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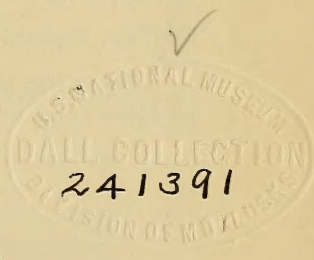
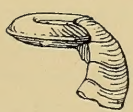
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BY

WILLIAM E. HOYLE.

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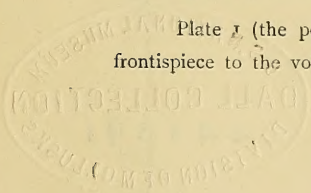
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ADHESIVE ESPECIALLY APPLIED TO
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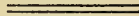
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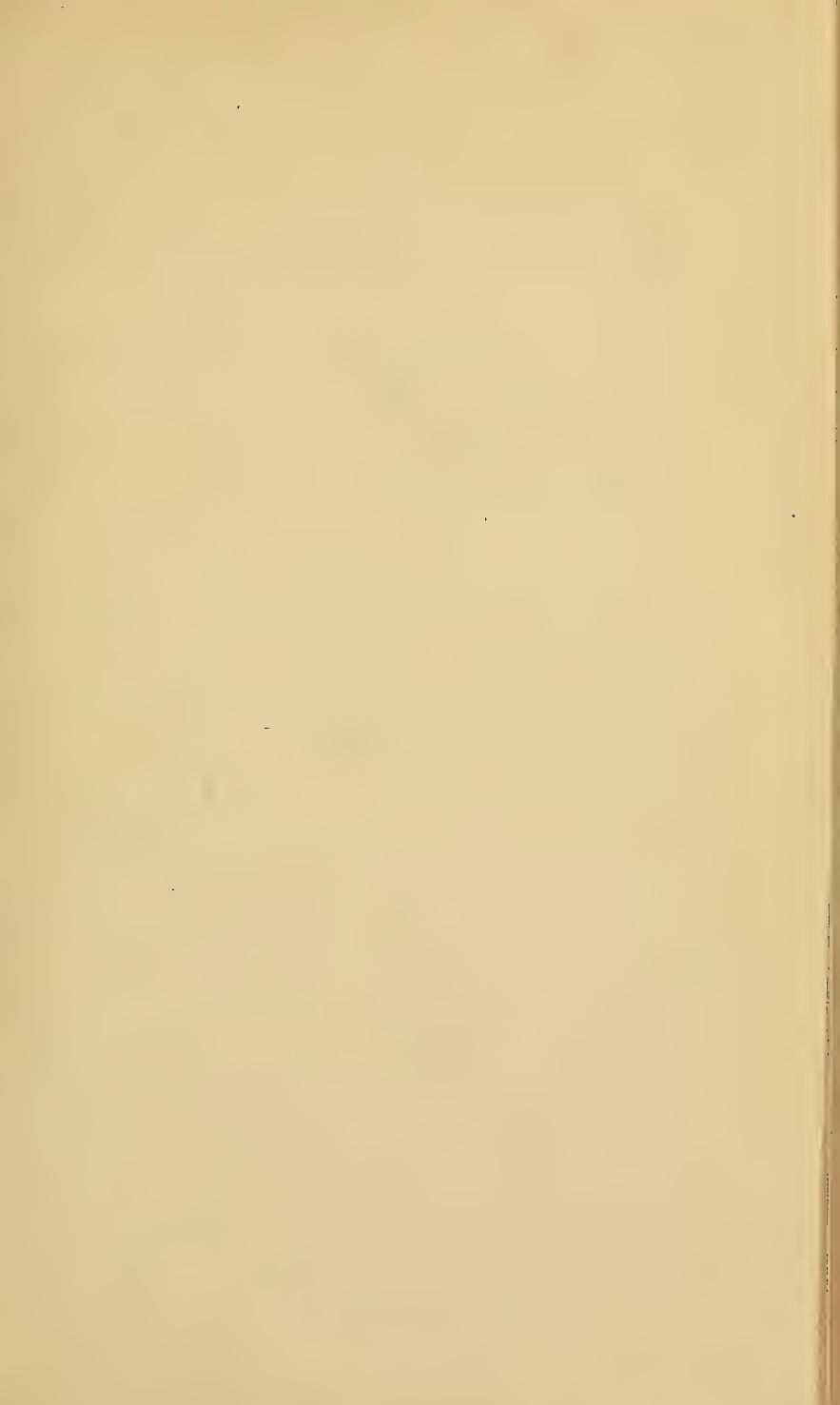
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CORRIGENDA.

- P. 28, last line, for "incisions" read "excisions."
 P. 267, line 16, for "Northampton" read "Dover."
 P. 378, line 23, for "July and August" read August and September."
 P. 424, line 9, from below for "Mai" read "Juin."
 See also p. 132.



THE
JOURNAL
OF
CONCHOLOGY.

P R E F A C E .

The 'Journal of Conchology,' which Mr. J. W. Taylor has conducted with so much enthusiasm and success for the last twenty-one years, has now become the property of the Conchological Society. It will for the future be issued under the direction of the Council, by a Publication Committee which at the present time consists of the undersigned.

It is hoped that the character of the journal will be fully maintained, and that articles of morphological interest may be somewhat more frequent than in the past.

We may also indicate that papers will be received on Palæo-Conchology, this branch of the subject being of the utmost importance to the geologist as well as to the recent systematist. The former is enabled by fossil shells to fix his geological horizons, whilst the latter must study the shell-life of the past if he wishes to become acquainted with the ancestral forms of many of the modern genera.

The formalities consequent upon the change of ownership have somewhat delayed the appearance of the present number, but every effort will be made in the future to secure regular publication,

It is proposed to continue the practice of printing short Notes where space allows, and the committee will be happy to receive communications of this nature from members of the Society and others.

Among the papers which it is hoped will appear in the near future are a 'Catalogue of the Shells of Lifu,' by Messrs. Melvill and Standen, containing descriptions and figures of new species, and a 'Monograph of the British *Odostomia*,' with figures of all the species, by Dr. G. W. Chaster.

The EXCHANGE COLUMN recently inaugurated will be continued, and will for the present be open free to members of the Society, and to others on payment of a small fee. It is also proposed to institute an ENQUIRY COLUMN in the hope that members may be induced to facilitate each other's studies by the communication of scraps of knowledge.

In conclusion it may be allowable to remind the members of the Society that the Journal having now become their property, each one incurs a certain amount of responsibility for its successful continuance, and it is hoped that all will co-operate in carrying on its useful work.

H. CROWTHER,	} <i>Committee of Publication.</i>
EDWARD COLLIER,	
R. D. DARBISHIRE,	
W. E. HOYLE (<i>Editor</i>),	
R. BULLEN NEWTON,	



MOLLUSCAN ALBINISM AND THE TENDENCY
TO THE PHENOMENON IN 1893.

BY K. HURLSTONE JONES.

(Read before the Conchological Society, August 22nd, 1894; and before
the Manchester Branch, April 12th, 1894).

THE object of this little paper is not to set forth a lengthy dissertation on Albinism, but by bringing forward a few elementary facts and observations, and by an attempt to draw deductions from them, to awaken an intelligent interest and to call forth further investigation in this much-neglected branch of the study of conchology.

I think it is advisable in the first instance, before dealing specially with albinism in the mollusca, to define and give a slight sketch of albinism generally. Albinism is lack of colour.

That Albinism is not due to a white pigment, as occasionally advanced, is easily proved. The eye of an albino is proverbially pink; the pink colour is due to the fact that the blood-vessels are visible through the transparent iris. Were any white pigment present, such vessels would be obscured by it, and the eye would appear white. Albinism is always an abnormality.

There are, it is true, many albino species—instance the white rabbit, rat, and mouse; but these are the propagation of an abnormality by man, and not natural products. There are, also, numerous instances of white animals, such as the polar bear, and many birds. These are not albinos. The polar bear, although its fur is white, has brown eyes, whilst the mucous membrane lining the inside of the lips, and the claws are black. Some animals there are, moreover, which are white at one season of the year and brown at another. The Alpine hare and the ptarmigan are white in winter and brown in summer.

The above remarks have their bearing on the conchological aspect of the subject, as I shall endeavour to show later on,

With this brief glance at albinism generally, let us turn to albinism from a strictly conchological point of view, and in doing so, a few words as to the structure and colouring of the shell, and the various parts of the animal from which they are produced, may not be out of place.

The shell consists of three layers. The most external, the epidermis or ectoderm, is chitinous ; the middle, the thickest, is calcareous, and sometimes called the prismatic ; the third, or nacreous, also calcareous, is always smooth and shining and frequently beautifully coloured. The external and middle layers are formed in the Gastropoda by the collar, and in the Pelecypoda by the free edge of the mantle, which corresponds to the collar of the former class.

In both orders the nacreous layer is secreted by the mantle.

The colouring of the shell. There are two kinds of colouring : that produced by the deposition of particles in such a manner as to break up the light and give rise to the idea of colour ; and that due to the deposition of particles of colouring matter, which matter is known as melanin. The shell of an *Anodon* gives a good illustration of both varieties, the pearly inside being a good sample of the first, and the green ectoderm of the second. The ectoderm is generally coloured, the nacreous layer less frequently, and the prismatic but rarely. The ectoderm is developed from the collar, therefore the collar plays the most important part in the colouring of the shell as a whole. Indeed, the collar presents a highly complex organ, producing as it does two different kinds of shell material and the colouring material of the ectoderm at one and the same time. There are many minor points, very interesting in themselves, with regard to the colouring matter of the shell ; but, as they do not bear directly on the subject in hand, and would take up much space, I am forced to leave them untouched in this paper.

A mollusc bearing an albino shell presents a paradox. The shell may be perfectly devoid of colour, but the animal inhabiting it is always more or less pigmented. In short, a shell-bearing

albino mollusc, in the general conchological acceptance of the term, is not an albino at all. The coloured mollusc, carrying an albino shell, is, indeed, in precisely the same position as the polar bear, mentioned above. There are, also, shells which are partly albino and partly typical in colour. I have two specimens of the shells of *Planorbis corneus*, taken at Birch, which were partly white and partly typical in colour. Mr. Moss and Mr. Cairns have similar specimens from Ashton-under-Lyne. Examples of this curious abnormality have also occurred among the terrestrial mollusca. Capt. W. J. Farrer has taken a specimen of *Helix hispida* at Bassenthwaite in Cumberland, the last whorl of which is albino, the others are typical. I took, also, a specimen of *H. rufescens*, at Matlock, presenting the same curious condition. Mr. Standen possesses a specimen of *Clau-silia rugosa*, the apex of which is white, the rest typical. There are other instances, but these are sufficient for illustration. The rule seems to be that a shell, having started typically, finishes as an albino, for most of the above present this condition ; there are, of course, exceptions.

The cause of the above remarkable phenomenon I do not exactly know ; it is, however, I think, due most probably to constitutional weakness in the animal, and not to lack of something in the food. Were the latter the case, instead of finding single individuals presenting the above remarkable characteristics, we should find colonies representing the condition.

That food, however, does influence the colouring of the shell in a very remarkable manner, I have experimental evidence to prove. My friend, Capt. W. J. Farrer, took at York *Helix arbustorum* var. *fusca* and *H. hortensis* var. *olivacea*, both in considerable quantities. Having transported the specimens, which were about half-grown, to Bassenthwaite, he commenced feeding them upon cabbage-leaves. All that portion of the shell in both species which has been formed since their arrival at Bassenthwaite is pure white. Obviously something is wanting in the food supplied to them—that something may possibly be a cer-

tain combination of iron. It may be urged that a similar explanation will suffice for those parti-coloured individuals which have been captured at large. I do not think it will, and for this reason: if the cause had been one dependent on food material, all the animals in a certain locality would have presented pseudo-albino tendencies, as was the case with Capt. Farrer's *Helices*, but this, so far as we know, has not been noticed with regard to free-roaming snails. Such an explanation will in no case account for the abnormality in the specimens of *Planorbis corneus* mentioned above, which were taken where both the white variety and the type existed under exactly similar conditions, and living on the same kind of food in the same pond.

Albinos, as a rule, are taken under one of two conditions: either singly or in colonies. Many instances, embracing many species, both freshwater and terrestrial, can be cited in proof of this. There is a pond at Birch in which occurs *Planorbis corneus* var. *albida* in such quantities that last year the white specimens numbered 73 per cent. of the whole! Again, in a pond at Gorton, I found white *Planorbis corneus* present to the extent of 16 per cent.

Among the terrestrial mollusca, the tendency to form colonies is still more marked. Capt. Farrer communicates to me that he has found *Clausilia rugosa* var. *albida* congregating in quantities on a wall near Kew Gardens. The same observer finds that although *Helix rotundata* can be found in any quantity around Bassenthwaite, there is only one spot—a certain heap of stones—where the white variety occurs, and that in that spot the type is never met with. The white variety is so numerous, however, where it occurs, that he has taken as many as fifteen specimens from the same stone. Last year, Mr. F. Taylor, a member of the Manchester Branch, took at Plumstead, *Hyalinia nitidula* var. *helmii* and *H. rotundata* var. *alba*, both living in large colonies and within circumscribed limits. Mr. Charles Oldham informs me that some years ago he took

from a bank in Derbyshire large numbers of *Helix concinna* var. *albida*. This year, I took at Disley in Cheshire specimens of *Hyalinia cellaria* and *H. alliaria*, both white, and both from the same bank, and that not thirty feet long. Again, in the same locality last year I found in a pile of bricks, not ten feet square, two specimens of *Hyalinia cellaria* var. *albina*, and some type individuals, the shells of which were so light in colour that it was difficult to say whether they were albinos or not. Indeed, though it sounds anomalous to say so, a *Hyalinia* to be white must have a shade of green. This green appearance is, however, I am of opinion, due more to the composition of the shell than its colouring matter.

There are many more instances of gregarious habits among molluscan albinos, so called, but one will suffice. Captain Farrer has lately taken at Bassenthwaite, *Pupa cylindracea* var. *albina*, in considerable quantity. There is a curious point with regard to this particular colony. The mollusca occur upon a wall, which is whitewashed in one part; on that part which is whitewashed, and that only, occur the animals with the white shells, though the type is plentiful on that portion of the wall which is not whitewashed. Captain Farrer is inclined to regard this instance as one of protective colouring. I cannot altogether agree with him. I think the dark body of the mollusc, being very plainly visible through its semi-transparent shell, prohibits the idea that that shell is of much service as a protective agent.

All these facts, I believe, go to prove that albinism amongst mollusca is extremely hereditary. Take the case of *Planorbis corneus* at Birch. Mr. Standen can remember a few years ago when, out of several hundreds, he did not obtain a single white specimen. Then a few began to appear, and, in succeeding years, the few continually increased, till in 1893 they formed nearly three-fourths of the total. Probably in this case a few albinos, or perhaps a brood of albinos, were produced accidentally, so to speak, and these growing up and coming to maturity have propagated the abnormality, some doubtless, however, reverting

to the original type. In a pond everything is in favour of this. The animals cannot, in the generality of cases, leave their habitat, even if they wish to do so, and provided food be plentiful there is no reason why they should make the attempt.

As regards land snails, conditions are very similar. The animals do not wander far in search of food as a rule, for every collector knows how certain species, or varieties of species, are found year after year in the same locality, though that locality may be only a few yards across. Single albinos are also frequently taken. Last year I took in the Reddish canal a single specimen of *P. corneus* var. *albina*, and, although I searched a whole afternoon most diligently, I was not rewarded with a second. But the conditions in a pond and in a canal are widely different. In the former the inhabitants are cramped into a small space without the opportunity of travelling far, in the latter there are currents, together with unlimited space to rove over, so that no doubt broods of albinos in the latter get widely dispersed, and are prevented from propagating the abnormality. I believe that an albino is such owing to constitutional deficiency and not on account of its surroundings. Where one finds albinos there are frequently typical individuals living on the same food and under similar conditions.

It is worth while bearing in mind the fact that there are some species of mollusca which normally carry an albino shell, for instance, *Carychium minimum* and *Hyalinia crystallina*, and it is possible that such species have been evolved from species having coloured shells in a manner similar to that of the white varieties mentioned above. Most probably, however, the earliest shell-bearing mollusca carried uncoloured shells, and it is possible that such snails as *C. minimum* and *H. crystallina* represent an older form of shell development, and that albinos are a reversion to the original type.

The popular idea is that a shell in order to be an albino must be white. From a scientific point of view this is not necessary. Albinism is lack of colour. Then, a transparent, or,

to speak more correctly, a semi-transparent shell, may possess no colour, yet not be white, and still an albino. The fact is that a shell appears white when it is opaque, because all the rays are reflected from it; it does not appear white when transparent, because it allows the rays of light to pass through. These two modifications of albinism can be well studied on a specimen of *H. virgata* var. *hyalozonata*, where they may be seen side by side. Such a thing as a really transparent shell does not exist, but a good test for a semi-transparent one is to lay the specimen on a sheet of white paper—if any colour is seen it is not an albino.

The title of this paper contains the word ‘Tendency.’ By “tendency,” I mean to indicate a general and wide-spread inclination amongst shells last year to occur lighter in colour than normally. The word ‘tendency’ may also, and more correctly, perhaps, be used to indicate the frequency of albinism proper during last year. Whether this observed frequency is in reality due to an unusual prevalence of the phenomenon last year, or whether it is an outcome of investigation into the subject, I cannot say. In many cases where the albino variety of shell is found the typical specimens are extremely light in colour. At Birch, for instance, the typical shells are of a light straw or amber colour, which is quite different to the usual condition. *Hyalinia cellaria* at Disley in Cheshire, and at Matlock, were last year of a very faint yellow colour; *H. cellaria*, however, is a shell normally light in colour. *H. glabra* is a shell usually dark, but last year at Disley, and this at Marple, specimens were as light as *H. cellaria*. The locality at Marple is that in which this shell was discovered by Mr. Thomas Rogers, and has naturally been under surveillance for a long time, and it is noteworthy that a light form of this species has never been met with there before. The lightness may be due to one of two causes—the usual amount of pigment granules may be deposited of a lighter colour, or fewer granules of the normal shade may be produced. The fact that these light coloured individuals have been taken

living with albinos is significant, but on the original cause I do not care to speculate. In the Reddish canal last year *Bythinia tentaculata* was taken in many cases abnormally light in colour. The specimens ran, in fact, through every shade from normal to real albinos.

I now append a list of the albino shells taken last year by the members of the Manchester Branch. To make the list more complete, those which have been taken in the present year have been added. Such varieties as *vitrina* of *H. excavata* and *viridula* of *H. alliaria*, are included as at any rate the nearest approach to albinism in those species.

Those specimens taken in 1894 are marked with an asterisk.

Hyalinia cellaria. Disley, Cheshire, K. H. Jones ; Bassenthwaite, Cumberland, W. J. Farrer.

(?) **H. glabra.** Disley, Cheshire ; Marple, Cheshire,* K. H. Jones.

H. alliaria. Disley, K. H. Jones ; Co. Donegal,* R. Standen.

H. nitidula. Oban, G. W. Chaster ; Port Salon, Co. Donegal, R. Standen ; Plumstead, F. Taylor.

H. excavata. Disley, Cheshire, K. H. Jones ; Bassenthwaite, W. J. Farrer.

Helix rotundata. Matlock, Derbyshire, K. H. Jones ; Port Salon, R. Standen ; Oban, J. R. Hardy ; Bassenthwaite,* W. J. Farrer.

H. aculeata. Oban, J. R. Hardy and R. Standen ; Bassenthwaite, W. J. Farrer.

H. hortensis. Bassenthwaite, W. J. Farrer.

H. arbustorum. Bassenthwaite, W. J. Farrer.

H. cantiana. W. J. Farrer.

H. rufescens. Bassenthwaite, W. J. Farrer.

H. hispida. Bassenthwaite, W. J. Farrer ; Matlock, K. H. Jones.

H. itala. W. J. Farrer : Co. Donegal,* R. Standen.

- H. caperata.** Bassenthwaite, W. J. Farrer.
Pupa anglica. W. J. Farrer; Isle of Man,* R. Cairns and W. Moss.
P. cylindracea. Keswick, Cumberland,* W. J. Farrer; Isle of Man,* R. Cairns and W. Moss.
P. muscorum. Port Salon, R. Standen.
Vertigo pusilla. Port Salon, R. Standen.
Clausilia laminata. Helmsley, Yorkshire,* W. J. Farrer.
Cochlicopa lubrica. Bassenthwaite, W. J. Farrer.
Planorbis corneus. Ashton-under-Lyne, R. Cairns and W. Moss; Birch, K. H. Jones and R. Standen; Gorton, K. H. Jones; Reddish canal, K. H. Jones.
P. carinatus. Reddish canal, K. H. Jones; Little Tarn, Cumberland, W. J. Farrer.
Ancylus fluviatilis. W. J. Farrer, W. Moss, and R. Cairns.
Velletia lacustris. W. Moss and R. Cairns.

In conclusion, it only remains to offer my best thanks to those who have so kindly placed their observations at my disposal, especially my friends Mr. R. Standen and Captain W. J. Farrer.



On the occurrence of *Pulsellum lofotense* Sars. in the Irish Sea. During the summer I received from my friend, Mr. R. Cairns, of Ashton-under-Lyne, who was then staying at Peel, Isle of Man, a quantity of mud brought up by a trawler from a depth of 60 fathoms, about five miles North-West of that place. An examination of this yielded six live examples of *Pulsellum lofotense* (the *Siphodontium lofotense* of Jeffrey's 'British Conchology'). The specimens are all of small size, the largest measuring only .09 inch in length. The nearest locality recorded for the species is, I believe, the Clyde district, in which Mr. David Robertson obtained a few examples.—G. W. CHASTER, Southport. (*Read before the Manchester Branch of the Conchological Society, November 8th, 1894.*)

Vertigo substriata Jeff. var. albina. A beautiful live specimen of this variety—which I presume is a new British record, if not new to science altogether—was taken by Captain W. J. Farrer near Bassenthwaite last summer, and exhibited by me at the Branch Meeting on October 11th, 1894.—R. STANDEN (Hon. Sec. Manchester Branch).

CONCHOLOGICAL SOCIETY
OF GREAT BRITAIN AND IRELAND.

PROCEEDINGS.

226th (or ANNUAL) MEETING, SATURDAY, 9th JUNE, 1894.

Held at the Manchester Museum, Owens College, Manchester.

At 3 p.m. there was an Exhibition of specimens by members, the exhibitors being as follows:—

Exhibits:

- By the President, Mr. W. E. Hoyle: A series of objects illustrating his address, comprising (a) Micro-sections of Gills of *Anodon*, *Arca*, *Nucula*, *Pecten*, *Cuspidaria*, and *Mytilus* shown under a number of microscopes; (b) Dissections of the same showing position of Gills, illustrative of Pelseneer's system of classification; and (c) a selection of Shells from the principal families of Bivalves, showing the various forms of hinge upon which Neumayr's system is based. All these exhibits were accompanied by explanatory drawings and diagrams.
- By Mr. R. D. Darbishire: A drawer containing a fine series of *Mülleria lobata* D'Orb. from Bogota, and *Etheria caillaudi* Fér. from the Nile Cataracts; and a drawer of Helices from Australia.
- By Mr. E. H. McConnell: *Achatinellæ* and *Helicinæ* from Sandwich Islands.
- By Rev. H. Glanville Barnacle: Land Shells from Somali-land.
- By Mr. Ed. Collier: A drawer of varieties of *Helix nemoralis* and *H. hortensis*, and a drawer of exotic Succinea, Vitrina, *Helix*, *Buliminus*, *Bulimulus*, and others, also a fine series of varieties of *Helix virgata*.
- By Mr. Chas. Oldham: The fine collection of British Land and Freshwater Shells presented by him to the Cabinet of the Branch.
- By Mr. Thos. Rogers: A collection of Tasmanian Land Shells.
- By Mr. J. Ray Hardy: A fine collection of British and Foreign Tellina.
- By Mr. G. W. Chaster: *Idas argenteus* Jeff., *Cocculina spinigera* Jeff., *Cryptodon incrassatus* Jeff., *Astyris haliæti* Jeff., *Cyclostrema levigatum* Jeff., *Ukko turtoni* Bean, and monst. *scalariforme*; *Pulsellum quinquantulare* Forbes, *Portlandia frigida* Torell, and other rare British Marine Mollusca.
- By Mr. W. Moss: Land and Freshwater Shells from Trinidad, including a fine series of *Bulinus oblongus*, adult, young, and eggs; *Ampullaria urceus* and *effusa*, with specimens of the pretty green eggs of the latter; *Marisa cornu-arietis*, *Cyclotus translucidus*, *Unio leotaudi*, *Guppya livida*, *Simpulopsis corrugata*, and many others. Also a fine series of photographs of small mollusca and of radulæ.
- By Mr. R. Standen: Eighty species of Foreign *Scalaria*, and the four British species, *S. communis*, *S. turtonæ*, *S. trevelyana* and *S. clathratula*, from many localities.

By the Manchester Museum : Two specimens of *Nautilus stenomphalus*, with the animal, from Lifu ; and a collection of Foreign Tellina.

At 5 p.m. the members partook of tea in the College Refectory.

At 6 p.m. the Annual Meeting was held in the Natural History Lecture Theatre, Owens College.

Mr. W. E. Hoyle, M.A., F.R.S.E., etc., President, in the chair. There were present the following members—Messrs. P. B. Mason, F.L.S., V.P. ; Edward Collier and Charles Oldham, members of Council ; R. D. Darbshire, B.A., F.G.S., and Robert Standen, President and Secretary of the Manchester Branch ; Thomas Hey, John Hill, R. Cairns, Wm. Moss, A. Leicester, L. St. G. Byne, E. C. Stump, K. Hurlstone Jones, Rev. H. G. Barnacle, A. T. Daniel, M.A., Thos. Rogers, etc., and also a large number of members of the Manchester Branch, and a few other visitors.

The minutes of the 225th Meeting were taken as read, and confirmed.

Appointment of Scrutineers :

Messrs. Edward Collier and R. Cairns were appointed to examine the voting-papers sent in.

Annual Reports :

The Annual Report of the Council (which had previously been circulated in proof among the members present) was read by Mr. Robt. Standen, acting on behalf of the Honorary Secretary, Mr. W. Denison Roebuck, F.L.S. (who was unavoidably prevented from attending) ; and on the motion of Mr. P. B. Mason, F.L.S., seconded by Mr. Alfred Leicester, was unanimously adopted.

The Treasurer's report for 1893 (as printed at page 355 of the Journal of Conchology for April, 1894) was also adopted by an unanimous vote, on the motion of Mr. Thomas Rogers.

The report of the Manchester Branch was read by Mr. Robert Standen, its Secretary, and adopted.

Election of Office-Bearers :

The Scrutineers reported that twenty-six voting papers had been sent in, of which twenty-five being unmarked were valid, and that the choice had fallen unanimously upon the following :—

For PRESIDENT :

Mr. JOHN W. TAYLOR, F.L.S.

For VICE-PRESIDENTS :

Mr. WILLIAM E. HOYLE, M.A., F.R.S.E. ;

Mr. P. B. MASON, J.P., F.L.S. ;

Mr. JOHN R. B. MASEFIELD, M.A. ;

Rev. R. BOOG WATSON, LL.D., F.R.S.E.

For HON. TREASURER :

Mr. LIONEL E. ADAMS, B.A.

For HON. SECRETARY AND RECORDER :

Mr. W. DENISON ROEBUCK, F.L.S.

For HON. CURATOR :

Mr. WILLIAM NELSON,

For HON. LIBRARIAN :

Mr. HENRY CROWTHER, F.R.M.S.

For the COUNCIL :

Mr. B. STURGES DODD ;

Mr. JOHN H. JAMES, A.R.I. Cornw. ;

Mr. EDGAR L. LAYARD, C.M.G., F.Z.S. ;

Mr. J. COSMO MELVILL, M.A., F.L.S. ;

Rev. JOHN MCMURTRIE, D.D., M.A. ;

Mr. R. BULLEN NEWTON, F.G.S.

These members were thereupon declared to have been duly elected to serve the respective offices for the year 1894-95.

Proposed Transfer of Head-Quarters of Society :

On the motion of Mr. R. D. Darbishire, B.A., F.G.S., seconded by Mr. Edw. Collier, it was unanimously resolved to ask the incoming Council to consider the question of the proposed transfer of the society's head-quarters from Leeds to Manchester.

Place of next Annual Meeting :

An invitation having been sent by the Leeds members, it was resolved that the next annual meeting be held in Leeds at such a date as might suit the convenience of the newly-elected President, and that the thanks of the society be tendered to the Leeds members for their invitation.

The Presidential Address

was then delivered by the retiring President, Mr. W. E. Hoyle, M.A., etc., who took as his subject 'The Classification of the Pelecypoda.'

At the conclusion of the address it was proposed by Mr. Alfred Leicester, seconded by Mr. P. B. Mason, F.L.S., supported by Mr. R. D. Darbishire, B.A., F.G.S., and unanimously resolved, that the best thanks of the society be tendered to the retiring President for his services during the year and the able address just delivered.

On the motion of Mr. Darbishire, thanks were also voted to the authorities of Owens College for the use of the museum buildings for the annual meeting, as also for the facilities they show to the Manchester Branch in respect of a place of meeting, and in other ways.—W. D. R. from notes by R. S.

ANNUAL REPORT FOR 1893-4.

The report now presented is for an unusually short year of nine months, in which the Society has kept up its customary quiet and steady progress. The membership is now 205, composed of 10 honorary life members, 12 ordinary members resident abroad, and 183 ordinary members on the home list.

Eight new ordinary members have been elected during the year, while twelve have resigned, one has died and several have been struck off for non-payment of subscriptions and arrears.

The member of whom the Society has been deprived by death is the veteran naturalist the Rev. George Gordon, LL.D., of Elgin, whose name will ever be honourably associated with the development of natural science in the north of Scotland, and for his own herculean share of work done in investigating the Fauna and Flora of the province of Moray.

In this connection mention should be made of the great loss which our science has sustained in the death of Mr. Charles Ashford, for although he was never actually a member of the Society, he was an anatomist and conchologist with whom very few if any could compare in the accuracy and fidelity of his work.

Eight meetings have been held since the last Annual one, all of them in Leeds, and a large number of interesting exhibits have been made at all the meetings.

The following papers and notes have been read :—

- R. Standen & J. Ray Hardy—‘The Land and Freshwater Mollusca of Oban and the Island of Lismore.’
- Rev. S. Spencer Pearce, M.A. and Arthur Mayfield—‘The Land and Freshwater Mollusca of East Norfolk.’
- G. B. Sowerby, F.L.S.—‘Marine Shells of South Africa.’
- G. W. Chaster and W. H. Heathcote—‘Dredging at Oban.’
- R. F. Scharff, Ph.D.—Short Notes on a Method of ‘Distinguishing *Limax maximus* and *L. arborum*, and on a New Mode of Killing Mollusks in an Extended Condition.’
- A. T. Daniel, M.A.—‘*Hydrobia jenkinsi* in an inland locality.’
- R. Bullen Newton, F.G.S.—‘Note on Some Molluscan Remains lately observed in the English Keuper.’
- Edgar Leopold Layard, C.M.G., F.Z.S.—‘Mimicry in Mollusca.’
- John W. Taylor, F.L.S.—‘Occurrence of a Sinistral Example of *Succinea oblonga* in South Perthshire.’
- Edgar A. Smith, F.Z.S.—‘Note on the Genus *Balea*.’
- Lionel E. Adams, B.A.—‘*Hydrobia (Paludestrina) jenkinsi* at Lewes.’
- J. T. Marshall—‘Additions to British Conchology.—Addenda.’

All these papers have been, or will shortly be, published in the ‘Journal of Conchology,’ and it will be seen from the list given that the members’ attention is devoted to all branches of the science.

Three numbers of the ‘Journal of Conchology’ have been issued during the past year, the contents of which show that it is still worthy of its position as the most important English periodical devoted to the study of the mollusca.

The arrangements for its issue made with the Editor in 1889 will continue to be in force till the end of the volume now publishing. Your Council are engaged in negotiations with the Editor respecting the future conduct of the Journal, and the terms on which future volumes are to be issued.

The Society’s collections which are deposited in the Museum at Leeds, have received numerous interesting additions during the year. Special

attention may be called to some of the donations, as follows :—Shells illustrative of new county records for Scotland from Mrs. Carphin, Mr. Thomas Scott, F.L.S., Mr. Lionel Hinxman, Rev. W. Turner, Mr. Alex. Shaw, and Mr. T. W. Evans; fine series of shells from Nottinghamshire and Gloucestershire, from Mr. A. G. Stubbs; a series of Corsican shells from Dr. R. F. Scharff; and of Madeiran shells from his brother, Mr. W. E. Scharff; and other donations from Mr. J. G. Milne, T. F. Burrows, and Mr. J. W. Taylor, F.L.S.

Donations in money towards the Cabinet Fund have been received from Dr. Scharff, Mr. J. G. Milne, Mr. W. Whitwell, Rev. Carleton Green, Mr. H. Coates, and Mr. J. B. Dixon. Further contributions will be acceptable.

The Library (which has been moderately used during the year) has increased during the nine months by various donations and purchases. The donors have been Dr. R. Bergh, Mr. W. H. Dall, Leeds Public Library, Dr. Scharff, Mr. Brazier, Rev. G. Gordon, Dr. R. E. C. Stearns, Canon Norman, and Mr. W. Denison Roebuck, in addition to the various journals and transactions received in exchange for the 'Journal of Conchology.'

In conclusion your Council have a matter of some importance to bring before the members viz :—a proposal that the head-quarters and general management of the Society be transferred from Leeds to Manchester. The proposal is one that has been informally and spontaneously made by the Leeds members of the Council, by whom the Society was founded and uninterruptedly carried on for the space of eighteen years with the success that we all know, and it has been accepted by the Manchester members, the transfer to be made at the next succeeding Annual Meeting, subject to the approval of the Society. It was the decided wish of the Leeds members, by whom the heat and burden of the day had been borne for so many years, and particularly of your secretary, that transfer be made at once, but they have been prevailed upon to retain their respective offices for another year.

The Treasurer's Report and Balance Sheet, which in accordance with the resolution passed at the last annual meeting, has been made out and duly audited for the calendar year ending 31st Dec. last, and have been already printed in the 'Journal of Conchology' (pp. 353-355) will be submitted for approval, as also will the report of the Manchester Branch.

REPORT OF THE MANCHESTER BRANCH, JUNE 9th, 1894.

MR. PRESIDENT AND GENTLEMEN :

I am pleased to report that the interest shown by members in the proceedings at our monthly meetings is unabated and very gratifying, and the attendance at each meeting has been extremely good.

Several excursions have been made to places around Manchester, resulting in some important additions to our local records.

The exhibits at each meeting have been numerous and varied, embracing a wide range of subjects of considerable interest locally and geographically.

Some valuable papers have been read, the interest of which has been enhanced by their being fully illustrated by the exhibition of the shells dealt with in the several communications.

The following is a list of the principal papers contributed :—

By Capt. W. J. Farrer—‘Notes on the Habits of certain North American Mollusca.’

By Mr. Edward Collier—‘On the Geographical Distribution of the Genus *Placostylus*.’

By Mr. Hugh Fulton—‘On the Genus *Pleurolomaria*.’

By Messrs. J. Cosmo Melvill and R. Standen—‘On a Collection of Marine Shells from the Loyalty Islands.’

By Mr. K. Hurlstone Jones—‘On Albinism in Mollusca, with Observations on the Tendency to the Phenomenon during 1893.’

The donations to our Cabinet have been very numerous and valuable. To Mr. Chas. Oldham we are especially indebted for the gift of his whole collection of British land and freshwater shells, which, besides being complete as to species, is also very rich in varietal and local forms, and remarkable for the extreme beauty of the specimens, which have been selected and preserved with the utmost care, and neatly mounted by the donor, so as to be readily available for reference.

The conchological collection in the Manchester Museum is becoming one of very considerable extent, and affords valuable material for the student and collector. The keeper has reported from time to time the additions made during the year. These have been exhibited to the members, and the most notable of them are the following :—(a), an extensive series of *Placostyli* from New Caledonia and Loyalty Islands; (b), a large collection of *Helicidæ* from South America and India, containing many rare species; (c), a collection of marine, land and freshwater shells made in the Loyalty Islands by the Rev. James Hadfield; (d), a collection of marine shells from Norway, named by Prof. G. O. Sars, and presented by Dr. Fridtjof Nansen; (e), a collection of *Cylindrellidæ* from Jamaica; and (f), a fine series of *Tellina*.

A number of useful conchological works have been presented to the Library of the branch by various members and friends.

The approaching completeness, so far as the collection at present extends, of the catalogue of works of natural history, and with especial reference to the sub-kingdom of the mollusca, in the Library of the Museum is anxiously to be welcomed. This Library is open to the public on application to the keeper, and will be found of very great value to the collector and the student.

R. STANDEN, Hon. Sec., Manchester Branch.



LIST OF MEMBERS.

(With year of election; O = founder, or original member; L = Life Member, who has compounded for his subscription).

HONORARY MEMBERS

(Limited to ten in number).

1889. Bergh, Prof. Dr. Rud., Vestregade, Copenhagen.
 1889. Binney, Wm. G., 222, E. Union St., Burlington, New Jersey, U.S.A.
 1889. Cossmann, Maurice, Ingénieur-chef des services techniques du chemin de fer du Nord, 95, Rue de Maubeuge, Paris.
 1889. Crosse, Hippolyte, Rue Tronchet, 25, Paris.
 1878. Kobelt, Dr. Wilhelm, Schwannheim, Frankfort-am-Main.
 1886. Martens, Dr. Eduard von, C.M.Z.S., Paulstrasse, Berlin, N. W.
 O Nelson, William, Gandy Row, Crossgates, Leeds.
 1889. Philippi, Dr. R. A., Director del Museo Nacional, Santiago, Chile.
 1889. Sars, Prof. G. O., Universitet, Christiania, Norway.
 1889. Simroth, Dr. Heinrich, Gohlis, Leipzig.

ORDINARY MEMBERS.

1891. Adams, Gerald Wheatley, M.R.C.S., L.R.C.P., Elmfield, 241, Moseley Road, Birmingham.
 1885. Adams, Lionel Ernest, B.A., 77, St. Giles Street, Northampton.
 1889. Agius, Paul, B.A., 106, Strada Reale, Valetta, Malta.
 1892. Alletsee, Albert Gregory, 40, Milward Crescent, Hastings, Sussex.
 1891. Ancey, César Felix, Membre de la Société Malacologique de France, Member of Colorado Biological Association, Membre de la 'Societas Entomologica' de Zurich, etc., Administrateur-Adjoint, Boghari, Algeria.
 1895. Arnold, Bernard, Milton Lodge, Gravesend.
 1888. Bailey, Rev. George, F.R.M.S., The Manse, Finchingfield, Essex.
 1886. Baillie, William, Brora, near Golspie, Sutherlandshire.
 1889. Baker, Arthur Edwin, 1, Bridlesmith Gate, Nottingham.
 1886. Barnacle, Rev. H. Glanville, M.A., F.R.A.S., The Vicarage, Holmes Chapel, Crewe, R.S.O.
 1891. Beckett, James Benjamin, 11, Lancaster Road, Great Yarmouth.
 1888. Bell, Alfred, 78, Wells Street, Oxford Street, London.
 1886. Bendall, Wilfrid, 77, Baker Street, Portman Square, London, W.
 1884. Bostock, Edwin D., Tixall Lodge, Tixall, Stafford.
 1879. Brazier, John, F.L.S., C.M.Z.S., Curaçoa House, 82, Windmill Street, Sydney, N.S.W.
 1893. Brierley, Mrs. H. G., Glen View, Gledholt, Huddersfield.
 1887. Brown, Alfred, 7, Bowmont Terrace, Glasgow.
 1890. Burkill, Isaac Henry, B.A., Caius College, Cambridge.
 1888. Burrows, Thomas F., 4, Wellington Road, Newark-on-Trent.
 1879. Butterell, J. Darker, 4, Willow Grove, Westwood, Beverley.
 1888. Byne, Loftus St. George, 5, Sea View Terrace, Teignmouth, Devon.

1891. Cairns, Robert, 159, Queen Street, Hurst, Ashton-under-Lyne.
1893. Carphin, Mrs. Janet, 52, India Street, Edinburgh.
1878. Cash, William, F.G.S., F.R.M.S., 26, Mayfield Terrace, Halifax.
1892. Champ, Henry, c/o S. & J. Watts & Co., Portland St., Manchester.
1887. Chaytor, R. C., Scrafton Lodge, Middleham, Bedale, Yorkshire.
1889. Christy, Robert Miller, F.L.S., Pryors, Broomfield, near Chelmsford, Essex.
1893. Clark, James, M.A., Ph.D., Ass.R.C.S., Yorkshire College, Leeds.
1886. Coates, Henry, F.R.S.E., Pitcullen House, Perth.
1885. Cockerell, T. D. A., F.Z.S., F.E.S., Agricultural College, Las Cruces, New Mexico, U.S.A.
1880. Collier, Edwd., 1, Heather Bank, Moss Lane East, Oxford Road, Manchester.
1892. Cooper, James Eddowes, 93, Southwood Lane, Highgate, London, N.
1886. Coulson, Frank, Greenhead Brewery, Greenhead, Glasgow.
1888. Cox, Chas. Stanley Bell, B.A., M.R.C.S., San Remo, Chelston, Torquay.
1892. Craven, Henry Ernest, West Cliff Pharmacy, Whitby.
1890. Crawford, James, c/o J. C. Kemsley and Co., Port Elizabeth, Cape Colony.
1889. Crawshaw, Rev. C., Opal House, Emerald St., Saltburn-by-the-Sea.
1886. Crick, Walter D., 7, Alfred Street, Northampton.
1888. Crouch, Walter, F.Z.S., Grafton House, Wellesley Road, Wanstead, Essex.
1893. Crowther, Henry, F.R.M.S., The Museum, Leeds; and 52, Brudenell Mount, Hyde Park, Leeds.
1879. Cundall, J. W., 21, Elgin Park, Redland, Bristol.
1886. DaCosta, Solomon J., 2, Craven Hill, London.
1888. Dale, Henry F., A.A., B.Sc., F.R.G.S., F.R.M.S., F.Z.S., F.E.S., etc., Post Office, Estabrook, Park Co., Colorado, U.S.A.
1888. Dale, (Mrs.) Violet, P.O., Estabrook, Park Co., Colorado, U.S.A.
1888. Dale, (Miss) A. M., Hatherley, Bampfylde Rd., Torquay, Devonshire.
1892. Daniel, Arthur Trevelyan, M.A., Richmond Terrace, Shelton, Stoke-on-Trent.
1893. Daniel, Frederic E., M.D., 141, Abbey Road, Barrow-in-Furness.
1886. Darbshire, Robert D., B.A., Victoria Park, Manchester.
1889. Dawson, Oswald, Seacroft, Leeds; and Albion Walk Chambers, Leeds.
1888. Dewick, Rev. Edward S., M.A., 26, Oxford Square, London, W.
1892. Dixon, James Bassett, 15, Bushell Place, Preston.
1886. Dodd, B. Sturges, 67, Beech Avenue, New Basford, Nottingham.
1892. Eccles, John Christopher, 20, Winckley Square, Preston.
1891. Elgar, Hubert, 3, St. Michael's Terrace, Fant Road, Maidstone, Kent.
1884. Elliot, Edward J., High Street, Stroud, Gloucestershire.
1888. Evans, (Mrs.) A., sen., Brimscombe Court, Thrupp, near Stroud.
1886. Eyre, Rev. W. L. W., M.A., Swarraton Rectory, Alresford, Hants.
1889. Falloon, (Mrs.) Barbara J., Christchurch Vicarage, Dover.

1891. Farrer, Captain Wm. James, Chapel House, Bassenthwaite, Keswick.
 1890. Fierke, Frederick Wm., 52, Francis Street West, Hull.
 1884. Fitzgerald, Rev. H. Purefoy, Wellington College, Berks.
 1886. Fitzgerald, (Mrs.) J., 10, West Terrace, Folkestone, Kent.
 1888. Fortune, Riley, F.Z.S., Ravensgill, Franklin Mount, Harrogate.
 1892. Fulton, Hugh, 216, King's Road, Chelsea, London, S.W.
 1886. Gain, Wm. Albert, Tuxford, Newark, Notts.
 1887. Galizia, Joseph Sylvester, M.D., 65, Strada Vescovo, Valletta, Malta.
 1889. Gaskell, Roger, M.A., 5, The Grove, Highgate, London, N.
 1887. Gatto, Alfred Caruana, B.A., 59, Strada Levante, Valetta, Malta.
 1887. Gerland, Conrad, M.Sc., Ph.D., F.C.S., etc., Accrington, Lancashire.
 1886. Godlee, Theo., Whips Cross, Walthamstow, Essex.
 1886. Greene, Rev. Carleton, M.A., Great Barford Vicarage, St. Neots.
 1890. Grocock, Leonard Oakley, 21, Beckenham Road, Penge, London.
 1890. Gude, G. K., 5, Giesbach Road, Upper Holloway, London, N.
 1892. Guppy, R. J. Lechmere, 26, Queen's Terrace, Port of Spain, Trinidad.
 1886. Gwatkin, Rev. Prof. H. M., M.A., 8, Scrope Terrace, Cambridge.
 1891. Hadow, Gerald Elliot, M.A., South Cerney Vicarage, Cirencester.
 1886. Hagger, John, F.L.S., Repton School, Burton-on-Trent.
 1888. Halstead, John J., 19, Millholme Terrace, Carlisle.
 1887. Hanley, Sylvanus, F.L.S., Hanley Road, Hornsey Road, London, N.
 1887. Hargreaves, J. A., 40, Ramskill Road, Scarborough, Yorkshire.
 1889. Hartley, Alfred, 14, Croft Street, Idle, near Bradford, Yorkshire.
 1887. Harvard, T. Mawson, 16, Radford Road, Hither Green, Lewisham, London, S.E.
 1891. Hawell, Rev. John, M.A., Vicarage, Ingleby Greenhow, Middlesbrough.
 1891. Hawes, Alfred, Penistone, Yorkshire.
 1887. Heathcote, Wm. Henry, 47, Frenchwood Street, Preston.
 1889. Hedworth, Thos. H., 1, Railway Terr., Dunston, Gateshead-on-Tyne.
 1888. Heitland, (Mrs.) M., The Priory, Shrewsbury.
 1892. Henshall, Joseph, Ivy Cottage, Barton-on-Irwell, near Manchester.
 1878. Hepburn, Frederick, B.A., Sutton, Surrey.
 1887. Hey, Thomas, 8, Bloomfield Street, Derby.
 1887. Hey, Rev. Wm. Croser, M.A., Derwent House, West Ayton, Seamer, York.
 1893. Hill, John, Little Eaton, near Derby.
 1886. Hillman, Thomas Stanton, Eastgate Street, Lewes, Sussex.
 1888. Hodgson, (Mrs.) Julia, Chalgrave Vicarage, Leighton Buzzard, Beds.
 1886. Holmes, W. J. O., F.L.S., Strumpshaw Hall, Norwich.
 1891. Horsley, Rev. J. W., St. Peter's Rectory, Walworth, London, S.E.
 1884. Howell, George O., 210, Eglinton Road, Plumstead, Kent.
 1892. Howorth, Sir Henry Hoyle, K.C.I.E., M.P., F.S.A., etc., Bentcliffe House, Eccles, Manchester.
 1886. Hoyle, W. E., M.A., M.Sc., M.R.C.S., F.R.S.E., Keeper of the Manchester Museum, Owens College, Manchester.

1883. Hudson, Baker, Public Library, Middlesbrough-on-Tees.
 1886. James, John H., A.R.I.Cornwall, 3, Truro Veau Terrace, Truro, Cornwall.
 1891. Jenner, James Herbert Augustus, F.E.S., 4, East Street, Lewes.
 1894. Jones, Kenneth Hurlstone, St. Bride's Rectory, Old Trafford, Manchester.
 1888. Jones, Wm. Jas., jun., 27, Mayton Street, Holloway, London, N.
 1889. Jordan, H. K., F.G.S., The Knoll, Clytha Park, Newport, Monmouthshire.
 1887. Kew, H. Wallis, F.Z.S., 3, Topsfield Rd., Crouch End, London, N.
 1889. Knight, G. A. Frank, M.A., Rosenlauri, Bearsden, Glasgow.
 1879. Laver, Henry, M.R.C.S., F.L.S., Trinity Street, Colchester, Essex.
 1894. Lawson, Peter, 11, The Broadway, Walham Green, London, S.W.
 1892. Layard, Edgar Leopold, C.M.G., F.Z.S., etc., Otterbourne, Budleigh Salterton, South Devon.
 1878. Leicester, Alfd., 1, Priory Gardens, Weld Rd., Birkdale, Southport.
 1886. Lightwood, James T., Hope House, Lytham, Lancashire.
 1889. Linter, (Miss) J. E., Arragon Close, Twickenham, Middlesex.
 1886. Lowe, Edward Joseph, D.L., J.P., F.R.S., F.L.S., F.G.S., F.R.A.S., etc., Shirenewton Hall, Chepstow, Monmouthshire.
 1887. Luther, S. M., Garrettsville, Ohio, U.S.A.
 1891. Lyons, Lady, Kilbrough, Swansea, Glamorganshire.
 1889. MacAndrews, James J., Lukesland, Ivy Bridge, Devonshire.
 1885. McKean, Kenneth, F.L.S., Lloyds, London, E.C.
 1886. McMurtrie, Rev. John, M.A., D.D., 5, Inverleith Place, Edinburgh.
 1884. Madison, James, 167, Bradford Street, Birmingham.
 1885. Marquand, Ernest D., Fermain House, Guernsey.
 1887. Marshall, J. T., Sevenoaks, Torquay, Devonshire.
 1887. Masefield, John R. B., M.A., Rosehill, Cheadle, Staffordshire.
 1888. Mason, Philip Brooke, J.P., M.R.C.S., F.L.S., F.Z.S., Trent House, Burton-on-Trent.
 1889. Mayfield, Arthur, 88, Stafford Street, Norwich.
 1880. Melvill, James Cosmo, M.A., F.L.S., Brook House, Prestwich, Manchester.
 1891. Middleton, Robert, Gledhow, near Leeds.
 1888. Milne, J. Grafton, Mansfield House, Canning Town, London, E.
 1879. Milnes, Rev. Herbert, M.A., Winster Vicarage, near Derby.
 1891. Mitchell, James, 240, Darnley Street, Pollokshields, Glasgow.
 1891. Morris, Cecil Herbert, Lewes, Sussex.
 1891. Moss, William, F.C.A., 13, Milton Place, Ashton-under-Lyne.
 1887. Newstead, A. H. L., B.A.Cantab., Roseacre, Epping.
 1891. Newton, Richard Bullen, F.G.S., 7, Melrose Gardens, West Kensington Park, London, W.
 1890. Nicholson, John, Chapeltown, Pudsey, Yorkshire.
 1891. Norman, Rev. Canon Alfred Merle, D.C.L., F.R.S., F.L.S., etc., Burnmoor Rectory, Fence Houses, Durham.
 1887. North, S. W., M.R.C.S., F.G.S., Monkgate, York.

1887. Oldham, Charles, Ashlands, Ashton-on-Mersey, Cheshire.
 1889. Paling, Albert, B.A., B.Sc., Middlesex Hospital, London.
 1882. Parke, George H., F.L.S., F.G.S., St. John's, Wakefield.
 1887. Parry, Lieut.-Col. G. S., 18, Hyde Gardens, Eastbourne, Sussex.
 1886. Pearce, Rev. S. Spencer, M.A., Long Combe Vicarage, near Woodstock, Oxfordshire.
 1892. Petch, Tom, B.A., Hedon, near Hull.
 1886. Ponsonby, John H., F.Z.S., 15, Chesham Place, London, S.W.
 1885. Quilter, Henry E., 34, Sparkenhoe Street, Leicester.
 1888. Radcliffe, John, 111, Oxford Street, Ashton-under-Lyne.
 1886. Ramage, John, Thistle Street, Dundee, Forfarshire, N.B.
 1887. Reader, Thomas W., F.G.S., 171, Hemingford Road, Barnsbury, London, N.
 1885. Redding, J. Roland, 31, Belvedere Road, Dublin.
 1887. Renton, Robert, Fans Road, Greenlaw, Berwickshire, N.B.
 1888. Rhodes, Frederick, 16, Moorland Place, Leeds Road, Bradford, Yorkshire.
 1888. Robertson, David, LL.D., F.L.S., F.G.S., Fernbank, Millport, Great Cumbrae, N.B.
- O
- Roebuck, Wm. Denison, F.L.S., Sunny Bank, Leeds.
 1886. Rogers, Thomas, 27, Oldham Road, Manchester.
 1893. Roseburgh, John, 54, Market Street, Galashiels.
 1892. Rosevear, John Burman, 113, New King's Rd., Fulham, London, S.W.
 1893. Rufford, Philip James, 1, Gloucester Place, The Croft, Hastings.
 1877. Scharff, Robert F., Ph.D., B.Sc., M.R.I.A., Curator of the Natural History Museum, Dublin; 9, Leeson Park, Dublin.
 1893. Scharff, W. E., Hillcrest, Ripon Road, Harrogate.
 1886. Scott, Thomas, F.L.S., 14, Lorne Street, Leith, N.B.
 1893. Shackelford, Lewis John, Ripley College, Ripley, Derbyshire.
 1887. Shaw, Alexander, 154, New City Road, Glasgow.
 1892. Shillito, John G., 20, Elmore Road, Sheffield.
 1884. Skilton, (Mrs.) Mary, 21, London Road, Brentford, Middlesex.
 1886. Smart, Rev. R. W. J., M.A., Parkham Rectory, Bideford, N. Devon.
 1886. Smith, Edgar A., F.Z.S., Nat. History Museum, South Kensington, London, W.
 1892. Smith, Mrs. Louisa J., Monmouth House, Monmouth Street, Topsham, Exeter.
 1894. Smith, Wm. Chas., Vanston Ho., 7, Vanston Place, Walham Green, Fulham, London, S.W.
 1886. *L* Somerville, Alexander, B.Sc., F.L.S., 4, Bute Mansions, Hillhead, Glasgow.
 1887. Somerville, Rev. James E., M.A., B.D., 11, Southpark Terrace, Hillhead, Glasgow.
 1886. Sowerby, Geo. Brettingham, F.L.S., 121, Fulham Rd., London, S.W.
 1892. Span, Bartlet, Heywood Mount, Tenby, South Wales.
 1886. Standen, Robert, 40, Palmerston Street, Moss Side, Manchester.
 1888. Stanley, Frederick, Rokeby, Edgar Road, Margate, Kent.

1886. Steel, James, (Glass Stainer), 104, Renfrew Street, Glasgow.
 1888. Stirrup, Mark, F.G.S., High Thorn, Bowdon, near Manchester.
 1888. Storrs, Rev. George Godwyn, B.A., Glen Holme, Crosslanes, Claremont Avenue, Woking.
 1885. Storey, J. A., B.A., St. Joseph's, High School, Cardiff.
 1890. Stubbs, Arthur Goodwin, 9, Park View, Gloucester.
 1893. Stump, Edward Constadine, 16, Herbert St., Moss Side, Manchester.
 1888. Sykes, Ernest Ruthven, B.A., 9, Belvedere, Weymouth, Dorsetshire.
 1886. Taylor, (Miss) Helen L., Woodside, Rowditch, Derby.
 1887. Taylor, J. M., Free Museum, Paisley, Renfrewshire, N.B.
 O Taylor, John W., F.L.S., Spring Bank, Horsforth, Leeds.
 1886. Tomlin, J. R. Brockton, B.A., 59, Liverpool Road, Chester.
 1886. Turner, Rev. Wm., 5, St. Andrew's Square, Edinburgh.
 1880. Tye, G. Sherriff, 10, Richmond Road, Handsworth, Birmingham.
 1886. Viner, C. W., M.A., Ph.D., 9, Seymour Street, Bath.
 1890. Warren, (Miss) Amy, Moyview, Ballina, Co. Mayo, Ireland.
 1891. Walker, Bryant, 18, Moffat Building, Detroit, Michigan, U.S.A.
 1885. Waters, A. II., B.A., Willoughby House, Mill Road, Cambridge.
 1886. Watson, Rev. Robert Boog, LL.D., B.A., F.R.S.E., F.L.S., Free Church Manse, Cardross, Dumbartonshire.
 1888. Whatmore, Charles A., Much Marele, Herefordshire.
 1886. Whitwell, Wm., F.L.S., 4, Thurleigh Road, Balham, London, S.W.
 1893. Williams, Ernest W., Boif Street, Bridgetown, Barbados, B.W.I.
 1889. Williams, John M., 4, Exchange Alley, Liverpool.
 1891. Williamson, Rev. Charles Arthur, M.A., 14, Upper Mount Street, Dublin.
 1890. Wood, Albert, Midland Lodge, Sutton Coldfield, Warwickshire.
 1893. Wood, Chas. Ed., 41, Darlington Street, Wolverhampton.
 1886. L Woodward, Bernard B., F.G.S., F.R.M.S., 131, The Grove, Ealing, London, W.
 1886. Wotton, F. W., 43, Sotheby Road, Highbury, London, N.
 1895. Wright, Charles East, Orchard View, Kettering.

Helix aspersa Müll., m. *sinistrorsum* Taylor.—At the September meeting of the Manchester Branch a fine specimen of this monstrosity was exhibited by Mr. J. Ray Hardy. He had found it in a collection of shells recently acquired by him, formerly belonging to an old Manchester collector, and it bore a label with 'Morecambe, 1841,' upon it. This is interesting from the fact of its being the second record for Lancashire; the first being the specimen taken in Whalley churchyard during an excursion of the Branch in 1889.—R. STANDEN (Hon. Sec. Manchester Branch).

ALTERATIONS IN 'BRITISH CONCHOLOGY.'

By J. T. MARSHALL.

(Read before the Conchological Society, August 22nd, 1894).

In a paper which appeared in the 'Journal of Conchology' for October, 1893, on "Additions to 'British Conchology,'" I expressed my intention of writing a second and supplementary one on some of the changes of nomenclature and classification which have been proposed or adopted since the publication of that excellent work—with many reservations, however. These proposed alterations are of such a nature and extent as would, if carried out, wholly revolutionise British conchology as laid down in our standard works, and as generally accepted by British naturalists. That many obvious changes are necessary and even imperative is, of course, admitted; some due to original error, and others to more light having been thrown on certain groups and species. But it is possible to overdo this. At the same time, every writer has a perfect right to propose, reject, or adopt any system of nomenclature or of classification he pleases; there is no law to the contrary, and no arbiter to decide which shall prevail. In science, we have not yet reached that happy stage when rival and conflicting views can, like those of a coal or a cab strike, be referred to a board of arbitration.

The following notes are therefore offered only as a modest contribution to a rectification and modification of some palpable errors, and of changes that may fairly be considered absolutely necessary in arranging any new British List.

I hope in a further paper to give a list of the additional localities, which have been recorded for British marine shells since the publication of 'British Conchology.' These are very numerous, embracing as they do a period exceeding a quarter-of-a-century.

Argiope capsula Jeff. 'Professor King proposed to make this species the type of a new genus, which he named *Gwynia*, out of compliment to me; but although I duly appreciate the intended honour, I cannot conscientiously accept it. Although the species is unquestionably distinct from the foregoing (*A. cistellula*), it may be the young of *A. neapolitana*.'—Jeffreys, 'B. C.,' vól. ii., p. 22.

The identity of this species as a good one is now well established, and the use of *Gwynia* as a sub-genus (not genus) is generally adopted. The shell is quite unlike *Argiope*, either internally or externally. The animal is undescribed, and although I have taken many specimens *in situ* at different times, its sluggishness or temerity, to say nothing of its minuteness, renders it difficult to examine. I have watched them for days, but could never observe the slightest movement in them.

Lamellibranchiata Blainville. Mr. Edgar Smith, in the 'Challenger' Report, has suggested, and on very excellent grounds, that 'the name *Pelecypoda* given to this section of mollusca by Goldfuss ought to be used in preference to that of *Lamellibranchiata* Bl. Not only has it priority, but it is more in conformity with the nomenclature of the other classes of mollusca—the Cephalopoda, Pteropoda, Gastropoda, &c.—and points to the modification of one of the most important organs (that of locomotion) of the animals.'

Pecten testæ Bivona (1836), according to Monterosato, in his 'Nomenclatura,' is *P. incomparabilis* Risso (1826), and the latter should therefore take precedence.

P. testæ var. **suborbicularis** Jeff. I think this variety should now be expunged from the list, thirty years having elapsed without adding to the single valve on which it was founded.

P. septemradiatus Müll. The *Ostrea pes-lutræ* of Linne. 'The Linnean name appears to have been first recognised

and adopted by the late Mr. Gay in 1858, but the var. *dumasii* agrees more nearly with Linne's description.'—Jeffreys, 'Lightning' Report.

It is now generally conceded that *P. septemradiatus* Müll. is a variety only of the type, the type being what English collectors have hitherto called var. *dumasii* Payr. The latter should therefore be called *P. pes-lutræ* L., and the former *P. pes-lutræ* var. *septemradiatus* Müll.

Lima elliptica var. *leviuscula* Jeff. The author fell into an error in making this a variety. He observes that 'although evidently immature, it differs from the young of the typical form in being destitute of ribs.' These specimens are about a line in length, and are dredged in very fine sand in deep water. But if compared with adult examples from similar ground and depth, it will be observed that the region of the umbones in the adult is quite smooth, and the shell generally thinner and less strongly ribbed than those from shallower water. I have specimens from the Minch, 70 fathoms; the Sound of Sleat, 85 fathoms; and other localities in the Hebrides, with the umbonal area perfectly smooth, clearly indicating that this variety is the young stage of a thinner form. The very young of *L. loscombi* are also smooth.

Leda pygmæa Münst. Philippi assigned his *Nucula tenuis* to the *N. pygmæa* of Von Münster, but that is a different species, and fossil, so that Phillipi's name *tenuis* should stand for this species. (See 'Lightning' Report, p. 577.) Both names are inappropriate to the species, and especially that of *tenuis*, as there is not only some confusion between the genera *Nucula* and *Leda*, but there is already a well-known *Nucula tenuis*.

Mr. Edgar Smith has substituted *Nuculana* for *Leda* on account of the priority of the former by some years, and Dr. Mörch agrees with him. Mr. Dall, on the other hand, claims *Nuculana* for a group only of *Leda*,

retaining the latter name for another group. As the difference between these authorities arises as to the correct rendering of a deceased author's (Link's) German definition, it seems inadvisable to change a well-established name for one which is in doubt.

Kellia cycladia S. Wood. This was definitively assigned to the genus *Axinus* by Jeffreys in the 'Lightning' Report. It is the *Poromya subtrigona* of Sowerby's Index (plate ix.), and *Kellia cycladia* of his Supplementary Plate. Both these figures, however, differ from that of 'British Conchology,' and neither of the three are good. Sowerby's figure of *Kellia cycladia* (plate xxv.) is quite unlike, but that under the name of *Poromya subtrigona* (plate ix.) is better, and the best of the three. Jeffreys' figure has the beaks too obtuse.

Artarte sulcata var. *incrassata* Brocchi (1814) should be altered to *A. sulcata* var. *fusca* Poli (1791).

Tapes pullastra Mont. is the northern form of *T. geographicus* Chem., a Mediterranean species. The latter is much smaller, and the 'geographical' markings which give it its name are usually spread over the whole shell, instead of, as in ours, being confined to the posterior end; but they are otherwise identical. The proper name for the British form should be *T. geographicus* var. *pullastra* Mont., but in the absence of the former species from our coasts, British collectors may prefer to retain Montagu's specific name.

Solecurtus candidus Renier. Considerable doubt being entertained as to this being Renier's species, recent writers have not followed it, but adopted mostly that of *S. multi-striatus* Scacchi. Turton's *Psammobia scopula*, however, published in 1822, has priority over all other names.

Pandora inæquivalvis var. *obtusa* Jeff. Jeffreys admits that this was described by Montagu as *Solen pinna*, but he gives no reason for re-describing it as var. *obtusa*, and it is only right that Montagu's name should be restored.

Saxicava rugosa var. **minuta** L. This variety should be expunged; it is admittedly the immature stage of the var. *arctica*.

Cadulus subfusiformis Sars. = **C. jeffreysi** Monts. (See 'J. of C.,' vol. vii., No. 8).

Dentalium abyssorum Sars = **D. striolatum** Stimpson (1851) as Sars himself admits.

D. tarentinum Lam.—The law of priority in zoological nomenclature has been strangely disregarded in reference to this species, for while Lamarck neither figured nor properly described *D. tarentinum*, Da Costa did both for *D. vulgare* long previously, and it is surprising to find Jeffreys adhering to Lamarck's name "because it would be inconvenient now to substitute it for *tarentinum*, which has been for between sixty and seventy years accepted and used by nearly every conchologist." The British Association rules are too rigidly applied to make any allowances for "inconvenience," and strict justice demands its restoration.

Gasteropoda.—Without any explanation, Jeffreys merely says in his Appendix to 'British Conchology'—"For *Gasteropoda* read *Gastropoda*." But the suggestion has not met with general approval. Dr. Watson writes in the 'Challenger' Report—"The alteration of Cuvier's word to *Gastropoda*, which has found some acceptance, could only have been justified had he been wrong in his spelling, which he is not. Between the two forms of the Greek root in composition, surely Cuvier was free to choose which he pleased even though he preferred the less common one."

Against this, it may be remarked that it is a canon of literary law that a redundant letter or syllable, when doubtful or extraneous, may be expunged. Thus *Pecten tigerinus* has been changed to *P. tigrinus*, *Siphonodentalium* to *Siphodentalium*, &c., and they lose nothing by the incisions.

Chiton hanleyi Bean. Jeffreys (' Lightning ' Report) has changed this name to *C. mendicarius* Mighels on the ground of priority ; but the identity of Mighels' species with Bean's is not uncontested, and Gray, on presumably good grounds, had long previously changed the name to *C. debilis*, by which it is more generally known.

Mr. Dall (' Explor. Alaska ') and Professor Haddon (' Chall. ' Report) cite *C. debilis* and *C. mendicarius* as two species without expressing any opinion on them.

We have recently been told ⁽¹⁾ that we have no Chitons in England ; they are all something else. The statement in itself would hardly require further notice, but that the writer of it adopts the extraordinary and unusual assumption that it is the result of " the light of our advancing knowledge," and he holds up to compassion, as being in the outer pale of darkness, those who may not acquiesce in it. A proper appreciation of contemporary writers should teach him that this is fallacious, and that the differences between naturalists arise from some preferring to treat sections or sub-genera as such, while others regard them as genera, as to which every one has a right to judge for himself. We are now invited to divide our small group of eleven species of *Chiton* into no less than six genera—a long step towards a condition of things so strongly protested against by a well-known author, when " we shall soon have a distinct generic title for every specimen of a shell we possess, and the confusion of the Tower of Babel will be reproduced in conchology." And when it is considered that these old-new names have been proposed, some for more than a century, and none less than half-a-century ago, it is not quite clear how they have evolved from " the light of our advancing knowledge." And yet this brand-new arrangement, after leaving the writer's hands but before it can reach the reader, undergoes yet another rearrangement !

(1) Malacological Society's Proceedings, 1894.

Obviously, a quarterly journal is utterly inadequate to keep us *au courant* with the change of systems ; we shall almost require a daily tape to record the movements of "our advancing knowledge."

Tectura fulva Müll. Both Mr. Dall and Professor Sars have examined the animal of this species, and declare it to be a true *Lepeta*. The name should therefore be changed to *Lepeta fulva*, although Dall places it in the sub-genus *Pilidium*, and Sars in the sub-genus *Scutellina*.

Emarginula cancellata Phil. This was figured though not described in "British Conchology," and inserted in Somerville's List. But I fear there has been some error as to its origin. Herm has been well searched since the two alleged specimens were taken by Mr. Gallienne thirty years ago, yet no further examples have been found, and Mr. Gallienne's collection in the Guernsey Museum certainly does not contain these two specimens. I think it should be put in the same category as other species that have had a supposed origin in Guernsey and Herm.

I have myself found in the latter island a perfect specimen of *E. elongata* Costa. This differs from *E. fissura* in being more depressed, with much coarser though similar sculpture, the apex overhangs the margin, and the slit is shorter and wider. Many currents converge on Herm Island, and some of its little bays and shores are strewn with shells knee-deep.

Scissurella crispata var. *paucicostata* Jeff. In the 'Lightning' Report Jeffreys states that Philippi's var. *aspera* corresponds with his var. *paucicostata*, and is "more conical, with fewer and stronger striæ." The latter name must, therefore, be withdrawn in favour of the former.

Trochus duminyi Requier. *Circulus striatus* Phil. is prior to *T. duminyi*, and must take its place. Philippi originally described it as *Valvata striata* ; Cantraine afterwards redescribed it as *Solarium philippi*, and Requier subse-

quently as *Delphinula duminyi*. Although the animal is not known, Jeffreys had suggested that it should form a section of *Trochus* under the name of *Circulus*, which has since been adopted as a generic name by Monterosato and others, perhaps prematurely. As it was necessary, however, to alter the name, and as *Trochus striatus* is already occupied by a well-known Linnean species, the alteration to *Circulus striatus* is perhaps the best that could have been adopted. It should be placed provisionally between *Cyclostrema* and *Trochus* until the animal becomes known.

T. glaucus Möll. Möller described his *Margarita glauca* in 1842, but Brown described its fossil representative as *T. olivaceus* in 1827, so that the latter name must stand. Brown's type is a fossil of the Clyde beds. It is the *Margarita argentata* of Gould (1841), and *M. harrisoni* of Hancock (1846).

T. amabilis Jeff. This was originally described by Philippi as *T. cinctus* as long ago as 1836 for a fossil shell, and must therefore take the place of *T. amabilis*. It is also the *Solariella maculata* of Searles Wood, from the Coralline crag. Jeffreys erred in describing it as new because these fossil typical specimens are "usually marked with an irregular row of reddish spots, which are not observable in the recent form."

T. millegranus Phil. This specific name is long subsequent to *T. miliaris* Brocchi, and the latter should take precedence according to the strict law of priority, although it is quite true that "the specific name *miliaris* is not appropriate if it has reference to millet-seed, nor is it a Latin word." (Jeffreys, 'Lightning' Report).

Rissoa cancellata var. *paupercula* Jeff. I do not think this variety should hold a place any longer in the British List on the strength of "a dead and worn specimen found at Herm."

R. abyssicola Forbes. This is admittedly a variety of *R. testæ* Arad. and Mag., but as the latter is not found on our coasts it appears undesirable to make any alteration in the List, so that *R. abyssicola* will remain.

Dr. Norman, in the "Annals" for November, 1893, criticising Jeffreys, considers *R. abyssicola* Forbes a variety of *R. subsoluta* Arad. He also queries *R. deliciosa* Jeff. as a synonym of the latter, and he further assigns *R. fischeri* Jeff. to *R. testæ* Arad. and Mag.

Now, I fear Dr. Norman has not seen specimens of *R. fischeri*, nor a sufficient series of *R. deliciosa*, and compared them with typical *R. testæ* and *R. subsoluta*, or I think he would have arrived at different conclusions. The three are quite unlike each other, and in my opinion, such as it is worth, are good species.

Given a sufficient series of specimens from various localities and depths, *Rissoa abyssicola* can be graduated with ease into *Rissoa testæ*, and the two forms appear self-evident as one species; but *R. subsoluta* is not like either. The Norwegian form of *R. subsoluta* (which is *R. abyssicola* Sars = *R. elegantissima* Seg.) approaches *R. abyssicola* Forbes in its sculpture, but that is the only resemblance. It differs from *R. testæ* and all its forms in having much finer sculpture, 4-5 whorls instead of 5-6, which are more convex, and especially in the apex being obtuse or button-shaped. In *R. testæ* and the var. *abyssicola* the apex is always pointed.

Then, *R. fischeri* Jeff. has no affinity with *R. testæ*, and cannot be compared with it in any way. It is placed by Jeffreys next to *R. dictyophora* (which it most closely resembles); he compares it with *R. calathus*, and says it is "allied to *R. zetlandica*"; but *R. testæ* is like none of these species. Jeffreys' figures of *R. fischeri* and *R. testæ* in the 'Lightning' Report, though admirably executed, are not a sure guide. That of *R. testæ* is much too coarsely

sculptured, while the body-whorl of *R. fischeri* should be more expanded, and the peculiar spiral apex should be shown. The latter is a very coarsely sculptured shell, and the intersections of the ribs are nodulous, while those of *R. teste* would be more correctly described as riblets in comparison. And I speak here of similar specimens of *R. teste* to those adduced by Dr. Norman—*R. teste = conformis*, Palermo.”

Dr. Norman also places *R. deliciosa* Jeff. (with a query) as a synonym of *R. subsoluta*; but Jeffreys' figure of the former (a good one) shows an altogether different shell; it is a short cone, with compressed whorls and a bulbous apex, and comes nowhere near any of the forms of *R. teste* or *R. subsoluta* except in its var. *multicostata*; in this the sculpture is somewhat similar to the finely-sculptured abyssal form of *R. subsoluta*.

It must not be forgotten that Jeffreys separated his *R. deliciosa* from *R. subsoluta* only after having received the type of the latter from the author, Aradas. And it is the same species described as *R. electa* by the Marquis de Monterosato, who would be well acquainted with *R. subsoluta*.

The variation of *R. deliciosa* is no doubt extreme, as well as its great diversity of habitat, and Jeffreys might well say of it that species-makers would revel in the manufacture of other forms out of it; but its family likeness is always apparent.

I have all these shells before me, and find no difficulty in determining Jeffreys' types and varieties.

R. costulata Alder. This stands in the same category as *R. abyssicola*, being a variety of the *R. similis* of Scacchi, which name is prior to Alder's; but for the same reason as previously stated, it is not advisable to alter the name in the British List. *R. similis* is smaller and more slender than this, and has numerous varieties outside Britain. Moreover,

some writers regard both these forms as only varieties of *R. parva*, and Dr. Boog Watson has well expressed the prevailing confusion of this group of *Rissoa* in the 'Challenger' Report, p. 588 :—" Dr. Jeffreys regards *R. similis* Scac., as a small variety of *R. costulata* Alder, a view I entirely share, with the addition that I believe both these and a great many other species, both British and foreign, to be mere varieties of *R. parva* Da Costa. Perhaps, when all zoological classification has been reduced to chaos, and each museum specimen has received a separate name, a real revision of species will be entered upon. In the meantime, such labour is thrown away, and Scacchi's species has as much right to recognition as the others around it."

Hydrobia similis and **H. ventrosa** should be expunged from Mr. Somerville's List. Under no circumstances can they be regarded as marine species.

Aclis unica Mont. Dr. Jeffreys in the 'Lightning' Report adopted this species as the type of his genus *Cioniscus*, which differs from *Aclis* proper in several respects. It has well-defined characters, and differs in the apex, the shape of the aperture, and particularly in having longitudinal striæ. He has associated with it two other species taken in the 'Porcupine' Expedition—*C. gracilis* and *C. striatus*.

A. gulsonæ Clark. In 'British Conchology' the author had remarked that "this and *A. unica* are aberrant forms of *Aclis*. Each has peculiar characters which render their systematic allocation very difficult." Having, therefore, suggested a new genus for the reception of *A. unica*, he proposed *Menippe* for *A. gulsonæ*; but in his Appendix he altered that again to *Pherusa*, as *Menippe* was already employed in the *Crustacea*. Clark, when originally describing the species, called it *Pherusa*.

Odostomia scillæ var. **compactilis** Jeff. (See 'J. of C.' vol. vii., No. 8).

O. acicula var. **ventricosa** Forbes. (Ibid.).

Eulima distorta Desh. (Ibid.).

I must repeat here what I have already informed Mr. Sykes in reply to his inquiry *in litt.*, and which should have satisfied him, that whatever this species might eventually prove to be, "in no case should I ascribe *E. latipes* Wats. to my MS. *E. tumidosa*." He should be aware of the elementary fact that a MS. name is of no account against a published one.

Natica grœnlandica Beck. Jeffreys has abandoned the *N. grœnlandica* of "British Conchology" in favour of *N. pallida* Brod. and Sow. on the ground of priority; but it is doubtful what is Broderip and Sowerby's *N. pallida*, as the type is lost and no figure was published with the original description. Dr. Boog Watson puts the matter thus:—"It is quite possible that the *N. pallida* of Gray, Middendorff, and Philippi may be *N. grœnlandica* of Beck, though all three authors assert the contrary. Jeffreys himself says that he had been 'inclined to doubt whether it might not be *N. islandica*.' The state of the case is this—some shells called *N. pallida* Brod. and Sow. are *N. grœnlandica* Beck, but whether they really are Broderip and Sowerby's species no one can tell." ('Challenger' Report, p. 448). In this view of the case, it would be preferable to retain the name used in "British Conchology" to using a doubtful one.

N. alderi Forbes. "As a mere act of justice to the illustrious Swede, I feel myself compelled to substitute for *alderi* the specific name *glaucina*, by which Linné originally and undoubtedly designated and fully described this common European shell in his 'Fauna Suecica.'" (Jeffreys, 'Lightning' Report, p. 30).

Lamellaria Mont. Various names by various authors have been proposed or adopted for this genus, which was long left unnoticed, probably on account of its shell not being external or visible. Jeffreys says that "a great deal has

been written on the historical part of this subject," which he abridges, but acknowledges that he does not "claim any merit for endeavouring to elucidate it." ('B. C.' vol. iv., pp. 234-5). However, Dr. Rudolph Bergh in the 'Challenger' Report, and also in his Monograph on the *Marseniadæ*, has attacked the question boldly, and the result is an exhaustive account of the genus, which may now be said to be placed on a substantial basis. Shortly stated, the case stands thus—*Lamellaria tentaculata* was described by Montagu in the Trans. Linn. Soc. Lond. in 1811, and referred by him to his genus *Lamellaria*. His generic name, however, so resembled that of *Laminaria* (a group of *algæ*), as also the fact that *Lamellaria* cannot be fitly applied to Montagu's type, which was *Pleurobranchus membranaceus*, that in 1819 Leach advocated the disuse of the name and adopted that of *Marsenia*, which has been followed by some authors, and which will no doubt be now generally followed.

Capulidæ Fleming. Jeffreys has placed this family between *Lamellaria* and *Velutina*, instead of between *Fissurella* and *Calyptrea*, and says that Mr. Jabez Hogg, writing on the radula of the mollusca, states that the 'dentition is seen to be almost identical with *Velutina*.'

Torellia vestita Jeff. There are no grounds for including this species in the British fauna; 'a single dead specimen, not in good condition,' is obviously insufficient. And although specimens were taken in the 'Lightning' and 'Porcupine' expeditions between the Hebrides and Færœs, they were from stations nearer the latter group of islands.

Cerithium perversum L. 'From Professor Möbius's notes and drawings, it appears that the animal of this species differs considerably from that of *Cerithium*, particularly in respect of the foot and odontophore. I would consequently adopt the genus *Triforis* of Deshayes for this species.' (Jeffreys, Ann. & Mag. Nat. Hist., June, 1870).

In the 'Lightning' Report, Jeffreys has extended these remarks. He there observes:—'I am now inclined to separate *Triforis* from *Cerithium* by reason of the differences in the apex or embryonic part of the shell, and in the former having a short basal canal instead of a mere groove or notch. The spire [tip] of *Triforis* is finely blunted; in *Cerithium* it is blunt. In *Triforis* the apical whorls are much narrower in proportion and are closely striated lengthwise, and the canal is small and nearly closed, as in *Murex*; in *Cerithium* the groove is comparatively large and open. According to Meyer and Möbius there is also a characteristic distinction between the animals and odontophores of the two genera. The snout in *Triforis* and *Cerithiopsis* is retractile, while in *Cerithium* it is contractile. *Triforis* appears to be congeneric with *Cerithiopsis* and to belong to the same family. When the shells of *T. perversa* and *C. tubercularis* are exhibited, one before a mirror and the other not, it will be seen that almost the only differential character consists in the lower or basal portion of the mouth being more closed in *Triforis* than in *Cerithiopsis*.'

