizontal, posterior one transverse. *ingrami.*

DESCRIPTION OF A NEW VARIETY OF ISOMERIA SUBCASTANEA, PFR.

By G. K. GUDE, F.Z.S.

Isomeria subcastanea v. **kobeltiana**, n. var. Figs. 1, 2.

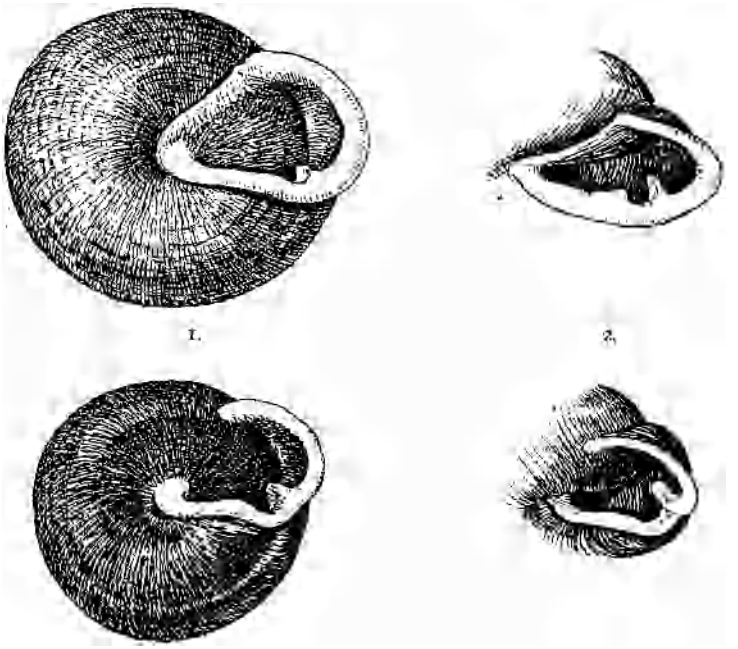
Differs from the type in being larger and of lighter colour; the whorls are less convex above, and the last is not inflated below, behind the peristome; the base is less distinctly ribbed; the greater portion of the lower surface and a narrow zone above the periphery, are distinctly malleated in concentric rings, a character totally absent in the type. The principal differences, however, lie in the peristome and its teeth; in the variety the peristome is strongly thickened and broadly expanded, its basal margin is flattened, and its columellar margin, which is almost straight, completely covers the umbilicus; these margins are subparallel and are united by a thick white callus on the parietal wall. The outer tooth is not raised and there is only one slight depression behind the peristome, corresponding to the outer tooth; to the left there is also a strong tooth sloping gently towards the columellar margin. In the type, on the other hand, the peristome is less thickened and expanded but more reflexed; the basal margin is deeply sinuous, the columellar margin convex at first, then concave, and only partially reflected over the umbilicus; there is only one tooth which is raised on an eminence, with a corresponding scrobiculation behind the peristome; there is no second tooth to the left, but there is a depression in its place behind the peristome. A narrow milky band proceeds from the scrobiculation below the periphery, and gradually loses itself.

Measurements of the variety *kobeltiana*: Diam. maj. 47, min. 41, alt. 23 mm.

Hab.—Ecuador.

Isomeria subcastanea was originally described by Broderip as

Carocolla globosa.[1] The specific name having already been employed by Sowerby for a fossil species of *Helix*,[2] Pfeiffer substituted the name *subcastanea*[3] for it. On grounds of strict priority, Broderip's name has precedence, *globosa* not having been employed previously in the genus *Isomeria*, but I do not think it advisable to consign so well-known a name as *subcastanea* to the limbo of synonymy.



1. 2.

3. 4.

Figs. 1 and 2.—*Isomeria subcastanea* v. *kobeltiana*, n. var.
Figs. 3 and 4.—*Isomeria subcastanea*, type.

For comparison of the variety with the type, I give illustrations of one of several specimens of *I. subcastanea* from Paramba, Ecuador (3500 ft.), received from Mr. Rosenberg (Figs. 3, 4). These specimens agree with the type shells which are in the British Museum. The one figured measures diam. maj. 39, min. 34·5, alt. 20 mm. The largest of the type specimens in the Museum measures 43 mm. in diameter; but I have seen, in the possession of Messrs. Sowerby

1 Proc. Zool. Soc., 1839, p. 30.
2 Min. Conch., ii, f. 230.
3 Symb. Hist. Helic., 1842, ii, p. 103.

and Fulton, a still larger individual measuring diam. maj. 44·5, min. 38, alt. 25 mm.

Of the variety, besides the single specimen in my collection, received from a French dealer, I have seen three specimens in Mr. Da Costa's collection, and there are two specimens labelled "Ecuador" in the British Museum. I also refer to this variety the shell figured by Dr. Kobelt [4] as *subcastanea*.

OBITUARY.

G. SHERRIFF TYE.

Born November 30, 1841, Died February 4, 1900.

MALACOLOGISTS and field naturalists in general have lost an eminent worker in the person of Mr. G. Sherriff Tye. He was born at Handsworth, near Birmingham, and resided in the same parish throughout his life. Although from a boy fond of the country and all objects of nature, his career as a naturalist may be said to date from about 1858, when he commenced to study the British Land and Freshwater Shells. For many years he took an active interest in the Birmingham Natural History Society, and formed in connection therewith a Conchological Section, of which he was President for some years. He was an early member of the then Leeds Conchological Society, and an original member of the London Malacological Society. Towards the latter end of his life he took a great interest in the formation of the Midland Malacological Society, holding the view, which the present writer heartily supports, that the formation of local societies is very desirable, for if rightly managed they may become centres of great usefulness to those whose circumstances in life place them away from large scientific libraries and museums.

Mr. Tye's published writings are few, he was always very loath to put anything into print, and yet he was certainly one of the most careful, thorough, and patient students of the mollusca it has ever been my privilege to be associated with, and in certain departments no one was more qualified to express an opinion. Some seven years ago the present writer suggested to Mr. Tye the desirability of putting on record some of the many observations and figures he had made of the British Freshwater Mussels, and although severely handicapped by the absence of a library containing the literature, at the time of his

4 Conch. Cab., 1885 (2), iv, t. 181, figs. 1, 2.

G. SHERRIFF TYE.

death, much material had been systematically worked over, and had he lived, would shortly have been ready for publication as a series of supplements to the "Journal of Malacology," to which paper from its establishment in 1890 he had been a generous supporter.

In his home-life he was always surrounded with numerous pets. Following on a visit to the Channel Islands in 1876, he established a small marine aquarium, which had been kept in a healthy and flourishing condition up to the time of his death.

Although lost to us with an unrivalled storehouse of observations in almost every department of malacology, I am pleased to say that there is every probability of his valuable collections finding a permanent home in his native town.—W. E. C.

We regret to have to record the deaths of Gérard Vincent, Conservator of the Natural History Museum of Brussels, on April 14th, 1899, in his 75th year; Baron d'Hamonville, on November 17th, 1899, age 70; R. P. J. Hervier, on February 20th, 1900; and E. J. Lowe, on March 10th, 1900, age 75.

NOTES.

The Genus Histiopsis, Hoyle, preoccupied.—In the January number of that invaluable publication the "*Revue Critique de Paléozoologie*," M. M. Cossmann points out (p. 44) that the name *Histiopsis*, used for a genus of Cephalopods described by Hoyle in the "Challenger" Reports, has been previously used for mammals (*Histiops*, Pet., 1869), he therefore proposes the name *Hoylia*.—W. E. C.

CORRIGENDA.

In Mr. H. Suter's paper "Malacological Communications from New Zealand" the following corrections should be made:

p. 49 line 2 for 'ovoviviparous' read 'oviparous.'

p. 51 line 24 for '26—1—27' read '26—1—26.'

p. 54 line 8 from below for '*jukeriana*' read '*jukesiana*.'

p. 54 bottom line for 'Robinson' read 'Robison.'

PROCEEDINGS OF THE MIDLAND MALACOLOGICAL SOCIETY.

16TH MEETING, FEBRUARY 9TH, 1900.

The President in the Chair.

PAPER READ.

"Some observations on the Asiatic Slug-Fauna," by Walter E. Collinge, F.Z.S.

EXHIBITS.

By Miss Litchfield: Shells of *Helix itala*, from Hastière, Belgium, also very fine collections of fossil shells from the Coralline Crag, Orford Castle, and the Red Crag, Waldringfield.

By Mr. Partridge: Series of fossil shells from the Barton Clay.

By the President: Specimens in illustration of his address, and a peculiar coloured specimen of *Arion subfuscus*, from Hale, Cheshire.

17TH MEETING, MARCH 9TH, 1900.

The President in the chair.

PAPER READ.

"On some malformed specimens of *Anodonta cygnea*," by H. H. Bloomer.

EXHIBITS.

By Mr. Bloomer: Specimens in illustration of his paper.

By Mr. Breeden: Shells of *Sphærium corneum*, from Toome Bridge, Co, Antrim, Ireland.

By the President: Small collection of shells of Indian *Cyclophoridæ*

18TH MEETING, APRIL 6TH, 1900.

The President in the chair.

A communication from Mr. Henry Suter, of Christchurch, New Zealand, was read, in which he intimated his desire to present to the Society a collection of Swiss Land Shells and New Zealand Land, Freshwater also Marine Shells, also a series of his writings. The Hon. Secretary was requested to convey to Mr. Suter the Society's thanks.

The following nomination for membership was read: Mr. E. B. Smith.

PAPERS READ.

"Description of a new Species of *Anadenus* from China." By Walter E. Collinge."

"Description of a new Variety of *Helix virgata*." By H. Overton.

EXHIBITS.

By the President: Specimens of *Anadenus dautzenbergi*, n.sp., from Qua Toun, Fo Kien, China; also shells of *Acavus waltoni*, Reeve, *A. phœnix*, Pfr., and *A. hæmastoma*, L., all from Ceylon.

By Mr. Overton: Shells of *Helix virgata* v. *tessellata*, n. var., from St. Catherine's Rock, Tenby; also specimens of *H. virgata* from Tenby, Deal, Dover, Gloucester, and Dudley, and 12 varieties from Tenby. *H. pisana* and the vars. *ochroleuca* and *albida*, also from Tenby.

By Mr. Bloomer: Shells of 19 species of *Achatinella*, from the Hawaiian Islands.

CURRENT LITERATURE.

Möllendorff, O. F. von.—Semper's Reisen in Archipel der Philippinen. Landmollusken.—Ergänzungen und Berichtigungen [Includes at pp. 54–60, a contribution "On the Anatomy and Systematic Position of the Genus *Philippinella*, Mlldff," by Walter E. Collinge], 1899, Bd. viii. p. 51—98. T. v—x.

The continuation by Dr. Möllendorff of Semper's great work is valuable, not only for the new material that he has studied, but especially for the critical notes and figures of little-known species.

In the present part he deals with the genus *Helicarion*, of which he admits 18 species, and then passes to *Macrochlamys* with 20 species, next to *Macroceras* with its single form *M. spectabilis*, and concludes with the first portion of his review of *Otesia*. *Pliotropis* as a sub-genus of *Otesia* (type *O. biangulata*, Pfr.) is not marked as new, but the name appears unfamiliar.

Mr. Collinge has contributed some interesting details on the anatomy and systematic position of the recently described *Philippinella*. Of the three species placed in this genus by Dr. Mollendorff, Mr. Collinge points out that *P. philippinensis*, Semp., is really generically distinct from the other two, being more nearly related to *Parmarion*, and the genus *Parmunculus* is proposed for its reception. This genus may be separated from *Philippinella* by the external form of the animal, and also by differences in the generative organs. The anatomy of *Philippinella* is also dealt with and a new species described, *P. möllendorffi*, from Mindoro.—

E. R. Sykes.

Bouvier, E. L., et Fischer, H.—Etude Monographique des Pleurotomaires actuels. Journ. de Conchyl., 1899, pp. 1—75, pl. iv—vii.

MM. Bouvier and Fischer have given an interesting and valuable account of the anatomy of the nervous system of *Pleurotomaria quoyana*. This is prefaced by a general systematic and historical review of the genus. The anatomical part opens with a short description of the external features, followed by that of the radula and organs of sense. The two otocysts are interesting in that they illustrate an important primitive character, the presence of a considerable number of unequal-sized otoliths. In the absence of the figures we can only very briefly summarise the work. In general form the nervous system shows affinity to that of the *Fissurellidae* and *Trochidae*, but in detail there seems to be resemblances to the condition which obtains in the Amphineura. The investigations on the pedal and pallial ganglia, throw considerable light upon the subject of the origin of the pedal nerves, and the relation of these two ganglia to each other in the Gastropoda generally. Although at first sight the pallial ganglia appear to be absent, it is seen on a closer investigation that they lie in close proximity with the pedal, and the authors' conclude from the condition present in *Pleurotomaria*, and a comparison with that in many other Gastropods, that what have been generally termed pedal nerves in the Gastropoda are really mixed nerves, originating from the pedal and pallial ganglia. These latter ganglia, in many forms, have an anterior part, usually termed the pallial ganglion, and a posterior part which is fused with the pedal ganglion. In *Pleurotomaria* the pallial ganglia are not divided in this manner, and further, they are clearly marked off from the pedal by a deep groove. The authors discuss in detail the origin of the nervous system of Prosobranchs, and conclude that the condition found in *Pleurotomaria* may be regarded as intermediate between the Amphineura and Prosobranchs. Many other points of interest are discussed, not the least interesting of which is perhaps the origin of the visceral commissure.—

W. E. C.

Creighton, Charles.—Microscopic Researches on Glycogen. Pt. ii. Glycogen of Snails and Slugs in Morphological and Physiological correspondence with the Lymph System of Vertebrates. 8vo., pp. 127, 9 col'd plates. London: 1899, Adam and Charles Black.

It has long been known that molluscs, particularly the land Pulmonates, contain in their tissues large quantities of glycogen. In the work before us Dr. Creighton

gives an account of an exhaustive research, and concludes that the distribution of glycogen in the tissues of molluscs "stands therein in the same accessory or subsidiary relation to the white blood that the lymph of vertebrates stands in to their red blood." He finds in it "the morphological (as well as the physiological) beginning of the lymphatic system, which has its complete development in the vertebrates along with the acquisition of red blood."

Provided that the substance met with is in all cases glycogen, and this is open to doubt, from the fact that the author has contented himself with one test only, viz., the micro-chemical reaction with iodine, it seems to us that two of the first proofs required are 1. its general distribution throughout the different classes of molluscs, and 2. a gradual perfecting, evidencing the evolution of a lymphatic system, as we pass from the lower to the higher molluscs. Neither of these proofs are forthcoming, the author himself was struck by the absence of glycogen in many Gastropods, and it has not yet been satisfactorily shown to exist in the Cephalopoda, where there is a very perfect vascular system.

