THE

JOURNAL OF MALACOLOGY

Established in 1890 *by* WALTER E. COLLINGE, *as* "THE CONCHOLOGIST, *a Journal of Malacology.*"

EDITED BY

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VOLUME IV.

LONDON: DULAU & CO.

BERLIN: FRIEDLAENDER & SOHN.

1895.

PREFACE.

The end of 1895 will see the completion of the fifth year of the publication of the JOURNAL OF MALACOLOGY, which has now reached its fourth volume, the parts issued in 1892 and 1893 forming Volume II.

Judging from the gratifying letters received from time to time, the present volume in no wise falls short of its predecessors, and as Acting Editor, I must sincerely thank those members of the staff on whose efforts the success of the JOURNAL has been largely dependent, as well as the literary and artistic contributors during the year. The care expended by the printer on the production of the work should also be made mention of.

It is contemplated that after this number, the BIBLIOGRAPHY should be put into the hands of Mr. E. R. Sykes, who has kindly offered to superintend the whole of the work in connection with this department.

Nothing more remains to be said except to express the hope that in 1896 still better work may be aimed at and accomplished.

WILFRED MARK WEBB.

CONTENTS OF VOLUME IV.

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Vol. IV. (No. 1.)

CONTENTS.

March 30th, 1895.

London: DULAU & CO., 37, Soho Square.

Berlin: FRIEDLÄNDER & SOHN, Carlstrasse 11.

Quarterly. Issued Post-free to Subscribers only, for 4s. 4d. per annum.

All communications to be made to—

WILFRED MARK WEBB, "Holmesdale," Brentwood, Essex, England.

THE

JOURNAL OF MALACOLOGY.

No. 1. MARCH 30th, 1895. Vol. IV.

OYSTERS AS DISSEMINATORS OF DISEASE.

JOHN C. THRESH, D.Sc., M.B., D.P.H., etc.

Editor of the Journal of State Medicine.

THE origin of the 'Oyster scare' which is so seriously affecting one of our great national industries, that of Oyster culture, appears to be known to few outside the medical profession, and many erroneous opinions are held with reference to the manner in which the Oysters cause Typhoid Fever. The two diseases which Oysters are believed to have helped to disseminate are Cholera and Typhoid Fever, both of which are now well known to be due to the entrance into the human system of certain organisms—Bacilli—peculiar to these diseases. Cholera cannot arise without the Cholera Bacillus, nor Typhoid Fever without the Typhoid Bacillus. It follows, therefore, that no article of food, including oysters, can cause either of these diseases unless the living bacilli are present. Such being the case, it is nonsense to talk about dead or stale oysters, or decaying food being the cause of either Typhoid Fever or Cholera. The freshest food, the freshest oysters, if contaminated with the specific bacilli, will cause one or other of these diseases, if partaken of by a susceptible person.

Oysters were first seriously suspected of causing Cholera, during 1893 when the disease was introduced several times into our ports. Shortly after this introduction, a number of cases of Cholera occurred in certain inland towns, which at the time could not be accounted for. At length, however, suspicion rested upon the Oysters which came from one of the ports and

from beds which were certainly contaminated with sewage. The full details, will shortly be published by the Medical Officer of the Local Government Board.

The first epidemic of Typhoid Fever attributed to the eating of Oysters occurred in October last in America. An outbreak of Typhoid occurred amongst the students of the Wesleyan College, Middletown, Connecticut, and its origin was fully investigated by Professor Conn. He found that on October 12th, the several fraternities of students had held their annual invitation supper. The attacks were limited to three fraternities who alone had partaken of oysters. Certain visitors had sat at their tables, and it was discovered that several of these had also been attacked. At the same time an outbreak of Typhoid Fever occurred at Amherst College, and it was found that the students there had had a supper on the same evening, and had eaten oysters from the same source, as those supplied to the Wesleyan College. Professor Conn's investigations seem to prove conclusively that the Typhoid germs had been conveyed by the oysters, and fortunately he was able to shew how the bacilli gained access to the oysters. The bi-valves in question came from a fresh-water estuary in which they had been laid to fatten and within 400 feet of where they were laid was the outfall from a sewer from a private house, in which house there were two patients suffering from Typhoid Fever. As the bacilli abound in the excreta of such patients, they would be discharged with the sewage near the oyster beds: some of them were received within the shell of certain of the oysters and so were conveyed into the alimentary canal of those who afterwards suffered.

When these details were published in the English Medical papers, an epidemic of Typhoid Fever was in progress in the West End of London which quite baffled the investigations of the Medical Officers of Health. Suspicion at once rested upon Oysters as a probable cause, and soon evidence was forthcoming that tended to incriminate them, and on January 12th Sir W. Broadbent, Physician to the Prince of Wales, published in the *British Medical Journal*, details of a series of cases, which he said he considered it his duty to make known, and which had convinced him that Oysters were capable of disseminating Typhoid Fever. Other cases have since been published and the evidence is now such as to bring conviction to any unbiassed mind.

Many (chiefly interested) persons have urged that Oysters

cannot convey Typhoid Fever because the Typhoid organism has not been proved to be capable of living in salt water. This is quite a mistake, for Professor de Giaxa, in the Bacteriological Laboratory at Naples, found that when Typhoid Bacilli were introduced into sea-water, they at first multiplied rapidly, but afterwards gradually died. Many, however, were still present on the ninth day. Cholera Bacilli disappeared more rapidly, the rate at which they decreased being dependent upon the number of other, non-pathogenic, organisms also present. Experiments were also made with oysters and other shell fish by inoculating them with the microbes of Cholera and Anthrax. After the shell fish had been replaced in sea water it was found that the microbe had disappeared in six hours. No experiments, with the Typhoid Organisms, appear as yet to have been made on these lines. It has, however, been pointed out that although the organisms introduced within the shells speedily die, that those which may be adherent to the edge of the shell may survive some time, and would be introduced into the oyster during the process of opening. Professor Crookshank, of King's College, who has recently made a series of bacteriological experiments with Oysters from a certain bed, says, that whilst the danger has been exaggerated, yet he is "convinced that it is quite possible that just as unboiled milk mixed with typhoid-infected water may distribute typhoid fever amongst the consumers, so also the liquid of uncooked oysters may be the means of conveying typhoid fever, if water infected with typhoid fever is imprisoned between the valves of the oyster."

The investigations which have been made by the special correspondent of the *British Medical Journal* and by well-known Medical Officers of Health prove conclusively that in several localities, sewage is discharged in dangerous proximity to the beds on which oysters are cultivated, and it is to be hoped that now that attention has been called to the matter, that this source of danger will speedily be removed. The Local Government Board, fully alive to the danger, has ordered an enquiry to be made, upon the possibility of Cholera and Typhoid Fever being conveyed by Oysters and other Molluscs which are consumed in an uncooked condition.

The scare has had a most serious effect upon the oyster industry, and no doubt will continue to affect it, until the public is assured that all possible precautions have been taken to prevent the pollution by sewage of all waters in which Oysters and other such Molluscs are bred or fattened.

DESCRIPTION OF A NEW SPECIES OF SLUG OF THE GENUS LIMAX, FROM IRELAND.

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

Demonstrator of Zoölogy and Comparative Anatomy, Mason College, Birmingham.

Some short time ago[1] I briefly described a specimen of *Limax* which I had received from Mr. James N. Milne, of Culmore, Derry, Ireland, which I thought to be sufficiently distinct, anatomically and otherwise, from any other known species, to rank as a species.

Mr. Milne has been good enough to procure for me another example from the same locality—viz., Rathmullan—and one from Walworth, Co. Derry, both of which confirm my previous diagnoses. I now wish to describe and figure the same, which I am naming *Limax hedleyi*, after Mr. Charles Hedley, F.L.S., the distinguished malacologist, of Sydney, N.S.W.

Limax hedleyi, sp. nov.

Ground colour chocolate black, with a light or yellowish-brown stripe on the keel, which is slightly interrupted anteriorly. The tentacles and fore part of the head are minutely spotted with brown. The ventral edges of the mantle and the parts of the body covered by the same are of a dirty white colour covered by irregular sepia dashes. There are no traces of banding. The region of the pulmonary orifice is distinct, standing out as a faintly-marked circular margin. Foot-fringe very dark sepia; foot-sole with lateral sepia-coloured planes and a white median plane. Keel very prominent, posteriorly attenuated. Generative orifice immediately below, and posterior to the right inferior tentacle.

Length 136 millimetres.

Habitat. Rathmullan, Co. Derry, Ireland. (James N. Milne).

1 Journ. of Malacology, 1894, vol. iii., p. 56.

Anatomy of Generative System.

The vestibule is indistinct, being formed partly by the terminal portion of the penis and free oviduct. The penis commences as a narrow tube dilating into a bulbous portion at about the first third of its length; from here it is a wide, thick, muscular walled organ, folded upon itself so as to form a spiral.

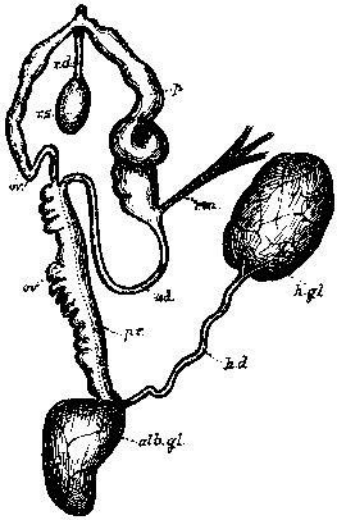

Fig. 1.—Generative system of Limax hedleyi, Cllge.

alb. gl.—Albumen gland.
h. d.—Hermaphrodite duct.
h. gl.—Hermaphrodite gland.
ov.—Oviduct.
ov'.—Free oviduct.
p.—Penis.
pr.—Prostate.
r. m.—Retractor muscle.
r. s.—Receptaculum seminis.
r. d.—Receptacular duct.
v. d.—Vas deferens.

The vas deferens is almost as long as the penis, of which it is a direct continuation; at the junction of the two organs a large retractor muscle is attached. The free oviduct is much shorter than the penis, and consists of a narrow tube, which, previous to its joining with the oviduct, makes a sharp loop (fig. 1), which was characteristic of the three specimens dissected. The oviducal portion (fig. 1, *ov.*) of the common duct is richly convoluted, becoming almost filiform at about its middle third; the prostatic portion (fig. 1, *pr.*) is a long, narrow tube, externally slightly pigmented. The receptacular duct, unlike that in *L. maximus*,

opens separately from the penis, so that one might very correctly speak of the portion into which the free oviduct, penis, and receptacular duct open, as a vestibule. The duct is quite distinct from the oval receptaculum seminis, which is about the same length as the duct. There is a large albumen gland. The hermaphrodite duct is long and not convoluted; it leads from the hermaphrodite gland, a large, oval-shaped body and is formed by the coalescence of two smaller ducts.

It may be questioned if it is worth while separating this form from *L. maximus*. I think it is for the following reasons:—

1. There are a number of very important differences in the form of the generative organs, constant in the three specimens examined, which distinctly separate *L. hedleyi* from *L. maximus*.

2. Judging from the specimens which I have seen, it is easily recognised by its external appearance as being distinct from *L. maximus*.

3. In studying the fauna of a country, isolated like Ireland, it is very important that varieties of any slug which appear constant, should be carefully noted, and if on examination it is found that there are anatomical differences which are constant in examples from different localities, it seems to me the best course to adopt, is to describe and name such.

4. That *L. hedleyi* is a form of *L. maximus* I readily admit, but it is sufficiently distinct to take specific rank. Such forms as *L. geographicus*, Ren., *L. subalpinus*, L. & P., *L. monticola*, Btg., are not more constant or better defined, yet there are few European malacologists acquainted with these slugs who would be bold enough to group them as varieties of *L. maximus*.

Limax hedleyi stands in the same relation to *L. maximus* as *Arion lusitanicus*, Mab., does to *A. empiricorum*, Fér.

AMALIA PARRYI, A SUPPOSED NEW SPECIES.

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

Mason College, Birmingham.

In the last number of the Journal[1] I described and figured the generative system of a species of *Amalia* from Santa Cruz, Tenerife, which I thought might be referred to *A. marginata*, Drap. The examples I compared it with are, I find, but poor specimens of Draparnaud's species; but I have recently received from Mr. F. Babor, of the Institute of Comparative Embryology of Prague, two examples in excellent condition, from which it is at once evident that I am wrong in classing the Tenerife specimens under this species. Mr. Babor suggests that it is the variety *raymondiana*, Simr.,[2] of *A. gagates*, which is the same as *maderensis*, Ckll.[3]

I have compared it carefully with the descriptions of the above, and also with Cockerell's descriptions[4] of *A. fuliginosa* (Gould), *A. antipodarum* (Gray), and its varieties *pallida*, (Ckll.,) and *emarginata* (Hutton), all of which are less distinct from *A. gagates* than this; in fact, *maderensis* (= *raymondiana*) and all the above-mentioned forms seem to me to be only colour variations of *A. gagates*, and I think both externally and internally there are sufficient points of difference in the Tenerife specimen to separate it from *gagates*, chiefly in the form of the oviduct and free oviduct, sperm duct, receptaculum seminis, and hermaphrodite gland. I shall, therefore, name it after Lieut.-Colonel G. S. Parry, to whom I am indebted for the specimens.

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1 Journ. Malacology, 1894, vol. iii., pp. 70-73.
2 Nova Acta, 1891.
3 Ann. Mag. Nat. Hist., 1891, p. 334.
4 Ibid, p. 339-40.

A MESS-MATE OF LIMNÆA STAGNALIS.

By GEORGE BAILEY, F.R.M.S.

SOME time ago I had a number of *Limnæa stagnalis* put into a bell-glass and kept alive for purposes of observation. They were obtained from a small, obscure, pond south of Croydon, in Surrey. The only special features noticeable about the shells were their more than usually eroded condition, and the distinct white mark on the last whorl near the columella. The molluscs in confinement were very active. This seemed the more remarkable because they were infested about the head and mantle with what appeared to the naked eye like parasites. The Limnææ, however, gave no signs of discomfort, in spite of the host of "hangers on."

When detached and observed under a 1 inch objective, the appearance and form of these bodies resembled worms; and they moved after the manner of leeches, by attaching themselves to the glass cells, and did not attempt in any way to swim freely. On examining one of them under a $\frac{1}{5}$ inch objective, it soon became evident that the subject of inquiry was a naïd worm.

One species of naïd is said to have parasitic tendencies, attaching itself usually to *Limnæa*, and feeding on animalcules. Manifestly the example under consideration was living as a *commensal* with *Limnæa stagnalis*; and it answers fairly well to the description of *Chætogaster vermicularis* given by Claparéde, Grube, and others. Johnston, in his "Catalogue of Annelids," describes the genus *Chætogaster*—"Body cylindrical, truncate in front, eyes none, mouth terminal, barbed underneath, bristles all forked spineti." Various synonyms are used by different authors, evidently describing the same worm—*e.g.*, *Naïs vermicularis*, *Naïs diaphana*, *Chætogaster limnæa*, *Chætogaster diaphana*, and *Chætogaster vermicularis*.

In all naïd worms, it appears that the sexes are distinct, and that propagation is both by ova and spontaneous transverse division. Dr. W. B. Carpenter gives a somewhat minute account of the remarkable process of the non-sexual multiplication of these creatures. A bud is thrown out between two rings near the middle of the body, and ultimately developes into a distinct individual. Dr. Williams, in his Report of the British Annelida presented before the British Association in 1851, declared "with deliberate firmness that there is not one word of truth" in the descriptions which Prof. Owen, Dr. Carpenter, and others have given of the reproduction of naïd worms by a process of fission.

FIGURE 1. *Chætogaster vermicularis*, just after division has taken place. Shewn in optical section from the under side.

This confident assertion by such an acknowledged authority is, to say the least, very surprising. For while examining *Chætogaster vermicularis* under the microscope, I undoubtedly saw the process completed. I did not make a sketch of the appearance *before division*, but I noted very carefully certain facts observed. Although the constriction near the middle of the body was very decided, and the existence of two stomachs very evident, it was equally clear that the alimentary canal was not divided, and that minute portions of food passed through the

anterior portion of the worm into the stomach posterior to the constriction. At length the worm divided while still under observation, and became two worms, presenting the appearance represented in Fig. 1. Comparing the new worm with the original, it was seen that the mouth of the former was yet imperfect, time being required for the further development.

FIGURE 2. A group of setæ from *Chætogaster vermicularis*, enlarged.

There were twelve clusters of bristles, or setæ, arranged as shown in Fig. 1, on each worm; and these setæ were instruments used as hooks for the purpose of hanging on to the body of the mollusc. Being forked hooks (Fig. 2), they were well adapted for this purpose. As I saw *Chætogaster*, it was clinging to *Limnæa*, and waving itself to and fro continually, as though feeding or searching for food in the water.

The contents of the stomach of one of these divided specimens furnish interesting data respecting the food of *Chætogaster*. Most numerous was a quantity of oval bodies—transparent sacs filled with chlorophyll grains, doubtless unicellular plants. There was a number of flat circular organisms, of a deep brown colour, which might be diatoms with the endochrome not destroyed. Several species of diatoms (Fig. 1) were nicely cleaned and very perfect, especially *Navicula* and *Cocconema*.

NOTES UPON THE GENERIC TERMS CASSIDARIA AND ONISCIA.

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

British Museum (Zoölogical Department), London.

Both of these genera for many years found general acceptance, until the appearance of the Manuals by Philippi and the Messrs. H. and A. Adams. Tryon, who had an aversion to upsetting what *he* considered established names, employs both of them, and they likewise appear in Woodward's Manual. On the other hand, they are rejected by the Messrs. Adams, *Galeodea* and *Morum* being respectively substituted. Philippi rejects *Cassidaria* in favour of *Morio*, and employs *Oniscia*; and in the latest Manual by Fischer, the same course is adopted. Seeing this great divergence of opinions, I thought it would be useful to place on record the result of a further independent investigation. I will therefore proceed to discuss these two genera separately, commencing with *Cassidaria*.

Cassidaria.

Herrmannsen, Philippi, Fischer, Watson and Chenu give the date of Lamarck's *Cassidaria* as 1812. This is not correct, for, although the French term "Cassidaire"[1] appeared in that year, but without one word of description, it was not until 1816 that the Latinized form, *Cassidaria*, was employed. In the explanation of plate 405 of the Encyclopédie Méthodique, which was the work of Lamarck himself, and was published in 1816, the term *Cassidaria* is there applied to the well-known *Cassidaria tyrrhena*. There is, however, no generic description whatever, and, apparently, the genus was not properly characterized until 1822, in the seventh volume of the Syst. Anim. sans Vert., p. 214.

However, if 1812 were admissible as the date of this genus, it could not be retained, as two other properly characterised

1 Extrait du Cours de Zool., 1812, p. 119.

genera, one of which is tenable, have precedence, namely, *Morio*, Montfort, and *Galeodea*, Link.

The Rev. R. Boog Watson[2] rejected *Morio* in favour of *Cassidaria*, because "*Latreille* used that name in the same year, and, as I believe, with acceptance, for a group of Coleoptera." If Mr. Watson had looked up Latreille's description,[3] he would have found that he originally wrote his genus *Morion*. He did, however, subsequently[4] use the term *Morio*, which has been, and is still, generally employed by Coleopterists. As there is a Latin word *morion*, with a signification different from that of *Morio*, there really was no occasion for him to make the change. Under any circumstances, Montfort's name should take precedence, and it would seem to me advisable for the Coleopterists to revert to the genus *Morion* as first of all written by Latreille.

Mr. Watson also rejects Link's name *Galeodea*, published in 1807, because "Galeodes had been already employed by Martini in 1771 for his group of *Semicassis*, in which he included *Cassidaria echinophora*, Linné, the type of Link's genus. The same name, too, was used by Olivier in 1791 for a genus of Arachnida, and by Bolten in 1798 for a group of *Pyrula* and *Purpura*."

Although *Galeodea* is not absolutely identical with *Galeodes*, it evidently has a similar derivation, and therefore I quite agree with Mr. Watson in rejecting it.

The case with *Morio*, however, is different, and I do not see how we can avoid using it, if we pay attention to the usually accepted "law of priority." *Cassidaria*, too, also included species of "*Tritonidæ*," *Cassis*, and *Oniscia*, and it was not until 1824, two years after it was properly founded by Lamarck, that it was assigned its present limits by Sowerby.[5] Moreover, if we accepted 1822 as the date of *Cassidaria*, it could not be used, as *Echinora* of Schumacher has five years' precedence.

With regard to the signification of the terms *Morio* and *Morion*, respectively used by Montfort and Latreille, we have no guidance. According to Smith's Latin Dictionary, morio signifies a fool or jester; morio or morion a dark brown gem;

2 Gasteropoda of the "Challenger," p. 410.

3 Consider. gén. Crust., &c., 1810, pp. 139 and 425.

4 Cuvier's Règne Anim., vol. iii., p. 189 (1817).

Gen. Recent and Foss. Shells, Number xxiii. (1824).

and morion, a narcotic plant. As neither of these words appear to have any significance in connection with either the group of shells or beetles in question, we are at liberty, I think, to make a definite suggestion with regard to their future use. I would therefore suggest that morio be retained for the Molluscan genus, and morion for the group of Beetles, unless the Coleopterists prefer to use a new name, supposing there is no synonym available.

The synonymy of *Morio* is as follows:—

Morio, Montfort.

1807—Galeodea, Link (non Galeodes Olivier, 1791), Beschreib. Natur. Samml. Thier. Rostock, Abth. 3, p. 113. Type and only species quoted, *G. echinophora*.

1810—Morio, Montfort, Conch. Syst., vol. ii., p. 478, type and only species quoted, *M. echinophorus*.

1812—Cassidaire, Lamarck, Extrait du Cours de Zool., p. 119. Name only.

1816—Cassidaria, id, Ency. Méthod. Name only on explan. of plate 405.

1817—Echinora, Schumacher, Essai nouv. Syst. vers test, pp. 75, 249. Type and only species quoted, *E. tuberculosa* (= *echinophora*).

1822—Cassidaria, Lamarck, Anim. Sans Vert., vol. vii., p. 214. First species quoted, *C. echinophora*; other species belong to *Triton*, *Cassis*, and *Oniscia*.

Oniscia.