The description of the apical whorls of *T. perversa* given by Dr. Watson in the 'Challenger' Report does not agree with that of Dr. Jeffreys in 'British Conchology.' While the latter describes them as exhibiting 'very minute and numerous longitudinal striæ, which are encircled in the middle by a delicate spiral thread in such a manner as to make them appear keeled or angulated, and the nucleus is smooth and glossy,' Dr. Watson says that these apical whorls 'are beset with close-set and numerous riblets, and they have two close-set spirals at the carina, while the extreme apex has about seven spiral scratches, parted by roughened threads.' This discrepancy may be accounted for by the former writer habitually using no higher power than a Coddington, while the latter used a microscope.

The *Siphobranchiata* should therefore properly commence with and include *Triforis*, instead of beginning, as hitherto, with the *Cerithiopsidæ*.

Cerithiopsis pulchella Jeff. Dr. Watson, in a paper on the 'Cerithiopsidæ from the Eastern Side of the North Atlantic' (Linn. Soc. Journ., Aug., 1885) stated that *pulchella* was pre-occupied by C. B. Adams for another species, and adopted the specific name *jeffreysi*; but Conti, in his 'Fossiles di Monte Mario,' had previously called it *concatenata*, which name should stand.

Cassidaria echinophora L. (See J. of C. for April, 1894).

Trophon truncatus Ström. Admittedly a variety of *T. clathratus* Linné, which does not occur in our seas except as a glacial fossil. The name, however, should remain as it is, for the reasons given under *Rissoa abyssicola*, *R. costulata*, etc.

Nassa nitida Jeff. This is so obviously a variety of *N. reticulata*, that it has been tacitly ignored as a species as published in 'British Conchology.' Moreover, only some specimens from the Thames and Orwell answer to Jeffreys' description, while others partake more or less of the characters of the type. These are—turreted whorls, fewer and broader ribs, and absence of tubercles on the inner lip. The turreted whorls are certainly peculiar, but the number of ribs in the type are exceedingly variable, being nearly twice as many in some specimens as in others, there being, in fact, no two specimens alike in this respect, while the absence of tuberculation on the inner lip is owing to the want of carbonate of lime, those on the outer lip being much fainter than the type, and the shell generally thinner. As to the number of ribs, I have typical specimens which are quite as sparsely ribbed, and which are also without the usual reticulations.

Columbella haliaëti Jeff. Dr. Jeffreys, reporting on the results of the 'Triton' cruise, stated that this species should be

placed in the genus *Pleurotoma*; that it is the *Fusus costulatus* of Cantraine, but as the type of the latter has been lost he adhered to his specific name *haliaëti*.

Although Cantraine's species was for a time identified with *C. haliaëti*, it is now held to be the same as Philippi's *Buccinum acuticostatum*, a Calabrian pliocene fossil, which is certainly not Jeffreys' *C. haliaëti* according to Boog Watson.

The conclusions of Seguenza and of Monterosato cannot be accepted on this point, as the species they had before them was *Buccinum acuticostatum* Phil.

Then, as to Hörnes' *Columbella corrugata* (which he referred to *Buccinum corrugatum* Broc. whereas the latter is a *Nassa*), his species is provided 'with strong teeth' both on the inner and outer lip, which is not the case with *C. haliaëti*; teeth are present but they cannot be called strong. But if Hörnes' *C. corrugata* is the same thing as ours, then Michelotti's name of *harpula* is prior. Dr. Watson well says—'It is obvious that there is here a whole group of *Columbellas* greatly in need of revision.'

However, it is so far clear up to the present that *C. haliaëti* of Jeffreys has as much right to stand as a species under that name as under any other.

Mr. Sowerby figures this in his Index as a smooth white shell; but it is strongly ribbed, with interstitial striæ, and of a light yellowish brown.

Cylichna umbilicata var. **conulus** S. Wood gives place to *C. ovata* Jeff. (See J. of C., vol. vii., No. 8).

Scaphander librarius Lovén was described and published five years subsequent to *Bulla punctostriatus* Migh. and Ad., so that the latter specific name takes precedence.

Spirialis retroversus Fleming. *Limacina* was published long prior to *Spirialis*, and is now generally used.

S. retroversus var. **jeffreysi** F. and H. This variety should be cancelled. It is admittedly immature. I have some

very large specimens of the type from the west coast of Ireland, about a line in length, and if a section of the spire of one of these large specimens be compared with the figure of the variety, it is seen that they are identical.

SUMMARY.

<i>Argiope capsula</i> Jeff.	...	=	<i>Gwynia capsula</i> Jeff.
<i>Lamellibranchiata</i> Blainv.	...	=	<i>Pelecypoda</i> Goldf.
<i>Pecten testæ</i> Biv.		=	<i>P. incomparabilis</i> Ris.
<i>P. testæ</i> v. <i>suborbicularis</i> Jeff.			To be cancelled.
<i>P. septemradiatus</i>			
v. <i>dumasii</i> Payr.		=	<i>P. pes-lutræ</i> L.
<i>P. septemradiatus</i> Müll.	...	=	<i>P. pes-lutræ</i>
			v. <i>septemradiatus</i> Müll.
<i>Lima elliptica</i> v. <i>leviuscula</i> Jeff.			To be cancelled.
<i>Leda pygmæa</i> Münst.	...	=	<i>L. tenuis</i> Ph.
<i>Kellia cycladia</i> S. Wood	...	=	<i>Axinus cycladius</i> S. Wood
<i>Astarte sulcata</i> v. <i>incrassata</i> Broc.		=	<i>A. sulcata</i> v. <i>fusca</i> Poli.
<i>Tapes pullastra</i> Mont.	...		To remain.
<i>Solecortus candidus</i> Rénier	...	=	<i>S. scopula</i> Turt.
<i>Pandora inæquivalvis</i>			
v. <i>obtusa</i> Jeff.	...	=	<i>P. rostrata</i> var. <i>pinna</i> Mont.
<i>Saxicava rugosa</i> v. <i>minuta</i> L.			To be cancelled.
<i>Cadulus subfusiformis</i> Sars		=	<i>C. jeffreysi</i> Monts.
<i>Dentalium tarentinum</i> Lam.		=	<i>D. vulgare</i> Da C.
<i>D. abyssorum</i> Sars	...	=	<i>D. striolatum</i> Stimps.
<i>Gasteropoda</i> ...	...	=	<i>Gastropoda</i>
<i>Chiton hanleyi</i> Bean	...	=	<i>C. debilis</i> Gray.
<i>Tectura fulva</i> Müll.	...	=	<i>Lepeta fulva</i> Müll.
<i>Emarginula cancellata</i> Phil.			To be cancelled.
<i>Scissurella crispata</i>			
v. <i>paucicostata</i> Jeff.		=	<i>S. crispata</i> v. <i>aspera</i> Ph.
<i>Trochus duminyi</i> Req.	...	=	<i>Circulus striatus</i> Ph.
<i>T. glaucus</i> Möll.	...	=	<i>T. olivaceus</i> Brown.
<i>T. amabilis</i> Jeff.	...	=	<i>T. cinctus</i> Ph.

<i>T. millegranus</i> Ph.	=	<i>T. miliaris</i> Broc.
<i>Rissoa cancellata</i> v. <i>paupercula</i> Jeff.	To be cancelled.	
<i>R. abyssicola</i> Forb.	To remain.	
<i>R. costulata</i> Ald.	To remain.	
<i>Hydrobia similis</i> Drap.	Non-marine.	
<i>H. ventrosa</i> Mont.	Non-marine.	
<i>Aclis unica</i> Mont.	=	<i>Cioniscus unicus</i> Mont.
<i>A. gulsonæ</i> Clark	=	<i>Pherusa gulsonæ</i> Clark.
<i>Odostomia scillæ</i> v. <i>compactilis</i> Jeff.	=	<i>O. compactilis</i> Jeff.
<i>O. acicula</i> v. <i>ventricosa</i> Forb.	=	<i>O. ventricosa</i> Forb.
<i>Eulima distorta</i> Desh.	=	<i>E. philippii</i> Weink.
<i>E. distorta</i> v. <i>tumidosa</i> Marsh.	=	<i>E. curva</i> Monts.
<i>Natica grænlandica</i> Beck	To remain.	
<i>N. alderi</i> Forb.	=	<i>N. glaucina</i> L.
<i>Lamellaria</i> Mont.	=	<i>Marsenia</i> Leach.
<i>Capulidæ</i> Flem.	To be transferred.	
<i>Torellia vestita</i> Jeff.	To be cancelled.	
<i>Cerithium perversum</i> L.	=	<i>Triforis perversa</i> L.
<i>Cerithiopsis pulchella</i> Jeff.	=	<i>C. concatenata</i> Conti.
<i>Cassidaria echinophora</i> L.	=	<i>C. tyrrhena</i> Lam.
<i>Trophon truncatus</i> Str.	To remain.	
<i>Nassa nitida</i> Jeff.	=	<i>N. reticulata</i> v. <i>nitida</i> Jeff.
<i>Columbella haliaëti</i> Jeff.	To remain.	
<i>Cylichna umbilicata</i> v. <i>conulus</i> S. Wood	=	<i>C. ovata</i> Jeff.
<i>Scaphander librarius</i> Lov.	=	<i>S. punctostriatus</i> Mi. & Ad.
<i>Spirialis retroversus</i> Flem.	=	<i>Limacina retroversa</i> Flem.
<i>S. retroversus</i> v. <i>jeffreysi</i> F. & H.	To be cancelled.	

ERRATUM.

In vol. viii., part i., p. 28, in last line, for 'incisions' read 'excisions.'

SEVENOAKS, TORQUAY,

February, 1895.

NOTES ON A CONCHOLOGICAL EXCURSION
TO THE WEST OF IRELAND.

By EDWARD COLLIER.

(Read before the Conchological Society, March 6th, 1895).

EARLY in August my son and I went for a few days collecting to the west of Ireland, and I thought a few notes and a list of the species collected would be interesting. We went direct from Dublin to Galway, where we arrived during the afternoon of Saturday, August 4th. We collected very little in the neighbourhood of Galway, as we did not stay there very long, but on or near the Oughterard Road we got the following species:—

Hyalinia cellaria Müll.—A few only.

Helix rotundata Müll.—One specimen only. This I was much surprised at, as it is generally one of the commonest shells in most districts.

H. rupestris Drap.—Very common on stone walls and very fine.

H. aspersa Müll.—Common everywhere; principally about walls.

H. nemoralis L.—Four specimens only on a wall about two miles from Galway.

H. rufescens Penn.—Fairly common.

H. rufescens var. *alba* Moq.—One specimen only.

H. hispida L.—A few only.

H. itala L.—Very plentiful and very fine; some of them were beautifully marked.

H. itala L. var. *alba* Charp.—A few only with the type.

H. virgata Da Costa.—Plentiful on the wall where we found the *Helix nemoralis*.

Pupa cylindracea Da Costa.—Very common.

P. cylindracea var. *curta* West.—A few with the type.

Balea perversa L.—One specimen only on the wall surrounding Queen's College.

Clausilia perversa Pult.—Common on walls.

Succinea elegans Risso. var. *ochracea* Betta.—Plentiful in one very damp field on flags and rushes that had been cut down.

Only a very short list, but we only collected on one day, and had no opportunity of getting any freshwater species, as we were here such a very short time.

On leaving Galway, we took the steamer across the bay to Ballyvaughan in County Clare, which was really the locality we had come to visit, as I had seen some very fine *Helix nemoralis* from there collected many years ago by my friend Mr. Thomas Rogers. This northern part of County Clare is all on the limestone, with hills rising to a height of over 1,000 feet, very often in terraces of the limestone pavement—a very paradise for ferns and botanical specimens generally. We only collected between Ballyvaughan and Black Head, a distance of some six miles, and got the following species :—

Hyalinia cellaria Müll. Not common.

H. nitidula Drap. A few only. I account for the scarcity of *Hyalinie* through there being so little cover for them. There were virtually no trees and very few bushes.

Helix rotundata Müll. Very scarce.

H. rupestris Drap. Everywhere; on rocks and walls, and generally very fine.

H. pulchella Müll. Two specimens only.

H. aspersa Müll. Very abundant, and a good size, but not very thick shells. In some of the little meadows this species and *H. itala* were so common that one could not step without crushing them by dozens as one walked across.

H. nemoralis L. The shell *par excellence* of this district. Very fine and very variable. The first two days at Ballyvaughan were very wet, and although we went out whenever practicable we could not find any, as they do not seem to crawl out during very heavy rain. When we found the

locality for them, which is on or near the stone walls that surround the little meadows and orchards, we found them fairly plentiful, although they always needed looking for. They were very restricted in locality, and in some seemingly likely places we could not find them at all. Their average size was 18 mill. in height and 25 mill. in breadth, but a few specimens were 20 mill. by 28 mill. They varied in colour very considerably, much more than in any other locality I have ever visited. The type specimens (five bands) were the commonest, and were generally very handsome shells, as the bands were very dark and mostly of the band formula (123)(45), but occasionally (12345). Below is a list of the varieties we found that are acknowledged in the last-published list of the Conchological Society:—

Var. *roseolabiata* Taylor.—Ten specimens.

Var. *albolabiata* Von Mart.—Six specimens (12345)
(123)(45) (12345).

Var. *bimarginata* Moq.—Two specimens only.

Var. *rubella* Moq.—Common. The three largest specimens we got were all of this variety.

Var. *libellula* Risso.—Common.

Var. *castanea* Moq.—Five specimens.

Var. *hyalozonata* Taylor.—Four specimens. This variety seems to be very soon weathered, and its light-cream coloured epidermis comes off in patches, leaving the shell pure white with translucent bands. I have them from Bundoran without a scrap of epidermis left.

M. *sinistrorsum* Taylor.—My greatest prize, a very fine specimen, fully mature, of the plain yellow colour (*libellula*). I found it low down and far in the wall surrounding a little meadow near Gleninagh Castle, Cregg, about three miles from Ballyvaughan.

Besides the above, I got the following :—

Var. **coalita** Moq.—Common.

Var. **punctella** Moq.—Fairly common.

Var. **petiveria** Moq.—Three specimens.

Var. **albescens** Moq.—Two specimens. One with a white mouth, the other with a black mouth.

Var. **luteolabiata** Ckll.—One specimen, of a uniform yellow colour with a brilliant yellow mouth.

Var. **tenuis** Ckll.—Four specimens, extremely thin, and all different in colour.

A good many of the shells were rather thin, not only of this species, but also of *H. aspersa* and *H. itala*, and one (var. *tenuis*) extremely thin ; and this I account for in the following way :—Although this is a purely limestone district, and therefore presumably suitable for snails with good thick shells, I found by observation and enquiry that nearly all the little meadows and orchards had been made by filling up the cracks in the limestone pavement, and then covering it over to a considerable depth with soil, brought from a distance, taken from underneath the peat when this had been removed. It is a well-known fact that snails do not thrive on bogs or in boggy places, and although on the limestone, the plants these snails lived on grew most on rich loamy or peaty soil.

Helix rufescens Penn.—A few only.

H. itala L.—In thousands, if not in millions. This is certainly the commonest shell in County Clare. By the roadside on walls, climbing rocks, on bushes, in the orchards and meadows, they were to be found by thousands. In one little meadow, in which were two of the small stacks they make in this part of the country, I could rake them off by hundreds at a time. There were a good many *H. aspersa* on the stacks and occasionally a few *H. nemoralis*.

H. itala L. var. **alba** Charp.—A few with the type.

- H. itala** var. **leucozona** Moq.—Fairly common, some of them very dark.
- H. caperata** Mont.—One specimen only on an old wall near the coast-guard station.
- Buliminus obscurus** Müll.—One only.
- Pupa cylindracea** Da Costa. — Very common and very generally distributed.
- Pupa cylindracea** var. **curta** West.—A few amongst the type.
- P. muscorum** L.—Common, under stones on the road-side on the way to Black Head.
- Balea perversa** L.—A few only.
- Clausilia perversa** Pult.—Fairly common on walls and under large stones.
- Limnæa peregra** Müll. v. **maritima** Jeff.—The only fresh-water shell we got. Plentiful on wet rocks by the road-side near Black Head. This answers exactly to the description given by Jeffreys, and is a very thick solid shell, with suture very deep and spire produced. A few of my specimens are rather larger than the one figured by Taylor (Journ. of Conch., vol. vi., p. 297).

On our return, we went by car from Galway to Westport, via Clifden, where we stayed one day, intending to go down to Dogs' Bay, near Roundstone, for some of the thick-shelled (semi-fossil) *H. nemoralis* from the sand-hills there, but the weather turned out so very bad we had to give it up, and we were weather-bound in the hotel all day, and the following day got thoroughly drenched in our forty miles drive to Westport.

Since writing the above, I have received about 150 more *Helix nemoralis* from Ballyvaughan, quite as variable as those I got myself, but amongst them was one specimen of var. *major* Fér., measuring 21 mill. in height and 29 mill. in breadth, of a reddish colour 00345 with the bands half-effaced.

CONCHOLOGICAL SOCIETY
OF GREAT BRITAIN AND IRELAND.

PROCEEDINGS.

232nd MEETING, WEDNESDAY, JANUARY 23rd, 1895.

Held at the Philosophical Hall, Leeds.

Mr. John W. Taylor, F.L.S., President, in the chair.

Donations to Library announced and thanks voted :

The Naturalist, No. 234, Jan., 1895; and Feuille des Jeunes Naturalistes, No. 291, Jan. 1895—from the respective editors.

Proceedings and Transactions of the Nova Scotian Institute of Science, session 1892—3, vol. i., part 3; and Transactions of the Royal Society of South Australia, vol. xviii. for 1893—4; from the respective societies.

New Member elected :

Mr. Bernard Arnold, Milton Lodge, Gravesend.

Candidate Proposed for Membership :

Mr. Charles East Wright (proposed by Mr. Lionel E. Adams, B.A., and seconded by Mr. Charles Oldham).

Exhibits :

On behalf of Mrs. Henry Crowther were exhibited a series of distorted examples of *Limnaea peregra*, collected by Mr. Joseph Whitwham, in a now-destroyed pond in Greenhead Park, Huddersfield, the specimens shown showing a great variety of excesses of growth of the lip, the margins being in some cases perfectly reflected. Examples of the same species from Middleton near Leeds were also shown.

The President exhibited a number of coloured drawings of snails and slugs, executed by Mr. Alfred Sich, F.E.S., including *Limax flavus*, *Helix rotundata*, *H. lapicida*, etc., the drawing of the last-named being especially characteristic.

On behalf of Mr. Alexander Shaw, of Glasgow, were shown a number of Scottish shells, including *Helix caperata*, *Pupa cylindracea*, and *Cochlicopa lubrica*, from Ayr, and the two last-named, together with *Vertigo edentula*, *Hyalinia altharia*, and *Helix rotundata* from Strathblane, South Perth vice-county.

233rd MEETING, WEDNESDAY, FEBRUARY 6th, 1895.

The President in the Chair.

Donations to Library announced and thanks voted :

The Naturalist and Feuille des Jeunes Naturalistes, for Feb., 1895, from the respective editors; and the Transactions of the Manchester Microscopical Society, for 1893, from the society.

New Member elected :

Mr. Charles East Wright, Orchard View, Kettering.

Exhibits :

On behalf of Mr. Alexander Shaw, of Glasgow, were shown various Scottish and Irish land and freshwater shells, sent for record, as follows :—*Ancylus fluviatilis*, *Carychium*, *Hyalinia cellaria*, *H. nitidula*, *H. crystallina*, and *Helix aculeata*, from Old Kilpatrick, Dumbartonshire ; *Vitrina*, *Hyalinia crystallina*, *H. alliaria*, *H. nitida*, *H. fulva*, *Helix rotundata*, *Pupa cylindracea*, *Clausilia perversa*, and *Carychium*, from near Salen, Island of Mull, vice-county of Ebudes South ; *Hyalinia alliaria*, *H. nitidula*, *H. fulva*, *H. crystallina*, *Helix hispida*, *H. rotundata*, *Pupa cylindracea*, *Clausilia perversa*, *Cochlicopa lubrica*, and *Carychium*, from Killin, Mid-Perthshire ; and *Clausilia perversa*, *Pupa cylindracea*, and *Helix rotundata*, from Coleraine, county Londonderry.

The Recorder also showed a number of shells, sent for record, by Mr. Wm. Evans, F.R.S.E., and collected by him at Oban in April, 1894, including *Arion hortensis*, *A. circumscriptus*, *A. minimus*, *Limax marginatus* (*arborum*), *Agriolimax agrestis*, *A. lœvis*, *H. aspersa*, *H. arborum*, *H. hortensis* var. *lutea* 12345, *H. rufescens*, *H. granulata*, *Hyalinia cellaria*, *H. pura*, *H. fulva*, *H. crystallina*, *H. nitidula*, *H. nitida*, *Clausilia perversa*, *Pupa cylindracea*, *Ancylus fluviatilis*, *Cochlicopa lubrica* and var. *lubricoides*, *Succinea putris*, *S. elegans*, *Vitrina*, *Limnea truncatula*, *L. peregra*, *Helix hispida*, *H. fusca*, *H. rotundata*, *H. pygmaea*, *Vertigo edentula*, *Planorbis parvus*, *Pisidium pusillum*, *P. fontinale*, and *Hyalinia cellaria* var. *albina*.

The Recorder also exhibited an example of *Succinea elegans*, collected by Mr. Evans, at Callander, May 6th, 1894.

234th MEETING, WEDNESDAY, MARCH 6th, 1895.

The President in the chair.

Donations to Library announced and thanks voted :—

The Naturalist and Feuille des Jeunes Naturalistes, for March, 1895 ; from the respective editors.

Report of Manchester Museum, Owens College, with appendices, Oct 1, 1890, to Dec. 31, 1894 ; from the keeper.

Reprint of paper by R. Bullen Newton, F.G.S., 'On a Collection of Fossils from Madagascar,' obtained by Rev. R. Baron (Q.J.G.S., Feb. 1895, pp. 72—91, and plates 2—3 ; from the author.

Donation to Cabinet Fund announced and thanks voted :—

Five Shillings from Mr. Wm. Whitwell, F.L.S.

Candidates Proposed for Membership :

Mr. Alfred Sich, F.E.S., and Mr. Wilfred Mark Webb, F.L.S. (both proposed by Mr. L. E. Adams, B.A., and Mr. John W. Taylor, F.L.S.).

Death of Member.

It was announced that Mr. John Hagger, F.L.S., of Repton School, Burton-on-Trent, died on Friday, 1st of March, and the secretary was requested to convey to his daughter an expression of the Society's condolences

with the family, and their regard for one who was so long a member of the Society, and so well-known a conchologist.

Papers Read :

A paper by Mr. Edward Collier entitled 'Notes on a Conchological Excursion to the West of Ireland' was read and is printed in the present number of the 'Journal of Conchology.'

A couple of notes by Mr. G. W. Chaster, M.R.C.S., on '*Nassa reticulata* var. *minor*,' and 'On the occurrence *Pulsellum lofotense* Sars in the Irish Sea,' were read, and appeared in the last number of the 'Journal' (see p. 11).

A couple of notes by Mr. Robert Standen, on '*Helix aspersa* monst. *sinistrorsum*,' and on '*Vertigo substriata* var. *albina*' were read, and were printed in the last number of the Journal (pp. 11, 23).

Three notes by Mr. Lionel E. Adams, B.A., on '*Helix vermiculata* in Staffordshire,' on '*Helix hortensis* var. *luteolabiata*, a variety new to science, in Northamptonshire,' and on 'Large specimens of *Helix ericetorum* in Northamptonshire.'

Exhibits :

On behalf of Mrs. Crowther was shown a series of cut sections of *Helix nemoralis* and *H. arbustorum*; large examples of *Limnaea peregra* from Cannon Hall pond, near Barnsley, S. W. Yorks., showing inflation of the shell-whorls by the animals at a time when there was excessive growth of plant-life; and a fine series of *Succinea elegans* from a pond close to the beach of Falmouth Bay, Cornwall, so close to high-water mark that only the pathway or road intervenes, and the pond is subject to occasional influxes of salt-water.

The Recorder showed some drawings and photographs of *Carychium minimum* and var. *curta* found at Edenhall, near Penrith, Cumberland; there were about eight examples found by Mr. J. Charles Smith, by whom the photographs and drawings were executed.

The President showed on behalf of Mr. Edward Collier examples of *Liguus virginicus* and *Helix picta* in illustration of polychromatism, and cut sections of *Helix nemoralis* to show the thickness to which it is possible for the shell to attain.

He showed on behalf of Mr. J. Ray Hardy an example of *Helix aspersa* var. *flammea* from Scarborough; and on behalf of Mr. Robert Standen monstrosities of *Planorbis albus* from the canal at Burnley, 1888; and examples of *Pl. spirorbis* from a ditch at Birch, near Manchester, 1889.

On behalf Mr. Charles Oldham he showed *Planorbis nautilus* var. *crista* from Rhos Neigir, Anglesea, 1892, and monstrosities of the same species collected at Hale, Cheshire, on the 15th of September, 1888.

On behalf of Mr. W. H. Heathcote he exhibited a large number of interesting specimens, as follows:—Scalariform specimens of *Limnaea peregra* from Grimsargh, Lancs. W., 1887; scalariform examples of *Planorbis spirorbis* from Tarleton, Lancs. S.; *Pl. nautilus* from Whittingham, Lancs. W., Charnock Moss and Walton-le-Dale, Lancs. S., and Lofthouse, Yorks. S. W. (Geo. Roberts); examples of *Limnaea stagnalis* collected in Drinkwater Park, Prestwich, Lancs. S., showing distortions caused by the chemical refuse which was formerly allowed to run into the lake; also examples col-

lected in the same lake after the refuse was turned into the river, in 1887; examples of the same species collected in the Ringley Canal, Lancs. S., in 1886, when the water was high and clear, and other examples collected in the same place on Aug. 24th, 1886, during the heavy and long-continued drought, when the water was stagnant and foul-smelling, with the top covered with iridescent scum from the aniline dye-works, these latter examples being much darker in colour than those collected during the spring; examples of *Limnæa peregra* var. *boissii* from Southport, Lancs. S., from a ditch which is filled with salt water at every tide, collected from the fronds of *Enteromorpha intestinalis* in three different lots, showing very great differences, one collected early in 1886, a second in the autumn of that year, and a third in 1887; *Planorbis nautilæus* var. *crista* and monst. *scalariforme* from Whittingham, Lancs. W.; and *Pl. albus* monst. *scalariforme* from Farington, Lancs. S.

The President also showed *Limnæa stagnalis* v. *appressa* Say, from Marl lake, Roscommon County, Michigan, where it was collected by Mr. M. L. Leach.

Hyperstrophy:

A discussion arose on the questions of sinistrorsity, inversion, and hyperstrophy, and eventually it was decided that the discussion be resumed at the next meeting.

235th MEETING, THURSDAY, MARCH 21st, 1895.

The President in the chair.

Donations to Library announced and thanks voted:

Iconographie malacologique des animaux mollusques fluviatiles du Lac Tanganika, par J. R. Bourguignat, 1888—from La Société Malacologique de France.

Donations to Cabinet Fund announced and thanks voted:

Five Shillings from Rev. C. A. Williamson, M.A.

New Members Elected:

Mr. Alfred Sich, F.E.S., Villa Amalinda, Burlington Lane, Chiswick, Middlesex.

Mr. Wilfred Mark Webb, F.L.S., Editor of the 'Journal of Malacology, Staff Demonstrator in Biology to the County Council of Essex, Holmesdale, Brentwood, Essex.

Candidates Proposed for Membership:

Mr. Reginald Hawkesworth Barker (proposed by Mr. J. A. Hargreaves and Mr. Robert Standen), and Mr. Charles R. C. Hibbert, F.Z.S. (proposed by Mr. John W. Taylor, F.L.S. and Mr. William Nelson).

Exhibits:

The President showed some abnormal specimens of *Helix nemoralis*, bleached examples found on the sand-dunes in the neighbourhood of Ballyshannon or Bundoran in co. Donegal, sent by Mr. Wm. Swanston, F.G.S., of Belfast, one being a specimen with abnormal mouth, and two examples of monst. *scalariforme*.

The President also exhibited *Planorbis spirorbis* monst. *scalare* from a pond on Hayling Island, Hants S., 1881, collected by Mr. H. H. Haines; and examples of the var. *major* of both *Planorbis complanatus* and *Pl. corneus* from Kupinowa, Sclavonia, collected by Mr. W. Eagle Clarke some years ago.

The discussion on hyperstrophy was continued, and in illustration of it the President showed *Ampullaria olivacea*, *Marisa cornu-arietis* from Trinidad, and *Meladomus olivaceus* from Zanzibar, as examples of the three stages in the process.

The Recorder showed on behalf of Mr. Alexander Shaw, of Glasgow, examples of *Hydrobia ulvæ* Mont., from Dunstaffnage Castle, Oban, collected in July, 1894.

236th MEETING, WEDNESDAY, APRIL 3rd, 1895.

The President in the chair.

Donations to Library announced and thanks voted:

The Naturalist and Feuille des Jeunes Naturalistes for April, 1895—from the respective Editors.

New Members Elected:

Mr. Reginald Hawkesworth Barker, Grosvenor Bank, Scarboroughh.

Mr. Charles R. C. Hibbert, F.Z.S., F.E.S., Sefton Park, Slough.

Papers Read:

A note by Mr. Lionel E. Adams, B.A., on '*Segmentina lineata* in Northamptonshire' was read, and will in due course be printed in the 'Journal.'

A note by Mr. Robert Standen entitled '*Note on Cyprea tessellata* (Sowb.)' was read, and will in due course appear in the 'Journal.'

Exhibits:

The President showed photographs of deep-water and shallow-water forms of *Limnæa stagnalis* found in Lake Michigan, U.S.A., the deep-water examples occurring at twenty feet below the surface.

The President further showed some of his own original drawings for his Monograph, and a series of the clausia of all the British species of *Clausilia*, viz., of *Cl. bidentata*, *Cl. cravenensis*, *Cl. laminata*, *Cl. rolphii*, and *Cl. biplicata*, which had been carefully extracted by Mr. Fred. Rhodes, of Bradford; and also a section of *Neritina fluviatilis* prepared by the same member.

The Recorder showed on behalf of Mr. Charles Oldham a number of spirit-specimens of *Amalia gagates*, which were referable to vars. *plumbea* and *rava*, and of *Limax maximus*, which, although not very characteristic of any of them, were referable to the type form and to vars. *cellaria*, *mülleri*, and *fasciata*, all collected in September, 1894, in a nursery garden at Sale, Cheshire.—W.D.R.

MANCHESTER BRANCH MEETING,

At the Owens College, September 13th, 1894.

Mr. Thos. Rogers in the chair.

New Members Elected :

Mr. William Wright, of West Gorton ; and Mr. George Viney, of Moss Side.

Exhibits :

By Mr. Thos. Rogers : *Ianthina africana*, from Lord Howe Island ; *Helix nemoralis*, from Ross Point, co. Sligo ; and a set of *H. aspersa* showing erosion of the living shells by blowing sand.

By Mr. W. Moss : Series of *Amphidromus chloris* ; land shells from Arabia ; *H. perplexa*, *Cyclotus grenadensis*, and *Helicina keatei*, from Grenada, West Indies ; *Endodonta novozelandica* and *E. unguicula*, from New Zealand.

By Mr. J. Ray Hardy : *Helix aspersa* monst. *sinistrorsum*, from Morecambe ; and a series of large *H. nemoralis* from the Aran Is., Ireland.

By Mr. R. Standen : *Buccinum undatum* v. *littoralis*, from Southport ; *Acme lineata*, from Bassenthwaite (collected by Captain Farrer) ; *Unio margaritifera* of unusual form, from river Teith, Callander ; *Helix arbustorum* v. *fusca*, from Seydisfiord, Iceland ; *Nanina adamsi*, from Pitcairn's Island ; and a fine series of *Xylophaga dorsalis* (presented to the cabinet by Dr. G. W. Chaster).

By Mr. Chas. Oldham : Series of *Unio pictorum*, from Cheshire localities (presented to the cabinet).

By Mr. R. Cairns : A large series of land shells from the Isle of Man, including *Helix aspersa* monst. *sinistrorsum*, *Pupa anglica*, from three localities, *Bulimus acutus*, *Succinea elegans* v. *ochracea*, *Acme lineata*, and *Zonites radiatulus* ; also a fine specimen of *Helix arbustorum* monst. *scalari-forme*, from Miller's Dale, Derbyshire.

MANCHESTER BRANCH MEETING,

At the Owens College, October 11th, 1894.

Mr. R. D. Darbishire in the chair.

Papers Read :

By Mr. Ed. Collier : 'Notes on a Conchological Excursion to the West of Ireland,' and is printed in the present number of the Journal.

By Dr. G. W. Chaster : 'Note on *Nassa reticulata* v. *minor* Marshall.'

Exhibits :

By Mr. Ed. Collier : Series of all the species treated of in his paper, the most notable being a handsome yellow sinistral *Helix nemoralis*, taken alive, and mature.

By Mr. W. E. Hoyle : Recent gifts to the Manchester Museum. A collection of marine shells from Singapore (collected by Dr. S. Archer), including fine examples of *Aspergillum pulchrum*, *Fistulana clava*, *Anomia enigmatica* in situ on leaves of mango tree, and the great freshwater bivalve *Cyrena essingtoniana*.

By Mr. R. D. Darbishire : *Buccinum undatum* v. *zelandica* from Aberdeen, and specimens of *Daudebardia novozelandica* with the animal.

By Mr. Thos. Rogers : *Helix nemoralis* v. *castanea* from Herefordshire.

By Mr. R. Cairns : *Helix nemoralis* with remarkably broad single band, from Blackpool.

By Mr. C. Oldham : *Limnæa truncatula*, from Leasowe, Cheshire, and an unusual form of *Sphærium corneum* v. *nucleus*, from Mouldsworth (presented to the cabinet); also two cases of choice specimens of *Achatinella*, from the Sandwich Islands.

On behalf of Captain W. J. Farrer, a large number of interesting species of land shells were shown, collected by him in the neighbourhood of Bassenthwaite, Cumberland, including a fine live example of *Vertigo substriata* v. *albina*; also a remarkably distorted form of *Patella vulgata*, from Ramsgate.

MANCHESTER BRANCH MEETING,

At the Owens College, November 8th, 1894.

Mr. Thomas Rogers in the chair.

Communications Read :

From Mr. R. D. Darbishire : A Transcript of an interesting letter from a friend at Châlet St. Denis, Switzerland, describing a visit to a 'Snail Farm' for the culture of *H. pomatia*.

From Dr. G. W. Chaster : 'Note on the occurrence of *Pulsellum lofo-tense* Sars, near Peel, Isle of Man' (printed in the Journal, vol. viii., p. 11).

Exhibits :

By Mr. R. D. Darbishire : 'A Study in *Helix pomatia*,' in which he showed a large series of forms from a number of British and continental localities, and series of the allied species, viz., *H. schläflii*, *H. buchii*, *H. lutescens*, *H. ligata*, *H. cincta*, and *H. melanostoma*.

By Mr. W. Moss : A collection of land and freshwater mollusca from New Zealand, the more minute species being shown under the microscope.

By Mr. W. Wright : *Buccinum undatum* monst. *sinistrorsum*, picked from a mussel-stall in the city.

By Mr. F. Taylor : *Helix pulchellum*, *Pisidium amnicum*, *P. henslowianum*, *P. obtusale*, *P. pulchellum*, and *P. milium*, collected about Ashton-under-Lyne.

By Mr. R. Standen : A collection of marine shells from Gulf of Finland, and freshwater species from near Cronstadt (presented to the Manchester Museum by Mrs. G. Linnæus Banks).

By Mr. Thos. Rogers : Specimens of *Cypræa*, *Nerita*, and *Columbella*, obtained from Coptic tombs by Prof. Flinders Petrie; probable date 600 A.D.

By Mr. R. Cairns : *Helix nemoralis* v. *albolabiata* and v. *roseolabiata*, from the Isle of Man.

MANCHESTER BRANCH MEETING,

At the Owens College, December 13th, 1894.

Mr. Wm. Moss in the chair.

Additions to Library :

'Monograph of British Land and Freshwater Mollusca,' by J. W. Taylor (part I); and a reprint of Dr. Woodward's address to the Malacological Society, Oct., 1894.

Exhibits :

By Mr. R. Cairns : A large series of *Isocardia cor*, dredged near Peel, Isle of Man.

By Mr. Fred. Taylor : Series of varieties of *Limnæa peregra* and *L. glabra*, from near Oldham; *Helix aspersa* v. *flammea*, from Douglas, Isle of Man; and several forms of *H. nemoralis*, from Belvedere, Kent.

By Mr. W. Moss : *Clausilia tetsua*, from China; and an extensive series of *Bulinus glaber* from Trinidad, and *B. auris-sciuri* from Grenada; showing connecting links between the two.

By Mr. Chas. Oldham : *Helix nemoralis* v. *cristata*, *Limnæa auricularia*, and others, from Cheshire localities (presented to the cabinet).

MANCHESTER BRANCH MEETING,

At the Owens College, January 10th, 1895.

Mr. Thos. Rogers in the chair.

Paper Read :

By Mr. Ed. Collier : 'On the genus Macroön, Pilsbry.'

Exhibits :

By Mr. Ed. Collier : A fine series of nearly all the known species of Helicophanta, Panda, Acavus, and Stylodonta, comprising the genus Macroön, dealt with in his paper.

By Mr. Chas. Oldham : *Helix pygmaea*, from Wythenshawe (presented to the cabinet); *Cypræa tessellata*, *C. caput-anguis*, *C. isabella*, *C. arabica*, *C. mauritiana*, *C. carneola*, *Trivia madagascariensis*, and others, from Honolulu.

By Mr. Thos. Rogers : *Rhytida whiteleggei*, and some near allies from Tasmania; *Nanina sophia* and *Helix howeinsule*, from Lord Howe Island; *Helix globosa*, *Rhytida confusa*, and *Helicarion robustus*, from New South Wales.

MANCHESTER BRANCH MEETING,

At the Owens College, February 14th, 1895.

Mr. R. D. Darbishire in the chair.

Exhibits :

By Mr. Darbishire : A case of *Helix nemoralis* showing difference between British and Continental specimens; *Admete viridula*, and ten species of *Trichotropis*, mostly collected by the late Mr. H. Adams in Japan, including a fine example of *T. unicarinata*, and examples of *T. borealis* from east and west coasts of Scotland, Iceland, North America, and Japan; *Chiton discrepans* of unusual size, and spirit specimens of *Sepiolo atlantica*, and *Loligo media* from Jersey; sections of shells of *Oliva erythrostoma* and *Ovula volva*, prepared by Mr. A. Hartley.

By Mr. Ed. Collier : Rare land shells from Central China, German New Guinea, and Philippines, received from O. F. von Möllendorf, including *Cochlostyla dactylus*, *C. connectens*, *C. evanescens*, *C. diversicolor*, *C. fuliginosa*, and *C. hidalgoi*, *Obba bulacanensis*, and *O. horizontalis*, *Chloræa cærulea*, *Stegoderà augusticollis*, and *Geotrochus wiegmanni*.

By Dr. G. W. Chaster : *Teredo megotara* var. *minola* collected alive on the shore at Southport, and a series of the British Eulimidæ.

By Mr. J. Cosmo Melvill : Eight specimens of *Conus splendidulus* dredged off Berbera in the Gulf of Aden ; and *Achatina churchilliana*, a new species from Natal, described by Messrs. Melvill and Ponsonby (*Ann. Mag. Nat. Hist.*, Feb. 1895). This unique specimen is in the collection in the Manchester Museum, Owens College.

By Mr. J. Ray Hardy : A fine specimen of *Buccinum humphreysianum* taken from the stomach of a gurnard purchased in the London market.

MANCHESTER BRANCH MEETING,

At Prestwich, March 14th, 1895.

In response to an invitation from Mr. J. Cosmo Melvill to hold a meeting at his residence, Brook House, Sedgely Park, a large number of members of the branch and friends attended, and greatly appreciated the opportunity thus afforded of viewing a considerable portion of his extensive and varied collection of all orders of mollusca.

Mr. Melvill occupied the chair, and read 'An Epitome of the Life of the late Hugh Cuming, F.L.S., C.M.Z.S.' (Printed in this number of the Journal.)

A cordial vote of thanks was tendered to Mr. Melvill, and the rest of the evening was agreeably passed in examination of the collections in his numerous cabinets.

Note on *Cypræa tessellata* (Sowb.). The precise habitat of this species has been long uncertain, and localities, when given at all, have been quoted doubtfully. Later writers give the Sandwich Islands and New Zealand—the latter with a query. Authentic information was afforded by the recent exhibition to the Manchester Branch of two examples collected on a sandy beach at Kahuku, Oahu, Sandwich Islands, in 1891, by Mr. E. Worthington, who was present at the meeting, and gave an interesting account of his finding them associated with *Trivia Madagascariensis*, *Cyp. caput-anguis*, and numerous other species of lesser note. The smaller specimen is now in the collection of Mr. R. Cairns ; and the other, a magnificent one, in good condition, (40 mill. long, by 29 mill. broad, and 23 mill. high), is in the collection of Mr. Thomas Rogers. The above dimensions considerably exceed those mentioned by Mr. J. Cosmo Melvill (*Monogr. Cypræidæ*, pp. 22, 70). Two of three specimens in the Manchester Museum, Owens College measure about 28 mill. in length.—R. STANDEN (*Read before Conch. Soc., April 3rd, 1895*).

BIBLIOGRAPHY.

The Cambridge Natural History. Vol. III. Molluscs, by the Rev. A. H. Cooke; Brachiopods (recent), by A. E. Shipley; Brachiopods (fossil), by F. R. C. Reed. London: Macmillan, 535 pp., 8vo., maps and cuts; price 17/-.

The present volume, although the third in respect of the complete scheme of the work, is the first to appear of a new treatise on zoology, which is edited and for the most part written by Cambridge men, and "is intended, in the first instance, for those who have not had any special scientific training, and who are not necessarily acquainted with scientific language. At the same time, an attempt is made not only to combine popular treatment with the latest results of modern scientific research, but to make the volumes useful to those who may be regarded as serious students in the various subjects." It will be seen from these extracts from the prospectus that the work could hardly have been planned on lines better fitted to meet the requirements of the members of the Conchological Society.

Turning to the contents of the book itself, we find at the outset a tabular statement of the classification adopted. The arrangement of the *Cephalopoda* presents no noteworthy features, except that it professes to follow that given in the 'Challenger' Reports, but does not. The *Gastropoda* (or *Gasteropoda* as Mr. Cooke prefers to write the word) are divided into *Amphineura*, *Prosobranchiata*, *Opisthobranchiata*, and *Pulmonata*. The *Prosobranchiata* are sub-divided, firstly in accordance with the number of auricles in the heart, and secondly according to the form of the radula. Among the *Opisthobranchiata*, we notice the inclusion of the *Pteropoda*, which, however, are still retained as one group and not divided between the Bulloid and Aplysioid Tectibranchs, as by Pilsener. This appears to us rather a half-hearted proceeding. The Bivalves, for which the name *Pelecypoda* is (rightly, in our opinion) adopted, are classified according to the anatomical scheme, based mainly on the gills, of Pilsener. This is doubtless a great advance on the artificial system of Fischer's well-known text-book, and is probably the best which has been hitherto propounded, though the way in which it runs counter to some of Neumayr's beautiful palaeontological series renders it open to suspicion in certain directions.

The earlier chapters of the work discuss general questions, such as 'Origin of land and fresh-water mollusca; their habits and general economy.' The important topic of 'Variation' is discussed in fourteen pages, and appreciative reference is made to our President's memoir in vol. v. of this Journal. We would especially commend to the notice of all our collectors, the figures on page 90. We should much like to erase the names from it, and then hand it round as a kind of picture puzzle, and ask the views of conchologists as the number of species there represented. Particularly interesting reading will be found in chapter iv., which treats of the decorative and economic uses of mollusca, including the rate of exchange at which cowries pass for money, the use of bivalve hinges as bills and receipts, pearls and pearl

fisheries, the oyster and its culture, the rearing of snails for market, and concluding with a few words on the prices that have been paid for remarkable shells.

The anatomical sections are clearly written and well up-to-date, and as might be expected, the treatment of the radula is specially complete; we are acquainted with no work in which the account of this organ is so satisfactory. Three chapters are devoted to geographical distribution, and the more striking forms characteristic of the different regions of the world are enumerated. The last one-hundred-and-fifty pages are devoted to a systematic survey of the whole sub-kingdom, in which the definitions of the groups are given as far down as families, with abundant illustrations of typical species. Particularly instructive are two series of drawings depicting the transition of the shell, from the pointed spiral to the almost flattened plate, and also its gradual covering by the mantle in the Tectibranchiata.

The *Brachiopoda* are treated from two distinct points of view—the morphological, with special reference naturally to the recent forms, by Mr. A. E. Shipley; and the palæontological by Mr. F. R. Cowper Reed. Both are in their different ways admirable.

We cannot conclude without a word in praise of the illustrations in the work; a very large proportion of them are new—a most praiseworthy contrast to the practice of reproducing figures time after time, which is only too prevalent. This fact naturally renders the volume somewhat more expensive than it would otherwise have been, but it is anything but dear. We commend it to all our members who have a mind for the scientific aspects of their study, which alone can render the collection of shells a dignified and intellectual pursuit.

The Manchester Museum, Owens College. Museum Handbooks. Catalogue of the Books and Pamphlets in the Library, arranged according to subjects and authors. By William E. Hoyle. Manchester: Cornish. 302 pp. 8vo.; price 2/6.

The Library of the Manchester Museum and its collections are, we learn from the regulations printed on the cover of this volume, "open to persons desirous to make use of them for the purposes of study." To such it must be of great importance to be able to ascertain in their own homes whether the works they desire to consult are in the library or not, and to obtain an accurate idea of the resources of the library on any given topic. Such knowledge may save many a fruitless journey and suggest many a productive one.

To facilitate the work of consultation, the catalogue has been drawn up in duplicate: in the first section the books are arranged according to subjects, and the difficulty of deciding in doubtful cases on the class to which the book should be assigned is met by a liberal use of cross references. Looking for 'Mollusca,' we find them treated under 'Palæontology,' and also under 'Zoology.' This division may seem somewhat antiquated when so much stress is laid on the necessity of studying recent and fossil forms side by side, but it was perhaps advisable in the case of a museum where the respective collections are in the main separated. The titles of books and pamphlets bearing on

these animals occupy twenty-five pages. Amongst them we notice the classic treatises of Kiener, Reeve, Sowerby, and Tryon, along with a large number of tracts bearing on the fauna of different regions; for example, twenty-six works are catalogued bearing on the mollusca of France alone, and other countries are nearly as well represented.

In the second section of the catalogue, the works are arranged alphabetically, according to the author's name, the titles being contracted so that two columns may go in a page, so that if a particular work by a particular author is sought it can be very readily found. At the end is an index of subjects by which reference can be instantly made either to the shelves of the library or to pages of the catalogue. We are sure that all working naturalists in Manchester and the neighbourhood will find this catalogue a valuable help in their studies.

The Journal of Malacology, Vol. IV, No. 1, March 30th, 1895.

Edited by Wilfred Mark Webb, F.L.S., and Walter E. Collinge, F.Z.S.

The first number of this magazine, already so well-known to all students of the mollusca, under the new joint editorship of Mr. W. M. Webb and Mr. W. E. Collinge, augurs well for its future, and we would wish to express our sincere congratulations and best wishes for its success in every way.

The principal original articles are six in number: two being devoted to our native oyster (*Ostrea edulis*) under two different aspects. One is by Mr. W. M. Webb, on the di-myarian stage of this bivalve, with three explanatory diagrams, and one full plate, which would tend to prove the existence of a posterior adductor muscle at one period of its existence; the other, by John C. Thresh, deals with oysters as disseminators of disease, especially cholera and typhoid fever, when the beds are liable to sewage contamination. The eating of oysters procured from such sources is proved to be attended with much danger, and the earlier attention is called to the matter the better.

There are descriptions of *Limax hedleyi* sp. n. from Ireland, and a note on *Amalia parryi* sp. n. from Santa Cruz, Teneriffe, by Mr. Walter E. Collinge. Mr. George Bailey has observed the process of fission in *Chato-gaster*, a worm parasitic on *Limnea stagnalis*, but his paper would have been more complete if he had referred to Lankester's work on the subject; and, lastly, Mr. Edgar A. Smith unearths the prior names *Morio* (Montfort) and *Lambidium* (Link.) which will have in future to supersede the well-known terms *Cassidaria* (Lamarck) and *Oniscia* (Sowerby). We are sorry for this, but it is well to have the question settled, once for all, and doubtless many other well-known names will in time have to give place to others waiting for a priority-student to unearth. We may point out that many generic names are in a like predicament, and we fear the classification of these will be a most difficult, and in some cases almost hopeless, matter. Some interesting notes on mollusca, both recent and fossil follow, and the number concludes with the usual full and clear tabular arrangement of current literature.

AN EPITOME OF THE LIFE OF THE LATE
HUGH CUMING, F.L.S., C.M.Z.S., &c.

BY J. C. MELVILL, M.A., F.L.S.

(Read before the Conchological Society, May 1st, 1895).

THE science of conchology, more especially as regards its geographical and systematic aspects, owes, perhaps, more primarily to the subject of the forthcoming sketch than to any who either preceded or followed him.

The history of the career of the late Mr. Hugh Cuming may be told very briefly. He was born on February 14th, 1791, at West Alvington, near Kingsbridge, South Devon, and we gather his parents were possessed but of small means, for very early in life, say at the age of thirteen or fourteen, he was apprenticed to a sail-maker in the neighbourhood, and this gave him the opportunity of making acquaintance with many sailors, who fired his youthful imagination, in which a strong leaning towards the pursuit of natural history had already been discerned, with stirring tales of the delights and excitements of foreign travel. Accordingly he did not rest until he himself had with his own eyes beheld the marvels so vividly portrayed by his friends; and, in the year 1819, the opportunity somewhat suddenly arrived. An opening in business was found for him in Valparaiso, and he accordingly set sail for Chili in the middle of that year. Here he at once began, without delay, to lay the foundations of those collections for which he became so famous in after years, and by a piece of good fortune he almost at the outset fell in with Lieut. Frembley, one of the officers of the survey under the command of Captains King and Fitzroy. Frembley is well known as a conchologist, having been the first to study those large Chitonidæ which abound on the Chilian coasts, and many were described by him for the first time. The other officers also lent their aid to Cuming, and Mr. Nugent, the English consul at Valparaiso, proved a very kind

and valued friend to the young enthusiast. So absorbing indeed were these tastes, that a few years later, in 1826, he actually retired from business, in order that he might be unfettered and able without let or hindrance to follow the dictates of his inclination. He, therefore, built and fully equipped a yacht, especially designed for the purpose of dredging and collecting natural history specimens, and began his cruise amongst the South Pacific Islands. He first touched at the Island of Juan Fernandez, situate some 400 miles west of Valparaiso, and noteworthy as the retreat of Alexander Selkirk.

From thence he sailed to the Society Islands, and visited Pitcairn's Island, so famous for having been colonized by the descendants of the mutineers of *The Bounty*. Nearly forty years had passed since this event when Cuming visited the place, and he was pleased at making acquaintance with John Adams, one of the few original survivors. He stayed with him some little time, and was much impressed at the patriarchal character assumed by this good old man as head of the colony, now so prosperous.

One after another of the small groups of islands, most of them coral-reefs or atolls, was visited by Cuming. It will be noticed that the small Island of Annaa, only signified by a minute dot on the Polynesian map, being one of the most westward of the Low Archipelago, or Paumotu Isles, is mentioned as a locality for many rare tropical shells in the pages of Reeve and Sowerby, and on the older labels of the national collection. For some time Mr. Cuming made this isle his head quarters, and here reaped a rich and abundant harvest, principally in the showy marine genera—*Conus*, *Mitra*, *Pleurotoma*, *Cypræa*, etc., that affect sunny shallow coral reefs.

After a circular tour round most of these groups, he returned to Valparaiso, and forthwith began to prepare for his second extensive voyage of exploration, viz., along the western shores of the great South American continent. He was aided

in every way by the Chilian Government, which allowed him to anchor in its ports free of charge, and also provided him with letters of introduction to the authorities of all the places he wished to visit ; and consequently every facility was given him, and his collections grew apace.

Two years were spent in explorations along the coasts, from Lima southward to the Isle of Chiloe, where he both dredged largely and collected shells at half-tide and low water. Here the larger forms of *Patella*, *Chiton*, and *Fissurella*, attain their maximum size, and other interesting monotypic forms, such as *Chorus giganteus* and *Concholepas peruvianus*, delight the naturalist. It is calculated Cuming collected nearly 400 species during this expedition. He included the Galapagos Islands in his researches, at which isolated group he found 111 marine shells. He did not pay so much attention to the land mollusca as Darwin, who visited the group a year or two later in *The Beagle*, and made closer observations regarding its climate, soil, and natural productions.

This voyage completed, Cuming now returned to England and thereupon came a turning point in his career. He awoke to find himself famous. In 1831 the Zoological Society came into existence, and its opening volumes contain the first descriptions of new species discovered by this ardent conchologist. Mr. W. J. Broderip and Mr. G. B. Sowerby, the elder, mainly contributing the systematic and descriptive articles, while Prof. R. Owen detailed the anatomy of the more remarkable. This brought Mr. Cuming very prominently before the scientific world, and it was thought desirable that a man possessing such unusual qualifications should explore portions of the tropical eastern hemisphere in the same way as the western had been so successfully traversed, and he, therefore, turned his attention to that large, and then almost unknown, group, the Philippine Islands, belonging then, as now, to Spain. Through the influence of the Earl of Derby, he was provided with letters from the authorities at Madrid to the Governor of Manila, and

likewise to the Archbishop of the same place, and on his arrival, he found every attention given him, and assistance in carrying out his work. He happily possessed a considerable knowledge of the Spanish tongue, which was, of course, indispensable. He systematically travelled through nearly all the islands, not merely Luzon and Mindanao, but the smaller, such as Samar, Leyte, Bohol, Ticao, Cebu, Mindoro, Masbate, Panay, Negros, and others, everywhere becoming the guest for the time being of the Padre of each village and township; and for four-and-a-half years he continually laboured, with unrivalled results. It is true that Semper, and more recently von Moellendorff, have added several species to the lists, but still the fact remains that so assiduously did Cuming scour the interior, sometimes quite pathless, of these islands after specimens, that by far the majority of the terrestrial and fluviatile mollusca were discovered by him. It is calculated, by Kobelt, that there are about 600 species in the Philippines—of these the genus *Cochlostyla*, in its wider sense, contains more than a third, say 211 species (Fischer).

The principal method adopted by Cuming was, by a small bribe, to engage the services of the school children, who would traverse the woods and forests where the greatest exuberance of life was to be found, and daily bring him new and beautiful spoils, many being thus secured which are still almost, if not quite unique. Such is the *Cochlostyla leytensis*, that beautiful almost hyaline shell, latticed with green.

The natives, naturally, were slow to comprehend why he required this vast array of snail shells, and he was frequently interrogated as to this. He found that they were beyond understanding what cabinets of Natural History meant; and as they are in the habit of burning these shells for the sake of the ash to assist them in chewing the betel-nut, he had to resort to the expedient of telling them that he required all he could get to send to England for the same purpose, and this appeared to satisfy their minds. Another strong influence he exercised over

the natives by practising as a medicine man. Nearly all our most successful travellers, such as George Gardner, in Brazil, and Wallace, in the Malay Archipelago, have attributed much of that success to this gift, and Cuming always carried supplies of quinine and other drugs with him, and was soon considered a friend in need by all. He was not only welcomed, but feared as a kind of supernatural power, and the priest often came second-hand in their regard, upon some patient being restored by his agency.

More than four years passed in this arduous, but delightful way, and he then on his return journey paid short visits to Singapore, and the Malay Peninsula, finishing up with a short period at St. Helena, and quickly returning to England with more spoils than had ever before fallen to the lot of one man to collect personally. According to Woodward, he found 2,500 species of marine shells, of which 250 were *Mitra*, 120 *Conus*, 100 *Pleurotoma*, and 50 *Cypræa*, and in land shells over 500 species. He also collected 130,000 specimens of plants, both living and dried, some of which, specifically and generically, bear his name. Many birds, mammals, and reptiles, also, several new to science, were included in his collections, and, although he was not, as were Wallace and Bates, an entomologist, he did not neglect this vast field, but brought home many specimens of both Lepidoptera, Coleoptera, and Hymenoptera. As we have before remarked in this sketch, a search through the early volumes of the 'Proceedings of the Zoological Society,' of the 'Annals and Magazine of Natural History,' then known as 'Charlesworth's Magazine,' and of the Linnean Society, amply testifies to the value of his collections.

Mr. Cuming, being his own master, was enabled to exchange his specimens for other desiderata, and annually he visited the chief museums and cabinets in Europe, always with an eye to a satisfactory bargain. He thus succeeded in amassing a series unequalled and unique in every way, and estimated to contain nearly 19,000 species and varieties.

He was a well-known figure at Stevens' sales, in King Street, Covent Garden, in the days when shell sales used to be more frequent than at present, and always well attended, with a considerable amount of competition amongst the many votaries, as Miers, Lombe-Taylor, Angas, Barclay, &c., who all were in the habit of personally attending. In April, 1865, at the sale of the collection of the late J. Dennison, of Liverpool, which abounded in rare and beautiful examples, I have a very vivid recollection of seeing him sitting before the green baize table in front of the auctioneer's desk, and very intent on the various treasures as they were handed round lot by lot before being put up to auction. *I remember him as a somewhat stout, rubicund, good-humoured looking old man, with scanty, white curly hair, dressed in black, with open waistcoat, and white-frilled shirt front. I remember, too, seeing him secure what probably was his last purchase—*Pseudachatina Downesii* and *P. Wrightii* on the third day of the sale. He died four months later (Aug. 10). That winter (1865) his duplicates mostly of land shells were sold by Stevens, enormous quantities of the commoner forms of *Helicostyla*, *Cochlostyla*, *Cyclophorus*, etc., being put up to auction, proving how enormous were the stores of duplicates amassed, especially from the Philippine Islands.

The disposition of his collection, and the offer of them primarily to the British Museum for the sum of £6,000, occasioned the Keeper of the Natural History department (the late Sir Richard Owen,) much anxiety, his first fear being that so valuable and unique a collection should be allowed to depart from this country, and it is worth while here transcribing part of the appeal issued by Professor Owen, in which he urges, in impassioned language, the purchase by the nation, in a letter addressed to Dean Buckland, a trustee of the British Museum, during Mr. Cuming's life-time, in 1848, when the first offer for sale was made, but not then accepted:—

* I exhibit a photograph of Mr. Cuming, taken about the year 1861, by Joseph Sidebotham, Esq., of Bowdon, who gave it me many years ago.

“ I may briefly state that this collection, as now offered to the British Museum, contains upwards of 19,000 species and varieties of shells, represented by about 60,000 specimens ; and that not only is every specimen entire, but choice and perfect of its kind, as respects form, texture, colour, and other characters that give it value in the eyes of the shell-collector.

“ As I can affirm from my personal knowledge, and from authentic sources of information, that no public collection in Europe possesses one-half the number of species of shells that are now in the Cumingian collection, you may judge of the vast proportion of rarities and unique specimens possessed by Mr. Cuming. It is this which has given him for some years past the command, so to speak, of all the conchological cabinets in Europe. He is better known and respected, and his labours more truly and generally appreciated in any city or town in Europe having a public natural history museum than in busy London. Mr. Cuming in his annual visits to the continent carries with him the inferior duplicates of his rarities, representing species with the sight of which the eyes of the foreign naturalist are gladdened for the first time. They open to him their treasures in return, and from most of the collections of Europe Mr. Cuming has borne away the prized species or specimens in exchange for the still rarer and more valuable shells which his abundance has enabled him to offer without detriment to his own stores.

“ The mode in which Mr. Cuming has obtained this conchological wealth is as moral and exemplary as the result is important and marvellous, considered as the work of one individual. Not restricting his pursuit to the stores and shops of the curiosity-mongers of our seaports, or depending on casual opportunities of obtaining rarities by purchase, he has devoted more than thirty of the best years of his life to arduous and hazardous personal exertion, dredging, diving, working, wandering under the Equator and through the Tropics, the Temperate Zones, both north and south, in the Atlantic, in the Pacific, in

the Indian Ocean, and in the islands of its rich Archipelago—in the labour of obtaining from native seas, shores, lakes, rivers, and forests, the marine, fluviatile, and terrestrial mollusca, 60,000 of whose shelly skeletons, external and internal, are accumulated in orderly series in the cabinets with which the floors of his house now groan. I never think of the casualties to which such a collection in such a place is subject without a shudder! . . . Perhaps one of the most striking points in the estimate of the scientific value of an extensive collection like Mr. Cuming's, arises out of its relation to the present active pursuit of geology as an indispensable instrument to the determination of fossil shells. No one can give higher sanction than yourself to any expression of the importance of well-determined fossils, and especially shells, to a right knowledge of the relative age and position of the strata in which they were embedded; and the geologist's confidence in results based upon fossil conchology must be in the ratio of the extent of this comparison with recent shells that have been gone through in the determination of the fossil shells, and especially before a species is pronounced to be extinct.

“ This, however, is but one of its scientific uses. From the period when the Atlantic, American, and Polynesian departments of the Cumingian collection reached England, in 1831, scientific conchologists have there found subjects without intermission for their descriptions, and the novelties were far from being exhausted when Mr. Cuming having undertaken a third exploring voyage, returned in 1840 from Manilla, stored with the conchological riches of the Indian Ocean, which have subsequently kept the pens of competent describers of new genera and species actively at work, and will supply them for years to come. Thus the Cumingian Collection has directly advanced the science of conchology in an unexampled degree, and possesses the same peculiar claims upon the Government as custodians of the National collection here which Linnæus' Herbarium did upon the Swedish State. Mr. Cuming's

collection contains, for example, the originals from which many hundred new species have been described in the scientific periodicals or systematic works published since its arrival in this country.

“Any doubt that may arise through the incompleteness or obscurity of the description, or from the inaptitude of the student, may be decided at once by reference to the original specimens. These ‘types of the species’ become, therefore, an instrument of great importance to the progress of the science in the country in which they are preserved and made accessible. Delay in securing for the nation the Cumingian types of new species of shells may involve the necessity of crossing the Atlantic in order to compare and verify the descriptions and synonyms of Broderip, Sowerby, Gray, Reeve, and other eminent conchologists.

“The value of a shell, as of a jewel, depends much upon its rarity, and is to that extent artificial. The *Concha unica*, which to-day commands the sum of twenty pounds, shall, next week, when a score of specimens have come into the market, fall in price to as many shillings. Still, the commonest exotic shell, if it be perfect and well coloured, and taken from a living mollusk, as is the case with the Cumingian collection, from which ‘dead’ shells have been strictly excluded, finds its market.

“I am given to understand, by competent authorities, that the sum of £6,000 asked by Mr. Cuming in 1846 does not exceed two-thirds of the most moderate estimate of the present market value of his subsequently augmented collection.

“That ten times that sum would not bring together such a series as Mr. Cuming has offered to the British Museum, I do firmly believe, from a knowledge of the peculiar tact in discovering and collecting, the hardy endurance of the attendant fatigue under deadly climes and influence, and the undaunted courage in encountering the adverse elements, and braving the opposition of the savage inhabitants of seldom-visited isles, which have con-

duced and concurred to crown the labours of Mr. Cuming with a success of which his unrivalled collection is a fitting monument, and of which science, and, let us hope, its cultivators in his native country more particularly, will long continue to reap the benefits." *

The British Museum purchased the collection in 1866.

No less than 152 species of shells were specifically named in honour of this great naturalist, and I exhibit this evening examples of considerably more than half that number, the most conspicuous perhaps being the *Voluta*, *Mitra*, *Natica*, *Cerithium*, *Neritina*, *Tridacna*, and *Maetra*.

Unio cumingii is also perhaps the most beautiful of a somewhat sombre assemblage. Several of the species named after Mr. Cuming are unique and only to be found in our national collection, while others I have searched in vain for even there. One—*Engina cumingiana*—I described as recently as January in this year (1895) from a specimen in the national collection, formerly in Mr. Cuming's.

Mr. Cuming died August 10th, 1865, aged seventy-four years. One of his daughters married Mr. Thomas Bridges (1803—1865) a successful South American traveller and naturalist, in whose honour *Bulinus bridgesii* and *Fissurella bridgesii* were named.



A portrait of Mr. Cuming, reproduced from a photograph taken by the late Mr. Sidebotham, F.L.S., of Bowdon, which was exhibited at the meeting, appears in this number of the Journal.

On the succeeding pages is given a list of mollusca named in honour of Mr. Hugh Cuming, amounting, as I have said, to 152 species, besides which Sowerby called after him the genus *Cumingia* in the family *Tellinidæ*, consisting of eighteen species of West American and Antillean mollusca.

*c. f. "Life of Sir Richard Owen," by his grandson, the Rev. Richard Owen, vol. i., pp. 313, etc., 1894, where this appeal is given almost in extenso.

LIST OF MOLLUSCA NAMED IN HONOUR OF THE
LATE HUGH CUMING.

PTEROPODA.

Hyalea Cumingii (A. Adams).

GASTROPODA.

Murex Cumingii (A. Adams).*Typhis Cumingii* (Brod. and Sowb.).*Neptunea Cumingii* (Crosse).*Cantharus Cumingianus* (Dunker).*Metula Cumingii* (A. Adams).*Daphnella Cumingii* (Powis).*Mangilia Cumingii* (E. A. Smith).*Triton Cumingii* (A. Adams).*Ranella Cumingiana* (Dunker).*Bullia Cumingiana* (Dunker).*Buccinum Cumingii* (Sowb.).*Phos Cumingii* (Reeve).*Nassa Cumingii* (A. Adams).*Leptoconchus Cumingii* (Desh.).*Oliva Cumingii* (Reeve).*Tudicla Cumingii* (Jonas).*Voluta Cumingii* (Broderip).*Mitra Cumingii* (Reeve).*Marginella Cumingiana* (Petit).*Columbella Cumingii* (Reeve).*Engina Cumingiana* (Melvill).*Dolium Cumingii* (Hanley).*Natica Cumingiana* (Recluz).*Scalaria Cumingii* (Carpenter).*Terebra Cumingii* (Desh.).*Chennitzia Cumingii* (Carp.).*Eulima Cumingii* (A. Adams).*Stylifer Cumingiana* (A. Adams).*Solarium Cumingii* (Hanley).*Conus Cumingii* (Reeve).*Cypræa Cumingii* (Gray).*Ovulum Cumingii* (Mörch) = *con-*
cinnum β *Cancellaria Cumingiana* (Petit).*Cerithium Cumingii* (A. Adams).*Lampania Cumingii* (Crosse).*Paludomus Cumingianus* (Dohrn).*Melania Cumingii* (Lea).*Echinella Cumingii* (Phil.).*Modulus Cumingii* (A. Adams).*Paludina Cumingii* (Hanley).*Fossar Cumingii* (A. Adams).*Rissoina Cumingii* (Reeve).*Ampullaria Cumingii* (King).*Ampullaria Cumingii* (Phil.).*Annicola Cumingiana* (Fischer).*Turritella Cumingii* (Reeve).*Siliquaria Cumingii* (Mörch).*Narica Cumingii* (Recluz).*Neritina Cumingiana* (Recluz).*Navicella Cumingiana* (Recluz).*Crucibulum imbricatum* (Brod.) var.*Cumingii* (Carp.).*Trochus Cumingii* (A. Adams).*Gibbula Cumingii* (A. Adams).*Margarita Cumingii* (A. Adams).*Stomatella Cumingii* (A. Adams).*Broderipia Cumingii* (A. Adams).*Fissurella Cumingii* (Reeve).*Emarginula Cumingii* (A. Adams).*Rimula Cumingii* (A. Adams).*Patelloidea Cumingii* (Reeve).*Chiton Cumingii* (Frembley).

OPISTHOBRANCHIATA.

Tornatella Cumingii (A. Adams).*Lophocercus Cumingii* (A. Adams).*Umbrella Cumingii* (Desh.).*Lobiger Cumingii* (A. Adams).

PULMONIFERA.

Streptaxis Cumingiana (Pfr.).*Oleacina rosea* (Fér.) = *Cumingii* (Peck)*Ennea Cumingiana* (Pfr.).*Feltella Cumingii* (Pfr.).*Helicarion Cumingii* (Beck).*Omalonyx Cumingii* (Pfr.).*Simpulopsis Cumingii* (Pfr.).*Achatina Cumingii* (Shuttleworth).*Helix* (*Axina*) *Cumingii* (Pfr.).*H.* (*Arianta*) *arbustorum* (L.)var. *Cumingiana* (Boubée).*Cochlostyla Cumingii* (Pfr.).*Carelia Cumingiana* (Pfr.).*Achatinella Cumingii* (Newc.).*Cionella Cumingiana* (Pfr.).*Tonigerus Cumingii* (Newc.).

- Strophia Cumingiana* (Pfr.).
Succinea Cumingii (Beck).
Cylindrella Cumingiana (Pfr.)
 = *elongata* β
Clausilia Cumingiana (Pfr.).
Planorbis Cumingianus (Dunker).
Pythia Cumingiana (Petit).
Cassidula Cumingiana (Recluz).
Amphipeplea Cumingiana (Pfr.).
Physa Cumingii (H. Adams).
Ancylus Cumingianus (Bourg.).
Pterocyclos Cumingii (Pfr.).
Cyclophorus Cumingii (Sowb.).
Helicina Cumingiana (Pfr.).
Cataulus Cumingii (Pfr.).
Pupina Cumingiana (Pfr.).
Stoastoma Cumingianum (C. B. Ad.).
Truncatella Cumingii (C. B. Ad.)
 = var. *scalaris*.
- PELECYPODA.
- Aspergillum Cumingianum* (Chem.).
Jouannetia Cumingii (Sowb.).
Cyrtodaria Cumingii (Dunker).
Cultellus Cumingianus (Dunker).
Anatina Cumingii (Val.).
Periploma Cumingiana (Fischer).
Pandora Cumingii (Hanley).
Mactra Cumingii (Desh.).
Zenatia Cumingiana (D'Orbigny).
Cacella Cumingiana (Desh.).
Heterocardia Cumingii (Desh.).
Soletellina Cumingiana (Desh.).
Tellina Cumingii (Hanley).
Galathea Cumingii (Dunker).
Sunetta Cumingii (Hanley).
Dosinia Cumingii (Reeve).
Tapes Cumingii (Sowb.).
Anatis Cumingii (Sowb.).
- Donax Cumingii* (Dunker).
Venerupis Cumingii (Desh.).
Glaucanome Cumingii (Prime).
Cyrena Cumingii (Desh.).
Cyrenoida Cumingii (Sowb.).
Cardium Cumingii (Brod.).
Tridacna Cumingii (Reeve).
Lucina Cumingii (Adams & Angas).
Loripes Cumingiana (Frfld.).
Diplodonta Cumingii (Sow.).
Scintilla Cumingii (Desh.).
Pythina Cumingii (A. Adams).
Crassatella Cumingii (A. Adams).
Cardita Cumingii (Desh.).
Unio Cumingii (Lea).
Anodonta Cumingii (Lea).
Monocondylaea Cumingii (Lea).
Mytilus Cumingianus (Recluz).
Crenella Cumingiana (Dunker).
Lithodomus Cumingianus (Dunker).
Septifer Cumingii (Recluz).
Dreissena Cumingiana (Dunker).
Perna Cumingii (Reeve).
Pinna Cumingii (Hanley).
Arca Cumingii (Dunker).
Limopsis Cumingiana (A. Adams).
Nucula Cumingii (Hinds).
Neilo Cumingii (A. Adams)
 = *australis* (Quoy).
Pecten Cumingii (Reeve).
Spondylus Cumingii (Sowb.).
Lima Cumingii (Sowb.).
Placunanomia Cumingii (Brod.).
Ostrea Cumingiana (Dunker).
- BRACHIOPODA.
- Terebratulina Cumingii* (Davidson).
Mages Cumingii (Gray).
Discina Cumingii (Brod.).

Segmentina lineata in Northamptonshire. Mr. C. E. Wright, of Kettering, has shown me a specimen of this species which he lately found in Desborough brook. This is, I believe, the first record for the county.—LIONEL E. ADAMS, Northampton, *March 5th*, 1895. (*Read before the Conchological Society, April 3rd*, 1895.)

SOME PERSONAL REMINISCENCES OF THE
LATE HUGH CUMING.

By E. L. LAYARD, C.M.G., F.Z.S., &c., &c.

I hope I may be permitted to add to Mr. Melvill's Epitome of the Life of the Late Hugh Cuming some personal reminiscences of my old friend with whom I was on such intimate terms, as a man so much my senior, would admit a younger man. I was one of the very few, and I suspect I am about the only man living, who was ever admitted to his *sanctum sanctorum*—the third floor of his residence in Gower Street (No. 80 I think it was) where he worked, and kept many of his rarest duplicates, the vast majority of which were stored in the cellar.

He permitted me to see him at his work, *i.e.*, making up collections for his customers and correspondents, a privilege accorded but to few. To me he had taken a great fancy. I had corresponded with him when I resided at Point Pedro, the northern point of Ceylon, as a Magistrate, and there commenced my first dredging experiences, with a dredge, the design of which he had sent me, cut in cardboard.

I first knew him, *personally*, in 1852 or 1853, just before the Crimean War. I had taken lodgings in Great Russell Street, facing the British Museum (where I was then working at my "Catalogue of the Birds of Ceylon,") and was thus pretty contiguous to Gower Street. He often spent the evening with us, and always called for me on the meeting nights of the Zoological Society, when we walked to and from the Society's rooms together. While thus walking he used to delight to recur to his collecting days, and recount his experiences to one whom he felt was as ardent a collector as himself, and could participate in the intense enjoyment of the pursuit. I well remember his description of his finding *three* examples of

Conus gloria-maris † under one stone, on a reef, somewhere in the Philippine Islands. "I nearly fainted with delight," he said.

On another occasion, immediately after his arrival in the Islands, he met a native, whom he had commissioned to get him some land-shells, stalking along with a large palm branch bag slung over his shoulder, from which escaped grand *Cochlostyli*, at that time perfectly unknown to science and to European collectors. They were crawling down the man's back and dropping to the ground, while he walked on in perfect indifference to the treasures he was losing, but the sight of which drove my old friend frantic with delight!

I had placed my entire collection at his disposal, and it took him three nights to go over it! Each night he carried off one of the drawers of my cabinet, 16 × 14 inches, heaped up with specimens! "Madam," he said to my mother, "I have never obtained so many valuable specimens from any single collection, in my life!" One night, I remember, he suddenly pounced down on a pair of most lovely *Eulima*, and placed them in his pocket, saying they were quite new, and too valuable to be trusted among the other shells. They were the only pair I ever dredged, and they came together in one haul. They were over an inch long, of the most surprising smoothness and lustre, and a delicate rose tint.

In exchange for the shells I gave him, he gave me a fair series of the Philippine Island shells, and a series representing most of the genera of land and fresh water shells, to which I found myself obliged to restrict my collection, as I was a poor man, and unable to afford the necessary cabinets to contain the numerous and large marine species, and the cost of trans-

† These three *Conus gloria-maris* were found on a reef off the Island of Juena, near Bohol. Two of them now in the British Museum are not full grown; the third is larger. Rumour has it that this particular reef was annihilated shortly afterwards through volcanic action, and certainly no *Conus gloria-maris* have been found since that time (1838) either in this or any other locality. It may, therefore, lay claim to being almost as extinct as the Great Auk, or Dodo.—J. C. M.

porting these cabinets, and their contents, from place to place, as I had no fixed home.

I have often been asked why I have so seldom described the new species I have discovered in the various branches of Zoology to which I have, from time to time, devoted myself. This was entirely owing to the advice he gave me. He pointed out, that without access to large museums and extensive libraries, in which to compare and work out my specimens, I must inevitably create numberless synonyms, and thus only make "confusion worse confounded." He urged me to continue my work as a *field naturalist*, and I have never regretted the choice I then made.

I was once witness to a most amusing scene with him. On being admitted into the house, and told that Mr. Cuming was in his "den," I ran upstairs and found my old friend in a towering passion. He was walking excitedly up and down the room, declaiming to his secretary, "The idiots! the fools!"—he exclaimed as I entered the room—"see what they have done to those lovely shells! Ruined as beautiful a series as ever I put together! I got them together for the King of——* to present to the National Museum, and the curator has oiled them, and as you know the colour in most of the *Cochlostyli* is in the epidermis, which changes to a dull brown when wetted, or oiled, and they have sent back the shells, saying I have palmed off painted specimens! I don't care for that, for they are fools and don't know a good shell from a bad one! But to see those beauties ruined! That provokes me!"

I said I hoped they were not quite spoiled, and that if they had only been oiled, immersion in an alkali would probably restore them. He gradually calmed down and became his own courteous, old-mannered, self again, and presently stepping to a cabinet he produced a fine example of *Megaspira Rustenbergiana*, which he handed to me, saying—"That's a shell I

*I do not mention names, lest some of the actors should be living.

promised you for your generic collection." I have it still, and I often recall to mind the incident, when I see it.

I can see the old gentleman now! His heavy florid face beaming over his white "choker," and his extensive prominent white frilled shirt and black vest; he always dressed in black. I only knew him when he was like the larger of the two portraits I send, but it does not do him justice. He gave it to me himself, and wrote his name on it in my presence. And this reminds me, I do not think he could do more than write his name. All his letters to me were written by his secretary, though signed by himself, and I have heard him dictate to his employés scores of times. I regret the portraits are so damaged by water; this was done during a hurricane in Fiji, when a large slice of the roof of my house flew away, and let in a deluge of rain. I beg the Society's acceptance of them for its library, perhaps, if they are thought of any value, they can be cleaned, or restored to some even color throughout, when the damage will not be so apparent. I add a portrait of his friend, Lovell Reeve, who figured so many of his shells. I had this also from Mr. Reeve himself, and can vouch for its resemblance. The smaller portrait of Mr. Cuming I also had from himself.

I have often heard collectors complain of the inaccuracy of some of the localities given by Cuming, and I think I can account for this. As before stated, I have seen him making up a series of specimens for a correspondent, and I have also said I do not think he could write. I never saw a note book in his hand, nor were his shells in *separate labelled boxes*. He trusted entirely to his wonderful memory, not only for localities, but for the names of the shells and *their authors*. He had a long plank table on tressels running the entire length of the room with its three windows. Along this he would walk, with a basket, or box, full of shells in one hand, from which he selected such specimens as he intended to supply to the collection making up. Placing them on the table, he would dictate

to the secretary, name, author's name, and locality. These the young man wrote on a slip of paper already prepared, and placed by the specimens, which were afterwards packed by him. My only wonder is, not that he made mistakes, but that he made so few.

I hope these reminiscences of the life of one of the greatest, if not *the* greatest, of collectors in the field in which we all take so much interest, will be acceptable to my brother members of the Conchological Society.

Otterbourne, May, 1895.

Nassa reticulata var. *minor*.—Mr. Marshall has given this varietal name to those small specimens of the species which present apparently adult characters, having the outer lip thickened and fluted inside. During the autumn, when dredging and shore-hunting along the South Devon coast, in company with my friend Mr. L. St. G. Byne, of Teignmouth, a good opportunity was afforded for studying the species, which was taken alive both on the shore and in shallow water, and of both the typical and so-called varietal forms. It was at once seen that the 'variety' is merely the normal young state of the shell. If an adult be examined with a moderate degree of care it is readily seen that the growth of the shell has not been uniform, but that one, two, or three whitish areas are to be recognised on the spire extending over two or three of the longitudinal ribs; these ribs being set far more obliquely than those which immediately follow, there being a distinct line of demarcation between the two. Other similar areas not distinctly coloured may be detected. If, now, the shell be carefully broken, opposite each of these varicoid areas will be found, running down the inside of the whorl, the row of teeth which had once distinguished the var. *minor* stage. The columella opposite these is also frequently tuberculated. A shell of which one side has been ground away exhibits seven of these rows. Mr. Marshall's small variety of *Eulima bilineata* probably belongs to the same category, but as the length only is given, there being an entire absence of any description, it is of course impossible to speak with confidence. An examination, however, of a fine example in my collection reveals the presence of no fewer than five of these resting stages, during which the outer lip has been slightly thickened and the two characteristic coloured bands have coalesced.—G. W. CHASTER, Southport. (*Read before Manchester Branch of the Conchological Society, October 11, 1894.*)

CONCHOLOGICAL SOCIETY
OF GREAT BRITAIN AND IRELAND.

PROCEEDINGS.

237th MEETING, May 1st, 1895.

Mr. John W. Taylor, F.L.S., President, in the chair.