The work is very interesting and well illustrated, but much more evidence is required before physiologists can accept Dr. Creighton's views.—W. E. C.

Nabias, B. de.—Recherches sur le système nerveau des Gastéropodes pulmonés aquatiques. Cerveau des Limnées (*Limnaea stagnalis*). Trav. Lab Soc. Sci. et Stat. Zool. d'Arcachon, Bordeaux, 1899, pp. 1—30, pls. i—iii. et 4 figs.

Professor de Nabias has made a careful histological investigation of the central nervous system of *Limnaea stagnalis*. He corroborates and amplifies the work of Lacaze-Duthiers, and adds largely to our knowledge of the nervous system generally. The paper is illustrated by three plates and a number of figures in the text, all reproductions from photographs. Some of these it is quite impossible to make out.
W. E. C.

Boycott, A. E., and Bowell, E. W. W.—Contributions towards a fauna of Herefordshire. Mollusca. Woolhope Nat. Field Club, Hereford [1899]: pp. 1—104.

This is a most interesting and valuable piece of work enumerating 108 species of molluscs. Unlike most county and local lists, it treats of the Mollusca which occur in the county of Hereford, and not only of the shells of these animals. Much care has been given to the measurements of the shells of the various species and the variation in colour, banding, etc. The nomenclature has been carefully revised and although opinions may differ from those here expressed, there is evidence that the authors have thought and inquired for themselves.—W. E. C.

Scharff, R. F., and Carpenter, G. H.—Some Animals from MacGillicuddy's Reeks. Irish Nat., 1899, vol. viii, pp. 213—218.

In this interesting account of a preliminary survey of the fauna of the MacGillicuddy's Reeks, Dr. Scharff describes a new variety of *Limax marginatus*. The description is as follow: Var. nov. *niger*, Scharff. "Colour almost black, sides a little lighter, but no trace of bands, stripes, or spots. Foot-fringe black; sole light grey. Length, when fully extended, 35 mm. Keel strongly developed on posterior half of body." In general appearance, except colour, this variety is not unlike *Agriolimax agrestis*. It approaches the var. *rupicola*, L. & P.—W. E. C.

Hawell, J.—List of the Mollusca of the Cleveland district. Proc. Cleveland Nat. Field Club, 1899, pp. 19—34.

Records the land, freshwater, and marine species known to occur in the district. The author states "it makes no sort of claim to be exhaustive. Its principal utility will be to form a foundation for future investigation, and to act as a stimulus thereto." Nearly 200 species are recorded and numerous varieties.—W. E. C.

Dall, W. H.—Synopsis of *Solenidæ* of North America and the Antilles. Proc. U. S. Nat. Mus., 1899, vol. xxii, pp. 107—112.

A very useful synopsis. *Solen mexicanus*, *Ensis californicus*, and *Tagelus pœyi* are new species. *Novaculina gangetica*, Benn., *N. (Clunaculum) mollis*, Sby., *Tagelus gibbus*, Speng., and *T. (Mesopleura) divisus*, Speng., are rediagnosed.—W. E. C.

Dall, W. H.—The Mollusk Fauna of the Pribilof Islands. The Fur Seals and Fur-Seal Islands of the N. Pacific Ocean. Washington, 1899, pp. 539—546, 1 map.

Prof. Dall records 86 forms of marine shells. A Faunal summary of those of the Pribilof Islands is given, and the range of the various species in Japan, Kamchatka coast, in the Arctic Ocean, the Aleutian chain, and California. A similar summary of the Commander Islands is added for comparison.—W. E. C.

Johnstone, J.—Liverpool Marine Biology Committee Memoirs. III. Cardium. 8vo., pp. vii+84, 6 plts. and map. Liverpool: 1899, T. Dobb and Co.

Mr. Johnstone's monograph is in some respects very good, in others very disappointing. In the space of 63 pages he has given a very readable account of the anatomy of *Cardium edule*, and well illustrated the same. We are disappointed to find so little that is new, while some sections require bringing up to date. Much important literature bearing upon the morphology of the Pelecypoda does not seem to have been consulted, and throughout the work generally there is an absence of modern comparative treatment.

The description of the "Renal Organ" (p. 41) is poor. It does not seem to have occurred to the author that such terms as "nephridium" and "nephrostome" are preferable to those used, which are certainly not the terms employed "by students of Biology in our laboratories and Marine Stations," for whom it is largely written.

The Appendix, on the Economy of the Cockle, contains much that is valuable and of interest.—W. E. C.

Möllendorff, O. von.—Binnen-Mollusken aus Westchina und Centralasien. L'Ann. du Mus. Zool. d. l'Acad. Imp. Sci. St. Petersb., 1899, iv, pp. 1—99, pls. ii—viii.

This interesting and valuable contribution to the Asiatic molluscan fauna enumerates 99 species and 26 sub-species. A large number of these are new and include *Anodenus sinensis*, *Macrochlamys* 2, *Xestina* 1, *Kaliella* 3, *Patula* 1, *Camaena* 2, *Satsuma* 1, *Plectotropis* 3, *Stilpnodiscus*, nov. gen. 3, *Aegista* 3, *Eulota* 6, *Euchadra* 12, *Laeocathaica*, nov. gen. 13, *Cathaica* 20, *Platypetasus* 6, *Buliminopsis* 7, *Semibuliminus*, nov. sect. 1, *Stenogyropsis*, nov. sect. 1, and *Vallonia*, 1.—W. E. C.

Herdman, W. A., and Boyce, R.—Lancashire Sea-Fisheries Memoir. No. 1. Oysters and Disease. 4to., pp. 60, plts. i—viii. London: 1899, George Philip and Son.

The results of an important investigation are here set forth very clearly. The work has been mainly carried out on *Ostrea edulis*, L., *O. virginica*, Gm., and *O. (Gryphæa) angulata*, Lam. The structure of the Branchiæ, the Protractor Pedis muscle, and Gastric gland (Liver) are carefully described and figured. Green Oysters are then discussed, and the micro-chemistry of the same, together with numerous points chiefly of interest to the pathologist. The whole results are summarised in ch. xiv (pp. 53—55).

Professor Herdman and the Lancashire Sea-Fisheries Committee are both to be congratulated on this, the first of their memoirs on Marine Biology.—W. E. C.

Bavay, A., et Dautzenberg, Ph.—Descriptions d'espèces nouvelles de l'Indo-Chine. Journ. de Conchyl., 1899, pp. 5—32, pls. 1—3.

The authors describe and figure 13 new species from this region, in addition to which they figure the following species: *Clausilia fargesiana*, Heude, *C. duella*, Mab., *C. giardi*, H. Fischer, *C. ardoiniana*, Heude, and *Pupina laffonti*, Ancey. The new species are: *Helix (Chloritis) lambineti*, a form which approaches *H. tranquereyi*, Cr. and F., *H. (Obba) langsonensis*, *H. (Möllendorffia) spirra*, *H. (M.) messageri*, *H. (M.) callitricha*, *H. (Geotrochus) vatheleti*; seven interesting new species of *Clausilia*, viz., *C. vanbuensis*, *C. vatheleti*, *C. callistoma*, *C. condeini*, *C. freyi*, *C. grangeri*, *C. (Pseudonenia) messageri*, and *Pupina ancyi*, and *P. tonkiana*.—W. E. C.

Horst, R., et Schepman, M. M.—Catalogue Systématique des Mollusques. Mus. d'Hist. Nat. d. Pays-Bas. Pt. ii. 8vo., pp. 184. Leyden: 1899, E. J. Brill.

The second part of this useful catalogue fully maintains the standard set in part i. The collection is an exceedingly valuable one and contains many type species. The nomenclature used is not always correct both as regards priority and spelling. A useful purpose would have been served if the species had been numbered. The present part enumerates nearly 1300 species and upwards of 150 varieties.—W.E.C.

Melvill, J. C., and Standen, R.—Report on the Mollusca of the "Jackson-Harmsworth" Expedition to Frans-Josef Land (1896—97), and of the "Andrew Coats" Cruise (1898) to Kolguev, etc. Mem. and Proc. Manchester Lit. Phil. Soc., 1899, vol. xliv, pp. 1—14, fig.

Buccinum brucei from Günther Sound, Franz-Josef Land, is the only new species, it is distinguished by its narrow form, close-set whorls, and small aperture. In the authors' opinion it does not appear to be nearly allied to any other species of the genus, arctic or otherwise.—W. E. C.

Hedley, Charles.—Description of a new genus, *Austrosarepta*, and notes on other molluscs from New South Wales. Proc. Linn. Soc., N.S.W., pp. 429—434, figs. 1—7.

Mr. Hedley describes a new genus of the sub-family *Sareptinæ*. It is characterised by an amphidetic internal ligament and a distinct though feebly separated resilium. The type, *A. picta*, is figured and described, and is perhaps the smallest Australian pelecypod known, a large specimen measuring: height 2, length 2·3, breadth of single valve ·8 mm. *Teinostoma starkeyæ* is an interesting new species. *Cassis nana*, Tenison Woods, and *Cantharus waterhousiæ*, Brz., are figured for the first time, also the animal of *Solen sloanii*, Gray.—W. E. C.

Hedley, Charles.—Descriptions of new Land Shells, with notes on known species. Rec. Aust. Mus., 1899. vol. iii, pp. 151—154, pl. xxviii.

The new species are *Pamuina mayana*, *Endodonta aculeata*, *E. norfolkensis*, and *Dendrotrochus mentum*. *Tornatellina wakefieldiæ*, Cox, is figured for the first time. On anatomical grounds Mr. Hedley transfers *Cochlostyla hindei*, Cox, from *Helicostyla* (cf. Pilsbry, *Man. Conch*, 1894, p. 229) to *Papuina*. Figures are given of the jaw, radula, and generative organs.—W. E. C.

Stempell, W.—Die Muscheln der Sammlung Plate. (*Systematische Übersicht*). Zool. Jahrb. Suppl. iv, 1899, pp. 217—251, T. 12.

Dr. Stempell enumerates 57 species, of which the following are new: *Arca (Barbatia) platei*, *Avicula (Meleagrina) magellanica*, *Lasæa macrodon*, *Diplodontina tumbesiana*, *Lepton platei*, *Venerupis fernandesiana*, *Teredo (Xylotrya) martensi*, *Mytilus magellanicus*, Chemn., v. *curvata*, *Solen macha*, Molina, v. *coquimbana*. *Diplodontina* is a new genus. For the *Pecten australis* of Philippi,

Dr. Stempell proposes the name *P. rosaceus*, the former being preoccupied by Sowerby (1).—W. E. C.

Stempell, W.—Zur Anatomie von *Solemya togata*, Poli. Zool. Jahrb. (Abth. f. Morph.), 1899, Bd. xiii, pp 89—170, T. 8—10.

Supplementing his valuable researches upon the *Nuculidæ*, Dr. Stempell has given a very complete account of the anatomy of *Solemya togata*, Poli. The work was undertaken with the object of determining more exactly the value of the order Protobranchiata, constituted by Pelseneer in 1889 for the *Solemyidæ* and *Nuculidæ*. In accepting this order the author gives an emended definition, eliminating many of the characters given by Pelseneer as not being essentially characteristic. The two families are carefully compared and the differences between them stated. The *Solemyidæ* are regarded as the more specialised, a conclusion previously arrived at by Pelseneer, but Dr. Stempell differs from that author in not agreeing that the *Solemyidæ* have been derived from the *Nuculidæ*, he concludes, that in many points the former show greater simplicity due probably to the nature of their environment, and that both have been derived from a common ancestor possessing primitive characters, many of which have been retained.—W. E. C.

Stearns, R. E. C.—List of shells collected * in Heron and Eagle Lakes, Minnesota, with notes. Proc. U. S. Nat. Mus., 1899, vol. xxii, pp. 135—138.

Records 18 species and numerous varieties.

Stearns, R. E. C.—Description of a new variety of *Haliotis*, from California. Ibid., pp. 139—142.

H. fulgens, Phil. v. nov. *walallensis*. Differs from the type in its more elongate and flattened form, its constantly finer, spiral threading, and its paler nacre.

Kelly, H. M.—A Statistical Study of the Parasites of the *Unionidæ*. Bull. Illinois State Lab. N. H., 1899, vol. v. pp. 399—418.

Professor Kelly records some very interesting observations upon the parasites found infesting 44 species of American *Unionidæ*. The commonest parasite is *Aspidogaster conchicola*, v. Baer, others mentioned are *Catylaspsis insignis*, Leidy, 4 species of *Distomidæ*, *Bucephalus polymorphus*, v. Baer, and two other cercaria, various species of *Ataxi*, 2 species of Infusoria, and an oligochæte worm. The largest number of different parasites in any one species was found to be 7, many had 6, 5, or 4. Six very carefully prepared tables are given. As a result of his studies the author arrives at the following conclusions: "The host species seem to exhibit unlike capacities for infestation, both as to the number of individuals and the kinds of parasites present. It appears that the differences shown are attributable only in a minor degree to the age and size of the host, the size of the stream, and the density of the unionid population. They are not sufficiently accounted for by the seasonal variation,—which is shown to exist to some degree at least in the case of certain parasites,—nor by the very slight difference in general structure between the various host species. The evidence therefore seems to indicate that the capacity for infestation in each host species is to a large extent a specific characteristic."—W. E. C.

Knight, G. A. F.—The Etymology of the names *Azeca* and *Assiminea* of Leach. Journ. Conch., 1900, vol. ix, pp. 271—76.

This is an interesting and useful paper and throws much light upon many of the generic terms used by Leach, whose derivation has hitherto been doubtful. The two in the title of this paper were regarded in 1842, by a committee of the British Association, as being "without any derivation or meaning whatever," and even Jeffreys says of *Assiminea*, "a ridiculous name." Mr. Knight enumerates the following names, and gives their probable derivation: *Thracia*, *Mysia*, *Bithynia*, *Thyatira*, *Lasæa*, *Dipsas*, *Pharus*, *Magdala*, *Barnea*, *Azor*, *Macoma*, *Orovithea*,

Pera, Zacanthusa, Alexia, Orixa, Eledone, Cydippe, Autonoe, Damaris, Zippora, Balcis, Subanœa, Roxania, Cadmusia, Gobreeus, Ariauia, Tachea, Azeca, and *Assiminea.*—W. E. C.

Collinge, W. E.—On a Collection of Slugs from South Africa, with Descriptions of some new species. Ann. Sth. Afr. Mus., 1900, vol. ii, pt. 1, pp. 1—8, pls. I—II.