The term *Morum*, of Bolten, being a mere catalogue name, and unaccompanied by any description, must, of course, be disregarded. In describing *Lambidium*, Link places *Morum* in the synonymy, and, although it may be equivalent to *Lambidium*—and, if so, it is unfortunate that Link did not adopt it—we are hardly in a position to resurrect it ourselves in preference to *Lambidium*. The generic name *Oniscia*, which has been in general use for many years, cannot be employed, if we pay any regard to the "law of priority." The remaining names, enumerated below, were proposed merely as subgenera, and, in addition, are not worthy of retention. *Oniscidia*, a mere typographical error for *Oniscia*, differs from *Lambidium* in having the

surface cancellated and the spire a little more acuminate; *Herculea* has the "inner lip sulcated, not granulated;" and *Plesioniscia* has not been characterised. The three divisions, *Lambidium*, *Oniscidia*, and *Plesioniscia*, contain species from three different geographical areas. The first includes *L. oniscus*, *L. lamarckii*, and *L. strombiforme* (the last two possibly vars. of *oniscus*), from the West Indies, and perhaps *L. ponderosa*; the last contains *L. tuberculosum* and *L. xanthostoma*; from California and the Galapagos Islands; and *Oniscidia* includes *L. cancellatum*, *L. grande*[6] (perhaps a var. of *cancellatum*), *L. dennisoni*, *L. exquisitum*, *L. macandrewi*, and *L. cithara*, from the China Sea, Sooloo Sea, and the Ki Islands, West of Papua.

The locality "Guadeloupe," assigned to *L. dennisoni* (Tryon, Man. Con., vol. vii., p. 282), seems to me very doubtful, and it is very possible that a specimen of *L. lamarckii*, which is a West Indian form, may have been mistaken for that species.

I am somewhat doubtful with regard to the position of *L. ponderosum*, but I certainly cannot agree with Tryon in considering it synonymous with *L. exquisitum*, nor has *L. grande* any relationship with that species, being, if not distinct, a variety of *L. cancellatum*.

LAMBIDIUM, Link.

1798—Morum, Bolten, Cat. Mus. Bolten. Without description.
1819 „ „ op. cit. ed 2, p. 38.
1807—Lambidium, Link, Natur. Samml. Rostock, Abth. 3, p. 112. Type and only species quoted, *L. oniscus*.
1824—Oniscia, Sowerby, Gen. Rec. and foss. shells, Number xxiv., pl. 233. Three species quoted—1, *O. cancellata*; 2, *O. oniscus*; 3, *O. cithara*, a fossil species.
(Subgenera.)
1853—Oniscidia, H. and A. Adams, Gen. Rec. Moll., vol. i., p. 220.
1858—Herculea (Hanley), H. and A. Ad., op.cit., vol. ii., p. 621.
1884—Plesioniscia, Fischer, Man. Conch., p. 660.

6 This form is figured by Reeve as *O. cancellata* (Con. Icon. Oniscia, fig. 4).

ON THE DI-MYARIAN STAGE OF THE "NATIVE" OYSTER.

By WILFRED MARK WEBB, F.L.S.,

Technical Laboratories, County of Essex.

It is, of course, a matter of common knowledge among malacologists that bivalves have been divided into sub-classes, according as the adult forms possess, two more or less equal muscles for the closing of their shells, one muscle—the anterior—much smaller than the other, or one—the posterior—only.

From this state of things it might be deduced, without great probability of error, that the last condition has been arrived at, from the first, through the second. This assumption, however, may be taken as proved, if one can find that during the early development of the one-muscled, or *mono-myarian* species, they pass through a two-muscled, or *di-myarian*, stage. Now, in the year 1883, Professor Huxley[1] showed that the oyster *must* pass through an undiscovered di-myarian stage, but none of our countrymen seem to have made any further observations on this fascinating case of "Recapitulation."

The evidence brought forward by Professor Huxley is briefly this:—That there is but one adductor muscle closing the shell of the oyster, in the embryo, as in the adult mollusc; but while the larval muscle is *dorsal*[2] to the alimentary canal, and is consequently the *anterior adductor* (Figs. A and B, *a. add.)*, that in the adult, being on the *ventral* side of the intestine, is clearly the *posterior adductor*. Therefore, the muscles being different ones at different ages, and the oyster not being able to do without any muscle at all, it stands to reason that there must be a time when both are present, one "rising," so to speak, while the other is "on the wane."

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1 "Oysters and the Oyster Question" [a lecture delivered at the Royal Institution, May 11, 1883, with additions], by T. H. Huxley. "*The English Illustrated Magazine*," 1883, p. 312.

2 In Dr. Jackson's paper, p. 299, the terms are accidentally reversed.

Seven years later Dr. Robert Tracy Jackson[3] described and figured a stage in the American oyster, in which the two muscles (Fig. C, *a. add.* and *p. add.*) were clearly to be made out. The embryos in question were examined after attachment, in the case of the experiment, on a strip of glass, which had been exposed in an earthenware drain-pipe partially sunken in the sand at low-water mark. No spat growth had taken place.

Last summer, when the writer had the privilege of working in the Marine Biological Laboratory which the County Council of Essex fitted up at Brightlingsea in connection with some

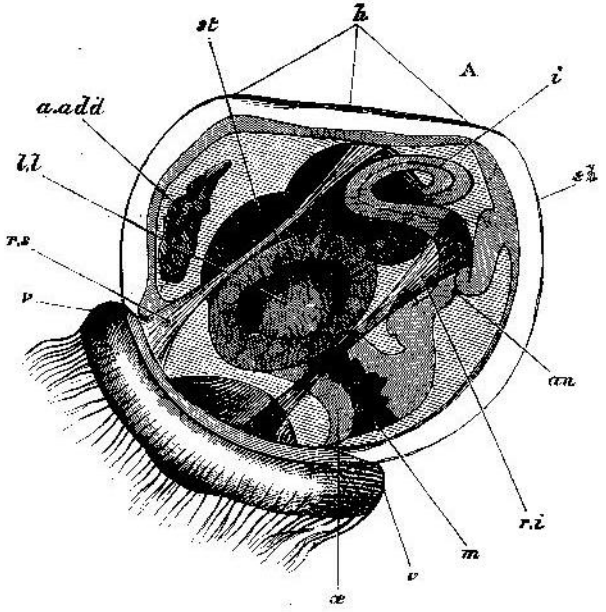

FIGURE A. An embryo of the European oyster, *Ostrea edulis*, L., seen in optical section from the left side. *a. add.*, anterior adductor muscle; *an.* anus; *h.* hinge of shell; *i.* intestine; *l.l. r.l.* left and right lobes of the "liver;" *æ.* œsophagus; *r.s. r.i.* superior and inferior muscles, which retract the velum; *st.* stomach; *v.* velum, with its long cilia. *(After Huxley.)* Reprinted from the *English Illustrated Magazine*.

experiments in Oyster Culture, he bethought himself of the di-myarian stage, but had to content himself with larvæ from

3 "The Phylogeny of the Pelecypoda," by Robert Tracy Jackson. Mem. Boston Soc. Nat Hist., vol. iv., 1890, p. 300, pl. xxiv., figs. 1 and 2. N.B. The discovery of the di-myarian stage was announced in Proc. Bost. Soc. Nat. Hist., vol. xxiii. (1888).

the "sick" oysters kindly brought to him from time to time, as the lateness and smallness of the second "fall of spat"—the first having been destroyed by an unexpected spell of cold weather—made it almost useless to attempt the capture of older embryos which had left the parent's shell, though mica plates were prepared for the purpose.

Nevertheless, it was possible to make out in the later "white spat" and in the "black spat," what appears to be a posterior adductor muscle (Pl. I., Fig. 1, *p. add.*), which occupies a spot just ventral to the anus, and is indicated, though not labelled, in Professor Huxley's drawing (Figure A). In Horst's Figure [1], also, the spot is surrounded by a continuous outline, and appears even more definitely, but is not mentioned nor described in the letterpress.

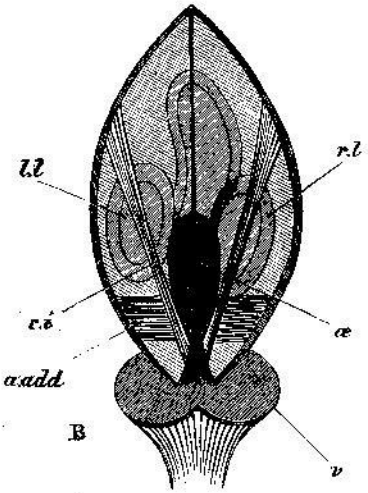

FIGURE B. The same as figure A, but seen from a point to its south-east. Lettering as before. (*After Huxley.*)

Now, it was not to be expected that the posterior adductor, if present before the attachment of the oyster, would be easy of identification, or it would have been recognised long ago; but in the light of the Brightlingsea specimens, those at the Royal College of Science were examined through the kindness of Professor Howes. The series there includes a slide made by Dr.

[1] R. Horst. "On the Development of the European Oyster, *Ostrea edulis*, L." Q. J. Mic. S., n.s., vol. xxii., 1882, plate xxvii., figure 12.

Horst, from which Figure A was probably taken, and the specimens show the general anatomy in greater detail than the writer's preparations, enabling one to locate the structure alluded to, with greater distinctness. In another fine preparation, looked at from the mouth side, the outline of the chamber, into which the other end of the alimentary canal opens, can be made out, together with a transverse thickening, slightly striated, on the side towards the mouth in the position that should be occupied by the posterior adductor (Pl. I., Fig. 2, *p. add.*).

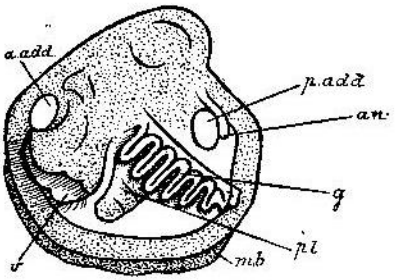

FIGURE C. An embryo of the American oyster, *Ostrea virginiana*, Lister, after attachment, seen as Figure A. *g.* gill; *m.b.* mantle border; *pl.* palps; *p. add.* posterior adductor. Other lettering as in Figure A. *(After Dr. Jackson.)*

The conclusion is, therefore, that the structure just described corresponds with that seen from the side view, and represents the posterior adductor in an incipient condition. During the next summer the writer hopes to be able to trace its development till it becomes functional, and spat growth begins.

CURRENT LITERATURE.*

It is hoped that all Malacologists will aid in making this Bibliography as complete and useful as possible. Writers, both at home and abroad, are especially asked to send in copies of their respective papers for review to Wilfred Mark Webb, Holmesdale, Brentwood, to whom all communications should be addressed.

MALACOLOGY IN GENERAL.

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2nd Series (Pulmonata), part 33a—introduction, etc., to vol. ix., pages i. to xlviii., plates 41-71, part 36, pages 161-366.

[These parts will be reviewed in detail later.—Ed.]

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Dr Simroth makes steady progress with this invaluable work of reference. The present part commences with an appendix to the *Polyplacophora*, bringing the account of this group abreast of current literature up to July, 1894. To this subject the plates also refer. He then proceeds with the *Scaphopoda*, the morphology of which occupies the rest of the part. Several interesting figures of the different forms of the shell are given and, to demonstrate that Dr. Simroth is "up to date," we may mention that the figure of *Schizodentalium*, only published last October, is reproduced.

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* An asterisk denotes that a reference has not been verified.

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New genus and species *Hedyle weberi.*

Bradshaw, Mrs. M. F.—"*Hamina virescens.*" Naut. viii., pp. 100-101., pl. ii., fig. 15.

Bradshaw, Mrs. M. F.—"*Megatebennus bimaculatus.*" Naut. viii., pp. 112-113.

Brazier, J.—"On a *Patella* said to have been found on the Kermadec Islands." P. Linn. Soc. N.S. Wales, ix., 183-4.

Denies that *P. Kermadecensis*, Pilsbry, comes from this locality and re-names it *P. (Scutellastra) pilsbryi.*

Chaster, W.—"A new species of *Lepton* from Guernsey." Ann. Nat. Hist. (s. 6), xv., 248, *L. sykesii*; no figure.

Chaper, M.—"Note sur quelques *Unionidæ* de Grèce." Mem. Soc. Zool. France, vii., 372-4, pl. vi.-vii.

The following so-called species are for the first time figured:—*A. quellennæ (Drouet), A. græca (Dr.), A. lepida (Dr.), U. pamisinus (Dr.), U. messenicus (Westerl.).*

Clapp, G. H.—"Mollusks in Alleghany Co. Pens." Naut. viii., p. 110.

Several new records.

Clapp, G. H.—"*Zonites cellarius* [*Vitrea cellaria*] in Western Pensylvania" (a note). Nautilus viii., p. 82 (introduced)

Dall, W. H.—"A new *Chiton* from California." Naut. viii., p. 90.

Dall, W. H.—"Description of a new species of *Doridium* from Paget Sound (*Doridium adella*)." Naut. viii., p. 73.

Dall, W. H.—"Land shells of the genus Bulimulus in Lower California, with descriptions of several New species." P.U.S. Mus. xvi., 637-47, pl. lxxi.-ii.

B. (Scutalus) baileyi, B. (Leptobyrsus) zeledoni, B. (L.) veseyianus.

Dall, W. H.—"Notes on the Shells collected from the shores of the Great Lagoon, Watling Islands, Bahamas." Bull. Mus. Comp. Zool. Camb. 1894, xxv., pp. 113-24., 1 pl.

New species are *Venus leptalea, Tornatina parviplica* and (fossil) *Cerion agassizii.*

Dall, W. H.—"On a new species of *Holospira* from Texas." Naut. viii., 1894, p. 112.

Dall, W. H.—[Siberian Miocene; see "Palæontology."]

New sp.:—*Semele stimpsoni, Siphonaria penjinæ, Conus okhotensis, Cerithium cymatophorum, Diloma (Chlorodiloma) ruderata.*

Ford, John.—A new variety of *Olivella gracilis.* Naut. viii., pp. 103-104.

Gill, Thos.—"Rangia, the proper name of the Mactroid genus *Gnathodon.*" Naut. viii., pp. 102-103.

Haller, B.—"Notes on (Poly) placophora." Abst. in J. R. Mic. Soc., 1894, pp. 670-671. Morphol. Jahrb., v, 1894, p. 24.

Hedley, C.—"On a Molluscan genus new to and another forgotten from Australia." Proc. Roy. Soc. Vict., 1894, pp. 197-200, pl. xi.

Mr. Hedley describes the occurrence in Australia of the genus *Lucapinella*. A new species, *L. pritchardi*, is described and figured. Another addition to the Australian fauna is *Scyllæa pelagica*, L., collected at Port Phillip.

Hedley, C.—[Mol. N. Guinea; see "Fauna."]

New species: —*Otopoma macgregoriæ*, *Sitala anthropophagorum*, *Papuina secans*.

Kobelt, W.—"Zweiter Nachtrag zur Fauna der Nassauischen Mollusken." Jahrb. Nassau, ver. xlvii., 83-9, pl. iv.

? New species: —*Unio (pictorum var.) ballonensis*.

Martens, E. von.—"On *Dreissensia polymorpha*, Pallas." J. of C., vii., 1894 (Pub. 1895), pp. 415-416.

Points out that its specific name should stand.

Melvill, J. C., and **Ponsonby, J. H.**—"Descriptions of Four New Species of Terrestrial Mollusca from South Africa." Ann. Nat. Hist. (s. 6), xv., 163-5, pl. xii.

Zingis delicata, *H. (Trachycystis) alcocki*, *Achatina churchilliana*, *Cyclostoma fovealatum*, *Natalina chaplini*, and *Dorcasia inluzana* are also figured.

Monterosato, Marquis de.—"Note sure le genre *Hagenmulleria*, de Bourguinat." J. de Conch. xlii., No. 2, 1894 (pub. 1895), p. 112-116.

Newton, R. Bullen.—[See "Palæontology." Madagascar fossils.]

The following new species of Mollusca are described and figured:—*Trochacteonina richardsoni*, *Perna latoconvexa*, *Gervillia iraonensis*, *Lima iraonensis*, *Mytilus madagascariensis*, *Modiola angustissima*, *Corbula grandidieri*, *Pseudotrapezium ventricosum*, *P. depressum*, *P. elongatum*.

Pelseneer, P.—"Branchiate Pulmonates." Abst. in Jour. R. Mic. Soc., 1894, p. 670. Compt. Rend., Ac. Sci., Paris. v. 1894, pp. 357-358.

Pilsbry, H. A.—"New Forms of American Shells." Naut. viii., p. 109. *Gastrodonta* and *Somatogyris*.

Pilsbry, H. A.—"New Forms of Western Helices." Naut. viii., p. 81. (One new species.)

Pilsbry, H. A.—"New American Fresh-water Molluscs." Naut. viii., pp. 114-116.

Sargent, H. E.—"*Ferussacia subcylindrica* [*Cochlicopa lubrica*, Risso], and two new species in Jackson County, Alabama." Naut. viii., pp. 104-105.

Scharff, R. F.—"A supposed new Species of *Limax* from Ireland." Irish Nat., 1894, p. 261.

Simroth, H.—"Ueber einige von Herrn Dr. Sturany auf der Balkanhalbinsel erbeutete Nacktschnecken." Ann. K. K. Natur. Hist. Hofmuseums, 1894, Bd. ix., pp. 391-4, figs. 1-11 T xix.

Three new species of *Agriolimax* are described and figures given of parts of their anatomy. The differences are so minute, and confined to one organ almost, that we doubt whether they can be regarded as good species. The three forms are named *Agr. turcicus*, *Agr. sturanyi*, and *Agr. murinus*.

W.E.C.

Smith, E. A.—"Descriptions of new Species of Land Shells from New Guinea." Ann. Nat. Hist. (s. 6), xv., 230-3, no fig.

Nanina amblytropis, *N. lissorhapha*, *Rhysota armiti*, *H. (Hadra) stirophora*, *H. (Dorcasia) subplicifera*, *H. (Chloritis) ephamilla*, *Chl. perambigua*, *H. (Cristigibba) musgravei*.

Stearns, R. E. C.—[See "Fauna," Galapagos Is. Mol.]

The so-called new species have already been preliminarily described, but are now figured for the first time. They are:—*Onchidium lestici* (*St.*), *Nitidella incerta* (*St.*), *Littorina* (*Tectaria*) *galapagiensis* (*St.*).

Stearns, R. E. C.—"On rare or little known Mollusks from the West Coast of North and South America, with descriptions of new Species," P.U.S. Mus., xvi., 341-52, pl. 1.

Chicoreus palma-rosæ mexicana is described. By the bye, is its name strictly "binomial"? *Tectarius atyphus* (*St.*) and *Ucanilla regina* (*St.*) are figured for the first time.

Sterki, von.—"*Vertigo morsei*, n.sp." Naut. viii., 89-90. From Kent County, Michigan.

Sterki, von.—"Two new *Pisidia*." Naut. viii., No. 9, pp. 97-100, pl. ii., figs. 1-13.

Sturany, R.—[See "Fauna."]

The following new species are described and figured:—*Clausilia* (*Alinda*) *distincta*, *Cl.* (*Papillifera*) *lophauchena*, *Planorbis* (*Gyrorbis*) *macedonicus*, *P. presbensis*, *P. paradoxus*, *Valvata rhabdota*, *Emmericia munda*.

Taylor, G. W. "The present condition of Canadian Conchology." Ottawa Nat., viii. (1895), pp. 143-159.

Warren, Miss Amy.—"*Donax vittatus*, var. *truncatus*, Marshall, M.S." Irish Nat., vol. iv., Jan., 1895, p. 18.

Whiteaves, J. F.—"Notes on some Marine Invertebrates from the Coast of British Columbia." Quoted in Naut. viii., p. 84. A new *Pecten*.

PALÆONTOLOGY.

Bather, F. A.—"Cephalopod Beginnings." Nat. Sci., V., 1894, pp. 423-436. A criticism on the observations of J. M. Clarke.

Clarke, J. M.—"Cephalopod Beginnings." Amer. Geol. xv., 125-8.

Crick, G. C.—"Jurassic Cephalopoda from Western Australia." Geol. Mag., 1894, pp. 433-441.

Dall, W. H.—"A subtropical Miocene fauna in Arctic Siberia." P.U.S. Mus. xvi., 471-8, pl. lvi. [See "Systematic Work."]

Dall, W. H.—"Notes on Miocene and Pliocene of Gay Head, Martha's Vineyard, Mass." Amer. Journ. Sci., Oct., 1894, p. 1.

Frauscher, K.—"Nautilusse von Guttaring." Jahrb. des Naturhist. Landes-Mus. Kärnten, lxi. and lxii. (1895), pp. 185-207. 2 pls., 6 figs.

New species:—*N. tumescens* and *Aturia brunlechneri*.

Gregory, J. W.—"On a Collection of Fossils from the Lower Greensand of Great Chart, in Kent." Geol. Mag. (s. 4), II., 97-103.

No new species.

Hyatt, Alpheus.—"Phylogeny of an acquired characteristic." Proc. Amer. Phil. Soc. xxxii., pp. 349-647, 14 pls.

Based upon fossil cephalopods.

Kittl, Ernst.—"Die Gastropoden der Schichten von St. Cassian der Südalpinen Trias," III. Theil Schluss. Ann. des. K.K., Natur. hist. Hofmuseums Wien. ix., part 2, 1894, pp. 143-277, 9 plates.

Mayer-Eymar, C.—"Coquilles fossiles des terrains tertiares supérieurs." J. de Conch, xlii., No. 2, 1894 (pub. 1895). pp. 117-128, 2 plates to this and next paper.

Eleven new species of bivalves.

Mayer-Eymar, C.—"Coquilles fossiles des terrains tertiares inférieurs." Loc. cit., pp. 129-130.

One new species of *Natica* and one of *Cypraea*.

Newton, R. Bullen.—"Note on some Molluscan Remains lately discovered in the English Keuper" (continued from p. 412). J. of C., vii., 1894 (pub. 1895), p. 413, 2 figs.

Newton, R. Bullen.—"On a Collection of Fossils from Madagascar obtained by the Rev. R. Baron." Quart. J. Geol. Soc., ii., 72- , pl. ii.-iii.

A good account of previous discoveries and description of new species. (See "Systematic Work.")

***Schluter, Chen.**—"Zur Kenntnis der Pläner-Belemniten." Verhandl. Nat. Ver Preuss Rheinl., li.

***Schmeltz, J. D. E.**—Schnecken und Muscheln in Leben der Völker Indonesiens and Oceaniens, Ein Beitrag zur Ethnoconchologie.