Donations to Library announced and thanks voted :

The Naturalist and Feuille des Jeunes Naturalistes, for May, and May—June, 1895—from the respective Editors.

Reprint of paper by Mr. C. T. Simpson, on Distribution of Land and Freshwater Mollusca of the West Indian Region and their evidence with regard to Past Changes of Land and Sea,—and Reprint of paper by Dr. Rudolph Bergh,—Die Hedyliiden, eine Familie der kladohepatischen Nudibranchien (Wien 1895) from the respective Authors.

Resignation of Members announced.

Dr. C. W. Viner, and Mr. Wilfred Bendall.

Papers Read :

A Paper by Mr. James Cosmo Melvill, M.A., F.L.S., entitled "An Epitome of the Life of the late Hugh Cuming, F.L.S., C.M.Z.S., etc.," was read. (See Journal of Conchology for April, 1895, p. 59).

Exhibits :

The President showed *Limnæa abyssicola* from the Lake of Geneva, where it is found at a depth of 30—100 metres, sent by Dr. Aug. Brot ; a new species of *Azeca* found at Ingleton ; examples of *Limnæa auricularia* and distorted examples of *L. stagnalis* from the salt marshes of the Sea of Aral, sent by Rev. A. H. Cooke ; specimens of *Unio tumidus* taken by Rev. W. C. Hey at the dam at Yearsley, and the Foss near York, and others found within a hundred yards ; the latter specimens being normal, the former much distorted by their position at the dam ; as well as examples of monstrosities of *Planorbis marginatus*, collected by Mr. J. Beever at Waterloo near Leeds.

He also showed a number of shells collected in the Camargue, or Delta of the Rhone; dept. Bouches-du-Rhone, France, by Mr. W. Eagle Clarke, F.L.S., including *Cardium edule*, *Helix aspersa*, *H. vermiculata*, *Aporrhais pes-pelecani*, *H. pisana*, *H. acuta*, *Limnæa stagnalis*, and *L. palustris* from the Camargue itself, *H. aspersa* and var. *exalbida* and *H. nemoralis* var. *castanea* ooooo from Arles, *H. aspersa*, *H. vermiculata*, *H. virgata*, *H. terrestris*, *H. pisana*, and *Limnæa palustris* from la Crau, *L. palustris* from the Etang de Consecanière, *Anodonta anatina*, *Limnæa stagnalis*, *L. palustris*, *Planorbis corneus*, *Paludina contecta*, and *Bythinia tentaculata*, from the Marais de Meyranne, Bouches-du-Rhone.

On behalf of Mr. Fred Rhodes was shown a specimen of *Helix nemoralis* var. *rubella* 00000 from Calverley, Yorkshire.

On behalf of Mr. Edgar L. Layard, C.M.Z.S., were shown a number of examples of a very dark form of *Helix itala* (*ericetorum*) from the Isles of Aran, off the West Coast of Ireland.

On behalf of Mr. J. R. B. Masefield, M.A., were shown examples of *Limnæa peregra* from a very hot water cistern at Cheadle, Staffs.—and some most interesting details given of the behaviour of the molluscs in respect of the diurnal variations of temperature.

238th (or Annual) MEETING, Saturday, 18th May, 1895.

Held at the Philosophical Hall, Park Row, Leeds.

From 2 p.m. in the afternoon there were a number of exhibits on view in the Library and the Industrial Museum Room. In the latter the collection of the late Mr. Charles Ashford now on deposit at the Leeds Museum, was displayed for inspection and a series of exhibits made on behalf of the Leeds Philosophical and Literary Society. Mr. Henry Crowther, F.R.M.S., had some exhibits in the same room. In the Library the President, Mr. John W. Taylor, F.L.S., showed a great number of original drawings of Molluscan anatomy, mostly by the late Mr. Ashford, but some by Mr. G. Sherriff Tye and others, and in a large flat case Mr. Taylor showed a large series of shells illustrating the effects of environment in modifying form and colour.

At 5 p.m. the President entertained a number of the members to tea.

- The Annual meeting was held in the Library of the Philosophical Hall at 6 p.m., the retiring President, Mr. John W. Taylor, F.L.S., in the chair. There were also present amongst others Messrs. W. E. Hoyle, W. Denison Roebuck, W. Nelson, H. Crowther, B. Sturges Dodd, J. C. Melvill, R. D. Darbishire, Robert Standen, A. E. Baker, R. Cairns, E. Collier, F. W. Fierke, Wm. Moss, Charles Oldham, Mr. and Mrs. Brierley.

The minutes of the 237th meeting were taken as read and confirmed.

Appointment of Scrutineers :

The President appointed Mr. Brierley and Mr. Roebuck to examine and report upon the voting papers sent in.

Donations to Library announced and thanks voted :

Cambridge Natural History, vol. iii., Mollusca and Brachipods—1895—from the Publishers.

Manchester Museum Handbooks—Catalogue of Library, by W. E. Hoyle, 1895—from the Museum.

Journal of Malacology, March 30th, 1895—from the Editor.

Candidates Proposed for Membership :

Messrs. John Ray Hardy (proposed by R. Standen and W. E. Hoyle, M.A.), W. A. Herdman, D.Sc., F.R.S., (by W. E. Hoyle, M.A., and W.

Denison Roebuck, F.L.S.), Sydney J. Hickson, D.Sc., M.A., F.R.S., (by W. E. Hoyle, M.A., and J. C. Melvill, M.A.), F. W. Gamble, M.Sc., Vict., (by W. E. Hoyle, M.A., and J. C. Melvill, M.A.), Rev. Adam Hann (by W. H. Heathcote, F.L.S., and E. Collier), and G. A. Booth, F.E.S. (by W. H. Heathcote, F.L.S., and R. Standen) were proposed for membership.

Annual Reports :

The Annual Report of the Council (including the Balance Sheet which had previously been circulated in proof among the Members present) was taken as read, the Annual Report of the Manchester Branch was also read, and on the motion of Mr. R. D. Darbshire, both were unanimously adopted—this adoption involving the alteration of Rule No. 8 to suit the altered condition of the Society resulting from the transfer of headquarters to Manchester.

Election of Office-Bearers.

The Scrutineers reported that 35 voting papers had been received, of which 6 were void from informality, and that the following were duly elected as the Office-bearers for the ensuing year :

FOR PRESIDENT :

J. COSMO MELVILL, M.A., F.L.S.

FOR VICE-PRESIDENTS :

R. D. DARBISHIRE, B.A.

P. B. MASON, J.P., F.L.S.

Rev. A. M. NORMAN, D.C.L., F.R.S.

JOHN W. TAYLOR, F.L.S.

FOR HON. TREASURER :

LIONEL E. ADAMS, B.A.

FOR HON. SECRETARY AND RECORDER :

EDWARD COLLIER.

FOR HON. CURATOR :

ROBERT STANDEN.

FOR HON. LIBRARIAN :

WM. E. HOYLE, M.A., F.R.S.E.

FOR THE COUNCIL :

HENRY CROWTHER, F.R.M.S.

JOHN H. JAMES, A.R.I.Cornw.

JOHN R. B. MASEFIELD, M.A.

WILLIAM MOSS, F.C.A.

WILLIAM NELSON.

CHARLES OLDHAM.

Place of next Annual Meeting.

On the motion of Mr. Hoyle, seconded by Mr. Collier, it was unanimously resolved that the next Annual Meeting be held in Manchester.

The Presidential Address

was then delivered by Mr. John W. Taylor, F.L.S., who gave a review of the history of the Society and of the progress of Land and Fresh Water Conchology in Great Britain and Ireland during the past twenty years.

Votes of Thanks :

At the conclusion of the address a hearty vote of thanks to Mr. Taylor for his services as President during the past year was proposed by Mr. Darbshire, seconded by Mr. B. S. Dodd, put to the meeting by Mr. W. E. Hoyle, and adopted unanimously, as was also a complimentary resolution also brought forward by Mr. Darbshire with respect to the retiring secretary.

W.D.R., Hon. Sec.

MANCHESTER BRANCH MEETING,

At the Owens College, May 9th, 1895.

Mr. R. D. Darbshire in the chair.

The chief business was the discussion of certain matters connected with the proposed transference of the head-quarters of the parent society, from Leeds to Manchester, and its effect upon the branch. It was agreed that during such time as the parent society may be located in Manchester the branch shall be suspended, and maintain a passive existence, its active functions to be resumed in case of future transference of head-quarters to some other centre. The hon. secretary was requested to address a circular letter to all members of the branch, who do not also belong to the parent society, explaining the nature and advantages of the proposed change, and inviting them to join.

Exhibits :

By Mr. R. D. Darbshire : A gigantic specimen of *Lima excavata* Sars, dredged on the coast of Norway, and measuring $6\frac{1}{2}$ inches long \times $4\frac{3}{4}$ inches broad.

By Mr. E. C. Stump : An interesting collection of marine shells from the coast of Tasmania, containing representatives of many genera, and notably many choice examples of *Venus*, *Trigonia*, *Pecten*, and *Voluta*.

By Mr. William Moss : Fine specimens of *Bulimus vincentinus*, *Cistula arapensis*, and other land shells from Trinidad and the Island of Granada.

By Mr. R. Standen : A series of *Cypræa cruenta* var. *coloba* Melv. from Red Sea, and from 'San Francisco Market'; a pale, spotless form of *Cypræa caput-serpentis* L., and some interesting forms of *Limnæa peregra* and *L. truncatula*, from Southport, collected by Dr. Chaster.



THE ANNUAL REPORT FOR 1894-5.

The Report now presented covers the period of eleven months which has elapsed since the last Annual Meeting, in which the Society has steadily maintained its position, in spite of the fact that the year must be regarded as one of transition, pending the change of headquarters from Leeds to Manchester, a change which was decided, though not acted, upon at the last Annual Meeting.

The membership is now 213, including 10 honorary life members, 13 ordinary members resident abroad, and 190 ordinary members on the home list.

Eight new ordinary members have been elected during the year, while three have resigned and one has died, this being Mr. John Hagger, F.L.S., of Repton, near Burton-on-Trent, who has for a long period being a quiet and unobtrusive member of the Society.

Eleven meetings have been held since the last annual one, all of them in Leeds, and a considerable number of exhibits of interest have been made at all the meetings.

The following papers and notes have been read :—

- Edgar A. Smith, F.Z.S.—‘The Nomenclature of *Dreissensia polymorpha*.’
 Dr. Ed. von Martens—‘The Nomenclature of *Dreissensia polymorpha*.’
 Kenneth Hurlstone Jones—‘Molluscan Albinism and the Tendency to the Phenomenon in 1893.’
 II. A. Pilsbry—‘On *Gibbula incincta* Sowerby.’
 J. T. Marshall—‘Alterations in “British Conchology.”’
 Rev. J. W. Horsley—‘Notes on Mollusca at Canterbury.’
 C. H. Morris—‘*Hydrobia (Paludestrina) jenkinsi* at Lewes.’
 John W. Taylor, F.L.S.—‘*Succinea oblonga* in Jersey.’
 James Cosmo Melvill, M.A., and Robert Standen—‘Notes on a Collection of Shells from Lifu and Uvea, Loyalty Islands, formed by the Rev. James and Mrs. Hadfield, with List of Species.’
 J. E. Cooper—‘Notes on Dorsetshire Marine Shells.’
 Edward Collier—‘Notes on a Conchological Excursion to the West of Ireland.’
 G. W. Chaster, M.R.C.S.—‘*Nassa reticulata* var. *minor*.’
 G. W. Chaster, M.R.C.S.—‘Occurrence of *Pulsellum lofotense* Sars in the Irish Sea.’
 Robert Standen—‘*Helix aspersa* monst. *sinistrorsum*.’
 Robert Standen—‘*Vertigo substriata* var. *albina*.’
 Lionel E. Adams, B.A.—‘*Helix vermiculata* in Staffordshire.’
 Lionel E. Adams, B.A.—‘*Helix hortensis* var. *luteolabiata*, a variety new to Science, in Northamptonshire.’
 Lionel E. Adams, B.A.—‘Large *Helix itala (ericetorum)* in Northamptonshire.’
 Henry Crowther, F.R.M.S.—‘Biology of *Spharium corneum*.’

Lionel E. Adams, B.A.—‘*Segmentina lineata* in Northamptonshire.’

Robert Standen—‘Note on *Cypræa tessellata* (Sowb).’

J. C. Melvill, M.A., F.L.S.—‘An Epitome of the Life of the late Hugh Cuming.’

Most of these papers have been—or will shortly be—published in the ‘Journal of Conchology.’

Four numbers of the ‘Journal of Conchology’ have been issued during the year, two of them under the editorship of Mr. John W. Taylor, F.L.S., by whom it was founded in 1874 and ably conducted for a period of 21 years.

The arrangement made in 1889 for the publication of the Journal as the Society’s organ came to an end at the close of the year 1894, when the goodwill, copyright and the stock of back numbers were acquired from Mr. Taylor by purchase. The Journal is now entirely the property of the Society and the two numbers which have been published under this new arrangement have been edited by Mr. W. E. Hoyle.

The Society’s collections which are deposited in the Museum at Leeds, have received a few additions by gifts. The principal donor being Mr. J. E. Cooper, who presented the series of shells illustrating his paper on the marine shells of Dorsetshire. Donations in money towards the Cabinet Fund have been received from Rev. C. A. Williamson, Mr. W. Whitwell, and Mr. J. E. Eccles.

The Library (which has been made use of by members during the year) has been increased during the year by various donations. The donors have included Dr. W. H. Dall, Mr. R. E. C. Stearns, Mr. C. A. White, Mr. R. Bullen Newton, Mr. C. T. Simpson, and Dr. Rudolph Bergh, in addition to the various Societies and Institutions which present their publications in exchange for the ‘Journal of Conchology.’

All arrangements have been made for the transfer of the head-quarters of the Society from Leeds to Manchester at the close of the present meeting, but the only alteration of the Rules which that change renders necessary is in the wording of the 8th Rule. As the Branch in Manchester will in future naturally exist, if at all, only in suspense while the head-quarters of the whole Society are established in that city, your Council recommend that the 8th Rule be amended by the omission of the words “Manchester Branch,” and the substitution of the words “Leeds and London Branches, and such other branches as may afterwards be accepted at an Annual Meeting.”

The Leeds and London members have during the year resolved that branches be formed in their respective districts, the acceptance of which Branches your Council heartily recommend.

Treasurer’s Report.

The financial condition of the Society remains much in the same condition as last year. The expenses have, however, been slightly less and one more number of the Journal has been paid for than was the case last year. The arrears continue about the same.

BALANCE SHEET.

GENERAL FUND.

Receipts.	£ s. d.	Payments.	£ s. d.
Brought forward from 1893	3 18 6	Cost of Journals (7, 8, 9, 10, 11) ...	34 9 6
Subscriptions received in 1894 ...	45 7 6	Secretary's Expenses (Postages, &c.) ...	6 2 0
Sale of Lists, &c. ...	1 14 6	Treasurer's ditto. ...	2 11 6
		Stationery ...	3 8 11
		Books bought ...	9 8
		Rent of Museum ...	10 6
		Subscription to Y.N.U. (3 years) ...	9 0
		Balance in Hand ...	2 19 5
	<u>£51 0 6</u>		<u>£51 0 6</u>

CABINET FUND.

Receipts.	£ s. d.	Payments.	£ s. d.
Brought forward from 1893... ..	1 3½	Stationery ...	4 6
Donations in 1894 ...	2 0 0	To Balance due for Cabinet ...	11 0
		Lettering Cabinets ...	12 6
		In Hand... ..	13 3½
	<u>£2 1 3½</u>		<u>£2 1 3½</u>

LIONEL E. ADAMS,

Hon. Treasurer.

March 25th, 1895, examined and found correct,

WILLIAM MOSS, F.C.A.,

ROBERT CAIRNS.

REPORT OF THE MANCHESTER BRANCH.

May 18th, 1895.

MR. PRESIDENT AND GENTLEMEN :

The monthly meetings of the Branch held at the Manchester Museum, Owens College, have been exceedingly well attended, and much interest has been shown by members in the proceedings.

The March meeting was held, by special invitation of Mr. J. Cosmo Melvill, at his residence, Brook House, Prestwich, and a large number of members and friends availed themselves of the opportunity thus afforded of inspecting a considerable portion of Mr. Melvill's fine collection of all orders of Mollusca.

J.C., viii., July 1895.

Two new members have been elected, and the total number of members of the Branch is now fifty two, the majority of whom are also members of the Parent Society. We have every reason to believe that when the transference of headquarters is effected those members of the Branch who are not already members of the Parent Society will willingly join.

Some interesting Notes and Papers have been contributed by members to which additional interest has been added by the exhibition of full suites of the shells treated upon in each communication.

The following is a list of the Notes and Papers contributed :—

By Dr. G. W. Chaster :—‘ Note on *Nassa reticulata* var. *minor* (Marshall),’ and ‘ On the Occurrence of *Pulsellum lofotense* (Sars), off Peel, Isle of Man.’

By Mr. R. D. Darbshire :—‘ A Visit to a Snail Farm in Switzerland.’

By Mr. Edward Collier—‘ Note on a Conchological Excursion to the West of Ireland,’ and ‘ On the genus *Macröon* (Pilsbry).’

By Mr. J. Cosmo Melvill :—‘ An Epitome of the Life of the late Hugh Cuming, F.L.S., C.M.Z.S.’

The general exhibits at each meeting have been of an interesting and instructive character, and very numerous and varied, giving occasion for much interesting discussion.

A considerable number of additions have been made to the British collection in the Cabinet of the Branch. A special Cabinet has been devoted to the collection presented by Mr. Charles Oldham, and we are indebted to that gentleman for many additional donations made during the year.

A number of useful additions have been made to the Library of the Branch, by purchase, and the donations of members and friends.

R. STANDEN,

Hon. Secretary.

***Helix hortensis* var. *luteo-labiata* var. *nov.* and large *Helix itala* in Northamptonshire.** During the past year (1894), I have taken four specimens of yellow lipped *hortensis* in a limestone quarry at Blisworth, Northamptonshire. Mr. J. W. Taylor, to whom I submitted a specimen, proposes the above name, as it does not appear that this form has hitherto been noticed. This quarry at Blisworth contains some other uncommon forms. The yellow *hortensis* found here are all more or less diaphanous with pink lips and often with pink cloudy blotches. I have two very pretty shells of diaphanous yellow, 000(45), the band being semi-transparent crimson. I have also taken here two yellow specimens with the rare banding 12045. *H. itala* (*ericctorum*) swarms here. The shells run very large, one measuring 22 mm. in diameter. The beautiful milk-white form with translucent bands also occurs, though not abundantly.—LIONEL E. ADAMS, Northampton, March 5th, 1895. (Read before the Conchological Society, March 6th, 1895.)

NOTES ON A COLLECTION OF SHELLS
FROM LIFU AND UVEA, LOYALTY ISLANDS,
FORMED BY
THE REV. JAMES AND MRS. HADFIELD,
WITH LIST OF SPECIES.

BY JAMES COSMO MELVILL, M.A., F.L.S., AND
ROBERT STANDEN.

(Read before the Conchological Society, June 9th, 1894).

THE Loyalty Islands, of which the three principal are Lifu, Maré, and Uvea, form part of the New Caledonian Archipelago, and are situate east of the main isle, with its capital Noumea, being placed long. 168° E. lat. 22° S. They are not, therefore, very far within the tropic of Capricorn.

Belonging to France, it is not surprising that several eminent naturalists of that nation have made an especial study of the fauna of this group. Accordingly we find, mainly in the pages of the 'Journal de Conchyliologie,' numerous papers on both the Terrestrial and Marine Mollusca, mostly from the pens of MM. Crosse, P. Fischer, Souverbie, Gassies, and three resident conchologists of note—Lambert, Marie, and Montrouzier. Mr. John Brazier* has likewise described a few new forms from this region, and we must not omit the name of Mr. Edgar L. Layard, C.M.G., for many years British Consul in New Caledonia, who here, as elsewhere, made large collections.

The period of most active research in this quarter, so far as the mollusca are concerned, would appear to have been the decade 1865-75, but several novelties have been described since that later date.

We cannot find, however, that any catalogue of the whole Marine Molluscan Fauna of the Loyalty Island group has been

* Proc. Linn. Soc. N.S.W., iv. (1879), 1880, pp. 388—392.

published, and, as a step towards this desired end, we venture to offer the following list of over 600 species, about twenty or twenty-one of which are considered new, this list being based upon a very beautiful and interesting collection, rich in individuals as well as number of species, formed by the Rev. James and Mrs. Hadfield, of Lifu, and coming mostly from that island, with some also from the neighbouring island of Uvea. They were collected during 1891-3.

Many of them, it is true, are beach shells, and a little worn, but their colours are so untarnished, and condition so perfect as to preclude their being considered as otherwise than in good condition. The small number of Pelecypoda is remarkable; the bulk of the shells collected are marine Gastropoda, and we may signalize *Conus*, *Mitra*, *Cypræa*, and *Columbella* especially as being very numerous, both in individuals and species. We have also included these amongst the terrestrial and fluviatile mollusca, also collected by Mr. and Mrs. Hadfield.

It is nothing new to be able to pronounce these islands as being as rich, almost, in marine Mollusca as the famous Philippine Islands, or Mauritius, for MM. Crosse and Fischer give forty-five species of *Mitra* and fifty species of *Conus*, for instance, as being found within the New Caledonian region. Many of these are of very wide distribution, and it is curious to observe how large a number of the forms found in Mauritius are here also, some 3,000 miles or more to the eastward, although it forms part of the same vast sub-division, the Indo-Pacific Province. The late M. Paul Fischer, however, considers the Australo-Polynesian region, in which he places these islands, distinct from the Indo-Pacific Province of Woodward. These sub-divisions, however, must necessarily be somewhat arbitrary, and their lines of demarcation optional. The fact remains, that in the Marine Mollusca, at all events, there is a close connection between the Mauritian and the New Caledonian Fauna.

We had, at first, in mind the possibility of a general

catalogue brought up to date of all the species hitherto reported from this group; but, upon reflection, we think it best merely to include those species received from time to time from Mr. Hadfield. Our especial thanks are due to Mr. William Moss, Mr. R. Cairns, and Dr. G. W. Chaster. To Mr. Moss, for photographing for us some of the new species in a very clear and accurate manner, and for allowing us to inspect, on several occasions, the large stores he received from Mr. Hadfield. To Mr. Cairns for having aided Mr. Moss in the separation and arrangement of so large a mass of material and for having permitted the selection by us of what might be of interest for this catalogue; and to Dr. G.W. Chaster also for some beautiful photographs of the new species, reproduced herewith by the collotype process. This aid has been to us invaluable. To Mr. Edgar A. Smith, F.Z.S., of the Natural History Museum, South Kensington, and to Mr. Ernest Ruthven Sykes, F.Z.S., we must also offer our best acknowledgments, for their ready help in discriminating some of the more critical species, and advice on the subject of the new forms; and to Mr. John Ray Hardy, of the Manchester Museum, Owens College, we are also indebted for much valuable assistance in the arrangement of the collection generally.

LIST OF SPECIES.

CLASS CEPHALOPODA.

ORDER DIBRANCHIATA.

FAMILY *SPIRULIDÆ*.

Spirula peronii Lam.—Several specimens of this pelagic species, mostly in a fragmentary condition.

ORDER TETRABRANCHIATA.

FAMILY *NAUTILIDÆ*.

Nautilus macromphalus Reeve.—A long suite of individuals ranging in size from very young ones, 22 mill. in diameter, to adult. Two very fine specimens came in spirit and contained the animal in good condition. In

the umbilical cavities of each of these specimens are colonies of a small Cirrhipede, allied to *Lepas fascicularis* L.

N. pompilius Linné.—One adult specimen.

CLASS GASTROPODA.

ORDER PULMONATA.

FAMILY TESTACELLIDÆ.

Paryphanta Seisseti Montr.—Several fine specimens.

Rhytida inæqualis Pfr.—Several.

Diplomphalus lifuanus Montr.—Plentiful and very fine.

FAMILY HELICIDÆ.

Helix pomatia Linné.—A large number of this species were received, mostly differing but slightly from European examples, but several are almost black in colour. Of course the species has been introduced, and Mr. E. L. Layard gives a graphic description of his first finding it in the Island of Lifu in 1879, and subsequent tracing of the authors of its introduction, who were the officers of a French man-of-war (vide Wallis Kew, 'The Dispersal of Shells,' London, 1893).

H. (Geotrochus) sinistrorsa Deshayes=**Buliminus sinistrorsus** Pät.—A curious little shell, placed by Clessin in the sub-section *Pseudopartula* Pfr. Our specimens, of which there are a great number, have been identified as the above by Mr. E. L. Layard and others, but agree as nearly with *Buliminus theobaldianus* Gassies, as figured in Gassies' Faune Conch. Nouvelle-Calédonie, pt. 2 pl. iii., fig. 9.

H. (Patula) costulifera Pfr.—Several.

H. (Patula) confinis Gassies.—Several.

Bulimus (Placostylus) Alexander Crosse.—Several examples of this fine species.

B. (Placostylus) Edwardsianus Gassies.—Several.

B. (Placostylus) fibratus Martyn.—Several.

B. (Placostylus) insignis Petit.—Very abundant, most of the specimens minus epidermis.

B. (Placostylus) ouveanus Dotzauer.—Plentiful; from the island of Uvea.

FAMILY *PUPIDÆ*.

Buliminus (Rhachis) zonulatus Gass. = **B. mageni** Gass.
—A large number of pretty examples in great variety of colour and pattern of markings.

Vertigo pediculus Shuttl.—Several specimens.

FAMILY *STENOGYRIDÆ*.

Stenogyra (Opeas) artensis Gassies.—Common.

S. (Opeas) Souverbianus Gassies.—Exceedingly abundant in all stages of growth.

FAMILY *SUCCINEIDÆ*.

Succinea (Tapada) Montrouzieri Crosse = **S. australis** Gassies, non Fér.—Fairly plentiful.

FAMILY *AURICULIDÆ*.

Scarabus chalcostomus Adams.—Very abundant.

S. maurulus Gassies.—Many fine specimens.

Plecotrema Souverbiei Montrouzier.—One example.

P. labrella H. & A. Adams.—Likewise one specimen.

Melampus luteus Quoy.—A good many very fine specimens.

M. crassidens Gassies.—Several.

M. coffea Küst.—Not uncommon.

M. fasciatus Deshayes.—Common.

M. flavus Gmelin.—Several.

FAMILY *LIMNÆIDÆ*.

Planorbis Montrouzieri Gassies.—Plentiful.

FAMILY *PHYSIDÆ*.

Physa incisa Gassies.—Many fine specimens.

FAMILY *SIPHONARIIDÆ*.

Siphonaria cochleariformis Reeve.—One specimen.

Siphonaria sp.—Several specimens too worn to identify, but allied to *S. diemenensis* Quoy.

ORDER OPISTHOBRANCHIATA.

FAMILY *ACTÆONIDÆ*.

Actæon affinis A. Adams.—Several of this pretty species.

A. (*Buccinulus*) *solidulus* Linné.—Plentiful, and in great variety.

A. (*Buccinulus*) *nitidulus* Lamarck.—Common.

A. (*Buccinulus*) *alveolus* Souverbie. — Several beautiful specimens.

FAMILY *TORNATINIDÆ*.

Tornatina voluta Quoy.—Several specimens.

FAMILY *SCAPHANDRIDÆ*.

Atya naucum Linné.—Two specimens.

A. *debilis* Pease.—Several.

A. *solida* Linné.—Several.

FAMILY *BULLIDÆ*.

Bulla ampulla Linné.—A considerable number of very small specimens.

B. *nebulosa* Gould.—Many prettily-marked specimens.

Haminea tenera A. Adams.—Three specimens.

Haminea Cairnsiana sp. nov. (Pl. II., fig. 1).

H. testa alba, pellucida, cylindrica, striis transversim regularibus instructa, posticè truncata, lateribus rectis, labro quadratulo, apud basim producto.

Long. sp. majoris ; 8.50 mill. Lat. 6 mill.

Hab. Lifu.

Several specimens, but only a few full grown. A very delicate white shell, allied to *H. papyrus* and also *H. ambigua*, both of A. Adams. It is cylindrical, transversely delicately striate, posteriorly truncate, sides straight, lip slightly quadrate, produced at the base. We received the specimens from Mr. Robert Cairns, of Ashton-under-Lyne, just as Mr. Hadfield had forwarded them to him in shell-sand, and are glad of the opportunity of connecting his name with this new form, in slight recognition of the services he has rendered us.

FAMILY *RINGICULIDÆ*.

Ringicula caledonica Morelet.—Several.

R. *australis* Hinds.—Many specimens, which we believe are referable to this species, but the genus is a difficult one,

abounding in synonymy and false species, and badly needing a competent monographer.

ORDER PROSOBRANCHIATA.

FAMILY TEREBRIDÆ.

- Terebra (Subula) casta** Hinds.—Near *T. hastata* Menke.
A pretty species. Several specimens.
- T. (Subula) crenulata** Linné.—Several fine specimens in various stages of growth.
- T. (Subula) dimidiata** Linné.—Several.
- T. (Subula) duplicata** Lamarck.—Three specimens.
- T. (Subula) maculata** Linné.—Very numerous in all stages of growth, several specimens being large and well marked.
- T. (Subula) muscaria** Linné.—Abundant and very fine.
- T. (Abretia) affinis** Gray.—A beautiful, but common form. Numerous examples.
- T. (Abretia) cerithina** Lamarck.—One full-grown specimen in good condition.
- T. (Hastula) circumcincta** Deshayes. — A conspicuous shell, spirally transverse-striated. Several specimens.
- T. (Hastula) lanceata** Lamarck.—A number of worn or fragmentary examples of this elegant species.
- T. (Euterebra) Bernardi** Deshayes.—An Australian form. One or two specimens.
- T. (Euterebra) circinata** Deshayes. — A few examples. Originally described from China.
- T. (Euterebra) Mariesii** Smith.—One specimen only, but exactly agreeing with the Japanese type; it has been referred to the describer of the species.
- T. (Euterebra) straminea** Gray.—Two specimens.
- T. (Euterebra) tricolor** Sowerby.—Several imperfect but characteristic specimens.
- T. (Myurella) argus** Hinds.—One fine example only.
- T. (Myurella) cingulifera** Lamarck.—A few worn shells.
- T. (Myurella) myuros** Lamarck.—Uncommon.

T. (*Myurella*) *nectarea* sp. nov. (Pl. II., fig. 2).

T. testa elongato-subulata, ad basim latiore, albida, parum nitida, supra suturas regulariter brunneo-maculata, anfractibus tridecim, transversim multi-sulcatis, longitudinaliter costatis, costis gemmulatis infra, juxta suturas, duabusque macularum ordinibus plus minusve decoratis, ultimo anfractu bicingulato apud medium atque ad basim, apertura ovata, labro exteriori simplice.

Long., 35 mill. *Lat.*, 10 mill.

Hab., Lifu.

One specimen of this distinct and handsome shell was brought home by Mr. Hadfield in 1891-2. The longitudinal ribs beaded just below, and the double row of brown spots above the sutures, resemble no other species with which we are acquainted, excepting perhaps *T. tigrina* Gmelin, a smooth shell with the same disposition of marking; it bears also some superficial likeness to *T. corrugata* Lam., *T. histrio* Desh., and others of the same section. But in form *T. interlineata* Desh., from the Sandwich Isles, gives the closest approach to our species. This, we believe, is still unique in the Cumingian collection at South Kensington. In this shell, however, the whorls are divided by a broad transverse groove, and there is no sign of this in *T. nectarea*. Care must be taken not to confound imperfect specimens of *Vertagus Martinianus* Pfr. with this shell.

T. (*Myurella*) *nodularis* Deshayes.—Not uncommon. Perhaps only a form of *T. textilis* Hinds.

T. (*Myurella*) *oculata* Lamarck.—Several good specimens of this fine species.

T. (*Myurella*) *subulata* Linné.—Common.

T. (*Myurella*) *textilis* Hinds.—Common.

FAMILY *CONIDÆ*.

***Conus imperialis* Linné.**—Several; one very fine.

***C. marmoreus* Linné.**—Numerous; mostly young specimens.

***C. pulicarius* Bruguière.**—Abundant; several very fine specimens with epidermis intact,

- C. (*Stephanoconus*) *baeticus* Reeve. — Very plentiful; mostly wave-worn.
- C. (*Stephanoconus*) *balteatus* Sowerby. — A few small specimens.
- C. (*Stephanoconus*) *lividus* Bruguière. — Abundant, but few in good condition.
- C. (*Stephanoconus*) *plumbeus* Reeve. — A few differing from the type in colour, which is brickdust red in the Lifu examples received.
- C. (*Puncticulis*) *arenatus* Bruguière. — Great numbers of small-sized specimens, some with epidermis quite perfect.
- C. (*Puncticulis*) *miliaris* Bruguière. — Several.
- C. (*Puncticulis*) *nanus* Broderip. — Many small specimens.
- C. (*Coronaxis*) *fulgetrum* Sowb. — Three good specimens.
- C. (*Coronaxis*) *hebraeus* Linné. — Common.
- C. (*Coronaxis*) *minimus* Linné. — Several.
- C. (*Coronaxis*) *musicus* Bruguière. — Common.
- C. (*Coronaxis*) *sponsalis* Chemnitz. — Several.
- C. (*Coronaxis*) *vermiculatus* Lamarck. — Several.
- C. (*Nubecula*) *geographus* Linné. — Many specimens in all stages of growth and fair condition, some large and well-marked.
- C. (*Nubecula*) *striatus* Linné. — Numerous specimens in all stages, mostly worn.
- C. (*Nubecula*) *tulipa* Linné. — Several small but pretty specimens, with a few of typical size.
- C. (*Dendroconus*) *figulinus* Linné. — Several very large specimens.
- C. (*Dendroconus*) *quercinus* Bruguière. — Three examples.
- C. (*Lithoconus*) *eburneus* Bruguière. — Very abundant; small specimens of the form usually known as var. or sp. *crassus* Brug. occurring in hundreds.
- C. (*Lithoconus*) *litteratus* Linné. — Some small specimens,

all var. *millepunctata* (*Conus millepunctatus* Lamarck)—by some conchologists still considered a good species.

- C. (*Lithoconus*) *magus* Linné.—One specimen only, in poor condition, of this ubiquitous Eastern species.
- C. (*Leptoconus*) *generalis* Linné.—A few somewhat worn examples.
- C. (*Rhizoconus*) *cinctus* Sowerby.
- C. (*Rhizoconus*) *lineatus* Chemnitz.
- C. (*Rhizoconus*) *lithoglyphus* Reeve = *ermineus* Dillw.
- C. (*Rhizoconus*) *miles* Linné.
- C. (*Rhizoconus*) *planorbis* Born.
- C. (*Rhizoconus*) *tahitensis* Bruguière.
- C. (*Rhizoconus*) *vexillum* Reeve.—A large number of each of the above species; of ordinary character and in poor or immature condition generally.
- C. (*Rhizoconus*) *sulphuratus* Bruguière.—One good specimen. We think this is a species distinct from *C. mustelinus* Brug. with which it is usually joined.
- C. (*Chelyconus*) *catus* Bruguière.—Abundant.
- C. (*Chelyconus*) *monachus* Linné.—Several.
- C. (*Chelyconus*) *pertusus* Bruguière.—One fine richly-coloured specimen.
- C. (*Cylinder*) *canonicus* Bruguière.—Two specimens.
- C. (*Cylinder*) *textile* Linné.—Several rather poor examples.
- C. (*Hermes*) *atramentosus* Reeve.—Four specimens.
- C. (*Hermes*) *glans* Bruguière.—Several good examples.
- C. (*Hermes*) *nussatella* Linné.—A few small shells in poor condition.
- C. (*Hermes*) *tenuistriatus* Sowerby.—One specimen only.
- Pleurotoma* (*Turris*) *abbreviata* Reeve.—Very abundant and in fair condition.
- P. (*Turris*) *cingulifera* Lamarck.—Several specimens somewhat worn.
- P. (*Surcula*) *bijubata* Reeve.—Plentiful.
- P. (*Surcula*) *brevicaudata* Reeve.—Common.

P. (Surcula) cincta Lamarck.—Common.

P. (Drillia) Hadfieldi sp. nov. (Plate III., fig. 23).

P. testa fusiformi, albida, rugosa, anfractibus septem, longitudinaliter paucicostatis, costis crassiusculis, ventricosis, transversim funiculatis, costis alternatim squarrosé ochraceotinctis, apertura subrotunda, labro exterioré incrassato, intus denticulato, columellari simplice, extus minuté albipustulato.

Long., 6 mill. Lat., 3 mill.

Hab., Lifu.

A pretty species, small, roughly ventricosely costate, transversely crossed by coarse raised lines, the ribs being alternately squarely blotched with ochraceous, columellar lip smooth and simple.

P. (Drillia) Lamberti Montrouzier. — Two specimens. Seemingly allied to the West Indian *Pl. zebra* Lam.

P. (Drillia) obliquicostata Reeve.—Common.

P. (Drillia) pupoidea A. Adams.—Very abundant. This species is identical with *Pl. victor* Sow., recently described from Mauritius.

P. (Drillia) regia Beck.—A number of fine and beautifully-marked specimens. One of the most attractive of the genus.

P. (Crassispira) fuscescens Gray. — Several specimens. Also found in the West Indies, thus showing a wide distribution.

P. (Clavus) bilineata Reeve.—One or two examples.

P. (Clavus) unizonalis Lamarck.—Common.

P. (Clavus) vidua Reeve.—Plentiful; very variable in size.

Mangilia (Defrancia) albifuniculata Reeve.—One specimen of a very small though striking species.

M. (Defrancia) granicostata Reeve. — Several pretty specimens.

M. (Defrancia) philippinensis Reeve.—Rather common.

M. (Defrancia) granularis E. A. Smith.—Two specimens.

M. (Glyphostoma) Aliciæ sp. nov. (Pl. II., fig. 15).

M. testa elongato-fusiformi, gracillima, nivea, anfractibus decem, in medio ventricosulis, apud suturas subconstrictis, undique confertim transverso-striatis, longitudinaliter rotundocostatis, apertura oblonga, labro exteriori multum incrassato, brunneo-tincto, præcipue marginem apud suturalem, simul ac ad basim labri exterioris.

Long. 9 mill. *Lat.* 4-50 mill.

Hab. Lifu.

About twenty specimens of this pretty species of *Glyphostoma*, which occupies a position near *G. crassilabrum* Reeve, but is distinct. It is white, graceful, ten-whorled, the whorls somewhat ventricose, transversely striate, and roundly longitudinally costate. The outer lip is much thickened, and the outer sinus stained brown, there being also a brown blotch towards the base of the outer lip. We have much pleasure in associating with this species the name of Miss Alicia Mayor Standen, who has assisted us considerably in the general assortment of a large portion of the collection.

M. (Glyphostoma) calcicincta sp. nov. (Pl. III., fig. 21).

M. testa minuta, incrassata, rugosa, pellucida, nivea, anfractibus sex, longitudinaliter crassicosatis, costis paucis prominentibus, apud medium transversim una conspicua zona, calcarea, candida, opaca, circumambiente, ultimum apud anfractum latiore, apertura angusta, labro exteriori crassiusculo, albo, minutè pustulato, intus quadri-denticulato, columellari quadri-plicato.

Long. 4 mill. *Lat.* 2-25 mill.

Hab., Lifu.

A single specimen in beautiful condition of a little bright white semi-opaque shell, this opacity being caused by a dead-white transverse band crossing the coarse ribs and becoming broader in the last whorl. The outer lip, under a lens, is very beautiful, being minutely warted, and with four denticles, the columellar margin with four plaits. This species is of the same character as *G. rugosa* Mighels.

M. (Glyphostoma) crassilabrum Reeve.—One or two specimens.

M. (Glyphostoma) cremonilla sp. nov. (Pl. III., fig. 31).

M. testa fusiformi, solidiuscula, pallide-straminea, infrâ suturas ochraceo-cincta, anfractibus septem, apud medium longitudinaliter ventricosè crassi-costatis, transversim rudiliratis, liris paucis, incrassatis, apertura oblonga, labro exteriorè intus sex-denticulato columellari multi-plicato.

Long., sp. maj., 12 mill. Lat., 6 mill.

Hab., Lifu, in shell sand.

By those authors who would reconstitute the genus or sub-genus *Borsonia* (Bellardi), founded upon a Tertiary fossil possessing one or more columellar plaits, this species and two or three others from Lifu would be included in it. At present we prefer following the arrangement as set forth in our National Collection, and adding these new forms to the sub-genus *Glyphostoma*, and taking as the types *G. crassilabrum* Reeve and *G. rugosum* Mighels. The *G. cremonilla* cannot be confounded with *G. nigrocinctum* (Montrouzier) from New Caledonia; it is a coarser-ribbed species, and banded with pale ochre, not black. Two specimens.

M. (Glyphostoma) Emmæ sp. nov. (Pl. III., fig. 24).

M. testa acuminata, fusiformi, semi-pellucida, pallidè straminea, ventricosa, anfractibus octo, omnibus præter ultimum longitudinaliter paucicostatis, transversim fortiter supra suturas bi vel tri-funiculocinctis, regulariter inter costas longitudinales, juxta suturas, squarrosè brunneo-maculatis, ultimo anfractu apud medium simili modo decorato, longitudinaliter multi-costulato, transversimque multi-funiculato, apertura oblonga, labro exteriorè denticulato, præsertim uno dente conspicuo columellari quadri-denticulato, canali brevi.

Long., 12 mill. Lat., 5 mill.

Hab., Lifu, in shell-sand.

A very elegant little species, in good condition, somewhat ventricose, acuminate, semi-transparent, and straw-coloured, unicolorous excepting for the few square brown spots situate just above the sutures, between the longitudinal costæ on the central whorls and continued in the middle of the last whorl, culminating in the specimen before us in a large dorsal square brown mark near the outer lip. The whorls, with the exception

of the last, are few ribbed, and transversely crossed twice or thrice with strong projecting corded ribs, the last whorl is many ridged and many corded. Mouth oblong, with a very strong prominent tooth in the outer lip, which is, besides, 4-denticulate, the columellar margin being also 4-denticulate. Canal rather short.

We have much pleasure in associating the name of Mrs. Emma Hadfield with this attractive little shell.

M. (Glyphostoma) Giliberti Soubervie.—Described originally from the island of Lifu: our only specimen agrees fairly with the description and representation.

M. (Glyphostoma) rugosa Mighels.—Several.

M. (Glyphostoma) scalarina Deshayes.—One specimen.

M. (Glyphostoma?) theskela sp. nov. (Pl. III., fig. 26).

M. testa attenuato-fusiformi, gracillima, delicatula, albida, anfractibus sex vel septem, longitudinaliter costulatis, transversim densiliratis, liris tenuibus, supra, juxta suturas, inter costas et apud medium anfractus ultimi brunneo-maculatis, apertura oblonga, labro exteriori crassiusculo, simplice, margine columellari octo-plicato.

Long., 7-50 mill. Lat., 3 mill.

Hab., Lifu.

This very interesting little shell we place provisionally under *Glyphostoma*, from which assemblage it differs in the simple outer lip and more uniform shape. The inner or columellar margin of the lip possesses seven or eight close and minute plicæ, there is also one minute process at the parietal sinus. It is of a graceful attenuate form, six-whorled, or perhaps seven, but the apex is broken off in the only specimen we have. The pure whiteness of the shell is relieved by a row of brown spots between the ribs just above the sutures and in the middle of the last whorl. The specific name is from the Greek *θέσκελος* 'wonderful,' in allusion to the strange configuration of the species.

M. (Cythara) cithara Gould.—A few pretty specimens.

M. (Cythara) inepta Smith.—One fine specimen. Hitherto

only recorded from Honduras! The author of the species has examined our specimen and agrees with our determination.

M. (Cythara) reticulata Reeve.—Common; a very elegant form.

M. (Cythara) vexillum Reeve.—Abundant.

M. (Daphnella) bella Reeve.—Several specimens of this curiously-marked species.

M. (Daphnella) dulcinea sp. nov. (Pl. III., fig. 25.)

M. testa fusiformi, albida, anfractibus sex, ventricosis, apud suturas impressis, longitudinaliter costulatis, transversim delicatuli-striatis, hic illic minutissimè sparsim brunneo-punctatis, apertura oblonga, labro exteriorè effuso.

Long., 6 mill. Lat., 2-50 mill.

Hab., Lifu.

A very delicately-striated shell, with swollen whorls, impressed at the sutures, obscurely longitudinally ribbed; outer lip effuse, under a lens the surface is seen to be very finely besprinkled with minute dust-like brown spots. One specimen.

M. (Daphnella) nexa Reeve.—A few only.

M. (Daphnella) saturata Reeve.—Several.

Besides these there are a few species of minute *Pleurotomidæ* that we cannot yet determine. Many species have been described, mainly by French conchologists, of which we have no representatives in our National or other collections.

FAMILY CANCELLARIIDÆ.

Cancellaria (Trigonostoma) costifera Sowerby.—Several specimens. This genus seems but poorly represented in the Loyalty Islands, although several are described from New Caledonia.

FAMILY OLIVIDÆ.

Oliva (Strephona) episcopalis Lamarck.—A large number of handsome specimens.

O. (Strephona) erythrostoma Lamarck.—Very numerous. Some specimens unusually large, all in excellent condition and brilliantly coloured.

- O. (*Strephona*) *masaris* Duclos.—A fine specimen, now in the collection of the Ven. Archdeacon Anson.
- O. (*Strephona*) *guttata* Lamarck.—A large number of very pretty specimens in all stages.
- O. (*Strephona*) *maura* Lamarck.—Two specimens only.
- O. (*Strephona*) *picta* Reeve.—Two specimens, in worn condition.
- O. (*Strephona*) *tremulina* Lamarck. — Several very fine specimens of an unusually dark form.
- O. (*Porphyria*) *sericea* Bolt.—Two fine specimens.
- Olivella parvula* Martyn (?)—Several specimens, all somewhat worn, and therefore rather doubtful.

FAMILY *HARPIDÆ*.

- Harpa articularis* Lamarck.—One specimen in young condition.
- H. minor* Rumphius.—Two specimens in the Manchester Museum, Owens College, and three fine ones in the collection of the Ven. Archdeacon Anson—all received from Mr. Hadfield.

FAMILY *MARGINELLIDÆ*.

- Marginella* (*Persicula*) *lifuana* Crosse.—A considerable number of this pretty little species.
- M. (Volvaria) caledonica* Jousseau.—Very near the West Indian *M. avena* and *M. tæniata*, but the columella is only three-plaited, and the angle at the suture of the last whorl is more pronounced. Several specimens.

FAMILY *MITRIDÆ*.

Species of this family, exclusive of *Turricula*, are exceedingly well represented by an enormous number of individuals in all stages, and for the most part in fairly good condition.

Mitra (*Eumitra*) *cardinalis* Gmelin.—Several.

- M. (Eumitra) episcopalis* Linné.—Many very fine specimens, some of the adults having the outer lip beautifully serrated.

- M. (Eumitra) pontificalis** Lamarck.—One adult and several young specimens.
- M. (Scabricula) eximia** A. Adams.—All of a beautiful warm reddish orange colour variety. One of the most abundant shells sent. The typical form occurs in the Mauritius.
- M. (Scabricula) sphærulata** Martyn.—Very common, but mostly worn and poor.
- M. (Scabricula) texturata** Lamarck, var. *lifouana* Crosse.—Very plentiful.
- M. (Cancilla) filaris** Linné.—This species, for many years known as *M. filosa* Born., possesses two well marked varieties, the typical *M. filaris* being an attenuate and fusiform shell, the form β . *nexilis* Martyn, to which all the Lifu and Uvea specimens we have seen belong, is much more obese than the type. The late Mr. Andrew Garrett, who is entitled to speak authoritatively on the subject, as his personal acquaintance with the Polynesian *Mitridæ* was more extended and full than that of any who have preceded or followed him, considered *M. nexilis* a true species. (*c.f.* Garrett, Polynesian *Mitridæ*, "Journal of Conchology," vol. iii., p. 21, 1880).
- M. (Chrysame) ambigua** Swainson.—Plentiful.
- M. (Chrysame) coronata** Chemnitz.—This species and *M. tiarella* seem almost too closely allied. The forms we here place under *M. coronata* would appear intermediate between the two. It is abundant on the coasts of Lifu and Uvea.
- M. (Chrysame) ericea** Pease.
- M. (Chrysame) laeta** Adams.
- M. (Chrysame) lugubris** Swainson.
- M. (Chrysame) tiarella** Swainson.
- M. (Chrysame) ticaonica** Reeve.
- M. (Chrysame) turgida** Reeve.
- M. (Chrysame) vexillum** Reeve.

Most of the above very plentiful, but usually waterworn and in poor condition.

M. (Chrysame) fulvosulcata Melvill, Journal of Conchology vol. v., p. 287, 1888. (Pl. III., fig. 32.)

Originally described from Mauritian specimens sent by Mr. Robillard to Mr. G. B. Sowerby. Several have now come to our notice from Lifu, and the species will doubtless occur in intermediate localities. The transverse furrows, stained with yellow, impart at once a characteristic appearance to the species. We figure the original type, from Mauritius.

M. (Volutomitra) honesta sp. nov. (Pl. III., fig. 17.)

M. testa pyramidato-fusiforimi, nitida, brunnea, crassiuscula, lævi, anfractibus sex, ultimo rapidè accrescente, ventricoso, apud medium transversim unicingulatis, apertura oblonga, intus cinerea, labro exteriori paululum incrassato, effuso, columella triplicata, plicis conspicuis, cinereis.

Long., 10 mill. Lat., 4.5 mill.

Hab., Lifu.

Two specimens of a little *Mitra* somewhat resembling the Mediterranean *Volutomitra ebenus* Lam., and possibly a tropical form of that variable species, though its presence in Lifu would hardly be suspected.

M. (Strigatella) decurtata Reeve = **M. scutulata** Lam.—Several very fine specimens.

M. (Strigatella) flexilabris Swainson.—One or two in good condition.

M. (Strigatella) litterata Lamk. = **M. maculosa** Reeve.—Common.

M. (Strigatella) retusa Reeve = **M. paupercula** Lamarck.—A large number of rather poor specimens.

M. (Strigatella) zebra Reeve.—Common.

M. (Turricula) turriger Reeve.—One specimen.

M. (Costellaria) arenosa Lamarck.—Common.

M. (Costellaria) armiger Reeve.—Several.

M. (Costellaria) cadaverosa Reeve.—Common.

M. (Costellaria) Deshayesi Reeve.—Some large and very beautiful specimens of this interesting species.

- M. (Costellaria) dimidiata** Sowb.—A few good specimens.
M. (Costellaria) discoloria Chemnitz.—Common.
M. (Costellaria) exasperata Reeve.—Abundant, but mostly of a variety we characterize as follows :—
M. (Costellaria) exasperata var. **Hadfieldi** var. nov. (Pl. II., fig. 14.)

Shell turreted, eight or nine ribbed, differing from the type in being dark-brown, banded at the line of the sutures of the upper whorls, and also twice transversely banded at the last whorl. Occasionally specimens occur wholly suffused with dark-brown.

An extremely common form at the Loyalty Islands, several hundred specimens having been forwarded by Mr. Hadfield.

- M. (Costellaria) modesta** Reeve.—A few.
M. (Costellaria ?) nitidissima sp. nov. (Pl. III., fig. 19.)

M. testa minuta, perlevis, nitente, brunnea, tenui, anfractibus sex, paullum ventricosis, longitudinaliter costulatis, apertura oblonga, labro exteriori vix incrassato, columella quadriplicata.

Long., 5 mill. Lat., 1.5 mill.

Hab., Lifu.

Four specimens from shell-sand, all precisely alike, of a very small brown, very shining and smooth shell, longitudinally roundly costate; columella four-plaited. The species may really belong to *Volutomitra* rather than *Costellaria*.

- M. (Costellaria) nodilyrata** A. Adams.—Several.
M. (Costellaria) pacifica Lamarck.—Rather larger than *M. cadaverosa* of which it may be but a variety. Many specimens.
M. (Costellaria) semifasciata Lamarck.—Not uncommon.
M. (Pusia) alveolus Reeve.—Three not quite full grown specimens we refer almost certainly to this species; the vivid black and white marking, as in *M. tusa* Reeve, rendering it conspicuous. It is allied both to this species and also *M. Shoplandi* Melvill, lately described from Aden.
M. (Pusia) amabilis Reeve.—A few good specimens.

- M. (Pusia) dermestina** Lam.—Several.
- M. (Pusia) lubens** Reeve.—One specimen.
- M. (Pusia) luculenta** Reeve—Several specimens. Probably a variety of *M. Graeffei* Crosse.
- M. (Pusia) muriculata** Lamarck.—Extremely abundant, but few specimens in good condition.
- M. (Pusia) nodosa** Swainson.—Several.
- M. (Pusia) Savignyi** Payr. — Two specimens. Quite inseparable from the Mediterranean shell (*vide* E. A. Smith).
- M. (Pusia) rosea** Reeve.—A pretty purple species. Two or three specimens.
- M. (Pusia) tuberosa** Reeve.—Very common.
- M. (Pusia) tusa** Reeve.—Several pretty specimens in good condition.
- M. (Pusia) venustula** Reeve.—Common.
- M. (Cyllithea) casta** A. Adams.—One good specimen of this elegant species.
- M. (Cylinder) dactylus** Linné.—One very fine specimen.
- M. (Cylinder) nucea** Gronovius.—Common.
- M. (Cylinder) crenulata** Lamarck.—A few small specimens.
- Imbricara conica** Schmck.—Many small specimens.
- I. olivæformis** Swainson.—Several.
- I. ossea** Reeve = **I. punctata** Swainson.—A number of rather worn specimens.

FAMILY *FASCIOLARIIDÆ*.

- Fusus gradatus** Reeve.—One good specimen.
- Fasciolaria filamentosa** Martyn.—A number of very fine fresh specimens.
- Latirus lautus** Reeve.—Several.
- L. nodatus** Martyn.—One young specimen.
- L. (Plicatella) caledonicus** Petit. — Very plentiful, but mostly in poor condition.
- L. (Plicatella) polygonus** Linné.—Two specimens in the Manchester Museum, one in the collection of the Ven. Archdeacon Anson.

- L. (*Peristernia*) *aureotinctus* Lamarck.—One specimen in the Manchester Museum, one in J. C. Melvill's collection.
- L. (*Peristernia*) *chlorostomus* Sowerby = *L. crenulatus* Kiener.—Three nice specimens.
- L. (*Peristernia*) *incarnatus* Deshayes.—Several specimens in various stages.
- L. (*Peristernia*) *nassatulus* Lamarck.—Several.

FAMILY *TURBINELLIDÆ*.

- Cynodonta ceramica* Kiener.—Two small specimens.
- C. cornigera* Lamarck.—Several immature specimens.
- C. imperialis* Reeve = *C. tubifera* Anth.—Two specimens.

FAMILY *BUCCINIDÆ*.

- Tritonidea* (*Cantharus*) *gracilis* Reeve.
- T. (*Cantharus*) *undosus* Linné.
- T. (*Cantharus*) *marmoratus* Reeve.
A few specimens of each, mostly worn.
- T. (*Cantharus*) *menkeanus* Dunker.—Our only example agrees very well with Japanese specimens of Dunker's species in J. C. Melvill's collection.
- Engina alveolata* Kiener.—One or two examples.
- E. astricta* Reeve.—Several good specimens showing some variation.
- E. iodosia* Duclos. (Pl. III., fig. 20).—A most interesting re-discovery of a lost species, which has not been with absolute certainty identified by any conchologist since the time of the original describer, although its identity was suspected by the late Mr. G. W. Tryon, Junr. It appears to run into its allies, *E. monilifera* Reeve, and *E. echinata* Pse. (both of which will have to be merged in *iodosia*) and exactly resembles Duclos' figure. These figures are considered by some to be fantastic and artificial, so many — exceeding fifty species — having been thus described by Duclos, and not identified since, mostly appertaining to the genera *Columbella*, *Engina* and *Oliva*; but

we hope, since several have been satisfactorily re-identified, others will follow. His plates, reproduced also by Tryon, are very clear, and should leave little room for doubt when comparison is needed.

E. lineata Reeve.—In hundreds.

E. mundula sp. nov. (Pl. II., fig. 6).

E. testa parva, oblonga, solida, alba, obtusa, anfractibus sex, longitudinaliter costatis, costis sulcis transversim decussatis, gemmulato-noduliferis, brunneo ochreoque alternatim pictis, apertura angusta, labro crassiusculo, brunneo hic illic maculato.

Long., 8 mill. *Lat.*, 4 mill.

Hab., Lifu.

A few specimens of a pretty little shell, doubtless allied to *E. lauta* Reeve from the Philippines, but differing much in size, (being about half the diameter of *E. lauta*), and also in greater obesity of whorl.

E. phasinola Duclos.—Several specimens. There can be but little doubt that this species is not a *Columbella*.

E. rutila Reeve.—Very rare.

E. spica sp. nov. (Pl. II., fig. 12).

E. testa attenuato-pyramidata, solida, albida, squarrosé brunneo maculato, anfractibus octo, undique transversim densi-striatulis, irregulariter costatis, costis subacutis, ultimo anfractu in medio conspicuè angulato, apud basim attenuato, apertura angusta, labro exteriori incrassato, intus denticulato.

Long., 11 mill. *Lat.*, 5 mill.

Hab., Lifu.

A striking little shell, of which only one specimen in very fine condition occurred. Its nearest allies are *E. alveolata* Kiener, and *E. Reevei* Tryon=*alveolata* Reeve non Kiener. It is white, solid, attenuate at both extremities, with irregular acutely noded ribs, the nodules imparting a prickly angular appearance to the centre of the last whorl especially. The mouth is narrow, dentate on the interior of the outer lip, which is thickened in the manner characteristic of the genus; the

coloration is, as has been said, white, with squarrose brown variegated markings.

E. sinensis Melvill.—Proc. Malac. Soc., vol. i., p. 227, 1895.
(Pl. III., fig. 27).

This species, described since the original reading of this paper, from two specimens in the National Collection marked 'China Seas,' has, curiously enough, turned up in fair quantity, viz., ten or twelve specimens, in the Loyalty Islands also. We have thought it worth while to append a figure taken from Lifu specimen.

E. variabilis Pease.—A few, but worn, specimens.

E. zatricium Melvill.—Proc. Malac. Soc., vol. i., p. 51, 1894.
(Pl. II., fig. 4).

Described from Mr. Hadfield's first consignment of specimens, and found not to be infrequent by the numerous examples, since received. It is allied to *E. bonasia* von Mart. and *E. fusiformis* Pease, but distinct from both. We give a representation of this species.

E. zonata Reeve.—In remarkable abundance, and more plentiful than *E. lineata*, which, while it occurred in its hundreds, was eclipsed by the thousands of *E. zonata*. Mostly in capital condition, and showing a good deal of variation, some specimens, for example, being quite black at the base, with hardly any white markings at all.

E. (Pusiostoma) mendicaria Linné. — Abundant and variable.

It will be seen by the above array of species of this genus that the Loyalty Islands may almost be considered their metropolis, and we hope, in future, for other interesting and perhaps yet unknown species from this locality. It is urgently to be wished that some specimens might be dredged alive so as to afford opportunity for examination of the radula.

Phos nodicostatus E. Ad.—Two specimens of this elegant form.

P. senticosus Linné.—Common and very fine.

FAMILY *NASSIDÆ*.

Nassa arcularia Linné.

N. coronata Bruguière.

N. callospira A. Adams = *N. callosa* A. Adams.

N. (Niotha) albescens Dunker.

N. (Niotha) densigranata A. Ad.—Not quite typical.

N. (Arcularia) globosa Quoy.

N. (Arcularia) granifera Kiener.

N. (Alectryon) glans Linné.

N. (Alectryon) monilis Kiener.

N. (Alectryon) mucronata A. Ad.

N. (Alectryon) papillosa Linné.

N. (Alectryon) suturalis Sowerby.

N. (Telasco) dispar Adams = *N. filosa* Gray.

N. (Telasco) fluctuosa Adams.

N. (Telasco) gaudiosa Sowerby. — Many varieties of this species.

N. (Hebra) uricata Quoy and Gaim.

N. (Hima) eximia H. Adams.

N. (Hima) plebecula Gould.

Of the above, *N. granifera* and *N. monilis* are the most abundant—some hundreds of each; but nearly all are well represented by good specimens in various stages of growth. Besides these, there are seven or eight other *Nassæ* that we have been unable, so far, to identify.

FAMILY *COLUMBELLIDÆ*.

Columbella (Pygmæa) Tankervillei Montr. — Abundant, but poor specimens.

C. (Pygmæa) turturina Lamarck.—Plentiful; variable in size and colour.

C. (Pygmæa) Tyleri Gray = *C. pardalina* Lam.—Over a thousand specimens in every conceivable variation of colour and marking, and in excellent condition.

- C. (*Pygmæa*) *varians* Sowerby.—A large number of pretty specimens.
- C. (*Pygmæa*) *versicolor* Sowerby.—Several.
- C. (*Mitrella*) *albina* Kiener.—Common.
- C. (*Mitrella*) *ligula* Duclos.—Very abundant, and showing considerable variation in colouration. Quite the most beautiful of the genus, in our opinion.
- C. (*Atilia*) *galaxias* Reeve.—Several pretty examples.
- C. (*Amycla*) *conspersa* Gaskoin. — An elegant species of which we have a few nice specimens. We are indebted to Mr. S. Pace for these last two identifications.
- C. (*Anachis*) *lachryma* Gaskoin.—Very few.
- C. (*Anachis*) *marquesa* Gaskoin. — Several specimens, which exhibit so much variation, both in form, sculpture, and marking, as to be apparently separable into two or three species. We are again indebted to Mr. Pace, who is making an especial study of the genus, for his opinion on this matter.

FAMILY *MURICIDÆ*.

- Murex* (*Chicoreus*) *adustus* Lam.—Several good specimens and many worn ones. This includes *M. australiensis* A. Adams, a colour variety represented in some quantity.
- M. (*Vitularia*) *vitulinus* Lam. = *M. purpura* Chem.—Three specimens.
- M. (*Ocinebra*) *benedictus* sp. nov. (Pl. II., fig. 12).

M. testa parva, candida, ovato-fusiformi, anfractibus sex biangulatis, undique transversim tenuissimè, sub lente, strigillatis, longitudinaliter paucicostatis, costis angulatim arguté anguliferis, hic illic squarrose pallide brunneo tessellatis, apertura angusta, oblonga, ad basim producta, labro exteriorè conspicuè denticulato.

Long., 7 mill. Lat., 4 mill.

Hab., Lifu, in shell-sand.

A very small but exquisite shell, of which we have only seen one full-grown specimen. It is white, microscopically transversely finely lirate, longitudinally few ribbed, ribs sharply

angled and almost prickly. The aperture is narrowly oblong, outer lip conspicuously toothed within. It is a moot question whether this species is an *Ocenebra* or *Coralliophila*; we incline to the former view at present.

M. (*Ocenebra*) breviculus Sowerby.—One specimen.

Purpura persica Lamarck.—Five fine specimens.

P. (*Thalessa*) bitubercularis Lamarck. — A few small specimens.

P. (*Thalessa*) hippocastanum Linné.—One specimen.

P. (*Thalessa*) intermedia Kiener.—Several.

P. (*Stramonita*) rustica Lamarck.—One specimen.

P. (*Stramonita*) vexillum Reeve.—A few small examples.

P. (*Iopas*) sertum Lamarck.—One fine specimen.

Pentadactylus (*Ricinula*) arachnoides Lamarck = **P. ricinus** L.—Several specimens of both type and var. *albolabris* Blainville.

P. (*Ricinula*) biconicus Blainville.

P. (*Ricinula*) clathratus Lamarck.

P. (*Ricinula*) digitatus Lamarck.

P. (*Ricinula*) horridus Lamarck.

P. (*Ricinula*) spectrum Reeve.

A fair number of each of above, excepting *P. biconicus*, in moderate condition.

P. (*Sistrum*) anaxares Duclos.—Several examples of this pretty little *Engina*-like species.

P. (*Sistrum*) asper Lamarck.—Common.

P. (*Sistrum*) cavernosus Reeve = **P. ochrostomus** Blainville.—Common.

P. (*Sistrum*) chaideus Duclos.—Common.

P. (*Sistrum*) chrysostomus Desh.—Common and variable.

P. (*Sistrum*) fragrum Blainville.—One example only.

P. (*Sistrum*) margariticulus Broderip.—Several specimens.

A variable species that requires more careful attention in order to discriminate its extent of variation.

P. (*Sistrum*) morus Lamarck.—Abundant.

FAMILY *CORALLIOPHILIDÆ*.

- Coralliophila coronata* Barclay.—Worn, but agreeing with specimens of the Mauritian shell in J. C. Melvill's collection.
- C. madreporarum* Sowerby.—Several specimens in a worn condition.
- C. monodonta* Quoy.—One specimen.
- C. neritoidea* Chemnitz=*C. violacea* Auct.—Several fine specimens in the Manchester Museum and the collection of the Ven. Archdeacon Anson.

FAMILY *TRITONIDÆ*.

- Triton variegatus* Lamarck.—Many, in various stages of growth.
- T. (Simpulum) aquatilis* Reeve.—One good specimen.
- T. (Simpulum) chlorostomus* Lamarck.—One only.
- T. (Simpulum) eximius* Reeve.—One.
- T. (Simpulum) gemmatus* Reeve.—Several. A very neat shell.
- T. (Simpulum) pilearis* Linné.—Three examples.
- T. (Simpulum) rubecula* Linné.—Plentiful and extremely varied in colouration. A rather small form.
- T. (Cabestana) labiosus* Wood.—One example.
- T. (Lotorium) pyrum* Linné.—A single fine specimen.
- T. (Lotorium) tuberosus* Lamk.—Many small specimens.
- T. (Epidromus) decapitatus* Reeve.
- T. (Epidromus) obscurus* Reeve.
- T. (Epidromus) truncatus* Hinds.
- A single specimen each of the above three species.
- T. (Persona) ridens* Reeve.—One very juvenile example only.
- R. (Lampas) affinis* Broderip.—Several.
- R. (Lampas) livida* Sowerby.—Abundant.
- R. (Lampas) siphonata* Reeve.—One specimen.
- R. (Apollon) anceps* Lamarck.—One worn example.
- R. (Apollon) pusilla* Broderip.—Several, worn.

FAMILY *CASSIDIDÆ*.

- Cassis (Semicassis) pila* Reeve.—One poor example.

- C. (*Casmaria*) *torquata* Reeve.—Three specimens in good condition.
- C. (*Casmaria*) *vibex* Linné.—Several.

FAMILY *DOLIIDÆ*.

- Dolium olearium* Brug.—Several medium-sized examples.
- D. *perdix* Linné.—Several ; one or two very fine.

FAMILY *CYPRÆIDÆ*.

- Ovula ovum* Linné.—A large series of very fine shells, one of which has been bored for wearing as an ornament.
- O. *tortilis* Martyn.—One only, a very beautiful specimen in fine condition.
- O. (*Calpurnus*) *verrucosa* Linné.—Many fine examples of this pretty species.
- Cypræa argus* Linné.—Many very beautiful specimens, some of large size and with great variety of pattern.
- C. *carneola* Linné.—Common ; variable in size, some being exceptionally large.
- C. *caurica* Linné.—Abundant, but very few specimens in good condition.
- C. *coffea* Gray.—A striking little shell, occurring in considerable numbers.
- C. *exanthema* Linné.—Several, young and adult, of ordinary character.
- C. *interrupta* Gray.—Several, most of them badly worn.
- C. *isabella* Linné.—Abundant.
- C. *mauritiana* Linné.—A great number. Some of the adult shells are very fine. Many specimens are young, in all stages.
- C. *microdon* Gray.—Abundant.
- C. *Rashleighana* Melvill (Pl. II., figs. 7 and 8).—A few specimens of a shell hitherto unique, and considered of uncertain locality. The establishment of the particular habitat of this species is of considerable interest. We

have thought it worth while re-figuring as the former representations were hardly up to the mark.

- C. *scurra* Chemnitz.—Several, rather worn. One good specimen in Archdeacon Anson's collection, and another, very fine, in that of Mr. Cairns.
- C. *tabescens* Solander.—Several specimens, showing considerable variation; some are very dwarfed in form, and two are of a pale straw colour without the usual dorsal marking.
- C. *talpa* Linné.—Rather common; several specimens unusually brilliant in colour and large-sized.
- C. *testudinaria* Linné.—Several very fresh and beautiful specimens.
- C. *ursellus* Gmelin.—Common and very fine.
- C. (*Aricia*) *arabica* Linné.—Plentiful in all stages.
- C. (*Aricia*) *annulus* Linné. — Common; some unusually bright in colour.
- C. (*Aricia*) *caput-serpentis* Lamarck.—Common; several very large specimens.
- C. (*Aricia*) *moneta* Linné.—Abundant and variable in size and form.
- C. (*Aricia*) *sulcidentata* Gray.—One young but fine live specimen with teeth not fully developed in Mr. Cairns' collection.
- C. (*Luponia*) *asellus* Linné.—Plentiful.
- C. (*Luponia*) *aurora* Solander = *C. aurantium* Mart.—Mr. Hadfield, in a letter to one of the authors, records coming across a fine specimen of this shell in a native hut, where it was held in much veneration by the occupant, who considered it a kind of fetish.
- C. (*Luponia*) *cernica* Sowerby.—Several.
- C. (*Luponia*) *clandestina* Linné.—Type absent, but the pretty little var. *Artuffeli* Jousseume (Pl. III., figs. 28, 29) is abundant.

- C. (*Luponia*) *cribraria* Linné.—Plentiful.
- C. (*Luponia*) *erosa* Linné.—Plentiful.
- C. (*Luponia*) *flaveola* Linné.—Several.
- C. (*Luponia*) *gangrenosa* Dillwyn.—A few.
- C. (*Luponia*) *helvola* Linné.—Common.
- C. (*Luponia*) *lutea* Gronow.—A fine series; many, however, being somewhat waterworn, in which condition they might readily be mistaken for *C. ziczac*. Some of our specimens seem to be var. *Humphreysii* Gray.
- C. (*Luponia*) *lynx* Linné.—Moderately plentiful, but mostly worn.
- C. (*Luponia*) *mappa* Linné.—A number of remarkably fine examples in the most perfect condition, including a handsome specimen of var. *panerythra* Melv. (in Mr. R. Cairns' collection), and several of var. *subsignata* Melv.
- C. (*Luponia*) *poraria* Linné.—Very abundant, some remarkably fine and richly coloured.
- C. (*Luponia*) *poraria* var. *albinella* nov.—Base white; dorsal surface yellow with white ocelli, the purple tinge of the type entirely wanting. A very beautiful and striking colour variety. Two specimens.
- C. (*Luponia*) *spurca* Linné.—A few rather small specimens.
- C. (*Luponia*) *stercus-muscarum* Lamarck.—Several. A form nearly allied to *C. punctata* L.
- C. (*Luponia*) *tigris* Linné.—Many large and beautiful shells. Also some in a juvenile condition.
- C. (*Luponia*) *vitellus* Linné.—Common. Mostly small in size. Two examples of var. *sarcodes* Melv.
- C. (*Luponia*) *ziczac* Gmelin.—Several.
- Trivia *Childreni* Gray.—One fine specimen.
- T. *insecta* Mighels.—Several; variable in size.
- T. *oryza* Lamarck.—Several.
- T. *staphylæa* Linné.—Common.
- T. (*Pustularia*) *nucleus* Linne.—Abundant.

- T. (Epona) cicercula** Linné. — Common; mostly worn.
Several examples of var. *Lienardi* Jousseau.
- T. (Epona) globulus** Linné.—Common.
- Erato corrugata** Hinds.—Several.

FAMILY *STROMBIDÆ*.

- Strombus thersites** Gray = **S. ponderosus** Phil.—One specimen of this rare species in the finest condition, brought over by the Rev. James Hadfield on his first visit in 1891-2 (now in J. C. Melvill's collection).
- S. urceus** Linné.—Received by J. C. Melvill from Mr. Hadfield's first consignment, 1891. It does not occur in the second or third collections, which is surprising.
- S. (Monodactylus) pacificus** Swainson = **S. novæ-zealandiæ** Chem.—Two fine specimens and several worn ones.
- S. (Canarium) floridus** Lamarck.—Some hundreds of specimens, showing great variation in size and colouration.
- S. (Canarium) gibberulus** Linné.—Abundant.
- S. (Canarium) samar** Chemnitz.—One fine specimen.
- S. (Conomurex) luhuanus** Linné.—Several small specimens.
- Pterocera (Harpago) chiragra** Linné.—Several specimens, chiefly of a stunted form and richly coloured.
- P. (Heptadactylus) lambis** Linné.—One small specimen in the Manchester Museum, and a few mature in that of the Ven. Archdeacon Anson, of Birch Rectory, Rusholme.
- Terebellum subulatum** Linné.—Some hundreds of fine specimens with great variety of marking. The size and beauty of these surpass those we have seen from any other quarter of the tropics.

FAMILY *CERITHIIDÆ*.

- Triforis connatus** Montrouzier.—One of the larger species.
- T. Hindsii** Deshayes.—Several.
- T. sculptus** Hinds.—Several.
- T. violaceus** Quoy.—Of a pale lilac hue, whorls much noded.

Cerithium armatum Phil. var. **lifuensis** nov. (Pl. III., fig. 33). Differs from the type in greater nodulosity of whorls, especially round the sutures, and in more pronounced yet delicate marking and brighter colour. Apparently common in Lifu.

C. carbonarium Phil.—Three or four specimens. Allied to the West Indian *C. atratum* Born.

C. corallinum Sowerby.—One small specimen of this Philippine Island species, received through Mr. R. Cairns.

C. columna Sowerby.—An immense number of specimens, many being fine and thousands in fragmentary condition.

C. dichroum sp. nov. (Pl. II., fig. 5).

C. testa solida, breviter fusiformi, pallidè ochracea, transversim crassistriata, anfractibus octo, irregulariter suprà suturas nodulosis atque castaneo zonatis, ultimo apud peripheriam alterâ zonâ, nunc tenui, nunc latiore et interdum interrupta succincto, canali paullum producto, apertura ovata, labro simplice.

Long., 8 mill. Lat., 3.50 mill.

Hab., Lifu.

A somewhat shortly-fusiform species, the whorls much cemented together, and since they are uniformly transversely striate, it is difficult to descry the sutural juncture. A brown chestnut band, in some specimens broader than in others, encircles the shell just above the sutures, the last whorl also having an additional band round the periphery. Various nodules, somewhat irregularly placed, also encircle the whorls above the sutures.

Several specimens. Near *C. unilineatum* Pease, from the Galapagos Islands.

C. dubium Sow. = **C. eludens** Bayle.—Several in a young state.

C. gracile Pease = **C. rostratum** Sow.—Several.

C. morus Lam. = **C. variegatum** Quoy.—Not so abundant as some of the other tropical forms at Lifu. Mostly young specimens.

- C. nassoides** Sow. = **C. maculosum** Mighels. — A few specimens of this pretty little species.
- C. salebrosum** Sow. — Several, showing much beautiful variation.
- C. zebrum** Kiener.—Described originally from the Galapagos Isles, but we see hardly any difference in the numerous Lifu specimens, including the var. *delectum* Sowb., which is also represented.
- C. (Vertagus) aluco** Linné.—A handsome and infrequent species.
- C. (Vertagus) articulatum** Ads. & Reeve.—Several.
- C. (Vertagus) fasciatum** Bruguière.—A large number of very fine specimens. One good and several poor examples of the form known as *V. martinianus* Pfr.
- C. (Vertagus) lineatum** Lamarck.—Several specimens.
- C. (Vertagus) obeliscus** Bruguière.—Several specimens in poor condition.
- C. (Vertagus) semi-nudum** Sowb.—Several. A form allied to *C. obeliscus* and differing slightly in sculpture.
- C. (Lampania) lacteum** Kiener.—Plentiful.
- C. (Lampania) piperitum** Sowerby—Plentiful.
- C. (Lampania) zonale** Bruguière.—Several.
- C. (Pyrasus) palustre** Linné.—Two specimens in poor condition.
- Bittium** sp.—Several specimens of a form near *B. abruptum* Watson. Probably a new species, but we hesitate at present to describe it as it does not seem to possess many salient characters.
- Potamides caledonicus** Jousse.—One small specimen only.
- Cerithiopsis sinon** Bayle. (Pl. I., fig. 3).—Several specimens of a remarkably beautiful shell, which appears to be so scarce and little known that we give a figure of it. It was originally described as *C. clathratus* Ads., and in the British Museum there are three tablets so named; but Bayle preferred the change on account of this name being pre-occupied by a fossil species.

FAMILY *MODULIDÆ*.

Modulus tectum Gmelin.—Several. A small variety.

FAMILY *PLANAXIDÆ*.

Planaxis virgatus Smith.—Common.

FAMILY *VERMETIDÆ*.

Vermetus (Phylacodes) cf. nodoso-rugosus Lischke.—
Very few specimens, enabling us only to make a guess at
the identification. Lischke's species, however, seems the
nearest to our form.

FAMILY *TURRITELLIDÆ*.

Mathilda sinensis Fischer. (Pl. III., fig. 27.)—One speci-
men in J. C. Melvill's collection, received from Mr.
Hadfield in 1891. White and umbilicate, very exquisite
in sculpture, but only 6 mills. in length.

FAMILY *MELANIIDÆ*.

Melania Matheroni Gassies.—Abundant.

M. Rossiteri Gassies.—One or two in Mr. Cairns' collection.

FAMILY *LITTORINIDÆ*.

Littorina obesa Sowerby.—Common.

L. (Melaraphe) mauritiana Lam.—Several specimens; a
small form.

L. (Melaraphe) undulata Gray.—Several.

Tectarius miliaris Quoy.—Several.

FAMILY *SOLARIIDÆ*.

Solarium (Philippia) oxytropis A. Adams.—Several, but
small. A rare species.

Torinia infundibuliformis Gmelin. — Several, prettily
chequered.

T. perspectivunculum Chemnitz.—Two specimens.

FAMILY *LITIOPIDÆ*.

Diala A. Adams is included as a sub-genus of *Litiopa* by Tryon
and also Paul Fischer, but we are inclined to agree with

Adams as to the generic distinctness of both this and *Alaba*, also of Arthur Adams.

Three species or perhaps more of this genus appear to occur, but so much difficulty attends the elucidation of the species, and so little is their distribution known, that it is impossible to arrive at any certainty on the subject. The genus, distinct in our opinion from *Litiopa*, as observed above, sadly needs a competent monographer.

D. Hardyi sp. nov. (Pl. II., fig. 10).

D. testa pyramidato-fusiforimi, lactea, solida, nitida, anfractibus septem, apud suturas canaliculatis, undique regulariter striato-sulcatis, ultimo apud peripheriam angulato, apertura rotunda labro apud marginem columellarem ochraceo.

Long., 3.25 mill. *Lat.*, 1.15 mill.

A small milk-white species, very regularly striately sulcate, unicolorous and without markings.

D. Hardyi β *prolongata* var. nov. (Pl. II., fig. 11).

Whorls 8, more rounded, shell more elongate, not angled at the periphery.

Long., 4 mill. *Lat.*, 1.15 mill.

Hab., Lifu and Uvea, with the preceding, in shell sand.

These two forms occur together, and are distinct enough when taken notice of at first, but the more one studies them, the more they are seen to be joined by intermediates. The variety seems near *D. suturalis* Adams from the Philippine Isles. We have much pleasure in connecting with this species the name of Mr. John Ray Hardy, of the Manchester Museum, Owens College, who has rendered us much assistance in the sorting and investigation of this Lifu collection of shells.

D. ludens sp. nov. (Pl. II., fig. 9).

D. testa oblonga fusiformi, solida, albescente, anfractibus sex planatis, levibus, in medio circaque basin ultimi anfractus sulcato-striatis, transversim albo tessellatis, præcipue juxta suturas, et apud peripheriam, transversimque interruptis lineis brunneis decoratis. Apertura rotunda, labro crassiusculo simplice.

Long., 4 mill. *Lat.*, 1.75 mill.

Hab., Uvea (in shell-sand, from Mr. Hadfield).

Seven or eight specimens, but only one or two in good condition. Allied, though not very nearly, to *D. lauta* Adams, from South Australia, but much smaller and less shining. The compressions at the sutures are not so marked, and the lineation of the brown transverse marking more interrupted and not so broad. The opaque white tessellated ornamentation is not present in *lauta*. *D. albugo* Boog Watson, from Wednesday Island ('Challenger' Expedition) of which there are specimens also in J. C. Melvill's collection from Thursday Island, from shell-sand collected there by Mr. Arnold Umfreville Henn, is also allied, though distinct.