The new species are *Amalia ponsonbyi, Apera natalensis, Oopelta flavescens,* and *O. granulosa. Limax variegatus,* Drp., and *Arion fuscus,* O. F. Müll., are additions to the fauna.

Hedley, Charles.—A Zoogeographic Scheme for the Mid-Pacific. Proc. Linn. Soc., N.S.W., 1899, pp. 391—417.

Cossmann, M.—Sur la découverte d'un gisement palustre a Paludines dans le terrain bathonien de l'Indre. Bull. Soc. Geol. France, 1899 (s3). T. xxvii, pp. 136-143, figs. 1—5.

Webb, W. M.—Some Mollusca and the Microscope. Ann. of Micros., 1900, pp. 1—5, 12 figs.

Bavay, A., et Dautzenberg, Ph.—Description de coquilles nouvelles de l'Indo-Chine. Journ. de Conchyl., 1899, vol. xlvii, pp. 275—296, pl. xii.

Thirteen new species of *Clausilia* and 9 varieties are here described under the following names: *C. lemyrei* and v. *fusca, C. auricoma, C. babensis, C. gisota, C. backamensis, C. (Pseudonenia) darvi* and vars. *elongata, minor,* and *cristator, C. thaikhanua* and vars. *obesa* and *minor, C. dichroa, C. semipolita, C. falvifera, C. euplaura, C. sykesi* and v. *major, C. hamonvillei* and v. *obsoleta.*—W. E. C.

Dautzenberg, Ph.—Description d'une nouvelle espèce d'*Achatina* provenant du Haut-Congo. Ann. Soc. Roy. Malac. Belgique, 1899, T. xxxiv, pp. 27—28, fig.
Achatina weynsi, n. sp.

Pritchard, G. B.—Mollusca, pp. 135—141 in "Handbook of Melbourne," for the use of members of the Australian Assoc. Adv. Sc., Melbourne, 1900.

Contains an account of the various collecting grounds round Melbourne, the Mollusca found there, and notes on their habits.

Hervier, J.—Le Genre *Columbella* dans l'Archipel de la Nouvelle-Calédonie. Journ. de Conchyl., 1899, vol. xlvii, pp. 303—391, pls. xiii—xiv.

M. Hervier gives a valuable account of the species of *Columbella* occurring in the Archipelago of New Caledonia. In addition to a large number of new varieties, the following new species are described and figured: *C. goubini, C. subphilodicia, C. desmia, C. lwaltyensis, C. procellarum, C. lifouana, C. nanisca, C. ocellatula, C. brevissima, C. roseotincta, C. succinea, C. obesula, C. dautzenbergi, C. sublachryma, C. pinguis, C. alphonsiana, C. iozona,* and *C. fischeri.*—W. E. C.

GENERAL REVIEWS.

Text-Book of Palaeontology.—By Karl A. von Zittel. Translated and edited by Charles R. Eastman. Vol. I, pp. viii+706, 1476 woodcuts. London, 1900, Macmillan & Co., Ltd.

In bringing out an English edition of Professor von Zittel's well-known work, Dr. Eastman has very wisely availed himself of the assistance of a series of specialists

in the different departments. The chapters on the Protozoa and Coelenterata are practically as in the original Grundzüge, all the others have been remodelled, enlarged, and brought up to date. The sections dealing with Polyzoa, Brachiopoda, Mollusca, and Trilobites have been entirely rewritten. The work therefore is something more than a translation, it is a new treatise on invertebrate palaeontology founded upon Professor von Zittel's *Grundzüge der Palaeontologie*, and it is greatly to be regretted that the different collaborators have not followed more closely the method of treatment in that invaluable work.

The two great faults, which stand out conspicuously, are the excessive subdivision of the various sub-kingdoms into families, sub-families, and genera—a feature in which American zoologists excell—and the large number of cases where the authority for such divisions is omitted. In looking through the classification the student is bewildered to know if these families, etc., are here described for the first time or hitherto. Many of the divisions are new, though in some cases both the authority and definition are omitted. However desirable it may have seemed to include the special views on classification of the various authors, a students textbook is surely the last place in which to introduce such changes. We do not hesitate to say that so far as the general bulk of palaeontological students are concerned, the value of this work has been greatly impaired by such treatment, particularly so as regards the Polyzoa, Brachiopoda, Mollusca, and Arthropoda.

The sub-kingdom Mollusca has been treated of by Dr. Dall (Pelecypoda), Professor Pilsbry (Scaphopoda, Amphineura, Gastropoda, Pteropoda), and Professor Hyatt (Cephalopoda).

Dr. Dall's work is perhaps the most satisfactory, and Professor Hyatt's the least so. Many of the minor errors in all the classes might have been avoided with a little more care. In not a few cases the essential characters of a family have been overlooked or omitted, this is particularly apparent amongst the Amphineura and Gastropoda, in fact throughout the sub-kingdom, excepting the Pelecypoda, the definitions are inadequate.

In conclusion, we think the advanced student and others will find Dr. Eastman's book a valuable work of reference, the general student, however, still awaits a reliable work in the English language.—W. E. C.

An Elementary Course of Practical Zoology.—By the late T. Jeffery Parker and W. N. Parker. 8vo, pp. xii + 608, and 156 figs. London: 1900, Macmillan & Co., Ltd.

As a handbook to an elementary course of study in practical zoology the work before us will be welcomed by both teacher and student. Adopting the method pursued in Huxley and Martin's "Elementary Biology," the authors have produced a very readable and practical guide which will take its place in the majority of zoological laboratories. It has long been felt that the present works on practical zoology were unreadable, and largely out of date, and often the desire has been expressed for a new and revised edition of Huxley and Martin's admirable work. Professor Newton Parker is to be congratulated on having produced a work which embraces all the good points of the former.

The accounts of the different types are well arranged and carefully thought out, and with a few exceptions the practical directions are all that could be desired.

The illustrations, many of which are from Professor Parker's other works, and Professor Howe's "Atlas," have been selected with discretion, and are all excellent.
W. E. C.

A Treatise on Zoology.—Edited by E. Ray Lankester. Pt. III. The Echinoderma. By F. A. Bather, assisted by J. W. Gregory and E. S. Goodrich. 8vo., pp. viii + 344. London: 1900. Adam and Charles Black.

The work before us marks a distinct advance in the style and scope of zoological

text-books. Hitherto it has been the custom for some individual zoologist to treat of the whole Animal kingdom, so far as recent forms were concerned. While this was to a certain extent possible, as regards the subject, twenty or thirty years ago, the wealth of work and workers during the intervening period, has made it more and more evident, that for the production of a reliable work, and one which would remain for some considerable time a standard treatise, the co-operation of a series of specialists, each treating of his own special study, was absolutely necessary. Further, it is obvious that a study of recent forms of animal life, apart from their fossil relations, can only end in a very one-sided and incomplete knowledge, it is therefore an excellent departure in the systematic treatment of zoology, to find the fossil forms so carefully and elaborately set forth as in the present work. Finally, no pains has been spared to make the Bibliographical references of some value. The treatment of references in some of the most recent zoological text-books is little less than disgraceful. It is not at all uncommon to find many entirely incorrect, while the rule seems to be to omit either the year of publication, the number of the volume, or the series, and to abbreviate the title of the work until unrecognisable.

Throughout the work the style and method of treatment are admirable, and all three authors are to be congratulated on the clearness and force which characterises their respective contributions. Mr. Bather is responsible for the major portion of the work, viz., five of the eight chapters. The first gives a general description of the Phylum, and here most zoologists will regret that the morphology has been treated with such brevity; the remaining four chapters deal with the Cystidea, Blastoidea, Crinoidea, and Edrioasteroidea. Mr. Goodrich contributes the chapter on the Holothurioidea, which though brief is excellent. The two remaining chapters on the Stelleroidea and Echinoidea are the work of Dr. Gregory.

The illustrations, of which many are original, are numerous and clear.

Accepting the present volume as typical of the series, the work worthily represents the Oxford School of Zoologists, whose success—one might almost say foundation—is due in no small measure to the Editor of this comprehensive and valuable Treatise.—W. E. C.

EDITOR'S NOTES.

We have received from Messrs. Sowerby and Fulton a set of their admirable Catalogues, copies of which should be in the hands of every museum curator and collector. The five catalogues extend over 100 pp., and enumerate nearly 12,000 species. They are well printed, in double columns, with wide margins each side, so that they may be useful as check-lists.

Reviews of two very important works are unavoidably held over till our next issue viz: those of Sarasin's "Land Mollusken von Celebes," and Dr. Wilhelm Pfeiffer's study of the Genus *Triboniophorus*.

To the April number of "The Nautilus," Mr. Bryant Walker contributes an interesting article on the *Planorbis corpulentus* of Say. He clearly shows that it is entitled to rank as a valid species, and further that it is very distinct from *P. trivolvis* on the one hand, or *P. ammon* or *binneyi* on the other.

THE

JOURNAL OF MALACOLOGY.

No. 7. SEPTEMBER 29TH, 1900. VOL. VII.

A LIST OF A SMALL COLLECTION OF SHELLS FROM CHINA.

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

British Museum (Natural History), London.

IN 1899 Capt. A. W. T. Wingate made a journey across China, on the route collecting Zoological specimens, which he very liberally sent to the Natural History Museum, South Kensington. Starting from Shanghai he ascended the Yang-tse River in a Chinese gunboat as far as Yo-tchau, and thence, crossing the Tong-Ting Lake, proceeded up the Yuen River, across the Hunan and Kwei-chow provinces to Yunnan city, and thence to Bhamo in Burma. The following is a list of the shells obtained on this journey. The most interesting specimens are two series of *Melania gredleri* and *Vivipara auriculata*. The latter especially shows the remarkable variation which occurs so frequently or invariably in freshwater species. Taking the two extreme types of this species, one would never for a moment consider them as forms of one and the same species, yet it seems impossible to do otherwise when the intervening links are studied.

(a.) FRESHWATER FORMS.

1. Vivipara chinensis, Gray.

Hab.—Hunan and Kwei-chow.

2. Vivipara quadrata, Benson.

Tong-Ting Lake, Hunan.

3. Vivipara, sp.

Hab.—Hunan.

A solid form, of a uniform olivaceous colour or with three more or less dark zones upon the last whorl, varying very little in form, some specimens however, being a trifle less globose than others. They are always imperforate, none exhibiting the slightest rimation. The periostracum has the fine lines of growth crossed by fine spirals giving the surface a textured appearance.

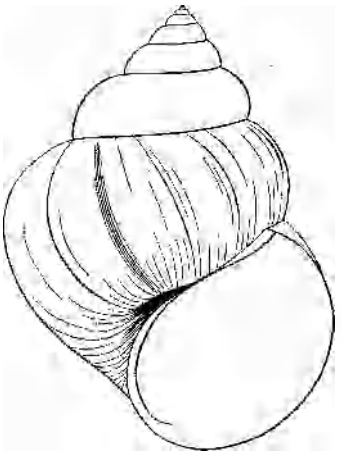
4. Vivipara, sp.

Hab.—Hunan.

Smaller and less globose than the preceding species, mostly subrimate, plain or banded, with lines of growth only, no spiral striation, having the body-whorl slightly keeled or angled at the periphery.

5. Vivipara wingatei, n. sp.

Testa rimata, turbinata, tenuis, dilute rufescens vel pallida, epidermide tenui olivacea, oblique strigata induta; spira turrita, ad



Vivipara wingatei, n. sp.

apicem acutissima et nigrescens; anfractus 7 convexi, lineis incrementi

tenuibus striati, striis spiralibus plus minus conspicuis sæpe sculpti, ultimus interdum malleatus, subglobosus; apertura obliqua, inverse auriformis, longit. totius $\frac{1}{2}$ paulo superans; peristoma tenue, interdum nigro marginatum, margine columellari incrassato, vix reflexo.

Longit. 57 millim., diam. maj. 45, min. 40. Apertura 31 longa, 23 lata.

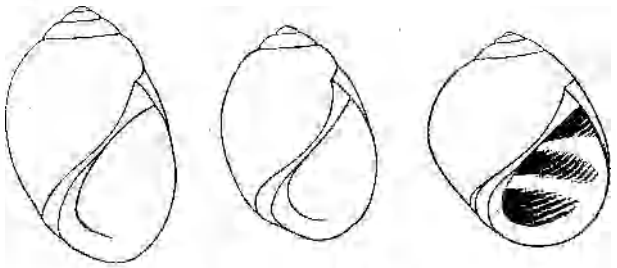
Hab.—Hunan.

A fine large species, remarkable for its thinness, convex whorls and acute apex. The surface has a somewhat textured appearance (more noticeable in some specimens than others) produced by fine spiral striæ crossing the lines of growth. One of these spirals around the middle of the upper whorl is sometimes rather prominent giving a slight subangled appearance.

6. Vivipara auriculata, Martens.

Hab.—T'aoyüan Lsien, also Hung Chiang, Province of Hunan.

A most instructive series from the above localities showing the connection of the *Paludomus rusiostoma* of Gredler with this species. Starting with quite globular specimens every intermediate form is met with until we arrive at the typical auriculated type. Some of these are very large and solid, the finest specimen being 39 millim. in



Vivipara auriculata Marts.

length. The more rounded examples *(rusiostoma)* generally exhibit three more or less distinct zones within the aperture, whereas this part in the typical form is uniformly whitish. Several forms described by Heude under the generic title of *Rivularia* (*Mém. sur la Chine*, pl. xl and xli) also appear to belong to this polymorphous species.

7. Melania baccata, Gould.

Hab.—Taoyuen, Hunan.

Two specimens, one strongly nodosely cancellated, the other spirally costate only.

8. Melania cancellata, Benson.

Hab.—Tungting hu = Tong Ting Lake, Hunan.

9. Melania gredleri, Böttger.

Hab.—Chin Chow, T'aoyüan, Hunan.

Most of the specimens are very short and broad, much shorter than the shells figured by Heude (*Mém. sur la Chine*, vol. i, pl. xli, figs. 30, 32). An averaged size example is 27 millim. in length and 12 in breadth.

10. Unio leai, Gray.

Hab.—China. Exact locality not stated.

11. Unio shanghaiensis, Lea.

Hab.—Lu She.

12. Unio, sp.

Hab.—Chien Yang.

A single valve only.

13. Corbicula, sp.

Hab.—Pu Shi.

14—16. Corbicula, spp.

Hab.—Pu Shih, Yüan Chow, Chin She, Tsing She, Chien Yang, T'aoyüan, Hunan.

A series of specimens from these localities apparently belong to three or four species, but to attempt to distinguish them would necessitate long and special study of the genus.

17. Modiola fortunei, Dunker.

Hab.—Hunan.