Read at Anthropol. Sect. Brit. Ass., Oxford, 1894. Leiden, 1894, 8°., 43 p.

Simpson, C. T.—[Drift fossils from Toronto. See "Fauna."]

Tate, R.—"Note on the Tertiary Fossils from Hall Sound, New Guinea." P. Linn, Soc., N.S. Wales, ix., 213-4.

No new species.

***Ulrich, E. O.**—"The Lower Silurian Lamellibranchiata of Minnesota in Final Rep. Geol. and Nat. Hist. Survey, Minnesota." Vol. vii., chap. vi., pp. 475-628, 8 pls.

Webb, Wilfred Mark.—"Pleistocene Non-Marine Mollusca from Walton-on-the-Naze." Essex Naturalist, vol. viii. (1894), pp. 160-162.

A list of 19 species collected by the late John Brown, F.G.S., of Stanway. It forms No. 1 of Museum Notes.

Zickendraht, Ernst.—"Notiz über einige Conchilien aus dem Tuffsande bei den Sperlingsbergen nächts Moscau." Bull. Soc. Imp. Moscow, 1894, No. 2, pp. 275-276.

COLLECTING AND CULTURE.

Calderwood, W. L.—"Mussel Culture and Bait Supply, with reference more especially to Scotland." Macmillan and Co., 1895.

This is an interesting little work of 121 pages, calling attention to the gradually decreasing supply of mussels as bait, and to the best methods to be adopted to prevent the threatened decline of the line fishing industry of the North Sea. The first two chapters deal with the supply and demand of mussel bait, and with the geographical distribution and general character of the principal mussel beds of Scotland. The third chapter gives an account of the Natural History of the Mussel as a preliminary to technical details as to mussel culture and general treatment of "scalp." This is followed by an

important chapter on the "Bouchot" system of culture as practised in France and on the east coast of Scotland. The results, however, obtained at the home stations do not appear to have been altogether satisfactory.

Hedley, C.—"A Shell Hunt Forty Feet under the Sea." Naut. viii., p. 85-88.

An interesting account of collecting in diver's dress at Port Jackson.

Sterki, Von.—"On collecting *Pisidia*." Naut. viii., p. 113-114.

BIOGRAPHY.

Schuberg, August.—"Carl Semper," Arb. Zool. Inst. Würzb. Vol. x., 1895, pp. i.-xxii. Portrait and Bibliography.

NOTES.

Note on the Synonymy of Plutonia, Stabile.—In the notes to his Check-list of Slugs (Conchologist ii., p. 204) Professor T. D. A. Cockerell calls attention to the fact that the name *Plutonia* has also been used for a genus of Trilobites. In a foot note thereto, Mr. Collinge, assuming that the Trilobites had priority, proposes to substitute *Vitriplutonia* for the genus, and *Vitriplutoninæ* for the sub-family. At Professor Cockerell's request I have looked up the references, and find that *Plutonia* stands for Mollusca, the synonymy being as follows:—

Plutonia Stabile: Atti Soc. Ital. Sci. Nat. vii. (1864) p. 121, *non*. Hicks 1868 (*nom. nud.*) Trilobita.

Viquesnelia Morelet: Notice Hist. Nat. Azores (1860) *non* Deshayes (1857) *nec* Fischer (1857) = *Plutonia* Morelet in litt. Type *V. atlantica*, Morelet, loc. cit., p. 139, pl. 1, fig. 1.

Vitriplutonia, Collinge, Conchologist ii. (1893) p. 204, note.

[The Trilobite is to be re-christened *Plutonides*.—ED.]

(BV)²

Sinistral Shells and Superstition.—The following remarks on left-handed shells as luck-bringers are extracted from a letter:—As to the "superstition," I heard it from one of the apothecaries at Port Blair, who told me that some natives of India in Rangoon, on hearing that he was ordered to Port Blair, begged him to send them a left-handed shell, if he could find any, as they believed that these secured great wealth, immunity from drowning and general good fortune (or long life) to their possessor.—A. H. FINN, Bridport, Pagoda Avenue, Richmond.

New Pleistocene Mollusca from Crayford.—Last year, while working at the Pleistocene deposits at Crayford, I had the good fortune to discover two species of mollusca not before recorded from that locality, viz.:—*Limax agrestis* and *Littorina rudis*. Both species were represented by a single example, now in the British Museum. *Limax agrestis* has already been recorded from the Pleistocene at Grays; while the example of *Littorina rudis* belongs to the brackish-water form still to be found in the Thames estuary.—A. S. KENNARD, Beckenham.

A Pleistocene Deposit containing Shells at Chelmsford.—At a meeting of the Essex Field Club on March 9th, papers were read (1) on the geology of a Brick pit at Chelmsford, by T. V. Holmes, F.G.S.; (2) on the bones of Elephas and other animals found in the pit, by E. T. Newton, F.R.S.; and (3) on the molluscan remains from the brick-earth, by Wilfred Mark Webb, F.L.S.—A preliminary list of eight species of land and fresh-water molluscs was given in the last paper.

Succinea elegans from the Ilford Brick-earth.—Among some specimens from Ilford lately put into my hands by Mr. Williment, of Brentwood, there is an example, *Succinea elegans*, Risso, a species not recorded from that locality in Woodward's "Pleistocene Mollusca of the London District."—WILFRED MARK WEBB, Brentwood.

A Train Stopped by Snails.—The following is quoted from *The Nautilus*, and came originally from the *Dèpêche Tunisienne*, to which it was contributed by an engineer of the Tunis Railway:—"The train coming east from Suk-el-Arba last Thursday was two hours late, for a very singular reason. The road was literally covered with snails, the wheels of the locomotive crushing these molluscs into a pulp, which destroyed all adherence, and caused the locomotive wheels to skate, so to speak, in their places."

Inter-breeding of Type and Variety of Helix aspersa.—A pale yellow variety of *Helix aspersa* is not uncommon at Blaxhall, Suffolk, being most frequently met with in an old walled-in kitchen garden. In August, 1883, being desirous of obtaining a supply of this variety, I placed three or four adults in a large glass-fronted box in a greenhouse, hoping thus to secure and rear some of their progeny. To enable them to deposit their eggs in the usual way, the bottom of the box was covered with soil some two or three inches deep. On August 13th one of these snails paired with a specimen of the normal colour, which unfortunately had managed to get into the box, and on the 16th it laid a batch of eggs. These were hatched in due course, though, in this case, I omitted to note the interval which elapsed between laying and hatching. Though many died in various stages of growth, I managed to keep some of the young ones till late in the autumn of 1884, when the last died, being then hardly a third of the size of an adult of average dimensions. After the age of three months, their growth was extremely slow; in fact, from that period till they were 15 months old, there was scarcely any increase in size, and the shells had a stunted, unhealthy look. Perhaps under more favourable circumstances they would have thriven better; but being away from home a good deal at the time, I had to keep them in a tin box, so as to be able to take them about with me. They were fed on cabbage leaves—possibly an unsuitable diet. Contrary to what might be supposed, almost every one of these young snails was of the colour of the yellow parent.—G. T. ROPE, Blaxhall, Wickham Market.

The Mollusca of Essex.—I should be very glad to receive any records of Land and Freshwater Shells, and more particularly of Slugs (with the localities) taken in Essex, for my forthcoming list of the Non-Marine Molluscs of Essex in the "Essex Naturalist." Any information with regard to the occurrence in the County, of *Vitrea draparnaldi*, *Vitrea excavata*, *Helix fusca*, *Clausilia rolphii*, or *Limnæa glutinosa* would be specially welcome.—WILFRED MARK WEBB, "Holmesdale," Brentwood.

PROCEEDINGS OF SOCIETIES.

The Malacological Society of London.

JANUARY 11th, 1895.—Ordinary Meeting.—Dr. H. Woodward, President, in the chair.

C. S. B. Cox and Mons. Pasquali were elected members of the Society.

The following communications were read: (1) 'On a collection of land shells made by Mr. I. Kubary in German New Guinea,' by Dr. O. F. von Moellendorff; (2) 'Descriptions of three new species of *Engina* and a new species of *Defrancia*' by J. C. Melvill; (3) 'Notes on the anatomy of *Natalina trimeni*, Melv. and Pons.' by S. Pace.

FEBRUARY 8th, 1895.—Annual Meeting.—Dr. H. Woodward, President, in the chair.

The Report and Statement of Income and Expenditure were adopted; and the following were elected as the Officers of the Council for the year 1895:—President, Prof. G. B. HOWES, F.L.S., F.Z.S.; Vice-Presidents, W. H. HUDLESTON, F.R.S., Rev. R. BOOG WATSON, F.R.S.E., E. A. SMITH, F.Z.S., Dr. H. WOODWARD, F.R.S.; Treasurer, G. F. HARRIS, F.G.S.; Secretary, E. R. SYKES, F.Z.S.; Editor, B. B. WOODWARD, F.G.S.

Six other Members of Council:—G. C. CRICK, F.G.S., S. J. DA COSTA, Lt.-Col. H. H. GODWIN-AUSTEN, F.R.S., R. BULLEN NEWTON, F.G.S., J. C. MELVILL, F.L.S., G. B. SOWERBY, F.L.S.

After the Annual Meeting an ordinary Meeting was held, at which Charles Cooper and Peter Lawson were elected Members of the Society.

The following communications were read:—(1) 'On the genus *Clea*, by E. A. Smith; (2) 'The sinistral character of the shell of *Planorbis*,' by J. A. Vanstone.

(Vol. I., No. 5. of the Proceedings has just been published.—ED.)

EDITORS' NOTES.

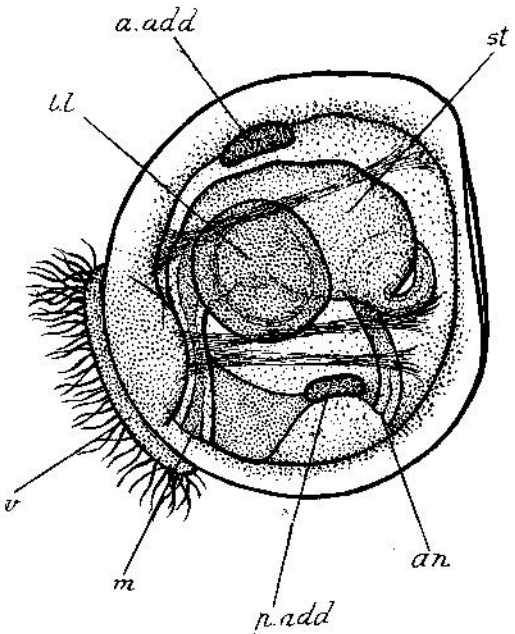
"The Zoological Record."—Zoologists have long deplored the fact that the parts of "The Zoological Record" are not sold separately. It may, therefore, interest some of our readers to know that Mr. S. Pace (Royal College of Science, London, S.W.) is dividing up the already bound (current and past) volumes, and issuing the separated parts to subscribers. Although it is, of course, not intended to make a profit out of the scheme, it will be necessary to charge slightly more for each part than its exact proportionate value, as some parts will, no doubt, remain unsold.

From the preface to Vol. VII. of "The Journal of Conchology," we learn that for the future it will cease to exist as an independent publication and that it will be continued as the organ of the Conchological Society of Great Britain and Ireland, under the editorship of Mr. W. E. Hoyle, M.A., of Manchester.

It is proposed to issue the title-page and index to Volume III. shortly.

Volume I. of "The Cambridge Natural History, Molluscs and Brachiopods" by Cooke, Shipley & Reed (Macmillan & Co.) has been received, but too late for review.

1.



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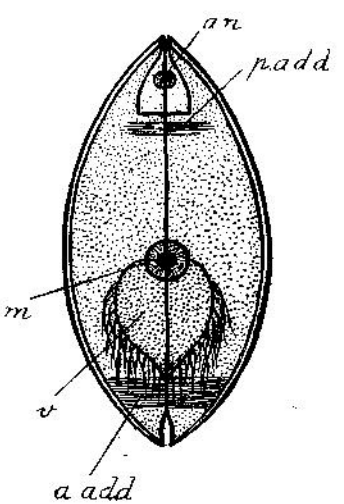

EMBRYO OF *Ostrea edulis*, *L.*

DESCRIPTION OF PLATE I.

FIGURE 1. An embryo of *Ostrea edulis*, L., seen from the left side in optical section. *a. add.* anterior adductor muscle; *an.* anus; *l.l.* left lobe of liver; *m.* mouth; *p. add.* posterior adductor muscle; *s.* stomach; *v.* velum.

FIGURE 2. The same, surface view from the ventral side. Lettering as in Figure 1.

THE JOURNAL OF MALACOLOGY

Established in 1890 by Walter E. Collinge as "THE CONCHOLOGIST, *a Journal of Malacology.*"

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VOL. IV. (No. 2.) JUNE 29th, 1895.

CONTENTS.

LONDON: DULAU & CO., 37, Soho Square.

BERLIN: FRIEDLAENDER & SOHN, Carlstrasse 11.

Quarterly. Issued Post-free to Subscribers only, for 4s. 4d. per annum.

All communications to be made to—

WILFRED MARK WEBB, "Holmesdale," Brentwood, Essex, England.

THE

JOURNAL OF MALACOLOGY.

No. 2. JUNE 29th, 1895. Vol. IV.

THE HABITS OF THE YOUNG SEPIA.

By FRANCIS A. BATHER, M.A., F.G.S.

British Museum (Natural History), London.

I send you a page and some sketches from my notebook at Roscoff last autumn. The notes may be of very small value, but I have seen no similar observations published.

For a day or two after its escape from the egg-capsule, the young *Sepia officinalis* attaches itself to the floor of the glass vivarium, or to other flat substances. The adhesion is effected by a definite area on the ventral surface of the body and of the postero-ventral arms, which area acts like a sucker, or in some ways like the foot of a gastropod. (Fig. 1.) The area has a distinct border not identical with the fins, but about one-third or half way between them and the median ventral line. The area is flat and colourless, except for a few pale yellow chromatophores such as are also found on the funnel and just within the pallial cavity. It is bordered by the ordinary chromatophores. The under surface of the fins is quite plain, but chromatophores extend for a little distance over their dorsal surface. This development of a ventral sucker is no doubt with the object of preventing the young cuttle-fish from being swept far away by currents, and is paralleled by the suckers in the young of many other animals, e.g., in tadpoles. The terminal disc in *Spirula*, if, as some have supposed, it is really a disc of attachment, may possibly have been derived from some such juvenile sucking habit. Pelseneer, however, denies this function to the terminal disc.

The young Sepia swims equally well in either direction by the thin transparent border of the mantle, which moves in sinuous waves with great rapidity. Only when considerably irritated does it shoot back by the expulsion of water from its funnel. One baby, when thus irritated, ejected ink twice within one minute of being taken from the egg-capsule. The ink, however, was not in the least enough to obscure its movements.

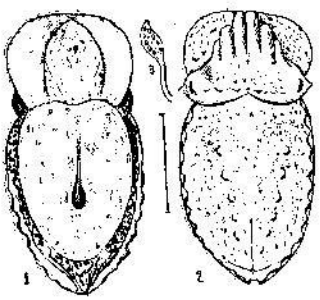

FIG. 1. Young *Sepia officinalis*. From below, attached to a glass plate, and drawn with the help of a mirror. The ink-sac is seen through the thin integument.

FIG. 2. From above while in the same position; the arms are retracted. The line between these two figures represents the actual length of the animal.

FIG. 3. One of the long arms, which are not seen in Fig. 2.

In early youth the chromatophores are not much used, or rather, one should say, the cells are usually kept contracted, so that the animal appears quite pale. Now and again a blush spreads over the back of the head between the eyes, and at the same time the antero-dorsal arms are stretched out. The effect is peculiar; one seems to *see* the animal thinking.

The two postero-ventral arms are very much larger than the others, perhaps three times as large. Next to them come the long arms, which partly lie in a small fold of the interbrachial membrane; they are the smallest pair. (Fig. 3). From them the arms increase in size, up to the antero-dorsal pair.

There are numerous tubercles on the body: six in a row down either side of the back, one under each eye, and a well-marked row on the ridge between the eyes. (Fig. 2.)

NEW BRITISH MARINE SHELLS.

By J. T. MARSHALL.

Scintilla eddystonia, n. sp.

Shell triangularly oval, a little broader than long, with an oblique outline, compressed, moderately solid for its size, semi-transparent, and glossy; sculpture, numerous but irregular concentric lines of growth; periostracum, none; colour, clear white except for irregular frosted patches, which are opaque; margins regularly rounded in front and at the sides, but with a more extended slope from the beak on the anterior side; beaks small but prominent, somewhat incurved, and nearer the posterior side; teeth, in the right valve, two strong and prominent cardinals, the posterior one being the larger, and a small lateral, on the posterior side; in the left valve, the same number and kind of cardinals, but not quite so large, with the position reversed, and the same lateral; inside highly polished; margins plain; muscular scars large and distinct. Length, 0·85; breadth, 0·1. Localities: Eddystone, Land's End, and Guernsey.

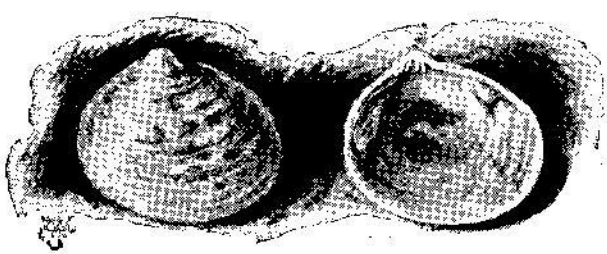

FIGURE 1. *Scintilla eddystonia*, n. sp. (enlarged). Eddystone.

I have been greatly puzzled where to place this species. I submitted it to Dr. Boog Watson and Mr. Edgar Smith without receiving any enlightenment. The Marquis de Monterosato, however, who has made the subject of Mediterranean mollusca his own, writes that it is "a species of a genus allied to *Scacchia*, near to *S. inversa*, Hil., and *S. pusilla*, Brugn., but different and smaller." The two last-mentioned species are Monte Pellegrino fossils.

The frosted patches are, I believe, a characteristic of this peculiar genus, and cover about half the surface of the shell.

It is not the young of any British species, and its nearest representative among British shells is *Lepton clarkiae*; but this species is thinner, more oval and depressed, the beaks are less prominent and not so central, and the dentition is altogether different. Than the young of *Diplodonta trigonula*, which is also oblique and has somewhat similar teeth, the present species is thinner and more oblique, being broader than long. And in comparison with *Axinus cycladius*, this is more compressed, has strong and well-defined teeth, and is much less fragile.

I have named the species after the Eddystone Lighthouse, near which my specimens (five valves) were found about ten years ago. I have since then obtained another valve from the Land's End and one from Guernsey (20 fathoms), and I also have a pair of valves dredged by the Porcupine Expedition off Vigo Bay, in 20 fathoms, not noticed by Jeffreys in his report of that expedition.

It must be living in the vicinity of the Eddystone, as all the valves are quite fresh. They were procured in trawl refuse on ground composed mainly of the remains of polyzoa, known to the trawlers as "moss," and were associated with *Argiope cistellula*, *Cerithiopsis metaxae*, *Philine angulata*, and other rare species all new to this region, and I was doubtful at first whether the trawlers had not gone out considerably to sea, but am satisfied that the material came from the Eddystone grounds, the "moss" bottom being well known to trawlers.

The shells may possibly have previously been passed over for water-worn valves of *Astarte triangularis*, which swarms on the Eddystone grounds, and is not very unlike them outwardly, but is thicker, more simply triangular, and has a crenulated margin.

Lepton sykesii, Chaster.*

This species occurred to me in the summer of 1893, from dredgings obtained off the east coast of Guernsey, between the trawling grounds and St. Martin's Point, in 18 fathoms, with *Argiope decollata*. I had provisionally given it the MS. name of *Lepton pusillum*, and although my diagnosis does not quite agree with Mr. Chaster's, I have no doubt that my specimens belong to the same species.

* Annals and Mag. Nat. Hist., March, 1895, page 248.

It is like a minute *Pisidium*, and bears no resemblance to any British species except *L. sulcatulum*—in fact, Dr. Norman, who has seen the shells, pronounced them such. Like that species, it is circular in shape when viewed outwardly, but inwardly a slight though distinct angularity is observed at each corner, imparting a slightly squarish outline; it is glossy and semi-transparent, of a pale yellowish white, the concentric striae are finer and more close set, with stronger marks of growth, and these striae are visible inside the valves; the margins are equally rounded on all sides; the beaks are obtuse, they do not project beyond the outline of the shell, nor incline to either side; there is a comparatively conspicuous lateral tooth on each side of the beak in each valve; these are of the same size, and run parallel with the hinge-line, which is gently curved (I could not detect the "extremely minute cardinal" mentioned by Mr. Chaster); inside iridescent; margins plain; scars obscure. Length, 0·03; breadth, 0·03.

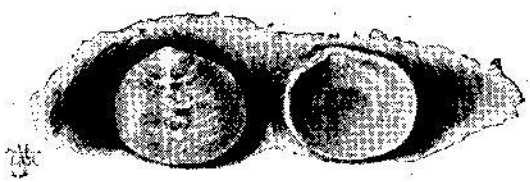

FIGURE 2. *Lepton sykesii*, Chaster (enlarged). Guernsey.

Than *Lasaea pumila*, S. Wood, this species is more convex, the striae are irregular lines of growth, the outline is somewhat oblique, and the dentition is different.

It is not, of course, the re-discovery of *Limopsis pellucidus*, Jeff., dredged by the author off Guernsey in 1858. That is a *Crenella*, of the size and shape of *Argiope capsula*, and has not since been met with in British waters. It is figured in Sowerby's Index.

L. sykesii comes under the genus *Neolepton* of Monterosato, but what other writers prefer to consider a sub-generic section of *Lepton*.

Although I have had many dredgings off the coasts of Guernsey, I have only met with this species once, and I had passed about a dozen valves in the examination of the material before my attention was attracted to it as differing from *L. sulcatulum*. But I secured a live specimen and half a-dozen valves,

and as I have indicated the precise locality for it, no doubt more will be found hereafter.

Odostomia oblongula, n. sp.