D. semistriata Phil. = **varia** A. Ad.—Rare, and agreeing with authentic specimens from Adams marked '*varia*' in J. C. Melvill's collection.

FAMILY *RISSOIDÆ*.

Rissoina distans Anton. = **R. canaliculata** Schwartz.—
Two specimens.

R. minuta Neville.—One specimen, like *R. scolopax* or *R. subconcinna*, but only 0.3 millimetres in length, may perhaps be placed here. (It is figured in Kuster's Conch. Cab., pl. xv., fig. 12).

R. scolopax Souverbie.—Many. Evidently common, and very beautiful.

R. (Zebina) curta Adams.—Several.

R. (Zebina) funiculata Souverbie. — Several. Perhaps identical with *R. spiralis* Souverbie, of which we have not seen specimens.

R. (Zebina) subconcinna Souverbie.—Several. Resembling *R. scolopax* Souv.

R. (Moerchiella) spirata Sowb. — Two specimens of the type, and several of
var. **Lamberti** Souverbie,
var. **Orbigny** A. Adams, and
var. **artensis** Montrouzier.—This last a turreted form.

- R. (Moerchiella) spiralis** Souverbie.—One specimen seems to approach *R. artensis* Montrouzier, just mentioned.
- R. (Pyramidelloides) miranda** Adams.—Several. Probably synonymous with *R. insolita* Desh. from the Mauritius. A curiously sculptured and very beautiful species.

Barleeia Chasteri sp. nov. (Pl. III., fig. 22).

B. testa minuta, lævissima, vix pellucente, anfractibus quinque, lævibus, ventricosulis, ochraceo-brunneis, infra suturas transversim vitta calcarea succinctis, simul æ apud basin anfractus ultimi, apertura rotunda, pupinæformi, labro fere continuo, incrassato.

Long., 1·75 mill. *Lat.*, 1 mill.

Hab., Lifu (in shell-sand).

Twenty to thirty specimens of this pretty little shell have come under our observation. Some specimens are of a darker ochreous-brown colour, and therefore show the contrast with the chalky white transverse band just below the sutures more distinctly than the paler forms. The whorls are five in number, and the whole shell is extremely smooth, barely translucent; whorls slightly ventricose; operculum unknown.

We think (as pointed out to us by Mr. Edgar Smith) that the genus *Barleeia* fits this species more nearly than any of the other Rissoïd sectional genera or sub-genera, although we believe the seas of Europe alone contain nine-tenths, if not all, the hitherto described species of the genus. M. Fischer includes *Fairbankia bombayana* Blanford, however, with *Barleeia*, and it is probable that it is generally diffused over the tropical area—indeed, in Paetel's Catalogue, some Mauritian and Californian species, not known to us, are included likewise.

FAMILY *CYCLOSTOMATIDÆ*.

Omphalotropis granum Pfr.—Common.

FAMILY *TRUNCATELLIDÆ*.

Truncatella conspicua Brown = **T. vitiana** Gld.—Not uncommon.

FAMILY *HIPPONYCIDÆ*.

- Hipponyx antiquatus** Linné=**H. mitrula** Gmel.—Many, mostly waterworn.
- H. australis** Linné.—Not uncommon; one example *in situ* on a specimen of *Turbo petholatus*.
- H. barbata** Sowerby.—Several.

FAMILY *CAPULIDÆ*.

- Capulus intortus** Meusch.—Several.
- C. militaris** Linné.—Several.
- Calyptræa hipponiciformis** Reeve.—Several, mostly worn.
- C. tortrix** Reeve.—Several pretty specimens.

FAMILY *NATICIDÆ*.

- Natica chinensis** Lam.—Common, and in good condition.
- N. Gaidei** Souverbie=**N. lineozona** Jous.—Plentiful. A very clearly marked and beautiful little shell.
- N. Gualteriana** Phil.—An imperfect specimen or two.
- N. marochiensis** Gmelin.—Many specimens of this widely-distributed species, showing some amount of variation.
- N. picta** Recluz.—Worn, but with the characteristic markings.
- N. Robilliardi** Sowerby.—Allied to *N. gambiæ* Recluz, and hitherto only known from Mauritius. Several fine specimens. We are indebted to Messrs. Edgar A. Smith and E. R. Sykes for aid in determination of this species.
- N. violacea** Sowerby.—Common.
- N. (Ruma) simiæ** Chemnitz.—Common.
- N. (Ruma) succinoides** Reeve=**N. melanostoma** Gmel.—Abundant.
- N. (Mamma) aurantia** Lam.—Several; the finest hitherto recorded, in the collections of John Hardy and R. Cairns.
- N. (Mamma) mamilla** Linné—Common.
- N. (Mamma) orientalis** Gmelin.—Common.

FAMILY *SCALARIIDÆ*.

- Scalaria (Scala) pyramidalis** Sowerby.—One specimen.

- S. (Amaea) fimbriata** Adams (?)—One pretty specimen, which we somewhat doubtfully place here, has been referred to Mr. E. A. Smith, who informs us that it is near to Adams' species, which is unfigured and was described from Japan, but it has fewer ribs, and may be new. We refrain, however, from naming our solitary example until more specimens come to hand for comparison, especially as it is not in first-rate condition.
- S. (Acrilla) gracilis** H. Adams.—Two specimens.

FAMILY *EULIMIDÆ*.

- Eulima proxima** Sowerby.—Two specimens.

FAMILY *PYRAMIDELLIDÆ*.

- Pyramidella mitralis** A. Adams.—Several.
- P. nitida** A. Adams.—Common.
- P. nodicincta** A. Adams.—Several.
- P. variegata** A. Adams.—Abundant.
- Obeliscus dolabratus** A. Adams.—Several.
- O. pulchellus** A. Adams.—Several.
- O. sulcatus** A. Adams.
- O. turritus** A. Adams.—Several.
- Odostomia interstriata** Souverbie.—Two specimens—one white, one yellowish—the number of whorls is not quite as many as in the typical form, of which there are specimens from Upolu in J. C. Melvill's cabinets, but we place the species here with considerable certainty.
- Syrnola brunnea** A. Ad.—Three worn specimens of this interesting form.
- S. Mossiana** sp. nov. (Pl. II., fig. 16).
S. testa attenuata, lævi, nitida, delicatula, anfractibus septem, suprâ subventricosis, apud suturas pallidè ochraceo-cinctis, ultimo anfractu recto, prolongato, in medio ochraceo-cincto, apice obtuso, aperturâ oblongâ, labro exteriori simplici, columella uniplicata.
Long., 7.50 mill. Lat., 2.25 mill.
Hab., Lifu.

A few specimens only. The shell is smooth, whitish, shining, pyramidal, whorls seven, the upper ones somewhat ventricose, the last whorl straight and produced, with a pale ochraceous median band, this band being also perceptible around the sutures of the upper whorls. The apex is obtuse, outer lip simple, columella with one fold or plait. We have much pleasure in associating with this shell the name of Mr. William Moss, of Ashton-under-Lyne.

FAMILY *HELICINIDÆ*.

Helicina gallina Gassies.—A pretty species. Fairly common.

H. lifouana Crosse.—In great numbers, and very variable. Specimens from Uvea which have been identified as a form of this species, are considerably larger than those received from Lifu.

H. mediana Gassies.—Common and variable.

H. Primeana Gassies.—Common. Several specimens of the carinated variety.

H. sphæroidea Pfr.—Common.

H. sublævigata Pfr.—Common.

Several thousands of the above-mentioned small species of *Helicina* came to hand; in one or two parcels received from Mr. Hadfield they had apparently been used for packing, the interstices between the larger shells being filled in solid with them. Many of the shells are "dead," and very few retain the operculum.

FAMILY *HYDROCENIDÆ*.

Hydrocena Fischeriana Gassies.—Abundant.

FAMILY *NERITIDÆ*.

Nerita polita Linné.—Several.

N. (Peloronta) aurantia Recluz.—Several.

N. (Peloronta) chrysostoma Recluz.—Common.

N. (Peloronta) filosa Reeve.—Several.

N. (Peloronta) plicata Linné.—Several.

N. (Thelicostyla) albicilla Linné.—Several.

- Nerita** (*Thelicostyla*) *marmorata* Homb.—Common.
Neritina (*Vitta*) *morosa* Gassies.—Common.
N. (*Dostia*) *lifuensis* Ads. & Angas.—Several.
N. (*Clithon*) *nucleola* Morelet.—Common.

FAMILY *NERITOPSIDÆ*.

- Neritopsis** *radula* Linné.—One fine specimen.

FAMILY *TURBINIDÆ*.

- Turbo** *petholatus* Linné.—A number of very fine and perfect specimens; also many young ones.

- T.** (*Senectus*) *argyrostomus* Linné.—One remarkably fine specimen.

- T.** (*Senectus*) *artensis* Montrouzier.—Two fine specimens in the collection of the Ven. Archdeacon Anson. Peculiar to the New Caledonian group.

- T.** (*Senectus*) *chrysostomus* Linné.—Several pretty specimens.

- T.** (*Senectus*) *moluccensis* Phil.—One of the most interesting examples in the collection. Although we have never seen the type, the description given by Philippi is so lucid, and Sowerby's figure (*Thes. Conch.*, *Turbo*, pl. xiv., fig. 177) so plain that we have had but little difficulty in our identification. The original locality is Amboyna. The shell is a warm yellow, narrowly umbilicate, with polished transverse ribs, the interstices being obscurely crenulate, whorls five in number, and the ribs flecked with red and yellow spotting; last whorl slightly angled below the sutures, and outer lip tinged with green. In the Manchester Museum collection.

- T.** (*Senectus*) *nicobaricus* Gmelin.—Abundant.

- T.** (*Senectus*) *radiatus* Gmelin.—Many, mostly young or worn.

- T.** (*Senectus*) *sparverius* Gmelin.—Several.

- T.** (*Senectus*) *spinosus* Chemnitz.—One fine specimen.

FAMILY *TROCHIDÆ*.

- Trochus** *niloticus* Linné.—One small specimen.

- Polydonta conspersa** Raff.—Several.
P. histrio Reeve.—Several.
P. tricatēnata Reeve.—Two specimens.
P. tubifera Kiener.—Several.
P. obesa Reeve.—Several.
P. (Infundibulum) concava Gmelin.—Two, in the collection of the Ven. Archdeacon Anson, of Birch Rectory, Rusholme, both received from Mr. Hadfield, in 1892.
Pachypoma rhodostoma Lamarck.—Several.
Pyramidea fenestrata Gmelin.—Several.
P. obeliscus Gmelin = **P. pyramis** Born.—Three specimens.

Minolia glaphyrella sp. nov. (Pl. III., fig. 18).

M. testa rotundo-conica, profundē sed angustē umbilicata, solidiuscula, pallidē straminea, apice obtuso, anfractibus quinque, ventricosis, ad suturas impressis, undique transversim arcuē liricinctis, liris regularibus microscopicē brunneo-punctatis, continuis, anfractu ultimo apud peripheriam subangulato, obscurē brunneo-maculato, apertura parva, rotunda, labro exteriorē vix incrassato, simplicē, margine columellari parum contracto.

Long., 2·25 mill. *Lat.*, 5 mill.

Hab., Lifu.

A neat little species, very pale straw colour, rather solid, and uniformly delicately transversely lirate; under a lens some very obscure small brown spotted markings on the liræ, and larger spots at the periphery, are observable; umbilicus deep but narrow, mouth small, roundish. This shell seems for the present, at all events, best located in *Minolia* (A. Ad.), where we would also place *M. lifouana* rather than in *Monilea* (Swains.). It is more elaborately sculptured than *M. lifouana*, to which it does not bear more than a passing resemblance.

Minolia lifouana Fischer.—A few of this pretty little shell.

Clanculus clanguloides Wood. — A pretty pink-suffused variety.

C. Thomasi Crosse. — One, not perfect, but exhibiting the peculiar sculpture.

- C. unedo** A. Adams.—Several.
Elenchus (Thalotia) elongatus Wood.—Several.
G. nucleus Phil.—Common. Not quite typical, but not sufficiently distinct to separate in any way.
Ethalia guamensis Quoy.—Five specimens. The absence of any species of *Umboonium* seems remarkable.
Margarita striatula Phil.—Several specimens which, if not this species, are a close ally. We are indebted to Mr. E. Ruthven Sykes for the identification.

FAMILY *DELPHINULIDÆ*.

- Delphinula distorta** Linné.—One specimen.
D. laciniata Lamarck.—Two very handsome specimens.
Liotia varicosa Phil.—One or two specimens.

FAMILY *STOMATIIDÆ*.

- Stomatella haliotidea** Sowerby.—Two specimens.
S. maculata Quoy & Gaim.—One specimen.
S. Mariei Crosse.—Two, agreeing exactly with authentic specimens in J. C. Melvill's collection.
S. orbiculata A. Adams.—Several.
S. papyracea Chemnitz.—Several.
S. sulcifera Lamarck.—One small example.
Gena stellata Souverbie.—One fine specimen.
Stomatia decussata A. Adams.—One specimen.

FAMILY *HALIOTIDÆ*.

- Haliotis** sp.—In the collection of the Ven. Archdeacon Anson. Too imperfect to identify.
H. (Padollus) ovina Chemnitz.—Several small specimens.

FAMILY *ACMÆIDÆ*.

- Acmæa crucis** Ten.-Woods.—One pretty specimen.
A. conoidea Quoy.—Several.

FAMILY *PATELLIDÆ*.

- Patella stellaris** Reeve.—Several.
P. variegata Reeve.—Several.

CLASS SCAPHOPODA.

FAMILY DENTALIIDÆ.

Dentalium sp.—Three specimens too worn to identify with certainty, but closely allied to *D. politum* L.

CLASS PELECYPODA.

ORDER TETRABRANCHIATA.

FAMILY OSTREIDÆ.

Ostrea crista-galli Linné. — One perfect specimen and several valves of juvenile examples.

FAMILY SPONDYLIDÆ.

Spondylus ocellatus Reeve.—Several valves.

S. pacificus Reeve.—This last we identify with some little doubt, the specimens being in rather poor condition.

FAMILY PECTINIDÆ.

Pecten pallium Linné.—One perfect specimen and several valves of this beautiful species.

P. radula Linné.—Valves only, mostly juvenile.

FAMILY AVICULIDÆ.

Avicula (Meleagrina) margaritifera Linné. — A number of small-sized specimens.

A. (Meleagrina) anomoides Reeve.—Two specimens, one perfect but very juvenile.

Crenatula *cf.* **flammea** Lamarck.—One young example.

Perna *cf.* **linguæformis** Reeve.—One young specimen.

FAMILY MYTILIDÆ.

Mytilus sp.—Several specimens perhaps of *M. subdistortus* Recluz, but too young to identify with certainty.

Septifer pilosus Recluz.—Several perfect specimens.

Modiola tulipa Lamarck.—We cannot make out any difference between our specimens and the Australian and West Indian forms of this species.

Lithodomus gracilis Phil.—Two very fine and perfect examples.

FAMILY *ARCIDÆ*.

Barbatia fusca Brug.—Four perfect specimens and several valves.

Two or three other species of *Arcidæ* are in the collection, but all single valves, and somewhat worn. One comes near *A. japonica* Reeve.

Pectunculus *c.f.* **novo-caledoniensis** Angas.—One large valve and three juvenile examples which seem to be this species.

FAMILY *CARDITIDÆ*.

Mytilicardia muricata Sow.—Many single valves.

M. variegata Brug.—Several valves.

FAMILY *ERYCINIDÆ*.

Kellia fidelium sp. nov. (Pl. III., fig. 30).

K. testa ovato-rotunda, tenui, nitida, lactea, latere postico rotundato, antico compressiusculo, vix subquadrato.

Long., 17 mill. *Lat.*, 13.5 mill.

Hab., Lifu.

A very beautiful milk-white shining species, not unlike some of the *Scintillæ* in form, but more agreeing with the genus *Kellia*, to which we have relegated it. The hinge appears that of a normal *Kellia*. Rare.

FAMILY *TRIDACNIDÆ*.

Tridacna crocea Lamarck.—Two perfect specimens, one of them a juvenile only 20 mills. wide.

FAMILY *CARDIIDÆ*.

Lævicardium australe Sowerby.—Several.

Hemicardium cardissa Linné.—One small specimen.

H. hemicardium Linné.—Several valves.

H. (Fragum) unedo Linné.—Valves only.

FAMILY *CHAMIDÆ*.

Chama foliacea Quoy.—Worn valves only, but showing the distinctive red staining within.

FAMILY *CYPRINIDÆ*.

Libitina angulata Lam.—Several very pretty specimens.

FAMILY *VENERIDÆ*.

- Caryatis inflata* Sow. = *C. affinis* Gmel.—Several valves.
Lioconcha castrensis Linné.—Several well-marked specimens in various stages of growth.
L. picta Lam.—Two fine specimens.
L. sulcatina Lam.—Valves only.
Chione sp., near *C. cancellata* Chem.—One small example.
C. costellifera Ads. & Reeve.—Several perfect specimens, almost identical with Philippine examples of this species.
C. marica Linné.—Several beautiful specimens.
C. reticulata Linné.—One very fine specimen and some single valves.

FAMILY *DONACIDÆ*.

- Donax (Latona) australis* Lam.—One good perfect example and several single valves.

FAMILY *PSAMMOBIIDÆ*.

- Asaphis deflorata* Linné.—Many fine specimens.

FAMILY *LUCINIDÆ*.

- Lucina (Codakia) exasperata* Reeve.—Two perfect specimens and several valves.
L. (Codakia) fibula Reeve.—Many in great variety of color and form, white, salmon-pink, and yellow.
L. (Codakia) interrupta Lam.—One fine perfect specimen received by J. C. Melvill from Mr. Hadfield in 1891; also one in the Anson collection from the same source.
L. (Codakia) punctata Linné.—One perfect and several valves.
Loripes edentulus Linné.—Many imperfect specimens; valves only.
Corbis fimbriata Linné.—Several large and very beautiful specimens.

FAMILY *TELLINIDÆ*.

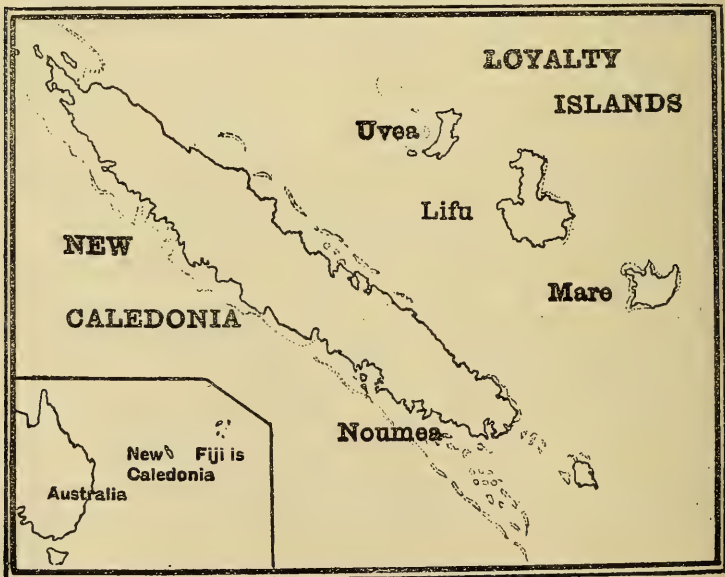
- Tellina (Tellinella) interrupta* Wood.—One specimen.
T. (Tellinella) jubar Hanley = *T. virgata* var.—Two beautiful specimens.

- T. (*Tellinella*) *perna* Speng.—One or two.
 T. (*Tellinella*) *picta* Desh.—Several fine examples.
 T. (*Tellinella*) *rugosa* Born.—Some good specimens, and several single valves.
 T. (*Tellinella*) *virgata* Linné.—Common.
 T. (*Tellinella*) *vulsella* Chemn.—Valves only.
 T. (*Donacilla*) *rhomboides* Quoy & Gaim.—Two perfect specimens and several odd valves. A very pretty form.
 T. (*Acropagia*) *scobinata* Linné.—Two fine examples.
 T. (*Tellinula*) *culter* Hanley.—A few brilliantly-coloured examples, crimson, white, or yellow.
 T. (*Tellinula*) *dispar* Conrad.—One specimen.
Macoma æqualis Deshayes.—A few examples, near *M. subovata* Sow. We fancy the true *M. subovata* also occurs, its head-quarters being New Zealand.

BRACHIOPODA.

FAMILY TEREBRATULIDÆ.

Terebratella sanguinea Chem.—Three specimens.



ADDENDA.

Upon again examining the last collection sent over by Mr. Hadfield, we find several species which we regret were not noticed in time to be placed in their proper sequence in the foregoing list. We now append them, and they will serve as a proof, should such be needed, that the resources of these islands are very far from being exhausted, and that any future consignments from this locality would be the means of adding several important, and possibly specifically new additions, to the large number already catalogued.

Rhytida Deplanchesi Gassies.—Several.

R. ouveana Souverbie.—Three specimens.

Planorbis Rossiteri Crosse.—Several.

Conus (Rhizoconus) capitaneus Linné. — One, in very fine condition, with epidermis.

C. (Lithoconus) Gruneri Reeve.—One.

Oliva (Strephona) carneola Lamarck. — Several, showing some variation of banding and colour.

Latirus (Peristernia) Wagneri Ant. = **L. crenulatus** Reeve.—One or two.

Ranella (Lampas) Paulucciana Tapp.-Canefri. — One, a good specimen and very distinctive.

Triton verrucosus Reeve.—One specimen.

T. (Lotorium) sinensis Reeve.—Several.

Cypræa aurora Sol. (p. 112).—Mr. Hadfield, in letter dated July 27, 1894, gives the following additional information: "Mrs. Hadfield has come upon a rare treasure in the shape of a fine orange Cowrie. It is reported among the natives that the old woman who found it was struck on the forehead by a demon, who asked her why she took the shell, a similar one never having been found in those waters. She died from the effects of the blow, so her good pastor tells me."

- Cerithium nodulosum** Bruguière.—One very fine specimen.
- Mitra (Pusia) Montrouzieri** Souverbie.—This little species is more commonly known as *M. tricolor* Montr., a name preoccupied by a Mediterranean species (*M. tricolor* Gmel.).
- Engina pulchra** Reeve.—One, typical and very beautiful.
- Purpura (Thalessa) echinata** Blainville.—Two specimens.
- Pentadactylus (Sistrum) elongatus** Blainville= **cancelatus** Quoy.—One good specimen showing the characteristic interstitial pitting.

ERRATA.

Page 85, line 16.—Transpose the words “these amongst.”

Page 87, line 7.—For “*Paryphanta seisseti*” read “*Micromphalia seisseti*”; on line 11, for “*pomatia* Linné” read “*aspersa* Müller.”

Page 88, line 4.—For “(*Rachis*) *zonulatus* Gass.=*B. mageni* Gass.” read “(*Rachis*) *mageni* Gass.=*B. histrio* Pfr.”

Page 88, line 18.—“*Plecotrema*.” Since the former part of this paper was put in type, Mr. E. R. Sykes has published (Proc. Mal. Soc., vol. i., pp. 241-299) an exhaustive review of the genus *Plecotrema* H. & A. Adams. In accordance with the law of priority, the two species hitherto known as *P. labrellum* H. & A. Adams and *P. Souverbiei* Montr. must now be termed *P. striatum* Philippi and *P. bellum* H. & A. Adams respectively.

Page 107, line 19.—For “*uricata*” read “*muricata*.”

Page 108, line 25.—For “fig. 12” read “fig. 13.”

Page 110, line 7 from bottom.—For “*R.*” read “*Ranella*.”

Page 116, line 30.—For “plate I.” read “plate II.”

Page 117, line 11.—Delete “(Pl. III., fig. 27).”

Page 119, line 19.—For “0·3” read “3.”

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The Journal of Malacology, vol. 4, No. 2, June 29, No. 3, Sep. 30, 1895.

"The Habits of Young *Sepia*," by F. A. BATHER. "New British Marine Shells" [*Scintilla eddystonia*, *Lepton Sykesii*, *Odostomia oblongula*], by J. T. MARSHALL. Notes on "Habits of the *Agnatha*," by W. M. WEBB. "Specific Identity of *Papuina hedleyi* and *P. canefriana*," by E. R. SYKES. and "Variations in radulæ," by G. BAILEY. "Mollusca of the Oriental Region," by C. HEDLEY [This should be extended to include the Papuan, Polynesian, and Melanesian sub-regions]. "Notes on a Few of the less-known British Marine Mollusca" [*Adeorbis imperspicuus*, *Lepton Sykesii*, *Ctenella pellucida*, *Cerithiopsis Clarkii*], by G. W. CHASTER; "New British Marine Shells" [*Rissoa subsoluta*], by J. T. MARSHALL.

Transactions of the Royal Society of South Australia, vol. 19, part I.

"Descriptions of New Species of Marine Mollusca of South Australia," by J. C. VERCO [*Murex Tatei*, *M. robustus*, *Trophon angustus*, *T. levis*, *Triton mimeticus*, *Latirus aurantiacus*, *L. Pulleinei*, *Crassatella producta*, *C. micra*]. "A Revision of the Recent Gasteropods of South Australia," by J. C. VERCO [This instalment includes only the families Muricidæ and Tritoniidæ]. "Correlation of the marine tertiaries of Australia," by R. TATE and J. DENNANT [Gives a list of fossil mollusca and other organisms].

The Irish Naturalist, vol. 4, Nos. 4 to 11, 1895.

"Some Cases of the Disintegration of Shells," by Miss R. HENSMAN [Treats of the effects of *Gomontia polyrhiza* and other algæ. To the "Galway Conference Number" Mr. R. STANDEN contributes a list of 212 marine species, and 62 land and freshwater forms collected during the excursions. Some interesting particulars are given regarding the semi-fossil land shells of Dog's Bay, Connemara]. "The Raised Beaches of Inishowen," by R. LLOYD PRAEGER [Several lists of mollusca].

Transactions of the Manchester Microscopical Society for 1894.

"The value of the Radula as an aid to Classification," by W. MOSS [Adduces instances in which examination of the radula has been instrumental in determining the relationship of doubtful forms; figures are given of the radulæ of *Zonites alliarius*, *Helix pomatia*, *H. (Macrocyclis) quekettiana*, *Rhytida kraussi*, *R. ptychomphala*, *R. greenwoodi*, and *Natalina coerneiensis*].

The Annals of Scottish Natural History, Nos. 13—16.

“Additions to the Authenticated Comital Census of the Land and Freshwater Mollusca of Scotland,” by W. DENISON ROEBUCK. [Mrs. CARPHIN records a reversed *Helix hispida* in Berwickshire, and Mr. G. M'DOUGAL gives some additions to Mr. Roebuck's list].

Proceedings of the Academy of Natural Sciences of Philadelphia, 1894, part 3, 1895, part 1.

“New and otherwise interesting Tertiary Mollusca from Texas,” by G. D. HARRIS [Gives descriptions and figures of sixty-five new species]. “New Species of the genus *Cerion*,” by H. A. PILSBRY and E. G. VANATTA [By cutting sections of the shells of this genus it has been found that certain species externally alike present differences in the internal teeth or lamellæ; about a score of new forms thus distinguished are briefly diagnosed, further information and figures being reserved for a future communication].

Transactions of the Wagner Free Institute of Science of Philadelphia, vol. 3, part 3.

“Contributions to the Tertiary Fauna of Florida,” part 3, a new classification of the Pelecypoda, by W. H. DALL.

[Some years ago (1889) Mr. Dall published in outline his new classification of the *Pelecypoda*, primarily based, like that of Neumayr, on hinge characters, though other parts of the anatomy receive a share of attention. The memoir begins with an account of the anatomy of the order, with special reference to matters of systematic importance, which occupies 26 pages; then follows the systematic list, in which all the sub-orders, super-families, and families are diagnosed by characters based on known facts and comparable one with another. In conclusion, we find some remarks on nomenclature which will, we should think, find general acceptance. We cannot but regret that so valuable a paper should be as it were hidden away as an appendix to a work on the paleontology of a special and limited district, but we doubt not that those who are really interested will find it out, and give it the careful study it deserves].

Journal de Conchyliologie, vol. 42, No. 3, for July, 1894 [dated on cover 1894, received Oct. 25, 1895].

[The whole of the present number is occupied by the first instalment of a paper by Mons. H. Crosse, entitled “Faune malacologique terrestre et fluviatile de la Nouvelle-Calédonie et des ses Dépendances,” and is illustrated by two coloured plates. At the outset a list is given of twenty-three forms which have been wrongly attributed to these islands, and on this ground it is proposed to change the name of *Partula caledonica* to *P. Pfeifferi*. The number of species recorded so far is 202—*Charopa subacanthinula* is described as new; *Helix Raynaldi* Gassies is made the type of a new genus *Ouapagia*; and *Scarabus leopardus* Gassies (*non* Reeve) is rechristened *Pythia Gassiesi*.]

Transactions of the Academy of Science of St. Louis, vol. 6, No. 18, vol. 7, Nos. 1—3.

"A study of the *Unionidæ* of Arkansas, with incidental reference to their Distribution in the Mississippi Valley," by R. ELLSWORTH CALL [This revision is "based upon an extensive private collection of *Unionidæ*, which is geographically and numerically all but complete," and on some months' study in the Smithsonian Institution. No less than 59 species are recorded (*Unio*, 52; *Margaritana*, 3; *Anodonta*, 4) none of them being new; 22 species are figured in 21 plates, and it is noted that in several cases the synonymy has been increased by different sexes having been described as specifically distinct.]

Scientific Results of Explorations by the U.S. Fish Commission Steamer, "Albatross," xxxiv.

"Report on Mollusca and Brachiopoda Dredged in Deep-Water, chiefly near the Hawaiian Islands, with Illustrations of hitherto Unfigured Species from North-West America," by W. H. DALL.—*Proc. U. S. Nat. Museum*, vol. 17, No. 1032, with 10 plates.

[The *Albatross* made eight hauls of the dredge on approaching Honolulu in 200 to 400 fathoms, and brought up some half-dozen to one dozen small bottles of material, which did not contain a single species heretofore described. One new sub-genus (*Spergo*) of *Pleurotomidæ*, and numerous species are described, and a very full account is given of the anatomy of *Euciroa pacifica*, the representative of the family *Euciroidæ*.]

Beiträge zur Kenntniss der Strombiden, besonders der Gattung *Terebellum* Klein, by R. BERGH. *Zool. Jahrbücher*, vol. 8, pp. 342—378, plates 22, 23.

[The research, which contains a detailed account of several members of the family *Strombidae*, scarcely admits of abstraction. The conclusion that *Terebellum* belongs to this group, first definitely shown when Adams and Reeve examined the animal, is fully maintained.]

Feuille des jeunes naturalistes, Nos. 291—301, Jan.—Nov., 1895.

"Catalogue raisonné des mollusques des montagnes de Saint-Béat et du Pic-du-Gar" (Haute-Garonne), by M. GOURDON. [Records 59 species]. "Description d'une nouvelle espèce de *Modiola* [*M. gallica*] provenant du littoral occidental de la France," by PH. DAUTZENBERG (figured). "Récolte des mollusques (conseils aux voyageurs)," by M. BAVAY. "Revue de paléoconchologie," by M. COSSMANN [The first of a series of articles in which the author proposes to record the progress of this branch of our science]. "Faunule marine locale de Bandol et complément à la faune bathonienne (Var) du gîte la Sorquette, près Bandol," by M. CAZIOT [Lists supplementary to previous writings on the same subject]. "Faune malacologique terrestre et fluviatile du département de la Vienne," by M. CAZIOT [In progress].

ON THE OCCURRENCE OF
ALECTRYONIA UNGULATA, IN S.E. AFRICA;
 WITH A NOTICE OF PREVIOUS RESEARCHES
 ON THE CRETACEOUS CONCHOLOGY
 OF SOUTHERN AFRICA.

By R. BULLEN NEWTON, F.G.S., of the British Museum.

(Read before the Conchological Society, July 3rd, 1895).

During a visit to this country, some months ago, Mr. David Draper, F.G.S., presented a specimen of *Alectryonia ungulata* to the British Museum (Nat. Hist.), which he had found on the beach at Sofala, off S.E. Africa, and which had evidently, from the colour of its matrix, been washed out of a red-coloured limestone formation.

The chief interest of this fossil shell lies in the fact that its characters afford reliable evidence of the presence of the uppermost cretaceous rocks in this part of Africa. Hitherto these strata have only been traced from the southern boundary of Natal to St. Lucia Bay in Zululand, so that their extension some seven hundred miles further northward is proved by this discovery at Sofala.

This species has a wide geographical range, having been recorded from England (near Cromer), France, Belgium (Ciply, near Mons), Holland (Mæstricht), Sweden (Balsberg), Russia (Crimea), Spain, Algeria, Suez, Asia Minor, India (Pondicherry), Madagascar (Ambohitrombikely), and the United States (Alabama and New Jersey). The following synonymy will be of service in showing the variety of names under which it has been known to science :

*Alectryonia ungulata** Schlotheim sp.

1768.—[Figures only]—Knorr: Recueil cat. petrifications, vol. ii., section I., pl. D. vii., figs. 5, 6, (Mæstricht).

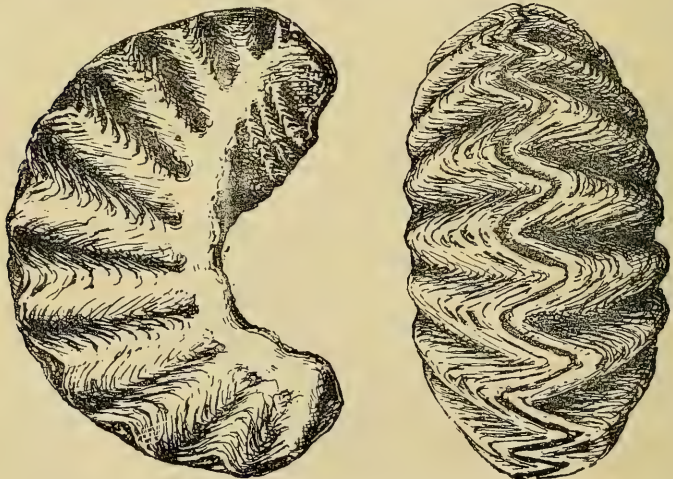
*This synonymy is mostly compiled from H. Coquand's "Monographie du genre, *Ostrea*—Terrain crétacé," 1869, p. 58.

- 1813.—OSTRACITES UNGULATUS, Schlotheim: Taschenbuch, [Leonhard] vol. vii., p. 112, (Mæstricht).
- 1816.—OSTREA CANALICULATA, J. Sowerby: Mineral Conchology, vol. ii., pl. 135, fig. 1, p. 77 (Norfolk).
- 1819.—OSTREA LARVA, Lamarck: Hist. nat. anim. sans vert., vol. vi., p. 216 (Mæstricht).
- 1827.—OSTREA LUNATA, Nilsson: Petrificata Suecana format. cretaceæ, pl. 6, fig. 3, p. 31 (Sweden).
- 1830.—OSTREA FALCATA, Morton: American Journal [Silliman] vol. xviii., pl. 3, fig. 19, 20, and vol. xvii., p. 284 (United States).
- 1833.—OSTREA ALÆFORMIS, S. Woodward: Geology of Norfolk, pl. 6, fig. 2, p. 48.
- 1834.—OSTREA MESENERICA, } Morton: Synopsis Cret., United
OSTREA NASUTA, } States, pl. 9, figs. 6 and 7, p. 51.
- 1835.—ALECTRYONIA ACRODONTA, Fischer de Waldheim: Bull. Soc. Moscou, vol. viii., pl. 5, fig. 2, p. 116 (S. Russia).
- 1837.—OSTREA LUNATA, Hisinger: Lethæa Suecica, pl. 14, fig. 4, p. 49 (Sweden).
- 1845.—OSTREA LARVA, d'Orbigny: Pal. française, terr. crétacés, pl. 486, figs. 4—8, p. 740 (France).
- 1846.—OSTREA TEGULANEA, Forbes: Trans. Geol. Soc. London, vol. vii., part iii., pl. 18, fig. 6, p. 156 (S. India).
- 1847.—OSTREA PONTICERIANA, d'Orbigny: Voy. pole sud, pl. 8, fig. 45, 46 [no text] (S. India).
- 1850.—OSTREA LARVA? Kner: Nat. Abhandl. [Haidinger], vol. iii., pl. 5, fig. 4, p. 30 (Lemberg, Austrian Poland).
- 1852.—OSTREA UROGALLI, Quenstedt: Handbuch Petrefaktenkunde, pl. 40, fig. 24, p. 499 (Mæstricht).
- 1869.—OSTREA UNGULATA, Coquand: Mon. Ostrea Crétacé, pl. 31, figs. 4—15, p. 58 (several localities referred to).

1889.—ALECTRYONIA UNGULATA, R. B. Newton: Quart. Journ. Geol. Soc., vol. xlv., pl. 14, fig. 12, p. 333 (Madagascar).

DESCRIPTION OF SPECIES.

Sigmoidal, narrow, elongate, unguulate, mostly smooth in the young state; valves with a convex aliform expansion on the inner sides near the hinge area, closely ridged with arched plications; the upper or dorsal surface bears a smooth median groove which extends along the entire length of shell, and is of the same width throughout, and sometimes rather concave; the buccal view presents from eight to sixteen (according to age) prominent saw-like teeth, which are pointed or obtuse; the teeth on the opposite side are not quite so prominent, being rather less in size and closer together; the outer sides are furnished with long, straight, and broad plications, directed obliquely, which are relieved by deeply excavated grooves; valves are obliquely convex outwardly and vertically sided within, after leaving the expansion; in the very young state the valves are depressed and possess few dentiform plications.



ALECTRYONIA UNGULATA.—Nat. size.
From the Upper Cretaceous beds of Sofala.

The left hand figure exhibits the aliform expansion, groove and lateral plications; the other figure gives the buccal view.

REMARKS.

According to the age of this species so it varies somewhat in the characters here given, though the smooth median groove can be always traced. In general contour and in possessing the prominent lateral plications, it resembles other forms of the genus, such as *A. frons*, Parkinson, sp., *A. carinata*, Lamarck, sp., *A. macroptera*, J. de C. Sowerby, etc.; but in all these shells the lateral plications meet on the dorsal summit of the valves, and exhibit no indication of the channel or groove, which is the distinguishing character of *A. ungulata*.

The present specimen from Sofala is fragmentary (its termination being wanting) and waterworn, though the distinctive features are well represented. Its valves are attached, the buccal view showing the powerful interlocking nature of the dentiform processes.

Although this species has the widest geographical distribution of any of the Ostreidæ it is geologically restricted to the uppermost cretaceous deposits known in South Africa as the zone of *Puzosia Gardeni*, and in Europe as the Campanien and the Mæstrichtien, the former being the highest division of the Senonian formation, the latter the lower portion of the Danien. In England this upper Cretaceous zone is represented by the topmost beds of the Upper Chalk developed at Mundesley and Trimmingham in Norfolk, where the species has been recognised as *alaeformis* and *canaliculata*, which together with *falcata*, *lunata*, and *larva* of other countries represent the junior stages in the growth of the true *ungulata*.

From the highest cretaceous strata of Southern India, called the Ariyalur Group, this species was recorded by Forbes, nearly half a century ago, under the name of *Ostrea tegulanea*; more recently in 1889* it was discovered in large numbers in Madagascar, and now that it is found in S.E. Africa we are furnished with additional evidence in favour of the view that

*R. D. Newton, Quart. Journ. Geol. Soc., 1889, vol. xlv., pl. 14, fig. 12, p. 333.

these widely separated areas were united by a land surface during cretaceous times, thus giving rise to the possible existence in that epoch, of an Indo-African Continent.

PREVIOUS RESEARCHES ON THE CRETACEOUS CONCHOLOGY
OF SOUTHERN AFRICA.

So far as I have been able to discover, the earliest record of Cretaceous Mollusca from South Africa was made by Hofrath Hausmann,¹ in 1837. He obtained certain shells from the district of Sunday river, about 18 miles from Enon, which, without being described or figured were determined as:—

Hamites, like *intermedius*, J. Sowerby, or

H. funatus, Brongniart,

Ammonites spinosissimus, (MS.),

Cytherea like *caperata*, J. de C. Sowerby,

Trigonia like *dædalea* and *clavellata*, Parkinson,

all of which forms were regarded as belonging to the Greensand formation.

Goldfuss² subsequently described and figured two of Hausmann's shells; one as *Lyrodon Hertzogi*, the other as *Cytherea Hertzogi*, both being recognised as Greensand fossils from the Sunday river neighbourhood near Enon.

In 1850 Dr. Ferdinand Krauss³ described several lamelli-branch shells, which he had collected during 1839, from deposits on the left bank of the Zwartkop river, and which were stated to indicate a Lower Greensand age.

They were figured and diagnosed as follows:—

Anoplomya lutraria (gen. et sp. nov.).

Astarte Bronni, sp. nov.

Astarte (Cytherea) Hertzogi, Goldfuss

Cucullæa cancellata, sp. nov.

1 Beiträge zur Kunde der geognostischen Constitution von Süd-Afrika. *Gottingische gel. Anzeigen*, 1837. Part 3, p. 1449.

2 Petrefacta germaniæ, 1837, vol. 2, pl. 137, fig. 5, p. 202.

" " 1840, vol. 2, pl. 149, fig. 10, p. 239.

3 Ueber einige Petrefacten aus der untern Kreide des Kaplandes. *Nov. Act. Acad. Cæs. Leop.-Carol Nat. Cur.* (Breslau & Bonn), 1850. Vol. 22, pls. 47-50, pp. 439-464.

- Exogyra imbricata*, sp. nov.
Gervillia dentata, sp. nov.
Lyrodon conocardiiiformis, sp. nov.
Lyrodon Hertzogi, Goldfuss
Lyrodon ventricosus, sp. nov.

W. H. Baily¹ in 1855 described a collection of fossils made by Captain Garden from the region of the Umtafuna river, called the Izinhluzabalungu Cliffs, about 5 miles from the southern boundary of Natal. This included a large number of mollusca referred to the horizon of the Blackdown Beds of England or the *Craie chloritée* of France, many of the species showing a distinct resemblance to those found in the Cretaceous strata of Southern India. These specimens were determined as follows ; names without authors indicating new species :—

CEPHALOPODA.

- | | |
|---------------------------|---------------------------|
| <i>Ammonites Gardeni</i> | <i>Ammonites Umbulazi</i> |
| <i>Ammonites Soutoni</i> | <i>Baculites sulcatus</i> |
| <i>Ammonites Stangeri</i> | |

GASTROPODA.

- | | |
|-------------------------------|---|
| <i>Chemnitzia Sutherlandi</i> | <i>Turritella Bonei</i> |
| <i>Natica multistriata</i> | <i>Turritella Meadi</i> |
| <i>Scalaria ornata</i> | <i>Turritella Renauxiana</i> , d'Orbig. |
| <i>Solarium pulchellum</i> | <i>Voluta rigida</i> |

LAMELLIBRANCHIATA.

- | | |
|--|---|
| <i>Arca natalensis</i> | <i>Ostrea</i> sp. |
| <i>Arca umzambaniensis</i> | <i>Pecten</i> allied to <i>virgatus</i> , Nilsson |
| <i>Astarte</i> sp. | <i>Pecten quinquecostatus</i> , |
| <i>Cardium</i> sp. | J. Sowerby |
| <i>Cardium denticulatum</i> | <i>Pectunculus</i> sp. |
| <i>Corbula</i> like <i>carinata</i> d'Orbigny | <i>Poromya</i> ? sp. |
| <i>Inoceramus expansus</i> | <i>Solecurtus</i> ? sp. |
| <i>Lucina</i> like <i>caperata</i> J. de C. Sby. | <i>Teredina</i> sp. |
| <i>Nucula</i> sp. | <i>Trigonia elegans</i> |

¹ Descriptions of some Cretaceous Fossils from South Africa ; collected by Capt. Garden of the 45th Regiment. *Quart. Journ. Geol. Soc.* 1855, vol. xi., pls. xi.-xiii., pp. 454-465.

Dr. Atherstone and A. G. Bain made further discoveries of molluscan remains from the strata skirting the Sunday and Zwartkop rivers which were fully described and figured by Daniel Sharpe¹ in 1856.

In opposition to the previous views of Hausmann and Krauss they were assigned to a Jurassic age.

The following were the shells described, names without authors representing the new species :—

CEPHALOPODA.

Ammonites Atherstonei *Ammonites Baini*

GASTROPODA.

Acteon ? undetermined *Natica*, undetermined

Acteon Atherstonei *Neritopsis* ? *turbinata*

Ampullaria ? undetermined *Trochus Baini*

Cylindrites ? undetermined *Turbo Atherstonei*

Natica Atherstonei *Turbo Baini*

LAMELLIBRANCHIATA.

Arca Atherstonei *Modiola Baini*

Avicula Baini *Myacites* ? *Baini*

Ceromya papyracea *Perna Atherstonei*

Cyprina rugulosa *Pholadomya dominicalis*

Cyprina ? *Baini* *Pinna Atherstonei*

Gastrochæna dominicalis *Psammobia Atherstonei*

Gryphæa (Exogyra) imbricata *Sanguinolaria* ? *africana*

Krauss *Trigonia vau*

Modiola Atherstonei

In 1867 Mr. Ralph Tate² in a comprehensive paper on South African fossils described and figured a number of shells from the Uitenhage district (Sunday and Zwartkop rivers, &c.), which he regarded as Jurassic. He designated the rocks containing them the "Uitenhage Formation." The following species were determined ; those without authors being new :—

¹ Description of Fossils from the Secondary Rocks of Sunday and Zwartkop rivers, South Africa, collected by Dr. Atherstone, and A. G. Bain, Esq. *Trans. Geol. Soc. London*, 1856, vol. vii., pls. xxii. and xxiii., pp. 193-202.

² On some Secondary Fossils from South Africa. *Quart. Journ. Geol. Soc.* 1867, vol. xxiii., pls. 7-9, pp. 149-175.

CEPHALOPODA.

Ammonites subanceps *Belemnites africanus*
Hamites africanus

GASTROPODA.

Actæonina Jenkinsiana (= *Actæon* ? undetermined, Sharpe)
Actæonina Morrisiana (= *Ampullaria* ? undetermined, Sharpe)
Actæonina Sharpeana (= *Cylindrites* ? undetermined, Sharpe)
Alaria coronata
Ampullaria ? *ignobilis* (= *Ampullaria* ? undetermined, Sharpe)
Chemnitzia africana
Patella caperata
Phasianella ? *Sharpei* (= *Natica*, undetermined, Sharpe)
Turbo Stowianus
Turritella Rubidgeana

LAMELLIBRANCHIATA.

<i>Arca</i> (<i>Cucullæa</i>) <i>Jonesi</i>	<i>Mytilus Jonesi</i>
<i>Astarte Longlandsiana</i>	<i>Mytilus</i> (<i>Lithodomus</i>) <i>Stow-</i> <i>ianus</i>
<i>Astarte Pinchiniana</i>	<i>Mytilus</i> (<i>Modiola</i>) <i>Rubidgei</i>
<i>Cardita nuculoides</i>	<i>Ostrea imbricata</i> Krauss
<i>Corbula</i> ? <i>Rockiana</i>	<i>Ostrea</i> (<i>Exogyra</i>) <i>Jonesiana</i>
<i>Crassatella complicata</i>	<i>Pecten projectus</i>
<i>Cucullæa Kraussi</i> (= <i>Cucullæa</i> ? <i>cancellata</i> , Krauss, non Sowerby nec Phillips)	<i>Pecten Rubidgeanus</i>
<i>Cucullæa</i> (<i>Macrodon</i>) <i>Ather-</i> <i>stonei</i> Sharpe sp.	<i>Pinna Sharpei</i>
<i>Cypricardia Niveniana</i>	<i>Placunopsis imbricata</i>
<i>Cyprina Borchersi</i>	<i>Placunopsis subjurensis</i>
<i>Lima neglecta</i> (= <i>Lima</i> sp. undetermined, Sharpe)	<i>Placunopsis undulata</i>
<i>Lima obliquissima</i>	<i>Trigonia cassiope</i> , d'Orbigny
	<i>Trigonia Goldfussi</i> , Agassiz
	<i>Trigonia ventricosa</i> Krauss
	<i>Trigonia vau</i> , Sharpe

Mr. C. L. Griesbach¹ published descriptions and figures in 1871 of several mollusca which he had collected from the

¹ On the Geology of Natal, in South Africa, *Quart. Journ. Geol. Soc.*, 1871, vol. xxvii., pl. 3, pp. 60-70.

same strata and locality yielding those previously diagnosed by W. H. Baily. The beds containing these fossils he termed the "Izinhluzabalungu Deposits." They consisted of five horizontal layers, the lowest resting unconformably on the older rocks of the Karoo Formation. In descending order they were tabulated thus :—

- 1 Zone of *Ammonites Gardeni*,
- 2 Gastropoda-Bed.
- 3 Ammonite-Bed.
- 4 *Trigonia*-Bed.
- 5 Sandstone with fossil wood, &c.

These zones or beds, stated to extend as far as St. Lucia Bay in Zululand, contained a fauna which was regarded as belonging to the Chalk, Upper Greensand and Lower Greensand horizons, and about twenty of the molluscan species were referred to Southern Indian Cretaceous forms. The determinations, with their horizons, embraced the following species ; those without author's names being new :

Most probably White Chalk (= No. 1 of section).

CEPHALOPODA.

Ammonites Gardeni, Baily.

Probably Upper Greensand (= No. 2 of section).

CEPHALOPODA.

Ammonites Umbolazi, Baily.

GASTROPODA.

Avellana ampla, Stoliczka

Cerithium (Fibula?) delectum, Stoliczka

Cerithium kaffrarium

Chemnitzia undosa Forbes (= *Turritella Meadi*, Baily, *Chemnitzia Sutherlandi*, Baily)

Euchrysalis gigantea, Stoliczka (= *Turritella Renauxiana*, Baily)

Fasciolaria assimilis, Stoliczka

Fasciolaria (Voluta) rigida, Baily

Lagena nodulosa, Stoliczka

- Natica multistriata*, Baily
Polia (Murex) pondicherriensis, Forbes
*Pugnellus (Strombus) uncatu*s, Forbes
Scalaria turbinata, Forbes (= *S. ornata*, Baily)
Solariella (Trochus) radiatula, Forbes
Solarium Wiebeli
Turritella multistriata, Reuss, (= *Turritella Sowerbyi*, Forbes,
T. Bonei, Baily)
Tritonidea (Murex), trichinopolitensis, Forbes

SCAPHOPODA.

Dentalium sp.

LAMELLIBRANCHIATA.

- | | |
|--------------------------------------|---|
| <i>Arca capensis</i> | <i>Ostrea</i> sp. |
| <i>Arca natalensis</i> , Baily | <i>Pecten amapondensis</i> |
| <i>Astarte</i> sp. | <i>Pecten quinquecostatus</i> , Sowerby |
| <i>Cardium denticulatum</i> , Baily | <i>Pectunculus africanus</i> |
| <i>Cardium Hillanum</i> , J. Sowerby | <i>Trigonia elegans</i> |
| <i>Inoceramus expansus</i> , Baily | <i>Venus arcotensis</i> , Forbes |

Lower Greensand. (= Nos. 3, 4, and 5 of section).

CEPHALOPODA.

- | | |
|-----------------------------------|------------------------------------|
| <i>Ammonites Soutoni</i> , Baily | <i>Ammonites Kayei</i> , Forbes |
| <i>Ammonites Stangeri</i> , Baily | <i>Anisoceras rugatum</i> , Forbes |
| <i>Ammonites remba</i> , Forbes | |

LAMELLIBRANCHIATA.

- | | |
|----------------------------|-------------------|
| <i>Trigonia Shepstonei</i> | <i>Teredo</i> sp. |
|----------------------------|-------------------|

Messrs. Holub and Neumayr's¹ paper of 1882 appears to form the latest contribution to the history of South African Cretaceous shells. These authors obtained their specimens from the Uitenhage strata of the Sunday and Zwartkop river districts. They included the following forms in their determinations, all being regarded as of Neocomian age:—

CEPHALOPODA.

- Crioceras (Ammonites) spinosissimum* (Hausmann MS.), n. sp.

¹ Über einige Fossilien aus der Uitenhage - Formation in Süd - Afrika. *Denkschr. k. Akad. Wiss. Wien*, 1882, vol. 44, pls. 1, 2, p. 267.

Olcostephanus (Ammonites) Atherstonei, Sharpe

Olcostephanus (Ammonites) Baini, Sharpe

GASTROPODA.

Monodonta Hausmanni, n. sp.

LAMELLIBRANCHIATA.

Cucullæa Kraussi, Tate

Trigonia Tatei, n. sp. (= *T. cassiope*, Tate non d'Orbigny)

Seebachia [n.g.] (*Astarte*) *Bronni*, Krauss

During 1884 Professor Rupert Jones¹ formulated a scheme of the geological strata of South Africa in which the Uitenhage Beds were severally named, and bracketed Jurassic, in the following descending order —

Jurassic :	Uitenhage formation.	{	(1). Trigonia beds.
			(2). Wood beds.
			(3). Saliferous beds.
			(4). Zwartkop Sandstone.
			(5). Enon Conglomerate.

Schenck² in 1888 founded the term “Utamfunaschichten” for the beds previously described by Griesbach as the Izinhluzabalungu deposits, which included the Upper Cretaceous rocks of South Africa. The Uitenhage formation, named the “Uitenhagenschichten,” he considered Lower Cretaceous, and adopted a similar arrangement of its beds to that furnished by Rupert Jones.

Prof. G. A. F. Molengraafe³ published a useful chart in 1890, illustrating the various opinions held by geologists from earliest times as to the geological structure of South Africa. In tabulating the Cretaceous rocks he gives Schenck's arrangement, but brackets the Utamfunaschichten as “Obere Kreide” (= Upper Cretaceous) and the Uitenhagenschichten as “Neocomian” (= Lower Cretaceous).

1 On the Geology of South Africa. *Nature*, 1884, vol. xxx., pp. 553-554.

2 Die geologische Entwicklung Süd-Afrikas. *Petermann's Mitteilungen*, 1884, vol. xxxiv., p. 231.

3 Schets van de Bodemgesteldheid van de Zuid Africaansche Republiek, etc. *Tijdschr. Konink. Nederlandsch. Aardrijksk. Genoots.* Jaargang 1890.

Dr. Franz Kossmat¹ has quite recently issued a paper on the Southern Indian Cretaceous formation, and compares it with other areas of similar age based mainly on a study of the molluscan fauna of this period. He recognises the fact, long since pointed out by Baily, Stoliczka, Griesbach and others, that the Upper Cretaceous beds of South Africa represented by the Izhnhuzabalungu deposits bear a Southern Indian facies, and may be grouped according to the divisions now adopted by the Geological Survey of India for that country.

These beds he tabulates, with their European equivalents, as follows :—

- | | |
|--|-------------------------------------|
| (1) Chalk, with <i>Ammonites Gardeni</i> } | =Ariyalur group
(=Senonien). |
| (2) Soft Sandstone, with numerous
Bivalves and Gastropods
(<i>Fasciolaria rigida</i> , <i>Chemnitzia undosa</i> , <i>Protocardium Hillanum</i> , etc. } | =Trichinopoly group
(=Turonien). |
| (3) Sandstone with <i>Ammonites Umbolazi</i> , <i>A. Soutoni</i> , <i>A. Stangeri</i> ,
<i>A. remba</i> , <i>A. Kayei</i> , <i>Anisoceras rugatum</i> . | =Utatur group
(=Cenomanien). |
| (4) Soft brown Sandstone (resembling No. 2), with <i>Trigonia Shepstonei</i> . | |
| (5) Chalky Sandstone, with <i>Teredo</i> . | |

From the foregoing epitome of the history of Cretaceous mollusca in South Africa, it will be observed that the Upper Cretaceous forms have been restricted to one particular region on the southern boundary of Natal, now extended northwards to Sofala in consequence of the discovery of *Alectryonia unguilata* at that place; whilst the Lower Cretaceous or Neocomian

1 Die Bedeutung der südindischen Kreide-Formation für die Beurtheilung der geographischen Verhältnisse während der späteren Kreidezeit. *Jahrb. k. k. geol. Reichsanstalt* (Wien), 1894, vol. xlv., part 3; p. 463.

species, at one time regarded as Jurassic, belong to the Sunday and Zwartkop River districts, in or near the province of Uitenhage. Their respective lists may be tabulated as follows, due regard having been given to a revision of the generic names, which are, as far as possible, brought up to date :—

UPPER CRETACEOUS MOLLUSCA FROM SOUTH AFRICA, WITH
THEIR GEOLOGICAL RANGES ACCORDING TO INDIAN
NOMENCLATURE.

Abbreviations—A=Ariyalur group=Senonien (Upper Chalk).
T=Trichinopoly group = Turonien (Lower Chalk).
U=Utatur group=Cenomanien (Chalk Marl, Chloritic Marl, Upper Greensand, and Gault).

CEPHALOPODA.

<i>Anisoceras rugatum</i> , Forbes	...	...	...	...	U.
<i>Baculites sulcatus</i> , Baily	...	...	...	...	U. (?)
<i>Lytoceras Kayei</i> , Forbes sp.	...	...	...	...	U.
<i>Puzosia Gardeni</i> , Baily, sp.	...	...	...	...	A.
<i>Puzosia rembda</i> , Forbes, sp.	...	...	...	...	U.
<i>Schloenbachia Soutoni</i> , Baily, sp.	...	...	...	...	U.
<i>Schloenbachia Stangeri</i> , Baily, sp.	...	...	...	...	U.
<i>Schloenbachia Umbolazi</i> , Baily, sp.	...	...	...	...	U.

GASTROPODA.

<i>Avellana ampla</i> , Stoliczka	...	...	...	...	T.
<i>Cerithium (Fibula?) detectum</i> , Stoliczka	...	...	...	...	A.
<i>Cerithium kaffrarium</i> , Griesbach	...	...	...	...	T.
<i>Euchrysalis gigantea</i> , Stoliczka	...	...	...	...	T. A.
<i>Fasciolaria assimilis</i> , Stoliczka	...	...	...	...	A.
<i>Fasciolaria rigida</i> , Baily, sp.	...	...	...	...	T.

<i>Lagena nodulosa</i> , Stoliczka	...	...	...	...	T. A.
<i>Natica multistriata</i> , Baily	...	...	...	...	T.
<i>Polia pondicherriensis</i> , Forbes, sp.	...	...	...	...	T.
<i>Pugnellus uncatius</i> , Forbes, sp.	...	...	...	...	T. A.
<i>Scala turbinata</i> , Forbes, sp.	...	...	...	...	A.
<i>Solarium pulchellum</i> , Baily	...	...	...	...	T.
<i>Solarium Wiebelsi</i> , Griesbach	...	...	...	...	T.
<i>Tritonidea trichinopolitensis</i> , Forbes, sp.	...	...	...	...	T.
<i>Turbonilla undosa</i> , Forbes sp.	T.
<i>Turritella multistriata</i> , Reuss	T. A.

SCAPHOPODA.

<i>Dentalium</i> sp.	T.
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LAMELLIBRANCHIATA.

<i>Alectryonia unguolata</i> , Schlotheim, sp.	A.
<i>Arca capensis</i> , Griesbach	T.
<i>Arca umzambaniensis</i> , Baily	...	...	...	...	T.
<i>Astarte</i> sp.	...	...	...	...	T.
<i>Axinæa africana</i> , Griesbach, sp.	...	...	...	...	T.
<i>Cardium denticulatum</i> , Baily	...	...	...	...	T.
<i>Corbula</i> , like <i>C. carinata</i> , d'Orbigny	...	...	...	...	T.
<i>Cucullæa natalensis</i> , Baily, sp.	...	...	...	...	T.
<i>Inoceramus expansus</i> , Baily	...	...	...	...	A. (?)
<i>Meretrix arcotensis</i> , Forbes, sp.	...	...	...	...	T.
<i>Neilhea quinquecostata</i> , J. Sowerby, sp.	...	...	...	...	U. T. A.
<i>Nucula</i> , sp.	...	...	...	...	T.
<i>Ostrea</i> , sp.	...	...	...	...	T.
<i>Pecten amâpondensis</i> , Griesbach	...	...	...	...	T.
<i>Poromya</i> ?	...	...	...	...	T.
<i>Protocardium Hillanum</i> , J. Sowerby, sp.	...	...	...	...	T.
<i>Teredo</i> sp.	...	...	...	...	U.
<i>Trigonia elegans</i> , Baily	...	...	...	...	T.
<i>Trigonia Shepstonei</i> , Griesbach	...	...	...	...	U.

LOWER CRETACEOUS MOLLUSCA FROM SOUTH AFRICA
(UITENHAGE FORMATION=NEOCOMIAN).

CEPHALOPODA.

<i>Belemnites africanus</i> , Tate	<i>Olcostephanus Atherstonei</i> ,
<i>Crioceras spinosissimum</i> (Haus-	Sharpe, sp.
mann MS.), Holub and	<i>Olcostephanus Baini</i> , Sharpe,
Neumayr	sp.
<i>Hamites africanus</i> , Tate	<i>Reineckia subanceps</i> , Tate, sp.

GASTROPODA.

<i>Actæonina Jenkinsiana</i> , Tate	<i>Neritopsis?</i> <i>turbinata</i> , Sharpe
<i>Actæonina Morrisiana</i> , Tate	<i>Patella caperata</i> , Tate
<i>Actæonina Sharpeana</i> , Tate	<i>Phasianella Sharpei</i> , Tate
<i>Actæon Atherstonei</i> , Sharpe	<i>Trochus Baini</i> , Sharpe
<i>Alaria coronata</i> , Tate	<i>Turbo Atherstonei</i> , Sharpe
<i>Ampullaria</i> (?) <i>ignobilis</i> , Tate	<i>Turbo Baini</i> , Sharpe
<i>Monodonta Hausmanni</i> , Holub	<i>Turbo Stowianus</i> , Tate
and Neumayr	<i>Turbonilla africana</i> , Tate, sp.
<i>Natica Atherstonei</i> , Sharpe	

LAMELLIBRANCHIATA.

<i>Arctica Borchersi</i> , Tate, sp.	<i>Pecten projectus</i> , Tate
<i>Arctica rugulosa</i> , Sharpe, sp.	<i>Pecten Rubidgeanus</i> , Tate
<i>Astarte Hertzogi</i> , Goldfuss, sp.	<i>Perna Atherstonei</i> , Sharpe
<i>Astarte Longlandsiana</i> , Tate	<i>Pholadomya dominicalis</i> ,
<i>Astarte Pinchiniana</i> , Tate	Sharpe
<i>Avicula Baini</i> , Sharpe	<i>Pinna Atherstonei</i> , Sharpe
<i>Cardita nuculoides</i> , Tate	<i>Pinna Sharpei</i> , Tate
<i>Ceromya papyracea</i> , Sharpe	<i>Placunopsis imbricata</i> , Tate
<i>Corbula</i> (?) <i>Rockiana</i> , Tate	<i>Placunopsis subjurensis</i> , Tate
¹ <i>Crassatellites complicata</i> , Tate	<i>Placunopsis undulata</i> , Tate
<i>Cucullæa cancellata</i> , Krauss	<i>Pleuromya Baini</i> , Sharpe, sp.

* I have followed W. H. Dall and H. A. Pilsbry in adopting *Crassatellites* of Krüger (Geschichte der Urwelt, 1823, vol. ii., p. 466) for Lamarck's *Crassatella* of 1799, the type of the latter being *Mastra cygnæa* of Chemnitz which has been correctly regarded by Conrad and others as *Trigonella* of DaCosta, 1778.

<i>Cucullæa</i> (?) <i>Jonesi</i> , Tate	<i>Pleuromya lutraria</i> , Krauss,
<i>Cucullæa Kraussi</i> , Tate	sp.
<i>Cyrena</i> (?) <i>Baini</i> , Sharpe	<i>Sanguinolaria</i> (?) <i>africana</i> ,
<i>Exogyra Jonesiana</i> , Tate	Sharpe
<i>Gari Atherstonei</i> , Sharpe, sp.	<i>Seebachia Bronni</i> , Krauss, sp.
<i>Gastrochæna dominicalis</i> , Sharpe	<i>Trapezium Nivenianum</i> , Tate,
<i>Gervillia dentata</i> , Krauss	sp.
<i>Gryphæa imbricata</i> , Krauss, sp.	<i>Trigonia conocardiiformis</i> ,
<i>Lima neglecta</i> , Tate	Krauss, sp.
<i>Lima obliquissima</i> , Tate	<i>Trigonia Goldfussi</i> , Agassiz
<i>Lithodomus Stowianus</i> , Tate	<i>Trigonia Hertzogi</i> , Goldfuss, sp.
<i>Modiola Atherstonei</i> , Sharpe	<i>Trigonia Tatei</i> , Holub and
<i>Modiola Baini</i> , Sharpe	Neumayr
<i>Modiola Rubidgei</i> , Tate	<i>Trigonia vau</i> , Sharpe
<i>Mytilus Jonesi</i> , Tate	<i>Trigonia ventricosa</i> , Krauss,
¹ <i>Parallelodon Atherstonei</i> , Sharpe, sp.	sp.



Helix hortensis monst. *sinistrorsum* in Northamptonshire.—In July last (1895) I found a sinistrorse *H. hortensis* var. *arenicola* 123(45) alive at Kettering. I have succeeded in bringing it up to maturity.—C. E. WRIGHT, Kettering. (Read before the Conchological Society, Nov. 6th, 1895).

Agriolimax agrestis v. *albida* Picard in Cheshire.—On June 2nd I found an example of this variety *in coitu* with one of the typical form at Romiley. Mr. W. D. Roebuck, to whom I submitted the specimen, writes me that it is perfectly characteristic of the variety.—CHAS. OLDHAM, Romiley, June 15th, 1895. (Read before the Conchological Society, July 3rd, 1895).

Limax cinereo-niger in Cheshire.—I took two specimens of this species on June 2nd from beneath the bark of some decayed and fungus-covered oak stumps, in a wooded clough on Werneth Low, Romiley. On June 11th I found three more in the same spot and other three on June 29th. The slugs were about half-grown, and only two of them showed the trifasciated foot sole which characterises this species when adult. Mr. W. D. Roebuck refers all the specimens to the var. *luctuosa* of Moquin-Tandon.—CHAS. OLDHAM, Romiley, June 15th, 1895. (Read before the Conchological Society, July 3rd, 1895).

¹ *Parallelodon* was substituted by Meek and Worthen in 1866 for *Macrodon* of Lycett, 1845, the latter name being pre-occupied by Müller in 1842 for a genus of fishes.

NOTES ON THE LAND AND FRESHWATER
MOLLUSCA OF THE ENGLISH
LAKE DISTRICT.

By CAPTAIN W. J. FARRER.

(Read before the Conchological Society, July 3rd, 1895).

THE lake district, as marked on the map of England, comprises a very large tract of country extending as it does on the north and east from St. Bees and Penrith; to Lancaster and the Irish Sea and Morecambe Bay on the south and west; but of this, the lake district proper, or what may be termed the 'lakeland of the poet and tourist,' forms but a small portion, and to this only do the following notes and records refer.

Geologically, lakeland as thus defined, would seem to be but poorly fitted for the abode of terrestrial shell-bearing mollusca, being almost entirely destitute of limestone, for although as it were surrounded by a ring-fence of this substance in no part is it encroached upon, excepting where a very narrow strip of what is locally known as Coniston stone appears, extending from Broughton to Long Sleddale, the rest of the district consisting of green and Skiddaw slate, with here and there a little granite and syenite. Yet, notwithstanding this great drawback, the district is most prolific in species, as out of the 130 species known as British, at least 75 are found throughout this portion of country.

From the abundance of water and plant life found in the many lakes, rivers, and streams, we might reasonably expect to find the water-loving species equally numerous, but whether owing to the low temperature of the water, the peaty nature of the surrounding soil, or the vast flocks of gulls, wild ducks, and other aquatic birds which congregate here during the autumn and winter months, the freshwater snails are, with the single exception of *Limnæa peregra*, comparatively rare, and diffi-

cult to find; especially is the genus *Sphærium* noticeable by its absence, for although Miss Donald, of Carlisle, has recorded it from the "River Derwent at Piel Wyke," in a "List of the Land and Freshwater Shells of Cumberland and Westmoreland," published in part VIII. of the "Transactions of the Cumberland Association for the Advancement of Science," some few years since, I have looked for it in vain. In any case the locality given must be a mistake, as the Derwent does not approach Piel Wyke by at least two-thirds of a mile.

That we find no trace of the Anodons is not surprising when we come to consider the stony nature of the lake bottoms and the rapidly flowing nature of the rivers and mountain streams; and no doubt it is from a like reason the mud-loving *Unio pictorum* and *U. tumidus* are absent from the list.

Probably further search will bring to light other species which have so far escaped my notice, although I have endeavoured to make a systematic collection during this and last season.

The arrangement followed is that of the Conchological Society's list of 1892.

Arion ater (L.).—Very common throughout the entire district, the only variation noticed being var. *rufa*.

This species I have commonly taken feeding on different species of the boletus tribe in pine plantations.

A. subfuscus Drap.—Abounds in all the low-lying meadow lands bordering the lakes. I have noticed as many as 187 individuals feeding on the remains of a dead frog. About Bassenthwaite the var. *aurantiaca* prevails, and the entrances to water-rat burrows are at times fairly lined with this variety—no doubt feeding on the rat droppings.

A. hortensis Fér.—Very common in woods, hedgerows, and gardens, and plays sad havoc with the cabbages in the latter.

A. circumscriptus Johnst.—Usually found with the above, but seems to prefer the woods.

- Amalia gagates* (Drap.).—Buttermere, Grasmere, Rosthwaite, Keswick, and Bassenthwaite. At the latter place the var. *plumbea* occasionally turns up. During the summer this species entirely disappears from sight.
- A. Sowerbyi** (Fér.).—Not uncommon in woods near Keswick and Braithwaite, though I have only taken one specimen at Bassenthwaite in Sir Wilfrid Lawson's woods.
- Limax maximus* L.—Very abundant throughout in woods, hedge-rows and gardens. The variety *maculata* seems to be confined to the latter situations.
- L. cinereo-niger** Wolf. — Two very fine examples of this species were taken in Sir Wilfrid Lawson's woods at Bassenthwaite.
- L. flavus** L.—A few about the ruins of an old mill at Bassenthwaite and one or two young from a wall at Keswick, are all I have met with of this slug.
- L. marginatus** (Müll.).—One of our commonest slugs, being met with at all times and seasons wherever trees afford it a hiding place. I have found it when bird-nesting on the topmost branches of lofty larch and beech trees.
- Agriolimax agrestis* (L.).—Needless to say we suffer, as does the greater portion of this country, from the ravages of this ever-present and variously-coloured "reptile," as I have often heard it called hereabout. From milky white to inky black—through every intermediate shade it may be found.
- A. lævis** Müll.—Very common indeed in the dampest part of the woods, amongst dead leaves and moss throughout the entire district.
- Testacella haliotide* Drap. — "Here's yan wi' his tail hoosed," was what a rustic said to me one day as he handed me a specimen of this species captured in Mrs. Howard's glasshouse, Ravenstone, Bassenthwaite.
- Vitrina pellucida* (Müll.).—Extremely abundant during the autumn and winter months in woods and hedge-rows, feeding on freshly fallen sycamore leaves. It is noticeably absent

during the summer, although dead shells are abundant enough.

- Hyalinia draparnaldi** (Beck).—A few specimens from the base of a garden wall at Keswick, in company with the next two species.
- H. alliaria** (Miller).—Everywhere abundant.
- H. cellaria** (Müll.).—As common as the above, but keeps more to gardens and the open country.
- H. nitidula** (Drap.).—Common in woods and on moss-covered rocks. Small and rather light coloured.
- H. radiatula** (Alder).—Not common, but is found throughout amongst dead leaves and moss, also at the roots of the bracken fern.
- H. pura** (Alder).—The brown form is common enough throughout the district. What is known as var. *margaritacea* occurs only sparingly, so far as I have noticed. I have found it only at Bassenthwaite.
- H. crystallina** (Müll.).—Very common and at times very fine.
- H. fulva** (Müll.).—Abounds in woods and on the borders of the lakes amongst dead reeds and under drift wood. The var. *Alderi* (Gray) occurs in moss at Little Tarn, near Bassenthwaite.
- H. nitida** (Müll.).—Common on dead reeds and other rejectamenta of the numerous lakes and mountain tarns.
- H. excavata** (Bean).—The var. *vitrina* is common throughout, but I have not met with the type in any single instance.
- Helix rotundata** Müll.—Very abundant. It is a noticeable fact that those specimens found in the woods are more highly coloured than those taken amongst stones in the open. The pretty var. *alba* could be taken in quantity amongst some stones on a road side at Bassenthwaite during the whole of last season. This season I have, so far, searched for it in vain—the type shell having taken its place. The vars. *Turtoni* and *rufula* are also found, the former being not uncommon.

- H. rupestris** Drap.—In great numbers on walls at Keswick, Ambleside, Bassenthwaite and other places. On the walls surrounding Armathwaite Park, the beautiful seat of Mr. Hartley, at Bassenthwaite, this snail simply swarms and many unusually fine examples have been taken therefrom. A few specimens were also found amongst the stones composing the cairn on Skiddaw summit, at an elevation of 3,054 feet.
- H. pygmæa** Drap.—Very abundant throughout the entire district amongst dead leaves.
- H. lamellata** Jeff.—Not common, though it may be taken throughout by careful searching. I have mostly taken it from amongst the heaps of dead leaves and road scrapings left at road-sides by the cleaners; also amongst moss at Lodore Falls.
- H. aculeata** Müll.—This may be called one of our commonest snails, abounding in the woods, on dry walls and amongst newly-fallen leaves. A few of the var. *albida* taken at Bassenthwaite.
- H. pulchella** Müll.—Curiously enough I have taken this shell only in one locality, and that the moss-grown roof of an old mill at Bassenthwaite. Probably carried thither by birds, as I have searched the immediate neighbourhood and elsewhere in the district for it in vain.
- H. aspersa** Müll.—Fairly common in gardens at Keswick. A few at Buttermere and four specimens at Bassenthwaite is my record for this species. Seemingly rare in the district.
- H. nemoralis** L.—Not at all common, although a fair number may be collected throughout. What seems to be the var. *undulata* is the common form at Bassenthwaite and Keswick. The vars. *albolabiata* and *roseolabiata* also occur.
- H. hortensis** Müll.—Very abundant, but so far I have only met with the yellow-coloured variety. In the hedge-rows when the Celandine is in bloom it is most difficult to distinguish the shells from the flowers, so much are they alike

in form and colour. A small and very transparent form occurs at Bassenthwaite, and many unusual band varieties are met with—the formula 10305 being quite common.

- H. arbustorum** L.—Common in hedge-rows with its vars. *alpestris*, *conoidea*, *flavescens*, *fusca* and *minima*. An unusually large specimen and another with a white band were taken near Ouse Bridge, Bassenthwaite.
- H. cantiana** Mont.—This species is not found in the district, but some introduced by the writer in August of last year have increased to at least double the number, so that as it is more than likely they may soon spread into the adjacent parts I think it better to mention the fact of their introduction.
- H. rufescens** Penn.—Very common and of the usual high-spired northern form. Vars. *alba* and *rubens* frequent and var. *albocincta* not frequent.
- H. hispida** L.—Abundant on nettles and in hedge-rows with its vars. *hispidosa*, *subrufa* and *subglobosa*. A curiously scalariform specimen was taken near Ireby.
- H. granulata** Alder.—On nettles at Piel Wyke, Bassenthwaite, Ambleside and Keswick. Not at all common.
- H. fusca** Mont. — This handsome snail is very abundant throughout wherever sedgy banks border the swiftly running “becks.” During the summer dead shells only can be found; about the beginning of September the young snails put in an appearance, and in about six weeks more and up to April the adult shell may be found in plenty. The favourite food seems to be the wild carrot.
- H. fusca** Mont. var. *vitrea* nov.—Shell pale glassy green, animal milky white with the exception of the bands leading from the tentacles. This, which may be called the albino form of *H. fusca*, occurs not uncommonly in the Park Woods, Bassenthwaite, with the type. When containing the living animal, the shell has a curious chalky appearance.

- H. itala** L.—This is another of the species introduced by myself last summer, and now increasing in numbers.
- H. caperata** Mont.—Commonly distributed throughout the district, and forming many vars., the most beautiful—var. *fulva*—being often almost black. I have a scalari-form example from near Bassenthwaite Hause.
- H. virgata** Da Costa.—This species I mention only from the fact that a large number introduced by the writer in August of last year quickly became the prey of birds, and I still find many dead and broken shells about the hedgerows, but I do not think there can be many left alive.
- Buliminus obscurus** (Müll.).—Not common, excepting where the lime crops up, although I have taken a fair number at Keswick and Bassenthwaite at the roots of furze bushes after a rain; also at Piel Wyke, Grasmere and Ambleside.
- Pupa anglica** (Fér.).—In woods throughout and amongst moss on the banks of the mountain streams. In the latter locality the shells are very black and solid.
- P. cylindracea** (Da Costa).—Very common on walls and under stones. A few on the Parsley fern on Skiddaw summit. One specimen taken with a trifid tooth. The var. *albina* is very common on the white-washed portion of a wall at Keswick, the type only on the portion not white-washed, which fact is a very strange one indeed. Vars. *curta* and *edentula* also occur with the type.
- Vertigo antivertigo** (Drap.).—Fairly plentiful at Keswick and near Lodore. A few on dead reeds at Little Tarn, Bassenthwaite, and half-a-dozen specimens at Ambleside
- V. moulinsiana** (Dup.).—I have only taken four specimens of this species at Friar's Crag, Keswick, and have to thank Mr. J. W. Taylor, of Leeds, for kindly identifying them for me. I may say the specimens were in a living state when taken.

- V. pygmæa** (Drap.).—Very rare. In woods on stones and dead leaves at Bassenthwaite and near Grasmere. Some dead shells from ejectamenta of the River Greta at Keswick.
- V. substriata** (Jeff.).—Common throughout the district. One perfectly white and pellucid specimen taken alive at Bassenthwaite.
- V. edentula** (Drap.).—Very abundant in the woods. Numbers may be taken in the autumn by the simple expedient of spreading sycamore leaves about their habitat. I have found as many as half-a-dozen on a single leaf by using this plan.
- Balea perversa** (L.).—On walls at Bassenthwaite, Keswick, Grange and Ambleside, but all very small.
- Clausilia perversa** (Pult.).—Walls and hedges throughout, especially where the latter are of beech.
- Cl. laminata** (Mont.).—Very rare. I have only taken a few specimens in the woods near the Thornthwaite lead mines between Piel Wyke and Braithwaite.
- Azeca tridens** (Pult.).—One specimen from near Bassenthwaite and three from Ambleside are all I have seen from the district included in this paper, although it is common enough at Caldbeck just outside the limits.
- Cochlicopa lubrica** (Müll.).—Very common all through, with the vars. *hyalina* and *lubricoides*.
- Stenogyra Goodalli** (Müll.).—Many of the glasshouses in the district provide this species.
- Succinea putris** (L.).—Not at all common, but is found throughout. A fine form which I take to be the var. *subglobosa* Jeff. occurs on Bassenthwaite Lake shore, near Scarness.
- S. elegans** Risso.—Common on boggy flats about the lakes. A small var., probably *ochracea*, is common at Little Tarn, and the var. *Pfeifferi* may be taken at Braithwaite.
- Carychium minimum** Müll.—Common throughout in moss, dead leaves, and under stones.