A single specimen of a richer browner tint than the type. (*Conch. Icon.*, vol. x, fig. 75).

18. Mytilus, sp.

Hab.—Hunan.

A single specimen of a very slender species, perhaps belonging to *M. martensi* referred to by Neumayr (*Neu. Jahrb. Mineral. etc.*, 1883, vol. ii, p. 22). It is 20 millim. long, 8 broad and 9 in diameter. In form and colour it somewhat resembles Reeve's figure of *M. minimus* (*Conch. Icon.*, vol. x, pl. xi, fig. 56), but it is rather more slender and has a sharper umbonal ridge. The beaks are acute, but not quite in contact at the tips. The valves are thin, finely concentrically striated, iridescent within, edentulous, but with a slight shelf at the apex which in consequence is hollow as it were within. The ventral side is concave with a narrow byssal opening. *Dreissensia suzuhoei* of H. Adams belongs to the same group as the present species, having a similar hinge and the iridescent nacreous inner surface.

(b.) Terrestrial Forms.

19. Cyclophorus punctatus, Grateloup.

Hab.—Yan Chow, Yuh Ping.

20. Succinea chinensis, Pfeiffer.

Hab.—Chin She, Nanking.

21. Eulota ravida, Benson.

Hab.—Tsing she Hün, Chunglch.

22. Eulota phragmitum, Heude.

Hab.—Yaochou.

23. Eulota huberiana, Heude.

Hab.—Yan Chow, Tsing She.

Smaller than Heude's figure (*Mém. sur la Chine*, vol. i, pl. xvii, fig. 1).

24. Eulota similaris, Férussac.

Hab.—Yaochou, Chen Kiang.

DESCRIPTIONS OF TWO NEW SPECIES OF SHELLS: MUREX MARCOENSIS AND CASSIS BOOLEYI.

By G. B. SOWERBY, F.L.S.

Murex marcoensis, n. sp.

Testa clavæformis, rufo-aurantia, antice purpureo tincta; spira mediocriter elata, acute conica; anfractus 6½, convexi, primi 3—4

Murex marcoensis, n. sp.

longitudinaliter confertim costati, deinde trivaricosi, sub-distanter crassicostati, undique spiraliter lirati, varicibus crassiusculis, rotundatis, hic illic brevissime spinosis; anfractus ultimus superne obtusissime angulatus, infra constrictus; rostrum sub-elongatum, rectiusculum, superne breviter spinosum, infra medium glabratum, purpureo tinctum, ad extremitatem albidum; apertura rotunde ovalis, intus albida crenulata; labrum serratum, extus crassivaricosum; columella callosa, polita, inferne leviter plicato rugosa.

Long. 31, diam. 16 mm.

Hab.—Marco, Florida.

I have been unable to indentify this species with any of its congeners. The specimens are prettily coloured, pink and reddish orange, tinged with purple in the middle of the rostrum, which is tipped with white. The varices are very sparingly spined, and some specimens not at all, excepting at the upper end of the rostrum. Compared with *M. chrysostoma* this shell is uniformly much smaller, narrower in proportion, less angular, and different in colour.

Cassis booleyi, n. sp.

Testa ovata, fulvo-albida, maculis numerosis quadratis rufo fus[illegible] quadriseriatim dispositis ornata; spira mediocriter elata, conica,

acutiuscula; anfractus 7; primi 2 læves, sequentes spiraliter sulcati, oblique filo-striati, sutura augusta impressa sejuncti; ultimus convexus,

Cassis booleyi, n. sp.

lævigatus, longitudinaliter irregulariter plicato-striatus, obtusissime angulatus, supra angulum leviter concavus, liris spiralibus 2—3 instructus, basim versus subobsolete sulcatus; apertura oblonga, labrum extus crassivaricosum, intus lirato dentatum; columella expansa, rugoso plicata; canalis valde contorto recurvus.

Long. 45, diam. 31 mm.

Hab.—Port Blair, Andaman Islands.

This species, collected at the above locality by the late Mr. G. H. Booley, differs from *C. pila* to which it has some general resemblance in the following particulars. The body whorl, instead of being regularly grooved as in *C. pila*, is almost smooth but longitudinally striated; it has an obtuse angle at the top, between which and the suture it is slightly concave, with two or three distinct spiral ridges. The examination of a considerable number of specimens of both species has confirmed my opinion that they are distinct.

MALACOLOGICAL NOTES.

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

1. On a three-valved Ischnochiton.

The specimen now described was collected by Mrs. A. F. Kenyon in Victoria and presented by her, very recently, to the British Museum. It is preserved in spirit and measures, when contracted, 13 by 8 millim. From the external appearance it appears to belong to *I. contractus* (Rve.).

The tail-valve occupies a space rather more than equal to that taken by the head and median valves together. At the posterior end the mantle is drawn up much as in *Schizochiton*, but this may be due

Fig. 1.—Three-valved *Ischnochiton*.

to contraction, or to the fact that the tail-valve has received some injury. The middle valve has the lateral area on one side much exaggerated and divided by a radiating line. The head-valve is normal.

Specimens of Polyplacophora, having less than the normal number of valves, appear to be very scarce. Seven-valved specimens are known, indeed there is one, a *Chiton*, in the British Museum, but I have never seen one with less than this number.

2. On the occurrence of Cryptoplax in South Africa.

The genus *Cryptoplax*, so far as known, ranges from the Philippines to the Australian Province. The occurrence therefore at Umkomaas, in Natal, of a specimen apparently belonging to that genus, is of unusual interest. The single specimen, which was collected by Mr. Burnup, and forms part of his collection, measured when alive, apparently, about 14 millim. in length but was curled up and shrunk in drying.

The girdle shows no signs of pores but is densely clothed with small spicules, forming bunches at the sutures. The valves, partly covered by the girdle, are all in contact and have no intervening area. The head-valve is granulose, while the other valves have an almost smooth central area, and the lateral and median areas are

sculptured with bold, slightly granulose ridges, this sculpture becoming more obsolete and the ridges breaking up into granules, as we proceed from the tail to the head-valve.

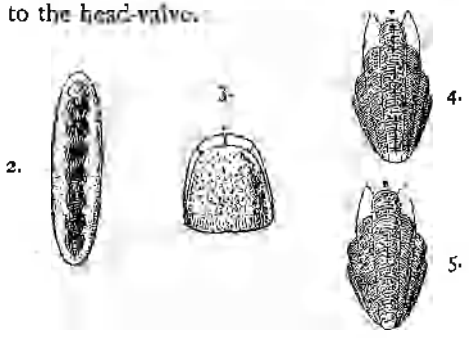


Fig. 2.—*Cryptoplax*, sp. Fig. 3.—Head-valve of same.
Figs. 4 and 5.—Seventh and eighth valve.

On comparing this species with young specimens of *C. striatus* (Lamk.), I have been unable to find specific characters sufficient to justify the description of it as distinct. Of course with only one specimen, it is by no means easy to arrive at the true specific value, but the occurrence of any specimen of the genus so far from the known habitat is of sufficient interest to be worthy of record.

Should more material come to hand, I shall hope to return to the subject.

3. Description of Acroptychia pyramidalis, n. sp.

Testa aperte umbilicata, pyramidata, turbinata, solidiuscula, leviter striata, (detrita) castanea, maculis albidis tessellata, linea unica inconspicue nigro-castanea cincta; anfr. $5\frac{1}{2}$, plano-convexi, ultimus turgidus; apertura subverticalis, subcircularis, supra angulum obtusum formans, peristomate incrassatulo, subreflexo.

Alt. 15; diam. max. 14, min. 11 millim.

Hab.—Madagascar. 6. 7.

Figs. 6 and 7.—*Acroptychia pyramidalis*, n. sp.

In colour pattern somewhat recalling *A. reticulata* (Ad. and Rve.), but may be severed from young specimens of that species, by the whorls being much flatter, the shell more elevated and thicker, and

the umbilicus not being so open. From *A. aequivoca* (Pfr.), which it most nearly resembles in colour, it may be separated by the size, the more elevated form, and the thickened but not reflected lip. *A. tubularis* (Morel.) is about the same size, but the shape is different and *A. pyramidalis* is not marked by the last whorl being so much drawn to one side.

The known species of *Acroptychia* appear to be as follows: *A. aequivoca* (Pfr.), 1857. (Synonym *A. manicata*, Cr. and Fisch., 1882.) *A. albocincta*, E. A. Smith, 1893. *A. metableta*, Cr. and Fisch., 1874. *A. notabilis*, E. A. Smith, 1892. *A. reticulata* (Adams and Reeve), 1848. *A. tubularis* (Morelet), 1861.

4. Description of Clausilia granulosa, n. sp. from Peru.

Testa magna, elongato-fusiformis, solidula, sub lente spiraliter et transverse striata, grisea, anfr. decussatuli, periostraco leviter induti. Anfr. (spec. trunc.) 6, plano-convexi, sutura impressa, ultimus deorsum angustatus, solutus, protractus, basi subrotundatus. Apert. magna, ovatocircularis; lamellæ approximatæ, validæ, marginales, supera verticalis, infera subhorizontalis, subcolumellaris nulla; plica principalis valida sed curta, cum lunella arcuata angulum efformans; peristoma expansum, reflexum, solutum, albidum.

Long. 29; lat. 7·6 millim. Long. apert. 8; lat. apert. 7.6 millim.

Hab.—Peru (Dedit G. B. Sowerby).

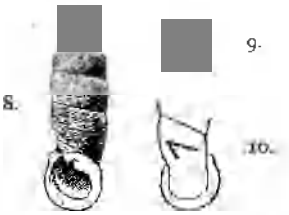


Fig. 8.—*Clausilia granulosa*, n. sp. Fig. 9.—Sculpture of same.
Fig. 10.—Posterior view of penultimate whorl.

A single dead shell of this handsome species was presented to me some years ago by Mr. G. B. Sowerby; I have delayed describing it in the hope either that I might obtain better material, or that some other person might be in a more fortunate position.

The sculpture appears to be due to both revolving and transverse striæ, which produce a decussated appearance, the spirals becoming comparatively much weaker on the lower whorls.

ON A BRITISH SPECIES OF MYRINA, WITH A NOTE ON THE GENUS IDAS.

By J. T. MARSHALL,

Sevenoaks, Torquay.

In the month of June last an Aberdeen trawl-boat brought into that port the skull of a whale, which arrested the attention of Mr. James Simpson, an indefatigable collector of the Mollusca, who resides in that city. When he went on board to examine it he found the skull bare of flesh, but covered with an oily exudation caused by some days exposure to a very hot sun, and although it was almost unapproachable on account of the indescribable stench, he went close enough to observe a number of "small mussels" clinging to it, and secured some of them. He writes me that "there must have been thousands on the skull, but by far the largest number were baby shells. The adults were anchored by a byssus in the cavities, while the young swarmed over the smooth surfaces. They were very much decomposed, so I was glad to get rid of the animal matter as soon as possible." One of the crew of the trawler, known to Mr. Simpson as a veracious man, at once told him that the whale's skull was brought up in the trawl "on the north edge of the Great Fisher Bank, about 150 miles N. E. of Aberdeen, which would be nearly 100 miles east of the Orkneys, in 40 to 50 fathoms."

Mr. Simpson having submitted some of these "mussels" for my opinion, I at once saw they were unlike any species yet found in our seas, and that they corresponded very closely indeed to the *Myrina* of H. and A. Adams, a genus founded on a single Japanese species. I propose therefore to name this shell *Myrina simpsoni*, after the discoverer. That it is a native of the British seas is placed beyond doubt from the fact that, wherever the whale's skull may have come from originally, it was trawled from the bottom, where it had sunk a foot deep in the mud, the marks of which were plainly visible. The Great Fisher Bank is practically a continuation of the Doggerbank, and extends up the North Sea from the Firth of Tay to the extremity of Caithness.

The animal could not be described on account of the collapsed condition the specimens were in. An attempt to soak one or two that were dried up revealed nothing of any consistency except the adductor muscles, which are unusually large and strong.

Myrina simpsoni, n. sp.

The shell is transversely oblong, convex, and of a thin texture; sculpture, microscopic and close-set striæ which radiate from the beaks, and equally fine transverse striæ, with coarse and irregular lines of growth; in the centre of each valve are five or six longitudinal obtuse riblets, which cross the shell from the upper to the lower margin; epidermis yellowish-brown, persistent, highly polished, with a blistered appearance over the central riblets; colour under the epidermis pearl-grey; margins nearly straight at the upper part, ascending very slightly from the umbones, gently incurved in the lower margin, rounded on the anterior side with a greater slope from the beaks, and sloping from the back on the posterior side and evenly rounded, though this part is broader in some specimens than in others, while both sides are always deeper than the centre; umbones very gibbous and swollen; beaks incurved, and placed very near the anterior side; ligament internal, large and strong; inside pearl-grey, iridescent, microscopically rayed; hinge-line almost straight; hinge-plate narrow, thickened, slightly and very finely crenated on the posterior side; there is a small and obtuse excrescence on the anterior side just below the beak; edges plain; muscular scars very slight.

Length 0·45 inch. Breadth 1 inch.

Hab.—North edge of the Great Fisher Bank, about 150 miles N.E. of Aberdeen, in 40 to 50 fathoms.

I have given the average dimensions, but the largest are just under 1¼ in. by ½ in. The central ribs or corrugations vary in degree from being merely faint rays to well-developed corrugations, and they probably serve the purpose of strengthening the shell in that part, like the internal strengthening ribs of *Isocardia cor*. These riblets show through the shell but are not impressed on the inside, being obviously only surface sculpture.

Fig. 1.—*Myrina simpsoni*, n. sp. View from the right side.
Figs. 2 and 3.—Hinge-line of left and right valves.

This shell is like, except in size, *M. coppingeri*, E. A. Smith,[1] a "Challenger" species from Cape York, N. Australia, 1400 fathoms; but this is wider in proportion to length, the lower or ventral margin

1 "Challenger" Pelecypoda, p. 287, pl. xvi, figs. 9, 9b.

is more incurved, with central rays or riblets, and the hinge-line is crenated on one side only of the ligament. It also resembles *Idas argenteus*, Jeffreys,[2] but this is very much larger, the lower margin is concave, the epidermis does not rise into fibrous excrescences on the posterior side, and the hinge-line is striated on one side only. Gwyn Jeffrey's figure must not be taken as correctly representing *I. argenteus*, that species having been described and figured from a decorticated valve, which could not exhibit the fibrous epidermis, in addition to which, the beaks are shown small and pointed, while they should be incurved and invisible, with large obtuse umbones as in *Modiola*, and similar to *Myrina coppingeri* and *M. simpsoni;* while it must also be remembered that *I. argenteus* is variable in its outlines, in consequence of its peculiar adaptability to habitat. In specimens of the same size the two are very closely allied, and in a strong light some examples of *I. argenteus* are found to have rays down the centre of each valve corresponding to the strengthening riblets of *M. simpsoni*.