Shell forming a long oval, with an obtuse apex and produced base, thin, semi-transparent, glossy; sculpture, microscopic only, and consisting of longitudinal flexuous lines of growth; colour, clear white, opaque in dead specimens; spire very short; apex apparently truncated, the nucleus being obliquely depressed and intorted: whorls three only besides the nuclear ones, compressed but not flattened, the last occupying two-thirds of the shell viewed with the mouth downwards; the upper part of each whorl shows the usual thickened rim of the genus; suture shallow but clearly defined, and nearly straight; mouth pear-shaped, narrow and acute-angled above, slightly expanded below, its length being not quite half that of the shell; outer lip thin, not projecting beyond the periphery; inner lip not uniting with the outer, slightly reflected below and on the pillar, which is nearly straight; umbilicus none, but a slight groove runs behind the pillar; tooth very minute and retired. Length, 0·1; breadth, 0·04. Six specimens.

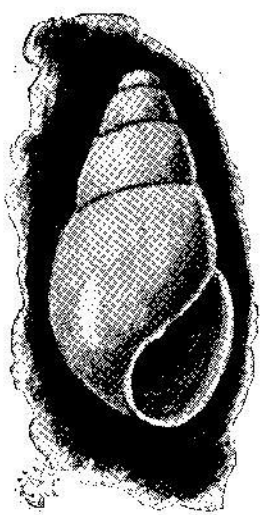

FIGURE 3. *Odostomia oblongula*, n. sp. (enlarged). The Minch.

Var. **ovata**, n. var.—Considerably expanded, egg-shaped, and umbilicate. Two specimens.

Habitat—The Minch, 72 fathoms, with *Eulima ephamilla*.

This species is characterised by a very short spire and long body-whorl. Its nearest British ally is *O. insculpta* var. *laevissima*, but in that shell the spire is longer and turreted, with a channelled suture, the aperture is oblong instead of pear-shaped, and there is a sinus at the upper corner of the outer lip. Its proper place is between *O. insculpta* and *O. diaphana*.

In comparison with *O. diaphana*, this is a stouter shell, with a distinct though slight tooth instead of an obscure fold, and the spire is not attenuated and spindle-like as in that species. From *O. obliqua* this species differs in being smaller, the suture is not so oblique, and the sculpture is absent. It is distinct from *O. tenuis*, Jeff., in being thinner, the spire shorter, the edge of the aperture does not describe a peristome, and the inside of the aperture is not grooved. From *O. nitens*, Jeff., it is marked off by being more oval, it has two whorls less, the apex is intorted, and it has a small tooth instead of an almost invisible fold; and finally, *O. oblongula* is thicker, broader, and is not so glossy as *O. crystallina*, Monts. MS.

I had at first taken these shells for two species, and the Marquis de Monterosato did the same; in fact, he allocated the first to the *Liostomia* group, represented by *O. clavula*, and the variety to the *Auriculina* group, represented by *O. obliqua*. But on full consideration I prefer to unite them, as intermediate specimens may yet be found to connect the two. At first sight they are very unlike, but I can detect no specific difference between them, except in the shape and in the presence of an umbilicus in the variety.

Macgillivray described an *O. oblonga*, * but that is our well-known *O. interstincta*, a very different shell.

Sevenoaks, Torquay,
May, 1895.

* Jeff.

CURRENT LITERATURE.

It is hoped that all Malacologists will aid in making this Bibliography as complete and useful as possible. Writers, both at home and abroad, are especially asked to send in copies of their respective papers for review to Wilfred Mark Webb, Holmesdale, Brentwood, to whom all communications should be addressed.

MALACOLOGY IN GENERAL.

Cooke, The Rev. A. H.—Molluscs. Shipley, A. E.—Brachiopods (Recent) Reed, F. R. C. -Brachiopods (Fossil). The Cambridge Natural History, vol. iii. (April, 1895) London, Macmillan & Co., 8 vo., 535 pp. (Price 17s. nett.) Mollusca pp. 1-459, 311 figures and 4 maps.

The writing of a book on a zoölogical subject, which shall be useful to "those who have not had a scientific training" † and at the same time to "serious students" † strikes one at the first as a task almost beyond the realms of realization, if not even, of expectation: for such an interest must be created, as to carry the novice merrily through those details that must otherwise seem dry to him, but in which, nevertheless, the old-hand intellectually revels. In order to bring about this state of affairs, the specialist must do what so many find to be an impossibility, and that is, to throw off that blind, unreasoning, not to say lamentable narrow-mindedness which is one outcome of specializing; he must feel, in spite of the opinions of his kind, that, after all, he is doing more real good to the cause which he has at heart, by gaining new adherents from a careless public and by taking his light from under the bushel of specialization, than by sitting still until some opportunity for feeding the flame of original research may come to him.

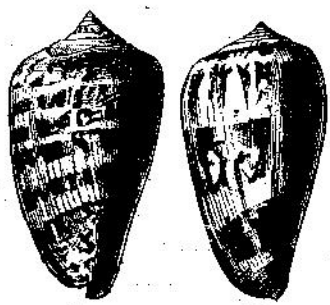

FIGURE 28. A. *Strombus mauritianus*, Lam., B. *Conus janus*, Hwass.

In volume iii. of the Cambridge Natural History, which deals with the Mollusca, and, to the credit of Malacology, is the first of the series to appear, the Reverend A. H. Cooke has come very near to attaining the ideal which he had before him, and, has succeeded in producing a book which cannot fail to bring new workers into the field, if only by the prominence given to those features of the Mollusca which have always rendered the deeper study of this well-defined group so especially fascinating; while the experienced Malacologist can find here much that was hitherto scattered now brought together for the first time in a way that he will appreciate, and even the general biologist may gain from this work fresh illustrations of those general laws of existence to which his life is devoted.

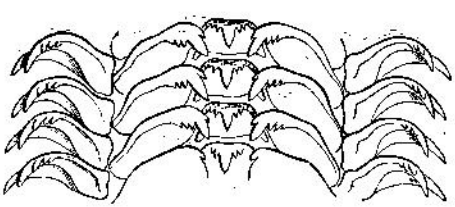

FIGURE 126. Four rows of teeth of *Vermetus grandis*, Gray, × 40.

Mr. Cooke in his opening chapters dilates upon the origin of land and fresh-water molluscs, together with the habits of these forms, and then, becoming more general he takes cognizance of the enemies of the group and the means of defence against them, including mimicry and protective colouration. Observations on this branch of

† See the prospectus of the Cambridge Natural History.

biology, with respect to the mollusca, are very sparse in the few books which deal with the subject, but many cases of protective colouring have been recorded, and although, in the work under consideration, space has been found for a number of these, one cannot help wishing for more. Figure 28, shewing a supposed case of true mimicry of a *Conus* by a *Strombus*, is reproduced. Parasitic molluscs, commensalism and variation have their fair share of attention and the facts presented under the last heading should act beneficially on the minds of those who still describe species from trivial shell-characters.

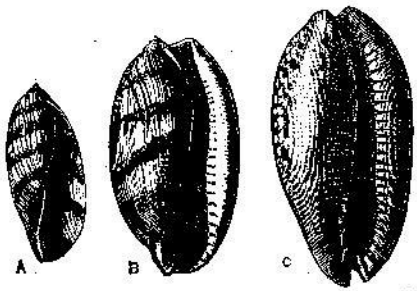

FIGURE 172. Three stages in the growth of *Cypraea exanthema*, L.

Passing on through the commercial aspects of the subject and the uses to which shells are put by civilized and uncivilized man, the mollusca are considered structurally and physiologically in an exceedingly thorough manner. Perhaps the chapter on digestive organs might be singled out for greater praise, seeing that it contains an exhaustive account of the radula; while on the other hand, in the chapter on the shell, although the adult form and the stages of its growth (see Figure 172) are dealt with in great detail, comparatively little light is thrown upon its minute structure.

Geographical distribution is discussed in the three chapters which follow, and illustrations are given of characteristic mollusca from the various regions and their divisions (see Figure 210). Finally, the several molluscan classes are systematically considered as fully as is possible in the space which remains; the classification as stated in the preface being in accordance with the views of "leading recognized specialists."

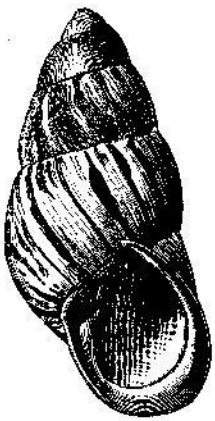

FIGURE 210. *Cochlostyla* (*Chrysalis*) *mindoroensis*, Brod. Mindoro Phillipines.

It is true that Pelseneer has been followed in so far as he puts the old class Pteropoda under the gasteropod order of Opisthobranchiata, but no further, the forms still being kept together as a sub-order. The Amphineura are included also under Gasteropoda, and are not considered to be worthy of the class-distinction accorded to them by Pelseneer.

In other instances un-notified, "discrepancies" will be found in which the specialists have been followed incompletely, or not at all.

It is, of course, easy for one who has taken an interest in some small points in Malacology to disagree with Mr. Cooke's treatment of those points, but the fact remains that the book, as a whole, deserves all praise, if only for two things- in the first place, it is not a monument to the weakness and laziness of authors, the short-sightedness and stinginess of publishers, or even to the extinction of draughtsmen and engravers, for the bulk of the illustrations are original; and in the second case the patriotic way in which, although the labours of workers outside the country are fully recognized,

those of Englishmen are systematically brought forward by the author of "Molluscs." Figure 20 is an instance of a copied drawing which does not represent what it is intended to show—to wit, the normally-extruded radula of a *Testacella* when feeding (see below p. 50).

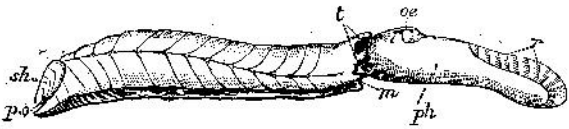

FIGURE 20. *Testacella haliotidea*. Drap protruding (?) its pharynx (ph.) and radula (r); oe., oesophagus; p.o., pulmonary orifice; sh., shell; t., tentacles (after Lacaze-Duthiers).

In conclusion, although all of us cannot consider, with Mr. Brooke in George Eliot's "Middlemarch," whose words are quoted on the back of Mr. Cooke's title-page, that "conchology is a light study" now that empty shells are not its sum total, yet one must allow that many readers will not find this out until they have left far behind, not only the title-page, but very many chapters of this delightful book, the success of which it is a pleasure to contemplate.

W. M. W.

Kobelt, W. and H. Rolle.—"Iconographie der land und süss wasser mollusken." Neue folge, Supplemental vol. 1, pl. 32. Wiesbaden, 1895.

Martini and Chemnitz.—"Systematisches Conchylien Cabinet." Fortges. Von W. Kobelt, Lief., 412. Achatinidae, pp. 108-132, pls. 30-35.

Tryon, G. W., continued by Pilsbry, H. A.—"The Manual of Conchology," series 1, part 60 (contains vol. xv., pp. 181-436, pls. 43-50, 59-61); series 2, parts 33a and 36 (contain Vol. ix., pp. i-xlviii. and 161-366, frontis. and pls. 41-71). Published by the Acad. Nat. Sci., Philad. Feb., 1895.

The enormous undertaking in which Mr. Pilsbry is engaged, and for which the support of all naturalists is deservedly sought, may be gleaned from the fact that this quarterly issue contains over 500 pages and 40 plates. In the marine series, part 60 completes the study of the Tectibranchiata, and no student of these forms can complain that they have been neglected of late, when they have been surveyed by Mr. Pilsbry in the present work with especial reference to recent species, while Mons. Cossman has elsewhere reviewed them from a palaeontological standpoint, and Dr. Pelseneer has incidentally reviewed their anatomy. The usual number of generic names is changed as each new monographer appears to bring to light old uses of these terms which have escaped his predecessors. While we doubt if it were worth while to revive the old genus *Retusa*, Brown, for the species usually known as *Utriculus truncatulus*, we equally doubt if it be allowable to use *Volvula*, Adams, there being already, as Mr. Pilsbry admits, two prior genera named *Volvulus*, and a suitable name having been proposed by Mr. Newton. A similar remark may be made with reference to *Cylichna*, there being a prior *Cylichnus*. A new family Akeridae is created to contain *Akera*, *Haminea*, etc.

With the present parts of the terrestrial series, Mr. Pilsbry completes his great monograph on the Helicidae and Endodontidae. This, the most thorough study the group has ever had, has been worked out not in the shell alone nor in a single anatomical characteristic, but on the only basis which can ever be permanent, the general combination of anatomical and conchological characters. The Endodontidae stand as a family by themselves, while the Helicidae are divided into five great groups, characterised by variations

in the genital organs, jaw, radula and shell. The oldest known species is from the Carboniferous of Nova Scotia, and is probably a member of the genus *Pyramidula*: and Mr. Pilsbry points out in confirmation of the age of the Endodontidae that they have a wider geographic range than either the Helicidae or Zonitidae. The origin of, and reasons for the present generic distribution are carefully discussed, and Mr. Pilsbry concludes "that the western portion of Asia, together with Europe and North America, is peopled by a peculiar, highly-organised type of Helices practically confined to these regions, but evidently derived from extreme south-east Asia or the East Indies by a cretaceous (?) immigration."

The systematic portion of the work is done with great care, though we cannot help thinking that too many sections have been created in, or admitted into, such groups as, for example, *Eulota*. The disappearance of old and familiar names, too, is a source of regret, though doubtless strictly warranted and rendered necessary by the law of priority. Mr. Pilsbry admits five epochs in the study of the terrestrial mollusca, namely:—Linnean, Lamarckian, Ferussacian, Beckian, Albers-Martensian: there may now be added a sixth, the Pilsbryan. E. R. S.

Tryon, G. W., continued by **Pilsbry, H. A.**—"Manual of Conchology," 2nd series, Pulmonata, Index to the Helices, pp. 1-126. May, 1895.

ANATOMY.

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Bergh, Dr.—"Beitrage zur kenntniss der Strombiden besonders der gattung *Terebellum*." Zool. Jahrb., vol. viii., pt. 3, 1895, pp. 342-378, pls. xxii. and xxiii.

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Preliminary note of a paper about to appear in the Bull. Soc. Geol., France.

Chatin, A., and Muntz, A.—"Analyse des coquilles d' huitres." C. R., vol. cxx., pp. 531-534.

Fuchs, S.—"Beiträge zur physiologie des kreislaufes bei den Cephalopoden." Arch. ges. Phys., vol. lx., pp. 173-204, pls. vii.-ix.

Garstang, W.—"On the gastropod *Colpodaspis pusilla* of Michael Sars." Proc. Zool. Soc., 1894, pp. 664-669, pl. xliv.

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The Pteropods are now recognised as being opisthobranch Gasteropods, but no mention is made of this fact, and the classification of the Mollusca is decidedly out of date.—W. M. W.

Kostal, J.—"Beitrag zur kenntniss des copulations-apparatus bei *Limacopsis coerulans*, Simroth (Bielz)." Sitz. Gesel. d. wiss. Math. Nat., Prague, 1894, T. xix.-xxii., pp. 1-15.

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The disused apex of the shell in *Bulimus decollatus* is removed by a *chance* contact with a resisting object.

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Simroth, Heinrich.—"Sur le développment de la coloration chez *Amalia gagates*." Ann. Sci. Nat., Porto, vol. ii., 1895, pp. 89-96.

The author points out that the colouration of young slugs represents an ancestral condition such as is seen in the lion-cub which is spotted. In *Limax maximus* the young ones of all the colour-forms—*cinereoniger*, *unicolor*, etc., etc.—are alike; very young individuals of the genus *Arion* belonging to the same species are of a colour peculiar to that species, but later on variations come in; in *Amalia* the young are usually like the parents, which vary geographically.

All the young of a black specimen of *Amalia gagates* were in the first place white with a semi-circular band of black on the mantle, one turned a reddish colour with a greenish tint on the sides, and of three others reared together, two became black, while the remaining one took upon itself a grayish tint with a suspicion of ochre.

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This continuation of the bivalves contains figures and descriptions of a number of new varieties. The exhaustive synonymy is strongly to be commended.

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Melvill, J. Cosmo.—[See under "SYSTEMATIC WORK":—Terrestrial Mollusca from South Arabia.]

Moellendorf, O. F. von.—[See under "SYSTEMATIC WORK":—Land shells from German New Guinea.]

Nobre, Augusto.—"Sur la faune malacologique des îles de S. Thomé et de Madère." Ann. Sci. Nat. Porto., vol. ii., 1895, pp. 97-98.

Nylander, Olof O.—"Shells of Aroostook, co. Maine." Naut., viii., 1895, pp. 125-126. 38 species.

Paar, L. A.—"*Campylaea intermedia*, Zgl. in Tirol." Nachr. Mal. Ges., 1895, pp. 98-99.

Pilsbry, H. A.—"Notes on Tasmanian *Acmæa* and *Ischnochiton*." Naut., viii., 1895, pp. 127-129. No fig.

Quadras, J. F., and Moellendorf, O. F.—[See under "SYSTEMATIC WORK":—New shells from the Phillipines.]

Rochebrune, A. T. de.—"Note sur les Mollusques recueillis par M. Diguet en Basse-Californie." Bull. Mus., Paris, 1895, No. 1, p. 36.

Schick, Morris.—"Mollusc-fauna of Philadelphia and environs." Naut., viii., 1895, pp. 129-130.

Smith, Edgar A.—[See under "SYSTEMATIC WORK":—A new *Helix* from Burmah.]

Standen, R.—"Note on *Cypræa tessellata*, Sowb." J. of C., vol. viii., 1895, p. 55.

Sykes, E. R.—[See under "SYSTEMATIC WORK":—A new *Endodonta* from New Zealand.]

Taylor, G. W.—"The present condition of Canadian conchology." Ottawa Nat., viii., 1895, pp. 144-159. Bibliography.

SYSTEMATIC WORK.

Aldrich, T. H.—"Descriptions of two new Eocene Solariidae from Alabama." Naut., ix., 1895, pp. 1-2, pl.

A var. of *Solarium elaboratum* and *Solarium planiforme*.

Cockerell, T. D. A.—[See under "FAUNA":—*Veronicella* in Central America."]

Professor Cockerell points out how important it is, in describing new species of this somewhat difficult genus, to have "at least a dozen mature examples of each species," as "there is danger of taking varietal characteristics for specific ones." Notes are given on *V. olivacea*, Stearns, 1871; *V. morelet*, Crosse & Fischer, 1872: *V. mexicana*, Pfr. and Strebel, 1873; *V. strebellii*, Semp., 1885 (?); and *V. decipiens*, Semp., 1885 (?). Two forms in the British Museum are described, but for the present left un-named; these are (1) *Veronicella*, sp. nov., vel. *mexicana*, var., Honduras; (2) *Veronicella*, sp. nov., vel. *punctatissima*, sub-sp., Panama. It seems that Heyneman has written "nov. sp.?" on the first. Judging from the descriptions of the above-mentioned specimens, we doubt very much their right to specific distinction.

W. E. C.

Cooper, J. G.—[See under "PALAEONTOLOGY":—Pliocene F. W. Fossils of California.]

Margaritana sub-angulata, n. sp.

Cooper, J. G.—[See under "FAUNA":—Mollusca of Lower California.]

Melaniella lastensis, n. sp.

Dall, W. H.—"An undescribed *Meretrix* from Florida." Naut., ix., 1895, pp. 10-11.

Meretrix simpsoni.

Dall, W. H.—"Contributions to the Tertiary Fauna of Florida: Part iii. A new classification of the Pelecypoda." Trans. Wagner Free Inst., 1895, vol. iii., pt. 3, pp. 485-570.

"In preparing the descriptive portion relating to different groups of the Pelecypoda, a point was reached when it became necessary to consider the general arrangement. As recent morphological and palaeontological studies have thrown a new light on the relations of the Pelecypoda, necessitating a revision of the earlier systems, and as a complete revision is nowhere accessible in print, it was thought that a statement of the characters chiefly relied on for classifying these animals, with comparable diagnoses of the several families in zoölogical order, would be useful for students of Palaeontology, and might form a proper introduction to the descriptive part of this memoir."

The above is Dr. Dall's own introduction to this most useful and valuable revision of the Pelecypoda of Florida, which, like all his writings, is characterised by a lucidity and thoroughness only too rare amongst students of the Mollusca. As our space does not permit of any lengthy review, it is sufficient to say that no student interested in either recent or fossil Mollusca, can afford to overlook so important a contribution, while those working at the Pelecypoda will welcome it as a most useful and valuable work.

A series of "Notes on Nomenclature" on pages 561-565 is well worth reading.

W. E. C.

Dall, W. H.—"New species of land shells from the Galapagos Islands." Naut., viii., 1895, pp. 126-127. No fig.

Bulimulus (Naesiotus) reibischii and *Bulimulus (Naesiotus) janneri*.

Dall, W. H.—"New species of land shells from Puget Sound." Naut., viii., 1895, pp. 129-130.

New species:—*Patulastra ?* (*Punctum ?*) *pugetensis* and *Pyramidula ? randolphii*.

Dall, W. H.—"Synopsis of a review of the genera of Recent and Tertiary Mactridae and Mesodesmatidae." Proc. Mal. Soc., vol. i., 1895, pp. 203-213.

Frauscher, K.—"Nautilusse von Guttaring." Jahrb. Mus. Kärnten, vols. lxi. and lxii., 1895, pp. 185-207, 2 pls., 6 figs.

New species: *N. tumescens* and *Aturia brunlechneri*. Description and figure of *N. seelandi*, Penecke.

Fulton, Hugh.—"Note on *Helix sauliae*, Pfr. (non Reeve) = *palumba*, Souverbie." Naut., viii., 1895, p. 125.

Jousseaume, F.—"Diagnose des coquilles de nouveaux mollusques." Bull. Soc. Phil., Paris (s. 8), vol. vi., 1894, pp. 98-105. No figs.

In the description of new species, all rules of nomenclature are ruthlessly set aside, and there is nothing to shew which generic names are new. The new species are:—*Conus milne-edwardsi, C. phoebus, Kyrina kyrina, Agagus agagus, Aspella gothica, Lampas bardeyi, Natica tadjourensis, Bulimus deflersi, Extra extra, Djeddilia djeddilia, Niotha voluptabilis, Rissoina savignyi, R. bouvieri, Plesiothyreus cosmani, Lepidopleurus rochebruni, Dentalium shoplandi, D. laugieri, Stolida avalitensis, Scala malhaensis, Crisposcala bouryi, C. audouini, Hyaloscala amica, Nodiscala bouryi, Ancillaria djiboutina, Cupulus putcherrimus, Psammosphaerita psammosphaerita, Venus djiboutiensis, Mactra crista, Metis coxa.* S. P.