- Planorbis albus** (L.).—Common on lily pads, etc., in the lakes and becks.
- Pl. spirorbis** Müll.—Ditches at Keswick and Bassenthwaite and in Derwentwater, near Lodore Hotel.
- Pl. vortex** (L.).—Frequent throughout in the same situations as the last species.
- Pl. carinatus** Müll.—I have only taken this shell at Little Tarn, near Bassenthwaite. All the specimens are very light coloured.
- Pl. contortus** (L.).—Common on lily pads and other water plants.
- Physa fontinalis** (L.).—Very rare and small. I have taken it at Little Tarn, Grasmere, Windermere, and Thirlmere.
- Limnæa peregra** (Müll.).—Very common, and running into many varieties. I have taken a few of the var. *Boissyi* Dupuy. Wherever watercress abounds in the streams I have noticed the shells to be much eroded—indeed, nothing but the body-whorl is left in many cases; and thus the shells appear at first sight to be the rare var. *Burnetti*.
- L. palustris** (Müll.).—Common in all the slow-running ditches but rather stunted in size.
- L. truncatula** (Müll.).—Very common, and in some localities unusually fine.
- L. glabra** (Müll.).—Not common in the district. In a drain at Bassenthwaite it occurs in quantity, and very large specimens may be taken; monst. *decollatum* is found with the type.
- Ancylus fluviatilis** Müll.—In all the swift-running becks, and often large in size. Vars. *gibbosa* and *albida* also occur. I find this species coupling in May.
- Velletia lacustris** (L.).—On reeds, Bassenthwaite Lake, Little Tarn, and in a ditch near Piel Wyke. Rather rare.
- Acicula lineata** (Drap.).—I have found this species only in one locality, viz., near Bassenthwaite. It exists in vast numbers, and when I say I have filled a two-ounce vial

with shells some idea may be formed as to its abundance. The shells are unusually fine, and the var. *alba* occurs with the type.

Valvata piscinalis (Müll.).—So far I have taken this shell only near Bassenthwaite. The specimens are very much depressed in form.

V. cristata Müll.—I have only one or two specimens from Derwentwater, but have no doubt it will turn up elsewhere in the district, as it is common at Caldbeck.

Unio margaritifer (L.).—The Greta at Keswick, the Derwent, and Chapel Beck, Bassenthwaite, have all provided me with specimens of this species.

Pisidium fontinale (Drap.).—Not common. Keswick and Bassenthwaite.

P. pusillum (Gmel.).—Very common, and in one or two localities at Bassenthwaite the shells are very large, clean, and shining.

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In conclusion, I should like to say that the present paper is not put forward as giving an exhaustive list of the land and freshwater mollusca of lakeland, as no doubt more careful attention than I have given to the subject will bring more species to light.

—————◆◆◆—————

Protective resemblance of shell of *Helix cantiana* Mont. to its surroundings.—Whilst at Airmyn, on August 14th, photographing the mouth of the River Aire, I had occasion to leave the narrow path which runs upon the top of the high embankment to take another view through the tall reeds and overhanging willows I then noticed on a large leaf of colts-foot (*Tussilago farfara* L.) a specimen of *Helix cantiana*, and on stooping down saw that there were several more on the same leaf. Further search showed that many of the neighbouring leaves were tenanted by these molluscs, and that there was a singular and protective resemblance between the pale-green fading leaves of the plant, with their autumnal patches of invading fungoid growths, and the brown blotched grey shell of *H. cantiana*. With this knowledge, on my return to the embankment of the river, I was able to gather specimens in places I had previously passed by without noticing them.—HENRY CROWTHER, F.R.M.S., The Museum, Leeds. (*Read before the Conchological Society, Sep. 4th, 1895.*)

THE MARINE MOLLUSCA OF TEIGNMOUTH BAY.
ADDITIONS.

BY L. ST. GEORGE BYNE, B.Sc.

(Read before the Conchological Society, July 3rd, 1895.)

IN the 'Journal of Conchology,' vol. 6, p. 175, appeared 'A Contribution towards a List of the Marine Mollusca of Teignmouth Bay.' Since then several additional species have been found.

Dr. G. W. Chaster, of Southport, paid this place a visit of about ten days' duration in September, 1894, and many of the additions recorded here are the result of his labours. A dredging expedition yielded many good species, the most important being *Cerithiopsis Barleei*, live *Odostomia acuta*, *O. fenestrata*, *O. interstincta*, *O. pusilla*, *Rissoa proxima*, *R. vitrea*, both alive and dead, dead specimens being abundant; *Chiton cancellatus*, *Pleurotoma nebula*, *P. brachystoma*, and *P. attenuata* alive. The taking of so many species of *Pleurotoma* in a living state was particularly pleasant.

The method employed in working the material brought up in the dredge may prove both interesting and useful. The depth of nine to twelve fathoms is maintained almost uniformly throughout the bay. The bottom is almost entirely composed of fine muddy silt, greasy to the touch, and thickly interspersed with *Turritella communis*, which is sometimes taken alive, but mostly in a dead condition, *Philine aperta*, starfish, and Alcyonaria. It was found best, after dismissing other plans, to work up a large amount of the mud with sea-water in a bucket, stirring the whole thoroughly. The water holding the mud in suspension after the shells and larger particles had had time to subside, was poured off. The mass remaining at the bottom of the bucket was then put through sieves, the finest being of miller's bolting cloth. By this means large quantities of mud can be worked without loss even of the minutest species.

A word as to the *Turritella*. They are usually fine shells, weathered on the surface even when alive, but in one part of the bay, off Labrador Tea Gardens, a much more highly coloured and fresher looking form was brought up. This latter is the young of the first year's growth, the shell being completed in another year by the addition of two more whorls. It will be noticed that all mature examples are more or less scalariform, and that the fresh appearance of these whorls contrasts strongly with that of the rest of the shell.

The late Mr. Clark, who worked Exmouth so thoroughly many years ago, enumerates in his valuable treatise several species such as *Aclis Gulsonæ*, *Lepton Clarkiæ*, *Philine pruinosa*, *Odostomia obliqua*, *Galeomma Turtoni*, etc., which I have been unsuccessful in rediscovering. This may perhaps be accounted for by the fact that I have never dredged on the hard ground which stretches past Dawlish to Exmouth. All my excursions have been carried out off Labrador Gardens and Watcombe, upon a muddy bottom.

I desire to offer my best thanks to Dr. G. W. Chaster for much of the information given in these pages, and especially that concerning *Cerithiopsis Barleei*.

Nucula nitida var. *radiata* Marsh. A few living examples from the dredged material.

Montacuta bidentata Mont. Living examples and valves dredged.

M. ferruginosa Mont. Valves dredged.

Kellia suborbicularis var. *lactea* Brod. Several from amongst type specimens from Pholas burrowings, Exmouth.

Cardium norvegicum var. *gibba* Jeff. Fine specimens. Oyster dredged with the type.

Cyprina islandica var. *crassa* Jeff. Oyster dredged with type.

Venus gallina var. *laminosa* Mont.—Two specimens. Valves are very plentiful in the mud brought up by the dredge.

- Tapes decussatus** var. **quadrangula** Jeff.—Found living in the mud flats behind the sand hills on the Dawlish Warren.
- Lutraria oblonga** Chem.—A valve cast up on the Warren.
- Scrobicularia nitida** Müll.—Many dredged alive, about eighty per cent. being broken. This is a small and excessively fragile form of this delicate species.
- S. alba** Wood.—Many dredged alive, but much smaller than examples from other places.
- Solecurtus antiquatus** Pult.—A fine dead example in good condition found under a stone in the crevices of a rock ledge.
- Pandora inæquivalvis** var. **obtusa** Jeff.—A living specimen dredged.
- Thracia distorta** Mont.—A good living example taken in an oyster dredge.
- Mya truncata** L.—A living example trawled; also a living specimen cast up on the beach. Both belonged to a thin form.
- Pholas candida** var. **subovata** Jeff.—Occurred amongst type examples obtained at Exmouth in 1838.
- Teredo megotara** Han.—Two or three in a piece of timber cast up on the Warren.
- Chiton cancellatus** G. B. Sow.—A living specimen dredged.
- Patella vulgata** var. **picta** Jeff.—Fairly plentiful on stone work. This form is easily detected amongst the type as the red rays shew very prominently through the shell.
- P. vulgata** var. **intermedia** Knapp.—Common on rocks at highwater mark throughout the Bay. The shells presented a large variety of internal markings, the colour being often very beautiful, quite equalling that of Channel Island examples. It has been found that these internal colourings sometimes fade on keeping, but this may be

obviated by *at once* cleaning out the animal of one shell with the thumb-nail before proceeding to remove another from the rock, instead of submitting them to a process of boiling at home.

The colours may be still further heightened by rubbing the inside of the shell with a trace of Vaseline, all excess of grease being carefully removed by thorough cleaning with rag.

P. vulgata var. **athletica** Bean.—Plentiful in rock pools.

They only inhabit those which are always left full of water after the tide has gone down. They are invariably covered with long tufts of seaweeds.

P. vulgata var. **cœrulea** L.—A few with the type.

Fissurella græca L.—Living examples trawled. This species was accidentally omitted from the former List.

Trochus magus var. **conica** Marsh.—One or two with the type.

Phasianella pullus var. **oblonga** Jeff.—About fifty living examples were taken on one occasion on weeds.

Littorina rudis var. **jugosa** Mont.—Common on stonework and buttresses. The higher parts were inhabited by great quantities of giant *Littorina neritoides*, which did not seem to associate with var. *jugosa*.

Rissoa semistriata var. **pura** Jeff.—Several alive from under stones occurring with the type.

R. cingillus var. **graphica** Turt.—About eighty per cent. of the Teignmouth *R. cingillus* belong to this variety.

Turritella communis Risso. var. **soluta** B., D. & D.—This is the form referred to in the preface. It is described and excellently figured in 'Les mollusques marins du Rousillon' fév. 1884, p. 226, figs. 9, 10. The authors state 'Elle se distingue par les derniers tours très convexes, comme détachés par une suture très profonde. La conséquence de cette déformation est que l'ouverture est presque ronde et que la coquille parait ombiliquée.' They also give

decisive reasons for the change in nomenclature from *Turritella terebra* L., to *Turritella communis* Risso.

Scalaria clathratula Ad.—A fairly good example from dredged material.

Odostomia rissoïdes var. **exilis** Jeff.—With the type from under mussels.

O. conoïdea Broc.—A fine dead example dredged.

O. conspicua Ald.—A young living example detected amongst *Odostomia acuta* var. *umbilicata*.

O. interstincta var. **suturalis** Phil.—Several dredged alive. All the Teignmouth specimens should be referred to this variety rather than to the type.

O. scalaris Phil.—A few dead specimens in dredged sand.

O. pusilla var. **minuscule** Marsh.—This variety only occurs.

O. nitidissima Mont.—A single specimen from drift.

Eulima subulata Don.—One adult and two immature living examples from dredged material. A living specimen trawled.

Cerithiopsis Barleei Jeff.—A fine living example was dredged in Sept. 1894.

The shell has been carefully compared with one of the original specimens in Mr. Jordan's collection, and its identity has been confirmed by our British authority upon the group, the Rev. R. Boog Watson, whose valuable paper 'The Cerithiopsides from the Eastern side of the North Atlantic.' 'Journ. Linn. Soc.', vol. 19, should be consulted by all who wish to understand our species of this rather difficult genus. Jeffreys' description is decidedly misleading. He describes the sculpture as resembling that of *C. tubercularis* but without any basal keel. In the last named species he remarks the presence of two basal keels, one below the periphery, and one round the canal. It is the latter which is wanting in *Cerithiopsis Barleei*. Perhaps it may not be altogether out of place here to note that the colouration is peculiar, sometimes cream or almost white but

generally there is a band of brown round the upper part or middle of each whorl.

The occurrence of this species in shallow water (10 fms.) does not seem to have been previously noted.

Since the above specimen was dredged, three more living examples have been found amongst some *Cerithiopsis tubercularis* taken from under stones in 1888. It cannot be called a rare species. It would be found plentifully in other places if careful search were made for it. I have a large quantity of good dead examples from Scilly dredgings.

Nassa pygmæa Lmk. Living and dead specimens plentiful in dredged material.

Pleurotoma nebula var. *abbreviata* Jeff. Occurs alive with the type.

Philine catena Mont. One from drift.

P. nitida Jeff. A few in dredgings.

Fiona nobilis A. & H. Two of these beautiful creatures trawled.

Tritonia plebeia Johnst. One found crawling over a stone.

Goniodoris nodosa Mont. Two examples dredged, attached to *Turritella communis*.

Doris bilamellata L. Plentiful under stones. It is no easy matter to discriminate between the animal and the rock, so closely do the two resemble one another. This has been previously noted by several observers in regard to many species of Nudibranchs.

Sepia officinalis L. The hard parts are frequently cast up on the beach. During August, 1895, large quantities of these were found along the shore, entangled in thick beds of sea-weed.



Helix lapicida var. *albina* in Kent.—My friend, Mr. H. Westley, while collecting with me at Ewell near Dover, on August 3rd, was fortunate enough to secure a fine specimen of this rare form.—LIONEL E. ADAMS, Northampton, August 5th, 1895. (*Read before the Conchological Society, August 7th, 1895*).

CONCHOLOGICAL SOCIETY
OF GREAT BRITAIN AND IRELAND.

PROCEEDINGS.

239th MEETING, JULY 3rd, 1895.

Held in the Manchester Museum, Owens College.

Mr. William Moss in the chair.

Donations to Library announced and thanks voted :

Feuille des Jeunes Naturalistes, No. 295 ; Proceedings of the Academy of Natural Sciences, Philadelphia, 1894, part 3.

New Members elected :

Mr. George Albert Booth, F.L.S., Fern Hill, Grange-over-Sands.

Mr. Fred. Wm. Gamble, M.Sc. (Vict.), Airdrie House, Victoria Park, Manchester.

Rev. Adam Hann, Wesleyan Manse, Whitchurch, Salop.

Mr. John Ray Hardy, The Museum, Owens College, Manchester.

Prof. W. A. Herdman, D.Sc., F.R.S., University College, Liverpool.

Prof. Sydney J. Hickson, D.Sc., M.A., F.R.S., The Owens College, Manchester.

Candidates Proposed for Membership :

Mrs. G. Linnæus Banks, Messrs. George William Chaster, M.R.C.S., A. Loydell, C. H. Schill, John Hardy, Percy W. Abbott, Fred. Taylor, George Shepherd Viney, T. H. Killingbeck, R. Wigglesworth, Thomas Sparkes, James L. Corker, Frank Collier, John Rowland Ragdale, and Robert Sykes.

Papers Read :

Mr. L. St. George Byne, "The Marine Mollusca of Teignmouth Bay, Additions."

Mr. Charles Oldham, "*Limax cinereo-niger* in Cheshire," and "*Agriolimax agrestis* var. *albida* Picard in Cheshire."

Mr. R. Bullen Newton, "On the Occurrence of *Alectryonia unguolata* in South-east Africa, with a notice of previous Researches in the Cretaceous Conchology of Southern Africa."

Captain W. J. Farrer, "Notes on the Land and Freshwater Mollusca of the English Lake District."

Exhibits :

Mr. Charles Oldham exhibited living specimens of the rare slug *Limax cinereo-niger* var. *luctuosa* in illustration of his paper ; *Limax maximus* var. *cellaria* and var. *fasciata*, and *Agriolimax agrestis* var. *albida*, all from Romiley, Cheshire. He also exhibited a large number of *Sphærium* and *Pisidium*, from Ohio, U.S.A., including a new *Pisidium* not yet described, and also for comparison *Pisidium fontinale* var. *Henslowana* from various British localities.

Mr. R. Standen exhibited some very fine mahogany-coloured specimens of *Dentalium tarentinum* dredged in Bantry Bay; *Littorina rudis* var. *jugosa* remarkable for vivid colouring, from Tenby; and very large specimens of *Ovula patula* from the Bristol Channel, shown on behalf of Mr. Bartlett Span. Also, on behalf of Mr. R. Wigglesworth, a set of very fine *Linnæa auricularia* from a pond at Clayton-le-Moors. Mr. L. St. George Byne sent for exhibit some remarkable forms of *Turritella terebra*, and a pretty variety of *Patella vulgata* from Teignmouth.

240th MEETING, AUGUST 7th, 1895.

Held at the Manchester Museum, Owens College.

Mr. W. E. Hoyle in the chair.

Donations to Library announced and thanks voted :

The Naturalists' Journal, vol. 4, No. 37.

Feuille des Jeunes Naturalistes, Nos. 296-7.

The Journal of Malacology, vol. 4, No. 2.

Proceedings of the Royal Society of Queensland, vol. 2, part I.

Proceedings of the Academy of Natural Sciences, Philadelphia, 1895, part I.

“The Origin of the Cephalopods and sexual characters in *Nautilus*.”

Extracts from Natural Science, Aug., 1895.

From Mr. Kenneth McKean, “Monograph of the British Species of *Cyclas* and *Pisidium*,” by Rev. L. Jenyns.

New Members elected :

Mrs. G. Linnæus Banks, 34, Fassett Square, Dalston, London.

Mr. George William Chaster, M.R.C.S., 42, Talbot Street, Southport.

Mr. A. Loydell, 19, Chassan Road, Acton, W.

Mr. C. H. Schill, Broom House, Didsbury near Manchester.

Mr. John Hardy, 11, Stockton Road, Chorlton-cum-Hardy.

Mr. Percy W. Abbott, 44, Brazennose Street, Manchester.

Mr. Fred Taylor, 34, Brackley Street, Oldham.

Mr. Geo. Shepherd Viney, 197, Moss Lane East, Moss Side, Manchester.

Mr. T. H. Killingbeck, Didsbury near Manchester.

Mr. Robert Wigglesworth, 13, Arthur Street, Clayton-le-Moors, Lancs.

Mr. Thomas Sparkes, 92, Heywood Street, Moss Side, Manchester.

Mr. James S. Corker, 93, Halston Street, Hulme, Manchester.

Mr. Frank Collier, 1, Heather Bank, Moss Lane East, Manchester.

Mr. John Rowland Ragdale, The Birches, Whitefield near Manchester.

Mr. Robert Sykes, Dardsley, Lostock Hall, near Preston.

Candidates Proposed for Membership :

Mrs. Helen Macleod Powell, Mr. E. W. Swanton, and Mr. Robert T. Wild.

Papers Read :

Mr. G. W. Chaster, “On the Variation of *Stilifer Turtoni* Brod.”

Mr. L. E. Adams, B.A., “*Helix lapicida* var. *albina* in Kent” and “*Littorina rudis* var. *tenebrosa*.”

Exhibits :

Mr. E. J. Elliott, of Stroud, sent alive some very fine specimens of *Arion minimus* from Woodley near Romiley, Cheshire; also *A. ater*, yellowish-brown form, from Woodley; and *Limnæa truncatula*, large, with expanded mouths, some with reflected lips, from Romiley.

Mr. W. Moss, a beautiful albino var. of *Helix perplexa* from Grenada, *Cyclosurus Mariei* from Mayotte, *Helix tristis* from Corsica, *Helicina occidentalis* from Grenada, and for comparison *Bulimus glaber* from Grenada, and its var. *auris-sciuri* from Trinidad, and a small form from Oropondra, Trinidad, differing from var. *auris-sciuri* and according to Mr. Ponsoby's recollection from the Venezuelan form var. *euryomphalus*.

Mr. E. C. Stump exhibited a number of shells he had received from Australia, including *Helix Rainbirdi* and *H. Yulei* from Queensland, *H. gratiosa* var. from Whitsunday Island, *H. launcestonensis* from Tasmania, *Bulimus porphyrostomus* from New Caledonia, *B. bivaricosus* from Lord Howe Island, *Buliminus Dufresnei* from Tasmania, and *Physa eburnea* and *Ancylus Irvinae* from Tasmania.

241ST MEETING, WEDNESDAY, SEPT. 4th, 1895.

Held in the Manchester Museum, Owens College.

Mr. J. Cosmo Melvill, President, in the chair.

Donations to Library announced and thanks voted :

The Irish Naturalist, vol. 4, Nos. 4-8, 1895.

Annals of Scottish Natural History, 1894, No. 13.

Transactions of the Manchester Microscopical Society for 1894.

Report of the Manchester Museum, 1895.

Report of the Australian Museum, 1894-5.

Dr. R. Bergh, *Breiträge zur Kenntniss der Strombiden, besonders der Gattung Terebellum Klein*, 1894.

Donation to Collection announced and thanks voted :

From Mrs. J. Fitzgerald, of Folkestone, seventeen species of marine shells from Viareggio, Italy.

New Members elected :

Mr. E. W. Swanton, Bratton St. Maur, Wincanton, Somerset.

Mrs. A. Powell, Nant-y-velin, Criccieth, North Wales.

Mr. Robert John Welch, 49, Lonsdale Street, Belfast.

Candidates Proposed for Membership :

Mr. John Simeon Edwards, Mr. Edward J. Bles, B.Sc., Rev. H. A. Hudson.

Papers Read :

Mr. R. Wigglesworth, "Notes on *Limnæa auricularia*."

Mr. H. Crowther, "Protective Resemblance of Shell of *Helix cantiana* Mont. to its Surroundings," and "Mucous Tracks of *Limnæa stagnalis*."

Exhibits :

Mr. L. E. Adams exhibited a large series of shells he had recently collected in Kent, including *Helix hortensis* var. *fuscolabiata*, *H. pomatia*, *H. aspersa*, and var. *exalbida*, *H. arbustorum* and vars. *marmorata* and *canigonenis*. Also a scalariform specimen of *H. lapicida*, and one of the var. *albina*. He also showed living specimens of *H. terrestris*, and stated that the species seemed to be firmly established and was extending in the neighbourhood where it was first discovered.

Mr. Thomas Rogers exhibited *Physa acuta* from the water-tanks in the hot-houses at Chelsea Gardens, and a *Physa* very like *heterostropha* from the Victoria regia House, Royal Botanic Gardens, Regents Park.

Mr. R. Wigglesworth exhibited a further set of *Limnaea auricularia* from Clayton-le-Moors in illustration of his paper.

Mr. R. Cairns showed a very fine series of *Acme lineata* from Whitestrand Bay, near Peel, and one specimen from Glen May, both in the Isle of Man.

Mr. T. Sparkes, *Purpura lapillus* from Coldwell Bay, Isle of Wight.

Mr. R. Standen, *Helix fusca* from Bassenthwaite, collected by Captain Farrer.

Mr. Alfred Sich, of Chiswick, reported the occurrence of a specimen of *Helix rotundata* m. *sinistrorsum* in a garden there.

242nd MEETING, WEDNESDAY, OCTOBER 2nd, 1895.

Held in the Manchester Museum, Owens College.

Mr. J. Cosmo Melvill, President, in the chair.

Donations to Library announced and thanks voted :

Annals of Scottish Natural History, 1895, Nos. 14-15.

The Naturalist, Nos. 242 and 243, 1895.

The Irish Naturalist, vol. 4, No. 9, 1895.

Transactions of the Royal Society of South Australia, vol. 19, part 1, July, 1895.

Transactions of the Wagner Free Institute of Science of Philadelphia, vol. 3, part 3, March, 1895.

Donations to Collection announced and thanks voted :

From Mr. J. E. Cooper, of Highgate, N., a collection of shells made at Aldeburgh, Suffolk, in illustration of his paper, including *Vertigo angustior*, *Cecilioides acicula*, *Modiolaria discors*, *Littorina rudis* var. *tenebrosa*, and *Buccinum undatum* var. *pauperata*.

New Members elected :

Mr. John Simeon Edwards, Chadwick Lodge, Crown Point Rd., Leeds.

Mr. Edward J. Bles, B.Sc., Moor End, Kersal, Manchester.

Rev. H. A. Hudson, 1, Johnson Street, Cheetham, Manchester.

Candidates Proposed for Membership :

Messrs. Ernest William Wake Bowell, Herbert Taylor Wake Bowell, Achille Chopin, and Isaac C. Thompson, F.L.S.

Papers read :

Mr. J. E. Cooper, "Some Mollusca from Aldeburgh, Suffolk.

Mr. L. E. Adams, "Interesting Kentish Shells," and "*Physa acuta* at Ostend."

Mr. L. St. G. Byne, "*Cardium aculeatum* in Teignmouth Bay."

Exhibits :

Mr. J. E. Cooper sent for exhibit fifty-eight species of shells collected at Aldeburgh.

Mr. L. St. G. Byne exhibited some very large *Cardium aculeatum* dredged in Teignmouth Bay; also *Saxicava rugosa* and *Defrancia gracilis* from Exmouth.

Mr. C. Oldham exhibited *Azeca tridens* from Romiley, Cheshire, *Helix hortensis* and var. *lutea* from Whaley Bridge, Cheshire, *H. arbustorum* from Romiley, and its var. *conoidea* from Whaley Bridge.

Mr. C. Taylor exhibited *Bulinus obscurus* var. *alba* from Plumstead, Kent, and *Helix hortensis* (00300) from Swanleigh, Kent.

243rd MEETING, WEDNESDAY, NOVEMBER 6th, 1895.

Held in the Manchester Museum, Owens College.

Mr. Thomas Rogers in the chair,

Donations to Library announced and thanks voted :

The Irish Naturalist, vol. 4, Nos. 10, 11, 1895.

The Journal of Malacology, vol. 4, No. 3, Sept., 1895.

Annals of Scottish Natural History, No. 16, Oct., 1895.

The Naturalist, No. 244, Nov., 1895.

La Feuille des Jeunes Naturalistes, Nos. 298-301, 1895.

Journal de Conchyliologie, vol. 42, No. 3.

Transactions of the Academy of Science of St. Louis, vol. 6, No. 18; vol. 7, Nos. 1-3.

W. H. Dall, Report on Mollusca and Brachiopoda dredged in deep water near the Hawaiian Islands, with Illustrations of hitherto unfigured species from N.W. America. No. 34. Washington, 1895.

New Members elected :

Mr. Ernest William Wake Bowell, Huntshaw, Bampton, North Devon.

Mr. Herbert Taylor Wake Bowell, Sissinghurst Vicarage, Cranbrook, Kent.

Mr. Achille Chopin, 120, Sandy Lane, Chorlton-cum-Hardy.

Mr. Isaac C. Thompson, F.L.S., Woodstock, Waverley Rd., Liverpool.

Candidates Proposed for Membership :

Mr. John Chadwick, Mr. Thomas Edwards, Mr. Robert Albert Phillips, and Dr. E. J. Sidebotham.

Papers Read :

Rev. S. Spencer Pearce, "On the Banding of *Helix nemoralis* L. and *H. hortensis* Müller."

Mr. Alfred Hartley, "*Helix nemoralis* and *H. virgata* without Food for Fourteen Months!"

Messrs. Edward Collier and Robert Standen, "Further Conchological Notes from the West of Ireland."

Mr. Charles Oldham, "On the Habits of *Vertigo edentula*."

Exhibits :

Mr. L. E. Adams exhibited a series of *Helix pomatia* showing line of nacre found inside the winter epiphragm, also one with abnormally thickened lip, and another with abnormal thick growth and detached pearl.

Mr. A. Hartley sent for exhibit two specimens of *Helix hortensis* var. *roseozonata* from Aberford, Yorkshire, also a living specimen of *H. hortensis* which had formed an extension of the mouth after completion of the lip, this extension having neither colour or epidermis.

Mr. C. Taylor exhibited a peculiar form of *Limnæa stagnalis* from brackish water near Cleethorpes.

Mr. Charles Oldham showed *Vertigo edentula* from Compstall, Cheshire, and a large series of *Pisidia* from various localities.

Mr. Edward Collier exhibited a large series of *Helix nemoralis* and *H. aspersa* from the West of Ireland, including *H. nemoralis* varr. *libellula*, *rubella*, *castanea*, *petiveria*, *albescens*, *hyalozonata*, *albina*, *punctella*, *bimarginata*, *albolabiata*, *roseolabiata*, *luteolabiata*, *tenuis*, *coalita*, *major*, and *m. sinistrorsum*, and two specimens distinctly umbilicated. He also showed a large series of the heavy semi-fossil *H. nemoralis* from Dogs Bay, and sections of the same to show the extreme thickness and solidity of the shell; *Helix aspersa* from Ballyvaughan, and the type and var. *exalbida* from the Aran Islands.

Mr. R. Standen exhibited from Dogs Bay, *Defrancia purpurea* and *D. lincaris*, *Pleurotoma costata*, *P. lævigata*, *P. nebula*, and *P. turricula*, *Cerithium reticulatum*, *Cerithiopsis tubercularis*, *Cylichna cylindracea*, etc. Also specimens of *Littorina littorea* and *Purpura lapillus* (broken) from the "Kitchen Midden."

244th MEETING, WEDNESDAY, DECEMBER 4th, 1895.

Held in the Manchester Museum, Owens College.

Mr. J. Cosmo Melvill, President, in the chair.

Donations to Library announced and thanks voted :

La Feuille des Jeunes Naturalistes, No. 302, Dec., 1895.

The Irish Naturalist, vol. 4, No. 12, Dec., 1895.

The Naturalist, No. 245, Dec., 1895.

Science Gossip (new series), vol. 1 and vol. 2, March to Oct., 1895.

Records of the Australian Museum, vol. 2, No. 6.

Donation to Collection announced and thanks voted :

From Mr. Charles Oldham, shells collected by him in Anglesea and exhibited in illustration of his paper.

New Members elected :

Mr. John Chadwick, 6, Stanley Grove, Sale, Cheshire.

Mr. Thomas Edwards, Waterloo House, Coventry Street, Leicester.

Mr. Robert Albert Phillips, Ashburton, Cork.

Dr. E. J. Sidebotham, Erlesdene, Bowdon, Cheshire.

Candidates Proposed for Membership :

Mr. George Fox Tregelles and Mr. Harry Overton.

Papers Read :

Mr. Edgar A. Smith, "A List of the Land and Freshwater Mollusca of Trinidad."

Mr. Geo. F. Tregelles, "The Marine Mollusca of Cornwall."

Mr. Charles Oldham, "Notes on some Anglesea Land and Freshwater Mollusca."

Exhibits :

Mr. J. C. Melvill, some Helices from Ferguson Island, viz., *Helix Rollesiana* Smith, *H. Tayloriana* var. *major* Sow., *H. Rehsei* Smith, and *H. minnegerodei* Strubell; also *Rhytida Hercules* Hedley from Queensland, *H. louisidensis* Forbes from the Louisiade Archipelago.

Mr. W. Moss exhibited *Bulinulus binominis*, and var. *Lascellesiana*, also a new dark-banded variety, all from Grenada; also *B. (Drymaeus) Broadwayi* n. sp. from Trinidad.

Mr. R. Standen exhibited a large series of shells lately presented to the Manchester Museum, including a fine collection of Fissurellidæ (about sixty species) including the genera *Fissurella*, *Glyphis*, *Macroschisma*, *Megatebennus*, *Lucapina*, and *Fissurellidea*; also an extremely fine series of *Carelia* from Kauai, one of the Hawaiian Islands, including *Carelia bicolor* and varr. *adusta* and *angulata*, *C. cochlea*, *C. Cumingiana*, *C. obeliscus*, *C. paradoxa*, *C. turricula*, *C. variabilis*, and var. *olivacea*; also a specimen of *Achatinella (Amastra) reticulata* showing young *in situ*.

Mr. Charles Oldham exhibited the series of shells from Anglesea in illustration of his paper.

LEEDS BRANCH.

INAUGURAL MEETING.

At a meeting of the Leeds members of the Conchological Society, held September 12th, it was resolved:—

- 1.—That a Branch be formed of the local members of the Conchological Society, in connection with the parent society, whose head-quarters are now at Manchester.
- 2.—That the Branch be called the "Leeds Conchological Society," and have for its object the encouragement of Conchological Science.
- 3.—That the meetings be held monthly at the houses of such members as are willing, by the reading of papers, demonstrations affecting the bionomics of molluscs, exhibitions of specimens, or in any other way to encourage original conchological research.
- 4.—That the subscription be a levy made from time to time to cover such small incidental expenses as may be incurred in the working of the Society.

Mr. William Nelson was elected President for the coming year, and Mr. Henry Crowther Hon. Secretary.

Meeting held by the invitation of the President at Crossgates, Oct. 10th.

A paper, illustrated by diagrams and specimens, was read by Mr. Nelson, on "The Wandering Mud-Snail *Limnæa peregra*."

Mr. Nelson showed his large collection of tracings of British and foreign *Limnæine*.

On behalf of Mr. H. A. Pilsbry, Philadelphia, were shown specimens of a new species of *Planorbis* allied to our *P. albus*, from the District of Columbia.

The Rev. Ashington Bullen sent a living specimen of *Helix nemoralis* on which was developed an additional anterior tentacle. It was noticed that this third tentacle, which was between the ordinary anterior pair and distinctly free and nearer the right than the left lateral one, was extended or withdrawn along with the others.

Mr. Alfred Sich exhibited a living reversed specimen of *Helix rotundata*, from his garden at Chiswick. This specimen and another are the only recent reversed forms of this species known.

Mr. J. T. Carrington sent living specimens of *Arion ater* var. *alba* from Rickmansworth, Hertfordshire.

Mr. J. W. Taylor read a communication from Mr. A. G. Stubbs, of Gloucester, illustrated by a diagram and specimens. When gathering shells along Penally Road, Tenby, Mr. Stubbs noticed that in the crevices of a wall above which the hedge had been cleared and grass grew, all the specimens of *Helix aspersa* were deformed, whilst in the walls over which the hedges grew on each side of this particular portion, the shells were normal in growth and form.

Mr. R. Wigglesworth, of Accrington, sent a fine series of *Limnæa auricularia*, and a communication respecting their peculiar development and growth in a pond at Clayton-le-Moors. Mr. Wigglesworth found that many of the shells when young—January to March—presented labial reflections, which from April to August disappeared before the normal curvature of the shell, but that on nearing maturity many of the species again reflected the shell-lip, resuming in this way the labial form of their younger stage—the adult reflected lip being adorned with a nacreous deposit.

For Mr. Lionel E. Adams were exhibited specimens of *Helix nemoralis* with a divided third band, and a translucent example of *Helix hortensis*.

Mr. Charles Oldham sent spirit specimens of *Hyalinia cellaria* from Romiley, Cheshire, infested with long parasitic worms.

It was resolved to accept the invitation of Mr. J. Whitwham, of Huddersfield, to hold the next meeting at his house, and inspect his collection of Unionidæ.

On the Variation of *Stilifer Turtoni* Brod.—Through the kindness of three correspondents in Scotland, I have had an opportunity of examining a large series, numbering about two hundred specimens, of this species obtained off the counties of Forfar, Kincardine, and Aberdeen. The range of variation exhibited is surprising. The following forms may be worthy of special mention:—**VAR. EX FORMA.** *S. Turtoni* Brod. var. *oblonga* nov. (fig. 1). Shell much elongated; the ultimate and penultimate whorls nearly equal in breadth; the suture nearly straight between the earlier turns, becoming more and more oblique below. H. 3.6 mm.; B. 2 mm. Three specimens. **VAR. EX COLORE.** *S. Turtoni* Brod. var. *lactea* nov. Shell entirely opaline milk-white, except the apex which retains its usual brown tint. This variety is connected with the type by all intermediate gradations of hue and transparency, but characteristic specimens are rare. In addition to the above, a single specimen of an individual abnor-



Fig 1.

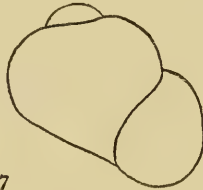


Fig. 2 a.

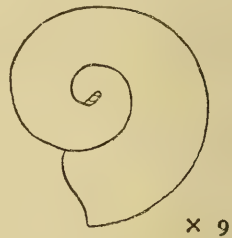


Fig. 2 b.

mality occurred, so remarkable as to merit description (figs. 2a, 2b). The apex, instead of being erect and prominent, is altogether invisible in side view. When, however, the shell is looked at from above, it is seen to be lying flat and to be surrounded by the next whorl. The arrangement indeed corresponds to that occurring normally in *Ianthina*. This group of departures from the typical form of a species is perhaps best designated as I have done, "individual abnormality," in contradistinction to "monstrosity," a term very loosely applied by conchologists to such forms as that described, to the effects of external agencies (decollation, erosion, etc.), as well as to monstrosities proper, in which the peculiar characters commence in embryonic life (sinistrorsion and true albinism, *i.e.*, of the animal as well as of the shell).—GEORGE W. CHASTER. (Read before the Conchological Society, August 7th, 1895).

***Physa acuta* at Ostend.**—Last August, I came across a pond full of this species close to Ostend. The shells were, I think, rather thicker than those bred in England, as I scraped the encrusting matter off with the large blade of my knife without causing any injury. I could find nothing else in the pond but a solitary *Limnæa peregra*.—LIONEL E. ADAMS, Northampton. (Read before the Conchological Society, Oct. 2nd, 1895).

FURTHER CONCHOLOGICAL NOTES FROM THE
WEST OF IRELAND.

BY EDWARD COLLIER AND ROBERT STANDEN.

(Read before the Conchological Society, November 6th, 1895).

IN July last we received an invitation to join the Irish Field Clubs' Union in their joint excursion to Galway and neighbourhood, which we gladly accepted, since it not only enabled us to revisit the district treated of by one of us in the April number of the "Journal of Conchology" for 1895 (pp. 42-46), but likewise afforded an exceptional opportunity for exploring a wider area of one of the richest and most varied fields in all Ireland for scientific work. The programme was extensive, comprising the inspection of Galway itself, and a trip to Gention Hill, in the outskirts of the town; day trips to the Twelve Bens of Connemara; to Ballyvaughan, and the Burren district of Co. Clare; to the Aran Islands; and to Oughterard, Carn Sefin, and Lough Corrib.

The conchologists in the party were but few, comprising only ourselves, Mr. R. Welch, of Belfast, and Mr. A. R. Nichols, and Miss Kelsall, of Dublin.

We do not propose to give a detailed list of all the species of mollusca collected, this having been already done in the September number of the "Irish Naturalist," but to notice some of our more important finds, together with such observations thereon as may be of general interest. Altogether we obtained 44 terrestrial, 27 fluviatile, and 112 marine species—the latter being the result of shore collecting, to which, as we had no dredging appliances, our researches were entirely confined.

From Galway to the northward extends a chain of lakes, and these, roughly speaking, form the boundary between the flat limestone country of the central plain and the high ground,

composed of the more ancient rocks, of Connemara and West Mayo. Eastward of Galway is the low limestone country ; and across the bay to the southward rise the terraced limestone hills of the Burren district of Co. Clare, whilst across the mouth of the bay, and midway between the coasts of Clare and Connemara lie the Aran Islands. The geological features of the district are exceedingly diversified, and proved to be of a somewhat unpromising character conchologically, whenever we got off the limestone.

Immediately after arriving at Galway the whole party drove through the suburb of Salthill to Gentian Hill, a promontory of drift standing out into the sea, whence a capital idea of the geographical features of the district may be obtained. Here we found a few land shells, including *Vitrina pellucida*, of which, as usual at this time of the year there were only dead specimens ; a small compact form of *Hyalinia crystallina* ; and one specimen (found by Mr. W. F. de V. Kane) of *Hyalinia excavata*. *Arion ater* and its var. *brunnea* were abundant, together with *Limax marginatus*. The rain coming on in the afternoon brought out *Helix nemoralis* in quantity, of ordinary form, but amongst them were four examples of var. *roseozonata* and a few of varr. *albolabiata*, *rubella*, and *castanea*. The *H. nemoralis* found here are not at all comparable for size and variety with those found at Ballyvaughan, directly across the bay. *Alexia denticulata* was very common on the shore, and of large size. The marine species observed were the usual common littoral forms.

On the 12th we proceeded by the recently opened light railway to the Twelve Bens of Connemara, passing through some most charming scenery. The original intention was for the party to stop at Ballynahinch, but the station being unfinished, we had to alight at Recess. This caused a deviation from our plans, as we had intended to search the shores of Ballynahinch Lake for *Vertigo Moulinsiana*, this being one of the recorded localities for that rare shell. Not caring to climb Ben Lettery with the bulk of the party, a few of us decided, as

we were so near Dogs Bay, to drive by car to Roundstone (11 miles), and spend a few hours there, and so full of interest did we find it, that we resolved to return on the breaking up of the party. As we drove along the banks of the River Blackadder, at Ballynahinch, we obtained several specimens of *Vertigo anti-vertigo* from the inside of dead stems of *Equisetum* in rejectamenta of the river.

On Saturday, the 13th, we all went by s.s. "Duras" to Ballyvaughan, Co. Clare. Here, although we found most of the species collected last year and already recorded, no additional species were obtained. We searched carefully in the old walls near Gleninagh Castle, where the fine example of reversed *H. nemoralis* was taken last year, but failed to find another. We, however, obtained the usual proportion of the beautiful var. *albolabiata*. On the shore at Gleninagh Mr. Nichols took *Modiolaria marmorata*, *Cardium norvegicum*, *Venus casina*, *Chiton marginatus*, and a few commoner marine species.

The following day we drove, in company with a few friends, to the ruins of Claregalway Abbey and to Annaghdown, on Lough Corrib, where many important finds were made. The piles of old coffin boards inside the abbey ruins proved a good hunting ground, and under these we found numerous varieties of slugs, including *Arion ater* var. *bicolor*; *A. subfuscus* var. *aurantiaca*; *Agriolimax agrestis* var. *albida*; and *Amalia Sowerbyi*. *Helix aspersa*; *H. nemoralis* in many pretty forms; *H. rufescens*, *H. hispida*, *H. rotundata* var. *Turtoni*, and some of the common *Hyaliniae* were plentiful; and on the banks of the river a small form of *Succinea putris* was abundant. At Annaghdown the shore of Lough Corrib yielded *Vertigo pygmaea*, *Hyalinia radiatula*, *Hy. nitida*, *Hy. fulva* of large size; *Hy. nitidula*, *Helix pulchella*—which here as elsewhere were all typical—and *Carychium minimum*. The Lough itself contained many small *Limnaea stagnalis*, *L. truncatula*, *L. palustris*, *Pisidium pulchellum*, and other common species.

On Monday, the 15th, the party started promptly at 6 a.m. on board the "Duras," bound for Aranmore, the largest of the Aran Islands, the prospect of visiting which had been one of our greatest inducements to join the trip. These islands, which are celebrated as being the locality for the largest British specimens of *H. nemoralis*, and also as one of the localities for *Vertigo Moulinsiana*, are the remnant of a great sea-shelf of carboniferous limestone, with precipitous cliffs on the Atlantic side 200—300 feet in height, and a series of terraces sloping down to the water on the other. They are extremely barren, and in a dry season there is very little vegetation. The cracks in the mountain limestone, however, are filled with beautiful ferns and other plants, and are the favourite resort of the larger *Helices*. Towards the eastern end of the island of Aranmore is Killeany Bay, where there is a considerable extent of sub-aerial sands, which are the resort of many land shells, numbers of which are buried by the shifting sands during gales of wind. At times also on the sea-board at low water, thousands of marine shells are blown up amongst them. We found, to our great disappointment, that time would not allow of a visit to the locality for *V. Moulinsiana*, which is a low swampy ground at the extreme western end of the island, about three miles from our landing place, Portmurvey, and our course lay in the opposite direction. After visiting the wonderful old pre-historic fort of Dun Ængus—the finest structure of its kind in Europe—we made our way across the island towards Kilonan. The intense heat of the day, and consequent dryness of everything, prevented our finding much of interest in the way of shells, with the exception of *Hyalinia Draparnaldi*. In a low swamp near Dun Oghill a few specimens of *Pisidium milium* occurred, and this locality was carefully searched for specimens of *Vertigo*, but unsuccessfully. Well on in the afternoon, and just as we began to despair of finding anything worth having, a welcome shower came on, and we lost no time in making our way towards Killeany. The heavy rain acted like magic, and we found *Helix*

aspersa, *H. nemoralis*, *H. virgata*, and *H. ericetorum* swarming out of the cracks and crawling over the scanty herbage in countless numbers. We made the most of our opportunity, and worked assiduously in the teeming rain, collecting a number of fine *H. nemoralis*, and *H. aspersa* var. *exalbida*. The shells were largely immature, and we were reluctantly compelled to leave behind very many beautiful examples on this account. The *H. nemoralis* did not differ very greatly from the Ballyvaughan specimens in their principal characteristics, and this is not to be wondered at, for the Aran Islands are of the same formation as the Burren district of Co. Clare and at one time doubtless were connected with it. Some particulars of the specimens taken may be of interest. The *H. nemoralis* were not nearly so large as specimens we had seen, taken in former years by Dr. P. B. Mason and others, and this may be accounted for by the extreme dryness of the early part of the season, at a time when the principal growth of the shell takes place. Many of the immature shells were larger than the full-grown specimens collected, and gave promise of a much greater development in size under favourable conditions. Out of the 169 mature specimens of *H. nemoralis* collected, no fewer than 30 were the white-mouthed form, var. *albolabiata*. All of these were of the yellow ground color of var. *libellula*, most of them with the bands completely or partly coalesced—a very unusual band formula for this variety. We have no doubt this form has been mistaken by some previous writers, in their observations on the mollusca of the Aran Islands, for *H. hortensis*, a species which, so far as our observations went, does not exist on Aranmore, and certainly all the white-mouthed specimens obtained by us were *H. nemoralis*. Of var. *hyalozonata* there were four specimens; of var. *roseozonata* two; of var. *rubella* thirty—all bandless; of var. *castanea* seven, typical; of var. *coalita* four; of var. *roseolabiata* five, of various bandings; and of var. *punctata* four. The remainder were var. *libellula*, many wanting the two upper bands, but no fewer than fifty were bandless. Two of the specimens exhibited

an unusual character, being decidedly umbilicate. The *H. aspersa* showed more variation here than in any other locality we visited—five full-grown and several immature examples of the var. *exalbida* were found, as well as a few of var. *undulata*. *H. rupestris* was plentiful on the walls throughout the island, and a small dark form of *H. ericetorum* was abundant. *H. acuta* and *H. virgata* were locally common, but exhibited little variation worthy of note, and a few *Pupa muscorum* were observed. We only searched a small portion of the shore near Kilronan, where *Rissoa parva* and *R. violacea* occurred in abundance. *Buccinum undatum* var. *paupercula* was common under stones, and *Chiton marginatus* was taken by Miss Kelsall. A pretty red variety of *Littorina rudis* was common on the rocks at Kilronan, and a huge fragment of wreckage full of living *Teredo norvegica* was noticed on the beach.

On Tuesday, the 16th, we went by train to Oughterard, and thence by car along the shore of Lough Corrib—a vast lake diversified with islands great and small. The main party proceeded to Carn Sefin, whilst we, along with Messrs. R. Welch and F. J. Bigger—who wished, if possible, to cross to the island of Inchangoil lying about two miles out in the lake—turned our car into the demesne of Mr. Hy. Hodgson, J.P., of Currarevagh. He, although we were all entire strangers to him, received us with characteristic Irish hospitality, and generously placed at our service a couple of good boats in which we were rowed by his men to the lovely little island—celebrated as being the burial place of Lugnaedon, St. Patrick's nephew, and replete with other historic associations. The fascination of the place was in no wise lessened by the feeling that we were probably the first conchologists who had ever set foot upon this secluded spot! Amongst the hoary old monuments around the two ancient ruined churches on the island, we found many *H. aspersa*, and small-sized *H. nemoralis*; very pale-coloured *H. aculeata*, on the decayed stems of blackberry and briars, which grow in great luxuriance; and *H. pygmæa*, and *Hyalinia fulva* amongst moss-

covered stones. *Hy. cellaria*, *Hy. alliaria*, *Hy. nitidula*, and *Helix pulchella* occurred sparingly. On the shore of the island *Succinea elegans* var. *ochracea* was plentiful. In the Lough itself we found a peculiar dwarfed form of *Limnæa stagnalis*, which seems identical with the var. *fossarina* from Lough Erne; and *L. palustris* of a peculiarly obese form—which may be var. *obesa* Taylor, and is certainly quite unlike any we have hitherto seen. Under stones, in shallow water, we found numbers of small-sized *Ancylus fluviatilis*, all being the somewhat scarce var. *gibbosa* Bourg. *Planorbis albus*, *Pl. marginatus*, *Pl. contortus*, *Valvata piscinalis* and a small form of *Limnæa peregra* were all plentiful. Near Mr. Hodgson's house we noted several specimens of *Limax marginatus*, and *Arion ater*.

On the breaking up of the party on the 17th we had little difficulty in persuading several friends to accompany us to Roundstone, for Dogs Bay, and spent two days in a thorough investigation of the place. We may here observe that Dogs Bay is about a mile from the pretty village of Roundstone, and lies at the base of Errisbeg. The water to the west is called Dogs Bay—evidently a contraction of its Celtic name, Portna-feadog, *i.e.*, “the port of the plover”—and that to the east Gorteen Bay; the two magnificent crescent-shaped strands are separated by an intervening ridge of sandhills, which form a narrow isthmus, connecting the mainland with an outlying peninsula called “Earawalla.”

Our chief object was to learn something definite about the large semi-fossil *Helix nemoralis*, found on the isthmus between the two bays, and to personally examine the remarkable deposit of land shells mentioned by Mr. R. D. Darbishire in the “Journal of Conchology” for April, 1885 (vol. iv. p. 317). This deposit he describes as occurring in “an old sward which appeared as a black band about two inches deep, in the face of a small cliff or section of the sandhills closing the bay to the eastward.” We could not find this “black band,” so conclude that the features of the isthmus must have altered very considerably

since his visit, but we discovered an equally interesting deposit, for, in several places where the action of the wind had cut a section through the sandhills, the old land surface was exposed underneath the overlying blown sand, and showed as an earthy layer about a foot deep, in which were embedded countless numbers of land shells in perfect preservation. From this layer we obtained the following species :—*Vitrina pellucida*, *Hyalinia nitidula*, *Hy. pura*, *Hy. crystallina*, *Helix aculeata*, *H. nemoralis*, *H. rufescens*, *H. concinna*, *H. virgata*, *H. ericetorum*, *H. aspersa*, *H. pulchella*, *H. pygmæa*, *Pupa muscorum*, *Vertigo substriata*, *V. angustior*, *Clausilia rugosa*, *Cochlicopa lubrica*, *Carychium minimum*, *Acme lineata*—all the above were obtained by Mr. Darbishire, and given in his list, our additions being *Hy. fulva*, *Hy. cellaria*, *Helix hispida*, *H. caperata*, *H. acuta*, and *V. pygmæa*. We searched carefully for living examples of any of the above, but found none on the sandhills ; we, however, found on the outlying peninsula one example of *H. aspersa*, and a few *H. acuta*, *H. ericetorum*, and *P. muscorum*, and on the road to Roundstone a few *H. nemoralis* of ordinary character were noticed. The search was carried on under favourable conditions—weather very wet and warm—and we could hardly have failed to find the shells had they been present. During our short stay our attention was confined entirely to Dogs Bay, and we had no time to search the immediate neighbourhood of Roundstone ; but our friend Mr. R. Welch, during a visit to the adjacent island of Inis Macdara, obtained specimens of *Balea perversa*, *Amalia gagates* var. *plumbea* Moq., *Pupa cylindracea* var. *curta*, and a small dark form of *Helix ericetorum*.

The sections in the sandhills enabled us to study the history of the large and massive semi-fossil *H. nemoralis*, for which Dogs Bay is specially noted, and which undoubtedly belongs to a gigantic race of shells which at one time existed here, and was apparently overwhelmed by some great sandstorm. The shells occur in a layer composed of clean sand, foraminifera, and finely comminuted shells, about three feet deep, lying

immediately below the earthy layer before-mentioned. This earthy layer contains many *H. nemoralis* of a similar type to that at present existing elsewhere ; the shells are thin, light in texture, and retain much of their colouring, and obviously belong to a later epoch than the heavy specimens in the stratum below. As the shells from both strata weather out they are blown by the wind into the hollows of the sandhills, where they lie by hundreds intermingled together, but after a study of the separate strata there is little difficulty in distinguishing individuals belonging to the two epochs, by noting the material with which they are filled. The older shells are not only remarkable for their weight—which varies from 70 to 79 grains—and solidity, but also for their dimensions, the largest measuring 28 mills. in breadth, by 18 mills. in height. The elevation of the spire varies considerably, some being much depressed. Several umbilicated specimens were found, and others had a thick, heavy, curiously constricted lip, folding inwards near the suture and forming a tooth-like protuberance ; some of the heavier shells have also an abnormally strong callus. Traces of the original banding occur in some few specimens, but they are mostly bleached pure white, and as a rule are very perfect, except that now and then an example occurs with a singular fracture, which consists in the breaking out of a small triangular portion of the lip near the suture. We are inclined to think that this is caused by the action of frost in expanding the damp material with which the shells are so tightly packed. A theory has been advanced by some of our friends, that the abnormal thickness of the shells is due to the gradual accretion of calcareous particles from the material in which they are embedded, and they point to the layers shown in a section of the shell as corroborative evidence of this. We cannot, however, bring ourselves to admit this theory of *post-mortem* thickening, for if such were the case we should expect the layers to be equally deposited on the outer side of the upper whorls, as well as on the inner side. But a section shows the colouring of the band on the upper whorl quite dis-

tinctly, proving that the actual thickening has been deposited on the inner side of the whorls during the life of the animal. The climate of this part of Ireland is largely influenced by the Gulf Stream, and Dogs Bay facing west, with the sheltering mountain of Errisbeg immediately behind, is extremely mild and damp, and thus favourable to a lengthened life-period with very little hybernation—causes which would naturally conduce to a greater development of shell, both before and after normal maturity. The substance of the shells appears to have undergone some chemical change during their long entombment, the usual calcareous material having been replaced by arragonite, which causes them to appear pellucid when wet, and renders them extremely hard.

The marine shells of Dogs Bay are remarkable alike for abundance and variety, especially of the smaller species. The shore is almost wholly composed of one vast mass of nearly pure foraminifera, intermixed with small shells—principally *Rissoæ*, *Odostomiæ*, and *Pleurotomidæ*. We brought home a quantity of this drift, and with the kind assistance of Dr. G. W. Chaster, have examined a small portion, obtaining from it the greater part of the 112 species recorded during the excursion. The following are some of the more notable records :—*Lima hians*, *L. subauriculata*, *Arca tetragona*, *Lepton nitidum*, *L. Clarkiæ*, *L. Sykesi*, *Montacuta bidentata*, *M. ferruginosa*, *Lasea rubra*, *Tellina donacina*, *Solen vagina*, *Tectura virginea*, *Trochus helycinus*, *Rissoa fulgida*, *R. soluta*, *Skenea planorbis*, *Homalogyra atomus*, *H. rota*, *Cæcum glabrum*, *Scalaria Trevelyana*, *S. clathratula*, *Odostomia turrata*, *O. diaphana*, *O. lactea*, *O. nitidissima*, *Ianthina rotundata*, *Eulima distorta*, *Lamellaria perspicua*, *Cerithium perversum*, *Trophon truncatus*, *Defrancia linearis*, *D. purpurea*, *Pleurotoma costata*, *Cylichna cylindracea*, *Philine punctata*, *Aplysia punctata*, *Spirialis retroversus*, and many other common species. Besides the mature shells a vast number of embryonic specimens are present, usually in beautiful condition. *Cæcum glabrum* with spiral attached is

common, and many detached spirals occur. *Helcion pellucidum*, *Patella vulgata*, and *Tectura virginea* with embryo spiral cap are also plentiful. The most important record from Dogs Bay is undoubtedly that of *Lepton Sykesi* Chaster. (Original description "Ann. and Mag. Nat. Hist.", March, 1895, p. 248; further notes by J. T. Marshall "Journ. Malacol.", June, 1895, p. 36). Both record it only from Guernsey, but Dr. Chaster informs us that he has since received it from Cornwall, and future investigations with the dredge will probably show it to be generally distributed around the British coasts.

Not the least interesting of our discoveries at Dogs Bay was the finding of a series of curious "Kitchen-middens" on the isthmus, which it may not be out of place to mention here. The isthmus is in most places scattered over with quantities of marine shells, intermixed with the *H. nemoralis* and other land shells; but in parts there are great mounds, each composed of one particular species, disposed in such a manner as to entirely preclude the idea that they can have been formed by other than human agency. Further confirmation, if needed, that these mounds are the "kitchen-middens" of a primitive people, was afforded by the discovery of twelve "hammer-stones," all showing signs of use; the upper part of a quern, and a portion of another; numerous round charred stones—which had possibly been used as "pot-boilers"—together with many teeth and broken bones of various animals, but no trace of pottery was observed. The principal "middens" were severally composed of the shells of *Patella vulgata*, *Littorina littorea*, and *Purpura lapillus*, but in some cases all three were mixed indiscriminately, and along with them a few shells of *Buccinum undatum*, and other marine shells occurred. These mounds which are shown on Pls. V—VII from photos taken on the spot by Mr. R. Welch, will serve as a characteristic illustration of the manner in which one species of shell only is found in one particular "midden." On closer examination we found signs of fire in every direction, and especially in the *Littorina*-mounds, where

the shells, though perfect, had been charred, and the fragments of quartzite mixed with them were burnt to a bright redness. In the *Purpura*-mounds all the shells had been broken in a peculiar manner, evidently whilst alive, but whether for food or bait is hard to determine, and certainly they would furnish poor material for either purpose. It is not unlikely that they have been broken with the hammer-stones before-mentioned, for with these we have obtained precisely the same results upon living specimens of *Purpura*. It is a remarkable fact that every one of the broken *Purpuræ* we brought home—several handfuls taken indiscriminately—exhibit the same peculiarity of fracture. In each case the apical whorls have been smashed, leaving the lower whorl with mouth intact, and in some cases portions of the second and third whorls remain along with part of the columella. None of the species of which the mounds are composed are particularly abundant upon the rocks in the immediate vicinity at the present time ; but they may have been collected on the neighbouring islands, and brought to this place by the people who used them. What fuel was used is also a mystery, and as far as can be ascertained there is no tradition relating to any tribe who may have formed these mounds. Is it possible that the *Purpuræ* can have been thus broken in order to obtain the dye from the animals? We believe that the ancient Irish had a purple dye such as might be furnished by *Purpuræ*, and though it may be urged that such a tiny portion of colouring matter is afforded by each animal that it would be practically useless, we may reply to such an objection by referring to the testimony of Pliny ⁽¹⁾ and others respecting the tedious process followed by the women of Tyre in obtaining the famed Tyrian purple dye from the animal of *Murex*—"a tiny drop from each living fish!" and likewise further refer to the Rev. W. Colenso's ⁽²⁾ graphic account of the equally tedious process employed by the Maoris in obtaining their brilliant dyes—a few threads of pre-

(1) Pliny, "Nat. Hist.," lib. ix., C. 60—53.

(2) *Trans. N. Zealand Inst.*, 1881, vol. xiv., p. 57.

pared flax are dyed at a time, usually in a *Haliotis*-shell, taken out and dried, then re-dipped until the proper shade of colour sought is obtained, and this operation is patiently repeated again and again until a sufficient quantity of threads are dyed. Dr. Ed. Schunck ⁽³⁾ also gives an account of the manner in which dyeing from shell-fish is still carried on by the natives of Central America, the shell employed being *Purpura patula*—a species closely allied to our own—and the process illustrates the patient assiduity of the Indians, each thread being dyed separately. The following passage in the Venerable Bede's Ecclesiastical History of England is interesting, as it points to a knowledge of the art of dyeing from shell-fish in our own country:—"There are also shells plentiful enough, and more than enough, from which dye of a scarlet color is made; of which the most beautiful red shade never grows pale under any heat of the sun, nor sustains any injury by rain, but the older it is the more beautiful it is." Bede died in 735, so this is a very early notice, authentic and dated, and genuinely indigenous. No doubt he had read of the Tyrian or Roman purple, but we feel pretty certain that in this passage he refers to some British process.

On our return from Roundstone to Dublin we broke our journey at Athlone, where we stayed the night. Near the town, and along the banks of the Shannon, we did not find much worthy of special note—the rejectamenta of the river yielded a few common species such as *Helix pulchella*, *H. pygmaea*, *Limnaea truncatula*, and *Bythinia tentaculata*. Early next morning we drove to Clonmacnois. Our car was frequently stopped to examine the road-side walls and hedgerows, and under some heaps of stones we found *Helix nemoralis*, *H. rufescens*, and very large-sized *Bulimus obscurus*. On the walls *Pupa cylindracea* and *H. rupestris* were abundant—the latter unusually fine. In the ruins of Clonmacnois, which are very extensive, including several churches, two round towers, and a castle, we found very

(3) *Journ. Chem. Soc.*, Aug., 1880.

prettyspecimens of *Helix nemoralis*—including a remarkably dark form of var. *coalita*. A small form of *H. rufescens* var. *rubens* was also plentiful. *H. aspersa* simply swarmed on every old grave-stone, sheltered by the rank nettles with which the whole ground is deeply covered. Careful search was made for varieties (perchance a reversed specimen!) but, with the exception of two examples of var. *conoidea*, nothing worthy of note was observed. *Arion hortensis* was not uncommon, the prevalent form being var. *nigra* Moq., and two specimens of *Arion circumscriptus* were noted.

The visit to Clonmacnois was the termination of our collecting experiences during a very delightful excursion, our only regret being that the time at our disposal only allowed a very brief search in most places visited. But we saw enough to convince us that more leisurely investigation of the district would amply repay anyone who could carry it out. The enterprise of the Irish railway companies in opening up this charming country, and affording special advantages to tourists, now enables one to reach remote and hitherto little known parts with comparative ease, and we can confidently recommend the West of Ireland as an eminently suitable place for a conchological excursion. Roundstone and Dogs Bay in particular must please any naturalist: the result of our shore collecting there serves to show the wealth of the marine fauna, and what valuable captures might be effected by some systematic work with the dredge.

Note on the habits of *Vertigo edentula* Drap.—In September and October, 1895, I found great numbers of this species in a wood at Compstall, Cheshire. In a damp spot in the wood there is a luxuriant growth of Butterbur (*Tussilago petasites*), whose broad leaves are often from two-and-a-half to three feet from the ground. A few of the little molluscs were found on the stems of this plant, but the greater number of them were adhering to the underside of the leaves, individuals often occupying the “coign of vantage” formed by the junction of two ribs. So numerous were the shells that I counted seventeen of various ages on a single leaf, and had I wished I might have gathered hundreds in a very short time.—CHAS. OLDHAM, Romiley, November 6th, 1895. (*Read before the Conchological Society, November 6th, 1895*).

THE MARINE MOLLUSCA OF CORNWALL.

BY GEORGE FOX TREGELLES.

(Read before the Conchological Society, December 4, 1895).

THE rugged coast-line of Cornwall, pushed out into the Atlantic, gives promise of a varied marine fauna in general, and molluscan fauna in particular, and the promise is well kept. Forbidding as are the western cliffs, we find, nestled among them, along the south coast, bights, beaches, and coves, often with stretches of rock-pools at low-tide. The sea, too, is very free from sediment, and its temperature is equable, so that the conditions are favorable, and the conchologist finds plenty of material on the shore and farther out with the dredge.

To the credit of the county be it said that its inhabitants have done much good work among the mollusca, and have not left to visitors the discovery of a *terra incognita*. Jonathan Couch of Polperro, and Williams Hockin of Truro, both devoted much attention to the study of molluscs, and published locally the results of their observations, in 1841 and 1866 respectively. It will be seen by the context that many others have followed their example, though but few have "rushed into print."*

The shores of Cornwall are so extensive that it is not surprising if the whole of them have not been worked with equal thoroughness. The following figures shew approximately the distribution of species, but allowance must be made for the fact that West Cornwall has received more than its share of attention. Out of about 350 species of marine mollusca (excluding nudibranchs) we find recorded for

East Cornwall	...	...	...	...	220 species.
West Cornwall	...	...	...	...	315 do.
Scilly	...	...	...	...	270 do.

* There is a Synopsis of the Fauna and Flora of Cornwall in the Transactions of the Penzance Natural History Society, new series, vol. iii., pp. 378-382.

Taking West Cornwall in detail we find recorded for			
Falmouth and Helford	...	...	285 species.
Mount's Bay	...	...	260 do.
Land's End and Porthcurnow	...	...	200 do.
Hayle and St. Ives	...	...	150 do.

Plymouth Sound, which, strictly speaking, is common to Devon and Cornwall, has been well studied by the officials of the Marine Biological Laboratory; but, naturally, they do not give much attention to the specific distinctions of molluscs. Whitsand Bay, Looe, Polperro, Fowey, and Goran have all been worked, but not exhaustively, and they will repay closer examination.

Falmouth and Helford offer so much variety—estuary, land-locked harbour, and open sea—that the record of species for that locality is large. Mount's Bay is at first sight disappointing—there are so few shells on the beaches; but the rock-pools and dredging yield very good results, and trawlers bring in some valuable species if they can be persuaded to save any of their "rubbish." Porthcurnow beach, near the Land's End, is mainly composed of small shells, broken and whole, and dead specimens of many species can be obtained there (*Ervilia castanea* Mont. being characteristic) when wind and tide are favourable. There must be a considerable nursery outside, but no one, I believe, has hit on the exact source of this inexhaustible supply. Whitsand Bay (Land's End) is similar, but the beach is much larger, and the shells more scattered. Hayle beaches are often strewn with shells, chiefly bivalves; *Loripes commutatus* Ph. and the rare *Mactra glauca* Born are occasionally found there.

From thence, north-eastwards, the coast is very barren; broad surf-beaten beaches alternate with beetling cliffs, and few species of shells are to be found on the shore, whatever dredging outside might yield. A few species have been obtained near Padstow, and probably that piece of coast is worth attention.

Scilly has been so well dealt with in this journal by the Rev. R. W. J. Smart and the late Mr. Clifford Burkill that I can add little to their remarks on that interesting, nay fascinating, archipelago, except to mention the occurrence there of thirteen species, as yet unrecorded for the mainland of Cornwall, viz.: *Natica sordida* Phil., *Rissoa Jeffreysi* Wall., *Eulima curva* Jeff., *Odostomia conspicua* Ald., *Trophon clathratus* var. *truncata* Str., *Bela Trevelyana* Turt., *Mangilia levigata* (Phil.) type, *Tornatina expansa* Jeff., *Montacuta Dawsoni* Jeff., *Lepton sulcatulum* Jeff., *Galeomma Turtoni* Eds. Zool. Journ., *Argiope decollata* Chem., and *A. cistellula* S. Wood.

The nudibranchs of Cornish seas have not received the attention they deserve, but the admirable paper by Mr. Garstang shews how rich is the field at Plymouth; and Falmouth has been well worked by the late Mr. W. P. Cocks and by Mr. Rupert Vallentin. Mount's Bay and Scilly, however, are practically untouched.

I regret that I cannot include the land and freshwater mollusca in my list, and must refer my readers to Mr. Marquand's paper, which deals with West Cornwall only.

The classification adopted is in the main that of the Rev. A. H. Cooke, M.A., in his recently published "Molluscs" (Cambridge Natural History, vol. iii., 1895), with hints from Canon Norman's unfinished "Revision of the British Mollusca" (Ann. and Mag. of N.H., 1890), and I am indebted to Dr. G. W. Chaster for valuable assistance in revising the terminology of genera and species.

I need not enumerate the more general works on conchology that have been consulted, but the following papers, etc., of local interest should be mentioned:—

Jonathan Couch, "Cornish Fauna," 1841.

"List of Shells, Mount's Bay," 1855: Trans. Penzance N.H. and Antiq. Soc., old series, vol. ii., p. 196 (Penz. List).

W. P. Cocks, "Fauna of Falmouth": Rep. R. Cornwall Polytechnic Soc., 1849.

- Williams Hockin, "Cornish Marine Shells": Journ. R. Institution of Cornwall, 1866.
- E. D. Marquand, "Land and Freshwater Mollusca of West Cornwall," 1883: Trans. Penzance N.H. and Antiq. Soc., new series, vol. i., p. 403.
- G. F. Tregelles, "Marine Testaceous Mollusca of Cornwall," 1885; *op. cit.*, new series, vol. ii., p. 43.
- Rev. R. W. J. Smart, M.A., and Rev. A. H. Cooke, M.A., "Marine Shells of Scilly": Journ. of Conch. 1885, 1886.
- C. Burkill and J. T. Marshall, "Marine Shells of Scilly": *op. cit.*, 1889, 1891.
- W. Heape, M.A., "Prelim. Report on Fauna and Flora of Plymouth Sound": Journ. M. Biological Assoc., 1888.
- W. Garstang, M.A., "Opisthobranchiate Mollusca found at Plymouth": *op. cit.*, 1890.

Private collections have been kindly placed at my disposal by Miss Hockin of Hayle, the late Miss H. Tyacke of Penzance, Mr. W. E. Baily of Paul, and the late Rev. R. N. Dennis, B.A., of Penzance. I have also had access to the public collections in the Penzance Museum (which now includes Miss H. Tyacke's collection), and the Truro Museum (including that of the late Rev. W. Rogers, M.A.). It gives me pleasure to acknowledge and recall kind personal assistance from the late Mr. Clifford Burkill, Mr. E. D. Marquand, Mr. J. T. Marshall, the Rev. R. W. J. Smart, M.A., Mr. R. V. Tellam, and many others.

The following is an index to the initials used in my list:—

Messrs. Alder & Hancock	A. & H.	Mr. Williams Hockin	...	W.H.
Mr. Clifford Burkill	...	Dr. J. Gwyn Jeffreys	...	J.G.J.
Mr. W. P. Cocks	...	Mr. J. T. Marshall	...	J.T.M.
Mr. Jonathan Couch	...	Rev. W. Rogers	...	W.R.
Rev. R. N. Dennis	R.N.D.	Rev. R. W. J. Smart	R.W.J.S.	
Messrs. Forbes & Hanley	F. & H.	Miss H. Tyacke	...	Miss T.
Mr. Walter Garstang	W.G.	Mr. Rupert Vallentin	...	R.V.
Miss Hockin	...	Author	...	G.F.T.

Journal of the Marine Biological Association J.M.B.A.

CLASS CEPHALOPODA.

ORDER DIBRANCHIATA.

SUB-ORDER OCTOPODA.

Octopus vulgaris Lmk.—Generally distributed.

Eledone cirrosa Lmk. — Plymouth Sound (J.M.B.A.);
Falmouth (W.P.C.); Mount's Bay (J. B. Cornish).

SUB-ORDER DECAPODA.

Spirula Peroni Lmk., is a tropical cephalopod, the dead shells of which are frequently cast ashore on the western beaches of Cornwall.

Sepia officinalis L.—Generally distributed.

S. Ruppellaria D'Orb. — Plymouth (J.M.B.A.); Polperro (Laughrin); Mawgan Porth, shells only (J.G.J.).

S. elegans D'Orb.—Polperro (J.C.).

Sepiola atlantica D'Orb. Plymouth, common (J.M.B.A.); Polperro (Laughrin); Falmouth (W.P.C. and R.V.); Mount's Bay (G.F.T.). [Many, if not all, of the older records of *S. Rondeleti* undoubtedly refer to this species, but it is still an open question whether the true Mediterranean *S. Rondeleti* occurs on the Cornish coast. It has been recorded by Giard from Roscoff.—Ed.]

Rossia macrosoma D.Ch.—Plymouth, twice in autumn of 1892 (J.M.B.A.).

Loligo Forbesi Stp.—Generally distributed.

L. marmoræ Vér.—Off Draystone, Plymouth (J.M.B.A.).

L. media L.—Cawsand Bay, Plymouth (J.M.B.A.); Falmouth (W.P.C. and R.V.).

Ommastrephes eblanæ Ball.—Plymouth (J.M.B.A.).

O. sagittatus Lmk.—Polperro (Laughrin); Falmouth (W.P.C.).

[It is not certain whether these records refer to *Illex Coindeti* or *Todarodes sagittatus*.—Ed.]

CLASS GASTROPODA.

ORDER AMPHINEURA.

SUB-ORDER POLYPLACOPHORA.

Lepidopleurus onyx Speng. [*Chiton cinereus* Jeff.].—Plymouth, Falmouth, Helford, Mount's Bay, Hayle, Scilly.

- L. cancellatus** Sow. — Helford and Falmouth (R.N.D.); Scilly (C.B.).
- Hanleya Hanleyi** Bean.—Off Plymouth (J.M.B.A.); Falmouth (W.P.C.); Scilly (C.B.).
- Trachydermon cinereus** L. [*C. marginatus* Penn.].—Falmouth (Brown); Mount's Bay (G.F.T.); Scilly (R.W.J.S.).
- Tonicella rubra** Lowe.—Falmouth (W.P.C.); Mount's Bay (Penz. List).
- Callochiton lævis** Mont. — Falmouth (J.T.M.); Helford (W.R.); Mount's Bay (Magor, G.F.T.); Land's End (W.H.); Scilly (C.B.).
- Acanthochiton fascicularis** L.—Whitsand Bay E., Falmouth, Helford, Penzance, Mousehole, Scilly.
- A. discrepans** BROWN.—Lantivet Bay (J.C.); Falmouth (W.P.C.); Helford (W.R.); Mount's Bay (Miss T.).

ORDER PROSOBRANCHIATA.

SUB-ORDER DIOTOCARDIA.

- Acmæa virginea** Müll.—Generally distributed.
- A. virginea** var. **conica** and **lactea** Jeff.—Helford (W.R.).
- Patella vulgata** L.—Generally distributed.
- Var. **depressa** Penn.—Generally distributed.
- Varr. **picta** Jeff., **elevata** Jeff. and **intermedia** Knapp.—Helford (W.R.).
- Helcion pellucidum** L.—Generally distributed.
- H. pellucidum** var. **lævis** Penn.—Generally distributed.
- Fissurella græca** L.—Moderately common.
- Emarginula fissura** L. — Plymouth, Falmouth, Mount's Bay, Porthcurnow, Porthgwarra, Land's End, Scilly.
- E. fissura** var. **elata** and **incurva** Jeff.—Land's End (W.H.)
- E. rosea** Bell.—Plymouth Sound (J.M.B.A.); S.E. Cornwall (J.C.); Fowey (Peach); Helford (R.N.D.); Mount's Bay (G.F.T.); Scilly (Lord Vernon).
- Cyclostrema Cutlerianum** Cl.—Fowey (Barlee); Falmouth (Webster); Helford (W.H.); Sennen and Scilly (C.B.).

- C. nitens** Phil. — Fowey (J.T.M.); Falmouth (W.P.C.); Sennen and Scilly (C.B.).
- C. serpuloides** Mont.—Falmouth (W.H.); Helford (W.R.); Mount's Bay (Penz. List); Scilly (C.B.).
- Trochus (Trochocochlea) crassus** Pult. [*T. lineatus* DaC.]
—Generally distributed.
- T. crassus** var. **minor** Jeff.—Helford (W.R.).
- Gibbula maga** L.—Generally distributed.
Var. **alba** Jeff.—Scilly (R.W.J.S.).
- G. cineraria** L.—Generally distributed.
Varr. **electissima** Bean and **variegata** Jeff.—Helford (W.R.).
- G. umbilicata** Mont.—Generally distributed.
Var. **atropurpurea** Jeff.—Falmouth (G.F.T.); Hayle and Mawgan Porth (Miss H.).
- G. tumida** Mont.—Plymouth Sound (J.M.B.A.); Falmouth (R.N.D.); Mount's Bay, trawl refuse (G.F.T.); Porthgwarra (R.N.D.); Land's End (W.H.); Scilly (R.W.J.S.).
- Calliostoma Montacuti** W. Wood.—Falmouth (Miss Carne); Mount's Bay, trawl refuse (G.F.T.); Scilly (R.W.J.S.).
- C. striatum** L. — Falmouth (Montagu); Helford (W.H.); Mount's Bay (Miss T.); Land's End (McAndrew); Scilly (R.W.J.S.).
- C. exasperatum** Penn.—Falmouth, Helford, and Penzance (R.N.D.); Land's End (Maton).
- C. millegranum** Born.—Falmouth, 30 fms. (W.H.); Porthgwarra (R.N.D.); Wolf Rock (Miss Carne); Scilly, one specimen only (R.W.J.S.).
Var. **pyramidata** Jeff. — Mount's Bay (C.B.); Scilly (R.W.J.S.).
- C. granulatum** Born.—Plymouth Sound, S.E. Cornwall, Falmouth, Maenporth, Mount's Bay (trawl refuse), Land's End, Scilly.
Var. **lactea** Jeff.—Mount's Bay and Scilly (C.B.).
- C. zizyphinum** L.—Generally distributed.

Var. **Lyonsii** Leach.—Near Fowey (J.T.M.); Helford (W.H.); Mount's Bay, living, from the trawl (G.F.T.); Porthgwarra (Marquand); Scilly (R.W.J.S.).

Var. **lævigata** J. Sow.—Helford (W.H.); Mount's Bay, trawl refuse (G.F.T.).

Var. **granulifera** Jeff.—Mount's Bay (G.F.T.).

Phasianella pullus L.—Generally distributed.

SUB-ORDER *MONOTOCARDIA*.

lanthina communis Lmk.—At intervals on most of the northern beaches from Bude to Land's End and Scilly; Mount's Bay, Falmouth, Whitsand Bay E. About the year 1869 large numbers of this species, and the next, were washed ashore at Scilly, the beaches being described as *blue* with them (R.W.J.S.).

l. exigua Lmk.—This species is not usually regarded as British, but it has been found in large numbers at Scilly, as mentioned above, and it is also recorded for Hayle (W.H.); Land's End (Turton); Whitsand Bay E., during storms (J.M.B.A.).

Scalaria communis Lmk.—Plymouth, Looe, Falmouth, Mount's Bay, Land's End, Hayle, Scilly.

S. Turtonæ Turt.—Plymouth (J.M.B.A.); Falmouth (J.C.); Land's End (W.H.); Hayle and Scilly (Miss H.).

S. Trevelyana Leach.—Plymouth Sound (J.M.B.A.); off Land's End (McAndrew); Falmouth (W.P.C.); Hayle (Miss H.); Scilly (Jenkinson).

S. clathratula Ad.—S.E. Cornwall (J.C.); Fowey and Falmouth (Alder); Penzance (Forbes); Mousehole and Porthgwarra (R.N.D.); Porthcurnow (J.C.); Scilly (R.W.J.S.).

S. pseudoscalaris Broc.—One specimen found at Porthcurnow by Miss Layars (B.C., vol. iv., p. 98); two specimens found at Scilly (J.T.M., Journ. of Conch., Apl., 1887).

- Acilis supranitida*** S. Wood.—Plymouth Sound (J.M.B.A.); Falmouth (Cranch); Fowey (Barlee); Sennen (J.T.M.); Hayle (W.H.); Scilly, one specimen (R.W.J.S.).
- A. ascaris*** Turt.—Plymouth Sound (J.M.B.A.); Helford (W.H.); Wolf Rock (Miss Carne); Land's End and Hayle (W.H.); Bude (Lindsay); Scilly (C.B.).
- Pherusa Gulsonæ*** Cl.—Fowey and Falmouth (Barlee); St. Mawes and Helford (W.H.); Scilly (C.B.).
- Var. ***tenuicula*** Jeff.—Land's End (W.H.); Scilly (C.B.).
- Cioniscus unicus*** Mont.—Falmouth (Montagu); Mount's Bay (Penz. List); Land's End and Hayle (W.H.); Scilly (C.B.).
- Natica (Lunatia) catena*** DaC.—Whitsand Bay E., Par, Plymouth, Falmouth, Helford, Mount's Bay, Porthcurnow, Hayle.
- N. Alderi*** Forb.—Plymouth, S.E. Cornwall, Falmouth, Helford, Mount's Bay (frequent), Porthcurnow, Land's End, Hayle, Scilly.
- Var. ***lactea*** Jeff. — Falmouth (C.B.); Helford (W.H.); Mount's Bay, trawl refuse (G.F.T.); Scilly (R.W.J.S.).
- N. sordida*** Phil.—Off Scilly (McAndrew).
- N. Montacuti*** Forb.—Cornwall (McAndrew); Menavawr, Scilly, three or four living specimens (R.W.J.S.).
- Lamellaria perspicua*** L.—Plymouth, Goran, Falmouth, Helford, Mount's Bay, Land's End, Hayle, Scilly.
- Var. ***lata*** Jeff.—Mount's Bay, dredged living (G.F.T.).
- Velutina lævigata*** Penn.—Falmouth (W.P.C.); Porthcurnow (R.N.D.); Hayle (W.H.); Scilly (R.W.J.S.).
- Capulus hungaricus*** L.—Fairly common in deep water, and not unfrequently found on the shell of *Pecten maximus*.
- Calyptræa chinensis*** L.—Plymouth Sound (J.M.B.A.); Fowey (Peach); Falmouth (W.P.C.); abundant in Helford River among old shells (R.N.D.).