Idas of Jeffreys is no more than a synonym of *Myrina*, H. and A. Adams. A valve was dredged in mid-Atlantic by the "Valorous" in 1450 fathoms, and another on the coast of Portugal by the "Porcupine" in 994 fathoms (not Bay of Biscay, wrongly recorded by Jeffreys). In describing the genus from these two valves, Gwyn Jeffreys ventured to describe the ligament or cartilage as external, and in describing the species (*I. argenteus*) he wrote "ligament not observable, the specimens being imperfect single valves, but certainly not internal"; while Mr. Edgar A. Smith, relying on this statement when describing his *Myrina coppingeri*, separates it, and rightly so, from *Idas* because though it "has the hinge-plate similarly crenated, the ligament is described as external," overlooking Gwyn Jeffrey's account of the discovery of living specimens "between the Hebrides and Faroes in 516 fathoms, inhabiting deserted tubes of *Teredo megotara* in a piece of pine-wood, and in which the *Idas* were affixed by a byssus. * * * An internal and long cartilage covers the hinge, and I was mistaken as to this when I described the species from two small valves." So that the genus *Idas* would appear to be quite superfluous. The author had originally written "Perhaps allied to *Myrina*, although that genus has an internal ligament and wants the hinge-plate crenated." We have seen that the former attribute was an error, and the latter cannot be considered a generic distinction seeing that it is a character equally shared by *Modiolaria*, *Dacrydium*, and *Crenella*, in addition to which

2 "Valorous" Mollusca, Ann. Mag. N. Hist., 1876, p. 248; and Moll. "Lightning" and "Porcupine," Proc. Zool. Soc., 1880, p. 683, pl. xlv. fig. 2.

I have a valve of an undescribed *Myrina* from Korea in which the hinge-plate is strongly crenated on both sides of the ligament. When Gwyn Jeffreys, however, put the matter right about the ligament, he did not formally abandon *Idas*, although the only reason for keeping it alive now is in the hope (a very remote one) of living specimens being found of *Idas dalli*, E. A. Smith,[3] a "Challenger" and "Porcupine" species, and in that shell being found to possess an external ligament. Mr. Edgar A. Smith writes of *I. dalli* that he could not discover "in any of the odd valves (no complete specimen was obtained) any trace either of an internal or external ligament: it is I expect of a very slight character." My valves are in poor condition, and appear granulated on the surface, but that may be owing to a micro-organism, as Mr. Smith describes the shell as "almost destitute of sculpture."

The foregoing three species of *Myrina* have the contour of *Modiolaria*, while *I. dalli* is mytiliform. Gwyn Jeffreys missed the opportunity of describing the animal of *M. argenteus*, and I have failed to make anything that would be reliable out of my resuscitated specimens.

NOTES.

On some large specimens of Valvata piscinalis.—I have recently received from the Concygre Reservoir, near Dudley, Staffordshire, some specimens of *Valvata piscinalis*, Müll., which seem worthy of recording on account of their large size. Three of the largest specimens measured in height 6·9, 6·8, and 6·5 mm., whilst the average of twenty was 6 mm. I at first thought that possibly this large size was due to the great volume of water in which they had lived, but curiously to say, examples of *Limnæa peregra* and *L. glabra*, which were found in company with *V. piscinalis* were all very small.—Walter E. Collinge.

Note on Helix rufescens.—In 1894, Mr. Collinge recorded the occurrence of *H. rufescens* from Selly Oak and near Olton, Warwickshire (Journ. B'gham. N. H. & Phil. Soc., 1894, vol. 1, p. 18). Previous to this, local conchologists doubted the presence of this widely distributed species, in the neighbourhood of Birmingham. The late Mr. G. Sherriff Tye, who had worked the district for very many years, had never met with it. It may therefore be of interest to record that I have taken upwards of a dozen specimens in the Solihull and Knowle district during the last five years. I have also recently examined the late Mr. W. G. Blatch's collection, which is now in my possession, and I find there thirteen specimens labelled "Knowle," collected between 1872 and 1877.—H. Willoughby Ellis.

3 "Challenger" Pelecypoda, p. 281, pl. xvi, figs. 10, 10b.

PROCEEDINGS OF THE MIDLAND MALACOLOGICAL SOCIETY.

19TH MEETING, MAY 11TH, 1900.

The President in the Chair.

New member elected: Mr. E. B. Smith.

EXHIBITS.

By Mr. Breeden: Shells of *Azeca tridens* and its variety *crystallina* from Birdlip.

By Mr. Overton: Shells of *Hyalinia draparnaldi* and *H. collaria* from Tenby; *H. glabra, nitidulus, purus, crystallina, excavatus, radiatulus,* and *alliarius,* from Sutton; *H. nitidulus, purus, and alliarius* from Dudley, also the variety *viridula* of the latter species from the same locality. *Vitrina pellucida* from Sutton, and its variety *depressiuscula.* Specimens of *Succinea elegans* and *putris* from Deal, Tenby, and Sutton.

By Mr. Bloomer: Shells of *Paludomus gardneri,* Rve., *undatus,* Rve., *neritoides,* Rve., *loricatus,* Rve., and *Acavus skinneri,* Pfr., all from Ceylon. Various Indian species of *Cyclophorus.*

20TH MEETING, JUNE 8TH, 1900.

The President in the chair.

The following additions to the Library were announced, for which thanks were voted: 26 pamphlets from Mr. Cecil Tye.

PAPER READ.

Note on some large specimens of *Valvata piscinalis,* Mull., by Walter E. Collinge.

EXHIBITS.

By the President: Shells of *Valvata piscinalis,* and of 9 species of British land molluscs presented to the Collection.

By Mr. Bloomer: Shells of *Helix hortensis* from Edge Hills, Warwickshire, presented to the Collection, and *Limnaea stagnalis* from Edgbaston Pool.

By Mr. Overton: Specimens of 41 species of British land and freshwater shells presented to the Collection.

CURRENT LITERATURE.

Pilsbry, H. A. — Tryon's Manual of Conchology, ser. ii, vol. xiii (pts. 49, 50), pp. 1–112. pls. i—xxiv.

Continuing the *Bulimulidae,* Dr. Pilsbry deals first with *Bothriembryon* (*Liparis,* Martens *nec* Olivier), a genus confined to Western and Southern Australia, with a single species in Tasmania. Passing then to *Placostylus,* he arranges the species in a geographical sequence. The genus is divided into nine sections, of which *Leucocharis* (type *P. pancheri*), *Placocharis* (type *P. macgillivrayi*), and *Callistochoris* (type *P. malleatus*) are new. In the present parts the species from New Zealand and Lord Howe Island, New Caledonia, New Hebrides, New Guinea, and the Solomon Islands are dealt with, and a commencement made with those from the Viti or Fiji Islands. In considering the New Caledonian fauna, we are pleased to see that the author has endeavoured to restrict the abundance of "specific" names given to slight mutations, and are thoroughly in accord with him that "there cannot be much doubt that too many species have been described from

specimens which represent merely individual or racial variations." With reference to the resemblance of *Placostylus* to *Partula*, noticed by Kobelt and others, Dr. Pilsbry regards it as quite superficial, and does not agree that it indicates the relationship claimed. We should much have liked to see some detailed discussion *re* the affinities of this interesting group, as it is, they are dismissed with the bald statement "The affinities of the group are nearest to *Bothriembryon*." We are not alone in regretting that in a great work of this kind such a feature should be so curtailed or omitted, a shortcoming which has ever characterised the chief monographs.

The following new species and varieties are described: *Bothriembryon physoides* v. *humilis*, *B. gunni* v. *brachysoma*, *Placostylus fibratus*, Marts., v. *strigatus*, *P. heterostylus* (New Hebrides), *P. garretti* (Habitat unknown, Viti group?)—W. E. C.

Sarasin, P. and F.—Die Land-Mollusken von Celebes. Demy 4to, pp. viii + 248, Tfn. 1—31. Wiesbaden: 1899, C. W. Kreidel.

The Drs. Sarasin are to be congratulated on the appearance of the second volume of their studies on the Mollusca of the Celebes. We had occasion to speak very highly of the previous volume treating of the freshwater species, and the present volume is fully equal, if not superior, to it. So far as printing and plates are concerned, no previous work which we can call to mind has reached the standard here attained. Indeed, plate 18, containing twenty coloured figures of the shells of *Xesta*, is, in our opinion, the finest coloured illustration of shells yet produced.

Apart from the great value of this work as a faunistic record, the two most notable features are, the invaluable observations upon the various forms or subspecies of certain molluscs, and the very important chapter treating of the anatomy and development of *Vaginulus*, and the anatomy of the genus *Atopos*.

After deducting the varieties, 170 species are enumerated, of which about one third are new, in addition to many new subspecies and varieties. Of these 140 are endemic, while 37 also occur in districts outside the Celebes. Various species are divided into "*forms*," the exact value of which varies in different cases; variety and subvariety would perhaps be preferable terms in some cases, whilst in others, distinct geographical races are indicated, e.g., *Obba listeri*, Gray, forms *mongondica*, *tominica*, *matinangensis*, and *buolica*.

Space will not permit an enumeration of all the new species, but some of the more important may find mention. There are seven new species of slugs described belonging to the following genera: *Vaginulus* 2, *Atopos* 4, *Philomycus* 1. In the *Nanina* group there are many interesting new species of which we may cite *Xesta porcellanica*, *ardens*, *fennemae*, *Hemiplecta weberi*, *wichmanni*, and *braam-morrisi*. Amongst others are *Cyclotus jellesmae* and *bonensis*, *Streptaxis nautilus*, and *celebicus*, a series of "forms" of *Obba listeri*, Gray, and *O. papilla*, Müll. All the new species, &c., are figured, in addition to many others.

To the authors, publisher, and all who have helped to produce this beautiful work, we offer our warmest congratulations.—W. E. C.

Pfeiffer, W.—Die Gattung *Triboniophorus*. Zool. Jahrb. (Abth. f. Morph.), 1900, Bd. xiii, pp. 293—358, Tfn. 17—20.

In 1898 Dr. Plate gave a valuable account of the anatomy of the genus *Janella* and Dr. Pfeiffer has now supplemented this by his study of the genus *Ancitea*, or as he prefers to term it *Triboniophorus*. The specimens selected for this investigation were three from Brisbane, which belong to a species hitherto undescribed, and which is now named *T. brisbanensis*. This species has been carefully compared with *A. graffei*, Humb., and its varieties *schutei*, Kfst., and *krefftii*, Kfst., the three remaining species *A. macdonaldi*, Gray, *A. hirudo*, Fisch., and *A. modesta*, C. and F., do not seem to have received attention.

The chapter on the Literature and Habits is very far from complete. The general anatomy shows a close relationship to *Janella*. The generative organ-

approach most nearly to those of *A. krefftii*, Kfst. (cf Zeit. f. wiss. Zool., 1865, Bd. xv, pp. 76—85, T. vi), although there are many important differences.—W. E. C.

Drew, G. A.—Locomotion in *Solenomya* and its relatives. Anat. Anz., 1900. Bd. xvii, pp. 257—266, figs. 1—12.

Dr. Drew gives an interesting account of the movements of burrowing and the musculature involved, in *Nucula*, *Yoldia*, and *Solenomya*. Taking *Yoldia* as an example, the movements and muscular systems being similar in all three genera, the various movements concerned in burrowing are explained, also those of leaping, whilst in *Solenomya* a third method of locomotion is described, that of swimming, which is effected by the expulsion of strong jets of water through the posterior opening of the mantle chamber. Possibly these jets are of use in cleaning the mantle chamber and burrow, and the animal has made use of them secondarily as a means of locomotion.—W. E. C.

Dautzenberg, Ph., et Fischer, H.—Description d'un mollusque nouveau. Bull. Soc. Zool. France, 1899, T. xxiv, pp. 207—209, figs.

The shell here described belongs to an exceedingly interesting mollusc, which is described by Prof. Pelseneer. Large numbers were found attached to a fragment of the beak of a Cephalopod, dredged off the Azores at a depth of 1557 metres, by the "Princess Alice." *Bathysciadium conicum, n. g. et. sp.*, is the name given to this mollusc, and it is placed in a new family—*Bathysciadidae*.—W. E. C.

Pelseneer, P.—Note sur l'organisation du genre *Bathysciadium*. Bull. Soc. Zool. France, 1899, T. xxiv, pp. 209—211, figs. 1—3.

Prof. Pelseneer gives an interesting account of the structure and affinities of *B. conicum*. No trace of eyes, gills, or ctenidia were found. The nervous system is similar to that of the *Patellidae*. There are two otocysts, each containing a single spherical otolith. The radula is very long and has 1 median, 3 lateral, and 1 marginal tooth on each side. The heart has a single auricle. There are two nephridia, that on the left side being much larger than is usual in the *Patellidae*. The species is regarded as hermaphrodite, but so exceptional a condition requires further confirmation. There is a long cephalic appendage, which is thought to be a copulatory organ. While possessing the general characters of the *Patellidae*, it is distinguished from all the existing families by the remarkable otocysts, the hermaphrodite condition, and the form of the radula.—W. E. C.

Melvill, J. Cosmo.—A Revision of the Textile Cones, with description of *C. cholmondeleyi*, n.sp. Journ. Conch., 1900, vol. ix, pp. 303—311, 1 fig.

No one is more competent than Mr. Melvill to treat of the subgenus *Cylinder*, Mont., and in the paper before us he gives a very useful revision of the 45 known forms. *C. cholmondeleyi* is described as a new species, which hitherto has been confused with *C. pyramidalis*, Lam. In its markings it somewhat resembles *C. corbula*, Shy., or *C. cuetrios*, Shy. The type is in the Manchester Museum.—W. E. C.

Sykes, E. R.—Fauna Hawaiiensis, 1900, vol. ii. Mollusca. With Intercalations on Anatomy by Lt.-Col. Godwin-Austen. pp. 271—412, pls. xi—xii.

Mr. Sykes has here given an extremely valuable account of the Land and Freshwater Mollusca of the Hawaiian Islands. He is of opinion that the fauna is nearly related to that of the Polynesian Islands, showing little trace of any continental influence, Asiatic or American. In nearly all cases the species are confined to one island. By a series of tables it is shown that 50 species are peculiar to Kauai, 175 to Oahu, 44 to Molokai, 25 to Lanai, 64 to Maui, and 37 to Hawaii.