Locard, A.—"Description de deux hyalinies nouvelles." Rev. Linn. xi., 1895, p. 4.

Hyalinia algarvensis and *Hyalinia gyrocurtopsis*.

Locard, A.—"Description de quelques Unionidae nouveaux pour la faune française." Bull. Soc. Elbeuf., vol. ii., 1893, pp. 49-62. No figs.

The *so-called* new species are:—*U. lancelevei, U. elbeuviensis, U. catinulus, U. lecoiturieri*, and *U. lacrymiformis*.

Marshall, J. T.—"Alterations in 'British Conchology.'" J. of C., 1895, pp. 24-41.

Melvill, J. Cosmo.—"Descriptions of new species of *Pleurotoma, Mitra*, and *Latirus*." Proc. Mal. Soc., vol. i., 1895, pp. 221-223, pl. xiv., figs. 1-6 and 9-10.

Melvill, J. Cosmo.—"Descriptions of two new species of terrestrial Mollusca from the Hadramaut district, South Arabia." Proc. Mal. Soc., vol. i., 1895, pp. 224-225, pl. xiv., figs. 7 and 8.

Buliminus lunti and *Otopoma bentianum*.

Melvill, J. Cosmo.—"Descriptions of four new species of *Engina* and a new species of *Defrancia*." Proc. Mal. Soc., vol. i., 1895, pp. 226-228, figs. 11-15.

Mollendorf, O. F. von.—"On a collection of land-shells made by Mr. J. Kubary in German New Guinea." Proc. Mal. Soc., vol. i., 1895, pp. 234-240, pl. xv.

New species:—*Planispira* (*Cristigibba*) *papuana, Satsuma eucosmus, S. dasypleuris, Papuina kubaryi, P. planogyra, Buliminus* (*Ena*) *colonus, Cyclophorus kubaryi, Cyclotus* (*Pseudocyclophorus*) *canaliculatus, Adelomorpha laeta*, and *Helicina* (*Sulfarina*) *sphaerocosmus*.

Parona, C. F.—"I Gasteropodi del Lias inferiore di saltrio in Lombardia." Boll. Soc. Mal. Ital., xxviii., 1895, pp. 161-181, 2 pls.

Pleurotomaria new forms. A new species of *Ataphrus* and of *Chemnitzia*.

Pilsbry, H. A.—[See under "FAUNA":—Tasmanian *Ischnochiton*.]

New species:—*Ischnochiton* (*Haploplax*) *mayi*.

Quadras, J. F., and Moellendorff, O. F.—"Diagnoses specierum novarum ex insulis Philippines." Nachr. Mal. Ges., 1895, pp. 73-88.

New species:—*Ennea (Diaphora) cylindrica, Vitrinidea quadrasi, Helicarion papillifer, Hemitrichia velutinella, Bensonia (Glyptobensonia) diplotropis, Aulacospira triptycha - Cylindrotis*, a new genus of the Auriculidae—*Cylindrotis quadrasi, Stenothyra decollata, Assiminea quadrasi, Ditropis pusilla, Cyclophorus aëtarum, C. coronensis, Lagochilus tumidulum, L. euryomphalum, L. cagayanum, L. scalare, L. polytropis, Leptopoma poecilum, Cyclotus anthopoma, C. anocamptus, Poreatlia canalifera, Alycaeus quadrasi, Helico morpha globulus, Arinia calathiscus, A. contracta, Palaina catanduanica, P. deformis, Diplommatina nasbatica, D. goniociampta, D. elegantissima, D. mindanaoica, D. diplosloma, P. cyrtochilus, Diarctia ? philippinica*, and *Georissa coccinea*.

Rolle, H.—"Eine neue *Achatina*." Nachr. Mal. Ges., 1895, pp. 100-101.

Achatina usambarensis.

Simpson, C. T.—"On the validity of the genus *Margaritana*." Amer. Nat., vol. xxix., 1895, pp. 336-344.

". . . . . *Margaritana* is not a valid genus . . . . . the name merely stands for certain groups, or parts of groups, of Unios of polyphyletic origin. . . . . all the species will have to be relegated to the genus *Unio*."

Simpson, C. T.—"*Unio ochraceus* and *cariosus*." Naut., viii., 1895, pp. 121-123, 2 figs.

Smith, Edgar A.—"Description of a new species of *Helix* from Burmah." Proc. Mal. Soc., vol. i., 1895, pp. 219-220. Fig.

Helix (Plectotropis) armstrongi.

Sowerby, G. B.—"Descriptions of nine new species of shells." Proc. Mal. Soc., vol. i., 1895, pp. 214-217, pl. xiii.

Bulimus corticosus, Bulimulus buckleyi, B. procteri, Conus coxianus, C. elegans, Pisania hednalli, Murex multiplicatus, Pecten townsendi, and *Sunetta kurachensis*.

Sykes, E. R.—"On a new helicoid land-shell from New Zealand." Proc. Mal. Soc., vol. i., 1895, p. 218.

Endodonta (Charopa) prestoni.

Sykes, E. R.—"Review of the genus *Plecotrema*." Proc. Mal. Soc., vol. i., 1895, pp. 241-246, figs. 1-6.

PALAEONTOLOGY.

Aldrich, T. H.—[See under "SYSTEMATIC WORK":—Eocene Solariidae.]

Bonarelli, G.—"Fossili domeriani della Brianza." Rend. Inst. Lombardo (ser. 2), vol. xxviii., 1895, pp. 326-

Cooper, J. G.—"On some Pliocene fresh-water fossils of California." Proc. Calif. Ac. (ser. 2), vol. iv., 1894, pp. 166-172, pl. xiv.

Dall, W. H.—[See under "SYSTEMATIC WORK":—Tertiary fauna of Florida.]

Frauscher, K.—[See under "SYSTEMATIC WORK": — Nautilusse von Guttaring.]

Kennard, A. S.—"Pleistocene Mollusca of Crayford." Sci. Goss. (new ser.), vol. ii., pp. 39-40. Figs.

Lioy, P.—"Sui resti organici trovati in alcune grotte del Vicentino." Atti. Inst. Veneto (ser. 7), vol. vi., pp. 312-317.

Parona, C. F.—[See under "SYSTEMATIC WORK":—Gastropods from the Lias of Lombardy.]

Simonelli, V.—"Fossili terziari e post-pliocenici dell' Isolo di Cipro raccolti dal Dott. A. Bergeat." Mem. Acc. Bologna (ser. 5), vol. iii,, pp. 153-162.

Vaughan, T. W.—"The stratigraphy of north-western Louisiana." Amer. Geol,, vol. xv., pp. 205-229.

Gives lists of the contained fossils.

Weller, S.—"The succession of fossil faunas at Springfield, Missouri." Am. Journ. Sci. (s. 3), vol. xlix., pp. 185-199.

COLLECTING AND CULTURE.

B———, D.—"La pêche de la nacre dans l'Inde." La Nature, vol. xxiii., p. 230.

A short account of the *Turbinella* fishing industry.

Collier, Edward.—"Notes on a Conchological Excursion to the West of Ireland." J. of C., viii., 1895, pp 42-46.

H———, W. A.—"Mussel-culture." Nature, vol. li., 1895, pp. 578-579.

A review of Calderwood. See J. of Mal , vol. iv., pp. 28-29.

Haynes, T. H.—[See under "Biology":—Pearl growth.]

States that one diver was able to predict the shells that would contain pearls, from the two sides of the hinge in these shells not being parallel.

Oliveira, P. de.—"Préparation et conservation de quelques animaux par l'aldèhyde formique." Ann. Sci. Nat. Porto., vol. ii., 1895, pp. 69-76.

Four parts of "normal solution"—40 %—to 100 parts of water, is the solution recommended.

Walker, Bryant.—"A month with the Michigan Fish Commission." Naut., ix., 1895, pp. 2 and 3.

Willey, Arthur, with a preface by **Lankester, E. Ray.**—"In the home of the *Nautilus*." Natural Science, vol. vi., 1895, p. 405, 2 figs.

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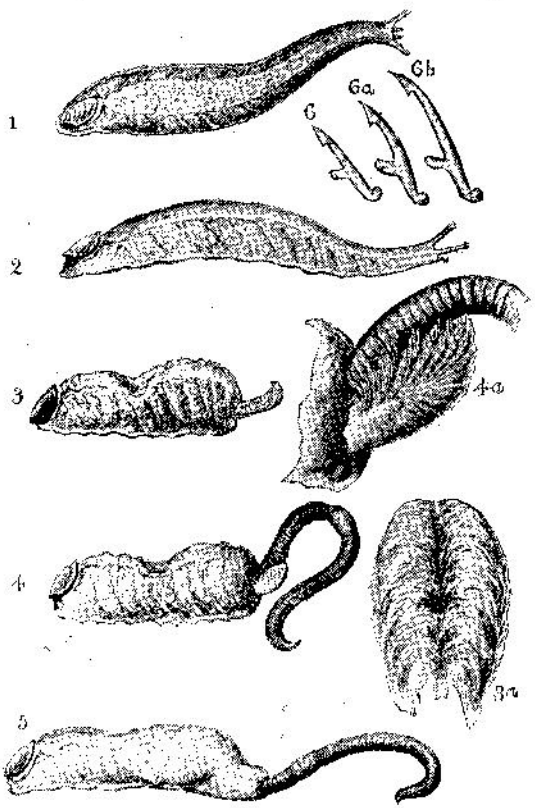
Melvill, J. C. "An epitome of the life of the late Hugh Cuming, F.L.S., C.M.Z.S." J. of C., viii., 1895, pp. 59-64.

Semper, C.—"Reisen im Archipel der Philippinen." Second part, title-pages to vols. i.-v., 1895, "Carl Semper," pp. vii.-xviii. Portrait and Bibl.

NOTES.

Habits of the Agnatha.*—Under this heading, Mr. Cooke, in the third volume of the "Cambridge Natural History,"† briefly describes the way in which he would lead one to suppose that *Testacella* catches and swallows its prey. The account is professedly based upon a sixteen-line note by Mr. Butterell,‡ and is intended to be made clearer by a drawing of



Testacella scutulum, Sowerby.—1. Seen from above.—2. From the right side.—3. Contracted and with the radula protruded.—3a. The radula from above, enlarged.—4. As 3, but the radula has an earth-worm in its grip.—4a. Radula seen from the right side, enlarged.—5. Enveloping the worm.—6, 6a and 6b. "Teeth" from the radula, isolated and enlarged.

Testacella haliotidea taken from a figure by Lacaze-Duthiers.§ The fact related by Mr. Butterell, that a gentle touch on the head with a pencil caused his specimen of *Testacella maugei* to protrude its radula, is not repeated by Mr.

* A. H. Cooke—*The Cambridge Natural History*, vol. iii., 1895, pp. 51-55.

† See above, p. 42.

‡ J. D. Butterell—"Note on *Testacella maugei*, Fér." Journ. of Conch., vol. iii., p. 277.

§ H. de Lacaze-Duthiers—"Histoire de la Testacelle." Arch. Zool. Expér. (ser. 2), vol. v., 1887, p. 459.

Cooke; but it is important in connection with the animal's habits, which have been made the subject of much fanciful exaggeration, as it points to the more or less automatic capture of the prey, the details of which are worked out in a paper by the present writer.* (Reference given by Mr. Cooke.)

It is, of course, very difficult to reproduce, in the open, conditions which are to be met with underground, but it seems fairly certain, from the various observations made during the last 150 years, that *Testacella*, as a rule, seizes the earth-worm by the anterior end (Figs. 4 and 4a), a fact which might also be surmised from the slug's habit of taking up its position in the burrows of its prey. Only in special cases, therefore, is another part of the victim's body impaled, as apparently happened in Mr. Butterell's somewhat artificial experiment where he held the worm, and in which the head of the latter "was rejected." Again, in life, apparently, the odontophore cannot be extruded unless the animal be itself contracted (Fig. 3), and swallowing is not so much effected by the withdrawal of the radula after the prey is transfixed by the barbed teeth with which it is beset (Figs. 4a and 6), as by the re-extension of the slug, which literally "puts itself outside" of its struggling repast (Fig. 5).

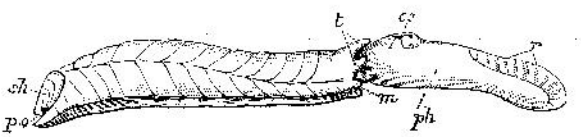


FIGURE 20. *Testacella haliotidea*. Drap protruding (?) its pharynx (ph.) and radula (r); oe., oesophagus; p.o., pulmonary orifice; sh., shell; t., tentacles (after Lacaze-Duthiers).

With respect to the figure after Lacaze-Duthiers—the original one represents a specimen which is by no means normal, being probably taken from a drowned example, or one that was at least "sick unto death;" it is, moreover, described by Lacaze-Duthiers as one shewing the buccal mass "evaginé," which cannot here be rightly construed into "protruding its pharyx and radula." In fact, Fig. 20, as it stands in the Cambridge Natural History, is calculated to give a very false impression as to the whereabouts of the oesophagus when the animal is feeding, in connection with which organ the only reference to the figure is made.

A reduced facsimile of the original drawings from nature illustrating the writer's paper already alluded to is reprinted from an abstract of the same in the "*Essex Naturalist*,"† through the kindness of the Editor of that publication.

WILFRED MARK WEBB.

On the specific identity of Papuina hedleyi, Smith, and P. canefriana (Dohrn. MSS.), Kobelt. At the suggestion of Mr. Hedley, I have examined the type of Mr. Smith's species and compared it with the figure and description given by Dr. Kobelt (Conch. Cab., *Helix*, Lief. 410, 1894, p. 708, pl. 202, figs. 1 and 2), and can only come to the conclusion that they are slightly varying forms of the same species.

E. R. SYKES.

The Larval Oyster.—At a recent meeting of the Malacological Society, Mr. Martin F. Woodward read a note on the larval oyster, in which he gave it as his opinion that the structure alluded to as a probable posterior adductor in the last number of this Journal has an epiblastic origin, and represents the beginning of the visceral nerve ganglion.

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* Wilfred Mark Webb—"On the manner of feeding in *Testacella scutulum*." Zool., vol. xvii., 1893, pp. 281-289, Pl. I.

† *Testacella scutulum*, Sowerby. Essex Nat., vol. vii., 1893, pp. 120-123.

Variations in Radulae.—It would be interesting to know what variations have been observed in the radulae of mollusca, for in some of the common species considerable modifications of the formula recognised as typical have been noted. The normal radula in *Buccinum undatum* appears to have 100 rows of teeth, each row consisting of a median tooth or plate with six pointed cusps between two laterals, each forming a set of four slightly-hooked cusps, as represented in Fig. A. Recently I have observed two variations in specimens I have mounted for the microscope. In one case there are six median spikes (one being bifurcated), with four on the laterals of one side and five on that of the other, as seen in Fig. B. In the other example there are six lateral (one being bifurcated) on one side and four on the other, as in Fig. C. The mollusca from which these radulae were dissected were obtained in the Central Fish Market, London, so that I cannot indicate the locality from which they were dredged.

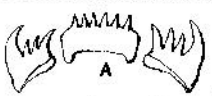

FIGURE A. Row of teeth from radula of *Buccinum undatum* (Rhachiglossate-type—formula 1-1-1).

FIGURE B. *Buccinum undatum*. Row of teeth with a bifurcated cusp to the middle plate.

Mr. Wilfred Mark Webb has, however, within the last few days, sent me an account of 22 radulae of *B. undatum* taken at random from Brightlingsea, and which show very great variation. Only eight of these are normal. One example has four median cusps between two sets of four lateral ones. Five specimens have five median between two sets of four lateral projections; and of these two examples have the second lateral cusp from the outside on the left hand small and adnate to the third lateral from the outside. Two specimens have six points to the median between four on the left hand lateral and three on the right. Four specimens have a median tooth showing seven points, while the lateral teeth are normal. One specimen resembles the last, but has an extra cusp to the median tooth; and lastly, one has the cusps on the median tooth increased to eight, while those of the lateral plates are reduced to three.

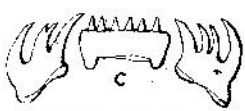

FIGURE C. *Buccinum undatum*. Row of teeth from radula. The right lateral plate has three complete cusps, one being bifurcated.

GEORGE BAILEY, F.R.M.S.

EDITORS' NOTES.

We thank "THE JOURNAL OF CONCHOLOGY" for its kindly notice of our previous Number, and express the hope that its new Editor and Committee of Publication may attain to that success which it so generously wishes us.

Corrigendum.—In Figure 1 on Plate I., the coil of the intestine should be on the left side of the stomach, that is, in front of, and not behind the latter, as there depicted.

THE JOURNAL OF MALACOLOGY

Established in 1890 by Walter E. Collinge as " THE CONCHOLOGIST, *a Journal of Malacology."*

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VOL. IV. (No. 3.) CONTENTS. SEPTEMBER 30th, 1895.

LONDON: DULAU & CO., 37, Soho Square.

BERLIN: FRIEDLAENDER & SOHN, Carlstrasse 11.

Quarterly. Issued Post-free to Subscribers only, for 4s. 4d. per annum.

All communications to be made to—

WILFRED MARK WEBB, "Holmesdale," Brentwood, Essex, England.

THE

JOURNAL OF MALACOLOGY.

No. 3. SEPTEMBER 30th, 1895. Vol. IV.

MOLLUSCA OF THE ORIENTAL REGION,

By CHARLES HEDLEY, F.L.S.

Australian Museum, Sydney, N.S.W.

As might have been anticipated from the tastes and previous writings of the author, one of the chief excellencies of Mr. A. H. Cooke's admirable work on "Molluscs," is the section dealing with Geographical Distribution. Though the subject is investigated independently of the classic scheme of Wallace, yet the conclusions of that great authority are generally taught by Cooke.

Wallace's limitations* of the Oriental Region seemed to me, when inquiring into that fauna, to rest upon less clear distinctions than those defining the Palaearctic, the Ethiopian or other main divisions. I prefer the first conception † he entertained on his return from the East, of a province "extending from the Nicobars on the north-west, to San Christoval, one of the Solomon Islands on the south-east, and from Luzon on the north, to Rotti, at the south-west angle of Timor, on the south." Fischer once wrote, ‡ "A study of the terrestrial molluscs, shows but little difference between the faunas of Bali and of Lombok, and only these particular features (certain birds) induces an appreciation of the importance of the line of demarcation drawn by Wallace." That Cooke, sharing Fischer's estimate of "Wallace's line," should, while retaining Wallace's provinces, shift his boundaries to a position past the Molluccas, is further proof of their indefinitness.

Only they to whom species are real entities, not mere names written on slips of paper, can hope to solve these problems. It is upon the experience of actual travel, collecting and study in Australia and New Guinea that I base my opposition to Mr. Cooke's views, and my contention that, on the one hand, Papua

*Geographical Distribution of Animals, vol. 1, chap. xii.
†Report British Assoc., 1863, Trans. p. 107.
‡Compte-Rendu des Séances du Congrès international de Zoölogie, Paris, 1889, p. 28.

is as integral a part of the Oriental Region as any of its recognised sub-regions; and that, on the other hand, as great a difference parts the Australian, from the Papuan sub-region as intervenes between any two regions. The Papuan tract agrees with the Oriental, in its characteristic wealth of operculates and *Naninidae*, and disagrees with the Australian, in the presence of these two and in the comparative absence of the *Rhytididae*, the *Endodontidae* and the *Acavinae*.

I wrote in 1891* "Wallace's line, so conspicuous a severance among the vertebrates, appears to be quite blotted out when the distribution of animals is regarded from a molluscan standpoint. No sharp break occurs between the Malayan fauna as exemplified in Borneo or the Philippines and in New Guinea. All the characteristic Malayan forms, *Atopos*, *Xesta*, *Helicarion*, *Microcystina*, *Trochomorpha*, *Obba*, *Chloritis*, *Cochlostyla*, *Pupina* and *Diplommatina*, are common to both regions. The Solomon Islands, Fiji, &c., appear by the light of the Papuan shells to be inhabited by an eastern extension of this Malayan fauna, which has also overflowed into Queensland." Wider knowledge has since strengthened my belief in the correctness of this estimate, and recently I have been gratified to receive support † from so high an authority, and one so well acquainted with the Malayan fauna, as Dr. von Moellendorff.

Botanists confirm the homogeneity of the province as thus expressed, for Hemsley writes, ‡ "There is no doubt that the combined Fijian, Samoan and Tongan flora is eminently Malayan in character." For the correspondence between the Bornean and the Papuan floras see Dr. O. Stapf's paper. §

Mr. Cooke's summing ‖ of the Papuan fauna much exaggerates its Australian tinge. We read that *Rhytida* "emphasises this union still further." But *Rhytida* is Alpine in New Guinea and only "unites" these two countries as an Alpine Gentian might "unite" Italy with Iceland. The *Pedinogyra* would indeed be– if it were not mythical—a strong link. That *Perrieria* inhabits both Queensland and New Guinea is hardly to the point, since, as Mr. Cooke admits, it has migrated southwards from the one to the other. Of the characteristic Australian genus *Hadra*, Mr. Cooke quotes (presumably from my article) four Papuan species. After dissection and closer

* P.L.S.N.S.W. (2), vi., p. 693.
† Pro. Malac. Soc., I., p. 234.
‡ Journ. Linn. Soc., Botany, xxx., p. 211.
§ Trans. Linn. Soc., 2nd Ser., Botany, vol. iv., pt. 2.
‖ Of "Molluscs," Cambridge Natural History, vol. iii.

examination I now eliminate all of these but *broadbenti* from *Hadra*.

Conversely: the affinities of New Guinea with western lands is unduly depreciated. The decisive testimony of a whole group of *Cochlostyla* is suppressed, *Obbina*, *Vaginulus* and especially *Rhysota*, all related westward, are more numerous than here indicated. While Mr. Cooke wrote, "Not a single *Cyclophorus* occurs," Dr. von Moellendorff's report of its occurrence was receiving publication. "*Lagochilus* so marked a feature of the Indo-Malayan fauna," instead of being as Mr. Cooke unfortunately declares, "conspicuous by its absence," had already been reported by Dr. von Moellendorff from Papua.