- Hemalogyra atomus** Phil.—Falmouth (Barlee); S. Mawes (W.H.); Mount's Bay (Penz. List); Land's End (J.G.J.); Scilly (C.B.).
- H. (Ammonicerina) rota** F. & H.—Falmouth (J.G.J.); Mousehole (Templer); Land's End (Webster); Carbis Bay and Scilly (C.B.).
- Littorina neritoides** L.—Plymouth Sound, Falmouth, Lizard, Mount's Bay, Porthcurnow, Gurnard's Head, Scilly.
- L. obtusata** L.—Generally distributed.
 Var. **fabalis** Turt.—Falmouth and Maenporth (R.N.D.).
- L. rudis** Maton.—Generally distributed.
 Var. **saxatilis** Johnst.—Mount's Bay and Helford (Miss T.).
 Var. **sulcata** Leach.—Land's End (Turton); Scilly (Barlee).
 Var. **jugosa** Mont.—Falmouth (J.T.M.); Prussia Cove (Miss T.).
 Var. **patula** Thorpe.—Eddystone, Lizard, Mount's Bay, Gurnard's Head, Portreath.
 Varr. **globosa** Jeff. and **tenebrosa** Mont.—Hayle (Miss H.).
 Var. **similis** Jeff.—Kynance Cove (Miss T.).
- L. littorea** L.—Generally distributed.
- Lacuna divaricata** Fabr.—Mount's Bay, common in shallow water (G.F.T.); Porthcurnow (J.G.J.); Land's End (James).
 Var. **quadrifasciata** Mont.—In shell-sand along south coast (J.C.); Falmouth (W.P.C.); Land's End (Truro Museum).
- L. crassior** Mont.—Porthcurnow (R.N.D.); Hayle (W.H.); Scilly, two dead specimens (R.W.J.S.).
- L. puteolus** Turt.—Porthcurnow (R.N.D.); Land's End (W.H.); Hayle (Miss H.); Scilly (C.B.).
 Varr. **conica** Jeff. and **expansa** Jeff.—Mount's Bay (C.B.).
 Var. **lactea** Jeff.—Hayle (Miss H.).
- L. pallidula** DaC.—Talland (J.C.); Falmouth (Brown); Penzance (Miss Carne); Porthcurnow (R.N.D.); Hayle (Miss H.); Scilly (R.W.J.S.).
 Var. **patula** Thorpe.—Lantivet Bay (Laughrin).
(To be continued).

CONCHOLOGICAL SOCIETY
OF GREAT BRITAIN AND IRELAND.

PROCEEDINGS.

245th MEETING, JANUARY 8th, 1896.

Held in the Manchester Museum, Owens College.

Mr. L. E. Adams in the chair.

Donations to the Library announced and thanks voted :

Journal de Conchyliologie, No. 4, vol. xlii.

Journal of Malacology, No. 4, Jan., 1895.

The Naturalist, No. 246, Jan., 1896.

Annals of Scottish Natural History, No. 17, Jan., 1896.

La Feuille des Jeunes Naturalistes, No. 303, Jan., 1896.

The Irish Naturalist, No. 1, vol. 5, Jan., 1896.

New Members elected :

Mr. George Fox Tregelles, 6, Clarence Place, Barnstaple.

Mr. Harry Overton, Brookdale, Tudor Hill, Sutton Coldfield, Birmingham.

Candidate Proposed for Membership :

Mr. Walter Garstang, M.A.

Resignation of Member :

Joseph S. Galizia, M.D., Valetta, Malta.

Papers read :

Mr. L. E. Adams : "*Helix fusca* Mont., *H. granulata* Alder, *H. lapida* var. *albina* Menke and *Clausilia Rolphii* Gray, in Northamptonshire."

Mr. F. W. Wotton : "*Helix hortensis* var. *nebulosa*."

Exhibits :

Mr. F. W. Wotton exhibited in illustration of his paper some specimens of *H. hortensis* which he proposed to call var. *nebulosa*.

Mr. R. Standen, hon. curator, exhibited four drawers from the Society's collection, showing different methods of mounting the shells.

Mr. Collier exhibited some peculiar Naninas and Cochlostylas from the Philippine Islands, including a very peculiar Nanina (*N. setigera* Sowb.), thickly covered on the upper surface with very strong hairs, whilst the under surface is quite smooth; also a specimen of *Helix psittacina* Desh., a lovely blue shell from the Island of Fuga, North Luzon.

Mr. Charles Oldham exhibited one specimen of *Pisidium hibernicum* West, from Lough Nagarriva, Glengariff, Co. Cork, and *P. pusillum* var. *obtusalis* from various localities for comparison.

Mr. W. Moss exhibited in spirit a very peculiar slug, *Otoconcha dimidiata* Pfr. from New Zealand.

Mr. R. Cairns exhibited various shells from Tasmania and Queensland, principally Helices and Bulimi, also very fine *Buccinum Humphreysianum*, from Jersey.

The Chairman announced that the Council had decided that twenty-five reprints should be presented to all writers of papers that are published in the Journal.

246th MEETING, FEBRUARY 5th, 1896.

Held in the Manchester Museum, Owens College.

Mr. J. Cosmo Melvill, President, in the chair.

Donations to the Library announced and thanks voted :

The Irish Naturalist, No. 2, vol. 5, Feb., 1896.

La Feuille des Jeunes Naturalistes, No. 304, Feb., 1896.

The Naturalist, No. 247, Feb., 1896.

Science Gossip, Nov., 1895.

Transactions of the Royal Society of South Australia, part 2, vol. 19.

Proc. and Trans. Nova Scotian Institute of Science, part 4, vol. 8.

Proc. Academy of Nat. Science of Philadelphia, 1895, part 2.

Donations to the Cabinet Fund announced and thanks voted :

From Mr. Henry Coates, F.R.S.E., 5/-; from Mr. Bernard Arnold, 5/-.

New Member elected :

Mr. Walter Garstang, M.A., of Lincoln College, Oxford.

Candidates Proposed for Membership :

Mr. John George Brass and Mr. William Rayson Smith.

Decease and Resignations of Members announced :

Mr. S. W. North, M.R.C.S., died in 1894 (not before noted in the Society's books).

Mr. T. D. A. Cockerell resigned in 1895.

Mr. G. A. Adams, Rev. E. S. Dewick.

Paper read :

Mr. J. T. Marshall: "Additions to British Conchology."

Exhibits :

Mr. J. Cosmo Melvill exhibited two specimens of the rare *Volute*, *V. canaliculata* McCoy—one of the specimens is in his own collection, the other in that of the Manchester Museum, Owens College. Only six individuals are so far known in collections, of which four, including these now exhibited, are in this country. It belongs to the section *Amoria* Gray (*Scaphella* Swainson) characterized by porcellanous smoothness of the whorls, and absence of nodulosity, or spines, the shell being fusiform, spire conical, columella with four to five plaits. The species differs from all its allies, in the channelled suture, and the four rows of fawn-coloured spots. Its length is barely two inches. Native of South Australia. All the other species of *Amoria* are either Australian or Tasmanian, *V. maculata* Sowb., being perhaps its nearest ally. Dr. J. C. Cox described this species as *V.*

Harfordii. (Proc. Zool. Soc., 1869, p. 358, pl. 26, fig. 2), but two or three months after McCoy had given it the name of *canaliculata*, (Ann. and Mag. Nat. Hist. ser. 4, vol. 4, p. 34, pl. 3, figs. 1, 2), also in 1869. The specimen in the Manchester Museum was previously in the Cholmondeley Collection.

Mr. Melvill also exhibited a magnificent specimen of *Paryphanta Hochstetteri* Pfr., from New Zealand, where it is always rare, and when found not often in passable condition. The epidermis is very smooth and shining, fawn colour concentrically variegated with dark-chestnut lines, while at the basal side of the periphery it becomes uniformly broad banded, giving a bipartite colouration to the base, and a most beautiful effect. *P. Busbyi*, the type of the genus, and most of the more showy species, are from New Zealand. A few occur in Australia.

Mr. Melvill further exhibited a series of species of *Siphonalia* A. Ad., separated from *Fusus* by the dentition and form of the shell. There are about fifty forms described, by far the greater portion coming from Japanese seas. Mr. A. Adams has described, mostly in the Ann. and Mag. Nat. Hist., 1863, about fifteen species, none of them being figured, and they have not been identified with certainty. This leaves about thirty-five species more or less known, of which the most conspicuous are *S. (Kellettia) Kellettii* Forbes, from Japan and N.W. America, *S. (Penim) dilatata* Q. & G., *S. (Austrofusus) alternata* Phil. Of the typical forms *S. trochulus* Reeve and *S. cassidariæformis* Reeve may be taken as typical. Mr. H. A. Pilsbry, in his elaborate work "On the Marine Mollusks of Japan," added two more species to that fauna, but his *S. hyperodon* is *S. mikado* Melvill, and his *S. Stearnsi* is *S. pseudo-buccinum* Melvill, both described eight years ago (J. of Conch., vol. 5, p. 348-9, 1888). Mr. Pilsbry, in a very courteous letter written to Mr. Melvill expresses his regret at the oversight, but still he is pleased that the species have been now so well figured, as in his Japanese Mollusca, pl. 2, fig. 1, 2, 6, 7, in which Mr. Melvill cordially concurs. Specimens of about twenty forms were shown from the Darbshire and Melvill Cabinets, including from both: *S. mikado* Melv., *S. pseudo-buccinum* Melv., *S. Kellettii* Forbes, nice vars. of *S. cassidariæformis* Reeve, and its var. *ornata*, the beautiful *S. signum* Reeve and *S. trochulus* Reeve, *S. grandis* Gray, from New Zealand, and many other species.

Mr. Melvill also exhibited three beautiful Helices of the section *Papuina*, viz.: *Papuina woodlarkiana* Smith, Woodlark Island; *P. roseolabiata* Smith, New Guinea; *P. Strabo* Brazier, New Guinea.

Mr. R. Cairns exhibited some shells he had recently received from South Africa, collected near the Kowie River, Cape Colony. They included eight specimens of a new species of *Cyclostoma* (*C. foveolatum* Melv. and Pons.), recently described, of which only four specimens were previously known. Also four specimens of *Celioxis Layardi* Ad. and Ang., and several other species not yet determined.

Two specimens of *Struthiolaria mirabilis* Smith, from Kerguelen Island, were exhibited from the Collection of the Manchester Museum.

The Secretary reported that several letters had lately been received from members, expressing approval of the Journal, and in particular, one signed "A Member," in which was enclosed £5 towards the expenses of publication. A unanimous vote of thanks was passed to the anonymous donor for his generous gift.

247th MEETING, MARCH 4th, 1896.

Held in the Manchester Museum, Owens College.

Mr. J. Cosmo Melvill, President, in the chair.

Donations to the Library announced and thanks voted :

The Naturalist, No. 248, March, 1896.

Journal de Conchyliologie, vol. 43, No. 1.

New Members elected :

Mr. John George Brass, The Grove, Barnard Castle.

Mr. William Rayson Smith, Harlesden, Norfolk.

Candidate Proposed for Membership :

Mr. William Valentine Burgess.

Resignation of Member announced :

Mr. Arthur E. Baker.

Paper read :

Mr. L. Shackleford : "Note on Boring of Mollusca by Carnivorous Gastropods."

Exhibits :

Mr. J. Ray Hardy exhibited in illustration of Mr. Shackleford's paper a large series of shells, chiefly bivalves, bored by mollusca, also a selection of similarly bored fossil shells, from the raised beaches of Uddevalla, Sweden. The exhibits led to a very interesting discussion on the position in which the hole was bored, generally, but not always, near the umbones.

Mr. R. Standen exhibited on behalf of Mr. Bartlet Span, of Tenby, very large specimens of *Tellina balthica* from Pendine, *Psammobia ferroënsis* Tenby, *Scalaria Turtonæ* and *S. clathratula* from Lampharne, *Ovula patula* Bristol Channel, and *Turritella terebra* and var. *nivea* from Milford Haven. He also showed *Tellina balthica* from Cark, Lancashire, for comparison with Mr. Span's examples, large-sized *Helix aspersa* from Oran and Tunis, *H. nemoralis* var. *interrupta* from Co. Antrim, *Amphidesma castanea* from Porthcurnow, Cornwall, and *Ancylus fluviatilis* var. *gibbosa* from Lough Corrib. He also showed a small collection of shells from Grand Canary, recently presented to the Manchester Museum, including *Helix Gaudryi*, *H. lemniscata*, *H. sarcostoma*, *H. malleata*, *H. pisana* and var., *Cyclostoma canariense*, and several marine species.

Mr. Thomas Rogers exhibited a fine series of Achatinellæ, from the Hawaiian Islands, including several new species recently described by Mr. Baldwin.

Mr. E. Collier exhibited a specimen of *Paryphanta Hochstetteri* for comparison with the one shown by Mr. Melvill at the previous meeting ;

also, from Antigua, a child's necklace made from the shells of *Tellina similis*, and two brooches for which had been used the shells of *Neritina viridis*, *Oliva oryza*, and *Trivia quadripunctata*.

After considerable discussion it was resolved that the Secretary notify the members who usually attend the meetings, that it is proposed to alter the time and date of the ordinary meetings to 6-30 p.m., on the second Thursday in each month, and that such alteration shall be voted on at the next meeting to be held on Wednesday, April 1st.

LEEDS BRANCH.

MEETING, JANUARY 11th, 1896.

At Huddersfield, by the kind invitation of Mr. J. Whitwham.

Mr. Wm. Nelson in the chair.

Mr. John E. Edwards, Leeds, exhibited specimens of *Fusus*, dredged off Whitby, deformed, apparently, by sponge growths.

Mrs. Brierley, Huddersfield, exhibited examples of *Helix virgata* var. *albicans* from Redcar, and the two-banded form of *H. nemoralis* common at Colwyn Bay, N. Wales.

Mr. J. W. Taylor showed specimens of *H. pisana* from Spain; Mr. T. S. Hillman sent *H. virgata* var. *alba* from Lewes; and an interesting series of *H. cartusiana* from the same locality. Mr. A. G. Stubbs sent a collection of nearly one hundred modifications of *H. virgata* which he had collected within a short distance of Tenby. A descriptive catalogue and photographs of the localities where the specimens were collected, accompanied the collection.

Mr. J. Whitwham exhibited and described his extensive collection of British Land and Freshwater Shells; the collection of *Unionidae* being exceptionally fine. Mr. Whitwham's principle of mounting is to display, if possible, on one tablet, the type and its variations from one pond or circumscribed locality; a method which enables the student to grasp the evolution of varietal distinctions.

MEETING, FEBRUARY 22nd, 1896.

At Leeds, by the kind invitation of Mr. Crowther.

Mr. Wm. Nelson in the chair.

Mr. W. Denison Roebuck showed specimens of *Limax flavus* var. *rufescens*, sent by Mr. Alfred Leicester, from Bush Poultry Farm, near Harlow, Essex. For Mr. F. B. Whitlock, shells of *Anodonta cygnea*, found in Nottinghamshire, on an island in the River Soar, which were bitten all round the edges, probably by otters, as the banks of the island drop sheer four feet, too high for smaller mammals.

Mr. Henry Crowther read a paper on "Some Chemical and Physical Properties of Molluscs." The experiments included the effects of running water on *Sphaerium corneum*; the polarisation of calcite in the embryonic

shells of certain Pelecypoda and the recognition of similar uniaxial crystals in the shell of *Succinea elegans*. The presence of lime salts and phosphoric acid in the tissues of *L. peregra* was chemically demonstrated, and the recent views on the action of this acid and carbon dioxide in the deposition of lime salts in animals explained. Mr. Crowther gave the results of a series of experiments on the behaviour of some freshwater molluscs in jars of water during the variations of weather, the height of the barometer and temperature being noted. Also the effects of aerated and non-aerated waters on freshwater molluscs. The paper concluded with an account of some observations on the vertical lifting power of *H. aspersa* and *H. arbustorum* whilst crawling up a plate of glass. The extreme weight carried by the former was 68·9 grams, of the latter 8·7 grams.

LONDON BRANCH.

INAUGURAL MEETING, JANUARY 17th, 1896.

A Meeting, convened by the Rev. J. W. Horsley, was held at the Borough Road Polytechnic, S.E., on January 17th, 1896. The attendance was disappointing, considering that there are about forty members residing in or near London.

The Rev. J. W. Horsley exhibited a fine series of *Helix virgata* (to illustrate the great variation of this species), also some rare band varieties of *Helix hortensis*.

Mr. J. E. Cooper showed *Petricola pholadiformis*, a North American species, found last year at Burnham-on-Crouch, Essex, also specimens of *Chrysodomus antiquus*, recent and fossil.

It was resolved that future meetings should be held at the various members' houses.

At the invitation of the Rev. J. W. Horsley, a number of members and friends met at St. Peter's Rectory, Walworth, on February 21st, to inspect Mr. Horsley's collections. In the British section were very fine series of *Helix virgata*, *H. nemoralis*, and *H. hortensis*, with many of the rarer varieties: *H. elegans* from near Dover, *Hydrobia similis* from Plumstead, and pretty specimens of *Limnaea stagnalis* var. *variegata*.

The foreign portion of the collection included many choice examples and rare species. We may mention *Helix lanceolata* Pfr., *H. Macgregori* Cox, *H. aphrodite* Pfr., *H. farafanga* H. Ad., *H. magnifica* Fér., *H. Souverbiana* Fisch., *H. cerina* Mor., *H. Croftoni* Cox, *H. Trailli* Pfr., *H. perplexa* Fér., *H. Maackii* Gerstf., *H. polygyrata* Born, *H. Bourcieri* Pfr., *H. Macmurrayi* C. B. Ad., *H. aspera* Fér., *H. Cunninghamsi* Gray, and *H. launcestonensis* Reeve.

J. E. COOPER, *Hon. Sec.*

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The Journal of Malacology, vol. iv., No. 4, Dec. 20, 1895.

"*Purpura coronata* Lam. in the West Indies (Trinidad)," by Rev. A. H. COOKE. "Notes on the Terrestrial Molluscan Fauna of New Caledonia," by E. R. SYKES [critical notes on M. Crosse's paper in Journ. de Conch., for July, 1894]. "The British Species of *Testacella*" [tabular exposition of external characters, and two plates], by W. M. WEBB. Notes:—*Clausilia recondita* from Gilolo, *Arion hortensis* var. *caeruleus* from Ealing, *Scacchia eddystonia*=*Diplodonta rotundata juv.*, G. W. CHASTER.

Journal de Conchyliologie, vol. 42, No. 4, for Oct., 1894 [received Dec. 16, 1895]; vol. 43, No. 1, for Jan., 1895 [dated on cover 1895, received Feb. 17th, 1896].

"Faune malacologique terrestre et fluviatile de la Nouvelle-Calédonie et de ses dépendances," by H. CROSSE. [The present instalment concludes M. Crosse's elaborate critical list of the L. and F. W. Mollusca of New Caledonia: 361 (or omitting three introduced forms, 358) species, divided among 25 families are recorded, and in a few pages the fauna of this group of islands is compared with that of New Zealand and some of the archipelagos of the Pacific]. "Description de deux Mélanies nouvelles," by A. BROU [M. *Crawfordi* Transvaal, M. *Leepei*, Tongatabu, both figured]. "Corrections et additions à la Liste synonymique et bibliographique des Mollusques terrestres et fluviatiles de la Nouvelle-Zélande," by H. SUTER.

"Étude zoologique de l'*Ovula (Neosimnia) spelta*, L. et du *Conus mediterraneus* Bruguière," by A. VAYASIERE [systematic and anatomical notes, with plate]. "Revision des espèces actuellement connues du genre *Geotrochatella*," by PH. DAUTZENBERG [5 spp., 1 n. sp., 1 n.n., figure not yet issued]. "Unionidæ nouveaux ou peu connus," by H. DROUET [Unio 7 n. spp., *Anodonta simulans*, n. sp.]. "Descriptions de coquilles fossiles des terrains tertiaires inférieures," by C. MAYER EYMAR [continued from vol. 42, p. 129].

Proceedings and Transactions of the Nova Scotian Institute of Science, vol. 8 (ser. 2, vol. 1), part 4.

"Notes on a collection of Silurian Fossils from Cape George, Antigonish County, Nova Scotia, with descriptions of four new species," G. H. M. ARNI [7 spp. (3 n.) of Brachiopoda, 4 spp. Pelecypoda, 2 spp. Gastropoda, 2 spp. Cephalopoda].

Feuille des jeunes naturalistes, Nos. 302—305, Dec., 1895—March, 1896.

"Conservation et préparation des mollusques," by M. BAVAY. "Revue de paléonchologie," by M. COSSMANN [continued]. "Faune malacologique terrestre et fluviatile du département de la Vienne," by M. CAZIOT [concluded].

Science Gossip, n.s., vol. 2, No. 21, Nov., 1895 [received Jan. 20, 1896].

“Protective colouration in British Clausilias,” by W. M. WEBB.
 “Local Land Shells in Kent,” by Rev. J. W. HORSLEY. “Notes on Land Molluscs,” by R. A. BULLEN [*Helix nemoralis* with five horns, oviposition of *Succinea putris* and *Helix nemoralis*].

Proceedings of the Academy of Natural Sciences of Philadelphia, for 1895, part 2, 1895.

“Descriptions of new species of Achatinellidæ from the Hawaiian Islands,” by D. D. BALDWIN [up to the present time 330 spp. of *Achatinella*, after eliminating *Auriculella* and *Leptachatina*, have been recorded, of which 102 are synonyms or varieties; 30 n. spp. are now described and figured]. “Observations on the dentition of Achatinellidæ,” by H. M. GWATKIN and H. SUTER, with a prefatory note by H. A. PILSBRY [three genera, *Achatinella*, *Leptachatina*, and *Carelia*, are recognised; the first is sub-divided into two groups, thus: (a), “jaw missing, radula broad, oblong, teeth very numerous, *en chevron* (rows sloping obliquely backward), centrals (if present), laterals, and marginals all of the same type, base narrow, head rather broad, with four, five, six or seven small tentacles”; (b), “Jaw arcuate, strong, not ribbed; radula oblong, not wide; teeth quadrate, in nearly straight rows; centrals small, narrow, sometimes faintly tricuspid; laterals larger, bicuspid; marginals bicuspid or multicuspid, as in *Helix*.”] “On the status of the names *Aplysia* and *Tethys*,” by H. A. PILSBRY [the author concludes (1), *Tethys* L., 1758, must replace *Aplysia* and *Laplysia* L., 1767, and (2), as a substitute for *Tethys* L., 1767, we must probably adopt one of the new spellings of this name proposed early in the century, or an entirely new generic name].

CORRIGENDUM.

In my sketch of the literature dealing with “The Cretaceous Conchology of Southern Africa,” in “The Journal of Conchology,” 1896, vol. viii., No. 5, I regret having wrongly attributed to Dr. Kossmat a tabular list of the Cretaceous rocks of Natal, quoted on page 147 of my paper. This list was furnished by Dr. Kossmat in his memoir in the “Jahrb. k. k. geol. Reichsanstalt,” 1894, vol. xliv., part 3, p. 463 (also published in the “Records Geol. Survey India, 1895, vol. xxviii., part 2, p. 42) as representing Mr. Griesbach’s views of 1871, and from which he dissents by regarding the Cephalopod fauna there bracketed Utatur (=Cenomanien) as belonging to the later Ariyalur (=Senonien) period.—R. BULLEN NEWTON.

- Var. *albescens* Jeff.—Mount's Bay (C.B.).
- Truncatella subcylindrica* L. [*T. truncatula* Drap.].—Plymouth (J.M.B.A.); Falmouth (W.P.C.).
- Rissoa parva* DaC.—Generally distributed.
- Var. *interrupta* Ad.—Generally distributed.
- Var. *exilis* Jeff.—Falmouth (J.T.M.); Scilly (C.B.).
- R. inconspicua* Ald.—Off Plymouth, Falmouth, Mount's Bay, Porthcurnow, Land's End, Scilly.
- R. (Galeodina) striatula* Mont.—Falmouth, Helford, Porthcurnow, Land's End, Scilly.
- R. (Alvania) lactea* Mich.—Near Fowey, three dead specimens (J.T.M.).
- R. cancellata* DaC.—Falmouth, Mount's Bay, Porthcurnow, Wolf Rock, Land's End, Scilly.
- R. calathus* F. & H.—Whitsand Bay E., Helford, Mount's Bay, Wolf Rock, Land's End, Scilly.
- R. reticulata* Mont.—Looe, Falmouth, Helford, Mount's Bay, Land's End, Scilly.
- R. cimicoides* Forb.—Falmouth, Helford, Mount's Bay, Porthcurnow, Scilly.
- R. Jeffreysi* Wall.—Scilly, a few dead but fresh specimens (C.B.).
- R. punctura* Mont.—Whitsand Bay E., Mount's Bay, Sennen, Scilly.
- Var. *diversa* Jeff.—Scilly (C.B.).
- R. (Flemingia) zetlandica* Mont.—Falmouth, Mount's Bay, Porthcurnow, Wolf Rock, Land's End, Scilly.
- R. costata* Ad.—Whitsand Bay E., Falmouth, Mount's Bay, Porthcurnow, Land's End, Scilly.
- R. (Zippora) membranacea* Ad.—Falmouth, Helford, Mount's Bay, Land's End, Scilly.
- Varr. *venusta* Phil. and *elata* Phil.—Mount's Bay (G.F.T.).
- R. violacea* Desm.—Falmouth (C.B.); Helford (Truro Mus.); Mount's Bay (R.N.D.).

- R. (Apicularia) Guerini** Rech. [*R. costulata* Ald.].—Helford (W.H.); Mousehole and Porthcurnow (R.N.D.)
- R. (Onoba) striata** Ad.—Mount's Bay, (G.F.T.); Porthcurnow (Penz. Mus.); Land's End (Marquand); Scilly (R.W.J.S.).
- Var. **arctica** Lov.—Sennen (C.B.).
- R. proxima** Ald.—Plymouth Sound, Falmouth, Helford, Mount's Bay, Hayle, Scilly.
- R. vitrea** Mont.—Whitsand Bay E. (J.M.B.A.); Looe (J.C.); Falmouth (W. H.); Scilly (C.B.).
- R. (Setia) fulgida** Ad.—Whitsand Bay E. (J.M.B.A.); Falmouth (F. & H.); Helford (W.R.); Mount's Bay (Penz. List); Scilly (C.B.).
- Var. **pallida** Jeff.—Helford (W.R.).
- R. (Cingula) trifasciata** Ad. [*R. cingillus* Mont.].—Plymouth Sound, Falmouth, Helford, Prussia Cove, Mount's Bay, Land's End, Scilly.
- Var. **rupestris** Forb.—Falmouth (W.P.C.); St. Michael's Mount (R.N.D.); Scilly (C.B.).
- R. obtusa** Cant. [*R. soluta* Phil.].—Plymouth Sound, Fowey, Falmouth, Helford, Mount's Bay, Wolf Rock, Scilly.
- R. semistriata** Mont.—Falmouth, Mount's Bay, Land's End Carbis Bay, Scilly.
- Barleeia rubra** Mont.—Whitsand Bay E., Helford, Penzance, Mousehole, Porthcurnow, Land's End, Scilly.
- Hydrobia ulvæ** Penn.—Falmouth (W.P.C.); Helford (W.R.); Hayle (Miss Carne).
- H. ventrosa** Mont.—Land's End (W.H.).
- Skenea planorbis** Fabr.—Falmouth (W.P.C.); Penzance (G.F.T.); Land's End (W.H.); Scilly (C.B.).
- Jeffreysia diaphana** Ald.—Falmouth, Maenporth and Helford (W.H.); Mousehole (R.N.D.); Porthcurnow (Marquand); Carbis Bay (C.B.).
- J. opalina** Jeff.—Falmouth (Barlee); Maenporth and Helford (W.H.); Mousehole (R.N.D.); Scilly (C.B.).

- Adeorbis subcarinatus** Mont. — Whitsand Bay E. (J.M.B.A.); Fowey (Peach); Helford, Penzance and Porthcurnow (R.N.D.); Land's End (W.R.); Scilly (C.B.).
- Triforis perversa** L. [*Cerithium perversum*].—Falmouth (W.P.C.); Helford (R.N.D.); Mount's Bay (G.F.T.); Porthcurnow (R.N.D.); Scilly (R.W.J.S.).
- Var. **pallescens** Jeff.—Scilly (R.W.J.S.).
- Bittium reticulatum** DaC.—Generally distributed.
- Var. **lactescens** Jeff.—Land's End (W.H.).
- Cerithiopsis tubercularis** Mont. — Falmouth (J.G.J.); Mount's Bay (G.F.T.); Porthcurnow (R.N.D.); Land's End (Truro Mus.); Scilly (R.W.J.S.).
- Varr. **nana** Jeff. and **albescens** Marsh.—Scilly (C.B.).
- Var. **scalaris** Monteros.—Scilly (J.T.M.).
- C. Barleei** Jeff.—Plymouth (J.T.M.); Falmouth (W.H.); Scilly (C.B.).
- C. Metaxæ** D. Ch.—Land's End and St. Merryn (W.H.); Scilly (R.W.J.S.).
- Var. **angustissima** Forbes.—Scilly (J.T.M.).
- Var. **alba** Marsh.—Scilly, 40 fms. (J.T.M.).
- C. concatenata** Conti. [*C. pulchella* Jeff.].—Plymouth (J.T.M.); Land's End (W.H.); Scilly (R.W.J.S.).
- Var. **lactea** Marsh.—Scilly (C.B.).
- Turritella communis** Riss. [*T. terebra* L.].—Generally distributed, but not plentiful.
- Var. **nivea** Jeff.—Plymouth (J.M.B.A.); Mount's Bay (G.F.T.); Scilly (R.W.J.S.).
- Var. **gracilis** Jeff.—Plymouth (J.M.B.A.); Falmouth (C.B.).
- Cæcum trachea** L.—Falmouth (Montagu); Helford (W.H.); Mount's Bay, dredged (G.F.T.); Whitsand Bay (J.G.J.); Scilly (C.B.).
- C. glabrum** Mont.—Falmouth (J.G.J.); Helford (W.R.); Mount's Bay (G.F.T.); Hayle (W.H.); Scilly (C.B.).
- Chenopus pes-pelecani** L. [*Aporrhais pes-pelecani*].—Plymouth, S. E. Cornwall, Falmouth, Helford, Mount's Bay, Scilly.

- Cypræa (Trivia) europæa** Mont.—Generally distributed.
- Ovula patula** Penn.—Plymouth (J.M.B.A.); Falmouth (Guppy); Mount's Bay, trawl refuse (G.F.T.); Wolf Rock and Porthcurnow (Penz. Mus.); Land's End (W.H.); Scilly (R.W.J.S.).
- Erato lævis** Don. [*Marginella lævis*].—Falmouth (W.P.C.) Mount's Bay, dredged (G.F.T.); Porthcurnow (E. D. Marquand); Land's End (J.C.); Hayle (Miss H.); Scilly (R.W.J.S.).
- Eulima polita** L.—Falmouth, Mount's Bay, Porthcurnow, Land's End, Hayle, Harlyn Bay, Scilly.
- E. intermedia** Can.—Off Plymouth (J.M.B.A.); Falmouth (Miss Vigurs and others).
 Var. **rubro-tincta** Jeff.—Scilly (C.B.).
- E. incurva** Ren. [*E. distorta* Desh.].—Plymouth (J.M.B.A.); Mount's Bay (Baily); Porthcurnow (Miss H.); Land's End (W.H.); Scilly (R.W.J.S.).
- E. curva** Jeff.—Scilly (C.B.). This shell was first recorded by Mr. J. T. Marshall as *E. latipes* Wats.
- E. bilineata** Ald.—Falmouth (W.P.C.); Mount's Bay (G.F.T.); Porthcurnow (Miss H.); Land's End (W.H.); Scilly (R.W.J.S.).
- E. (Subularia) subulata** Don.—Nare Point (Helford?) (W.H.); Porthcurnow (Millett).
- Stilifer Turtoni** Brod.—Plymouth (Stewart); Falmouth (W.H.); on spines of *Echinus (miliaris?)* (W.H.); Mount's Bay, on spines of *E. esculentus* (Baily).
- Odostomia minima** Jeff.—St. Mawes, 1865 (W.H.); Penzance (C.B.); St. Ives (Chaster); Menavawr, Scilly, one specimen (C.B.).
- O. nivosa** Mont.—Penzance (R.N.D.); Porthcurnow (Miss Carne); Land's End (W.H.); Scilly (C.B.).
- O. truncatula** Jeff.—Dredged near Eddystone (Barlee); Falmouth (Miss Vigurs); St. Mawes (J.G.J.); Hayle (Miss H.); Scilly (C.B.).

- O. clavula** Lov.—Plymouth (J.M.B.A.); Falmouth Harbour (W.H.); Scilly (R.W.J.S.).
- O. Lukisi** Jeff.—Porthgwarra (R.N.D.); Scilly (C.B.).
- O. pallida** Mont.—Off Plymouth, Looe, St. Michael's Mount, Mount's Bay, with dredge and trawl, Land's End, Falmouth, Scilly.
 Var. **angusta** Jeff.—Falmouth Harbour (J.T.M.); Scilly (R.W.J.S.).
- O. albella** Lov.—Falmouth (C.B.); Penzance (R.N.D.); Scilly (C.B.).
 Var. **sub-cylindrica** Marsh.—Scilly (J.T.M.).
- O. rissoides** Han.—Fowey, Mount's Bay, Land's End, Scilly.
 Var. **alba** Jeff.—Scilly (R.W.J.S.).
 Var. **dubia** Jeff.—Land's End, (W.H.); Scilly (R.W.J.S.).
 Dr. G. W. Chaster, who has made a study of the *Odostomie*, agrees with Clark in regarding *O. albella* and *O. rissoides* as dwarf littoral varieties of *O. pallida* (J. of Conch., 1893, p. 299).
- O. conoidea** Broc.—Falmouth, 30 fathoms (W.H.); Mount's Bay, dead (G.F.T.).
 Var. **australis** Jeff.—Falmouth, (Barlee and others); Scilly (R.W.J.S.).
- O. umbilicaris** Maim.—Land's End (W.H.).
- O. acuta** Jeff.—Falmouth Harbour (W.H.); Penzance (R.N.D.); Mount's Bay (G.F.T.).
- O. conspicua** Ald.—Scilly (R.W.J.S.).
- O. unidentata** Mont.—Falmouth (W.H.); Penzance (R.N.D.); Mount's Bay, dead (G.F.T.); Land's End (Truro Museum); Scilly (R.W.J.S.).
 Var. **elata** Jeff.—Falmouth Harbour (J.T.M.); Scilly (R.W.J.S.).
- O. turrita** Han.—Falmouth (C.B.); Penzance (R.N.D.). Mount's Bay, dead (G.F.T.); Land's End (W.H.).
 Var. **striolata** Ald.—Land's End (W.H.).
 Var. **nana** Marsh.—Scilly (C.B.).
- O. plicata** Mont.—Near Fowey (J.T.M.); Penzance (R.N.D.); Hayle (W.H.).

- O. insculpta** Mont.—Falmouth Harbour (W.H.) ; Mount's Bay (Penz. List) ; Scilly (R.W.J.S.).
 Var. **lævissima** Sars.—Scilly (C.B.).
- O. diaphana** Jeff.—Fowey (Barlee) ; Scilly (C.B.).
- O. obliqua** Ald.—Falmouth (J.G.J.) ; Helford (W.H.) ; Scilly (C.B.).
- O. Warreni** Thomp.—Falmouth (W.H.) ; Mousehole (R.N.D.) ; Land's End (W.H.) ; Scilly (C.B.).
- O. dolioliformis** Jeff.—Land's End and Hayle (W.H.) ; Scilly (C.B.).
- O. decussata** Mont.—Helford (W.H.) ; Mount's Bay (Penz. List) ; Scilly (R.W.J.S.).
- O. indistincta** Mont.—Mount's Bay (Penz. List) ; Land's End and Hayle (W.H.) ; Scilly (R.W.J.S.).
- O. interstincta** Mont.—Falmouth (Miss Carne) ; Mount's Bay (G.F.T.) ; Porthcurnow (Miss H.) ; Land's End (Truro Mus.) ; Scilly (R.W.J.S.).
 Var. **suturalis** Phil.—Scilly (C.B.).
- O. spiralis** Mont.—Falmouth (Miss H.) ; Mount's Bay, dead (G.F.T.) ; Land's End (W.H.) ; Scilly (R.W.J.S.).
 Var. **coarctata** Marsh.—Scilly (C.B.).
- O. fenestrata** Forb.—Fowey (Barlee) ; Falmouth and Helford (W.H.) ; Mount's Bay (Penz. List).
- O. excavata** Phil.—Fowey (Barlee) ; Falmouth and Helford (W.H.) ; Mount's Bay (Penz. List) ; Scilly (R.W.J.S.).
- Eulimella acicula** Phil.—Falmouth (W.H.) ; Mount's Bay, dredged (G.F.T.) ; Hayle (W.H.).
 Var. **turris** Forb.—Scilly (C.B.).
 Var. **ventricosa** Forb.—Falmouth (W.H.).
- E. scillæ** Scac.—Land's End (W.H.) ; Scilly (C.B.).
- E. nitidissima** Mont.—Falmouth (Montagu and others) ; Mount's Bay (G.F.T.) ; Padstow (Molesworth) ; Scilly (C.B.).
- Turbonilla scalaris** Phil.—Mount's Bay, (G.F.T.) ; Land's End (W.H.) ; Scilly (R.W.J.S.).

- Var. *rufescens* Forb. — Scilly (R.W.J.S.). Hitherto considered a northern variety.
- T. rufa** Phil.—Off Plymouth, Falmouth, Mount's Bay, Hayle, St. Merryn.
- T. lactea** L.—Falmouth, Helford, Mount's Bay, Land's End, Hayle, Scilly.
- T. innovata** Monteros—Falmouth (W.H.); Mount's Bay (G.F.T.); Scilly (C.B.). These may be *T. pusilla* Phil.).
- Var. *minuscule* Marsh.—Scilly (C.B.); Mount's Bay (J.T.M.).
- Var. *cylindrata* Marsh.—Mount's Bay (C.B.)?
- Murex (Ocinebra) erinaceus** L.—Generally distributed.
- Trophon muricatus** Mont.—In shell sand on S.E. coast of Cornwall, Falmouth, Mount's Bay, Porthcurnow, Wolf Rock, Land's End, Scilly.
- T. clathratus** var. *truncata* Str.—Menavawr, Scilly, "one dead and worn specimen with *T. muricatus*. The locality is noteworthy, Tenby being the southernmost locality given by Jeffreys" (Smart).
- Lachesis minima** Mont.—Helford (R.N.D.); Mount's Bay (G.F.T.); Porthcurnow (R.N.D.); Whitsand Bay (J.G.J.); Scilly (R.W.J.S.).
- Var. *pallescens* Jeff.—Scilly (C.B.).
- Purpura lapillus** L.—Generally distributed.
- Var. *imbricata* Lmk. — Falmouth (W.P.C.); Helford (W.R.); Hayle (W.H.).
- Var. *major* Jeff.—Helford (W.R.).
- Nassa (Tritonella) incrassata** Müll. — Par, Falmouth, Mount's Bay, Hayle, St. Minver, Scilly.
- Var. *major* Jeff.—Hayle (Miss H.).
- Var. *minor* Jeff.—Scilly (C.B.).
- N. pygmæa** Lmk.—Falmouth (W.P.C.); Mount's Bay, dredged (G.F.T.); Hayle (Miss H.).
- N. (Hinia) reticulata** L.—Generally distributed.
- Var. *nitida* Jeff.—Falmouth (Norman).

Buccinum undatum L.—Generally distributed.

Neptunea antiqua L.—(*Fusus a.*). Two young and dead specimens from Menavawr, Scilly (R.W.J.S.). “Cornwall” (J.G.J.) on the authority of Couch. Marked as Cornish; no locality, in a list by W. Hockin. Three fine specimens in the Rogers’ collection, Truro Museum, as from Helford; no reason to doubt their authenticity except that the species is a rarity in Cornish seas.

Sipho gracilis DaC.—Falmouth (J. C. and others); Helford (W.R.); Mount’s Bay, trawlers (G.F.T.); Scilly (Lord Vernon).

Var. **convoluta** Jeff.—Mount’s Bay, trawl refuse (Miss T.); Scilly, three specimens including a large fragment (R.W.J.S., C.B.).

S. propinquus var. **Jeffreysianus** Fisch. = (*Fusus Jeffrey-sianus*). Plymouth (Jordan); Mount’s Bay, trawlers, (G.F.T.); Scilly, three worn specimens (R.W.J.S.).

Bela turricula Mont.—(*Pleurotoma t.*). Falmouth (W.P.C., W.H.); Mount’s Bay (Penz. Mus.).

B. rufa Mont.—Falmouth (W.P.C.); Land’s End (W.H.); Scilly (Miss H.).

Var. **lactea** Jeff.—Scilly (C.B.).

Var. **semicostata** Jeff.—Land’s End (W.H.).

Var. **Cranchii** Bro.—Falmouth (Cranch).

B. Trevelyana Turt.—Scilly (Miss H.).

Mangilia costata Don.—Plymouth Sound, Falmouth, Helford, Mousehole, Porthcurnow, Porthgwarra, Land’s End, Scilly.

M. lævigata Phil.—Scilly, “one large specimen . . . the typical form, which thus appears to have been found for the first time on British coasts” (R.W.J.S.).

Var. **minor** Jeff.—Helford (W. H.); Marazion (Miss H.).

M. brachyostoma Phil.—Falmouth Harbour (W.H.); in dredged sand from Mount’s Bay, identified by Dr. Chaster (G.F.T.).

- M. nebula** Mont. Falmouth (Montagu); Helford (W.H.); Mount's Bay (Miss Carne, G.F.T.); Land's End (W.H.); Scilly (R.W.J.S.).
 Var. **abbreviata** Jeff. Falmouth (J.G.J.).
- M. attenuata** Mont. Falmouth Harbour (W.H.); Scilly, one specimen from Crow Sound (R.W.J.S.).
- M. striolata** Sca.—Land's End and Falmouth (W.H.); Mount's Bay (G.F.T.).
- M. rugulosa** Phil.—St. Merryn, 1865, first time of discovery in England (W.H.); Padstow (Goodall); Scilly, young and fresh examples (C.B.).
- M. (Clathurella) linearis** Mont. = (*Defrancia l.*) Falmouth, Helford, Mousehole, Mount's Bay, Porthcurnow, Wolf Rock, Land's End, Scilly.
 Var. **alba** Marsh.—Scilly, 40 fathoms, Land's End, rare (J.T.M.).
- M. Leufroyi** var. **Boothii** Brown.—Looe (J.C.); Falmouth Harbour (W.H.); Land's End (J.C.); Scilly (C.B.).
- M. purpurea** Mont.—In shell sand on S.E. coast; Falmouth, Helford, Penzance, Mousehole, Land's End, Hayle, Scilly.
 Var. **Philberti** Mich.—Scilly (R.W.J.S., C.B.).
 Var. **oblonga** Jeff.—Scilly (C.B.).
- M. reticulata** Ren.—Plymouth Sound (J.M.B.A.); Falmouth (W.H.); Scilly (C.B.).
 Var. **formosa** Jeff.—Falmouth (Barlee, W.P.C.).
- M. (Teretia) teres** Forb.—Off Plymouth (J.M.B.A.); Helford and Wolf Rock (W.H.); Scilly, very rare (R.W.J.S.).
- M. (Bellardia) gracilis** Mont.—Falmouth (W.H.); Mount's Bay (G.F.T.); Hayle (Miss H.); Scilly (Miss T., R.W.J.S.).
- M. (Hædropleura) septangularis** Mont.— [*Pleurotoma s.*] In shell sand along S. coast; Gerrans, Falmouth, Helford, Mount's Bay, Porthcurnow, Land's End, Scilly.

ORDER OPISTHOBRANCHIATA.

SUB-ORDER TECTIBRANCHIATA.

- Actæon tornatilis** L. —Whitsand Bay, E. (J.M.B.A.); Falmouth (W.H.); Mount's Bay, dredged (G.F.T.); Hayle (W.H.); Scilly (R.W.J.S.).
- Tornatina mammillata** Phil. [*Utriculus m.*].—Mount's Bay (Penz. List.); Land's End (W.H.); Scilly, dead, rare (R.W.J.S.).
- T. umbilicata** Mont. [*Cylichna u.*].—Falmouth (Montagu); Mount's Bay (G.F.T.); Hayle (W.H.); Scilly (R.W.J.S.).
- T. truncatula** Brug. [*Utriculus t.*].—Plymouth, Falmouth, Helford, Mount's Bay, Porthcurnow, Land's End, Scilly.
- T. hyalina** Turt.—Falmouth (W.P.C.); Porthcurnow (R.N.D.); Land's End (W.H.); Scilly, "one or two specimens only from deep water" (R.W.J.S.).
- T. expansa** Jeff.—Menavawr, Scilly, several dead specimens; new to England (C.B.).
- T. obtusa** Mont. Mount's Bay (Penz. List); Hayle (W.H.); Scilly, somewhat rare (R.W.J.S.).
 Var. **Lajonkaireana** Bast.—Scilly, with the type (R.W.J.S.); Hockin mentions a variety, probably this.
- Volvula acuminata** Brug. — Off Plymouth (J.M.B.A.); Nare Point (Helford?) (W.H.).
- Scaphander lignarius** L.—Plymouth, S.E. Cornwall, Falmouth, Mount's Bay, Hayle, Scilly.
 Var. **alba** Jeff.—Mount's Bay (G.F.T.); Hayle (Miss H.).
- Cylichna cylindracea** Penn.—Falmouth (Montagu); Mount's Bay (G.F.T.); Hayle (W.H.); Scilly (R.W.J.S.).
- Bulla utriculus** Broc.—Falmouth (W.H.); Mount's Bay (C.B.).
- B. (Haminea) hydatis** L.—Plymouth (Turton); Falmouth (W.P.C. and others); Scilly (R.W.J.S.).
- Acera bullata** Müll.—Falmouth and Helford (W.H., R.V.); Scilly (Lord Vernon, & C.B.).
- Philine aperta** L.—Generally distributed.

- P. nitida** Jeff.—Mount's Bay (Chaster, C.B.).
- P. scabra** Müll.—Falmouth (W.H.); Mount's Bay (G.F.T.); Hayle (W.H.); Scilly, dead specimens very common (R.W.J.S.).
- Var. **circa** Marsh.—Scilly (C.B.).
- P. catena** Mont.—Falmouth (W.P.C.); Mousehole (R.N.D.); Porthcurnow (Miss Carne); Land's End (W.H.); Scilly (C.B.).
- Var. **zona** Jeff.—Scilly (C.B.).
- P. angulata** Jeff.—St. Ives (J.T.M.).
- Var. **circumlustra** Marsh. — Eddystone, 28 fathoms (J.T.M.).
- P. quadrata** S. Wood.—Marked as Cornish by Mr. Hockin.
- P. punctata** Clark.—Off Plymouth, Whitsand Bay E., Falmouth, Mount's Bay, Sennen, Hayle, Scilly.
- Var. **cingulata** Marsh.—Sennen and Scilly (C.B.).
- P. pruinosa** Clark.—Off Plymouth (J.M.B.A.); Falmouth (Miss Vigurs); St. Mary's Sound, Scilly (C.B.).
- Colpodaspis pusilla** M. Sars.—A tectibranchiate mollusk, of which only two specimens have previously been obtained. Plymouth (J.M.B.A. Oct. 1894).
- Aplysia punctata** Cuv.—Generally distributed on S. coast, and at Scilly; no record for the N. coast.
- Pleurobranchus plumula** Mont.—Plymouth (J.M.B.A.); Falmouth (G.F.T.); Helford (W.P.C.); St. Michael's Mount, (Millett); Scilly, dredged in the roadstead, St. Mary's (R.W.J.S.).
- P. (Oscanius) membranaceus** Mont. — Plymouth (J.M.B.A.); Falmouth Harbour and Helford (W.H.); Mount's Bay (G.F.T.); Scilly (R.W.J.S.).
- Runcina coronata** Quatref.—Plymouth (J.M.B.A.).

SUB-ORDER *NUDIBRANCHIATA*.

- Doris (Archidoris) tuberculata** Cuv.—Plymouth (W.G.); Falmouth (W.P.C., R.V.); Mount's Bay (G.F.T.).

- D. flammea* A. & H.—Plymouth (W.G.); Falmouth (W.P.C., R.V.).
- D. (Jorunna) Johnstoni* A. & H.—Plymouth (W.G.); Falmouth (R.V., W.P.C.).
- D. (Addisa) testudinaria* Riss. — Plymouth Sound (J.M.B.A.); Falmouth (W.P.C.).
- D. (Caldina) repanda* A. & H.—Falmouth (W.P.C.).
- D. (Rostagna) coccinea* A. & H.—Not uncommon on the Cornish coast (A. & H.); Plymouth (W.G.); Polperro (R. Q. Couch); Falmouth (R.V., W.P.C.).
- Acanthodoris pilosa* Müll.—Plymouth (W.G.); Falmouth (R.V.); Mount's Bay (G.F.T.).
- Lamellidoris aspera* A. & H.—Plymouth, obtained rather often (W.G.).
- L. diaphana* A. & H. Falmouth (W.P.C.).
- L. bilamellata* L.—Common at Plymouth (W.G.).
- L. depressa* A. & H.—Falmouth (W.P.C.)?
- L. pusilla* A. & H. — Plymouth (J.M.B.A.); Falmouth (W.P.C.).
- L. sparsa* A. & H.—Plymouth, 15 fathoms (W.G.).
- L. oblonga* A. & H.—Plymouth (J.M.B.A.).
- L. (Adalaria) proxima* A. & H.—Plymouth (J.M.B.A.).
- Goniodoris nodosa* Mont.—Plymouth, very abundant, (W.G.); Falmouth (W.P.C., R.V.); Mount's Bay (G.F.T.).
- G. castanea* A. & H.—Plymouth (W.G.); Falmouth (W.P.C.).
- Idalina elegans* Leuc.—Plymouth (W.G.); Cornwall (Spence Bate).
- I. (Idaliella) aspersa* A. & H.—Penlee Point, Plymouth, one specimen (W.G.).
- I. pulchella* A. & H.—A single specimen dredged off St. Ives, 1853 (Barlee).
- Ancula cristata* Alder.—Plymouth (W.G.); Falmouth (W.P.C.).

- Thecacera pennigera** Mont.—Off Rame Head, in 20 fathoms (W.G.); Falmouth (W.P.C., R.V.); Cornwall (R. Q. Couch).
- T. virescens** A. & H.—Two specimens found at Bar Point, Falmouth, in 1849 (W.P.C.).
- T. capitata** A. & H.—Dredged off St. Ives in 25 fathoms, 1853, (Barlee).
- Polycera quadrilineata** Müll.—“Coasts of Devonshire and Cornwall, frequent” (A. & H.); Plymouth (W.G.); Gerrans (Vigurs); Falmouth (W.P.C., R.V.); Mount’s Bay (G.F.T.).
- P. (Palio) Lessonii** var. **ocellata** A. & H.—Plymouth (W.G.); Falmouth (W.P.C.).
- Triopa clavigera** Müll.—Fowey and Helford (Alder); Falmouth (R.V.).
- Aegirus punctilucens** D’Orb.—Plymouth (W.G.); Pridmouth, near Fowey (Peach).
- Tritonia Hombergi** Cuv.—Common on the trawling grounds, 40 N. of Longships (W.G.).
- T. (Candiella) plebeia** Johnst.—Taken somewhat frequently at Plymouth (W.G.).
- Scyllæa pelagica** L.—Three specimens at Falmouth, on *Laminaria bulbosa*, in 1847 (W.P.C.).
- Dendronotus frondosus** Ascan. [*D. arborescens* Müll].—Plymouth, two specimens, dredged in 23 and 25 fathoms (W.G.); Falmouth (R.V.).
- Doto fragilis** Forbes.—Plymouth, commonly found on *Antennularia*, and other Hydroids (W.G.); Fowey (Alder); Falmouth (R.V.).
- D. pennatifida** Mont.—Dredged by Dr. Benham off Picklecombe Fort, Plymouth (W.G.).
- D. coronata** Gmel.—Plymouth, common on *Plumularia* (W.G.); off Eddystone (J.M.B.A.); Falmouth (W.P.C., R.V.).

- Lomanotus marmoratus** A. & H. [*L. flavidus* A. & H., and *L. portlandicus* Thomp.].—Plymouth (W.G.).
- Æolis papillosa** L.—Plymouth (W.G.); Helford (R.V.); Falmouth (W.P.C.); Mount's Bay (G.F.T.). "An orange or buff variety" is more common on the Cornish coast (A. & H.).
- Æ. (Æolidiella) glauca** A. & H.—Plymouth (W.G.); Falmouth (W.P.C.).
- Æ. Alderi** Cocks.—Falmouth (W.P.C.).
- Cuthona (?) aurantiaca** (*Æolis a.*) A. & H.—Fowey Harbour (Alder).
- Cratena viridis** Forbes. [*Æolis v.*].—Cornwall in 25 fathoms (Forbes).
- C. amœna** A. & H.—Plymouth, obtained rather often (J.M.B.A.); Fowey, several specimens in 1847 (A. & H.).
- C. olivacea** A. & H.—Penzance (Alder).
- Cratena (?) Peachii** A. & H.—Fowey (Peach).
- Cratena (?) angulata** A. & H.—Plymouth (W.G.).
- Cratena (?) Couchii** Cocks.—Under stones at extreme low water, Gyllyngvase, Falmouth (W.P.C.).
- Tergipes despectus** Johnst. (*Æolis d.*).—Fowey (Alder); Falmouth (W.P.C.).
- Embletonia pulchra** A. & H.—Plymouth (W.G.).
- Amphorina cœrulea** Mont.—Plymouth; not met with on the English coast since the time of Montagu (J.M.B.A.).
- Galvina exigua** A. & H. [*Æolis e.*].—Plymouth, two specimens dredged near Duke Rock (W.G.); Fowey (Alder); Falmouth (W.P.C., R.V.).
- G. tricolor** Forbes. [*Æolis Farrani*, A. & H.].—Plymouth (W.G.); Falmouth (Alder).
- G. cingulata** A. & H.—Plymouth (W.G.).
- Coryphella rufibranchialis** Johnst. [*Æolis r.*].—Whitsand Bay E., 20 fathoms (J.M.B.A.); Falmouth (W.P.C.); Mount's Bay (G.F.T.).

- C. gracilis** A. & H.—Plymouth, two specimens (W.G.).
- C. Landsburgii** A. & H.—Plymouth, Duke Rock, two specimens (W.G.).
- Favorinus albus** A. & H. [*Æolis a.*].—Plymouth three specimens, Drake's Island and Cawsand Bay (W.G.); Falmouth (W.P.C.).
- Facelina Drummondii** W. Thomp. [*Æolis D.*].—Falmouth (Norman).
- F. coronata** Forbes.—Plymouth (W.G.); Fowey (A. & H.); Falmouth (W.P.C.).
- Calma glaucoides** A. & H. [*Æolis g.*].—Plymouth (W.G.).
- Fiona marina** Forsk [*F. nobilis*, A. & H.].—Falmouth, two specimens at Bar Point, 1849 (W.P.C.).
- Antiope cristata** D.Ch.—Plymouth (W.G.); Fowey (Alder); Falmouth (R.V.).
- A. hyalina** A. & H.—Plymouth, two specimens (J.M.B.A.);
- Hero formosa** Lov.—Plymouth (J.M.B.A.).
- Hermæa bifida** Mont.—A single specimen found on St. Germans River, Plymouth, by Prof. Johnson (J.M.B.A.).
- H. dendritica** A. & H.—Drake's Island, Plymouth, by Prof. Johnson (J.M.B.A.).
- Stiliger bellula** D'Orb.—Plymouth, 10 individuals dredged in Cawsand Bay, 3rd Aug., 1892. A species discovered by D'Orbigny sixty years before, and now re-discovered (J.M.B.A.).
- Elysia viridis** Mont.—Plymouth (Norman, W.G.).
- Limapontia capitata** Müll. [*L. nigra* Johnst.].—Plymouth (W.G.); Falmouth (W.P.C.).
- Cenia Cocksii** A. & H. [*Actæonia C.*].—Falmouth (W.P.C.).
- Actæonia corrugata** A. & H.—Falmouth (W.P.C.).
- Berghia cærulescens** Laurill—Plymouth; a species new to Britain (M.B.A., Nature, Feb, 16, 1893).

SUB-ORDER (?) *PTEROPODA*.

- Limacina retroversa** Flem. [*Spirialis r.*].—Falmouth Harbour (W.H.); Mount's Bay (Penz. List); Scilly (C.B.).
- Cavolinia trispinosa** Lesr.—Is marked in a printed list as Cornish, in the hand-writing of the late Mr. Williams Hockin. (?)
- Clione limacina** Phipps.—Pelseneer ('Challenger' Report) says, "There is in the collection of the Muséum d'Histoire Naturelle of Paris a specimen from Falmouth presented by Leach" (Norman).

ORDER PULMONATA.

SUB-ORDER *BASOMMATOPHORA*.

- Alexia denticulata** Mont. [*Melampus myosotis* Drap.].—Truro (King); Falmouth (W.P.C.); Penzance, Whitsand Bay, and Porthcurnow (Hennell); Scilly (R.W.J.S.).
- Var. **ringens** Turt.—Porthcurnow (W.E.B.); Scilly (Jordan).
- Leuconia bidentata** Mont. [*Melampus b.*].—Falmouth (W.P.C.); Helford (W.R.); Mousehole (R.N.D.); Land's End (King); Hayle Towans (Hennell); Scilly (R.W.J.S.).
- Otina otis** Turt.—Plymouth (J.M.B.A.); Lizard and Tintagel (Cooke); Mousehole (R.N.D.); Land's End (W.H.); Scilly (R.W.J.S.).
- Var. **candida** Jeff.—Sennen (C.B.).
- Var. **alba** Cooke.—Newquay (Cooke).

SUB ORDER *STYLOMMATOPHORA*.

- Oncidium celticum** Cuv.—Lantivet Bay, in crevices of the rocks, a little above high-water mark, apparently feeding on *Lichina pygmæa* (Laughrin, J.C.); Whitsand Bay E. (Spence Bate).

CLASS SCAPHOPODA.

- Dentalium vulgare** DaC. [*D. tarentinum* Lmk.].—Attached to byssus of *Pinna*, rare (J.C.); Plymouth (J.M.B.A.); Falmouth (Montagu); Mount's Bay (G.F.T.); Porthcurnow (R.N.D.).

D. entalis L.—Not unfrequent (J.C.). Plymouth, Falmouth, Mount's Bay, Hayle, Scilly.

CLASS PELECYPODA.

ORDER PROTOBRANCHIATA.

Nucula nucleus L.—Par, Falmouth, Mount's Bay, Hayle, St. Minver, Scilly.

Var. **radiata** F. & H.—Falmouth (W.H.); Mount's Bay (G.F.T.).

N. nitida G. B. Sow.—Falmouth (W.P.C.); Mount's Bay (Penz. List); Wolf Rock and Hayle (Miss Carne).

ORDER FILIBRANCHIATA.

SUB-ORDER ANOMIACEA.

Anomia ehippium L.—Generally distributed.

Var. **squamula** L.—Land's End (W.H.).

A. patelliformis L.—West Cornwall generally.

Var. **striata** Lov.—Falmouth (W.H.).

SUB-ORDER ARCACEA.

Arca tetragona Poli.—Generally distributed, but not common.

A. (Fossularca) lactea L.—Par, Falmouth, Mount's Bay, Land's End, Hayle, St. Minver, Harlyn Bay, Scilly.

Pectunculus glycimeris L.—Generally distributed.

Var. **pilosa** L.—Helford (W.H.).

SUB-ORDER MYTILACEA.

Mytilus edulis L.—Generally distributed.

Var. **ungulata** L.—Hayle (Miss H.); St. Minver (R.V.T.).

Var. **incurvata** Penn.—Par (R.V.T.); Falmouth (W.P.C.); Newquay (Miss H.); St. Minver (R.V.T.).

Var. **galloprovincialis** Lmk.—Par, (R.V.T.); Falmouth (W.P.C.); Helford (J.C.); Hayle (R.N.D.).

Var. **pellucida** Penn.—Falmouth (W.P.C.); Maenporth (R.N.D.); Hayle (Miss H.).

Var. **flavus** Poli.—Newquay (Miss H.).

(To be continued).

CONCHOLOGICAL SOCIETY
OF GREAT BRITAIN AND IRELAND.

PROCEEDINGS.

248th MEETING, APRIL 12th, 1896,

Held in the Manchester Museum, Owens College.

Mr. J. Cosmo Melvill, President, in the chair.

Donations to the Library announced and thanks voted :

Science Gossip, vol. 2, Nos. 22 and 23 ; Records of the Australian Museum, vol. 2, No. 7.

New Member elected :

Mr. William Valentine Burgess, 13, Groby Road, Chorlton-cum-Hardy.

Candidates Proposed for Membership :

Messrs. A. Blayney Percival, Graham Renshaw, and John Rhodes.

Exhibits :

Mr. F. Taylor exhibited *Hyalinia alliaris* and var. *viridula*, *H. nitida*, *H. excavata* and var. *vitrina* from Bardsley near Oldham ; also *Hyalinia glaber* from Marple.

Alteration of Time of Meeting :

After considerable discussion, it was resolved that the time of the ordinary meeting be changed from the first Wednesday to the second Wednesday in each month, and that the meeting commence at 6-30 p.m.

249th MEETING, MAY 13th, 1896.

Held in the Manchester Museum, Owens College.

Mr. J. Cosmo Melvill, President, in the chair.

Donations to the Library announced and thanks voted :

Science Gossip, vol. 2, No. 24 ; The Naturalist, Nos. 249 and 250 ; The Irish Naturalist, vol. 5, No. 6 ; Journal de Conchyliologie, vol. 43, No. 2 ; La Feuille des Jeunes Naturalistes, Nos. 305-309 ; Proceedings of the Academy of Natural Sciences of Philadelphia, Oct. and Dec., 1895 ; Kiener, Monographs of Strombus, &c., 2 vols. (from Mr. R. D. Darbishire).

New Members elected :

Mr. A. Blayney Percival, Somerset Court, Brent Knoll, Somerset.

Mr. Graham Renshaw, Sale Bridge House, Sale.

Mr. John Rhodes, F.E.S., 360, Blackburn Road, Accrington.

Candidates Proposed for Membership :

Rev. Addison Crofton, and Mr. Harry Simpson Wallace.

Papers read :

Report of London Branch Meeting, April 24th, 1896, by J. E. Cooper, Hon. Sec.

Note on *Tellina serrata* Brocchi, by J. T. Marshall.

Notes on *Helix Lucasi* and *H. hortensis*, by Rev. J. W. Horsley.

Helix fusca and *Azece tridens* in Denbighshire, by C. OLDHAM; *Limax maximus* var. *alba* nov. in Northamptonshire, by L. E. Adams.

Exhibits :

Mr. J. C. Melvill exhibited *Stenogyra rustica* M. & P., and a new species of *Cyclostoma* shortly to be described ; also a fine specimen of *Pholadomya candida* Sow., from the island of Tortola, West Indies, the only recent representative, if two deep sea species of minute size from the Atlantic be excepted, of a large genus abundant in Jurassic strata. Recent specimens have always been of great rarity, and only found after tornadoes, no doubt cast up from deep water.

Mr. W. Moss exhibited *Omalonyx felinus* Guppy, from Trinidad.

Mr. Thos. Rogers exhibited *Vitrina Etheridgei* from Lord Howe Island, *Helix lineata* Oliv. from Las Palmas, *H. virgata* var. *picta* from Kent, var. *alba* from Anglesea, and var. *leucozona*.

Mr. L. E. Adams exhibited a fine living example of *Limax maximus* var. *alba* nov. from Northamptonshire.

Mr. C. Oldham exhibited *Limnaea peregra* var. *labiata* from Romiley.

Mr. J. T. Marshall exhibited types of species and varieties of shells mentioned in his "Additions to British Conchology," viz.: *Mytilus edulis* var. *flava* Poli ; *Mouliacuta ferruginosa* var. *ovata* Marshall ; *Tellina serrata* Brocchi from Scilly Islands and Mediterranean ; *Psammobia tellinella* var. *lactea* and *purpurea* Marshall ; *Donax vittatus* var. *cuneata*, *albida*, and *truncata* Marshall, *turgida* and *nitida* Jeffr. ; *Amphidesma castaneum* var. *subtrigona* Monts., *Scrobicularia alba* type, and var. *acuta* Jeff. and *oblonga* Marshall ; and *Saxicava rugosa* var. *cylindrica* S. Wood.

Mr. Thos. Edwards exhibited *Buccinum undatum* var. *setlandica* and *Natica catena* from Shetland ; subscalariform *Purpura lapillus*, *Littorina littorea* and *L. rudis* from Margate ; *Unio pictorum* var. *curvirostris* and *Sphaerium corneum* from near Leicester ; a series of varieties of *Helix nemoralis* ; "repaired" specimen of *Helix aspersa* from Pegwell Bay ; and a fine scalariform specimen of *Planorbis carinatus* from Bradgate.

LONDON BRANCH.

MEETING, MARCH 20th, 1896,

Held at Walham Green, when members were invited to inspect Mr. Peter Lawson's large collection of marine shells. A curious specimen of *Cypraea tigris* was worthy of note, besides a number of choice examples of other shells.

MEETING, APRIL 24th, 1896,

Held at 23, Northbrook Road, Lee, by invitation of Mr. T. M. Harvard. The evening was spent in examining Mr. Harvard's collections of foreign marine shells, and British land and freshwater species. A very fine set of Pteropoda was much admired. We also noted a large number of North American Uniones, *Cypræa aurantium* and *C. decipiens*, *Magilus antiquus*, and fine British examples of *Sipho islandicus*.

J. E. COOPER.

Helix fusca Mont., **H. granulata** Alder, **H. lapicida** var. **albina** Menke, and **Clausilia Rolphii** Gray in Northamptonshire.—A most interesting discovery has been made by Mr. C. E. Wright of a specimen of *Helix fusca* near Kettering, this species, I believe, not having been recorded for any of the eastern counties, or nearer the above locality than North Staffordshire. Mr. A. Loydell has also added *H. granulata* to the county list by a single specimen from Brackley, in which neighbourhood he also found a perfectly white (though dead) specimen of *H. lapicida* var. *albina*. The same collector has also discovered a small colony of *Clausilia Rolphii* in Sywell Wood, about seven miles from Northampton.—LIONEL E. ADAMS, Northampton, Jan. 8th, 1896. (*Read before the Conchological Society, Jan. 8th, 1896.*)

Note on Helix Lucasi from North Africa.—A specimen of *H. lucasi* from North Africa, which I placed on a plant in my study, utterly despised vegetation and took to browsing on pamphlets instead, so that they looked as if they had been nibbled by mice. It apparently digested the literature.—J. W. HORSLEY, St. Peter's Rectory, Walworth. (*Read before the Conchological Society, May 13th, 1896.*)

Limax maximus L. var. **alba** nov. in Northamptonshire.—On May 3rd, while snail-hunting in Rockingham Park with Mr. C. E. Wright, I came upon the first British specimen of this variety under some dead wood. Messrs. W. Denison Roebuck and J. W. Taylor, to whom I sent the slug for inspection, inform me that there are only two instances known of its previous occurrence. Dr. Paul Fischer, in the *Journal de Conchyliologie*, records one in 1880, at Savigny-sur-Orge (Seine et Oise), and another from that locality twelve years before. My example measures three-and-a-half inches (fully extended) from head to end of tail. It is pure white, being entirely destitute of colour with the exception of a few microscopic specks of dusky red about the head and upper tentacles; and there is a reddish ring encircling each eyeball. Like the white form of *A. ater*, the skin is very transparent, and the internal organs can be well traced. The shell, too, is quite visible through the mantle. It is noteworthy that Dr. Fischer's description agrees with mine as regards the reddish circles round the eyes. As Dr. Fischer did not attach a varietal name to his description, I suggest var. *alba*.—LIONEL E. ADAMS, Northampton. (*Read before the Conchological Society, May 13th, 1896.*)

BIBLIOGRAPHY.

(LIMITED TO WORKS RECEIVED BY THE SOCIETY'S LIBRARIAN).

Journal de Conchyliologie, vol. 43, No. 2 (dated "1er Avril, 1895," received 21st April, 1896); No. 3 (dated "1er Juillet, 1895," received 8th June, 1896).

"Note sur le genre *Barleeia* Clark," by the MARQUIS DE MONTEROSATO [three European species recognised]. "Additions à la faune malacologique terrestre et fluviatile de la Nouvelle-Calédonie et de ses dépendances," by H. CROSSE [*Placostylus leucoleus* n. sp. figured]. "Coquilles nouvelles provenant des récoltes de M. LEVAY, dans les rapides du Haut-Mékong, pendant la campagne du Massie, 1893-1894-1895," by A. BAVAY [*Lacunopsis* 4 n. spp., *Pachydrobia* 4 n. spp., *Hydrorissoia elegans* n. g., n. sp., *H. Levoayi* n. sp., *Stenothyra* n. sp., all figured]. "Note sur l'animal du *Bulinulus pallidior* Sowerby," by H. FISCHER [with fig]. "Descriptions d'espèces nouvelles de l'Archipel Néo-Calédonien," by J. HERVIER [*Drillia* 2 n. sp., *Clavus* 4 n. sp., *Surcula* n. sp., *Glyphostoma* 13 n. sp.] "Descriptions de coquilles fossiles des terrains tertiaires supérieures (suite)," by C. MAYER-EYMAR [11 n. sp., all figured]. "Liste systématique des Natices des Faluns de la Touraine et de Pont-Levon, du Musée de Zurich," by C. MAYER-EYMAR.

The Naturalist, for March, April and May, 1896, Nos. 248-250.

"Rough notes on Marine Zoology in the Scarborough district during the last two years," by OXLEY GRAHAM [few common mollusca noted]. "Otters feeding on Freshwater Mussels," by W. DENISON ROEBUCK. "The Land and Freshwater Mollusca of Cheshire," by CHAS. OLDHAM [list with notes and localities, 102 species being recorded]. "Lincolnshire Notes," by H. W. KEW [*Helix* several species recorded].

The Journal of Malacology, vol. 5, No. 1, March 25th, 1896.

"Some new Marine Mollusca from Tangier," by G. W. CHASTER [*Cocum cuspidatum*, *Retrotortina* (n. g.) *fuscata*, *Pherusa carinata*, *Cyclostrema pruinatum*, *C. fenestratum*, all figured].

The Annals of Scottish Natural History, Nos. 17 and 18, Jan. and April, 1896.

"*Xylophaga dorsalis* Turton, in the Firth of Forth," by THOS. SCOTT. "Supplement to Dawson's 'Mollusca of Aberdeen and the Neighbouring Sea,'" by JAMES SIMPSON [47 additional spp. and varr. recorded]. "Large specimen of *Mytilus modiolus* in the Firth of Forth," by W. EAGLE CLARKE.

Feuille des Jeunes Naturalistes, Nos. 306-309, April-July, 1896.

"Recherches zoologiques dans les serres du Muséum de Paris—Mollusques," by P. DAUTZENBERG [4 indigenous and 3 exotic species]. "Revue de paléonchologie," by M. COSSMAN.

Devonia, part 4, June, 1896.

"British Land and Freshwater Shells," by E. W. W. BOWELL [*Limnaea stagnalis* and *L. auricularia* with vars., illustrated by two process blocks.

How any man in the present state of nomenclature can name varieties in his notebooks "merely for private convenience," and publish the same "without any desire to add to the number of existing synonyms" is incomprehensible; it is just by such action that synonyms are made.

The Irish Naturalist, vol. 4, No. 12, Dec., 1895, to vol. 5, No. 6, June, 1896.

"Notes on Glacial Deposits in Ireland: II., Kill-o'-the-Grange," by W. J. SOLLAS and R. LLOYD PRAEGER [list of 22 spp. mollusca, which indicate 'a cold sea of moderate depth, and an adjoining shore-line.'] "An addition to the Irish Molluscan Fauna," by R. F. SCHARFF [*Pisidium (Fossarina) hibernicum* Westerlund]; "*Spirula Peroni* in Co. Antrim [Port Ballintrae]," by B. TOMLIN. "The shell of *Helix nemoralis*," by GRENVILLE A. J. COLE [mineralogical composition]. "Notes on a Zoological Expedition to Valencia Island, co. Kerry," by F. W. GAMBLE [numerous Nudibranchiata noticed]. "Some Slugs from North-west Ireland," by W. E. COLLINGE. "Notes on the Rock-Pools of Bundoran," by J. E. DUERDEN [Opisthobranchs noted]. "A submerged Pine Forest," by R. LLOYD PRAEGER [few fossil shells].

The Naturalists' Journal, vol. 5, No. 48, June, 1896.

"Enemies of our Land and Freshwater Molluscs," by W. A. GAIN.

Science Gossip, vol. 2, Nos. 22-24, vol. 3, No. 25, Dec. 1895, and Jan. 1896 (received April 1, 1896; Feb. No. received May 1, June No. received June 6; March, April and May Nos. omitted).

"Winter habits of Helices," by CHARLES WILLIAMS. "Introduction of Mollusca into Britain," by A. S. KENNARD [criticism of KEW, 'The Dispersal of Shells'; many more species have been introduced into Britain than are so reckoned by that author].



Mucous tracks of *Limnæa stagnalis* L.—Whilst on a photographic tramp with my friend, Mr. H. G. Brierley, of Huddersfield, up Calder Vale, last bank holiday, we passed along the side of Tag Lock, a disused canal connecting two bends of the Calder. The canal is choked with common reeds, bur reeds, and water plantain, and *Limnæa stagnalis* and *Planorbis corneus* are plentiful. The molluscs, when sought for by Mr. Brierley, towards evening a few weeks previously were not to be found, but in the bright sunshine they were common enough. The tracks of the *Limnæa* were quite distinct on the lower surface of the water-film, and were visible to us as straight paths, six to eight feet long, and half-an-inch wide, of whitish iridescent slime. The clear water of the canal ran over a bottom darkened with black organic mud, against which the slightest deviations of the paths were plainly discernible. Singularly the many tracks ran across each other almost at right angles, and where they crossed there was no interruption of the continuity of the mucous secretion.—HENRY CROWTHER, The Museum, Leeds. (Read before the Conchological Society, Sep. 4th, 1895).

A LIST OF THE LAND AND FRESHWATER
MOLLUSCA OF TRINIDAD.

BY EDGAR A. SMITH.

(Read before the Conchological Society, Dec. 4th, 1895).

LISTS of the molluscan fauna of Trinidad having been published as recently as 1890* and 1893†, it might appear that another catalogue was scarcely necessary. So many species, however, in the lists referred to, required alteration in their nomenclature, that it was deemed advisable to publish a revision of the whole. The same sequence and numbers of the species are adopted as appear in Mr. Guppy's catalogue.

Alterations have been made in the generic or specific names of more than half the species, four new forms have been described, and two others are recorded which do not appear in Mr. Guppy's list. No attempt has been made to give references in every case, as this has already been done by M. Crosse.

An examination of the following table will show that some of the deductions with regard to the geographical distribution of the species, which appear in the report by the latter author, are no longer tenable. The increase of our knowledge, with respect to the identity of many of the species and the extension of their range, shows that the proportion of indigenous species is considerably less than was supposed. Of the twenty-two species cited by M. Crosse, only thirteen are now regarded as restricted to the island, and even several of these will probably be found elsewhere by future collectors.

To the twenty-eight species mentioned as living both in Trinidad and on the American continent, seven additional forms are quoted in the present paper. Of the eight species mentioned by Crosse as occurring on the mainland and Trinidad, but not on any of the other West Indian islands, one, *Guppya vacans*

* Crosse, Journ. de Conch., 1890, pp. 35-65.

† Journ. of Conch., vol. vii., pp. 210-231.

(=*G. semen-lini*), has been cited as from Cuba and Grenada. *Pupa Eyriesi*, *Homalonyx felina*, *Ampullaria cornu-arietis*, and *A. urceus* are also unknown further north than Trinidad. Of the five species quoted from Trinidad and other islands and said not to occur on the mainland, one, *Plecochilus auris-sciuri* (= *P. glabra*) is South American. In addition, *Cecilioides minutissima*, *Bulimulus Rawsoni*, *Veronicella occidentalis*, *Pedipes mirabilis*, *Planorbis lucidus*, and *Truncatella pulchella*, occurring in some of the other islands besides Trinidad, have not yet been met with on the continent.

TABLE OF DISTRIBUTION OF THE SPECIES.

NAMES OF THE SPECIES.	ISLANDS NORTH OF TRINIDAD	TRINIDAD	CENTRAL OR SOUTH AMERICA
<i>Cecilioides minutissima</i> - -	×	×	
<i>Subulina simplex</i> - - -		×	
<i>S. Urichi</i> , n. sp. - - -		×	
<i>S. octona</i> - - - -	×	×	×
<i>Opeas Beckianæ</i> - - -	×	×	×
<i>O. plicatella</i> - - - -	×	×	×
<i>O. micra</i> - - - -	×	×	×
<i>Leptinaria lamellata</i> - -	×	×	×
<i>Omphalina Guildingi</i> - -		×	×
<i>Vitrea implicans</i> - - -		×	
<i>V. umbratilis</i> - - - -		×	
<i>Guppya semen-lini</i> - - -	×	×	×
<i>Selenites alicæ</i> - - - -		×	
<i>Epiphragmophora coactiliata</i> -		×	×
<i>Thysanophora bactricola</i> - -		×	×
<i>T. fuscula</i> - - - -	×	×	×
<i>T. dioscoricola</i> - - - -	×	×	×
<i>Orthalicus zebra</i> - - - -	×	×	×
<i>Strophochilus oblongus</i> - -	×	×	×
<i>Plecochilus glaber</i> - - -	×	×	×

TABLE OF DISTRIBUTION OF THE SPECIES.—*Continued.*

NAMES OF THE SPECIES.	ISLANDS	TRINIDAD	CENTRAL OR SOUTH AMERICA
	NORTH OF TRINIDAD		
<i>Bulimulus pilosus</i> - - -		×	
<i>B. fraterculus</i> - - -	×	×	×
<i>B. aureolus</i> - - -		×	
<i>B. trinitarius</i> , n. sp. - - -		×	
<i>B. Rawsoni</i> - - -	×	×	
<i>B. Mossi</i> , n. sp. - - -		×	
<i>B. Broadwayi</i> , n. sp. - - -		×	
<i>B. Vincentinus</i> - - -	×	×	×
<i>Cylindrella trinitaria</i> - - -		×	×
<i>Pupa uvulifera</i> - - -		×	
<i>P. Eyriesi</i> - - -		×	×
<i>Ennea bicolor</i> - - -	×	×	
<i>Streptaxis deformis</i> - - -	×	×	×
<i>Simpulopsis rufovirens</i> - - -		×	×
<i>Succinea Cuvieri</i> - - -	×	×	×
<i>Homalonyx felina</i> - - -		×	×
<i>Veronicella occidentalis</i> - - -	×	×	
<i>Melampus coffea</i> - - -	×	×	×
<i>M. pusillus</i> - - -	×	×	×
<i>Pedipes mirabilis</i> - - -	×	×	
<i>Ancylus textilis</i> - - -		×	
<i>Gundlachia crepidulina</i> - - -		×	
<i>Planorbis terverianus</i> - - -	×	×	
<i>P. lucidus</i> - - -	×	×	
<i>P. Gundlachi</i> - - -		×	
<i>Physa rivalis</i> - - -	×	×	×
<i>Paludestrina crystallina</i> - - -	×	×	×
<i>Ampullaria cornu-arietis</i> - - -		×	×
<i>A. urceus</i> - - -		×	×
<i>A. glauca</i> - - -	×	×	×
<i>Neocyclotus translucidus</i> - - -		×	×

TABLE OF DISTRIBUTION OF THE SPECIES.—*Continued.*

NAMES OF THE SPECIES.	ISLANDS NORTH OF TRINIDAD	TRINIDAD	CENTRAL OR SOUTH AMERICA
<i>Neocyclotus grenadensis</i> - -	×	×	
<i>Diplommatina occidentalis</i> -		×	
<i>Truncatella pulchella</i> - -	×	×	
<i>T. bilabiata</i> - - - -	×	×	×
<i>T. subcylindrica</i> - - -	×	×	×
<i>Taheitia reclusa</i> - - -		×	
<i>Cistula aripensis</i> - - -		×	
<i>Helicina nemoralis</i> - - -		×	
<i>H. Dysoni</i> - - - -		×	×
<i>H. lirata</i> - - - -		×	×
<i>H. ignicoma</i> - - - -		×	
<i>Sphærium incurvum</i> - - -	×	×	
<i>Pisidium punctiferum</i> - - -		×	×
<i>Anodonta Leotaudi</i> - - -		×	

ENUMERATION OF THE SPECIES.

1.—*Cæcilioides minutissima* (Guppy).