Turning to the Systematic portion, 476 species and 30 varieties are enumerated. *Godwinia* is a new genus proposed for the *Vitrina caperata* of Gould. *Philonesia*,

a new genus with the *Microcystis baldwini*, Ancey, as the type. *Achatinella (Partulina) confusa*, a new name for *A. physa*, Newcomb. *Amastrella*, a new subgenus of *Amastra*, type *A. rugulosa*, Pease. *Kauaia*, a new subgeneric name for *Carinella*, Pfr., 1875, the latter having been used by Sowerby in 1839. The new species are: *Achatinella (Achatinellastrum) wailuensis, Perdicella fulgurans, Leptachatina arborea, conicoides, conversiuscula, emerita, imitatrix, konaensis, supracostata, vana, Auriculella perkinsi, Tornatellina compacta, confusa, cylindrica, perkinsi, trochoides, Succinea protracta*, and *Ancylus sharpi*.

A very complete bibliography, enumerating the titles of 178 works is given, and an exceedingly useful list of named forms, which are placed in the present work as varieties or synonyms.—W. E. C.

Collinge, Walter E.—Report on the Slugs. A. Willey's Zoological Results, 1899 [1900], pt. iv, pp. 429—438, pls. xl—xli.

The new species are *Veronicella willeyi*, from Lifu, Loyalty Islands, and *V. brunnea* from Esafate, New Hebrides. Two new varieties—*albida* and *fuscopallescens*—of *Anciteila berghi*, Plate, are described from Karavia, New Britain.

Aneitea hirudo, P. Fisch., is recorded from Lifu, and *V. leydigi*, Simr., and *V. hedleyi*, Simr., both from Esafate.

Pruvot, G.—Sur deux Neoméniens nouveaux de la Méditerranée. Arch. Zool. exp. et gén., 1899, T. 7 (s3), pp. 461—509, pls. xii—xiv.

Professor Pruvot describes two new genera and species of unusual interest. The first, *Stylomenia salvatori* is regarded as a transitional form, and its structure, which is treated of at some length, indicates many primitive characters. Like the genus *Ismenia* it finds its natural position in a group between the *Proneomeniidae* on the one hand and the *Neomeniidae* on the other. The second form, *Strophomenia lacazei* is probably derived from *Rhopalomenia aglaopheniae*, Kow. et Mar., or some closely allied form. Its actual affinities, however, are with *Pruvotia sopita*, Pr., and perhaps a Notomenia, described by Thiele, from Australia. In any case it represents a degenerate Neomenian, modified under the influence of parasitism.

Figures of both forms are given, in addition to many others, illustrating the structure.—W. E. C.

Williamson, M. Burton.—Æstivation of *Epiphragmophora traskii* in Southern California. Naut., 1900, vol. xiv, pp. 13—15.

Unlike their congeners of the eastern states, which hibernate during the winter months, the helices in southern California exhibit the greatest activity during this period, hibernating during the summer. "The reason for this is that the food supply is plentiful in the winter when the warm rains prevail; and during the summer months the arid condition of the foot-hills, the habitat of these quiet creatures, made the æstivation of snails a necessity, a question of economy, an adjustment of demand and supply. In process of time the necessity for æstivation rather than hibernation became a habit."—W. E. C.

Baker, F. C.—A Revision of the *Physæ* of Northeastern Illinois. Naut., 1900, vol. xiv, pp. 16—24.

This is a useful and interesting piece of work. The following species, &c. are described and figured: *P. heterostropha*, Say, *P. sayii*, Tappan, *P. gyrina*, Say, and var. *elliptica*, Lea, and *P. integra*, Hald. Some interesting observations on *P. gyrina* are given, from which we quote the following: "It is very interesting to watch a number of *Physæ* in an aquarium; as they are crawling along the bottom, one will be seen to rise suddenly to the top of the water and move along with the foot applied to the surface, the shell hanging down. Again, they may be seen descending, suspended by a thin thread of mucus. When the animal rises suddenly, the branchial cavity opens with a faint clicking sound, probably due to

the pressure of air in the lung. This species frequently inhabits water so cold as the freezing point, and may be observed in winter gliding along the bottom of a pond when the surface is frozen. The eggs are deposited on stones, the under side of sticks, etc., and are composed of large, glairy, transparent masses. * * * The egg masses measured 20 by 4 mill., and contained from 120 to 200 eggs." W. E. C.

Donald, J.—On some recent Gastropoda referred to the family *Turritellidæ* and their supposed relationship to the *Murchisoniidæ*. Proc. Malac. Soc. Lond., 1900, vol. iv, pp. 47—55, pl. v.

The object of Miss Donald's paper is to draw special attention to the shells of "some recent Gastropoda which bear considerable resemblance to certain fossil forms referred to the family *Murchisoniidæ*," in the hope that the animals as well as the shells may be studied, with the view of learning more of their affinities.

The genus *Murchisonia* is especially characterised by the possession on the outer lip of a deep narrow slit, many other genera show the same character, but otherwise differ greatly from the shells of the above mentioned genus, excepting seven species of *Turritella* and four new species which are here described under a new section *Colpospira*, with *Turritella runcinata*, Watson, as the type. Until the animal is known, the author thinks it advisable to regard *Colpospira* as a section of *Turritella*. All the species of this group have been dredged off the coasts of Australia, Tasmania, and New Zealand. The new species are *T. (Colpospira) smithiana*, *crenulata*, *godeffroyana*, *quadrata* and a variety *scitula*, nov. of the last named species. In *T. quadrata* the sinus is much broader and shallower; should it later be proved that the animal shows structural differences, Miss Donald suggests the name of *Platycolpus* for a new section for its reception.

It is to be hoped that sufficient material of some of these species for anatomical investigation may soon be obtained.—W. E. C.

Babor, J. F.—Mittheilungen über Nacktschnecken in der Sammlung des K. K. naturhistorischen Hofmuseum. Ann. d. K. K. naturhist. Hofmuseums, Wien, 1900, Bd. xv, pp. 95—102.

Two new species are described, *Ariolimax steindachneri*, from Puget Sound, North America, and *Atopos (Padangia*, subg. n.) *schildii*, from Padang, Sumatra.

Babor, J. F.—Uber die Nacktschnecken der Grazer Umgegend. Verhandl. d. D. Zool. Gesell., 1900, pp. 148—150.

Randles, W. B.—On the Anatomy of *Turritella communis*, Risso. Proc. Malac. Soc. Lond., 1900, vol, iv, pp. 56—65, pl. vi.

In view of the recent discussions upon, and the suggested affinities between, certain species of *Turritella* and the extinct genus *Murchisonia*, Mr. Randles' account of the anatomy of *T. communis* is very welcome. After a general description of the alimentary canal, radula, generative organs, the nephridium, gill, osphradium, and nervous system, the author concludes that though *Turritella* is in no way particularly specialised, it can hardly be regarded as approaching a primitive type; some few characters are undoubtedly primitive, such, for example, as the presence of an epipodium, the fringed and papiliated mantle, and in some species the presence of otoconia. The aggregate characters, however, especially as regards the nervous system, indicate that *Turritella* is a fairly highly organised monotocardian, and not at all approaching in structure the Diotocardia.—W. E. C.

Vayssière, A.—Description de deux espèces de Pleurobranchidés. Journ. de Conchyl., 1900, vol. xlviii, pp. 8—11.

The new species are *Oscaniopsis ombonei* and *Pleurobranchaea capensis*.

Kennard, A. S., and Woodward, B. B.—The Pleistocene non-marine Mollusca of Ilford. Proc. Geol. Assoc., 1900, vol. xvi, pp. 282—286.

Buddicom, R. A.—The Land and Freshwater Molluscs of Church Stretton. pp. 16, and plate. Shrewsbury: 1900.

Records 42 species, with notes on the distribution, habits, &c.

Cockerell, T. D. A.—A new *Philomycus*. Naut., 1900, vol. xiv, p. 59.

P. secretus, n. sp. "Length (in alcohol) 12 mm. Mantle very dark grey, with numerous small black spots, best seen at the sides. Body pallid, sole whitish with an ocherous tint. Jaw light yellow, arched, with five strong ribs in the middle, nearly the outer thirds being ribless. Teeth 9—11—13—1—13—11—9. The side cusps on both centrals and laterals are very small. Penis-sac as Binney describes for *P. hemphilli*.

Hab.—Roan Mtn., Mitchell Co., Nth. Carolina (A. G. Wetherby)."

Prof. Cockerell's new species differs from *P. hemphilli*, W. G. Binn., which it resembles by the characters of its jaws, "mainly in being only half the size." We hope, at an early date, the author will figure and describe the animal in greater detail, and give some account of the anatomy.—W. E. C.

Sykes, E. R.—The Zoological Record, London: 1900. Record vii, Mollusca, pp. 1—87.

With the increase in the number of workers and their writings this publication yearly becomes more and more indispensable. The present part chronicles papers dated from 1896 to 1899, although it is not always clear what the date is that any given paper bears, for, as we have previously pointed out, the year of publication is seldom given. For a work of this kind it is surprising how few slips the Recorder has made, we note, however, on p. 41, under Java, that *Microparmarion javanica*, n. sp., are omitted. The number of papers referred to under the "Systematic" portion, which do not find mention under "Titles," is, we regret to say, largely on the increase.

Hitherto the Record has taken no notice of abstracts and critical reviews of papers given in the "Journal of the Royal Microscopical Society," this, and other publications; whilst their inclusion would add largely to the number of pages, it would nevertheless make the Record more complete, and we venture to direct the Recorders attention to the consideration of this matter.—W. E. C.

Sturany, R.—Lamellibranchiaten des Rothen Meeres. Denk. K. Akad. Wiss. Wien, 1899, Bd. lxix, pp. 255—295, Tfn. i—vii.

In all 148 species were obtained of which 20 are new, these belong to the following genera: *Solecurtus* 1, *Lyonsia* 1, *Cuspidaria* 4, *Pseudoneaera* (n. g.) 1, *Raeta* 1, *Cardita* 1, *Limopsis* 1. *Anussium* 2. *Gastrochaena* 3. *Tellina* 1, *Chione* 1, *Diplodonta* 1, *Scintilla* 2. All the new species are liberally illustrated.—W. E. C.

Jensen, A. S.—Studier over nordiske Mollusker. I. *Mya*. Særtryk af Vidensk. Meddel. fra den naturh. Foren. i Kbhvn., 1900, pp. 133—158.

Jensen, A. S.—Om Leoninger af Grundtvandsdyr paa store Havdyb mellam Jan Mayen og Island. Ibid., pp. 229—239.

Rogers, Thomas.—The Eggs of the Kerry Slug, *Geomalacus maculosus*, Allman. Irish. Nat., 1900, vol. ix, pp. 168—170, pt. pl. v.

Nichols, A. R.—A List of the Marine Mollusca of Ireland. Proc. Roy. Irish Acad., 1900 (3), vol. v, pp. 477—662.

Byrnes, E. F.—The Maturation and Fertilisation of the Eggs of *Limax* [*Agriolimax*] *agrestis*, L. Journ. Morph., 1899, vol. xvi, pp. 201—236, pls. xi, xii.

THE

JOURNAL OF MALACOLOGY.

No. 8. DECEMBER 1ST, 1900. VOL. VII.

NOTES ON SOME FURTHER MALFORMED SPECIMENS OF ANODONTA CYGNEA, L.

BY H. H. BLOOMER.

SINCE my paper appeared in the June number of this Journal[1] describing certain malformations in the animal and shell of *Anodonta cygnea*, L., I have received from Mr. S. P. Bolton two more specimens, which, while exhibiting some similar malformations present others of an interesting character.

In the first specimen the left valve is fractured just below the umbo, and from here an indentation extends nearly to the ventral edge, while opposite to it, the right valve though not showing any sign of fracture is also slightly indentated, but in this case the indentation extends for about only half the distance.

On examining the animal I found that both the right and left mantle lobes were thickened along the part adjacent to the injury, the left lobe more so than the right one. The gills on the right side are normal, but those on the left have both received considerable injury, curious to say the inner one more than the outer one. A transverse section of the animal in the region of the injury (fig. 1), shows a fusion of the outer side of the left outer gill with the left mantle lobe, and a slight fusion of the outer side of the left inner gill with the inner

1 Journ. of Malac., 1900, vol. vii, pp. 126—128, pl. vii.

side of the left outer gill, very little remaining of the left inner gill. The left outer supra-branchial canal (fig. 1. sc) is considerably larger than the right outer one.

In the second specimen there is a large fracture of the right valve, which at the time it occurred evidently forced in a large mass of the valve. The animal afterwards rebuilt the shell beneath the fracture, the new portion consisting of the calcareous and nacreous layers only. On the inner side of the right valve there has arisen a thin ridge of shell 13 mm. long, and 7 mm. high, which passes in a posterior direction and is set at right angles to the valve. Dorsally there is a second, much smaller ridge, running parallel with the former one. The animal exhibits very few signs of injury. The ridges, mentioned above, have penetrated the posterior adductor muscle, the right portion of which has spread out and become forced into a more anterior position than the left portion, thus deforming the right kidney. Other than this the animal appears quite normal.

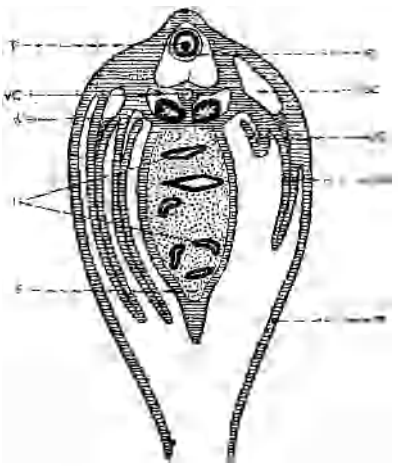


Fig. 1.—Transverse section of *Anodonta cygnea*, L.

F. foot, I. intestine, K. kidney, L.I.G. left inner gill L.O.G. left outer gill M. mantle, P. pericardial cavity, R. rectum, S.C. left outer supra-branchial canal, T. typhlosole, V.C. vena cava.

DESCRIPTION OF A NEW SPECIES OF VERONICELLA FROM THE FIJI ISLANDS.

By WALTER E. COLLINGE,

The University, Birmingham.

Some short time ago Prof. Gustave Gilson sent to me for indentification, a specimen of *Veronicella* collected by him in the Fiji Islands. Later he has very kindly placed further material in my hands for anatomical investigation. The species is a new one, and I am now giving a description of it, the account of its internal structure will appear elsewhere at a later date.

I have much pleasure in associating with this new form the name of Prof. Gilson.

Veronicella gilsoni, n. sp.

Like most species of this genus, there is little to distinguish it by the external appearance. Dorsally it is a dirty yellow colour with small, irregularly distributed, blackish blotches, and finely granulated. The perinotum is finely indented on its marginal edge, and is a brighter yellow colour than the notum; the hypnotum is a greenish-yellow colour. Foot-sole yellowish-brown, marked by a series of fine, regular, transverse lines.