Upon the hypothesis that the Queensland fauna is the oldest Australian constituent, Wallace derives * the New Zealand fauna therefrom. But upon the opposite premises that the Queensland fauna is the latest arrival in Australia, I deduce † that the New Zealand fauna sprang not from Australian, but from Melanesian sources. Having adopted ‡ my conclusions on the origin of the Queensland snail-fauna, Mr. Cooke cannot with compatibility accept also the results of Wallace's irreconcilable proposition § that the relations of New Zealand are with N.E. Australia. I may be excused for here repeating my statement, that the supposed molluscan community of New Zealand with Northern Australia rested upon the fictitious existence in New Zealand of *Paryphanta millegani*, *Hadra reinga*, *Cristigibba taranaki* and *Rhytida rapida*, and on the equally fictitious presence in Australia of *Charopa kivi*, *C. ophelia*, *C. ziczac* and *C. coma*.

It has been shown by the writer and accepted by Messrs. Cockerell and Collinge ‖ that the *Janellidae* properly embraces both *Janella* and *Hyalimax*. These ancient wrecks of past epochs, tempt speculation, as to whether the Oriental Region of to-day may not have been evolved from an equatorial tract whose crescent swept from New Zealand to Mauritius.

Summary: My conclusion briefly is that, as far as the mollusca are concerned, the Oriental Region should be extended to include the Papuan, Polynesian and Melanesian Sub-regions, the latter to contain New Zealand; while the Australasian should be restricted to Tasmania and Australia *minus* Queensland.

* Island Life, 2nd Ed., Chap. xxii. † Natural Science, vol. iii., pp. 187-191.
‡ p. 322; § p. 325 of vol. iii., Cambridge Natural History. ‖ Conchologist II., p. 195.

NOTES ON A FEW OF THE LESS-KNOWN BRITISH MARINE MOLLUSCA.

By GEORGE W. CHASTER, M.R.C.S.,
Southport.

Adeorbis imperspicuus, Monterosato,
1875, Nuova Rivista, p. 36 (name only).

In the "Conchologist" for June 24th, 1893, I announced the discovery in British waters of this shell which had been identified by the Rev. Canon Norman as *Cyclostrema millepunctatum*, Friele. Subsequently, when I had an opportunity of examining the description and figures of that species, grave doubts arose in my mind as to the correctness of the naming of my shells. These were submitted to Herr Friele who declared that they were not his species, of which he courteously sent a specimen for examination: it is much larger, shaped like *Helix pulchella*, and has the sculpture coarser and less regularly arranged in spiral rows.

The Marquis of Monterosato, however, at once recognized my shells as his *Adeorbis imperspicuus* and kindly sent me a type specimen labelled thus:—"*Tornus imperspicuus* Monts=*T. subcarinatus*, Mtg. *pullus ?* (*Adeorbis*) Palermo 80-100 fh."

The species has, so far as I can ascertain, never been described, except in the "Journal of Conchology" for Jan., 1894, when a short description was given of one of our Oban specimens (Chaster and Heathcote: Moll. of Oban, *loc. cit.*). This, however, partly refers to a varietal modification, and I, therefore, venture to figure and describe the type. No figure has been published before.

The Marquis of Monterosato is apparently in doubt as to whether his species is the fry of *Adeorbis subcarinatus*, Mtg., or not. When, however, a young shell of the latter, of the same size, is placed beside the former, the two are wholly unlike, evidently having no characters in common, as will be seen by comparing the rough sketch given in Fig. 2, with Fig. 1.

Adeorbis imperspicuus, *Monts.* Figs. 1, 1*a*. *Shell very thin, spire scarcely raised; whorls about two, flattened and sloping at the*

sides, rounded at the periphery, and markedly but bluntly angulated below, sculptured with numerous spiral rows of very minute pits or punctures which, except at the periphery, are obscured by closely-set, flexuous, oblique, raised striae in the direction of the lines of growth; suture channelled; mouth squarish; outer lip thin, flexuous, sinuated above; umbilicus very large, occupying all the under surface.—Height, 0·6 mm.; breadth, 0·8 mm.

FIGURE 1.

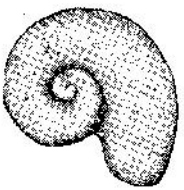


FIGURE 1A.

Adeorbis imperspicuus, Monts.

FIGURE 2.

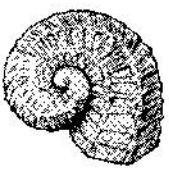


FIGURE 2A.

Adeorbis subcarinatus, Montg.

Varietas ex formâ, var. elegantula, nov. In many specimens the exaggerated lines of growth which in the type constitute a true sculpture are almost absent, the shell being hyaline and nearly smooth save for the characteristic punctation. In my limited experience, such shells are of smaller size and may be designated as above.

Distribution. I have met with the type in dredgings from Oban and Roundstone. Marshall records it from off Southport, * and Monterosato from Palermo and Messina.

The variety I have from Oban, Isle of Man, and Tangier Bay (7 fathoms). As regards the retention of the name *Adeorbis*, I follow Fischer and others, although the *first* species that S. Wood gave in his newly-created genus, *Adeorbis* was the shell now commonly known as *Circulus striatus*, Phil. which Monterosato therefore styles *Adeorbis striatus*, Ph. This is a matter upon which I am entirely unable to decide, and one upon which I should be glad to be informed authoritatively.

* Journ. of Conch., Oct., 1894: Marshall. Additions to Brit. Conch.

Lepton sykesii, Chaster.

Ann. and Mag. Nat. Hist., Mar., 1895, p. 248.

Mr. Marshall is quite correct in his supposition that it is my species that he described and figured in the "Journal of Malacology" of June last. His figures represent the outline and general appearance of the shell remarkably well, although the sculpture is not shown, the concentric markings seen in the sketch of the exterior not even suggesting the character of the sharply defined and regularly placed lines seen on the shell. Respecting the structure of this hinge I was able to satisfy myself as to its true nature, only by examining it in a live specimen the valves of which had been separated and deprived of the cartilage by careful boiling in dilute caustic soda solution. It is true that the minute cardinal I described is not very readily detected when the valve is examined in the usual flat position. If, however, this be placed almost vertically with the dorsal area uppermost it is quite apparent, and valves, even in the more or less worn state usual with dead shells from Guernsey dredgings, generally exhibit some trace of it.

The species is not, in my opinion, a member of the "*Neolepton*" group as Mr. Marshall declares. *Neolepton* is described by its founder Monterosato, in his "Nomenclatura," as follows:—"Genere proposto per le specie oblique che hanno una scultura concentrica ed il cardine di altra struttura." Now *L. sykesii* agrees with *Lepton* proper in its sub-rhomboidal outline and in its hinge, the latter, it is almost needless to say, being the most important character for purposes of classification. The hinge teeth are quite similar to those of *L. nitidum*, Turt., even in their position, the cardinal in the right valve being placed midway between the laterals, whilst that in the left valve is close to the posterior lateral.

This species is by no means restricted to the Channel Islands for I have it from other localities, having met with it in material from Mounts Bay, Cornwall, dredged by Mr. G. F. Tregelles, as well as in my own recent dredgings there. I also found a valve in shore-drift from Dogs' Bay, Connemara, collected this summer by Mr. R. Standen.

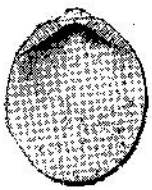
Crenella pellucida, Jeff., sp.

1859, *Limopsis pellucida*, Jeff., Ann. and Mag. Nat. Hist., p. 12, pl. 11, fig. 6.

Mr. Marshall's reference (*loc. cit.*) to this species seems wholly irrelevant, and is, moreover, unfortunate in containing

an assertion that this species has not been found in British waters since its discovery by Jeffreys. I have myself met with it in Guernsey dredgings. Still more unfortunate, however, was Jeffreys' statement in his "British Conchology" that it is the fry of *C. rhombea*, Berk. As the Annals and Magazine of Natural History for 1859 may not be readily accessible to many conchologists I have given below a figure of this species and an outline of the true fry of *C. rhombea* for comparison.

FIGURE 3.



Crenella pellcida, Jeff. × 30.

FIGURE 4.

Crenella rhombea, Berk. × 30.

Cerithiopsis clarkii, Forbes and Hanley.

1848-53, *C. clarkii*, F. & H., Brit. Moll.; vol. iii., p. 368, pl. ciii., fig. 6.

As a representative of this form I have but a dead specimen not in very good condition from Guernsey dredgings sent by Mr. E. R. Sykes.

Jeffreys in his "British Conchology" dismisses it with a scanty description as a monstrosity of *C. tubercularis*, Montg., obtained by Mr. Clark, at Exmouth, and by himself at Guernsey. In his "Lighting" and "Porcupine" papers he similarly disposes of it and gives as synomyms *C. bilineata* and *C. coppolae*. The Rev. R. Boog Watson, in his excellent "Cerithiopsides from the eastern side of the North Atlantic," * also confounds it with the Mediterranean shell. Now *C. coppolae*, Arad.(=*bilineata*, Brus., non Hörnes) is certainly quite distinct from *C. tubercularis*, its apex as well as its sculpture and shape, being very different. My Guernsey shell Monterosato designates "le vrai C. Clarkii, F. & H.," and declares to be distinct from *C. coppolæ*, an opinion with which I entirely agree. The figure in "British Mollusca" well represents it. I am anxious to learn whether others who have specially studied the molluscan fauna of the Channel Islands can give further information regarding this interesting species and whether or not it is to be considered extinct.

N.B. –In figure 1a the whorls are insufficiently flattened and sloping, and in figure 4 the shell is too equilateral and the umbo too acute.

* Journ. Lin. Soc., 1885, Zoölogy, vol. xix., p. 92.

CURRENT LITERATURE.

It is hoped that all Malacologists will aid in making this Bibliography as complete and useful as possible. Writers, both at home and abroad, are especially asked to send in copies of their respective papers for review to Wilfred Mark Webb, Holmesdale, Brentwood, to whom all communications should be addressed.

MALACOLOGY IN GENERAL.

Martini and Chemnitz.—Systematisches Conchylien Cabinet. Fortges. von **W. Kobelt.** Nürnberg, 1895, part 414, pp. 49-54, pls. zvi.-xxi. (finishes Mollusca Dimyaria—Gastrochaenidae), parts 413 and 415, pp. 751-794, pls. cvii.-cxiii. (*Helix*).

Taylor, J. W.—"A monograph of the land and freshwater mollusca of the British Isles." Part ii., 1895, pp. 65-128, pl. ii., figs. 139-286.

Tryon, G. W., continued by **Pilsbry, H. A.**—"Manual of Conchology," series 1, part 61 (contains vol. xvi., pp. 1-48, pls. i.-xvi.); series 2, part 37 (contains vol. x. pp. 1-48, pls. ii.-xv.), Philadelphia, Sept., 1895.

In the Marine Series, part 61 is almost entirely filled with an account of the *Philinidae*, which Mr. Pilsbry states may be divided into three, or possibly four, genera; these last being founded on combinations of the shell and external bodily characters.

An exceedingly interesting review of the history of the names *Bulimus* and *Bulinus* commences the new volume of the Terrestial series. The conclusions arrived at are that *Bulimus*, Adanson (1757) should be ignored; that *Bulimus*, Scopoli (1777 *non* 1786), represents a freshwater shell, preferably *Bythinia* (which name must be abandoned); that *Strophocheilus*, Spix (1827), should, therefore, be used for the group usually known as the *Bulimi*. It is with regret that we have to concur in this lamentable conclusion. In the letterpress referring to *Borus oblongus*, Müller, Mr. Pilsbry appears to have over-looked a recent study of the species by Mr. E. A. Smith (Proc. Mal. Soc. i., 1894, p. 137). A reference to this paper would have saved his naming from Tobago, a variety already described by Mr. Smith from that island.

Borus oosomus, from Brazil, is a new species belonging to the group of *B. ovatus*, to which it appears nearly allied.

An introduction and key to the groups are promised latter; we trust that the author will be as successful as when dealing with the *Helicidae*.

E.R.S.

ANATOMY.

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Note on papers by Mr. Willey, see p. 49; and Dr. A. Vayssière, see below, p. 61.

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Leon, N.—"Zur histologie des Dentalium-mantels." Jena Zeitschr, vol. xxix., 1893, pp. 411-416, pt. xii, Bibl.

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Michael, Richard. "Ueber Aptychen und Ammonitenbrut," Jahresber. Schlesischen Gesell., 1894 (pub. 1895), p. 113.

Schmidt, R.—"Beitrage zur Kenntniss der Entwicklungsgeschichte der Stylommatophoren." Zoöl. Jahrb. Anat., vol. viii., 1895, pp. 318-341, 9 figs.

Treats of I. "Die Sinnesplatten," II. "Die Entwicklung des Fusses," III. "Das Mantel oder Schalenfeld," in *Succinea*, *Limax* and *Clausilia*.

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Clapp, Geo. H.—"Disperal of Shells." Naut., vol. ix., 1895, p. 35.

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Brazier, J.—"*Trochus adamsi*, from Port Jackson, and new varieties of *Bulimus miltocheilus* from the Solomon Islands." P.L.S., N.S.W., pp. 567-570.

By a singular confusion the name *comptus* of Adams is set aside as pre-occupied by Philippi, and *adamsi* Brazier (new name) written in its place, yet proof is advanced in a foot-note that *comptus* Adams was of earlier publication than *comtus*, Philippi. For this species (of which *C. purpureo-cinctum*, Hedley, is a synonym) the name *Calliostoma comptus*, Adams, should be used by Brazier's evidence despite Brazier's verdict. Colour-varieties. *stramineus*, *minor* and *albolabris* are named of *Placostylus miltocheilus*. C. H.

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Harris, Gilbert D.—"New and otherwise interesting Tertiary Mollusca from Texas." Proc Acad. Nat. Sci., Philad., 1895, part 1, pp. 45-88, pls. i.-ix.

A large number of new species.

Hedley, C.—"Some conchological notes." P.L.S., N.S.W., 2, ix., pp. 464-466, fig.

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New species:—*Dentalium aenigmaticum*; *Punctulella chasteri*; *Trochus* (*Margarita*) *tetragonostoma*, T. (*Margarita*) *coulsoni*; *Eulima martyn-jordani*, *E. friclei*; *Actaeon browni*.

Ihering, H. v.—"Die Gattung *Paludestrina*." Nachr. Deutsch., Mal. Gesell., 1895, pp. 122-128.

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Parona, S. C. C. F., and Bonarelli, C.—"Nuovi genera di Ammoniti giuresi." Rend. Inst., Lombardo, 2, xxviii., 1895, pp. 686-687.

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Clea bangueyensis from Banguey Island off North Borneo.

Sowerby, G. B.—"New species of shells from Kurachi and the Mekran Coast, collected by Mr. F. W. Townsend." Proc. Mal. Soc., vol. i., 1895, pp. 278-280, pl. xvii.

Mangilia townsendi; *Bullia nitida*; *Niso venusa*; *Gibbula townsendi*; *Minolia gradata*; *Spondylus exilis*; *Meretrix tumida*.

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Stearns, R. E. C.—"A new variety of *Ocinebra circumtexta*, Stearns." Naut., Vol. ix., 1895, pp. 16.

Tate, R.—"Brief diagnoses of mollusca from Central Australia." Trans. Roy. Soc., S. Australia, vol. xviii., 1894, pp. 113-119.

Notices of 22 new species intended rather for the establishment of nomenclature than the recognition of species.

Tate, R.—[See under "PALAEONTOLOGY," Clays at Lake Callabonna.]

Thiele, Johann.—"*Hemitrichia guimaraensis*, n. sp." Nachr. Mal. Ges., 1895, pp. 131-132.

Verco, J. C.—"A revision of the recent gasteropods of South Australia." Trans. R. Soc., S. Australia, xix., 1895, pp. 94-107.

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New species:—*Murex tatei*, *M. robustus*; *Trophon angustus*; *Lutirus aurantiacus*; *L. pulleinei*; *Crassatella producta*, *C. micra*.

VARIATION.

J. C. W. and **P. H. A.**—"A remarkable monstrosity of *Fulgur canaliculatum*." Naut., vol. ix., 1895, pp. 25-27.

Sich, Alfred.—"*Helix rotundata*, Mull. (*sinistrorsum*, Taylor)." Zoöl., vol. xxx., 1895, p. 380. In a garden at Chiswick.

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Etheridge, R., jnr.—"Additional notes on the Palaeontology of Queensland." P.L.S., N.S.W., 2, ix, pp. 518-539, pls. xxxix.-xli.

Cypricardella rectangularis, *Edmondia smithii*, *Ptychomphalina randii*, new spp., fig., unnamed spp. of *Bellerophon*, *Loxonema* and *Productus*, figured, *Athyris royssii*, *Leveille* and *Chaenomya etheridgei*, Kominch, re-figured. All Palaeozoic.

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Contains list of fossil mollusca.

Harris, Gilbert D.—[See under "SYSTEMATIC WORK," Tertiary Mollusca from Texas.]

Kennedy, William.—"The Eocene Tertiary of Texas, east of the Brazos River." Proc. Acad. Sci. Philad., 1895, pt. i., pp. 89-160.

Lists of shell occurring in the various sections described are given.

Pritchard, G. B.—"Contributions to the Palaeontology of the older Tertiary of Victoria, Lamellibranchs, part i." Pro. Roy. Soc. Victoria, vol. vii., pp. 225-31, pl. xii.

New spp. *Trigonia tatei*, *Myochama trapezia*, *Pinna cordata*, *Cardita maudensis*, and *Chione halli*, all figured.

Tate, R.—"Notes on the organic remains of the osseous clays at Lake Callabonna," Trans. Roy. Soc. S. Australia, vol. xviii., 1894, pp. 195-6.

New species:—*Blandfordia* [*Coxiella*, Smith] *stirlingi* and variety *mamillata*, no fig.

Webb, Wilfred Mark.—"Note on the shells from the brick-earth at Chelmsford." Essex Nat., vol. ix., 1895, pp. 19-20.

A newly-described deposit containing:—*Pupa muscorum*, *Succinea elegans*, *S. oblonga*; *Lymnaea peregra*, *L. palustris*, *L. truncatula*; *Planorbis marginatus*, *P. spirorbis*.

COLLECTING AND USE.

Bavay.—"Récolte des mollusques (conseils aux voyageurs)." Feuille Jeunes Nat., 1895, pp. 137-142 and 161.

Etheridge, R.—"The Kuditcha shoes of Central Australia." P.L.S., N.S.W., 2, vol. ix., pp. 544-550.

The slippers are stuffed with shells of *Hadra perinflata* whose snail is eaten.

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NOTES.

Shells and Superstitions.—Apropos of Mr. Finn's note, the following may be worthy of record:—

A European had rendered some service to a chief of Erromanga, New Hebrides. As a token of gratitude the latter presented to him a charm to ensure good fortune, much esteemed by the natives. This consisted of a single normal specimen of *Turricula vulpecula* carefully wrapped in a piece of Tappa cloth.—J. JENNINGS, Australian Museum.

Sydney, N.S.W., June 9th, 1895.

Importation of Foreign Land Molluscs.—As affording some idea of the various modes by which foreign species of molluscs may be imported, the following is worth recording: During the last summer, whilst screening a quantity of Smyrna beans, large numbers of snail-shells were discovered in the refuse, some of these have lately come into my possession and belong to *Helix lactea* and *Helix candidissima*. Whether or not any of the specimens were alive on their arrival at Bishop's Stortford I have not been able to ascertain, but there appears to me to be no reason why living specimens should not be thus imported. Inquiries are being made with regard to this, and perhaps later, more definite information may be obtained.

FRANK HUGHES.

The Toheroa and its Enemies. There is a bivalve found on the coast (Wairoa) called Toheroa: it is found in the sand on the shore only where *fresh-water* runs across the beach. When the tide rolls in, the animals anchor themselves by a long tongue and the shells stand up in the sea-water—you may see them like tulips in a garden-bed. The birds of the shore are ready, and every now and then, down one drops, catches a Toheroa and rising up fifty feet or so, drops it on the hard sand and follows quickly to find the shell smashed, but often another sea-gull is there first and they have an argument about the matter. There is also a fish called "*Schnapper*" which makes a business of catching the bivalves, the fish come in shoals to where the Toheroas are found, and you can see their tails sticking up like grass in a field as they gulp down the poor things. These Schnappers are furnished with a pair of jaws like a stone-crusher, and boys and men catch them with a line and strong hook baited with a Toheroa and good they are to eat. The Toheroas are dug out like potatoes, and though they have many enemies they must increase very, very fast, for two inches below the surface there is often a layer three or four deep. The Maories go with pack-horses to fetch them.—SAMUEL WEBB, *Rockvale, Whakahara, June 19th*, 1895.

[It would be interesting to learn the specific name of the bivalve.—ED.]

New British Marine Shells.—*Rissoa subsoluta*, Aradas.—I had overlooked a specimen of this shell, dredged in 1890, off Menavawr Rock, on the Atlantic side of the Scilly Islands in 40 fathoms. It was taken with *R. jeffreysi*, *Odostomia compactilis*, *Utriculus expansus* and other species hitherto recorded only from the Shetlands. Although a difficult place to reach, and still more difficult to dredge at, more specimens will probably be found about the district, as it was taken in the Porcupine Expedition on the Atlantic slope off the Scillies, in 539 fathoms, and at the entrance to the British Channel in 690-717 fathoms.

My specimen is as fresh as if living and differs from the Mediterranean form in that the sculpture is coarser, and that the longitudinals and spirals

are more uniform, instead of the former predominating, making it appear reticulated like *R. testae*, just as I find in one of the Porcupine specimens from the Atlantic, off Scilly. I have previously noticed the tendency of Scillonian *Rissoae* to run coarse.

Jeffrey's figures in the Porcupine Report, which are otherwise good, show fine spiral sculpture on the lower part only, of each whorl; but these spirals should appear throughout the three sculptured whorls, the apex being smooth and polished. The species is very variable as regards the sculpture, some specimens having little or no traces of longitudinal ribs, but the fine spirals are always present throughout.

It may be considered a decidedly deep-water species, its Mediterranean range being 108-310 fathoms; but in the Porcupine Expedition it occurred at depths exceeding 1000 fathoms. The Scilly record of 40 fathoms must, therefore, be considered exceptional.

Some other notes by me regarding this species will be found in the "Journal of Conchology" for January and April, 1895.

J. T. MARSHALL.

[The above is an addition to Mr. Marshall's paper in the last number—ED.]

OBITUARY.

Miss Saul, who died a week or so ago, has bequeathed her collection to the University of Cambridge.

The death is announced of J. Kostal, Assistant in the Bohemian Polytechnicum, on September 26th, at Prague.