Glandina minutissima Guppy, Proc. Sci. Assoc., Trinidad, 1868, vol. i., p. 239; Crosse, Journ. de Conch., 1890, p. 36, pl. 2, fig. 1.

Geostilbia minutissima Guppy, Journ. of Conch., 1893, vol. vii., p. 211.

Hab.: Maraccas, Trinidad (Guppy); St. Vincent (H. H. Smith in Brit. Mus.).

This species, as I have already pointed out,* has the columella more distinctly truncate anteriorly than the typical form of *Geostilbia*.

* Proc. Malac. Soc., 1895, vol. i., p. 303.

2.—*Subulina* (*Nothus*) *simplex* Guppy. Pl. VIII., f. 1.

Spiraxis simplex Guppy, Ann. Mag. Nat. Hist., 1868, vol. i., p. 438.

Spiraxis simplex Guppy, Crosse, J. de Conch., 1890, p. 37.

Spiraxis simplex Guppy, Journ. of Conch., vol. vii., p. 212.

Hab.: Trinidad (Guppy); Oropouche, Trinidad (Ponsonby in Brit. Mus.).

This species, placed by Guppy in the genus *Spiraxis*, appears to be referable rather to the genus *Subulina*. In *Spiraxis*, of which *Achatina inusitata* C. B. Adams should be regarded as the type, there is a columellar "spiral lamina" at the upper part of the columella, which is absent in *Subulina*. In the latter, the columella is more or less distinctly truncate anteriorly, and has no spiral fold above. In this respect, *Spiraxis simplex* agrees with the well-known *Achatina octona*, which is commonly located in the genus *Subulina*. It seems, therefore, advisable to place the present species in that genus rather than in *Spiraxis*. If the group *Nothus* of Albers (type *Bulimus anomalus* Pfr.) be considered separable from *Subulina* on account of the reflexed columellar lip, forming an umbilical perforation, then this species should be placed in that section.

2a.—*Subulina* (*Nothus*) *Urichi*. Pl. VIII., f. 2.

Testa elongata, turrata, angusta, rimata, pallida, pellucida, nitida, striis incrementi tenuibus obliquis arcuatis sculpta; anfractus 8 mediocriter convexi, ad suturam crenulati; spira producta, ad apice subobtusa; apertura parva, inverse-auriformis, longit. totius, $\frac{1}{4}$ fere adæquans; labrum tenuissimum, obliquæ-arcuatum; columella rectiuscula, superne anguste reflexa, infra medium subtruncata vel plicata. Longit. $10\frac{1}{2}$ millim., diam. 3, apertura fere 3 longa.

Hab.: Oropouche (in coll. J. H. Ponsonby).

Rather larger than *Opeas micra* (= *octonoides* C. B. Ad.), more glossy, and with a plicate or subtruncate columella. Smaller and more slender than *S. simplex*, also with finer lines

of growth. Named after Mr. Ulrich, who collected this and many other species in the island.

3.—*Subulina octona* (Chemnitz).

Stenogyra octona. Guppy, Journ. of Conch., 1893, vol. vii., p. 212.

Hab.: Trinidad (Guppy).

The genus *Stenogyra* was founded by Shuttleworth* to include several groups of land shells which had already been indicated by various authors and which bore a superficial general resemblance. Among these were *Rumina* Risso, *Obeliscus* Beck, *Opeas* Albers, and *Subulina* Beck. As Shuttleworth did not name a type for his genus, and, in fact, did not place any species under *Stenogyra*, but merely included in it the species falling under the groups already mentioned, perhaps it would be advisable to reject *Stenogyra* entirely as a too comprehensive genus, and to revert to the groups previously established. There are certain conchological and other characters which are probably sufficient to separate them. At all events, *Opeas* is distinguishable from *Subulina* by the absence of a truncation of the columella, and *Rumina* and *Obeliscus* are groups having a different aspect altogether.

4.—*Opeas Beckiana* (Pfeiffer).

Stenogyra caracasensis Reeve, Guppy, *op. cit.*, p. 213.

Hab.: Trinidad (Guppy).

Bulimus oryza Reeve (? of Bruguière) and *B. caracasensis* Reeve are synonymous. Remarks upon the distribution of this species have been made by the writer in the Proc. Mal. Soc., 1895, vol. i., p. 309.

5.—*Opeas plicatella* (Guppy).

Stenogyra plicatella Guppy, Journ. of Conch., 1893, vol. vii., p. 213.

Opeas plicatella Smith, Proc. Mal. Soc., 1895, vol. i., pp. 308, 317, pl. xxi., f. 15.

* Bern. Mittheil., 1854, p. 45.

Hab.: Trinidad, St. Vincent, Grenada, St. Lucia; also South America (Guppy).

5a.—*Opeas micra* (d'Orbigny).

Bulimus micra d'Orb., Voy. Amér. Mérid., p. 262, pl. 41, f. 18-20 (1835).

Bulimus micra d'Orb., Reeve, Conch. Icon., f. 78, enlarged, and f. 579.

Bulimus octonoides C. B. Adams (1845); Reeve, *op. cit.*, f. 593.

Opeas micra. Smith, Proc. Malac. Soc., vol. i., pp. 309, 318.

This species is not recorded by Mr. Guppy, but a single Trinidad specimen was, among other species, presented to the British Museum by that gentleman in 1875.

Its distribution is given by the writer at the above reference.

6.—*Leptinaria lamellata* (Potiez & Michaud).

Cionella lamellata Guppy, *op. cit.*, p. 213.

Hab.: Various parts of the island.

This common West Indian species is located by Guppy in the genus *Cionella*. That genus, as I have already pointed out† is no longer available in conchological nomenclature.

7.—*Omphalina Guildingi* (Bland).

Stenopus Guildingi (?) Bland, Ann. Lyc. Nat. Hist., New York, vol. viii., p. 158.

Stenopus Guildingi (?) Tryon, Man. Conch., ser. 2, vol. ii., p. 182, pl. 54, f. 23-5.

Zonites Guildingi Guppy, Ann. Mag. Nat. Hist., 1868, vol. i., p. 439, *id.*; Journ. of Conch., 1893, vol. vii., p. 214.

Hab.: Porto Cabello, Venezuela (Bland); Aripo, Trinidad, 2,000-2,700 feet (Guppy).

H. nitensoides of d'Orbigny, from Cuba, which Guppy thought might "prove specifically identical" with this species, is quite distinct. A comparison of the type with a specimen of *Stenopus Guildingi* from Porto Cabello, presented to the Museum

† Journ. of Conch., vol. vi., pp. 339-343.

by Mr. Bland, shows that the umbilicus is considerably narrower in the latter, which is a more compressed shell with a flatter spire.

I have placed this species in *Omphalina*, as conchologically it is not unlike some of the forms belonging to that North American group. The animal has not yet been studied. The type of *Stenopus* (preoccupied for a Crustacean), viz., *S. cruentatus* Guilding, may also be referable to this genus. The second species (*S. lividus*) described by Guilding, appears to be different generically, and is now placed in *Guppya*.

8.—*Vitrea implicans* (Guppy). Pl. VIII., f. 3, 3b.

Zonites implicans Guppy, Journ. of Conch., 1893, vol. vii., p. 214; Amer. Journ. Conch., vol. vi., p. 307, pl. 17, f. 2.

As the figure quoted above is not characteristic, another is now given.

9.—*Vitrea umbratilis* (Guppy).

Zonites umbratilis Guppy, Journ. of Conch., 1893, vol. vii., p. 214; Amer. Journ. Conch., vol. vi., p. 307, pl. 17, f. 3.

10.—*Guppya semen-lini* (Moricand).

Helix semen-lini Moricand, Mém. Soc. Phys. Genève, 1846, vol. xi., p. 149, pl. v., f. 17; Reeve, Conch. Icon., vol. vii., f. 637; Pfeiffer, Conch. Cab., ed. 2, p. 457, pl. 155, f. 9-12; Tryon, Man. Conch., ser. 2, vol. ii., p. 175, pl. 53, f. 55-56.

Helix cassiquiensis Newcombe, Reeve, Conch. Icon., f. 334a-b.

Conulus vacans Guppy, Ann. Mag. N. H., 1866, vol. xvii., p. 53.

Guppya livida (non Guilding) Guppy, Journ. of Conch., 1893, vol. vii., p. 215.

Guppya vacans. Gibbons, Journ. of Conch., 1879, vol. ii., p. 129.

Hab.: Bahia (Moricand); Brazils (Mus. Cuming); Georgetown, Demerara (Gibbons); Trinidad (Guppy); Cassiqui, Cuba (Rve.); Demerara (Newcombe in mus. Cuming, for *Cassiquiensis*).

Mr. Guppy considers his *Conulus vacans* synonymous with Guilding's *Stenopus lividus*, but this identification does not

appear to be tenable, that is, if the shells in the British Museum from St. Vincent, named *lividus*, are correctly determined. These have *no spiral striation* which is so characteristic of *vacans*, *semen-lini*, and *cassiquiensis*, all of which I believe to belong to one and the same species. *G. livida* also is a little larger and less keeled at the periphery.

11.—Selenites alicea (Guppy). Pl. VIII., f. 4-4b.

Hyalinia alicea Guppy, Amer. Journ. Conch., 1870, vol. vi., p. 309.

Hyalinia alicea. Crosse, Journ. de Conch., 1890, p. 39.

Macrocyclus alicea Guppy, Journ. of Conch., vol. vii., p. 215.

Hab.: Oropouche (Guppy).

This species should, I think, be considered a small form of *Selenites*, rather than a *Macrocyclus*, a group now restricted to the large Chilian *Helix laxata* Férus.

12.—*Epiphragmophora (Trichodiscina) coactiliata
(Férussac).

Helix coactiliata. Guppy, Journ. of Conch., 1893, vol. vii., p. 216.

Hab.: Trinidad (Guppy).

With this species Mr. Guppy places as synonymous *H. suturalis* and *H. cordovana* of Pfeiffer, both of which differ in the absence of the colour-bands, which are so characteristic of *H. coactiliata*. They also vary slightly in form. The specimens obtained by Mr. Guppy appear to have belonged to the typical banded form. (Compare P.Z.S., 1875, p. 318).

13.—Thysanophora bactricola (Guppy). Pl. VIII., f. 5-5a.

Helix bactricola Guppy, Journ. of Conch., 1893, vol. vii., p. 216;

Amer. Journ. Conch., vol. vi., p. 307, pl. 17, f. 5.

Hab.: Also Venezuelan Guiana (Crosse).

14.—Thysanophora fuscula (C. B. Adams).

Helix plagiptycha Shuttleworth.

* Species marked with an asterisk have not been seen by the writer from Trinidad.

Helix ierensis Guppy, Amer. Journ. Conch., vol. vi., p. 307,
pl. 17, f. 4; Journ. of Conch., 1893, vol. vii., p. 217.
Hab.: Also St. Lucia and Guiana (Tate); Porto Rico,
Vièque, Jamaica.

In his remarks upon this species, Mr. Guppy suggests the possibility of this and the next form being "*sexes*" (!) of one and the same species. As these Pulmonates are supposed to be androgynous, we can well understand Mr. Guppy's difficulty to "advance any evidence in support of this view." Professor Pilsbry (Man. Conch., ser. 2, vol. ix., p. 57) suggests that this species is probably a mere variety of *T. plagioptycha* Shuttleworth, an opinion which is evidently correct.

15.—Thysanophora dioscoricola (C. B. Adams).

Helix dioscoricola C. B. Adams.—Pfeiffer, Conch. Cab., ed. 2,
p. 240, pl. 30, f. 29-32; Reeve, Conch. Icon., vol. vii.,
f. 347; Tryon, Man. Conch., ser. 2, vol. ii., p. 174, pl. 53,
f. 46-47.

H. caeca Guppy.—Tryon, *op. cit.*, vol. iii., p. 55, pl. 9, f. 23.

H. punctum Morelet.—Tryon, *op. cit.*, vol. iii., p. 53, pl. 9, f. 6.

Hab.: Jamaica (Adams); Vièque (Pfr.); Trinidad (Guppy);
Yucatan (Morelet).

Having compared specimens of the above three forms, I concur with Mr. Pilsbry in considering the two latter as "varieties of *dioscoricola*."

16.—Orthalicus zebra (Müller).

Orthalicus undatus Bruguière.—Guppy, Journ. of Conch., 1893,
vol. vii., p. 217.

Hab.: Trinidad (Guppy).

For remark upon this species and its distribution, see Proc.
Mal. Soc., 1895, vol. i., pp. 306, 321.

17.—Strophochilus (Borus) oblongus (Müller).

Bulimus oblongus. Guppy, *op. cit.*, p. 218.

18.—Plecochilus glaber (Gmelin).

Bulimus glaber Guppy, *op. cit.*, p. 218.

I quite concur with Mr. Guppy in considering the Trinidad form (*B. auris-sciuri* of Guppy) a variety of this species. It also occurs in Tobago (Sir R. Rawson). *B. euryomphalus* Jonas, and *B. otostomus* Pfeiffer, both from Venezuela, are also mere varieties.

19.—Bulimulus (Leptomerus) pilosus Guppy.

In form this species is very like *B. corneus* of Sowerby from Central America. It is well distinguished, however, by the different sculpture of the nuclear whorls. The apex in *B. pilosus* is almost truncate, and rather strongly longitudinally plicate or costulate; in *B. corneus* the apex is very minutely shagreened or granular. *B. fraterculus* is a larger, longer and narrower species.

20.—Bulimulus (Leptomerus) fraterculus Férussac.

B. tenuissimus Guppy, *op. cit.*, p. 218.

This species is omitted from Mr. Guppy's last catalogue. It certainly, however, does occur in Trinidad, for Mr. Guppy himself presented a series of it to the British Museum which he had collected on the island. It seems probable that the specimens he considers to belong to *B. tenuissimus* Fér. are in reality examples of *B. fraterculus*.* It is quoted from Guiana by Drouet.

21 part.—Bulimulus (Drymæus) aureolus (Guppy).

Pl. VIII., f. 6.

Bulimus aureolus Guppy, Ann. Mag. Nat. Hist., 1866, vol. xvii., p. 49.

Bulimulus aureolus typicus (varr. exclusis), Journ. of Conch., 1893, vol. vii., p. 218.

Hab.: Trinidad (Guppy).

The form originally described by Guppy was of a plain yellow tint. This he subsequently designated var. *typica*. At the same time he enumerated four other varieties, namely: 1, *albescens*; 2, *fasciata*; 3, *imperfecta*; 4, *Rawsoni*. After a

* He has since informed Mr. J. H. Ponsoy that such is the case.

careful study of these forms, I am inclined to consider it advisable to regard them as constituting three distinct species.

The variety *typica* forms the typical *B. aureolus*, the vars. *fasciata* and *imperfecta* constituting the second species (*B. trinitarius* n. sp.), and var. *Rawsoni* the third (*B. Rawsoni* of H. Adams),* originally described from Tobago. *B. liliaceus* of Férussac (in part) is very closely allied to *B. aureolus*, but the identification of that species is very uncertain.

Never having seen examples of Guppy's var. *albescens*, I am unable to express any opinion respecting its affinity.

21 part.—*Bulimulus (Drymæus) trinitarius* n. sp.

Pl. VIII., f. 7-7a.

Bulimulus aureolus vars. *fasciata* and *imperfecta* Guppy, American Journ. Conch., 1871, vol. vi., p. 308; Journ. of Conch., 1893, vol. vii., p. 218-219.

Testa elongata, superne acuminata, anguste perforata, alba, ad apicem fusca, zonis angustis fuscis (in anfr. penult. tribus, in ultimo quinis) cincta; spira mediocriter acuminato-conica; anfractus 6 regulariter accrescentes, supremi duo embryonales minute punctato-reticulati, convexi, cæteri convexiusculi, incrementi lineis exilibus obliquis, striisque spiralibus tenuibus sculpti, ultimus zonis duabus infimis cæteris latioribus; apertura inverse subauriformis, longit. totius $\frac{1}{2}$ haud æquans, alba, fusco-zonata; labrum tenue, antice subexpansum; columella rectiuscula, supra rimam reflexa.

Longit. 19 millim., diam. 9; apertura 9 longa, 5 lata.

This species is banded like *B. vincentinus* Pfr., but is very different in form. In the only two adult specimens I have seen, the zones on the body-whorl have a tendency to become more or less interrupted here and there. It may be the same as *B. rufolineatus* Drouet from Guiana, but it has five instead of four bands on the body-whorl, and the form is not quite the same.

21 part.—*Bulimulus (Drymæus) Rawsoni* H. Adams.

Hab.: Also from Tobago.

*Proc. Zool. Soc., 1873, p. 208, pl. 23, f. 12.

Bulimulus (Drymæus) Mossi. Pl. VIII., f. 8.

Testa elongata, rimata, alba, ad apicem et circa basim anfr. ultimi flavescens; spira acuminata; anfractus 5-6, supremi duo embryonales minute punctato-reticulati, convexiusculi, cæteri minus convexi, sutura leviter obliqua simplici sejuncti, infra suturam linea alba opaca angustissima marginati, lineis obliquis incrementi tenuissimis aliisque spiraliibus exilibus subundulatis sculpti, ultimus elongatus; apertura inverse auriformis, longit. totius $\frac{1}{2}$ superans; labrum tenue, antice paulo expansum; columella tenuis, supra rimam anguste reflexa.

Longit. $21\frac{1}{2}$ millim., *diam.* $9\frac{1}{2}$; *apertura* 12 longa, $6\frac{1}{3}$ lata.

In colour this species resembles *B. Rawsoni* of H. Adams. It differs from that species, however, in form, the more effuse outer lip and the more narrowly-reflexed columella. In *B. Rawsoni* the spire is longer and the aperture shorter than in this species, and the relative proportions are quite different. The single specimen examined has been kindly submitted to me for examination by Mr. W. Moss, after whom I have the pleasure of naming the species.

Bulimulus (Drymæus) Broadwayi n.sp. Pl. VIII., f. 9.

Testa brevis, ovata, vix rimata, tenuis, subpellucida, albo-cornea, ad suturam fusco-cincta; spira brevis, conica, ad apicem obtusiuscula, nigrescens; anfractus 5 subceleriter accrescentes, convexiusculi, supremi duo minute punctato-cancellati, sequentes paulo nitentes, lineis incrementi tenuibus striati, ultimus leviter globosus, costulis gracilibus obliquis plus minus numerosis instructus; apertura longit. totius $\frac{1}{2}$ paulo superans; peristoma tenuissimum, margine columellari vix incrassato, tenuiter et anguste reflexo.

Longit. 14 millim., *diam.* $8\frac{1}{2}$; *apertura* 8 longa, 6 lata.

Mr. Moss informs me that this very interesting addition to the fauna was discovered by Mr. W. E. Broadway, who at that time was an assistant in the Botanic Gardens, Trinidad. We are also indebted to him for the discovery of the preceding species. Mr. Moss, who has received from him a fine series of the Trinidad shells, has liberally placed one of his three specimens of this species in the British Museum collection. It is very different from all the other indigenous forms, and quite distinct from any of the continental species. The fine rib-like lines

of growth on the body-whorl are peculiar, and the style of colouration is very remarkable. I have much pleasure in naming this very interesting form after Mr. Broadway.

22.—*Bulimulus (Drymæus) vincentinus* (Pfeiffer).

Hab.: Also Venezuela (Guppy).

23.—*Cylindrella trinitaria* Pfeiffer.

24.—*Pupa uvulifera* Guppy. Pl. VIII., f. 10.

P. uvulifera Guppy, Ann. Mag. Nat. Hist., 1868, vol. i., p. 441.

In describing this species, Mr. Guppy does not give details of the dentition of the aperture. He merely remarks that the aperture is semi-ovate "plicis munita, plica parietalis verticalis, lamelliformis." Specimens of this species, presented to the British Museum by Mr. Guppy, exhibit five unequal teeth, viz.: a double parietal tooth larger than any of the other teeth, a single columellar tooth, and three palatal teeth, of which the uppermost on the right nearest to the parietal is very small and difficult of observation. *P. pellucida* Pfr. is very closely allied to this species.

25.—Pupa Eyriesi* Drouet.**

26.—*Ennea (Huttonella) bicolor* Hutton.

Also St. Thomas and St. Lucia (Gibbons), and Grenada.

27.—*Streptaxis deformis* Férussac.

Also occurs in Barbados and South America.

28.—*Simpulopsis rufovirens* (Moricand).

Simpulopsis rufovirens Pfeiffer, Conch. Cab., ed. 2, p. 30, pl. iii., f. 3-4; Reeve, Conch. Icon., vol. xiii., f. 3.

S. corrugata Guppy, Ann. Mag. Nat. Hist., 1866, vol. xvii., p. 53, Journ. de Conch., 1878, p. 323, pl. x., f. 3.

Hab.: Bahia, Brazil (Moricand); Trinidad, Guppy.

I cannot distinguish Mr. Guppy's *S. corrugata* from specimens of *S. rufovirens* preserved in the Cuming collection, and Mr. Guppy seems to be in doubt with regard to the validity of his species. I should also mention that in the figure in the

Journal de Conchyliologie the aperture of the shell is represented a trifle too wide.

29.—Succinea Cuvieri Guilding.

S. candeana Lea, Guppy, *op. cit.*, p. 221.

Mr. J. H. Ponsonby has presented specimens of this species to the British Museum, which he received direct from Trinidad. If *S. candeana* of Lea be synonymous, as stated by Mr. Guppy, it cannot be employed, as Guilding's name has many years priority (see Smith, Proc. Mal. Soc., vol. i., p. 307, 317). It is said to occur on the mainland (Guppy).

30.—Homalonyx felina Guppy.

Also found by Gibbons (Journ. of Conch., vol. ii., pp. 99 and 132) in Demerara.

31.—*Veronicella occidentalis (Guilding).

(See Cockerell, The Conchologist, vol. ii., p. 219).

32.—*Melampus coffea (Linn.).

33.—*Melampus pusillus (Gmelin).

34.—*Pedipes mirabilis (Megerle).

35.—Ancylus textilis Guppy.

36.—Gundlachia crepidulina Guppy.

37.—Planorbis terverianus d'Orbigny.

38.—Planorbis lucidus Pfeiffer.

Planorbis meniscus Guppy, Amer. Journ. Conch., vol. vi., p. 310; Journ. of Conch., vol. vii., p. 223.

Hab.: Cuba, Portorico, Guadaloupe, Martinique, St. Vincent.

With this species I am inclined to unite *P. lanierianus* d'Orbigny, *P. teniatus* Morelet, and *P. Redfieldi* C. B. Adams. If this union of species be correct, the range of this species becomes extended to Jamaica and the Isle of Pines.

Mr. Guppy appears to have included two species under his *P. meniscus*, for, in the original description he remarks that

it "approaches to *P. paropseides*, a species described by d'Orbigny from South America," and subsequently he observes that it is "very near to *P. haldemani* Adams, Jamaica." This view is also strengthened by the fact, that in a series of nine specimens which he kindly presented to the Museum in 1885, six are referable to *P. Haldemani* C. B. Adams, and three to *P. lucidus*.

***Planorbis Gundlachi** Clessin.

Planorbis Gundlachi (Dunker, MSS.), Clessin, Conch. Cab., ed. 2, p. 146, pl. 17, f. 8, 1884).

This species does not occur in Mr. Guppy's list. It may on comparison prove to be the same as the preceding species.

39.—Physa (Aplecta ?) rivalis (Maton & Rackett).

40.—Paludestrina crystallina Pfeiffer.

Paludina crystallina Pfr., Wiegmann's Arch. f. Naturgesch. 1840, p. 253; Philippi, Abbild., vol. i, p. 118, pl. i., f. 18; Küster, Conch. Cab., p. 5c, pl. x., f. 7, 8.

Paludestrina auberiana d'Orbigny in Ramon de la Sagra, Hist. Cub. Mollusq., vol. ii., p. 8, pl. x., f. 6, 7 (1842).
(var. *coronata*).

Paludina coronata Pfeiffer, *op. cit.*, p. 253; Philippi, *op. cit.*, p. 118, pl. i., f. 17; Küster, *op. cit.*, p. 51, pl. x., f. 9-12.

Hydrobia coronata. Martens, Festschrift Gesell. Nat. Freunde Berlin, 1873, p. 208, pl. ii., f. 13.

Paludestrina candeana d'Orbigny, *op. cit.*, p. 9, pl. x., f. 13, 14.

Melania spinifera C. B. Adams, Proc. Boston Soc. Nat. Hist., 1845, vol. ii., p. 17.

Bithinia spiralis Guppy, Ann. Mag. Nat. Hist., 1864, vol. xiv., p. 244; Proc. Sci. Assoc. Trinidad, vol. i., p. 34 (1866), as *Paludestrina*.

Amnicola candeana Guppy, Journ. of Conch., 1893, vol. vii., p. 224.

Hab.: Cuba (Pfr.); Cuba and Guadeloupe (d'Orb.); Venezuela (Martens); Jamaica (C. B. Adams); Trinidad (Guppy).

I cannot agree with Guppy in placing with this species d'Orbigny's *Paludina piscium*, *P. Parchappii*, and *P. australis*, or his *Paludestrina affinis*.

41.—*Ampullaria (Marisa) cornu-arietis* (Linn.).

It is doubtful whether the sub-generic division is worth retention; in any case, however, Fischer is wrong in giving preference to *Ceratodes* of Guilding, as that so-called genus was published four years after *Marisa* of Gray.* 1847, the date assigned by Fischer† to the latter, is incorrect. After comparison of a considerable series of specimens, I have failed to appreciate the specific distinctions assigned to *A. intermedia* Gray, *A. chiquitensis* d'Orbigny from Bolivia, and *A. Knorri* Philippi from Trinidad. It is possible that the slight difference referred to by Philippi may be sexual. The type of *Ampullaria* is *A. ampullacea* Linn., and not *A. urceus* as stated by Fischer.

42.—*Ampullaria urceus* (Müller).

The known distribution of this mollusc is far less extended than that of *Bulimus oblongus* as stated by Guppy.

43.—*Ampullaria (Pomus) glauca* (Linn.).

Ampullaria effusa Müll., Guppy, *op. cit.*, p. 226.

As Dillwyn, Deshayes, Philippi, Hanley, and others have many years ago shown that the above are synonymous, we are necessarily compelled to employ the older name *glauca*. The distribution and other synonyms of this species are given by the writer in the Proceedings of the Malacological Society, vol. i., p. 319.

44.—*Neocyclotus translucidus* (Sowerby).

Cyclotus translucidus Sow., Guppy, *op. cit.*, p. 226.

MM. Crosse and Fischer have shown that the genus *Cyclotus* (Guilding) Swainson is not referable to this and other allied forms from the West Indies, for which they proposed the new genus *Neocyclotus*.

*Phil. Mag. and Journ., vol. 63, p. 274, 1824.

†Man. de Conch., p. 737.

45.—*Neocyclotus grenadensis* (Shuttleworth).

Cyclotus grenadensis Smith, Proc. Mal. Soc., vol. i., p. 310, 319.

46.—*Diplommatina occidentalis* Godwin-Austen.

Diplommatina occidentalis Guppy, Ann. Mag. Nat. Hist., 1886
vol. xvii., p. 385 (name only).

D. Huttoni Pfr. var. *occidentale*, *Id.*, Proc. Sci. Assoc. Trinidad,
1872, p. 24 ; Journ. of Conch., 1893, vol. vii., p. 226.

D. Huttoni Pfr., *Id.*, Ann. Mag. Nat. Hist., 1867, vol. xx., p. 95.

D. Huttoni Pfr. var. *occidentalis* Crosse, Journ. de Conch., 1890,
p. 55.

D. Huttoni Pfr., Blanford, Ann. Mag. Nat. Hist., 1868, vol. i.,
p. 110.

D. occidentalis Godwin-Austen, Moll. India, p. 173, pl. xlv., f.
8, 8a, 8b.

The occurrence in Trinidad of a species of *Diplommatina*, which was identified the same as an Indian species, has given rise to considerable discussion as to whether it was not merely an introduction by human agency. Notwithstanding the (to my mind) conclusive proof given by Mr. Guppy* that this species is indigenous, he still appears to be in doubt, and out of respect to the opinions of M. Crosse and Mr. Blanford, considers it a "var. *occidentale*" of the Indian shell.

It is to be noticed that none of the writers quoted have offered any comparison between the shells of the two localities, but it was presumed to be identical solely upon the word of the late Dr. Pfeiffer.

As the types of *D. Huttoni* are in the Museum, and also a good series of the Trinidad shell, I am in a position to offer the following observations. On a careful comparison, I note certain differences, which, although individually small, in the aggregate appear to me sufficient to separate the two forms. I should, however, remark that, unfortunately, only three specimens of the Indian species are available.

*Ann. Mag. Nat. Hist., 1886, vol. xvii., p. 385.

In the first place, *D. occidentalis* is larger, has a stouter appearance; secondly, the riblets on the spire are further apart; thirdly, the penultimate whorl is not quite so gibbose; fourthly, the tooth on the columella is almost obsolete.

I would also point out that in the Indian species the costulations on the penultimate whorl are much closer together, that is, more numerous than on the rest of the volutions, whereas in *D. occidentale* they are, if anything, further apart. The columellar denticle is small but quite distinct in *D. Huttoni*, and the mouth is not quite so circular as in the Trinidad shell.

The dimensions given by Pfeiffer (Proc. Zool. Soc., 1852, p. 157) "Long. $2\frac{1}{2}$, diam. 1 mill.," are not quite accurate judging from the types. The length is exactly 2 mills. only, whereas the Trinidad species is about $2\frac{1}{3}$. Although this appears a very small difference, in conjunction with the greater width it makes *D. occidentale* appear a distinctly larger shell.*

47.—**Truncatella pulchella* Pfeiffer.

48.—**Truncatella bilabiata* Pfeiffer.

49.—**Truncatella subcylindrica* Gray.

50.—*Taheitia reclusa* (Guppy).

51.—*Cistula aripensis* (Guppy).

52.—*Helicina nemoralis* Guppy.

Perhaps sufficiently distinct from *H. columbiana* Philippi, with which it has been united by Bland (Ann. Lyc. Nat. Hist., N. York, vol. xi., p. 87). It differs in colour, and the body-whorl is a trifle more globose at the periphery. The opercula are identical.

*Since these remarks were penned, my attention has been called by Mr. Sykes to Godwin-Austen's account of the species of *Diplommatina* from the Western and Eastern Himalayas. In describing *D. Huttoni*, he has notified the differences between the Trinidad shell and that species, and has imposed upon the West Indian form the name *occidentalis*. He does not, however, regard it as indigenous, observing that "it remains to be discovered from what hill-district of India the Trinidad form has been conveyed." (Moll. India, p. 171).

53.—*Helicina Dysoni* Pfeiffer.

H. barbata Guppy, *op. cit.*, p. 228.

The late Mr. T. Bland* has already pointed out the identity of the above species ; but as Mr. Guppy† in his latest catalogue has failed to recognise this, I beg to confirm Mr. Bland's judgment. M. Crosse,‡ not having specimens for comparison, appears to have been in doubt upon this point.

54.—*Helicina (Pœnia) lirata* Pfeiffer.

H. lamellosa Guppy, *op. cit.*, p. 228.

The synonymy of this species has been fully worked out by Crosse and Fischer|| and Martens § Besides *H. unidentata* Pfr., and *H. rusticella* Morelet, I have no hesitation in uniting with the present form the *H. lamellata* of Guppy from Trinidad. The prominence on the basal margin of the peristome is only feebly indicated, but the strength of this is variable, being most developed in *H. unidentata*. The sub-genus *Perenna* of Guppy is synonymous with *Penia* H. and A. Ad.

55.—Helicina ignicomma* Guppy.**

Very near if not the same as *H. rugosa* Pfr.

56.—*Sphærium (Limosina) incurvum* (Guppy).

Cyclas incurva Guppy, *op. cit.*, p. 229.

Also Guadaloupe (Guppy).

57.—*Pisidium punctiferum* (Guppy).

Cyclas punctifera Guppy, *op. cit.*, p. 229.

Also Central America (Crosse).

58.—*Anodonta Leotaudi* (Guppy).

Anodon leotaudi Guppy, *op. cit.*, p. 229.

* Amer. Journ. Conch., vol. iv., p. 179.

† Journ. of Conch., vol. vii., p. 228.

‡ Journ. de Conch., 1890, p. 58.

|| Moll. Mexique, p. 397.

§ Biol. Central Amer. Moll., p. 41.

Autonoe riparia and *Stenogyra coronata* have been withdrawn from the fauna of Trinidad by Mr. Guppy, and his *Pupa auriformis* he considers a probable variety or "accidental form" of *P. uvulifera*. The *Autonoe* is said to be synonymous with *Auricula pellucens* of Menke, and the *Stenogyra* was founded upon a single example. Not having specimens of either of these or of the *Pupa*, I cannot offer any suggestions with regard to their identification.

Note on *Helix hortensis* near Dover.—On April 17th, I found *H. hortensis* well out and active in a shrubby chalk wayside bank near Dover, the day being warm and mild. They were mostly about three or four feet up the shrubs. Chief variations 00045, 00005, 10045, 10305, 0(23)(45), and 12045. Also *alba*, the presence of which in a locality seems to me to lead to variations with few bands; *H. cantiana* and *H. rufescens* the only other active shells. In another direction I found *H. nemoralis* swarming up the beech trees; *H. arborum* also active. These two had made two-thirds of their second year's shell already; *H. lapicida* also active. I found *H. terrestris* at home, but not as yet active, in its only British habitat. *H. aspersa*, *H. virgatâ*, and *H. caeperata* still hibernating.—J. W. HORSLEY, St. Peter's Rectory, Walworth. (Read before the Conchological Society, May 13th, 1896).

***Limax marginatus*-Müll. = *L. arborum* B.Ch. in Northamptonshire.**—On May 3rd, in Rockingham Park, I found several examples of the 'tree slug,' which is a new species to this county. Rockingham Park has only recently been thrown open to members of the Northants Natural History Society, and may yet yield other species.—LIONEL E. ADAMS, Northampton. (Read before the Conchological Society, May 13th, 1896).

***Helix fusca* and *Azeca tridens* in Denbighshire.**—In the early part of April, 1896, I paid a visit to the Cefn Caves in the carboniferous limestone of the Elwy Valley near St. Asaph. The time at my disposal for shell-collecting was limited to an hour, but, judging from the number of species obtained in that time, the hanging woods in the neighbourhood of the caves would well repay a thorough and systematic search. In addition to *Helix fusca* and *Azeca tridens*, of each of which I collected several examples, the following species, among others, were noted:—*Arion minimus*, *A. circumscriptus*, *Vitrina pellucida*, *Hyalinia glabra*, *H. pura*, and v. *nitidosa*, *H. crystallina*, *H. fulva*, *Helix rotundata* v. *pyramidalis*, *H. rupestris*, *H. pygmæa*, *H. aculeata*, *H. pulchella* v. *costata*, *H. arborum*, *H. granulata*, *Bulimus obscurus*, *Vertigo edentula*, *Clausilia laminata*, and *Carychium minimum*.—CHAS. OLDHAM, Romiley. (Read before the Conchological Society, May 13th, 1896).

- Modiola barbata** L.—Falmouth (W.H.) ; Mount's Bay (G.F.T.) ; Padstow (Enys) ; Scilly (R.W.J.S.).
- M. modiola** L.—Plymouth Sound, Par, Falmouth, Helford, St. Minver, Scilly.
- M. adriatica** Lmk.—Falmouth (Brown) ; Helford (R.N.D.) ; Mount's Bay (Penz. List) ; Hayle (Miss H.) ; Scilly (R.W.J.S.).
- Var. **ovalis** Sow.—Falmouth (G.F.T.) ; Scilly (R.W.J.S.).
- M. phaseolina** Phil.—West Cornwall and Scilly.
- Modiolaria costulata** Riss.—Falmouth, Helford, Penzance, Porthcurnow, Land's End, Hayle, Scilly.
- M. marmorata** Forbes.—Plymouth, Falmouth, Mount's Bay, Porthcurnow, Land's End, Hayle, Scilly.
- M. discors** L.—Falmouth, Mount's Bay, Porthcurnow, Wolf Rock, Scilly.
- Crenella (Rhomboidella) rhombea** Berk.—Mount's Bay (Penz. List) ; dredged 20 miles off Penzance (McAndrew) ; Land's End (W.H.) ; Scilly (R.W.J.S.).

ORDER PSEUDOLAMELLIBRANCHIATA.

- Avicula hirundo** L.—Found by trawlers off the Eddystone. Mr. Hockin records it as being taken off Falmouth (?)
- Pinna rudis** L.—Occurs in beds off the S. coast in moderately deep water, the upturned edges of the valves being destructive to trawl nets. Off Plymouth, Deadman, Lizard, Land's End, Hayle, and Scilly.
- Ostrea edulis** L.—Generally distributed. It is cultivated in the Tamar, Falmouth Harbour, and Helford River.
- Var. **parasitica** Turt.—Common (J.C.).
- Var. **deformis** Lmk.—Hayle (Miss H.) ; Par (J.T.M.).
- Pecten maximus** L.—Generally distributed.
- P. opercularis** L.—Generally distributed.
- Var. **lineata** DaC.—Plymouth Sound, Falmouth, Helford, Mount's Bay, Scilly.

- P. varius** L.—Generally distributed.
 Var. **purpurea** Jeff.—Falmouth (G.F.T.).
- P. incomparabilis** Risso. [*P. Testæ* Biv.].—Land's End and Nare Point (Helford ?) (W.H.).
- P. tigrinus** Müll. — Plymouth, Falmouth, Mount's Bay, Porthcurnow, Scilly.
 Var. **costata** Jeff.—Scilly (R.W.J.S.).
- P. striatus** Müll. — Plymouth (Jordan); Wolf Rock (Miss Carne) ; Scilly (J.G.J.).
- P. similis** Lask.—Plymouth Sound (J.M.B.A.); Falmouth (W.P.C.); Mount's Bay (McAndrew and Forbes); Wolf Rock (W.H.); Scilly (R.W.J.S.).
- P. pusio** L.—Generally distributed.
- P. sulcatus** Müll.—“ Mr. Hanley showed me a single valve, said to have been trawled near the Runnelstone [Wolf] Lighthouse off the Land's End.”—(J.G.J.—B.C. vol. v., p. 167).
- Lima (Radula) hians** Gmel.—Falmouth (J.C.); Mount's Bay (McAndrew & Forbes).
 Var. **tenera** Turt.—Falmouth (C.B.); Land's End (W.H.); Scilly (R.W.J.S.).
- L. subauriculata** Mont.—Plymouth Sound, Whitsand Bay E., Fowey, Falmouth, Mount's Bay, Porthcurnow, Scilly.
- L. Loscombii** G. B. Sow.—Plymouth, Falmouth, Mount's Bay, Porthcurnow, Land's End, Scilly.
- ORDER EULAMELLIBRANCHIATA.
 SUB-ORDER SUBMYTILACEA.
- Astarte sulcata** DaC.—Falmouth (J.C.); Helford (W.R.); Mount's Bay, trawl refuse (G.F.T.); Scilly (R.W.J.S.).
 Var. **paucicostata** Jeff.—Mount's Bay (Miss T.).
- A. Montagui** Dill. [*A. compressa* Mont.].—Falmouth (W.P.C.); Mount's Bay, a single valve (Miss T.).
- A. triangularis** Mont.—Whitsand Bay, E. (J.G.J.); Falmouth (Montagu); Mount's Bay (G.F.T.) Land's End (W.R.); Scilly (McAndrew).

- Cyprina islandica** L.—S.E. Cornwall (J.C.); Falmouth (R.N.D.); Mount's Bay (G.F.T.); Hayle (Miss H.); Scilly (R.W.J.S.).
- Isocardia cor** L.—Fowey (Peach); Falmouth (W.P.C. and others); the Manacles, Falmouth (W.R.).
- Lucina borealis** L.—Generally distributed.
- L. spinifera** Mont.—Plymouth Sound (J.M.B.A.); Falmouth, 30 fathoms (W.H.); Mount's Bay (G.F.T.); Scilly (C.B.).
- Loripes lacteus** L.—Falmouth (Montagu and others); Hayle (Miss H.); Scilly (R.W.J.S.).
- L. commutatus** Ph.—[*L. divaricatus* L.]—St. Mawes (J.G.J.); Falmouth (Montagu); Land's End (Turton); Hayle (Miss H.); Crow Sound, Scilly (R.W.J.S.).
- Axinus flexuosus** Mont.—Falmouth (Montagu); Helford (R.N.D.); Mount's Bay, very plentiful, with few exceptions, single valves (G.F.T.); Hayle (W.H.); Scilly, living specimens very rare (R.W.J.S.).
- Diplodonta rotundata** Mont.—Generally, but sparsely distributed.
- Montacuta substriata** Mont.—Penzance (W.H.); Mount's Bay (McAndrew & Forbes); Scilly, on spines of *Spatangus purpureus* (C. Jefferys).
- M. bidentata** Mont.—Falmouth, Mount's Bay, Porthcurnow, Land's End, Scilly.
- M. ferruginosa** Mont.—Mount's Bay (G.F.T.); Porthcurnow (Miss Carne); Hayle (Miss H.); Scilly (R.W.J.S.).
- M. Dawsoni** Jeff.—Scilly, a single specimen (C.B.).
- M. donacina** S. Wood.—A single valve at Falmouth in 1839 (J.G.J.).
- Turtonia minuta** Fabr. [*Cyamium m.*]—Whitsand Bay, E. (J.M.B.A.); Falmouth (J.G.J.); Mount's Bay (G.F.T.); Land's End (Truro Mus.); Scilly (Penz. Mus.).
- Kellia suborbicularis** Mont.—West Cornwall and Scilly.
 Var. **lactea** Bro.—Noted as Cornish by Mr. Williams Hockin.

- Lasæa rubra* Mont.—Generally distributed.
 Var. *pallida* Jeff.—Scilly (R.W.J.S.).
- Lepton squamosum* Mont.—Plymouth Sound (J.M.B.A.);
 Fowey (Alder); Helford (W.H.); Mount's Bay (G.F.T.);
 Scilly (Jenkinson).
- L. nitidum* Turt.—Falmouth (W.R.); Scilly (C.B.).
 Var. *convexa* Ald.—Falmouth (W.H.); Scilly (Jenkinson,
 C.B.).
- L. Sykesii* Chaster.—Dr. Chaster found this new species in
 sand dredged by me in Mount's Bay. He had previously
 found it in Guernsey dredgings, (Ann. Mag. Nat. Hist.,
 March, 1895).
- L. sulcatulum* Jeff.—Scilly, a dozen perfect specimens (C.B.).
- L. Clarkiæ* Cl.—Plymouth Sound (J.M.B.A.); Fowey
 (Barlee); Falmouth (W.H.); Scilly (C.B.).
- Galeomma Turtoni* Eds. Zool. Journ.—Mr. Stuart found a
 single valve at Menavawr, Scilly, and Mr. Burkill also found
 a single valve at Scilly.

SUB-ORDER *TELLINACEA*.

- Tellina crassa* Penn.—Generally distributed.
 Var. *albida* Jeff.—Falmouth (C.B.); Scilly (R.W.J.S.).
- T. balaustina* L.—Off Plymouth (J.M.B.A.); Falmouth
 (Mrs. Gulson and others); Scilly (C.B.).
- T. balthica* L.—Plymouth Sound, Par, Falmouth, Penzance,
 Hayle.
 Var. *minor* Jeff.—Helford (W.R.).
 Var. *nivea* Jeff.—Land's End (W.H.).
- T. tenuis* DaC.—Generally distributed.
- T. fabula* Gron.—Whitsand Bay, E. (J.M.B.A.); Falmouth
 (W.P.C.); Penzance (Miss T.); Hayle (W.H.); Scilly
 (R.W.J.S.).
- T. squalida* Pult.—Par (J.C.); Falmouth (W.P.C.); Helford
 (R.N.D.); Mount's Bay and Scilly (G.F.T.); Hayle (W.H.).

- T. donacina** L.—Falmouth (W.H.) ; Mount's Bay (G.F.T.) ; Porthcurnow (R.N.D.) ; Hayle (Miss H.) ; Scilly (Miss T.).
- T. pusilla** Phil. — Whitsand Bay E., Fowey, Falmouth, Helford, Mount's Bay, Porthcurnow, Land's End, Hayle, Scilly.
- Gastrana fragilis** L.—Falmouth (Miss Carne).
- Scrobicularia piperata** Gmel. — Looe, Par, Falmouth, Helford, Mount's Bay, Hayle, St. Minver, Scilly.
- Syndosmya** (*vel* **Abra**) **prismatica** Mont. — Whitsand Bay E., Falmouth, Mount's Bay, Hayle, Scilly.
- S. nitida** Müll.—Falmouth, Mount's Bay, Hayle, Scilly.
- S. alba** Wood. — Whitsand Bay E., Falmouth, Helford, Mount's Bay, Hayle, Harlyn Bay, Scilly.
- S. tenuis** Mont.—Mount's Bay, (Miss T.) ; Hayle (W.H.).
- Donax vittatus** DaC.—Par (J.C.) ; Falmouth (W.P.C.) ; Mount's Bay (R.N.D.) ; Hayle (G.F.T.) ; Padstow and St. Minver (R.V.T.).
- Var. **nitida** Jeff.—Hayle (Miss H.).
- D. (Capsella) politus** Poli.—Whitsand Bay E., Looe, Par, Falmouth, Mount's Bay, Helford, Porthcurnow, Hayle, Scilly.
- Ervilia castanea** Mont. [*Amphidesma c.*].—Whitsand Bay E., St. Austell Bay, Falmouth, Mount's Bay, Porthcurnow (especially plentiful), Land's End, Hayle, Scilly. Two perfect adult specimens at Scilly (C.B.).
- Macra solida** L.—Generally distributed.
- Var. **intermedia** Jeff.—Scilly (R.W.J.S.).
- Var. **truncata** Mont.—Plymouth Sound, Falmouth, Helford, Mount's Bay, Hayle, Scilly.
- Var. **elliptica** Bro.—Plymouth Sound, Falmouth, Mount's Bay, Porthcurnow, Land's End, Scilly.
- M. subtruncata** DaC.—Plymouth Sound, Par, Falmouth, Helford, Mount's Bay, Hayle, Padstow, St. Minver, Scilly.
- Var. **striata** Bro.—Helford (W.R.).

M. stultorum L.—Generally distributed.

Var. **cinerea** Mont.—Falmouth (W.P.C.); Hayle (Miss H.).

M. glauca Born.—Mounts Bay (?) (Penz. List); Land's End, fragments only (Lindsay); Hayle, single valves only (Miss H. and others).

Var. **luteola** Jeff.—Hayle (J.G.J.).

SUB-ORDER *VENERACEA*.

Circe (Gouldia) minima Mont.—Falmouth and Mount's Bay (G.F.T.); Wolf Rock (W.H.); Hayle (Miss H.); Scilly (R.W.J.S.).

Var. **triangularis** Mont.—Falmouth (Montagu and others).

Cytherea chione L.—Generally distributed.

Dosinia exoleta L. [*Venus e.*].—Generally distributed.

D. lupinus L. [*Venus lincta* Pult.].—Generally distributed, but less plentiful than *exoleta*.

Venus fasciata DaC.—Generally distributed.

Var. **radiata** Jeff.—Falmouth, Helford, Porthcurnow, Hayle, Scilly.

V. casina L.—Falmouth and Mount's Bay (G.F.T.); Porthgwarra (R.N.D.); Hayle (Miss H.); Scilly (R.W.J.S.).

V. verrucosa L.—Generally distributed.

V. ovata Penn.—Generally distributed. Common, chiefly from deep water, attached to byssus of the *Pinna* (J.C.). Mount's Bay, plentiful in trawl, and frequently found in stomachs of star-fish (G.F.T.).

V. gallina L.—Moderately common.

Lucinopsis undata Penn.—Whitsand Bay E., Falmouth, Helford, Mount's Bay, Wolf Rock, Hayle.

Var. **æqualis** Jeff.—Scilly (R.W.J.S.).

Tapes aureus Mühl.—Generally distributed. All four species of *Tapes* are especially common on the Bar at Falmouth, and at Helford.

Var. **ovata** Jeff.—Falmouth (J.G.J.).

- Var. *quadrata* Jeff.—Falmouth (W.H.); Hayle (Miss H.).
- T. virgineus** L.—Generally distributed.
- Var. *sarniensis* Turt.—St. Austell and Falmouth (J.C.); Scilly (R.W.J.S.).
- T. pullastra** Mont.—Plymouth Sound, Par, Falmouth, Helford, Mount's Bay, St. Minver, Scilly.
- Var. *perforans* Mont.—Plymouth Sound (J.M.B.A.); Par (R.V.T.); Falmouth and Penzance (C.B.); Helford (W.H.).
- T. decussatus** L.—Generally distributed.
- Venerupis irus** L.—Plymouth (J.M.B.A.); Falmouth (W.P.C.); Mousehole (Baily); Porthcurnow (Miss T.); Land's End (E.D.M.); Hayle and Harlyn Bay (R.V.T.).

SUB-ORDER *CARDIACEA*.

- Cardium aculeatum** L.—Plymouth Sound, Pentewan, Falmouth, Helford, Mount's Bay, Hayle.
- C. echinatum** L.—Generally distributed.
- C. tuberculatum** L.—Generally distributed.
- C. papillosum** Poli.—Falmouth Harbour, a fresh valve (J.T.M.); Helford (W.R.); Mount's Bay (G.F.T.); St. Ives (Dodd).
- C. exiguum** Gm.—Par, Falmouth, Mount's Bay, Hayle.
- C. fasciatum** Mont.—Falmouth, Mount's Bay, Porthcurnow (characteristic), Whitsand Bay, Hayle, Scilly.
- C. nodosum** Turt.—Fowey and Falmouth (Alder); Mount's Bay (G.F.T.); Wolf Rock (Miss Carne); Scilly (R.W.J.S.).
- Var. *rosea* Lmk.—Falmouth (W.H.).
- C. edule** L.—Generally distributed.
- Var. *crenulata* Lmk.—Mount's Bay (Miss H.); "a form approaching this variety" occurs at Scilly (R.W.J.S.).
- C. minimum** Phil.—Mr. Burkill dredged this shell at Scilly, and McAndrew obtained it 50 miles N.N.W. of Land's End, in 50 fathoms of water.
- Lævicardium norvegicum** Speng.—Generally distributed.
- Var. *gibba* Jeff.—Hayle (Miss T.).

Var. *rotunda* Jeff.—Helford (W.H.).

Var. *pallida* Jeff.—Helford (W.R.) ; Mount's Bay (G.F.T.) ; Hayle (Miss H.).

SUB-ORDER *MYACEA*.

Psammobia tellinella Lmk.—Plymouth Sound, S. Austell Bay, Falmouth, Mount's Bay, Land's End, Hayle, Scilly.

P. costulata Turt.—Goran, Falmouth, Mount's Bay, Porthcurnow, Hayle, Scilly.

P. ferroensis Chem.—Generally distributed.

P. vespertina Chem.—S.E. Cornwall, Falmouth, Mount's Bay, Land's End, Hayle, Scilly.

Mya truncata L.—Plymouth (J.M.B.A.) ; Falmouth and Mount's Bay (G.F.T.) ; Scilly (Jenkinson).

Sphænia Binghami Turt.—Falmouth (W.H.).

Lutraria elliptica Lmk.—Generally distributed.

L. oblonga Chem.—Par (R.V.T.) ; Falmouth (G.F.T.) ; Helford (Miss Carne) ; St. Minver (R.V.T.) ; Scilly (Jenkinson).

Corbula gibba Olivi.—Plymouth, Goran, Falmouth, Helford, Mount's Bay, Scilly.

Var. *rosea* Bro.—Nare Point (Helford ?) (W.H.).

Solecortus antiquatus Pult.—Plymouth Sound (J.M.B.A.) ; Looe (Montagu) ; Polperro (W.R.) ; Goran (Peach) ; Falmouth (J.G.J.) ; Mount's Bay (G.F.T.).

S. candidus Ren.—Falmouth (Hanley) ; Penzance (McAndrew & Forbes) ; Hayle (Hockin) ; Scilly (G.F.T., R.W.J.S.).

Var. *oblonga* Jeff.—Porthcurnow (Miss Lavars).

Pharus legumen L. [*Ceratisolen* L.] is doubtfully recorded for Falmouth and Scilly. As it is plentiful on one of the beaches of Bidford Bay, N. Devon, its occurrence on the Cornish coast is not improbable.

Solen marginatus Pult. [*S. vagina*, L.].—Falmouth, 30

- fathoms, and Helford (W.H.); Maenporth (R.N.D.); Mount's Bay (Penz. list); Hayle (R.N.D.).
- Ensis ensis** L. [*Solen e.*].—Whitsand Bay E., Mount's Bay, Falmouth, Helford, Padstow.
- E. siliqua** L.—Generally distributed.
- Siliqua pellucida** Penn.—S.E. Cornwall, Falmouth, Mount's Bay—abundant, Hayle, Scilly—numerous.
- Saxicava rugosa** L.—Plymouth, deep water off the Deadman, Mount's Bay, Falmouth, Helford, Porthcurnow, Scilly.
- Var. **arctica** L.—Plymouth, Falmouth, Mount's Bay, Porthcurnow, off Land's End, Scilly.
- Var. **præcisâ** Mont.—Common on rocks at low-water mark, attached to roots of coralline by the aid of a byssus (J.C.).
- Var. **cylindrica** S. Wood.—Land's End (J.T.M.).
- Gastrochæna dubia** Penn.—Taken from cavity of a stone from deep water (J.C.); Falmouth (W.H.); Penzance (Miss T.); Scilly, a single valve (R.W.J.S.).

SUB-ORDER PHOLADACEA.

- Pholas dactylus** L.—Plymouth (J.M.B.A.); near Fowey (J.C.); Falmouth (C.B.); Marazion (Millett); Penzance (E.D.M.); Hayle (Miss H.).
- P. (Barnea) candida** L.—Pridmouth (R.V.T.); Falmouth (W.H.); Mount's Bay (Miss T.).
- P. parva** Penn.—Plymouth (Bellamy); Pridmouth (J.C.); Falmouth (C.B.); Helford (W.H.); Penzance (E.D.M.).
- P. (Zirphæa) crispata** L.—Plymouth (Bellamy); Falmouth (W.P.C.); Hayle (W.H.).
- Pholadidea papyracea** Turt.—Plymouth (J.M.B.A.); Falmouth (W.H.); Hayle (Miss H.).
- Var. **aborta** Jeff.—Numerous in reddish sandstone from deep water (J.C.); Falmouth (C.B.).
- Xylophaga dorsalis** Turt.—Falmouth (Miss Vigurs); Lizard (Miss Carne); Scilly (R.W.J.S., C.B.).

Teredo norvegica Speng.—Plymouth (J.M.B.A.) ; Falmouth in timber of breakwater ; Maenporth, in drift-wood ; Penzance, in timber of jetty belonging to Trinity Board, Land's End (W.H.) ; Hayle (Miss H.).

T. navalis L., *T. megotara* Han., *T. malleolus* Turt., *T. bipinnata*, Turt., and *T. fimbriata* are all recorded for Cornwall, but I am not satisfied that any of them are indigenous.

SUB-ORDER ANATINACEA.

Pandora inæquivalvis var **obtusa** Jeff.—S.E. Cornwall (J.C.) ; Falmouth (W.H.) ; Mount's Bay, 20 fathoms (G.F.T.) ; Wolf Rock (Miss Carne) ; Scilly (R.W.J.S.).

Thracia prætenuis Pult.—Falmouth (Montagu) ; Mount's Bay (McAndrew & Forbes) ; Porthcurnow (Baily) ; Hayle (W.H.) ; Scilly (R.W.J.S.).

T. papyracea Poli.—Plymouth, Helford, Mount's Bay, Porthcurnow, Hayle, Scilly.

Var. **villosiuscula** Macg.—Helford (Miss Carne) ; Mount's Bay (G.F.T.) ; Wolf Rock and Porthcurnow (Miss Carne) ; Scilly (Jordan).

T. pubescens Pult.—Plymouth (J.M.B.A.) ; Falmouth (Montagu and others).

T. convexa W. Wood.—Plymouth (J.M.B.A.) ; Goran (Peach) ; Falmouth (W.H.) ; Helford (W.R.) ; Mount's Bay (Miss T.) ; Hayle (W.H.).

T. distorta Mønt.—Not uncommon in stones from deep water (J.C.) ; near Fowey (J.T.M.) ; Falmouth (Montagu) ; Mount's Bay (Miss Carne) ; Land's End (W.R.) ; Scilly (R.W.J.S.).

Var. **truncata** Turt.—Falmouth (J.G.J.).

Lyonsia norvegica Chem.—Plymouth (J.M.B.A.) ; Falmouth (W.H.) ; Mount's Bay (McAndrew and Forbes) ; Scilly (C.B.).

ORDER SEPTIBRANCHIATA.

Cuspidaria cuspidata Olivi.—Land's End (McAndrew).

BRACHIOPODA.

Argiope decollata Chem.—Dredged at Scilly by the late Clifford Burkill, about a mile-and-a-half N.E. of Menavawr Rocks, in 35 fathoms. He obtained three dead specimens and ten single valves.

A. cistellula S. Wood.—Dredged at Scilly by Mr. Burkill, single valves only.

ADDENDA.

Doris maculata Garstang.—This new species of nudibranch was first found in the western part of Plymouth Sound, in December, 1893, and has since been obtained there on several occasions. It has now been described and named by Mr. Garstang (J.M.B.A., Feb., 1896).

Tellina serrata Brocchi.—This Mediterranean species is recorded for Scilly by Mr. Marshall, and particulars will shortly be given in this journal.

Mytilus edulis var. *flava* Poli.—Not *flavus*; see p. 225.



The Mollusca of Plumstead Marshes.—My friend Mr. Poore and I have observed the following Molluscs in Plumstead Marshes. Can others add to the list?—*Arion ater*, *A. hortensis*, *Limax agrestis*, *L. marginatus*, *Vitrina pellucida*, *Hyalinia cellaria*, *H. fulva*, *Helix rotundata*, *H. pulchella*, *H. aspersa*, *H. nemoralis*, *H. hortensis*, *H. arbustorum*, *H. cantiana*, *H. rufescens*, *H. hispida*, *H. caperata*, *H. virgata*, *Clausilia laminata*, *C. bidentata*, *Cochlicopa lubrica*, *Cæcilioides acicula*, *Pupa cylindracea*, *Succinea putris*, *S. elegans*, *Segmentina nitida*, *Planorbis nautilus*, *P. spirorbis*, *P. vortex*, *P. corneus*, *P. contortus*, *P. umbilicatus*, *P. fontanus*, *Aplexa hypnorum*, *Physa fontinalis*, *Limnea peregra*, *L. palustris*, *L. truncatula*, *Bythinia tentaculata*, *B. Leachii*, *Valvata cristata*, *Sphærium corneum*, *Sph. lacustre*, *Hydrobia Jenkinsi*. I limit Plumstead Marshes by the Arsenal on the W., and the Croomes Outfall Works on the E. A little lower down *Hydrobia ventrosa* and other estuarine shells come in. On the land side, near but not in the marshes, *Helix lapicida*, *B. obscurus*, *Cl. Rolphii*, *Carychium minimum*, and *Cyclostoma elegans* are found.—
J. W. HORSLEY.

CONCHOLOGICAL SOCIETY
OF GREAT BRITAIN AND IRELAND.

PROCEEDINGS.

250th MEETING, JUNE 10th, 1896.

Held in the Manchester Museum, Owens College.

Mr. J. C. Melvill, President, in the chair.

Donations to the Library announced and thanks voted :

Science Gossip, Nos. 24 and 25, Feb. and June, 1896 ; Irish Naturalist, vol. 6, No. 6, May, 1896 ; The Naturalist, Nos. 250 and 251, May and June, 1896 ; Journal de Conchyliologie, vol. 42, No 3 ; Naturalists' Journal, No. 48, June ; La Feuille des Jeunes Naturalistes, Nos. 308 and 309 ; Devonia, part, 4, 1896 ; Proceedings Royal Society of Queensland, part 2, vol. xi. ; Proceedings Academy of Natural Science of Philadelphia, part 3, Oct.-Dec., 1895.

New Members elected :

Rev. Addison Crofton, M.A., Linton Court, Settle, Yorkshire.

Mr. Harry Simpson Wallace, Art Gallery, Newcastle-on-Tyne.

Exhibits :

Mr. C. Oldham exhibited *Helix nemoralis* v. *albo-labiata*, Deep Dale, Buxton, *Arion ater* v. *albo-lateralis*, *Limax maximus* v. *ferrussaci*, *Helix itala*, *Hyalinia nitida*, *Limnæa p̄regra* v. *maritima*, *Planorbis glaber*, *Pl. spirorbis* (with epiphragm), *Vertigo antiovertigo*, *V. substriata*, *V. pygmaea*, all from Abersoch, Carnarvonshire.

Mr. Lewis Shackleford exhibited a very fine series of *Voluta*, including *V. undulata*, *V. Angasi*, *V. pacifica* (very fine), *V. Güntheri* (the only one in England), *V. Kreuzeræ*, and *V. fulgetrum*.

Mr. J. C. Melvill exhibited *Voluta pulchra*, Australia ; *V. festiva* Australia ; *V. aulica*, Sooloo Archipelago ; *V. delessertiana*, West Indies ; *V. junonia*, Mexico.

The Manchester Museum showed seventy species of marine shells from Sydney, lately received from Mr. Arnold Henn, of Sydney, including *Drillia angasi*, *D. beraudiana*, *Mangilia jacksoniana*, *Cantharus australis*, *Mitra rhodia*, *Crosseia concinna*, *Scalaria jukesiana*, *Syrnola tincta*, *Olivella triticea*, *O. nympha*, *Neritula lucida*, *Nassa glans*, and many others.

Mr. E. Collier exhibited *K. (Chlorea) thersites* Pfr., Mindow ; *K. (Papunea) Tayloriana* Bby., New Guinea ; *K. (Papunea) Rollesiana* Sow., New Guinea ; *K. (Papunea) Louisadensis* Forbes, Torresados Islands ; *K. (Oblina) columbaria* Sow., Philippine Islands ; *K. (Mollendorffia) trisinuata* Maur., China.

251st MEETING, JULY 8th, 1896.

Held in the Manchester Museum, Owens College.

Mr. Thos. Rogers in the chair.

Donations to the Library announced and thanks voted :

Annals of Scottish Natural History, No. 19, July, 1896 ; Journal of Malacology, vol. 5, No. 2, June, 1896 ; Science Gossip, vol. 3, No. 26, July, 1896 ; The Naturalist, No. 252, July, 1896 ; Transactions and Annual Report, 1895, Manchester Microscopical Society ; Transactions of Academy of Science of St. Louis, vol. 6, No. 7 ; Annual Report, Geological Survey of Canada, vol. 6, 1892-3 ; Annual Report, Chicago Academy of Science, 1895 ; Bulletin, Chicago Academy of Science, vol. 2, No. 2 ; "Preliminary Outline of a new Classification of the family Muricidæ," by F. C. Baker ; Proceedings of the Royal Physical Society, 1894-5 ; Bihang till Kongl Svenska Vetenskaps Akademiens Handlingar, part 4 ; Jahreshft des Natur. Ver. des Trencsiner Comitates, 1894-5 ; Archivos do Museu Nacional do Rio de Janeiro, vol. 8 ; from the Smithsonian Institution, U.S. National Museum : "Classification and Geographical Distribution of the Pearly Freshwater Mussels," by C. T. Simpson—"Diagnosis of New Tertiary Fossils from the Southern United States," by W. H. Dall—"Diagnosis of New Species of Mollusks from the West Coast of America," by W. H. Dall—"Diagnosis of New Mollusks from the Survey of the Mexican Boundary," by W. H. Dall—"Description of four New Triassic Unios from the Haked Plains of Texas," by W. H. Dall ; from Mr. W. J. Webb, "The Museum," No. 7, vol. 2, Catalogue of W. J. Webb, 1896 ; "Yorkshire Carboniferous Flora," fifth report ; from the Authors, "Further Conchological Notes from the West of Ireland," by E. Collier and R. Standen.

Letter read:

The following letter to the Editor was read :—

"SISSINGHURST VICARAGE,

"CRANBROOK, KENT,

"DEAR SIR,—

"July 4th, 1896.

"I do not know whether it is possible so to do, but I should think I ought to have some opportunity (if you will kindly permit) of replying to the criticism of my paper in 'Devonia,' which has just appeared in the 'Journal of Conchology.'

"'In the present state of nomenclature,' the writer would appear to think, varieties ought to be inaugurated publicly and privately, without any compunction. Or is it possible that his sibylline sentence means that I am not acquainted with 'the present state of nomenclature' ?

"If I distinctly state in the immediate context that I do not desire anyone to add these to the number of existing synonyms, surely the person who does so is from my point of view 'incomprehensible.'

"The utility of such MS. names, or temporary varietal names, surely does not need elaborate proof. It would be well, in my

opinion, if a great many of the 'authorized' varietal names were submitted to wider scrutiny. It is strange, for example, that *roseolabiate* forms should rank as varieties, now that the term variety has practically come to mean 'sub-species'; strange, too, that there should be instances (as in *L. peregra*) of two or three 'varieties,' which are transitional forms only, and together make up but one sub-species.

"It is obviously a very good thing to have an 'authorized list,' as this Society has; but to set up the very best catalogue as an infallible guide to those who have and those who have not been concerned in its publication, appears to me slightly unreasonable, not to add unscientific. I am bound to make this slight protest, because I am convinced that the method of treating 'species and varieties' now in vogue is an entirely misleading one, and has merely grown up by custom, without reference to any philosophical considerations. The French system is only a little more absurd.

"Yours faithfully,

"E. W. W. BOWELL."

Paper read:

"A Snail Farm in Switzerland," by Mr. R. D. Darbishire.

Exhibits:

Mr. Moss exhibited several specimens of different sizes of the extremely rare *Paryphanta Hochstetteri*, also specimen of *Rhytida Greenwoodi*, all recently received by him from New Zealand.

Mr. R. Wigglesworth sent for exhibit subscalariform *Limnæa palustris* from Cricket Pit, Accrington, and *Valvata piscinalis* from Clayton-le-Moors.

On behalf of the Manchester Museum was exhibited a fine set of *Bartlettia stephanensis*, collected by Mr. Bartlett on the Upper Amazon and river Ucayali, Eastern Peru, and *Mülleria lobata*, from the river Magdalena, Bogota, New Granada, recently presented to the Museum.

Mr. J. Ray Hardy exhibited specimens of *Tridina nilotica*.

Mr. J. E. Cooper, of London, sent for exhibit *Cardium edule*, *Tellina balthica*, and *Scrobicularia tenuis* all in brackish ditches at Southwold, *Scrobicularia puperata* from river Blyth at Walberwisk, *Helix hortensis*, a clouded var. and *Planorbis spirorbis* from Blythsburgh, *Hyalinia nitidula*, *H. alliaria*, and *Helix hispida* from Southwold—all the above are from Suffolk East.

252nd MEETING, AUGUST 12th, 1896.

Held in the Manchester Museum, Owens College.

Mr. J. C. Melvill, President, in the chair.

Donations to the Library announced and thanks voted:

Science Gossip, vol. 3, No. 27, Aug., 1896; The Naturalist, No. 253, Aug., 1896; The Irish Naturalist, vol. 5, No. 8, Aug., 1896; La Feuille des Jeunes Naturalistes, No. 310, Aug., 1896; "New British Mollusca," by H. K. Jordan; "Label List of British Five-Banded Land Shells," by

J. T. Carrington; Memoirs and Proceedings of the Manchester Literary and Philosophical Society, vol. 10, 4th series; Proceedings of the Academy of Natural Science of Philadelphia, part 1, 1896.

Resignation of Member :

Mr. Tom Petch, B.A., Hedon near Hull.

Papers read :

"*Helix pomatia* (L.) not extinct in Northamptonshire," by C. E. Wright.

"*Amalia gagates* (Drap.) in Northamptonshire," by L. E. Adams, B.A.

"*Spirialis retroversus* in Killala Bay," by Miss Amy Warren.

Exhibits :

Mr. J. C. Melvill exhibited a specimen of *Orthalicus bowisianus* (Petit), also another recently described as *O. approximata*, both from the Andes of Peru, altitude 8,000 feet. Mr. Melvill also exhibited extremely fine specimens of *Natica (Lematia) Lewisi*.

Mr. R. Standen exhibited *Spirialis retroversus* and *Lepton Sykesii* from Killala Bay; *Adeorbis imperspicuus* and *Eulima incurva* from Plymouth; *Trochus occidentalis* from Aberdeen; *Cima cylindrica* and *Eulima microstoma* from Delos, Ægean Sea; *Scalaria Cantrainei* from Bay of Eleusis; series of *Onula patula* and *Scalaria clathratula* showing embryonal stages; *Hyalinia crystallina* from Merionethshire; and live *Vertigo angustior* from Killanley Marsh, county Sligo—all from Dr. Chaster's collection.

253rd (or ANNUAL) MEETING, SATURDAY, SEPTEMBER 19th, 1896,

Held at the Manchester Museum, Owens College. At 4 p.m. there was an exhibition of specimens by members:—

Exhibits :

By Mr. J. C. Melvill:—A selection of describers' "types" and other rare shells, many unique, including *Voluta Prevostiana*, *V. aulica*, *V. junonia*, *V. festiva*, *V. piperita*, *V. pulchra*; *Conus cedo-nulli*, *C. Bockii*, *C. Brazieri*, *C. malaccanus*, *C. sindon*, *C. gracilis*, *C. omaicus*, *C. euetrois*, *C. cervus*, *C. Du Saveli*, *C. catenatus*, *C. racemosus*, *C. gloria-maris*; *Mitra gigantea*, *M. Belcheri*, *M. Rossia*; *Harpa imperialis*; *Cerithium nobile*; *Cypræa guttata*; *Rostellaria Powisi*, *R. Martini*; *Corbis Sowerbyi*; and *Pholadomya candida*.

By Mr. A. G. Stubbs:—A fine collection of the land shells of Tenby district, showing especially handsome variation in *Helix pisana*, *H. virgata*, *H. caperata*, and *H. rufescens*.

Mr. L. Shackelford exhibited a fine series of *Volutes* collected by him in South Australia and New Zealand, including particularly large and beautiful *V. fulgetrum* and *V. pacifica*, and examples of two extremely rare species—*V. Kreisleræ* and *V. Güntheri*.

Mr. W. Moss exhibited eggs, and series of shells from newly hatched young to the fully adult, of *Paryphanta Hochstetteri*; *Paryphanta Busbyi*; and a fine series of other land shells from New Zealand.

Mr. K. H. Jones exhibited a fine series of British land and freshwater shells, including a remarkably thin form of *Helix nemoralis* from Denbighshire; *H. hortensis* var. *minor*, and scalariform *H. caperata* from Bassen-thwaite; and three drawers of Unionidæ, chiefly illustrating the variation in size and shape of *Anodonta cygnea*, from a pond at Middlewood, Cheshire, where it lives in company with *Unio pictorum* var. *grandis* (Braun)—50 per cent of which have salmon-coloured nacre.

Mr. R. D. Darbshire exhibited a collection of marine shells from China Seas, containing many rare and beautiful species.

Mr. T. Edwards exhibited *Buccinum undatum* vars. *carinatum* and *sinistrorsum*; *Fusus antiquus* vars. *sinistrorsum* and *scalariforme* from Margate; *Helix nemoralis* with double lip, *H. ericetorum* monst. *scalariforme* and *Planorbis carinatus* monst. *scalariforme* from Leicester; and other shells.

Mr. L. E. Adams exhibited a remarkable form of *Helix aspersa*: animal a true albino—white with pink eyes—shell unusually dark, from Northampton.

Mr. R. Standen exhibited a collection of British and exotic Scalaridæ, illustrating Tryon's classification.

Mr. T. Rogers exhibited new species of Achatinellæ, recently figured and described in the Proceedings of the Academy of Natural Sciences of Philadelphia, by D. D. Baldwin.

The Manchester Museum exhibited a number of drawers containing selections from various groups of the collection: *Conus*, *Cypræa*, *Voluta*, *Mitra*, *Pleurotoma*, *Achatinellæ*, *Tellina*, *Neritina*, *Cyclostoma*, etc., and a fine series of *Miilleria lobata* from River Magdalena, Bogota, and *Bartlettia stefanensis* from Upper Amazons, Peru. The general Museum collection displayed in the table cases, was also open to the inspection of the members.

The "Charles Oldham Collection," containing a complete set of British Land and Freshwater Mollusca from many localities was also exhibited.

At 5 p.m. the members partook of tea in the College Refectory.

At 6 p.m. the Annual Meeting was held in the Zoological Laboratory, Owens College.

Mr. J. Cosmo Melvill, President, took the chair, and the following were present:—Messrs. R. D. Darbshire, W. E. Hoyle, E. R. Sykes, T. Rogers, Hy. Coates, W. H. Heathcote, R. Wigglesworth, J. R. B. Masefield, R. Cairns, W. Moss, J. R. Hardy, P. B. Mason, Rev. H. G. Barnacle, Hy. Hill, E. C. Stump, L. Shackelford, C. Oldham, A. Leicester, W. Burgess, R. Standen, G. Renshaw, K. H. Jones, and several visitors.

The minutes of the previous meeting were read and approved.

Appointment of Scrutineers.

Messrs. W. H. Heathcote and A. Leicester were appointed scrutineers.

Annual Report.

The Annual Report of the Council and the Treasurer's Balance Sheet were read, and on the motion of the Rev. H. G. Barnacle, adopted.

Election of Office Bearers.

The Scrutineers reported that forty voting papers had been sent in, of which seven were invalid and of which thirty-two voted for the list as nominated by the Council. The list as given below was declared to be carried:—

For PRESIDENT :

Prof. SYDNEY J. HICKSON, D.Sc., M.A., F.R.S

For VICE-PRESIDENTS :

Mr. R. D. DARBISHIRE, B.A. ;

Mr. J. COSMO MELVILL, M.A., F.L.S. ;

Rev. CANON A. M. NORMAN, D.C.L., F.R.S. ;

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

For HON. TREASURER :

Mr. LIONEL E. ADAMS, B.A.

For HON. SECRETARY :

Mr. W. E. HOYLE, M.A., F.R.S.E.

For HON. RECORDER :

Mr. THOMAS ROGERS.

For HON. CURATOR :

Mr. ROBERT STANDEN.

For HON. LIBRARIAN :

Mr. CHARLES OLDHAM.

For the COUNCIL :

Mr. ROBERT CAIRNS ;

Mr. EDWARD COLLIER ;

Mr. JOHN R. B. MASEFIELD, M.A.

Mr. WILLIAM MOSS, F.C.A. ;

Mr. J. T. MARSHALL ;

Mr. P. B. MASON, J.P., M.R.C.S., F.L.S.

On the motion of the Council it was resolved :—

(1) "That Rule 4 be amended by the omission of all words after the word 'guineas.'"

(2) "That Rule 6 be omitted altogether."

The Presidential Address

was then delivered by the retiring President, Mr. J. Cosmo Melvill, on "The Principles of Nomenclature and their application to the Genera of Recent Mollusca."

A vote of thanks to the President for his services during the year and for his address was proposed by Mr. Henry Coates, seconded by Mr. Alfred Leicester, and carried unanimously. The meeting then adjourned.

LONDON BRANCH.

MEETING, MAY 29th, 1896.

Held at 93, Southwood Lane, Highgate, N. The evening was spent in examining part of the Hon. Sec.'s collection.

MEETING, JUNE 26th, 1896.

Held at St. Peter's Rectory, Walworth, by kind invitation of Rev. J. W. Horsley. Mr. Horsley exhibited and distributed living examples of *Helix pomatia*, *H. sylvatica*, *H. obvoluta*, *H. incarnata*, *H. personata*, *H. villosa*, *Buliminus montanus*, and some *Clausiliae* from Switzerland, also a large number of shells (chiefly marine) from Queensland, collected by his brother-in-law the Bishop of Rockhampton. It was decided to hold a field meeting in July.

J. E. COOPER, *Hon. Sec.*

ANNUAL REPORT FOR 1895-96.

YOUR Council in presenting this, the first Annual Report since the headquarters of your Society were removed from Leeds to Manchester, are pleased to report a year of considerable progress. This report covers a period of sixteen months, as our Annual Meeting is held much later this year than last.

Since the removal to Manchester, our membership has increased very materially. We have elected 46 new ordinary members, whilst 5 have resigned. We have, however, crossed off from our books a large number of members who were in some cases several years in arrear with their subscriptions.

We have at the present time 232 members, including 10 honorary life members, and 222 ordinary members, of whom 6 are resident abroad.

Fourteen meetings have been held since the last annual one, all of them in Manchester, and the attendance has been satisfactory. Many interesting exhibits have been brought or sent by the members, and discussions have often followed in various departments of conchology.

The following papers and notes have been read :—

- L. St. G. Byne—"The Marine Mollusca of Teignmouth Bay : Additions."
- C. Oldham—"Limax cinereo-niger in Cheshire."
- C. Oldham—"Agriolimax agrestis var. albida of Picard in Cheshire."
- R. Bullen Newton—"On the occurrence of *Alectryonia unguolata* in South-east Africa, with a notice of previous researches in the Cretaceous Conchology of Southern Africa."
- W. J. Farrer—"Notes on the Land and Freshwater Mollusca of the English Lake District."

- G. W. Chaster—"On the variation of *Stilifer Turtonæ* Brod."
- L. E. Adams—" *Helix lapicida* var. *albina* in Kent."
- L. E. Adams—" *Littorina rudis* var. *tenebrosa*."
- R. Wigglesworth—"Notes on *Limnæa auricularia*."
- H. Crowther—"Protective resemblance of Shell of *Helix cantiana* Mont. to its surroundings."
- H. Crowther—"Mucous Tracks of *Limnæa stagnalis*."
- J. E. Cooper—"Some Mollusca from Aldeburgh, Suffolk."
- L. E. Adams—"Interesting Kentish Shells."
- L. E. Adams—" *Physa acuta* at Ostend."
- L. St. G. Byne—" *Cardium aculeatum* in Teignmouth Bay."
- Rev. S. Spencer Pearce—"On the Banding of *Helix nemoralis* L. and *Helix hortensis* Müller."
- A. Hartley—" *Helix nemoralis* and *Helix virgata* without food for fourteen months."
- Edward Collier and Robert Standen—"Further Conchological Notes from the West of Ireland."
- C. Oldham—"On the Habits of *Vertigo edentula*."
- G. F. Tregelles—"On the Marine Mollusca of Cornwall."
- Edgar A. Smith—"A List of the Land and Freshwater Mollusca of Trinidad."
- C. Oldham—"Notes on some Anglesea Land and Freshwater Mollusca."
- L. E. Adams—" *Helix fusca* Mont., *Helix granulata* Alder, *Helix lapicida* var. *albina* Menke, and *Clausilia Rolphii* Gray in Northamptonshire."
- F. W. Wotton—" *Helix hortensis* var. *nebulosa*."
- J. T. Marshall—"Additions to 'British Conchology.'"
- L. Shackleford—"Notes on Boring of Mollusca by Carnivorous Gastropods."
- J. T. Marshall—"Note on *Tellina serrata* Brocchi."
- Rev. J. W. Horsley—"Notes on *Helix Lucasi* and *Helix hortensis*."
- C. Oldham—" *Helix fusca* and *Azeca tridens* in Denbighshire."
- L. E. Adams—" *Limax maximus* L. var. *alba* nov. in Northamptonshire."
- L. E. Adams—" *Limax marginatus* Müll. in Northamptonshire."
- R. D. Darbshire—"A Snail Farm in Switzerland."
- C. E. Wright—" *Helix pomatia* L. not extinct in Northamptonshire."
- L. E. Adams—" *Amalia gagates* Drap. in Northamptonshire."
- Miss Amy Warren—" *Spirialis retroversus* in Killala Bay."

Most of these papers have been or shortly will be published in the Journal of Conchology.

Five numbers of the Journal have been issued since the last report, under the editorship of Mr. W. E. Hoyle.

The Society's Collections have been removed from Leeds, and are now deposited in the Manchester Museum, Owens College. They are available for reference, but the Curator has not yet had time to rearrange the whole systematically.

Several donations have been made to the Society's Collections during the year, including marine shells from Viareggio, Italy, from Mrs. Fitzgerald of Folkestone; from Mr. J. E. Cooper, a collection of shells illustrating his paper on the shells of Aldeburgh, Suffolk; from Mr. Chas. Oldham, the whole of the shells collected by him in Anglesea, and exhibited in illustration of his paper.