Length (in alcohol) 23·5 mm.; foot-sole 2·5 mm. broad; hypnotum 4·5 mm. broad; female generative orifice situated on the right side 2 mm. from the foot-sole, 11 mm. from the right lower tentacle, and 9·5 mm. from the posterior end of the body.

Hab.—Nabukaluka, River Waidina, Viti Levu.

Type.—In my collection.

NOTE ON THE GAEOTIS DOUVILLEI OF DE MORGAN.

By WALTER E. COLLINGE,

The University, Birmingham.

In a recent part of the "Manual of Conchology" (1899, vol. xii, p. 228) Dr. Pilsbry, in treating of the Genus *Gaeotis* writes "*Gaeotis douvillei* de Morgan from the summit of Mount Tchabang, Perak, is doubtless a *Girasia* allied to *G. (Africarion) ater*, Godwin-Austen." On seeing this statement Professor Cockerell wrote me suggesting that I should

look up the original description and figure, and see if it differed at all from *Pseudaustenia siamensis*, Ckll.[1] As the Asiatic slug-like molluscs are so very imperfectly understood, the subject is perhaps worthy of a short note.

De Morgan's description[2] is as follows:

"*Animal.*—Limaciforme allongé, d'un brun clair, orné de chaque côté de deux bandes longitudinalis noires.

Coquille.—Unguiliforme, aplatie, fragile, très mince, transparente, composée de deux demi-tours de spire, la partie inférieure manquant, le dernier est très grande, stries d'accroissement très fines.

Dimensions. Long. 9 mm.; larg. 5·5 mm."

This is accompanied by a figure showing a *Peltella*-like slug. Both the description and figure are poor, and were it not for the latter, it would be very difficult to say to what genus this species belonged. Although poor, the figure is sufficiently clear to show that the species is closely allied to *Peltella*, in fact, is in all probability rightly assigned to the genus *Gaeotis*, I am therefore at a loss to understand Dr. Pilsbry's statement "doubtless a *Girasia*."

With reference to *Pseudaustenia siamensis*, Ckll., the type of which is in the British Museum collection; through the kindness of Mr. Edgar A. Smith, I have recently had an opportunity of examining this. There are two examples, and judging from the external appearance I should say they both belong to the genus *Parmarion* and are probably allied to *P. pupillaris*, Humb., if they are not young examples of that species. It is, however, very difficult to separate these slug-like molluscs on their external characters, and possibly *P. siamensis* would on dissection prove to be a valid species.

HELIX LAPICIDA, L., MONS. SINISTRORSUM, NOV.?

By F. J. PARTRIDGE.

Whilst staying at Lynton, North Devon, last summer I was fortunate enough to find a full grown sinistral example of *Helix lapicida*, L. There is a large colony of the type here inhabiting a low wall, together with the varieties *ecarinata* and *albina*. After a shower of rain they come out, covering the wall and adjacent rocks in countless profusion; and although I have collected here for some years, and taken many

1 Ann. and Mag. N. H., 1891, p. 107.
2 Bull. Soc. Zool. France, 1885, x, p. 388, pl. 8, Fig. 9.

forms of this species peculiar to the district, I have never before been fortunate enough to find a sinistral monstrosity.

The shell and animal seem typical in sculpture, form, and colour, having the peculiar looking glass appearance which seems to be characteristic of such shells as are typically dextral.

In looking up the literature upon this species I have failed to find any mention of a sinistrorse monstrosity, possibly foreign literature may contain such a record, and if so I should be glad of the reference.

PROCEEDINGS OF THE MIDLAND MALACOLOGICAL SOCIETY.

21ST MEETING, SEPTEMBER 14TH, 1900.

The President in the chair.

Several donations to the Library were announced, and thanks voted to the donors.

EXHIBITS.

By Mr. Overton: Marine shells from Bridlington.

By Mr. Partridge: *Limax maximus* v. *cinero-niger*, from Horner, Somersetshire; *Unio margaritifer* from the River Taw, *Helix hortensis*, *H. lapicida* m. *sinistrorsum*, nov. from Lynton, Nth Devon: and *Acavus haemastoma* and *Cyclophorus ceylanicus* from Ceylon.

By Mr. Breeden: Shells of various local land and freshwater shells.

By the President: Animal of *Capulus hungaricus* from Mumble's Head.

22ND MEETING, SEPTEMBER 14TH, 1900.

The President in the chair.

The evening was devoted to a study of *Helix aspersa*. The President gave a short account of the life-history, distribution, and variation of the species illustrated by numerous specimens.

Mr. Willoughby Ellis exhibited about 300 specimens, and Mr. Breeden a smaller collection. Specimens of *Helix rufescens* from Knowle, Warwickshire, were also exhibited by Mr. Ellis.

23RD MEETING, NOVEMBER 9TH. 1900.

The President in the chair.

PAPERS READ.

1. On the Anatomy of Certain Agnathous Pulmonate Molluscs.
   By Walter E. Collinge.
2. On some further malformed specimens of *Anodonta cygnea*, L.
   By H. H. Bloomer.

EXHIBITS.

By Mr. Bloomer: Specimens in illustration of his paper, also shells of *Helix nemoralis*. A short account of the nomenclature, variation and distribution of *H. nemoralis* was read, the remainder of the evening being devoted to the examination of the various collections of this species contributed by the President, and Messrs. Bloomer, Breeden, and Overton.

CURRENT LITERATURE.

Pilsbry, Henry A.—Tryon's Manual of Conchology, ser. ii, vol. xiii (pt. 51), pp. 113—176, pls. 35—48. Philadelphia: Academy of Natural Sciences.

The Fiji species of *Placostylus* are here completed, and the subgenus *Diplomorpha*, Anc., treated of. *P. coxiana*, New Hebrides, is a new species. The author then gives a series of descriptions, previously omitted, of various Australian Bulimoid *Helicidae*.

The larger portion of the present part is devoted to the genus *Amphidromus*, Alb. Dr. Pilsbry concludes from the researches of Semper, Wiegmann and Jacobi, that the genus does not belong to the *Bulimulidae*, but to the *Ephiphallogona* group of the *Helicidae*. The genus is a difficult one, and will probably remain so for some time to come, in fact until our knowledge of the specific anatomical characters is more complete. Dr. Pilsbry groups the species in 20 groups, agreeing in part with those of Fulton. Seven of these groups are dealt with in the present part, and keys to the shell-characters are given in most cases.—W. E. C.

Bergh, R.—Ergebnisse einer Reise nach dem Pacific (Schauinsland 1896—1897). Die Opisthobranchier. Zool. Jahrb. (Abth. f. Syst.) 1900, Bd. 13, pp. 207—246, T. 19—21.

Dr. Bergh here describes the Opisthobranchs collected by Prof. Schauinsland in 1896—97. The new forms are *Chelidonura hirundinina*, Q. and G., v. *elegans*, Bgh. (n.? sp.), *Archidoris nyctea*, *Aeolidiella drusilla*, *A. faustina*, and *Sunla annuligera*, n. g. et sp. The new genus belongs to the *Flabellinidae*, and is characterised by the beautiful perfoliate rhinophoria, a rounded anterior margin to the foot, a triseriate radula, with a denticulate anterior margin to the lateral teeth, and an unarmed penis.—W. E. C.

Smith, J. Perrin.—Larval Stages of *Schloenbachia*. Journ. Morph., 1899, vol. xvi, pp. 237—268, pls. A—E.

Mr. Perrin Smith continues his very valuable studies on the ontogeny of the Ammonites. A short time ago he gave a very careful account of the development of the genera *Lytoceras* and *Phyloceras*, and in the present paper the larval stages of *Schloenbachia oregonensis* are dealt with. The species is a remarkable one, in that its descent is so very clearly shown through its ontogeny. In its development it repeats in the first five septa the history of *Anarcestes*, *Parodoceras*, and *Prionoceras*; then for about a single whorl it is a *Glyphioceras*; in the next one and a quarter a *Gastrioceras*; then for a little more than one-quarter of a revolution a *Paralegoceras*, the goniatite history terminating at two and five-eighths coils. It now develops a keel, and resembles one of the simpler Permian and Lower Triassic ammonites. Then follow the ananeanic, metaneanic, and paraneanic stages. With the appearance of the sixth whorl, the shell commences to take on its own proper characters, and is then in the ephebic stage. Thus it will be seen, the larval stages may be compared with Paleozoic genera. This interesting form offers a striking illustration of the law of the acceleration of development.

With the advance of the stage, the author finds that there is a great increase in the individual variation, this being still greater with the acquirement of adult characters, so that were it not for the transitions between the varieties, one would feel inclined to make several species out of one.—W. E. C.

Smith, J. Perrin.—The Development and Phylogeny of *Placenticeras*. Proc. Cal. Acad. Sci. (3rd ser.), Geology, 1900, vol. i, pp. 181—240, pls. xxiv—xxviii.

This paper is prefaced by an interesting "Introduction" on the law of tachygenesis. The author then devotes a section to a discussion upon the affinities of *Placenticeras* and *Hoplites* and gives a phylogenic table of *Placenticeras* and associated genera, which must both prove of value to all students of fossil Cephalopoda.

P. pacificum, n. sp. is nautiloid in septa, but ammonoid in its calcareous protoconch in the earliest larval stage. The middle larval stage shows a form not unlike the Paleozoic *Glyphioceras*; while the last larval stage is analogous to *Nannites*, a Mesozoic genus. In the adolescent period it passes through the following stages: first one corresponding to *Cymbites* or some *Cymbites*-like form, then to some ægoceran genus of Upper Triassic or Lower Jurassic age, then to one of the early perisphinctoid genera, then to *Cosmoceras* of the Jura, and lastly to *Hoplites*. Thus by ontogenic study it is shown that *Placenticeras* developed out of *Hoplites*, and must therefore be placed with the last mentioned group under the *Stephanoceratidae* and not *Amaltheidae*, as is usual in nearly all text-books.

A parallel study of the ontogeny of *P. pacificum* and *P. californicum* only serves to shew that the results must be interpreted with caution, the differences being largely due to unequal acceleration of characters.

In this and the previous paper we cannot attempt to do more than very briefly indicate the line of ontogenic research, to be fully appreciated, the complete papers must be carefully read, and this all malacologists should do.—W. E. C.

Sturany, R.—W. A. Obrutschew's Mollusken-Ausbeute aus Hochasien. Denk. K. Akad. Wiss. Wien, 1900, Bd. lxx, pp. 17—48, Tfn. i—iv.

Dr. Sturany in a very welcome contribution, enumerates 59 species and 4 varieties of which the following are new: *Plectotropis comata*, *Stalpnodiscus euphyes*, *Metodontia griphodes*, *Cathaica obrutschewi*, *C. perrosa*, *Platypetasus obrutschewi*, ? *Satsuma kutupaënsis*, *Buliminus schypaënsis*, *B. obrutschewi*, *B. diaprepes*, *B. teres*, *B. ecrampelinus* and var. *thryptica*, *B. commensalis*, *B. ottonis*, *B. asaphes* and var. *brevior*, *B. amphidoxus*, *B. interstratus*, *B. euonymus*, *Serina cathaica*, Grdlr., var. *egressa*, *Pupopsis dissociabilis*, *P. polystrepta*, *P. paraplesia*, *Opeas schensiense*, *Planorbis canescens*, *P. neumayri*, *Valvata kukunorica*, *Corbicula obrutschewi*, *C. methoria*, and *Unio tschiliensis*. All the new forms are figured, in addition to 9 previously described by Dr. von Möllendorff. A very useful Bibliography, enumerating upwards of 100 papers, completes this interesting memoir.

Sturany, R.—Diagnosen neuer Gastropoden aus dem Rothen Meere. Anz. K. Akad. Wiss. Wien, 1900, Nr. xvi, pp. 1—4.

The new species are *Fusus bifrons*, *Nassa thaumasia*, *N. steindachneri*, *N. aesta*, *N. munda*, *N. lathraia*, *N. stiphra*, and *N. sporadica*.

Hedley, C.—Studies on Australian Mollusca. Pt. i, Proc. Linn. Soc. N.S.W., 1900, pp. 87—100, pls. iii—iv, and 4 figs. in text.

Mr. Hedley hopes in this series of papers to "fix by illustration the identity of such unfigured species as" he can obtain, and to note the occurrence of species on the coast of N. S. Wales not previously recorded. In the present part he treats of the following: *Sirius*, n. gen., type *Raulinia badia*, T.-Woods. The author agrees with Tate in considering *Raulinia* indistinguishable from the prior *Isapsis*, H. and A. Adams. *Fossarus sydneyensis* and *Couthouyia aculeata*. *Menon* a new genus of *Eulimidae*, with *M. anceps* as the type. *Seila attenuata*, and *Trinostoma orbitum*. In addition to the above mentioned new species, figures of the following are also given: *Stylifer tokdderae*, Felt., *Zeidora tasmanica*, Bedd., *Amauropsis moerchi*, Ad. and Ang., *Lodderia minima*, T.-Woods, *Fissuridea lineata*, Sby., and the animal of *Notarchus glaucus*, Chsm.

Simroth, H.—Ueber einige Nacktschnecken von Montenegro and Corsica. Nachr. d. Deutsch. Malak. Gesell., 1900, pp. 77—95.

The following are described as new: *Limax wohlberedti*, *L. wolterstorffi*, *L. obscurus*, *Agriolimax corsicus*, *Amalia dalmatina*, *Am. montenegrina*. The absence of any figures considerably detracts from the value of an otherwise very interesting paper.—W. E. C.

Mead, A. D.—Observations on the soft-shell clam. 30th Ann. Rpt. Commis. Inland Fisheries, U.S.A., 1900, pp. 1—25, pls. i—xi.

The author here gives some interesting details relating to the life history, &c. of the soft-shell clam. The eggs are exceedingly minute and the egg-laying period probably extends over May and June. They are extruded in large numbers, and in a short time after fertilisation, develope into minute free swimming forms not at all like the adults. In this condition they live for several days and are carried away by the tides, they then settle down and attach themselves to some object, a stone or a piece of sea-weed. The experiments of transplanting seem to prove that the rate of growth is more rapid than is usually supposed, the most rapid growth taking place where the molluscs are under the water most of the time. Certain facts strongly indicate that they breed during the first year of their life, although the age at which they reach sexual maturity has not been definitely ascertained.

Pilsbry, Henry A.—*Metostracon*, a new slug-like genus of dart-bearing *Helicidae*. Proc. Malac. Soc. Lond., 1900, vol. iv, pp. 24—30, pl. iii.