EDITORS' NOTES.

We are sorry to say that no response whatsoever has been made to the appeal for subscribers, printed on page 2 of the cover of the last two numbers, and we would ask those readers who are really interested in the success and well-being of the Journal, to obtain at least one other subscriber.

THE JOURNAL OF MALACOLOGY

Established in 1890 by Walter E. Collinge as "THE CONCHOLOGIST, *a Journal of Malacology.*

EDITED BY

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VOL. IV. (No. 4.)

CONTENTS.

DECEMBER 20th, 1895.

LONDON: DULAU & CO., 37, Soho Square.

BERLIN: FRIEDLAENDER & SOHN, Carlstrasse 11.

Quarterly. Issued Post-free to Subscribers only, for 4s. 4d. per annum.

All communications to be made to—

WILFRED MARK WEBB, "Holmesdale," Brentwood, Essex, England.

THE

JOURNAL OF MALACOLOGY.

No. 4. DECEMBER 20th, 1895. Vol. IV.

PURPURA CORONATA, LAM. IN THE WEST INDIES.

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

Fellow and Tutor of King's College, Cambridge.

Shells of a dwarfed form of *Purpura coronata*, Lam., have been in my possession for the last few years, having been brought back from Demerara in alcohol, with the animal inside, by a near relation. During a recent visit to the British Museum, Mr. Edgar Smith showed me some specimens of a *Purpura* which I immediately recognized as identical with those above-mentioned, and which had, in fact, been sent to him from Demerara for identification. Still more recently I received from Mr. R. J. L. Guppy, a bottle of marine shells taken alive on the coast of Trinidad, among which were a number of specimens of the typical *P. coronata*.

It appears to me worth while formally to notify the occurrence of this common West African species on the South American coast. In the Demerara form, which is so well marked as almost to require special notification as a variety, the shell is smaller than the type, and not nearly so squarely

massive, spire more elevated, tubercles faintly marked, and in some cases evanescent, the whole shell not presenting, except at the extreme apex, that curiously waxen appearance which is so characteristic of the type. On the other hand, the curiously ribbed suture and peculiar umbilicus are well marked. The shell presents the general appearance of a form occurring on a muddy foreshore, which is, I believe, its actual habitat. It occurs in company with *P. floridana* Conr., and *Littorina columellaris* Orb. The specimens from Trinidad are in all respects typical.

It is a singular fact that a shell of the size and abundance of *P. coronata* should not have been hitherto noticed from this locality, and it is quite possible that the species has not long established itself on the coast, in which case it will be interesting to trace the time and area of its eventual extension. The type has been hitherto exclusively characteristic of western tropical Africa, but the north and south range of the species does not appear to have been ascertained with accuracy.

Into the interesting question of the relation of the E. American and W. African tropical fauna, which is significantly hinted at in the occurrence of this species on both sides of the Atlantic, I do not now propose to enter. It is well known that the larva of a certain *Purpura* is pelagic (in which form, indeed, it has been more than once described as a new genus), and there can be little doubt that the larval form of the species in question has been carried across the Atlantic by the equatorial current which sets westward from Cape Palmas.

In the list of St. Helena mollusca, given by Mr. Edgar Smith in P.Z.S., 1890, p. 250, out of 177 species, 42, or about 24 per cent, also occur in the West Indies. Scarcely more than half-a-dozen of these, however, appear to be littoral species.

NOTES ON THE TERRESTRIAL MOLLUSCAN FAUNA OF NEW CALEDONIA,

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

Honorary Secretary of the Malacological Society.

We have to congratulate Mons. Crosse on the recent publication* of the first part of his excellent study on the fauna of New Caledonia. This has induced the writer to put together the following notes, the result of a study of that fauna made some time ago, in conjunction with Mr. Ponsonby. The responsibility for this publication, however, must rest with the writer.

Speaking of *Rhytida kanakina*, Gassies, Mons. Crosse remarks (p. 185) "De plus, les conditions dans lesquelles s'est "effectuée la dispersion de ses collections néo-caledoniennes, "rendent absolument incertaine la resource de la consultation "du type." Any record, therefore, of these types of Gassies is of interest: the British Museum, at the sale of his collection, acquired a considerable portion of the shells from New Caledonia, and amongst them were the following Helicoid land-shells, most of which are type specimens:—

Diplomphalus cabriti
Rhytida multisulcata
,, *lutcolina*
,, *lamberti*
,, *rufotincta*
,, *subnitens*
,, *testudinaria*
,, *raynali*
Hyalinia subfulva
,, *savesi*
Microcystis bourailensis
Platyrhytida occlusa
,, *bruniana*
,, *orinnda*
Charopa melalcucarum
,, *vetula*
,, *rusticula*
,, *dispersa*
,, *decreta*
,, *confinis*
,, *inculta*
,, *melitae*
,, *rhizophorarum*
,, *subcoacta*
,, *opaoana*
,, *koutoumensis*
Trochomorpha lalannei

There is also *Rhytida villandrei*, erroneously described from New Caledonia. The classification given above, is that of Mons. Crosse: Gassies, as is well known, usually describing his species as belonging to *Helix* or *Zonites*.

* Journ. de Conch., Tom xliii., No. 3, pp. 161-332, pl. vii.-viii., Oct., 1895.

It is worth while, too, remarking that the *Helix aulacospira*, Pfeiffer (1846), is, from an examination of the type, specifically identical with the *Helix multisulcata* of Gassies (1857). This fact does not appear to have come to the notice of Mons. Crosse. Judging from figures and descriptions, as also from specimens in this country, it would appear also that *H. luteolina*, Gassies= *H. deplanchesi*, and is another synonym of *H. aulacospira*.

One would have inclined, also, to place *H. yahounsis*, Gassies as a synonym of *H. multisulcata* (=*H. aulacospira*). Again, from an examination of the type of *Helix bisulcata*, Pfeiffer (1853), described as from Tasmania, it is clear that this species is identical with the *H. beraudi*, Gassies (1858). Some doubt must be felt, too, as to whether Mons. Crosse is correct in separating *Rhytida coguiensis*, Crosse, and *R. paulucciae*, Crosse, from *R. testudinaria*, Gassies.

The *H. pinicola* of Gassies, Layard, &c., is not the *H. pinicola* of Pfeiffer. The type of this latter species (Mus. Cuming) is labelled as from the "I. of Pines" and probably does not really come from New Caledonia. It appears to me that the *H. pinicola* of Gassies is a synonym of the *H. costulifera*, Pfeiffer.

Referring to the *Platystoma*, Ancey, which Mons. Crosse quite correctly replaces by *Platyrhytida*, Cockerell, it may be pointed out that, in addition to the use of the name by Klein, *Platystoma* has been used by Meigen (1803, *Diptera*), Agassiz (1829, *Pisces*), Swainson (1837, *Aves*), while Conrad used *Platyostoma* in 1842.

Mons. Crosse is thoroughly to be commended for having (p. 223) united *H. turneri*, *H. astur*, and *H. occlusa* into one species; the last two being only toothless forms of the former; they are correctly placed under *Platyrhytida*.

Mons. Crosse appears to have overlooked the fact, to which Mons. Ancey called attention in 1888, that when *Helix berlierei* was described there was also a *Helix berlieri*, Morelet, which took precedence. Though, of course, these two now are placed in different genera, still there were at one time two species in the same genus of the same name, and the rule of priority was violated.

Mons. Crosse also appears to be in ignorance of a paper by Dr. Boettger † in which the species of *Pupa* from New Caledonia were discussed; a new group, *Cylindrovertilla*, was proposed for

† In von. Martens, Conch. Mitth., 1880, vol. i., pp. 45-72, taf., x.-xii.

P. fabreana. and *P. paitensis*, and *P. artensis* was united with *P. pediculus*, Shuttl. A little note on the value of the name *Laimodonta* ‡ (which he emends to *Laemodonta*), by the present writer, seems also to have escaped his notice.

In conclusion, it need only be remarked that it is very much easier to endeavour to find mistakes in such a catalogue than to compile it, and that only those who have studied a fauna, so difficult as that of New Caledonia, are able to appreciate the time and labour involved in the work, of which Mons. Crosse has so successfully completed the major portion.

‡ Journ. Mal., vol. iii., p. 73.

NOTES.

Locality of Clausilia recondita, Sykes.—This *Clausilia*, recently described (*ante*, vol. iii., p. 48), from Sumbawa, has now been found among some shells collected in Gilolo. E. R. S.

Arion hortensis, var. caeruleus.—I have recently received from Mr. B. B. Woodward a number of specimens of *Arion hortensis*, Fér., from his garden at Ealing. Amongst these I was interested in finding two examples of the var. *caeruleus*, which I described some years ago (Conchologist, 1892, vol. ii.). The most southernly record I have previously had was near Oxford, where I collected it in 1890. WALTER E. COLLINGE, F.Z.S.

Note on Scacchia eddystonia, Marshall.—Having recently received a large quantity of sand, trawled off Plymouth, I examined it very carefully, in the hope of finding the small bivalve which Mr. Marshall described under the above name, in the "Journal of Malacology" for June last. A few valves were found agreeing exactly with Mr. Marshall's description and the admirable figures accompanying his paper (except that one valve is perfectly hyaline). But it was at once seen not to be a *Scacchia* at all, for although the shells closely resemble in shape *S. elliptica*, Scacchi of the same size, the hinge is utterly different. Moreover, the description given by Mr. Marshall is incorrect. The "two" cardinal teeth of which he speaks are really a single cleft cardinal, whilst his "lateral" is another simple cardinal. The hinge is, in fact, that of an absolutely typical *Diplodonta*. A reference to Jeffreys' "British Conchology" shows that the fry of *D. rotundata*, Montg., are evidently remarkable, for Jeffreys himself described young examples of the species, under the name of *Diodonta barleei*, in the "Annals and Magazine of Natural History" for 1858. The description of this *Diodonta barleei* is brief and the outline of the figure not very good, but the hinge is admirably shown, and it is easily identified with *Scacchia eddystonia*. I have been able to satisfy myself that it is in reality the fry of *Dip. rotundata*, Montagu, by an examination of the umbonal region of young specimens of the species kindly sent by my friend, Mr. H. K. Jordan, F.G.S.

Southport. GEO. W. CHASTER.

THE BRITISH SPECIES OF TESTACELLA.

By WILFRED MARK WEBB, F.L.S.,

Staff-Demonstrator in Biology to the County Council of Essex.

It is now recognised that there are three species of *Testacella* to be met with in this country, to wit, *Testacella maugei*, Férussac, *T. haliotidea*, Draparnaud, and *T. scutulum*, G. B. Sowerby. Of these molluscs, the two last are, at first sight, so much alike, that until recently, any shell-bearing slug not referable to Férussac's species was put down as *T. haliotidea*.

The history of the separation of the third species is as follows :—

1823. In this year Mr. G. B. Sowerby* described *Testacella scutulum* as a distinct species, but, following the opinion of Férussac, British conchologists, including Sowerby himself, came to consider this form to be merely a variation of Draparnaud's species.

1856. Mr. Tapping† re-described the species under the name of *T. medii-templi*, his specimens being found in the Middle Temple gardens.

1885. The following is an extract from a letter written by the late Mr. Charles Ashford to the writer, with reference to the anatomical work on which the following paper was founded :—

"The results of the examination of *T. scutulum* were "communicated to Mr. Taylor by letter. The first "specimen, received through Mr. Roebuck and sent me "at Mr. Taylor's request, was dissected in February, "1885, and was found to differ materially from Moquin-"Tandon's figure of *T. haliotidea*. Subsequent examples "sent me by Mr. Taylor showed the difference to be "constant."

1888. The paper‡ to which the credit of re-establishing Sowerby's species really belongs was published in this

* Genera of Recent and Fossil Shells. 1823. Pl. clix.

† Zoölogist, 1856, p. 5105.

‡ On the specific distinctness and geographical distribution of *Testacella scutulum*, G. B. Sowerby. Journ. of Conch., vol. v., 1888, p. 337.

year; in it Mr. J. W. Taylor described the external characters of the two less easily distinguished species and the points of difference in the anatomy of their reproductive organs made out by Mr. Ashford, together with others in the radulae. To the paper was added an exhaustive account of the distribution of *Testacella scutulum* in the British Isles and elsewhere.

1893. On June 1st the present writer made some remarks before the Linnean Society* on the manner of feeding in *Testacella scutulum*, and gave the results of some anatomical work on this species which bore out Mr. Ashford's statements.

In the Annals and Magazine of Natural History for July, Mr. Walter E. Collinge† also confirmed Mr. Ashford's results, giving an exhaustive account and figures of the reproductive organs of all three species.

In his paper, Mr. Taylor expressed the hope that the full distribution of *T. scutulum* would be worked out, but, as the writer has already indicated,‡ by the separation of this species a doubt must be thrown upon the existing records for *T. haliotidea*, and the most important piece of work on the distribution of these slugs, is the obtaining of a reliable list of localities for the latter species, like the one given for the other form by Mr. Taylor.

With this end in view, the writer has been endeavouring, with the welcome help of the gardening and other papers,§ to obtain specimens of *Testacella* for careful determination. Up to the present, the effort has been productive rather of a number of individuals than of localities; but the abundance of material which has been collected, through the kindness of correspondents throughout Great Britain, has given to the writer the opportunity of doing some work that might have been undertaken when his observations were made on *Testacella scutulum*, but which had perforce to stand over on account of the difficulty then, and till now, experienced of obtaining *T. haliotidea*.

In the following papers the British species of *Testacella* will be briefly compared externally and anatomically, and later, the distribution will be dealt with, more particularly that of *T. haliotidea*.

* Proc. Linn. Soc., 1892-3, p. 28. A paper embodying the remarks alluded to was published in the Zoölogist, ser. 3, vol. xvii. (August, 1893), pp. 281-289, pl. i.

† Ser. 6, vol. xii., pp. 21-25, pl. i.

‡ Nature, July 26, 1894.

§ Gardeners' Chronicle, 1895. Gardening World, vol. xii., 1895, p. 89. Nature, vol. lii. p. 597.

In the table below some of the more important external features of our *Testacellae* are set out, and with the help of Plates II. and III., on which the slugs and their shells are respectively figured, any of the British species should easily be determined.

EXTERNAL CHARACTERS.

	Testacella mangei, Fér.	*Testacella scutulum*, Sow.	*Testacella haliotidea*, Drap.
Shell. (For details and figures see *Plate III*).	Large, often half-an-inch in length or more; easily identified.	The smallest of the three species when adult, thin, covered with a brown periostracum.	In all but very young individuals it is solid looking and more or less weathered, showing rough lines of growth.
Skin.	Somewhat smooth, dorsal tubercles often distinct, lateral grooves fairly distinct.	Smooth, with slightly-marked lateral grooves.	Rougher, with distinct lateral grooves.
Colour of body generally.	Yellow, more or less marked & banded with brown.	More or less bright yellow & usually covered with tiny brown dots.	Not so pure a yellow, more or less tawny; dorsal lines and lateral grooves pigmented.
Of foot-sole.	Yellow.	Yellow.	Whitish.
Animal fully extended.	Heavily built, wider (proportionately) except towards the head, somewhat circular in cross-section. Dorsal lines do not meet in front of the shell.	Slender, of more uniform breadth. More circular in cross-section, owing to the swelling out of the body above the foot. (This is seen in *Fig. 5.*)	Gets more rapidly slender towards the head. Approximately triangular in cross-section. The dorsal lines enclose a more obtuse angle than in the preceding species.
Plate II.	*Fig. 1.*	*Fig. 2.*	*Fig. 3.*
Animal contracted	Cylindrical. Shell very evident, inclined in profile.	Cylindrical. Shell shows but slightly and is vertical in profile.	Conical. Shell evident and inclined in profile.
Plate II.	*Fig. 4.*	*Fig. 5.*	*Fig. 6.*

CURRENT LITERATURE.

It is hoped that all Malacologists will aid in making this Bibliography as complete and useful as possible. Writers, both at home and abroad, are especially asked to send in copies of their respective papers for review to Wilfred Mark Webb, Holmesdale, Brentwood, to whom all communications should be addressed.

MALACOLOGY IN GENERAL.

Taylor, J. W., with the assistance of **Roebuck, W. D.**, and **Ashford, Chas.** —"A monograph of the land and fresh-water mollusca of the British Isles." Part II., Leeds, August 24th, 1895, pp. 65-128, pl. ii., 147 figs.

Mr. John W. Taylor is again to be congratulated on the result of the careful and really hard work which is to be seen in the second part of his monograph on British land and fresh-water shells, and when one begins to realize what such a labour must be, where the author is also the illustrator, one feels that one's time might, perhaps, be better spent in praising the many perfections than in pointing out the few faults. The present part is creditably printed and excellently illustrated, while the thoroughness of treatment and general clearness of style which contributed, in no small way, to the success of Part I., are very well kept up. The introduction of thicker paper for the plate is a decided improvement, and with the plate itself, as a whole, it would be very difficult to find any fault, so well have the tints and shading of the shells been reproduced by the artist and lithographers. It is also pleasant to see that the colour-printing has not been done "in Germany."

FIGURE 151. *Lymnæa stagnalis.*

FIGURE 152. *Helix nemoralis.*

Showing transverse thickenings indicating growth checks sustained by the animal.

In the instalment under consideration, Mr. Taylor completes his account of variation in form, and proceeds to discuss variations of the shell in the character of the lip, in the armature of aperture, sculpture, periostracal appendages, and further differences in thickness, in form and in colour. Monstrosities of the shell and hyperstrophy are then considered, and finally "auxiliary organs"—viz., operculum and clausilium—are described.

It is to be expected that the introduction of varietal appellations which have been applied from time to time to casual variations will not find favour in the eyes of the present writer, who has always considered the retention of

such names to be the outcome of an inability to grasp the broad facts of Biology on the part of the describers, followed by the blindness of individuals who specialize without possessing a general knowledge of the science in which they dabble.

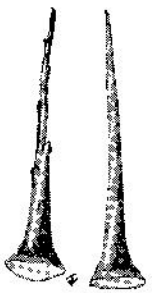

FIGURE 160. Periostracal hairs of *Helix granulata*, Alder.

There is this to be said, however, that Mr. Taylor might have been more prodigal of varietal names than he has been, though the terminology that allows of the labelling of a large *Helix aspersa* "showing the effect of a favourable environment," var. *major*, while a small example of the same shell showing the reverse is termed, var. *minor*, must appear to most minds to be —well, one will say—rather eccentric. Whatever one's idea of varietal characteristics may be, surely one would not include such differences from the general form as are temporary, only affecting the individual and not its descendants, unless subjected to the same environment.

Figures 151 and 152 illustrate some of the remarks on shell aperture, while periostracal hairs are well shown by Figure 160.

Under the heading of colouring, much interesting matter has been brought together. It is to this part that Plate II. refers, and although the

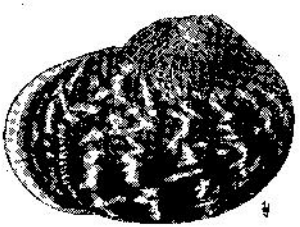

FIGURE 210. *Helix aspersa*, showing "interrupted" bands.

FIGURE 194. *Helix caperata*, variation probably avoided by sheep.

introduction of tropical shells may add to the brilliancy of the plate, yet the advisability of figuring foreign species in a British monograph may be questioned. An illustration of the distinctly marked variation of *Helix virgata*

FIGURES 229, 230, 231. *Limnaea peregra*, from a pool near Geneva. Showing the deformation of the columella and base of the shell, assumed to be caused by *Hydra viridis*.

supposed to be avoided by sheep, grazing on the downs, is reproduced above Figure 210 is a handsome variation of *Helix aspersa*.

Monstrosities receive a good deal of attention, and some remarkable forms are figured, including specimens (see Figures 229, 230, 231) of *Limnaea*

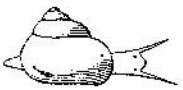

FIGURE 238. An orthostrophic sinistral shell as *Physa*, showing the heart at the base of the whorl.

FIGURE 239. Intermediate sub-discoidal sinistral shell.

FIGURE 240. Discoid form as *Planorbis*.

FIGURE 241. Intermediate sub-discoidal pseudo-dextral shell.

FIGURE 242. A hyperstrophic pseudo-dextral shell as *Pompholix*. The heart is now seen to be at spire side of body wall.

Diagrammatic figures showing in a conventional and simple way the changes from an orthostrophic sinistral to a hyperstrophic pseudo-dextral one.

pereger, probably deformed by the attachment of *Hydra* to the mollusc. The figures illustrating hyperstrophy given above speak for themselves.

W. M. W.

Pilsbry, H. A.—Manual of Conchology, series 1, part 62 (contains vol. xvi., pp. 49-112, pls. 17-31); series 2, part 38 (contains pp. 49-96, pls. 16-25). November, 1895.

Will be reviewed later.

ANATOMY.

Clubb, Joseph A.—"Notes on some points in the structure of the cerata of *Dendronotus arborescens*." Proc. and Trans. Liv. Biol. Soc., ix., pp. 220-234, pls. xiv.-xv.

Haller, B.—"Beiträge zur Kenntniss der Morphologie von *Nautilus pompilius*." In Zoöl. Forschungsreisen in Australien, Bnd. 5, lief. 2, pp. 187-204, pls. xi.-xii.

Heymons, Dr. R.—"Beimerkungen zur der von v. Erlanger veroffentlichen 'Etudes sur le développment des Gastéropodes pulmonés.'" Zoöl. Anz. Jahrg., xviii., no. 486, pp. 400-402.

Kerr, J. Graham.—"On some points in the anatomy of *Nautilus pompilius*." Proc. Zoöl. Soc., 1895, pp. 664-686, pls. xxxviii.-xxxix., figs.

The author concludes that the nearest living allies of the *Cephalopoda* are to be sought for amongst the Chitons. He is drawn to this result from a consideration, *inter alia*, of the bilateral symmetry, the general relations of the coelome and nephridia, and the fact that the eggs are developed within follicles.

Owsjannikow, Ph.—"Die Blutkörperchen der Flusskrebse (*A. fluviatilis et A. leptodactylus*) und der Teichmuschel (*Anodonta*)." Bull. Acad. Imp. Sci., St. Pétersbourg, ser. v., tome 2, pp. 365-382, pl.

Woodward, Martin F.—"Note on the anatomy of the larva of the European oyster, *Ostrea edulis*, Linn." Proc. Mal. Soc., vol. i., 1895, pp. 297-299, pl. xx.