In this interesting paper Dr. Pilsbry describes a slug-like mollusc derived from the true '*Helix*' stock, to which the name *Metostracon mima*, n. g. et sp. is given.

From the anatomical features a relationship to *Xanthonyx* is unmistakably indicated. Upon the affinities of these two genera the author makes some valuable observations. At first sight these genera recall the external form of certain *Arionidae—Binneya* and *Hemphillia*, the resemblance, however, is only superficial. The *Limacidae* and *Philomycidae* are obviously very different, whilst the slug-like genera of the *Bulimulidae* are clearly bulimuline. It would seem therefore that no known group of slugs will receive *Metostracon* and *Xanthonyx*; but a group of the *Helicidae* known as the Belogona Euadenia, agrees in all the important characters. The nearest allies then are apparently the genera *Epiphragmophora* and *Cepolis*, the four genera practically agreeing in all the important anatomical characters, excepting those correlated with the degeneration of the shell.

Whether *Xanthonyx* has an ally in the genus *Cryptostracon*, W. G. Binn., at present remains doubtful; this latter genus, the author thinks, may be a more advanced member of a sub-family which would contain the former genus and the new one here described. Seeing that it is by no means certain that these three genera have arisen from the same genus of Helicoid Belogona, the author refrains from so grouping them; certain anatomical features suggesting parallelism rather than a common phylogeny. This latter view, will, we think, be endorsed by malacologists.—W. E. C.

Pilsbry, Henry A.—Note on the Anatomy of the Helicoid genus *Ashmunella*. Proc. Acad. Nat. Sci. Phila., 1900, pp. 107—109, figs. 1—3.

An examination of the generative organs of *A. thomsoniana*, Anc., *A. porterae*, Pils. and Ckll., and *A. hyporhyssa*, Ckll., fully confirms the anatomical characters ascribed to this genus by the author in 1899. It is very distinct from *Polygyra*, and possibly related to the New Mexican species referred to the genus *Epiphragmophora*, which Dr. Pilsbry has examined. Judging from an immature example of *E. hachitana*, he thinks, a series of forms strikingly divergent in the reproductive organs from the Californian forms may be found here.

Pilsbry, Henry A.—Notices of new Japanese Land snails. Proc. Acad. Nat. Sci. Phila., 1900, pp. 381—384.

A Key to the Japanese species of *Aiycaeus* is given and the following new species and varieties described: *Diplommatina gracilis* v. *omiensis*, *Macrochlamys micrographa*, *Kaliella multivolvis*, *Vitrea harimensis*, *Georissa japonica*

Pilsbry, Henry A.—New South American Land snails. Proc. Acad. Nat. Sci. Phila., 1900, pp. 385—394, pls. xi, xii.

The following are new: *Happia iheringi*, *Polygyratia sargenti*, *P. affinis*, *P.*

stenostrepta v. *declinata Epiphrag. oresigena*, Orb., v. *bernardius*, v. Ihering, *Strophocheilus oblongus*, Müll., v. *sanctaepauli*, v. Ihering and Pils., *S. paranaguensis*, Pils. and v. Ihering, *Bulimulus steeri*, *B. haematospira*, *Helicina iguapensis*, and *H. inaequistriata*.

Ihering, H. von.—Description of a New *Strophocheilus*. Proc. Ac. Nat. Sci. Phila., 1900, p. 394, pl. xi, fig. 4.

S. pilsbryi from Sao Paulo, Brazil, allied to *S. rhodocheilus*, Rve.

Ihering, H. von.—Os Caracóes do genero *Solaropsis*. Rev. do Mus. Paulista, 1900, vol. iv, pp. 539—549, figs 1—12.

Dr. von Ihering describes the jaw, radula, and generative organs of *S. feisthameli*, Hupé, and *Psadara derbyi*, n. sp. *S. pilsbryi* and *S. bachi* are also new species. A key to the classification of the Brazilian species of *Solaropsis* is given, and a short account of their geographical distribution.

Stubbs, Arthur G.—The Land and Freshwater Shells of Tenby. Journ. Conch., 1900, vol. ix, pp. 321—28, 358—65.

The author records 70 species, 11 varieties, and numerous monstrosities. *H. aspersa* v. *rufula-zonata*, and *H. virgata* v. *coalita* are two new varieties. In addition to cataloguing the various forms, many interesting notes are given, e.g. the range of distribution of *H. pisana* in the neighbourhood, and various modifications of the shell of this species; a curious habitat of *Ancylus fluviatilis*; and various notes on the variation, etc.

Sykes, E. R.—On the genus *Acavus*, Mont. Proc. Malac. Soc. Lond., 1900, vol. iv, pp. 114—115.

The author recognises seven species, possibly *A. prosperus*, Albers, may prove to be only a variety of *A. haemastomus*, L. The *A. poleii* of Collett is regarded as only a white-lipped variety of *A. waltoni*, Rve.

Sykes, E. R.—On *Desponea cinnamomea*, n. sp., and type of a new subgenus *Chersodespoena*, with notes on some allied forms. Proc. Malac. Soc. Lond., 1900, vol. iv, pp. 136—138, 3 figs.

Sykes, E. R.—Notes on the non-marine Mollusca of Norfolk and Phillip Islands, with descriptions of new species. Proc. Malac. Soc. Lond., 1900, vol. iv, pp. 139—147, pl. xiii, and figs. i—iii.

The new species, etc., are: *Microcystis nux*, *M. castaneocincta*, *Trochomanina platysoma*, *Fretum*, *nom. nov.* for *Eurypus*, Semp., preoccupied, *F. suteri*, *F. grayi*, *Medyla imitratrix*, *Sitala macgillivrayi*, *Vertigo norfolkensis*, *Omphalstropis*, *brenchleyi*, *O. suteri*, *Paludestrina norfolkensis*. In addition to figures of all the new species, some drawings by Mr. Hedley, of species very briefly described by Cox and hitherto unfigured, are given; these are *Charopa (?) depsta*, Cox, *quintulae*, Cox, and *palescens*, Cox.

Gude, G. K.—Description of a new Species of *Plectopylis*, from Tonkin. Ann. Mag. N.H., 1900 (s. 7), vol. v, p. 313.

P. lepida, n. sp. Type in author's collection.

Gude, G. K.—Descriptions of new Species of Japanese Land Shells. Ann. Mag. N.H., 1900 (s. 7), vol. vi, pp. 398—401, 453—456.

The new species are: *Arnouldia ceratodes*, *A. nanodes*, *Crystallus sulcatus*, *C. velatus*, *Microcystis hirasei*, *Trishoplita cretacea*, *Plectotropis conica*, *Kuliella elata*, *K. crenulata*, *K. pagodaeloides*, *Pyramidula* (s. s.) *preliosa*, *Trishoplita dacostae*, *Ganesella tosana*, *Eulota (Euhadra) grata*, and var. nov. *zonata*. Types all in author's collection. We hope Mr. Gude will give figures of these.

Godfrey, R.—*Scpiola rondeletii* (Leach) in the Firth of Forth. Ann. Scott. Nat. Hist., 1900. p. 125.

Kellogg, J. L.—The Ciliary Mechanism in the Branchial Chamber of the Pelecypoda. Science, N.S. vol. xi, pp. 172–173.

Pilsbry, Henry A.—Note on the Australian *Pupidae*. Proc. Acad. Nat. Sci. Phila., 1900, pp. 426—430, figs 1—5.

Four genera of this family are represented, of which one, *Cylindrovertilla*, is known from Australia and New Caledonia only, the remaining three—*Pupoides*, *Pupa* and *Bifidaria*—being widely distributed. So far as their Australian distribution is concerned, they agree with the Epiphallogonous Helices and probably reached Australia by the same land connection and at the same time, from the northward.

Pilsbry, Henry A.—Note on Polynesian and East Indian *Pupidae*. Proc. Acad. Nat. Sci. Phila., 1900. pp. 431—433.

Dr. Pilsbry removes the Madeiran group *Staurodon* of Lowe from the nomenclature of Oriental *Pupidae*. In referring East Indian forms to this group undue weight has, he thinks, been given to a mere analogy. Four groups are recognised, viz. *Bifidaria*. Sterki, *Cylindrovertilla*, Bttgr., *Costigo*, Bttgr., and *Nesopupa*, Pils. (type *N. tantilla*, Gld.) In this latter group two sections are defined *Nesopupa* ss., and *Lyropupa*, nov. (type *N. lyrata*, Gld.).

Pilsbry, Henry A.—Additions to the Japanese Land snail fauna—II. Proc. Acad. Nat. Sci. Phila., 1900, pp. 443—448, pl. xiv.

The new forms are *Clausilia hakonensis*, *C. awajiensis*, *C. subaurantiaca*, *C. aulacophora*, *C. hirasei*, *C. hyperoptyx*, and *C. japonica* var. *surugae*.

Ihering, H. von.—On the South American Species of *Mytilidae*. Proc. Malac. Soc. Lond., 1900, vol. iv, pp. 84—98.

Dr. von Ihering here gives an excellent summary and classification of the American *Mytilidae*, a family which embraces two very difficult genera—*Mytilus*, L., and *Modiolus*, Lam. This family has previously attracted the attention of one of the most distinguished students of the *Pelecypoda*, Dr. W. H. Dall; and is now no less fortunate in having so able an exponent as the author of the present paper.

The great reliance which has been placed upon the position of the umbones, and the presence or absence of teeth, is here regarded in a much less important light; and the sculpture of the shell, and the presence or absence and position of the shell muscles are taken into consideration. In this particular feature the author differs from Dr. Dall; but it should be remembered that since part 4 of the "Tertiary Fauna of Florida" was published (1898), Dr. Dall himself is less inclined to attach the same importance to such characters, indeed, judging by his very apt remarks upon the "dentition" of the hinge in the *Leptonacea* (see this Journal p. 76), such characters are quite secondary.

While the present grouping seems to be an advance on any previously published, we must confess our surprise that all the characters of the actual mollusc, excepting the shell muscles, are entirely ignored. It is surely very evident that shell characters alone are unreliable, and we doubt very much if upon such, we can ever expect to see a classification which will indicate the phylogenetic relationships of any class or group of molluscs.

The following subgenera are new: *Eumytilus*, n. n. (=*Mytilus*, s. s.), type *M. edulis*, L; *Trichomya*, type *M. hirsutus*, Lam.; *Eumodiolus*, n. n. (=*Modiolus*, s. s.), type *M. modiolus*, L.—W. E. C.

GENERAL REVIEWS.

A Treatise on Zoology.—Edited by E. Ray Lankester.—Pt. ii. The Porifera and Coelenterа. By E. A. Minchin, G. Herbert Fowler, and Gilbert C. Bourne. With an Introduction by E. Ray Lankester. 8vo, pp. vi+37+178+81+84+25. London: 1900. Adam and Charles Black.

The second volume of this valuable work well sustains the high standard which characterised volume i. In the present volume there are six chapters, the first, by Prof. Ray Lankester, treating of the Enterocoela and Coelomocoela, will be welcomed by all zoologists as a masterly exposition of a difficult subject. After emphasising the physiological importance of the coelom, the history of our knowledge of the subject is dealt with, together with its relations to the vascular and excretory systems. The nephridia of the Platyhelmia, Nemertina, Rotifera, Chaetopoda, and embryonic Mollusca are shown to be of ectodermic origin, whilst in the remaining phyla these have been replaced by uropoëtic coelomoducts, which are parts of the coelomic wall itself.

The next chapter is devoted to the Porifera. Prof. Minchin groups these under three classes, viz.: -Calcarea, Hexactinellida, and Demospongiae. The portion devoted to this perplexing group takes up nearly half of the volume, and is by far the most comprehensive and detailed account that has yet been given in any English text-book.

Dr. Fowler ably treats of the Hydromedusae and Scyphomedusae in the two following chapters.

The Anthozoa and Ctenophora, dealt with by Mr. Bourne, concludes the volume.

Most of the illustrations are new, and all are excellent. At the end of each chapter is a carefully prepared bibliography, and a complete index.

The issue of volume ii only serves to emphasise the completeness of Prof. Ray Lankester's conception; while the comprehensive nature of this great work makes it indispensable to all teachers and advanced students, and a necessity in every public and scientific library.—W. E. C.

Descriptive and Illustrated Catalogue of the Physiological Series of Comparative Anatomy contained in the Museum of the Royal College of Surgeons of England. Vol. i. Second edition, pp. 1+160, pls. i—xiv, and 4 figs. in text. London: 1900. Taylor and Francis.

Prof. Charles Stewart and his able assistants, are to be heartily congratulated upon the appearance of this beautiful and intensely interesting volume. The subjects dealt with are the "Endoskeleton," "Flexible Bonds of Union and Support," and "Muscular and Allied Systems." The entry of each preparation bears a registration number, and in many cases a useful bibliographic reference; while in all cases the descriptions are wonderfully clear and concise. Very many of the preparations are new, and as near perfection as possible. This work should be in the hands of the Curator of every Natural History Museum in the country, it will at least show so far as a catalogue can, what can be done to illustrate Animal and Plant Structure, when the institution is guided and directed by a competent and qualified chief, even if he does not possess the rare curatorial genius of Prof. Stewart.

The work is illustrated by fourteen plates, mostly coloured, and while very beautiful, many fall a long way behind, so far as reproduction is concerned, those of continental lithographers.

We eagerly look forward to the publication of other volumes.—W. E. C.

A Monograph of Christmas Island (Indian Ocean): Physical Features and Geology. By Charles W. Andrews, with descriptions of the Fauna and Flora by numerous contributors. pp. xv+237. 21 pls., map, and figs in text. London: 1900. Published by order of the Trustees of the British Museum.

Christmas Island represents an area of about 43 square miles, and is situated about 190 miles from the nearest land, the intervening ocean attaining a depth of over 3 miles. Its limited fauna, it would seem, has been derived from the Sunda Archipelago, of which it probably once formed a part.

The account of the recent mollusca has been written by Mr. Edgar A. Smith, who described 11 different forms from this island in 1888, 9 of which have been collected by Mr. Andrews, besides single specimens of *Opeas subula*, *Melampus castaneus*, and *Assiminea andrewsiana*, nn. spp. Seven of the 14 recorded species are peculiar to this island, but "they belong to genera the species of which have no very striking characters." All the species are figured.

The fossil mollusca, from the reef-limestones, are described by Mr. R. Bullen Newton. The identifications that have been possible would seem to indicate the modern character of these shells.

The work is illustrated by 22 plates, many of which are coloured, a map, and numerous figures in the text. All concerned in the production of this interesting volume are to be congratulated.—W. E. C.

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Printed by Robert Birbeck & Sons, 158, Great Charles Street, Birmingham.