See *ante*, p. 51. My specimens in very few cases showed the alimentary canal, and it was for this reason that help was sought from those belonging to the Royal College of Science, in order to locate the structure presumed to be the "posterior adductor" muscle. W. M. W.

PHYSIOLOGY AND BIOLOGY.

Baring, Hon. Cecil, and Grant, W. R. Ogilvie.—"An expedition to the Salvage Islands" (from "The Field" of Sept. 21st and 28th, 1895). Zoöl., ser. 3, vol. xix., 1895, Mollusca, pp. 403-404.

Seven shells of *Helix pisana* found in the stomach of a kestrel. *Helix pauppercula* apparently forms the chief food of a tarantula (*Lycosa maderiana*).

Bowell, E. W. W., and Bazeley, E. H.—"On Banded Snails." Devonia, vol. i., part 1, Oct. 1895, pp. 17-21, figs.

Carazzi, D.—"Green Oysters." Nature, vol. lii., p. 643.

Herdman, W. A.—Presidential Address to the Zoölogical Section of the British Association, 1895.

Kofoid, C. A.—"On the early development of *Limax*." Bull. Mus. Comp. Zoöl., vol. xxvii., no. 2, pp. 35-118, pls. i.-viii.

Leighton, T.—"Notes on two cases of transport and survival of terrestrial mollusca in the New Forest." Proc. Mal. Soc., vol. i., 1895, p. 296.

Letellier, A.—"Une action purement mecanique permit d' expliquer comment les *Cliones* creusent leurs galeries dans les valves des huîtres." Bull. Soc. Linn. Normandie, ser. 4, tome viii., pp. 149-166.

Mosley, S. L.—"Boring shells and other animals." Nat. Journ., vol. iv., pp. 257-259.

Simroth, Dr. H.—"Die Gastropoden der Plankton Expedition." Kiel and Liepzig, 1895, pp. 1-206, pls. xx., figs.

Relates to embryonic shells, most of which the author is unable to identify with certainty.

Webb, Wilfred Mark.—"Protective colouration in British Clausilias." Sci. Goss., new series, vol. ii., Dec., 1895.

FAUNA.

Allen, E. J.—"Faunistic Notes: January to June, 1895." Journ. Mar. Biol. Assn., vol. iv., pp. 48-52. Mollusca at p. 51.

Anon.—"By the way." Devonia, vol. i., part ii., p. 56.

Anon.—"Large *Dreissena polymorpha*." Nat. Journ., vol. iv., p. 206.

Bendall, Wilfred.—"A list of the land mollusca of the island of New Providence, Bahamas, with an enumeration of the species recorded from the other islands." Proc. Mal. Soc., vol. i., 1895, pp. 292-295.

B[owell], E. W. W.—"Occurrence of *Helicella fusca*, Mont. (near Bampton, N. Devon)." Devonia, vol. i., part ii., p. 49.

Butterell, J. Darker.—"*Tectura testudinalis* on the Yorkshire Coast." Natural., No. 245, Dec., p. 346.

Collinge, Walter E.—"Notes on some slugs from Algiers." Proc. Mal. Soc., vol. i., 1895, pp. 336-337, pl. xxiii.

Amalia ater and *A. maculata*, new species.

Crosse, H.—"Faune malacologique terrestre et fluviatile de la Nouvelle-Calédonie et de ses dépendances." Journ. de Conch., vol. xlii., no. 3, pp. 161-332, pls. vii.-viii., October, 1895.

Dall, William Healey.—"Report on mollusca and brachiopoda dredged in deep water chiefly near the Hawaiian Islands, with illustrations of hitherto unfigured species from North-west America." Scientific results of explorations by U. S. Fish Commission steamer Albatross, No. xxxiv. Proc. U. S. Nat. Mus., vol. xvii., pp. 675-733, pls. xxiii.-xxxiii.

Many new species.

Gabriel, Jos.—"Marine dredging excursion." Victorian Nat., vol. xii. July, 1895, pp. 39-42.

Godwin-Austen, Lt.-Col. H. H.—"List and distribution of the land-mollusca of the Andaman and Nicobar Islands, with descriptions of some supposed new species." Proc. Zoöl. Soc., 1895, pp. 438-457, figs

This is one of those studies of island faunas which in a very great measure are the indispensable guides of working naturalists. It is interesting to note how little we yet know of these islands. For instance, Mr. Cooke, in his recent work (at p. 306), has stated that in the Nicobars the land operculates outnumber the pulmonates; turning to Col. Godwin-Austen's paper, we see that the reverse is really the case, as the Helicacea number 43, while the operculata are only 29 all-told. Again, Col. Godwin-Austen extends the range of *Amphidromus* to the Nicobars, while Mr. Cooke gave it as only being from the Andamans. New species are described belonging to the following genera:—*Sitala, Planispira, Pupa, Vaginulus, Acmella, Cyathopoma, Omphalotropis.* The general notes on species are also very interesting. There is a slip in the arithmetic of the table at the end, for if there be 74 species in the Andamans and 72 in the Nicobars, of which 8 are common, this cannot give a total of 137. We leave our readers to find out whereabouts in the table the error is. E. R. S.

Hedley, C.—"On the Australasian *Gundlachia*." Nautilus, vol. ix., Oct. 1895, pp. 61-8, fig.

Taken in the main from Mr. Hedley's paper in Proc. Linn. Soc., N.S.W. vol. viii., 1893: there are some notes added by Mr. Pilsbry on the American species.

Hume, W. F.—"Oceanic deposits ancient and modern, part ii. The Mollusca." Nat. Sci., vol. vii., pp. 385-394.

Imhof, Dr. Othm. Em.—"Summarische beiträge zur kenntniss der Aquatilia Invertebrata der Schweiz." Biol. Centralblatt, Bnd. xv., Oct. 1895, pp. 713-719.

Contains three capital tables with prefatory remarks. The tables relate to distribution—*(a)* by watersheds, *(b)* by altitudes.

Iwakawa, T.—"Fresh-water mollusca of Japan." Zoöl. Mag., Tokyo, vol. vii., no. 8, 1 pl. In Japanese.

Kingsley, R. J.—"Zoölogical notes, *Paryphanta hochstetteri*, found at low levels at West Wanganui." Trans. N. Z. Inst., 1894, xxvii., p. 239.

Locard, A.—"Notices Conchyliologiques, No. xxxii., une coquille Française méconnue." L' Echange, Rev. Linneenne, ann. xi., pp. 85-6.

Long, F. C.—"Shell-collecting around Whalley." Nat. Journ., vol. iv. pp. 273-4.

Melvill, James Cosmo, and Standen, Robert. "Notes on a collection o shells from Lifu and Uvea, Loyalty Islands, formed by the Rev. James and Mrs. Hadfield, with a list of species" (continued). Journ. of Conch., viii., 1895, pp. 89-128, pls. ii. and iii. (not finished).

The complete paper of 130 pages and two pages of addenda has been

issued separately as one of the Manchester Museum handbooks, under the title of the "Catalogue of the Hadfield Collection of Shells from Loyalty Islands," Manchester, 1895 (price 1s.).

Milne, J. N.—"*Helix arbustorum* in Armagh." Irish Nat., vol. iv., p. 348.

Pilsbry, Henry A.—"Catalogue of the Marine Mollusks of Japan, with descriptions of new species and notes on others collected by Frederick Stearns." Pub. by F. Stearns, Detroit, 8vo., pp. i.-viii., 1-196, pls. i.-xi., Oct., 1895.

The Marine Molluscan Fauna of the Japanese Seas has been studied by many writers, notably Dunker, Lischke and von Schrenck, and we have now to welcome a work by Mr. Pilsbry. Naturally, as being the latest, this is by far the most complete, containing, as the author remarks, "about 500 species more than Dunker's *Index*, although a considerable number of forms enumerated by him are herein considered synonyms, or are rejected from the Japanese list." The book is far more than a bare catalogue of species; it contains much original work, such as the study of *Umbonium* and the limpets, the placing of *Fissuridea* under the *Emarginulinae*, the use of such names as *Macroschisina macroschisina*, &c. Various new species are described, amongst them *Sepia hercules*, which contains a shell nearly 17 inches long. There is one point to which we must take objection, namely, the describing of species (e.g., *Clausilia stearnsii*) without any note that the descriptions have already been published. Both the author and publisher are to be congratulated on the general "get-up" of the book and on the lithographic plates. E.R.S.

Pritchard, G. B.—"Marine dredging excursion." The Victorian Naturalist, vol. xii., July, 1895, p. 40.
Notes on mollusca in Port Phillip.

Quadras, J. F., and Moellendorff, O. F. von.—"Diagnoses specierum novarum ex insulis Philippinis." Nach. Mal. Ges., 1895, pp. 137-153.

Scharff, R. F.—"An addition to the Irish molluscan fauna." Irish Nat., vol. iv., p. 335, fig.
The somewhat doubtful new species, *Pisidium hibernicum*, Westerlund.

Service, Robert.—"The shell slug in Scotland." Zoölogist, vol. xix., p. 436.
Testacella haliotidea found in Sang's nursery in Kirkcaldy.

Smith, Edgar A.—"Report on the land and fresh-water shells collected by Mr. Herbert H. Smith at St. Vincent, Grenada, and other neighbouring islands." Proc. Malac. Soc., vol. i., 1895, pp. 300-322, pl. xxi.

Smith, Edgar A.—"On a small collection of land-shells from Central Africa." Proc. Malac. Soc., vol. i., 1895, pp. 323-328, figs.

Standen, R.—"Report of the Galway Conference and excursion of the Irish Field Club Union, 1895. Mollusca." Irish Nat., vol. iv., pp. 264-270.

Stossich, Prof. Adolpho.—"Molluschi osservati e raccolti fra la Alpi Venete." Boll. Soc. Adriat. Sci. Nat., xvi., pp. 197-210.
A very useful faunal catalogue.

Swanton, E. W.—"Notes on British land and fresh-water shells." Nat. Journ., vol. iv., pp. 260-1.

Tomlin, B.—"*Spirula peronii* in co. Antrim."—Irish Nat., vol. iv., p. 348.

Travers, W. T. L.—"Notes on the larger species of *Paryphanta* in New Zealand, with some remarks on the distribution and dispersal of land-shells." Trans. N. Z. Inst., 1894, xxvii., pp. 224-228.

Ulicny, Josef.—"Einige neue formen der mollusken fauna von Böhmën." Verh. Nat. Ver. Brünn., Bnd. xxxiii., pp. 107-8.

Walker, Bryant.—"Review of our present knowledge of the molluscan fauna of Michigan." Detroit, 1895, 27 pp., 8vo.

Warren, Amy.—"*Lepton syhesii*, Chaster, in Killala Bay." Irish Nat. vol. iv., p. 348.

SYSTEMATIC WORK.

Dall, W. H.—"Note on the genus *Joannisia*." Nautilus, vol. ix., p. 78.

In April, 1895, the author proposed this name for two bivalves from the Philippine Islands; it now having come to his knowledge that the name had already been used, he proposes to replace it by *Joannisiella*.

Godwin-Austen, Lt.-Col. H. H.—"Description of a supposed new species of land-mollusk of the genus *Parmarion* from Pulo Laut, an island off the south-east coast of Borneo." Ann. Mag. N. H., ser. 6, vol. xvi., pp. 434-7, pl. xix., Dec. 1895.

Hector, J.—"On a new shell *(Anomia walteri)*." Trans. N. Z. Inst., vol. xxvii., 1894, pp. 292-3.

As no figure is given or comparison with other members of the genus instituted, the only and insufficient claim of this species appears to be the habitat.

Hedley, C.—"*Dendrotrochus*, Pilsbry, assigned to *Trochomorpha*." Rec. Austral. Mus., vol. ii., no. 6, pp. 90-1, pl. xxi.

This recently-described group is removed by Mr. Hedley from *Papuina* and placed in *Trochomorpha*, upon anatomical grounds.

Hedley, C.—"*Pterosoma*, Lesson, claimed as a Heteropod." Proc. Malac. Soc., vol. i., 1895, pp. 333-335, figs.

Jousseaume, Dr.—"Description de coquilles nouvelles." Le Nat., An. xvii., no. 203, p. 187.

Four new bivalves from Aden.

Kobelt, Dr. W.—"Iconographie der land und süsswasser mollusken von E. A. Rossmässler, fortgesetzt von Dr. W. Kobelt." Neue folge, Suppl. Bnd. i., lief. 3 and 4, pp. 33-48, pls. 1a, 7, 7a, 9, 13-18. Oct., 1895.

Several new *Helices*, principally from Bourguignat's M.S.

Kobelt, Dr. W.—"Systematisches Conchylien-cabinet." Bnd. iii., Heft. lii., lief. 416, Oct. 1895.

Contains pp. 177-216, pls. 25-30, relating to *Columbella*. No new species.

Locard, Arnould.—"Etude sur la collection conchyliologique de Draparnaud." Paris, 1895, 8vo., pp. 190.

What Mons. Locard has endeavoured in this work to do is best described in his own words, namely, "Nous allons, à notre tour essayer de faire pour Draparnaud, le créateur de la Conchyliologie Française, ce que Hanley a si bien fait pour l' immortel Linné." It is curious to note from the author's pages how few of the great French collections still remain in their native country. Draparnaud's is now at Vienna; those of Lamarck and Delessert at Geneva; while those of Moquin-Tandon and Dupuy are scattered to the winds. It will be fresh in the minds of our readers that Morelet's and the pick of Gassies' are now in this country. E. R. S.

Melvill, J. Cosmo, and Ponsonby, J. H.—"Descriptions of five new species of *Ennea* from South Africa." Ann. Mag. N. H., ser. 6, vol. xvi., pp. 478-480, pl. xviii., Dec. 1895.

Mitsukuri, K., and Ikeda, S.—"Gigantic cephalopod from Japan." Zoöl. Mag., Tokyo, vol. vii., no. 2.

Moellendorff, Dr. O. F. von.—"Pilsbry's neue Eintheilung der Heliciden." Nach. Mal. Ges., 1895, pp. 153-165.

The first part of a very instructive criticism of vol. ix. of the Manual of Conchology.

Newton, R. Bullen.—"On some new species of British Eocene Gastropoda, with remarks on two forms already described." Proc. Mal. Soc., vol. i., 1895, pp. 325-332, pl. xxii.

Pilsbry, H. A.—"A new Mexican *Bythinella*." Nautilus, vol. ix., Oct. 1895, pp. 68-9.

Pilsbry, H. A.—"*Epiphragmophora californiensis*, var. *contracostae*." Nautilus, vol. ix., Oct. 1895, p. 72.

Pilsbry, H. A.—"*Epiphragmophora remondi*, Tryon." Nautilus, vol. ix., Oct. 1895, p. 72.

E. verrilli, Ancey = *E. remondi*, which latter is distinct from *E. carpenteri*.

Pilsbry, H. A.—"On *Dolabella californica*, Stearns." Nautilus, vol. ix., pp. 73-74.

The first published description of the animal of this species. Mr. Pilsbry proposes a new sub-family, *Dolabellinae*, to contain the genus.

Schwarz, Ernest H. L.—"*Spirula peronii*, Lam." Journ. Mar. Zoöl., vol. ii., Oct. 1895, pp. 25-30.

The author deals with the embryonic and general shell-structure. He concludes that *Spirula* has been derived from the Belemnites through *Spirulirostra*. Surely the memoir by Huxley and Pelseneer, published last spring in the "Challenger" Reports, might have reached him.

Smith, E. A.—"Description of five new species of land shells from New Guinea." Ann. Mag. Nat. Hist., ser. 6, vol. xvi., pp. 362-5, pl. xx.

Sollas, W. J., and Praeger, R. Lloyd.—"Notes on glacial deposits in Ireland." Irish Nat., vol. iv., pp. 321-9.

Sterki, Dr. V.—"Descriptions of new *Pisidia*." Nautilus, vol. ix., pp. 74-6.

P. walkeri and *P. politum*, n.spp., from the United States.

Verco, J. C.—"Descriptions of new species of marine mollusca of South Australia." "A revision of the recent Gasteropods of South Australia." Trans. Roy. Soc. S. A., 1895, vol. xix., pp. 84-107, pls. i.-iii.

In Australia, Dr. Verco has for several years been known as an ardent and successful collector, and in these papers we welcome as a recruit to the ranks of conchological writers one who joins much practical experience of the dredge to clear and careful literary work. The first article describes as new *Murex tatei*, *M. robustus*, *Trophon angustus*, *T. levis*, *Latirus aurantiacus*, *L. pulleinei*, *Crassatella producta* and *C. micra*; re-described is *Triton mimeticus*, Tate. All these were dredged off the coast of South Australia, and all, we observe with satisfaction, are well illustrated. The second article commences a review, with especial attention to synonymy and distribution, of the marine gasteropoda of the colony, the Muricidae and Tritonidae being here discussed. Drawings of the radula of nine species are appended.

Wagner, Ant.—"Eine kritische studie über die arten des genus *Daudebardia*, Hartmann, in Europa und Asien." Anz. Kais. Akad. Wiss. Wien, 1895, vol. xiv., p. 138.

Some new names, with no descriptions.

PALAEONTOLOGY.

Anon.—"Geology at the British Association." Nature, vol. lii., pp. 558-561.

Bigot, A.—"Contributions a l'étude de la Faune Jurassique de Normandie: sur les *Opis*." Mém. Soc. Linn. Normandie, tome xviii., pp. 153-192, pls. viii.-ix.

Several new species, also a review of the group.

Bohm, Johs.—"Die Gastropoden du Marmolatakalkes." Palaeontograph., Bnd. xlii., pp. 211-308, 7 plates, figs.

Many new species and some new genera.

James, J. F.—"The first fauna of the earth." Amer. Nat., xxix., pp. 979-985, figs.

Hind, Wheelton.—"A monograph on *Carbonicola*, *Anthracomya* and *Naiadites*." Part 2, pp. 81-170, pls. xii.-xx. (Palaeont. Soc., vol. xlix.)

Hudleston, W. H.—"Jurassic *Gasteropoda*." Part 1, no. 8, pp. 391-444, pls. xxxiii.-xl. (Palaeont. Soc., vol. xlix.)

McHenry, H., and Watts, W. W.—"Guide to the collection of rocks and fossils belonging to the Geological Survey of Ireland." Dublin, 8vo, pp. 155.

Praeger, R. Lloyd.—"The raised beaches of Inishowen." Irish Nat., vol. iv., pp. 278-285.

Rzehak, Anton.—"Uber einige neue fossilien fundorte im Mährischen miocän." Verh. Nat. Ver. Brunn, Bad. xxxiii., pp. 252-262.

COLLECTING AND USE.

Bavay.—"Conservation et preservation des mollusques." Feu. Jeun. Nat., ser. iii., an. 26, no. 302, pp. 19-22.

Bowell, E. W. W., and Bazeley, E. H.—"British land and fresh-water shells." Devonia, vol. i., part i., pp. 3-8, pl. ii., Oct. 1895; part ii., pp. 34-9, pls. iii.-iv., Nov. 1895.

Turner, Edwin E.—"*Helix nemoralis* as ornament." Sci. Goss., 1895, p. 222.

BIBLIOGRAPHY.

Simroth, Prof. H.—"Neuere Arbeiten ueber Morphologie der Pulmonaten." Zoöl. Centralblatt, Jahrg. ii., pp. 321-333.

Simroth, Prof. H.—"Neuere Arbeiten ueber Prosobranchien." Zoöl. Centralblatt, Jahrg. ii., pp. 481-4.

Simroth, Prof. H.—"Neuere Arbeiten ueber Opisthobranchien." Zoöl. Centralblatt, Jahrg. ii., pp. 513-5.

Simroth, Prof. H.—"Neuere Arbeiten ueber die Verbreitung die Gastropoden." Zoöl. Centralblatt, Jahrg. ii., pp. 544-550.

Simroth, Prof. H.—"Einige Neuere Arbeiten ueber Pulmonaten." Zoöl. Centralblatt, Jahrg. ii., pp. 577-580.

Woodward, B. B.—Record of the literature on the mollusca for 1894, occupying 87 pages of the Zoölogical Record for 1894, published by the Zoölogical Society of London, 1895.

Mr. B. B. Woodward has done his work even more thoroughly than in the previous years of his recordership.

BIOGRAPHY.

Anonymous.—"Professor Sven Loven." Geol. Mag., n.s., Dec. 4, vol. ii., p. 480.

EDITORS' NOTES.

Messrs. Beddard and Haddon have written a paper, which will shortly appear in the Zoölogical Society's "Transactions," containing descriptions of a number of new species of Nudibranchiata from the Torres Straits.

We welcome the first and second numbers of a bright little monthly magazine entitled "Devonia," edited by E. W. W. Bowell and E. H. Bazeley, of Huntsham, Bampton, North Devon. We must confess, however, that we have more liking for the matter in it than the manner of its production.

Students of marine life may be interested to hear that H.M.S. Penguin recently ran out 4,900 fathoms of line and found no bottom in lat. 23° 40 S., long. 175° 10 W.

We are pleased to hear that Mr. Edgar A. Smith has been chosen as one of the new Assistant Keepers of Zoölogy at the British Museum.

The kindly notice of the Journal by the editor of the "Gardening World" is much appreciated by us.

LIST OF CONTRIBUTORS TO VOLUME IV.

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INDEX TO VOLUME IV.

BRITISH TESTACELLAE, extended and contracted.

Life-size.

1

2

3

4

Testacella maugei, Fér.

5

Testacella scutulum, Sow.

6

Testacella haliotidea, Drap.

W. J. Webb del. ad nat., Figures 1, 2 & 3.
Ethel Webb del. Figs 4, 5 & 6 from a photo. by F. Hughes.

Rudd & Son sculpt.
Garratt & Walsh sculpt.

SHELLS OF BRITISH TESTACELLAE, seen from above and below.

Enlarged twice, linear.

7   8

Testacella maugei, Fér.

This shell is large, and being markedly convexo-concave, will not be easily confounded with either of the other species.

9   10

Testacella scutulum, Sow.

The dorsal surface of the shell is flat, and even somewhat concave towards the edge away from the columella, which ends abruptly and has a more or less sharp edge.

11   12

Testacella haliotidea, Drap.

The shell is more massive, is pearly on the inside, and is not so pointed anteriorly, while the columella is flattened and broadened, especially under the apex of the shell.

Ethel Webb del. ad nat. Garratt & Walsh sculpt.