During the past year the Library has been transferred from Leeds to Manchester, and (by permission of the Museum Committee) has been placed in a special case in a room in the upper gallery of the Manchester Museum in close proximity to the collections.

The number of accessions has been 107; most of these are periodicals and publications of academies, received in exchange for the journal, but a few are independent works which are worthy of special mention:—

ADAMS—"The Collector's Manual of British Land and Freshwater Shells," ed. 2, 1896 (*from the author*).

BERGH—"Beiträge zur Kenntniss der Strombiden" (*from the author*).

JENYNS—"Monograph of the British species of *Cyclas* and *Pisidium*" (*from Mr. Kenneth McKean*).

KIENER—"Monographies des genres *Purpura*, *Harpa*, *Voluta*, *Strombus*, *Pteroceras*," 2 vols. (*from Mr. R. D. Darbishire*).

Considerable progress has been made with the preparation of a slip catalogue of the Library. From the beginning of 1896 onwards this work will be reduced to a minimum owing to the establishment of the Institute of Zoological Bibliography by Dr. Field at Zürich. For the small subscription of twelve shillings per annum the Society will receive a card catalogue of the whole of the works, reviews, and papers published on the mollusca in the course of the year. These will serve not only as a catalogue of the Society's own Library, but also as an index to the literature of Malacology. It is intended to mark with a rubber stamp those titles which are in the Society's Library, and to mark the others with some indication of what libraries in Manchester, if any, contain them. A catalogue of the works previously in the Library will be made on cards of the same size, so that the whole can be arranged in a single series, either alphabetically according to authors or in classes. It is hoped that the whole of this work may be completed before the end of next year.

Hon. Treasurer's Report for 1895.

It is satisfactory to be able to report that in spite of unusual expenses, necessarily incurred by the change of head-quarters from Leeds to Manchester, the large number of new members will speedily improve the financial position of the society. The arrears, however (amounting to nearly £30) will probably have to be regarded as a bad debt; and the liabilities of the society include a payment of £10 per annum for three years to Mr. Taylor for the back numbers of the journal.

BALANCE SHEET.

GENERAL FUND.

RECEIPTS.	£ s. d.	PAYMENTS.	£ s. d.
Balance from 1894 ...	2 19 5	Cost of Journals (vii. 12, viii. 1, viii. 2)	24 4 6
Subscriptions received in 1895	42 17 6	Secretary's Expenses ...	8 7 11
Sale of Journals, &c. ...	9 5 7½	Treasurer's do. ...	1 18 3
Advertisements	4 4 6	Rent of Room at Leeds and Porter's Gratuity	1 6 0
		Subscription to Y.N.U.	0 5 6
		Stationery	4 16 1
		Books Bought	0 10 6
		Editor's Expenses ...	2 0 6½
		Carriage of Cabinets and Travelling Expenses	2 1 2
		In hand... ..	13 16 7
	<hr/> <u>£59 7 0½</u>		<hr/> <u>£59 7 0½</u>

CABINET FUND.

RECEIPTS.	£ s. d.	PAYMENTS.	£ s. d.
Balance from 1894 ...	0 13 3½	Expenses nil	0 0 0
Donation in 1895	0 5 0	In hand	0 18 3½
	<hr/> <u>£0 18 3½</u>		<hr/> <u>£0 18 3½</u>

LIONEL E. ADAMS,

*Hon. Treasurer.*Examined and found correct, *May 6th, 1896.*

ROBERT CAIRNS.

E. C. STUMP.

REPORT OF THE LONDON BRANCH FOR 1896.

During the past year there have been seven meetings of the branch. The first was held at the Borough Road Polytechnic, the next five at various members' houses, and in July we had a field meeting on Plumstead Marshes. Considering that there are about 36 members of the Conchological Society in London and its suburbs the attendance at all the meetings was decidedly small, this no doubt was partly owing to the great distance apart that many members live; however it is hoped that more interest will be shown in future meetings. The subscription is only 1/- per annum—to cover postage of notices, &c.

J. E. COOPER, *Hon. Sec.*

J.C., viii., Oct. 1896.

NOTES ON A COLLECTION OF SHELLS
FROM LIFU AND UVEA, LOYALTY ISLANDS,
FORMED BY
THE REV. JAMES AND MRS. HADFIELD,
WITH LIST OF SPECIES.

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PART II.
—

BY JAMES COSMO MELVILL, M.A., F.L.S., AND
ROBERT STANDEN.

(Read before the Conchological Society, October 14th, 1896).
—

Murex (Ocinebra) brachys sp. nov. (Pl. IX., fig. 1).

M. testa minuta, ovata, solida, pallidè ochracea, anfractibus sex, corrugatis, supernis spiraliter unangulatis, nodulosis, ultimo anfractu undecim varicoso-costatis, costis fimbriatis, apud basim paululum producto, apertura ovata, labro extus scruposo, intus quadri-denticulato, columella recta.

Long., 6, Lat., 3 mill.

A small, obscure species, six whorled, the upper whorls (excluding the apical) being strongly once angled with prominent nodules, the last whorl with eleven rib-like varices, which are somewhat fimbriate; at the base the canal is a little produced, the aperture is oval, outer lip rough without, within four-denticled, columella straight. Only one specimen. ($\beta\rho\acute{\alpha}\chi\upsilon\varsigma$, short).

Nassa (Niotha) rotunda sp. nov. (Pl. IX., fig. 2).

N. testa ovato-globulari, subcompressa, pallidè ochracea, ad apicem attenuata, anfractibus sex, duobus apicalibus, lævibus, cæteris longitudinaliter arcte recti-costatis, costis nodulosis, spiraliter liratis, apud suturas vitta ochracea spiraliter decoratis, et impressis, ultimo anfractu ad basim compresso, apertura rotunda, labro incrassato, intus denticulato, canali brevissimo, calloso-incrassato, ad basim extremam fulvo-ochraceo suffuso.

Long., 6, Lat. 3 mill.

A small, very compact globular species, attenuate, however, towards the apex, the remaining whorls, which are compressed at the sutures, being very closely papillose with regular longitudinal papillary ribs, spirally crossed with liræ, the canal is very short, callous at the base and stained dorsally with darker ochre-brown, mouth round, outer lip denticled within with teeth that extend as striæ some way into the aperture. Five specimens.

Nassa (Telasco) Shackelfordi sp. nov. (Pl. IX., fig. 3).

N. testa ovata, lævissima, candida, polita, anfractibus septem, paululum tumidulis, perlævibus, nitidis, ad suturas indistinctè ochraceo-maculatis, ultimo dorsaliter ad basim sub lente transversim striatulo, et notis clathratis immersis ferè celatis, decorato, clathris sub lævissima superficie infra suturas et iterum ad basim calcareis, interstitiis gradatis, ochraceis, apertura ovata, labro extus paululum incrassato, intus decem denticulato, et continuo-striato, dente vel plica suturali, margine columellari ad basim bidenticulato, peristomate vix calloso, canali brevi.

Long., 13, *Lat.* 5 mill., *sp. maj.*

A polished white shell, usually seven whorled, most of the many specimens are, however, somewhat worn or broken at the apex, the aperture is ovate, peristome hardly callous, outer lip thickened and much denticulate within, the denticles extending in the form of striæ far into the mouth. There is a sutural tooth, and the columella is twice denticled towards the base, the canal being short. Occasionally pale ochraceous transverse spots exist round the sutures, and, dorsally, upon the last whorl a beautiful latticed pattern is with a lens observable in the smooth substance of the polished shell, this pattern being absent in the middle of the whorl.

We have great satisfaction in uniting with this species the name of the Rev. Lewis Shackelford, who has rendered us great assistance in many ways.

N. (Telasco) ecstilba sp. nov. (Pl. IX., fig. 4).

N. testa ovato-fusiforimi, concinna, candida, nitida, ferè lævi, anfractibus septem, duobus apicalibus, cæteris subturritis,

paullum ventricosus, longitudinaliter paucicostatis, costis lævibus, interstitiis sub lente spiraliter indistincte striatis, interdum lævissimis, in hac specimine inter medium suturasque anfractuum zona indistincta spirali succingente, in illa absente, in omnibus infrá suturam anfractus ultimi ochraceo-maculato, tæniæque ochracea apud medium accincta, simul ac ad basim extremam, apertura rotunda, labro incrassato, dorsaliter ochraceo-bimaculato, intus denticulato, columellari margine callosa, abbreviata, canali brevi.

Long., 10, *Lat.*, 5 mill.

Several specimens of a neat, white, shining *Nassa*, not unlike the *N. Cuvieri* Payr. from the Mediterranean, and possibly identical with *N. casta* Gould, an authentic specimen of which we cannot find represented in our museums. The whorls are seven, few ribbed, longitudinally and indistinctly spirally striate, but the shell gives the impression of much brightness, whiteness, and smoothness. The outer lip is denticulate within, thickened without, and with two brown blotches dorsally. The columellar margin is callous, white, shining. In some specimens a thin brown line is seen above the sutures, in others it is absent, but all have a brown ochre blotch just below the suture of the last whorl, about the centre of the back of the shell. (ἐκστίλβος shining).

Columbella (Seminella) Pacei sp. nov. (Pl. IX, fig. 5).

C. testa parva, compacta, albida, anfractibus sex, arcuè longitudinaliter costulatis, costis spiraliter clathrato-liratis, antepenultimo anfractu suprâ, juxta suturas, simul ac penultimo spiraliter et regulariter squarrosè-maculatis, maculis latè flavo-ochraceis, ultimo anfractu apud medium simili modo flavo-ochraceo maculato, in pluribus speciminibus dorsaliter fulvo-suffuso, usque ad basim, apertura augusta, labro incrassato, intus lævi, columella planata.

Long. 4, *Lat.* 1.75 mill.

Minute, yet particularly beautiful. Whorls six, compact, clathrate, with close longitudinal riblets and revolving liræ. Just underneath the sutures the ante-penultimate and penultimate

whorls are sparsely spotted with fulvous; in the last whorl the spots again occur towards the middle, but are contiguous to, and below joined with, one large dorsal effusion of the same colour. The mouth is narrow, lip thickened, simple. Several specimens. To Mr. S. Pace our thanks are due, he having given advice concerning the Columbelloidæ of this collection, and as a very slight return we would venture to associate his name with not the least elegant of that genus to which he is devoting so much laborious study.

Columbella (Mitrella) sigaloessa sp. nov. (Pl. IX, fig. 6).

C. testa ovata, perlævi, nitida, latè pallidè ochracea, anfractibus sex, ad suturas paululum impressis, lævissimis, transversim infra, juxta suturas, albizonatis, zona fulvo-brunnea sequente, et altera simili supra suturas, ultimo anfractu ad peripheriam latè rufo-zonata, et, infra, duabus similibus zonis accinctis, apertura angulatim ovata, labro extus paululum incrassato, intus multidenticulato, columella puniceo-tincta.

Long., 9, *Lat.*, 5.50 mill.

A smooth polished shell, prettily transversely banded with white and rufous, the body colour being very pale ochreous. Whorls six, slightly impressed at the sutures, and entirely smooth. Mouth effuse ovate, outer lip much denticulate within, columella stained with rose. Two specimens, one not so strongly banded.

Near *C. semi-convexa* Lamk. from Australia and *C. gausapata* Gould, this latter being a Central American shell. (σιγαλόεις, smooth, shining).

Scalaria eranna sp. nov. (Pl. IX., fig. 7).

S. testa perforata, fusiformi, sub-turrita, sordidè albida, anfractibus septem, apicalibus duobus vitreis, cæteris compressulis, arcuè lamellatis, lamellis bi- vel tri-crenatulis, undulatis, interstitiis lævibus, apertura ovato-rotunda, peristomate incrassato, extus undulato-rugoso, basim ad columellarem paululum extenso.

Long., 4.50, *Lat.*, 1.50 mill.

A highly interesting little shell. It is narrowly umbilicate, fusiform, roundly turreted, dirty white, seven whorled, two being apical and glassy, the rest somewhat compressed, closely variced, the lamellæ twice or thrice crenulate or undulose, the spaces between are smooth, the aperture roundly oval, the lip is thickened, without wavy-wrinkled, and towards the columellar base it is slightly produced. Seeming from the figure to be near *S. soluta* Ad. One specimen, but quite full-grown. (ἔρανος, lovely.)

S. exomila sp. nov. (Pl. IX., fig. 8).

S. testa imperforata, parva, gradato-fusiformi, turrata, albida, versus apicem attenuata, anfractibus sex, undique arcuè lamellatis, lamellis crassis, albis, interstitiis sub lente transversim striatulis, apertura rotunda, peristomate lævi, crassiusculo, continuo.

Long., 4, *Lat.*, 1·50 mill.

A minute, but full-grown species, with distinctive characters, the whorls are turreted, attenuate towards the apex, contracted at the sutures. The lamellæ are thick, dirty white, slightly angled below the sutures, and very finely striate at the interstices. Mouth round, peristome thickened, smooth and continuous. (ἑξόμλος, a stranger).

Drillia ione sp. nov. (Pl. IX., fig. 9).

D. testa incrassata, fusiformi, pallidè violacea, apud basim paululum expansa, anfractibus septem vel octo, ventricosulis, apud suturas impressis, longitudinaliter crassicostatis, costis paucis, spiraliter undique tenuissimè liratis, interdum dorsaliter brunneo suffusis, interstitiis sub lente mire decussatulis, apertura lata, ovali, labro exteriorè incrassato, transversim striatulo simul ac in anfractibus, canali brevè, lato, margine columellari simplice.

Long., 5, *Lat.*, 3 mill.

A chaste pale violet species, with occasional brown dorsal shading, small, of thickened fusiform build, longitudinally thickly costate, the costæ few in number. Sometimes, indeed, the ground colour is pale-brown or ochre, while other specimens

are pure white. Whorls seven or eight, slightly ventricose, uniformly spirally lirated, the interstices when viewed with a lens being beautifully decussate. Mouth wide, outer lip thickened, transversely striate, as are the whorls, columellar margin simple, canal short, wide. About ten or twelve specimens. (*Ione* from ïov a violet).

Drillia themeropsis sp. nov. (Pl. IX., fig. 10).

D. testa fusiformi, solida, percrassa, anfractibus septem (quorum apicalibus duobus), ventricosis, ad suturas crenulato-impresis, longitudinaliter crassi-costatis, ultimo anfractu costis ad medium et infra evanidis, undique transversim tenuissimè-striolatis, interstitiis lævibus, in uno specimine colore livido-cinereo, in altero læte ochraceo, ultimo anfractu spiraliter albo-cinereo cingulo vittato, interdum penultimo simili modo decorato, et apud basim hic illic albiparso, apertura ovata, labro exteriori multum incrassato, sinu perobscuro, columella simplice.

Long., 5, Lat., 2 mill.

In marking, this small species is a little like the well-known *D. vidua* Reeve, in comparison to which it stands a veritable pigmy. Two forms have been seen by us, differing in colour as follows:—In what would be considered the type, an ashy brown is the prevailing hue, filletted round the whorls transversely with bluish white; in the other, a handsomer variety, a warm ochre with flecking and median brown linear banding round the three last whorls, which are seven in number altogether. Form oblong, very solid, obtusely ribbed with fine spiral striolations, outer lip extremely thickened, inner simple. (*θεμέρωπις*, grave, sedate, from the sombre appearance).

D. xanthoporphyria sp. nov. (Pl. IX., fig. 11).

D. testa fusiformi, solidiuscula, parum nitente, anfractibus octo, quorum duobus apicalibus, brunneis, lævibus, cæteris pallidè violaceis, apud medium flavida zona accinctis, ventricosis, apud suturas crenulatis, longitudinaliter crassicostatis, costis obtusis, et spiraliter arctè filostriatis, apertura ovata, peristomate percrasso brunneo-strigato, sinu obscurissimo.

Long., 6, Lat., 5 mill.

One of the gems of the collection. Solid, in form fusiform, eight-whorled, two whorls being plain brown, small, apical, while the remainder are usually obtusely ribbed longitudinally, crossed with fine spiral lines, the colour is pale violet or purple, with a broad fulvous-yellow zone encircling each whorl, the lip is extremely incrassate, striped with brownish yellow, and the sinus is hardly perceptible.

Two specimens, precisely like each other. (The name is derived from the Greek signifying yellow—purple, in allusion to the bright coloration).

Mangilia agna sp. nov. (Pl. IX., fig. 12).

M. testa anguste oblonga, attenuata, fusiformi, albo-lactea, interdum dorsaliter ochraceo-effusa, subpellucida, eleganti, anfractibus septem vel octo, ventricosulis, conspicuè paucicostatis, costis rectis, longitudinaliter decurrentibus, transversim delicatissimè tenuistriatis, striis costas omnino accingentibus, apertura obliquè oblonga, sinu inconspicuo, labro extus effuso, incrassato, intus cum columella applanato.

Long., 5·50, *Lat.*, 2 mill.

A pure milky white much attenuate species, sometimes with a pale ochraceous dorsal clouding, longitudinally few ribbed, the ribs decurrent and descending in the same plane from whorl to whorl, transversely very finely striolate, the striæ surrounding the whole shell, including the ribs. The mouth is obliquely oblong, outer lip effuse, and, as well as the columella, quite simple within. (ἄγνος, castus).

M. bascauda sp. nov. (Pl. IX., fig. 13).

M. testa ovata, solidiuscula, pallidè ochracea, anfractibus sex, apicali simplice, lævi, cæteris longitudinaliter obliquè crassicostatis, et spiraliter acutiliratis, interstitiis minutissimè decussatis, apertura peroblonga, sinu suturali, inconspicuo, labro extus multum incrassato, fimbriatulo, intus septem vel octo denticulato, columella recta, simplice.

Long., 5·50, *Lat.*, 2·50 mill.

A pale ochraceous oval *Mangilia*, more like one of the section *Cythara* than *Clathurella*, ovate, with somewhat rounded

whorls, the apical simple, smooth, the rest obliquely thickly costate, with transverse acute liræ, the interstices extremely minutely decussate, the mouth is oblong, the sinus small, only half-hollowed out of the outer lip, and not extending across, the lip is much thickened, fimbriolate, within seven or eight denticled, columella straight, simple. A good many specimens. (*Bascauda* etymologically is interesting, as being an old British word, signifying a wicker basket; and subsequently Latinized cf. Juvenal xii.46, Martial xiv.9.9, and in more recent times again anglicized).

M. calathiscus sp. nov. (Pl. IX., fig. 14).

M. testa fusiformi, apud apicem attenuata, tenui, delicata, gradato-turrita, anfractibus octo, quorum tribus apicalibus, simplicibus, lævibus, minimis, cæteris crassicostulatis, transversim elegantissimè clathratis, gemmulatis, albido-crystallinis, hic illic sparsim ochraceo-tinctis, apud basim gemmulo-tuberculatis, canali recurvo, apertura sinuosa, sinu excavato, amplo, labro extus crenulato, intus octo denticulato, columella paululum obscure denticulata.

Long., 6, Lat., 2 mill.

An exceedingly graceful, delicate, crystalline shell, with thickened longitudinal ribs, and acute spiral liræ, the whorls being eight in number, of which three are small, and apical. The sutures are much impressed, whorls slightly tumid, canal recurved, aperture sinuate, sinus broad and excavate, outer lip crenulated without, eight denticled within, columella feebly and obscurely denticulate likewise. A very few specimens. (*Calathiscus*, a wicker basket).

M. eumerista sp. nov. (Pl. IX., fig. 15).

M. testa ovato-oblonga, lævissima, albida, nitida, anfractibus sex, ventricosis, longitudinaliter rotundi-costatis, costis lævissimis, ultimo anfractu infra, juxta suturas, inter costas ochraceo-punctato, lineis spiralibus semi-pellucidis ornato, apertura angusta, oblonga, labro extus incrassato, intus multidenticulato, columella etiam multi-denticulata.

Long., 6, Lat., 2.50 mill.

A pure white ovate species, very smooth white and shining, whorls six, ventricose, roundly longitudinally costate, on the last whorl there are just below the sutures brown spots between the costæ in one transverse line, and also sub-pellucid linear marking; the outer lip and columella are both much denticled. Sinus not very deep or conspicuous. Three specimens. (εὖ well, μέριστος separated).

M. himerodes sp. nov. (Pl. IX., fig. 16).

M. testa pergracili, subcrystallina, tenui, fusiformi, anfractibus septem, quorum duobus apicalibus, vitreis, lævissimis, cæteris gradato-turritis, infra suturas abruptè angulatis, longitudinaliter costulatis, costis regularibus, obliquis, undique spiraliter delicatè liratis, liris acutis, interstitiis sub lente longitudinaliter striatulis, ad angulum anfractuum pallidè ochraceo-tinctis, et apud medium anfractus ultimi ochraceo cingulo, dorsaliter evanido, sed conspicuo ad labrum exterius decoratis, apertura oblonga, angusta, labro extus incrassato, columella simplice, recta.

Long., 6·50, *Lat.*, 2·50 mill.

This species is on the border-land between the subgenera *Glyphostoma* and *Cythara*. A pure white, extremely delicate little species, subvitreous, fusiform, with seven whorls, two of which are glassy and apical, the remainder being all very delicately ribbed, with spiral liræ, the interstices longitudinally striolate. At the sutures and the angle of the whorls there is a pale ochre band, again appearing, but almost obsoletely, in the middle of the last whorl. It is very conspicuous, however, just at the back of the outer lip. The mouth is narrow, outer lip thickened, columella simple. Many specimens. (ἱμερώδης, pleasing, desirable).

M. himerta sp. nov. (Pl. IX., fig. 17).

M. breviter pyramidato fusiformi, parva, delicata, anfractibus sex, quorum duobus apicalibus, albo-vitreis, cæteris pallidissimè flavo-ochraceis, infra, juxta suturas, conspicuè angulatis,

apud suturas quasi-crenulatis, costis longitudinaliter crassis, paucis, accinctis, transversim conspicuè pauciliratis, interstitiis lævibus, ad suturas regulariter brunneo-sparsis, simul ac apud medium anfractus ultimi punctis regularibus, et dorsaliter ad medium labri exterioris brunneo-maculatis, apertura angusta, oblonga, sinu lato, labro extus incrassato, columella simplice.

Long., 4, Lat., 2 mill.

This little shell has much in common with *M. himerodes*, described in this paper, but is smaller and of a pale yellow-ochre colour throughout. The whorls are angularly turreted, they are six in number, including the two vitreous apical whorls. At the sutures there is a quasi-crenulation, owing to the commencement of the prominent longitudinal ribs, there crossed by acute liræ, the interstices being smooth. Faint brown transverse spots adorn the sutures and the middle of the last whorl; the back of the outer lip is likewise ornamented with one ochre median blotch and faint signs exist in some specimens of another, or, indeed, two more alternating with white, both above and below the median blotch just mentioned. We have a near ally of this species from Bombay, still undescribed. (*ἡμερτός*, pleasing).

M. orophoma sp. nov. (Pl. IX., fig. 18).

M. testa turrata, angusta, parva, nitida, pallidè-brunnea, anfractibus sex (apicalibus?) cæteris infra suturas angulatis, apud suturas impressis, rectis, longitudinaliter recticostatis, costis paucis, spiraliter liratis, liris in penultimo anfractu sex, in ultimo novem, interstitiis lævibus, apud basim tuberculato, canali paullum recurvo minime producto, apertura angusta, sinu amplo labrum excavante, labro extus incrassato, fimbriatulo, intus obscurè denticulato, columella plus minusve simplice.

Long., 3, Lat. 1.25 mill.

A minute turreted pale brown species, with six whorls, angled just below the sutures, then straight, the straight longitudinal ribs, few in number, are crossed by liræ, conspicuous

and large for the size of the shell, six at the penultimate, nine on the last whorl, and less in proportion (*e.g.* four in the antepenultimate) on the other whorls. Mouth narrow. Sinus large and hollowing across the outer lip; which is somewhat thickened and obscurely toothed within. Very rare. (ὀρόφωμα, a thatched roof).

M. stibarochila sp. nov. (Pl. IX., fig. 19).

M. testa angusta, fusiformi, crassiuscula, anfractibus sex, quorum duobus apicalibus, pallidè brunneis, subvitreis, cæteris brunneo-ochraceis, ventricosulis, longitudinaliter crassicostatis, costis albidis, transversim tenuiliratis, interdum, sicut ad peripheriam anfractus ultimi, liris crassioribus, apertura oblonga, sinu amplo, labrum semi-effodiente, labro extus percrasso, ochraceo, supernè albo-vittato, columella plana ochraceo-brunnea.

Long., 5, *Lat.*, 2 mill.

A small stoutly-built solid species, six whorled, of a lively ochraceous brown, fading into white across the ribs. Some of these are much thickened and crossed by liræ, of which a few are stronger than the others. The mouth is narrowly oblong, sinus wide and half extending across the very thick outer lip which is particoloured, white above, ochre below, the columellar margin clear ochraceous brown, simple.

The only specimen was in the first consignment (1891) of shells from Mr. Hadfield. (στίβαρος thick χείλος lip).

M. thalycra sp. nov. (Pl. IX., fig. 20).

M. testa parva, nitida, fusiformi, ad apicem attenuata, anfractibus septem, turritis, ventricosulis, albidis, ad suturas infra et supra, spiraliter ochraceo-vittatis, et ad medium anfractus ultimi simili modo ochraceo-cinctis, longitudinaliter obtusicostatis, costis incrassatis, paucis, transversim spiraliter sub lente tenuistriatis, apertura oblonga, labro exteriori recto, interdum obscurè denticulato, columella ochraceo-tincta, simplice.

Long., 6, *Lat.*, 1·75 mill.

A small brightly banded shell, the colour being white, banded with ochre, whorls seven, gradate, longitudinally stoutly ribbed, the mouth oblong, outer lip slightly thickened, columella ochre-tinged plain. Many specimens, mostly somewhat worn. (*θάλυκρος* glowing, from the bright colour).

M. thiasotes sp. nov. (Pl. IX., fig. 21).

M. testa fusiformi, solida, incrassata, alba, lætè ochraceo-tincta, anfractibus sex, apicali nigrescente, cæteris apud suturas fulvo-ochraceis, et, supra, juxta suturas, magnopere nodulosis, nodulis perconspicuis, paucis, nitidis, transversim striatis, ultimo in anfractu apud medium simili modo nodulifero, in specie majore nodulis tumescentibus, permagnis his subtus nodulis, ochreo-zonato, duobus nodulosorum minorum ordinibus transversim sequentibus, cum linea nigerrima dorsaliter a margine columellari usque ad basim labri exterioris, labro paullum incrassato, margine columellari simplice, canali brevi.

Long., 7·50, *Lat.*, 2·50 mill., *sp. min.*

„ 8 „ 4·25 „ *sp. maj.*

A very beautiful species, and we know of no pleurotomoid shell which presents the same characteristics. The whorls are six, the apex pitchy black, the remainder being white with bright ochreous tinting. In the younger specimens transverse shining white rows of large gemmæ cross the whorls just above the sutures, and in the middle of the last whorl, below, there are ochre bands, in the last whorl this is followed by two smaller rows of gemmæ, and then by a pitch black line reaching from the upper portion of the columellar margin, across the back of the shell, to the base of the outer lip. The more mature shell is conspicuous for the very swollen row of white peripheral nodules, banded below with fulvous colour. The canal is short, columellar margin simple. (*θιασώτης* a reveller).

M. (Cythara) euselma sp. nov. (Pl. IX., fig. 22).

M. testa fusiformi, attenuata, (in uno specimine latiore), delicatula, pallidissimè ochraceo, anfractibus sex, gradatulis,

apud suturas impressis, unangulatis, longitudinaliter costulatis, spiraliter liratis, junctura costarum minute gemmulatis, ultimo anfractu transversim quadri-vel quinque-brunneo-lineato, penultimo unilineato, apertura oblonga, sinu recto, labrum effodiente, labro extus incrassato, intus minutissimè denticulato, margine columellari recto, simplice.

Long., 4.50 mill. *Lat.*, 1.75 mill.

A very delicate species, with beautiful gemmuled ribs, and faint spiral linear brown banding. Of attenuate fusiform shape, pale ochreous, impressed at the sutures, whorls six, gradate, mouth oblong, sinus straight, deep. Outer lip incrassate, minutely denticled within, columellar margin straight, plain. A few specimens. (εὐσελμος, with good benches of oars, from the beautifully gemmuled riblets).

M. (Cythara) psalterium sp. nov. (Pl. IX., fig. 23).

M. testa attenuato-fusiformi, perlævi, gracili, anfractibus septem (?), omnibus longitudinaliter obliqui-costatis, costis lævibus, transversim ochraceo-zonatis apud medium, ultimo anfractu in medio simul ac ad basim simili modo zonato, intusque zonas bi vel tri vittato, apertura oblonga, angusta, labro extus paullum incrassato, intus lævi, columella simplice, obscurè denticulata.

Long., 9.10, *Lat.* 3 mill.

A handsome smoothly ribbed shell, attenuately fusiform, whorls probably seven, but only five appear on our broken specimens, an ochraceous band appears in the middle of every whorl, the last whorl two-banded, mouth oblong, narrow, outer lip thickened, inner smooth.

Slightly allied to *M. vexillum* Reeve, but not decussate. *M. gracilis* Reeve, from the Philippines, is of the same shape, and likewise banded in the same manner, but the revolving striæ are perfectly absent in *M. psalterium*. Very rare. (*Psalterium*, a harpsichord).

M. (Cythara) signum sp. nov. Pl. IX., fig. 24).

M. testa brevi, pyramidata, turrita, perlævi, anfractibus sex vel septem, longitudinaliter obliquicostatis, costis levibus, apud basim propè evanidis, undique transversim ochraceo-multiliratis et zonatis, juxta basim evanidis, apertura oblonga, labro extus paullum incrassato, intus denticulato, columella multidenticulata.

Long., 6-7, *Lat.*, 2.50 mill.

A prettily-banded, smoothly-ribbed, stout little species, of which we have five specimens. Whorls six to seven, turreted, perfectly smooth. Mouth oblong, outer lip and columella denticulate within. (*Signum*, a standard).

M. (Glyphostoma) chrysolitha sp. nov. (Pl. IX., fig. 25).

M. testa breviter fusiformi, albida, delicatula, anfractibus septem (fortasse, apicalibus absentibus), quorum duobus unicoloribus albis, omnibus longitudinaliter costulatis, et spiralliter clathratis, junctura flavo-gemmulatis, gemmis tuberculosis, nitidis, bino ordine in antepenultimo, trino in penultimo, in anfractu ultimo trino ad peripheriam ordine albido sequente, posthac duobus flavis ordinibus, apud basim parvis tuberculis, apertura oblonga, sinu suturali lato, parum labrum effodiente, labro multum extus incrassato, intus sex denticulato, columellari margine plano.

Long., 5, *Lat.*, 2 mill.

A very pretty species, with much similarity of marking and texture to *Clathurella granicostata* Reeve, but the mouth is that of a *Glyphostoma* or *Mangilia*. It is shortly fusiform, white, delicate, whorls probably seven, of which the two highest after the apical are plain and uncoloured, the remainder showing regular spiral rows of yellow gemmæ at the junction of the longitudinal costæ with the transverse liræ. There are two rows of these in the antepenultimate, three in the penultimate, and in the last, three above the periphery, where follows one row of spiral colourless gemmæ, then two rows of yellow, the base of the canal being tubercled and colourless. The mouth is oblong,

the sinus wide but not deeply cut, the outer lip much thickened, within six-denticled, columellar margin simple. Very rare. (The derivation of the specific name is the Latin *chrysolithus* from the golden-yellow gemmæ).

M. (Glyphostoma) dialitha sp. nov. (Pl. IX., fig. 26).

M. testa turrata, elongata, ad apicem attenuata, nitida, albescente, ad basim, atque ad suturas, ochraceo tincta, anfractibus octo, duobus apicalibus lævibus, cæteris tumidulis, ad suturas impressis, supernis binis spiraliter gemmularum ordinibus, pænultimo et ultimo anfractu trinis succinctis, gemmulis magnis, conspicuis, ultimo apud basim productam tuberculatis, apertura oblonga, labro extus corrugato, intus obscure denticulato, margine columellari trinis denticulis munito, sinu lato, sed non profundo.

Long., 5, *Lat.* 1·50 mill.

A pretty, small, elongate species, shining white, turreted, eight whorled, with impressed sutures, which are stained with pale ochreous colour, as is a transverse band at the base, the whorls are furnished, the upper with two, the lower with three spiral rows of large unduliferous gemmæ, white, shining, mouth oblong, outer lip wrinkled without, obscurely denticulate within, sinus wide, but not deep, and extending to the outer surface of the peristome. (*διάλιθος*, decked with gems).

M. (Glyphostoma) latirella sp. nov. (Pl. IX., fig. 27).

M. testa parva, fusiformi, turrata, anfractibus sex vel septem, uno vel duobus apicalibus, bullatis, crystallinis, cæteris anguliferis, ventricosis, ad suturas impressis, longitudinaliter paucicostatis, costis latis, angulatis, irregularibus, spiraliter crassiliratis, liris albis, interstitiis ochraceo-coloratis, ultimo anfractu ad basim attenuato, paullum producto, simili modo decorato, ad medium interstitiali sulco fulviore-ochraceo, apertura angusta, sinuosa, sinu amplo, labrum effodiente, labro extus ad basim paullum incrassato, intus tridenticulato, denticulis fulvis, columella tridenticulata, cum dente suturali simili modo fulvescente.

Long., 4·50, *Lat.*, 1·50 mill.

A very delicate species. At first we imagined it to be the juvenile of *Latirus turritus* Rve., but the mouth and processes are those of a true *Glyphostoma*. The apical whorls are glassy, shining, the rest impressed at the sutures, and very coarsely costate, also roughly liræ, the liræ being white, the interstices fulvous. The mouth is narrow, sinus ample and profound; the denticles of the outer lip, of the columella, and the sutural tooth are all tinged fulvous red. A few specimens. From the description of *Gl. Gaidei* Hervier, J. de Conch., vol. 43, p. 239, it must resemble this shell. There, however, are eight whorls, but little decussation, and other points of distinction. (*Latirella* resembling *Latirus turritus*).

M. (*Glyphostoma*) notopyrrha sp. nov. (Pl. IX., fig. 28).

G. testa parva, turrita, fusiformi, candida, solida, anfractibus septem, ventricosis, apud suturas compressis, longitudinaliter crassicostatis, transversimque pauciliratis, liris regularibus, conspicuis, ultimo anfractu infra suturas dorsaliter squarrosè brunneo-maculato, apertura angusta, labro exteriorè multum incrassato, intus denticulis magnis instructo, columella denticulata.

Long., 5, Lat., 2 mill.

Many specimens of a pure-white turreted little species, with a conspicuous dorsal squarrose brown spot just below the suture of the last whorl. The whorls are ventricose and ribbed longitudinally, crossed with a few conspicuous liræ, the outer lip is much thickened with large denticles on the inner surface, and the columella is toothed. (*νότος* the back, *πυρρός* rufous).

M. (*Glyphostoma*) rhodacme sp. nov. (Pl. IX., fig. 29).

M. testa fusiformi, delicatula, albida, anfractibus septem, ventricosis, apud suturas impressis, duobus apicalibus puniceis, lævissimis, simplicibus, cæteris longitudinaliter costatis, costis perpaucis, transversim spiraliter crassiliratis, apertura sinuata, sinu amplo, labrum effodiente, labro extus incrassato, intus quadri-denticulato, columella obscurè septem-denticulata.

Long., 7, Lat., 2.50 mill.

A delicate white, thickly ribbed, and coarsely transversely lirate species, pure white, with pink tip. Sinus broad and scooped out of the incrassate outer lip, which is four-denticled within, the columella being weakly denticulate also. (ῥόδον, rose; ἄκμη, point).

M. (Glyphostoma) thalera sp. nov. (Pl. X., fig. 30).

M. testa elongata, fusiformi, albida, solidula, anfractibus quinque, obliquè angulatis, et longitudinaliter pauci-costatis, transversim spissi-liratis, liris indistinctis, ultimo anfractu producto, infra suturas irregulariter transversim rufo-punctato (penultimo interdum simili modo decorato), apertura angusta, labro multum incrassato, rufo-tincto, intus multi-denticulato, columella multis denticulis munita, sinu obliquo, amplo, labrum effodiente.

Long., 7. *Lat.*, 2 mill.

This would seem variable both in form and marking. One specimen shows a leaning to *M. paucimaculata* Angas, another is almost marked as *M. theskela* M. & S. It is, however, far removed from this latter species. Rude in contour, five whorled, obliquely angled, coarsely ribbed longitudinally, and closely but indistinctly lirate transversely. In shape, elongate fusiform, mouth oblong. Sinus ample and deep, outer lip much incrassate, both it and the columella are many denticled, outer lip but not the columella tinged with fulvous. A few specimens of somewhat varying shape and size. (θάλλερος blooming, genial).

M. (Glyphostoma) theoteles sp. nov. (Pl. X., fig. 31).

G. testa ovato-pyramidata, minuta, anfractibus quinque, supernis albescentibus, subnitidis, tumidis, transversim papillosis, papillis grandibus, in penultimo anfractu bino ordine, papillarum, quorum inferiore maximo, ultimo præcipue bino ordine, ad suturas magno, conspicuo, interstitiis lætè ochraceis, hos quatuor ordines accingentibus, cætera superficie alba unicolore, apertura angusta, ad sinum angulata, sinu profundo, labrum exterius effodiente, labro extus multum incrassato, intus quadri-denticulato, columella simili modo quadri-denticulato.

Long., 3·50, *Lat.*, 1·75 mill.

Very small, and with some slight resemblance to *M. thepalea*. The nodulous papillæ are, however, much larger in proportion to the size of the shell, and, in consequence, fewer. The upper whorls are closely tubercled, shining white. The four rows—two on the penultimate, two on the last whorl—are approximate, and the space contained by them is banded with ochre, the white shining nodules standing out more prominently. The mouth is narrow, oblong, sinus deep, outer lip much thickened, four toothed within as is the columellar margin. Rare; we have seen very few examples. (θεοτέλης divinely perfect).

M. (Glyphostoma) thepalea sp. nov. (Pl. X., fig. 32).

M. testa parva, pyramidato-fusiforimi, albescente, delicatula, anfractibus septem, quorum apicalibus vitreis, cæteris (quinque) ventricosulis, longitudinaliter noduloso-costatis, costis in medium transversim unisulcatis, interstitiis longitudinaliter tenuissimè striolatis, infraque suturas simul ac apud medium anfractus ultimi pallidè ochraceo-cinctis, in uno specimine costis hic illic ad medium usque ad suturas utrinque ochraceo-punctatis, in altero tribus supernis (apicalibus exceptis) unicoloribus, nodulis papillaribus semper albis, haud ochraceo-tinctis. Apertura oblonga, sinu suturali, obliquo, labro exteriorè incrassato, intus conspicuè septemdenticulato, columella denticulis minoribus sex vel septem munita.

Long., 5·50, *Lat.*, 2 mill.

A very delicate, beautiful little shell. It is pyramidally spindle-shaped, white, with seven whorls, two being glassy and apical, the rest ventricose, impressed at the sutures, the longitudinal ribs are nodulous, shining, and very regular, one spiral sulcation crosses each rib in the middle, the interstices between are beautifully longitudinally striolate. At the sutures, and in the middle of the last whorl (in some specimens also on the upper whorls), there is a very pale ochraceous banding, the nodules of the ribs still retaining their white lustre. In other specimens the first three or four whorls remain quite colourless. The mouth is oblong, sinus sutural, obliquely extending over the

outer lip, which is much incrassate within with seven prominent denticles, these being provided with three also of lesser size. The species comes near *Glyphostoma disconicum* Hervey (J. de Conch., vol. 43, p. 48, published June, 1896), as regards the transverse sulcus, but in many respects—*eg.* the mouth denticles—it differs widely, so far as can be told by description alone, without a figure. Several specimens. (*θηπέλεος*, wonderful, astonishing).

M. (*Glyphostoma*) *thereganum* sp. nov. (Pl. X., fig. 33).

G. testa oblongo-fusiformi, omnino pallidè ochracea, gradatulo-turrita, apud suturas multum impressa, anfractibus septem, quorum duobus apicalibus puniceis, lævibus, cæteris juxta suturas angulatis, longitudinaliter costulatis, costis incrassatis, transversim liratis, liris superioribus paucis, has inter duabus minoribus intercingendis, ultimo anfractu apud basim tuberculifero, canali recurvo, sinu labrum exterius effodiente, profundo, apertura oblongo-sinuosa, labro extus percrasso, bino nodularum ordine longitudinaliter decorato, intus septem vel octo-denticulato, margine columellari simplice.

Long., 9, *Lat.*, 2.75 mill.

A conspicuous well-marked shell, though wholly plain ochraceous, unredeemed by any particular marking. It is fusiform, turreted, much impressed at the sutures, seven whorled, the two apical being stained with pink, the lower whorls are angled at the sutures above, regularly longitudinally ribbed, the ribs rather thick, and transversely spirally lirate, one large lira in the proportion of 2 : 1, the two smaller intervening; the last whorl is tubercled at the base. Mouth sinuous oblong. Sinus deep, outer lip very thick with double fimbriate row of nodules without, and within seven or eight denticulate, the columellar margin being simple. Very rare, two specimens only. (*θηπέγανον*, the wicker-basket of a cart, from the latticed appearance).

M. (*Glyphostoma*) *thesaurista* sp. nov. (Pl. X., fig. 34).

M. testa parva, fusiformi, attenuata, albida, solidiuscula, anfractibus decem (?) ad suturas impressis, ochraceo-cinctis,

longitudinaliter parvicostatis, costis inconspicuis liriformibus, liris spiralibus distantibus clathratis, ultimo anfractu apud medium cingulo ochraceo spiraliter decorato, apertura ovato-sinuosa, sinu cochleari, effuso, amplo, labro extus perincrassato, expanso, intus quinque denticulato, columella minutè denticulata.

Long., 6·50, *Lat.*, 2·25 mill.

A handsome fusiform shell, whorls probably ten, the apical being absent in our specimens, whorls slightly angled and ventricose, ribs and transverse liræ of about equal size, the former being small and feeble; at the sutures and round the middle of the last whorl are ochre bands. Outer lip much thickened and expanded, sinus spoon-shaped, wide and broad, outer lip finely denticled within, columella also denticulate. (*θησαυρος*, treasure).

M. (Glyphostoma) thyridota sp. nov. (Pl. X., fig. 35).

G. testa brevi, pyramidata, unicolore, albida, anfractibus sex, turratis, ventricosis, apud suturas angulatis, longitudinaliter conspicuè crassicosatis, transversim pauciliratis, apud medium anfractuum uno ordine profundo fovearum instructis, in ultimo bino simili ordine, apertura angusta, obliqua, labro extus multum incrassato, intus quadri-denticulato, columella minutissime denticulata, sinu profundè in labro exteriori effuso.

Long., 4·50, *Lat.* 2 mill.

A pure white, curtly pyramidal species, the surface not shining. Whorls six, turreted, angled at the suture, ventricose, longitudinally thickly ribbed, transversely ornamented with few lirations. In the middle of the upper whorl and doubly-ranked in the last whorl, are transverse regular deep pittings, squarrose, profound, between the ribs, which suggest the trivial name. The mouth is narrowly oblique, outer lip thickened, furnished with four strong denticles, the columellar teeth are more obscure and feeble. Only one specimen, and that slightly worn; but the characters are so remarkable as to excuse description from such scanty material. (*θυρίδωτος*, furnished with windows or doors.)

Clathurella caletria sp. nov. (Pl. X., fig. 36).

C. testa gracili, fusiformi, delicata, alba, ad suturas pallidissimè ochracea, anfractibus septem, quorum duobus apicalibus, mamillatis, lævissimis, cæteris gradatulo-turritis, arcuè longitudinaliter gracili-costulatis, costis delicatis, elevatis, rectis, spiraliter regulariter clathrato-liratis, junctura costarum lirarumque nitidè gemmulatis, ultimo anfractu zona indistincta pallidissimè ochracea apud medium, apertura oblongo-sinuosa, labro extus crenulato, intus simplice, sinu lato, labrum exfodiente, latere dorsali suturali callo crassiusculo, nitido, latè ochraceo, margine columellari versus basin minuti-denticulato, canali paullum producto.

Long., 4·50 mill. *Lat.*, 1·50 mill.

A very beautiful and delicate species, whorls seven, turreted, two being apical, finely and regularly clathrate; the mouth is sinuously-oblong, outer lip simple within, columellar margin minutely toothed towards the base, canal a little produced, a very pale ochraceous band round the middle of the last whorl, as at the sutures. The sinus is deeply cut behind, at the sutural margin of the outer lip is a bright ochraceous thickened callus. Only one specimen. (*κάλος* beautiful, *ἵτριος* woven).

C. cnephæa sp. nov. (Pl. X., fig. 37).

C. testa breviter fusiformi, corrugata, solidiuscula, omnino nigro brunnea, anfractibus sex vel septem, paullum ventricosulis, longitudinaliter crassicostatis, et spiraliter costulatis, costis crassiusculis, paucis, apertura oblonga, labro exteriorè intus quadri-denticulato, margine columellari recto, simplice, sinu superficiali.

Long., 4·75, *Lat.* 1·50 mill.

A completely unicolorous species, being either pale or dark blackish-brown, the latter predominating in the specimens before us in proportion of 5 : 2. A typical *Clathurella*, with squarely crossed costæ, both longitudinal and transverse of equal thickness, not many in number, say thirteen on last whorl, crossed by eleven, of which two spiral liræ below the suture are

approximate. The outer lip is denticulate within, sinus not extending beyond the middle of the outer lip. A considerable number of specimens. (*κνεφαίος*, dusky brown, from the colour).

Clathurella episema sp. nov. (Pl. X., fig. 38).

C. testa fusiformi, concinna, pallidè ochracea, anfractibus quinque (exclusis apicalibus), distanter costulatis, spiraliter crassiliratis, liris et costis albo-ochreis, interstitiis plus minusve ochraceo-fulvis, ultimo anfractu apud basim albescente, liris tuberculatis, apertura oblonga, labro extus incrassato, intus sex denticulato, margine columellari recto, simplice, sinu amplo, profundo.

Long., 4·50, *Lat.*, 1·25 mill.

A neat little species, with the usual fusiform shape, and five whorls, exclusive of the apical, not present in our specimens. The whorls are clathrate, with longitudinal ribs and spiral liræ, these being pale ochreous-white, the interstices darker ochreous. The last whorl is slightly prolonged and sculptured in the same way as the upper whorls; one or two of the longitudinal ribs seem thicker than the others, giving a very slightly varicose appearance. The columellar margin is straight, simple, six denticled, outer lip incrassate, six denticled within, sinus deep and large. (*ἐπίσημος* remarkable).

C. lita sp. nov. (Pl. X., fig. 39).

C. testa fusiformi, parva, ochraceo-brunnea, delicatula, anfractibus sex, quorum duobus apicalibus, tumidis, nitidis, cæteris ventricosis, obtusè crassicostatis, longitudinaliter, et spiraliter pluriliratis, interstitiis planatis, apertura latè ovata, intus brunnea, labro exteriorè paullum incrassato, albescente, sinu parvo, rotundato, margine columellari simplice.

Long., 4, *Lat.*, 1·50 mill.

A small plain shell of simple character, not very dissimilar to some of our European species. The whorls are six; the lower ones ventricose, the two apical swollen, smooth and shining. Obtuse and thick ribs, longitudinally, ornament the shell, and these are spirally crossed by many conspicuous liræ. The aperture is widely ovate, outer lip slightly thickened, whitish;

the mouth is brown within, columellar margin plain. Likewise the sinus on the outer lip is inconspicuous, small and rounded. Three specimens. (λίπος, plain, simple.)

C. longa sp. nov. (Pl. X., fig. 40).

C. testa attenuata, prolongata, solidula, brunnea, anfractibus novem vel decem, ventricosulis, ad suturas impressis, longitudinaliter crassicostatis, costis paucis, spiraliter bi- vel triflostriatis, ultimo anfractu medio usque ad basim filo-striato, striis duodecim vel tredecim accingentibus, apertura triangulari, sinu extenso, canali brevi, labro exteriori crassiusculo.

Long., 5 mill., *Lat.*, 1.50 mill.

A small brown attenuate shell, being long in proportion to its width, of the same facies as the Australian *C. Letourneuxiana* Crosse, but smaller, more approaching in this respect *C. incrusta* of Tenison Woods, from Tasmania, the whorls are (probably) nine or ten, but all our many specimens are worn at the apex. The whorls are ventricose, longitudinally few and thick ribbed, impressed at the sutures, crossed spirally with few (three or four) spiral lines, which, at the junction with the longitudinal ribs are pale and shining. The last whorl has altogether twelve or thirteen such spiral revolving lines. The canal is short, aperture triangular, this appearance caused by the wideness of the sinus. The outer lip is incrassate, as in most of this section. The specimen in most perfect condition, which is therefore taken as the type, is not so attenuately long as some others.

C. Rogersi sp. nov. (Pl. X., fig. 41).

C. testa oblongo-fusiformi, colore valde variabili, nunc pulchrè pallide rosea, nunc ochracea unicolore, nunc spiraliter brunnea multivittata, anfractibus sex, apicali rubro-coccineo vel fulvo-ochraceo, vitreo, cæteris angulato-costatis, undique spiraliter liratis, liris majoribus ad angulos costarum, suturis impressis, apertura oblonga, labro simplice, sinu perinconspicuo, sæpius absente.

Long., 4.50 mill. *Lat.*, 1.50 mill.

The prevailing form of this pretty little shell is the rose-pink, though there are many of the striped, and of the plain ochreous form in our collection ; we do not think it the young of any species, although the characters about the outer lip are not very defined. We have seen many specimens, all alike in sculpture, but are not quite certain yet of its genus. From the figure, it may be one of Duclos' lost species, *e.g.*, *C. cledonida*, placed as *Columbella*, but its affinities are distinctly Pleurotomoid. We have much pleasure in recognizing the many kind services extended to us by Mr. Thomas Rogers, of Manchester, in the naming of this species.

Clathurella spyridula sp. nov. (Pl. X., fig. 42).

C. testa minuta, delicatula, attenuata, angusta, albida, nitida, anfractibus sex, quorum duobus apicalibus simplicibus, cæteris clathratis et cancellatis, liris acutis, costis incrassatis, liris, junctura costarum, gemmulatis, apertura sinuosa, sinu effuso, lato, labro extus crasso, intus minutè octo denticulato, columella recta, simplice.

Long, 4, Lat., 1 mill.

Very minute, narrow, white, latticed, and cancellate, the junctions of these cancellated liræ being gemmuled ; the whorls are six, two being apical ; mouth sinuous, canal very short, outer lip minutely denticulate, columella straight, and of simple character ; we cannot find that its exact counterpart has been described. (*spyridula* dimin. from *σπίρις* a basket).

Daphnella terina sp. nov. (Pl. X., fig. 43).

D. testa fusiformi, delicata, albida, anfractibus sex, supra turrilis, undique tenuistriatis, sub lente, omnibus præter ultimum anfractum et apicalem indistincte longitudinaliter costuliferis, ultimo infra suturas brunneo-maculato, brunneisque flammis dorsaliter ad basim decorato, apertura angustè obliqua, labro simplice, sinu parvo.

Long, 5, Lat. 2.50 mill.

Has some affinity with the large *D. lymnaeiformis* and also *D. metcalfiana* Reeve, but is a smaller, shorter, and more deli-

cate species, and the upper whorls are white, turreted, and indistinctly ribbed. Two specimens. (τέπεινος tender).

D. thespesia sp. nov. (Pl. X., fig. 44).

D. testa delicatula, turrita, fusiformi, albida, anfractibus septem vel octo, squarrosé ventricosis, tribus apicalibus brunneis, subvitreis, cæteris albidis, arcé decussatis, costis longitudinalibus obliquis, liris transversis minuté gemmulatis, suprâ lineola una ochracea cingulatis, et, in duobus specimenibus, ad suturas, ultimo anfractu variipicto, in uno specimine infrâ, juxta suturas squarrosé ochraceo-punctato, et tribus ordinibus bilineatis cincto, in alio unilineatis, in alio lineis obsoletis, omnibus specimenibus dorsaliter ochraceo-maculatis, apertura oblonga, sinu lato sed non profundo, peristomate incrassato, suturaliter expanso, intus arcé denticulato.

Long., 6, Lat., 2.50 mill.

A beautiful species, by the description and figure allied to *D. varicosa* Sow. from the same region. There are, however, no signs of varices. The shell is pure delicate white, with seven or eight whorls, of which three are apical and vitreous brown, the remainder finely decussate; where the spiral lines cross the oblique riblets a gemmuliferous appearance is presented. The whorls are squarely ventricose, impressed at the sutures. The coloration consists in orange-brown lines, different in number in every specimen. Some specimens are almost plain, others have a row of square brown spots just below the suture on the last whorl. The mouth is oblong, outer lip incrassate, suturally expanded, finely denticulate within, and the sinus is broad, but not deep. This species seems to approach the border land between *Daphnella* and *Clathurella*. Seven or eight specimens. (θεσπέσιος, divine, is aptly applied to this exquisite form).

Mitra (Costellaria) Dorotheæ sp. nov. (Pl. X., fig. 45).

M. testa fusiformi, pallidissimé ochracea, spira acuminata, anfractibus octo, apicali simplice, lævi, cæteris ventricosulis, longitudinaliter crebricostatis, spiraliter arcé liratis, liris

costas contingentibus, ultimo anfractu supernè juxta suturas rotundo-angulato, anticè attenuato, costis rectis, apertura angusta, labro simplice, intus striato, columella quadriplicata, plica superiore magna.

Long., 19, Lat., 6 mill.

A critical species, which we have known for a long time, but never been able to diagnose with certainty. Its nearest affinities lie with *M. angulosa* Küster, a much more attenuate species, larger in all its parts; *M. Antonelli* Dohrn, differing in colour and the clear shining ribs, not covered by the spiral liration; *M. fusiformis* Kien. more closely ribbed and sharply angled, with different coloration; *M. salmonea* Dohrn, perhaps the nearest approach, but differing in colour and texture; and *M. compta* Reeve, but this last is not so easily comparable. It is a pretty shell, as are all the *Costellariæ*, palest ochre in hue, turreted, whorls eight, ventricose, angled below the suture and with straight longitudinal ribs crossed with frequent liræ. Mouth thick within, lip simple. A very few specimens. There is an individual in J.C.M.'s collection from Mauritius.

Bittium æolomitres sp. nov. (Pl. X., fig. 46).

B. testa minutissima, cylindræa, pupæformi, compacta, anfractibus octo, duobus apicalibus, cæteris bino gemmarum ordine spiraliter accinctis, in penultimo et antepenultimo anfractu gemmulis permagnis, nitidissimis, ultimo anfractu tribus similibus ordinibus decorato, apertura trigona, peristomate tenui, canali brevi.

Long., 2·25, Lat., 1·25 mill.

A very small species. Pupiform, with eight whorls, adorned with two rows of papilliform gemmæ, those in the two whorls before the last being the largest, the last whorl having three rows of gemmules. The coloration is vivid. Apical whorls fulvous brown, the two next ochreous, then a darker brown hue, the penultimate being slightly lighter, the last whorl pale ochreous above, towards the base darker brown. (ἀιολομίτρης, with glancing or glittering girdles.)

B. albocinctum sp. nov. (Pl. X., fig. 47).

B. testa minuta, cylindrica, ad apicem attenuata, apice obtuso, anfractibus octo, tribus gemmularum ordinibus serialim dispositis, uno ordine infra, juxta suturas, albido, duobus pallidè ochraceis, ultimo anfractu albido, bicingulato, apertura ovata, labro simplice, canali brevi.

Long., 4, Lat., 1·75 mill.

A very pretty species, of which we have seen two or three specimens. Much resembling in sculpture *B. uveanum*, but differing in the mouth being larger, the shell less tun-shaped, and in the coloration. These two *Bittia* belong to the same section of the genus as *B. pulvis* Issel (described by the author as a *Cerithiopsis*), and *B. tenthrenoïs* Melv., described in Proc. Mal. Soc., 1896, vol. 2, No. 3, p. 109, from Bombay.

B. marileutes sp. nov. (Pl. X., fig. 48).

B. testa minuta, cylindræa, nigro-brunnea, condensata, apud apicem obtusata, anfractibus octo, duobus apicalibus, cæteris transversim papilliferis triseriatis, papillis gemmulatis nitidis, regularibus, apertura rotunda, labro simplice.

Long., 2·50, Lat., 1 mill.

One of the smallest if not the most minute of the genus. An almost pitchy-black little species, with eight close-grained whorls; the whorls are adorned with three transverse rows of papilliform gemmæ, black, shining. Mouth simple, very small. Three specimens. (*μαριλέυτης*, a charcoal burner, from the colour).

B. uveanum sp. nov. (Pl. X., fig. 49).

B. testa minutissima, dolioliformi, nitida, violacea, in specimine juniore apicalibus quinque albidis, quam maximè attenuatis, anfractibus novem, apud suturas impressis, tribus spiraliùm gemmularum ordinibus regulariter accinctis, gemmulis nitidis, nodulosis, interstitiis planatis, ad basim infrá, simul ac ad apicem suprâ, multum attenuatis, apertura parva, ovata, labro simplice, canali brevissimo.

Long., 3·25, Lat., 1·25 mill.

Four or five specimens of a very small *Bittium*, pale violet in colour, one of them being a young shell, brownish in coloration, and exhibiting five perfect apical whorls, bright white in hue and extremely small and attenuated. The shell is tun-shaped, much attenuate at both ends, the mouth is very small, and the whorls are ornamented with three regular rows of nodular gemmæ, the interstices being plain.

Cerithiopsis aurantiaca sp. nov. (Pl. X., fig. 50).

C. testa longa, attenuata, subpellucida, latè aurantiaca, anfractibus duodecim (apicalibus?), apud suturas impressis et crenellatis, spiraliter tricarinatis, ultimo quadricarinato, carinis pulchrè crenellatis, longitudinaliter elevato-liratis, liris rectis, interstitiis quadratis, alveolatis, nitidis, apertura ovato-quadrata, labro simplice, basi nitida, planata.

Long., 4 mill. (approx.), Lat., 1.25 mill.

A very delicate, semi-transparent orange-coloured minute form, long, attenuate, with angled whorls, crenulate, and impressed at the sutures. In number the whorls are twelve (approximately speaking, for our specimens are not perfect at the apex). Three carinæ adorn the upper whorls, four the lowest one; quadrately interlaced with longitudinal liræ placed equi-distantly. Mouth ovato-quadrata, lip simple, base flattened, shining. Three specimens only.

C. catenaria sp. nov. (Pl. X., fig. 51).

C. testa parva, fusiformi, uniformi, ochraceo-brunnea, anfractibus duodecim, quorum duobus apicalibus, vitreis, ceteris ventricosulis, apud suturas impressis, tribus regularibus gemmularum catenis spiraliter decoratis, et longitudinaliter parviliratis, interstitiis alveolatis, simul ac ad suturas, apertura subquadrata, labro simplice, canali brevi.

Long., 6.15, Lat., 1.75 mill.

An elegant little species, fusiform, ochraceous-brown, with twelve whorls, two being apical, and glossy pale-brown, the rest ventricose, impressed at the sutures, longitudinally lirated, liræ small and transversely crossed by three chains of

gemmæ, the interstices are somewhat alveolate in appearance, the aperture square, lip simple, canal short. A few specimens, not differing from each other. (*catena*, a chain).

C. eutrappela sp. nov. (Pl. X., fig. 52).

C. testa perlonga, cylindrica, gradatim attenuata, albocinerea, delicatula, anfractibus quatuordecim, apicalibus tribus, simplicibus, haud nitentibus, carneo-cinereis, cæteris elegantissimis, ad suturas quasi-canaliculatis, pallide ochraceo-tinctis, tricarinatis, carinis subvitreis papilloso-gemmatissimis, undique longitudinaliter liratis, ultimo anfractu quadrinotatis, ad basim planato, paululum excavato, apertura quadrato-ovata, labro simplice.

Long., 7·50, *Lat.*, 1·50 mill.

A very elegantly chased, glassy species, cylindrical, fourteen whorled, the apical whorls being dark, cinereous, but smooth, the sculpture is such as is usual in this genus, thrice keeled whorls, the keels gemmulate at their junction with the longitudinal connecting liræ, last whorl four keeled, mouth quadrato-ovate, base somewhat excavate, smooth, shining. Three or four specimens. (*εντραπελος* elegantly formed).

C. Fosteræ sp. nov. (Pl. X., fig. 53).

C. testa gracillima, multum attenuata, delicatula, perpulchra, anfractibus quatuordecim, quorum tribus apicalibus, lævibus, ochraceo-brunneis, cæteris angulato-ventricosis, apud suturas canaliculatis, et ochraceo-zonatis, in medium anfractuum albescentibus, supra plus minusve violaceo-tinctis, duobus costis spiraliter conspicuè accinctis, regularibus, gemmulatis, interstitiis interdum, præcipue ad suturas, alveolatis, apertura subrotunda, peristomate tenui, marginem apud columellarem triangulatim expanso, canali brevi.

Long., 6, *Lat.*, 1 mill.

A most exquisite shell, extremely graceful and attenuate, with fourteen whorls, of which three are apical, pale-brown and smooth, the rest ventricose, slopingly angled, canaliculate at the sutures, and also banded at the junction of the whorls with ochraceous-brown, while the median portion is white, the

first seven or eight whorls being tinged with violet ; each whorl is spirally crossed by two prominent revolving ribs, these ribs gemmulate at the junction with the longitudinal striæ, the interstices between being sometimes honeycombed in appearance especially at the sutures. The mouth is roundish, lip simple, and triangularly expanded towards the columellar margin, canal short. Eight or more specimens ; and named, in honour of Mrs. Emma Hadfield, *née* Foster, as a small token of appreciation and esteem.

Cerithiopsis hedista sp. nov. (Pl. X., fig. 54).

C. testa angusta, cylindrica, attenuata, gracili, anfractibus duodecim, quorum apicalibus quatuor, pervitreis, lævissimis, cæteris spiraliter regularibus tribus gemmularum ordinibus decoratis, gemmulis papillatis, nitidis, his ordinibus variè coloratis, in uno specimine primo et medio albato, tertio ochraceo, in altero primo ochraceo, secundo et tertio albatis, ultimo anfractu ad basim bicarinato, apertura quadrato-ovata, labro brunneo-ochraceo, canali brevissimo.

Long., 5, *Lat.*, 1·50 mill.

A prettily variously-banded delicate cylindrical shell, the whorls ornamented with three rows of transverse gemmules, shining, papillary, these rows being coloured white and pale ochraceous-brown, sometimes two white rows together, followed by a brown row, and occasionally the obverse. The last whorl is furnished with two keels towards the base ; the lip is ochraceous-brown, and the canal very short. (*ἡδίστος*, most delightful).

C. adelpha sp. nov. (Pl. X., fig. 55).

C. testa attenuato-fusiformi, brunneo-nigra, regulari, subulata, anfractibus undecim, quorum duobus apicalibus, minutissimè punctatis, pallide brunneo-ochraceis, cæteris transversim papilloso-gemmulatis, gemmulis rotundis, nitidis, similibus, tribus ordinibus succinctis, ultimo anfractu non producto, ad peripheriam acutangulato, basi planulata, apertura quadrato-ovata, labro squarrosulo, tenui, simplice.

Long., 4, *Lat.*, 1 mill.

A dark-brown very attenuate *Cerithiopsis*, much resembling certain forms of European species, e.g. *C. diadema* Watson, but this latter is a larger shell. The arrangement of pattern is the same, viz., three rows of papilliform gemmules, round, brown, shining. Several specimens. (*ἄδελφος* akin).

Turbonilla belonis sp. nov. (Pl. X., fig. 56).

M. testa perlonga, attenuata, crystallina, albida, anfractibus duodecim, ventricosus, gradatulis, paulum supra subdistortis, undique longitudinaliter recticostulatis, interstitiis indistincte striatis, ultimo anfractu ad peripheriam fortiter spiraliter uncostato, hac costa basim circumcingente, apertura rotunda, labro circiter incrassato, intus ad labrum exterius quadridenticulato, columella supra simplice.

Long., 8.50, *Lat.*, 2 mill.

A highly interesting shell, which it was at first difficult to assign to any special genus. It is very long, attenuate, twelve whorled, crystalline, the whorls all ventricosely gradate and impressed at the sutures, longitudinally costate, the ribs being straight, at the periphery of the last whorl these ribs end in a strong transverse rib-process, which encircles the base. The mouth is round, lip thickened, and in the inner margin of the outer lip are four denticles which extend slightly within the orifice. The columellar margin is, so far as can be seen, simple. Undoubtedly a *Turbonilla*; *T. decussata* Pease has the denticled mouth, but there is no transverse ridge at the base of the last whorl in that species. (*βελονίς*, a small needle).

Pyrgulina gliiriella sp. nov. (Pl. X., fig. 57).

P. testa ovata, obtusa, livido-punicea, glandiformi, anfractibus sex, apicali puniceo, retorto, subvitreo, cæteris longitudinaliter densicostatis, interstitiis lævibus, apertura ovata, peristomate continuo, margine columellari fortiter uniplicato.

Long., 2.25 mill. *sp. min.*, 3.50 mill. *sp. max.*, *Lat.*, 1 mill. *sp. min.*, 1.50 mill. *sp. max.*

Extremely minute. Shell oval, obtuse, livid pink grey, in facies much like *Zafra pupoidea* Ad. in miniature. The last whorl, at the apex of the smallest specimen, is twisted over the next, as is the habit of most of the *Odostomiæ*. The other whorls are longitudinally densely ribbed, the interstices between being smooth. The mouth is ovate, peristome continuous, columellar margin with a strong single plait or fold. A few specimens. (dim. of *glis*, a dormouse).

Syrnola jaculum sp. nov. (Pl. XI., fig. 58).

S. testa acuta, attenuata, tenui, vitrea, anfractibus undecim, omnibus applanatis, in uno specimine quinque anfractibus superioribus pallidè apud medium brunneo-liratis, in cæteris omnino unicoloribus, apertura attenuata obliqua, labro tenui, columella uniplicata.

Long., 8, *Lat.* 2 mill.

Seven specimens of a pure white shining crystalline *Syrnola*, eleven whorled, whorls straight, very slightly channelled at the sutures, in one specimen only the five higher whorls, next to the apical, are delicately spirally twice zoned with narrow ochraceous brown lines, these becoming obsolete in the lower whorls. The other specimens have no trace of such banding. The whorls are perfectly smooth; mouth oblique; lip simple; columella once plaited. (*Jaculum*, a dart, from the pointed contour).

S. violacea sp. nov. (Pl. XI., fig. 59).

S. testa attenuata, lævi, nitida, duobus anfractibus apicalibus diaphanis, cæteris violaceis, unicoloribus, lævissimis, infrá suturas internam ob plicam transversim quasi unilineolatis, ultimo anfractu ad basim pallescente, apertura obliqua, labro simplice, columella uniplicata.

Long., 11, *Lat.*, 2.50 mill.

A smooth violaceous shell, ten whorled, quite plain excepting for the line of the revolving plica showing through each whorl transversely just below the sutures; mouth somewhat oblique, outer lip plain, columellar one-plaited. Three specimens, but only one in first-class condition.

Alaba zadela sp. nov. (Pl. XI., fig. 71).

A. testa perlonga, attenuata albo-cinerea, nitente, gracili, anfractibus circa decem, hic illic varicosis, varicibus tumidulis, ferè lævibus, undique spiraliter arcè livatis, liris minutè brunneo-punctatis, ultimo anfractu paullum prolongato, apertura ovata, labro tenui.

Long., 5, Lat., 1.50 mill.

A small elongate shining ashy-white shell, whorls probably ten, but our specimen is broken at the apex, swollen varices are scattered over the whorls, and spiral liræ uniformly cover them, with here and there bare patches where the varices come. These liræ are minutely brown dotted. Mouth ovate, lip simple. (ζάδηλος manifest).

Litiopa limnophysa sp. nov. (Pl. XI., fig. 72).

L. testa ovato-oblonga, rapidè attenuata versus apicem, tenuissima, rufocinerea, anfractibus septem, quorum tribus minimis nigrescentibus, apicalibus, cæteris tenuibus, sublævibus, ultimo expanso, sub lente transversim striatulo, infra suturas et apud medium anfractus spiraliter flammis maculisve rufis depicto, apertura oblonga, labro tenuissimo, columella versus basim subtruncata.

Long., 5, Lat., 1.50 mill.

Like a *Limnæa* in miniature. Seven whorled, ovate oblong, the last three whorls apical, decussate beneath a lens, and blackish, the rest ashy red, painted on the last whorl, which is very finely transversely striate, with rufous flames and spots. Mouth oblong, lip very thin, columella truncate towards the base. Two specimens only ; would appear near *L. nitidula* Pfr.

Alvania pisinna sp. nov. (Pl. XI., fig. 60).

A. testa minutissima, oblonga, albida, concinna, anfractibus sex, quorum duobus apicalibus subvitreis, lævibus, cæteris ventricosis, ad suturas multum impressis, arcè costulis longitudinalibus lirisque spiralibus decussatis, tribus lirarum ordinibus supernis, ultimo anfractu ordinibus quatuor, ad

basim spiraliter unicarinato, apertura rotunda, peristomate incrassato, continuo.

Long., 1, *Lat.*, 50 mill.

Very minute, pure white, whorls six, of which two are apical, much ventricose and impressed at the sutures. The whorls are ornamented with clathrate riblets and liræ, three-ranked spirally in the upper whorls, four in the lowest, with a sharply-turned keel round the base. Aperture round, outer lip continuous, thickened. (*pisinnus*, a small child).

Rissoina baculum-pastoris sp. nov. (Pl. XI., fig. 61).

R. testa prælonga, attenuata, interdum flexa, nitida, candida, anfractibus decem, apicali papillari, cæteris lævibus, ad medium spiraliter acutangulis, ad suturas impressis, ultimo anfractu biangulato, apertura ovata, peristomate incrassato, ferè continuo.

Long., 6, *Lat.*, 150 mill.

Allied, doubtless, to *R. spirata* Sowb., so protean in its forms, but it seems distinct from every variety. It may also be allied to *R. miranda* A. Ad. or *R. insolida* Desh., by some considered only a variety, but there is no sign of the crenulations, so very conspicuous an ornament on the whorls of these two last species. One of our specimens is bent, giving the aspect of a shepherd's staff, hence the trivial name. The shell is white, shining, ten whorled, the whorls smooth, impressed at the sutures, and uniformly spirally once ribbed, the last whorl twice; mouth ovate, peristome almost continuous, thickened. Some slight resemblance in sculpture to species of *Scalenostoma* may be observable.

R. catholica sp. nov. (Pl. XI., fig. 62).

R. testa oblongo-fusiformi, parva, nivea, nitida, apice obtusato, anfractibus sex, apicali simplice, cæteris ventricosulis, longitudinaliter arcuè obliquicostatis, interstitiis hic lævibus, illic sub lente tenuissimè striatulis, apertura ovata, paullulum effusa, labro incrassato.

Long., 3, *Lat.*, 125 mill.

A small white species of simple character. Longitudinally obliquely ribbed, the costæ being many, and with their interstices mostly smooth, but occasionally very finely striate when seen microscopically ; mouth oval, lip rather thickened.

R. enteles sp. nov. (Pl. XI., fig. 63).

R. testa pyramidato-fusiforâ, pellucida, albida, nitida, anfractibus septem, minimè tumidulis, spiraliter tenui-sulcatis, sulcis superficialibus, ultimo anfractu infra medium nitidissimo, planato, aliter tenuisulcato, apertura lunata, effusa, labro crassiusculo, planato, simplice.

Long. 6, *Lat.* 2.50 mill.

A white pellucid shell, with a milky tinge ; the whorls, seven in number, are finely sulcate, sulcations extremely superficial. There is a space round the body of the last whorl where these sulci are absent, but they are resumed round the base. The mouth is wide, lip somewhat incrassate. (*ἐντελής* perfect, complete).

R. nesiotès sp. nov. (Pl. XI., fig. 64).

R. testa elongata, turrita, albida, anfractibus novem, quorum duobus apicalibus, vitreis, lævibus, cæteris ventricosulis, pallidè ochraceo-teniatis, longitudinaliter obliqui-costatis, costis numerosis, lævibus, nitidis, interstitiis sub lente spiraliter tenuissimè striatis, in ultimo anfractu costis ad basim tuberculatis, tuberculorum quinque ordinibus, apertura ovata, labro multum incrassato, intus simplice.

Long., 6, *Lat.*, 1.50 mill.

A smooth shell, elongate, obtusely turreted, whorls ventricose, nine in number, two being apical and glassy ; all the whorls are simply obliquely costate longitudinally, the interstices being extremely finely striate. A pale spiral ochreous band surrounds the lower half of the whorls. At the base of the last whorl, the costæ become tuberculated ; there are five spiral rows of these. Mouth ovate, much thickened. Several specimens. N.B.—A form of this species also occurs in

which the ribs are all more or less tubercled; we fancy this may be the more juvenile state of the species. (*νησιώτης* an islander).

Rissoina (Phosinella) quasillus sp. nov. (Pl. XI., fig. 65).

R. testa fusiformi, candida, versus apicem attenuata, anfractibus decem, quorum apicalibus duobus vitreis, lævissimis, cæteris arcu costulatis, costis rectis, spiraliter lirarum ordinibus accinctis, liris elevatis, ad juncturam costularum gemmulatis, nitidis, apertura rotundo-lunari, labro extus paullulum incrassato, intus simplice.

Long., 4.50, *Lat.*, 2 mill.

A very neat rough little white shell, clathrate, gemmuled at the junction of the ribs with the spiral liræ, ten whorled, aperture roundly-lunar, outer lip slightly thickened, simple within. Allied to *R. Deshayesi* Schwartz, from the Philippines. Several specimens. (*Quasillus*, a small work-basket, dim. of *qualus*).

R. sincera sp. nov. (Pl. XI., fig. 66).

R. testa pyramidato-fusiformi, candida, sub-turrita, anfractibus octo (?) apud suturas impressis, tumidulis, superficialiter longitudinaliter costulatis; costis remotis, simul ac liris spiralibus intersectis, quadrato-clathratulis, interstitiis planis, apertura effusa, labro crassiusculo, intus simplice.

Long., 6.50, *Lat.*, 2.50 mill.

A shell of bold contour. White, probably eight whorled (but only five remain on our specimens), whorls slightly ventricose, longitudinally superficially costulate, spirally lirated; three rows on the two whorls before the last, on the last whorl there are five rows; the quadrate interstices are plain, non striate, lip effuse, incrassate. Two specimens.

R. zonula sp. nov. (Pl. XI., fig. 67).

R. testa perparva, fusiformi, compacta, solidiuscula, anfractibus sex, quorum duobus apicalibus, albovitreis, lævibus, cæteris concinnè longitudinaliter obliquicostatis, costis arcuatis, tenuibus, nitidis, interstitiis planatis, apud suturas utrinque spiraliter fulvozonatis, simul ac à medio anfractus ultimi usque ad

basim extremam; apertura ovata, peristomate incrassato, margine columellari paullum expanso.

Long., 2, Lat. 1 mill.

A very small edition of such a species as *R. fasciata* A. Ad. Though only two millimetres in length, it is a finished shell, and the lip remarkably incrassate for its size. The whorls are six, two being apical and glassy white, the rest are obliquely costate, shining, with rufous zones on either side of and joining the sutures, and the basal half of the last whorl is of the same colour. A few specimens. (*zonula*, dim. of *zona*, a band).

***Barleeia chrysomela* sp. nov.** (Pl. XI., fig. 68).

B. testa pyramidato-conica, semigradatula, levissima, nitida, aurantio-fulva, tenui, anfractibus septem, paullulum tumescens, apud suturas spiritaliter fulvo-brunneo vittatis, apertura parva, ovata, peristomate fere continuo, fulvo-brunneo vel nigrescente.

Long., 3, Lat., 1.50 mill.

Many specimens of a small *Hydrocena*-like species, which has many characters in common with the genus *Barleeia* Clark, where we place it provisionally. A conical shell, shining, golden orange-brown, with spiral darker sutural band, the peristome being of the same colour and nearly continuous. The mouth is somewhat contracted. (*chrysomela*, golden apple, from the colour).

***Rissoia joviana* sp. nov.** (Pl. XI., fig. 69).

R. testa oblonga, solidiuscula, ochracea vel ochraceo-cinerea, anfractibus decem (tribus apicalibus), ventricosis, ad suturas impresso-crenulatis, longitudinaliter rotundi-costulatis, costis interdum obscuris et irregularibus, spiritaliter arcte liratis, apertura rotunda, labro extus simplice, columella alba.

Long., 4, Lat., 1.50 mill.

An oblong ochraceous shell, rather stout, with ten whorls, three of them being apical and very small, the rest roundly ribbed, and transversely closely lirate, whorls ventricose and crenulately impressed at the sutures. Mouth round, lip simple,

columella white. We have this species also from Thursday Island. What appears to be another form of the same shell is also in the collection, with darker ochraceous spiral lines across the two last whorls, the longitudinal costæ obscure, and here and there wanting, apical whorls dark-brown.

Rissoia pyrrhacme sp. nov. (Pl. XI., fig. 70).

R. testa oblonga, delicatula, nivea, anfractibus novem (interdum octo), quorum apicalibus tribus, fulvo-ochraceis, cæteris albis, ventricosis, ad suturas crenulato-impresis, longitudinaliter costulatis, spiraliter arcuè sulculosis, apertura rotundo-ovata, labro simplice, paullulum effuso.

Long., 6, Lat., 2 mill.

A pure white ochre-tipped shell, whorls eight or nine, much swollen, longitudinally ribbed, spirally closely sulcate, aperture round, lip simple, a little effuse. We are not yet quite sure of the proper location of this and the preceding species, and only place them provisionally in *Rissoia*. If, indeed, they be *Rissoiæ*, they will, perhaps, be better included in a new section of the genus. Several specimens. (πύρρος ochre red, ἄκμη point).

Mathilda eurytima sp. nov. (Pl. XI., fig. 73).

M. testa delicata, pyramidato-fusiforimi, alba, anfractibus decem, ventricosis, ad suturas impressis, spiraliter acute tricarينات, carinis angulatis, interstitiis longitudinaliter clathratulis, clathris arctis, sub lente concinnis, ultimo anfractu quadricarinato, basi tornata, apertura ovato-rotunda, labro simplice, canali producto.

Long., 6, Lat., 2 mill.

A most delicately lovely, though minute shell. A second specimen having occurred, the first, named provisionally *M. sinensis* by us in our last paper, has been carefully re-examined and found to be distinct from that species. The spiral keels are only three on the upper whorls, as against four in *M. sinensis*, the shell is not of thickened texture, and the

colour is a purer white. The size is about the same. (εὐρύτιμος, honoured, excellent).

Euchelus favosus sp. nov. (Pl. XI., fig. 74).

E. testa conica, perforata, scruposa, candida, apice depresso, planato, anfractibus quatuor, apud suturas profundè canaliculatis, penultimo et antepenultimo transversim bicarinatis, ultimo anfractu sex-carinato (inclusa spirali carina circa umbilicum), carinis longitudinalibus liris inter se junctis, interstitiis alveolatis, vel favosis, carinis elegantissimè acuté crenulatis, umbilico angusto, apertura rotunda, labro extus scruposo, intus planato, margine sicut columellari.

Long., 3, Lat. 2 mill.

Very small, but most beautiful in sculpture. Pure white, four whorled, including the depressed apex; sutures deeply canaliculate, the second and third whorls twice, the last six times keeled, including the spiral keel round the umbilicus, these keels are longitudinally joined by stout liræ, the interstices being honeycombed; the carinæ are most elegantly sharply crenulate all round; the mouth is round, outer lip rough with the edges of the keels, within smooth. Four specimens. (*favosus*, honeycombed).

Leucorhynchia tricarinata sp. nov. (Pl. XI., fig. 75).

*L. testa perdepressa, albida, nitida, obtectè umbilicata, apice planato, anfractibus tribus circa suturas spiraliter crenelliferis, lævissimis, apud peripheriam ultimi anfractus tricarinatis, media carina fortissima, interstitiis carinarum sulcatis, ultimo apud basim circa callositatem peristomalem crenellifero, apertura circulari, peristomate columellarem apud marginem calloso, linguifero, prominente, regionem umbilicarem supra impendente, callositate ipsa sicut in typica *L. caledonica*.*

Alt., 1, Diam. 3 mill.

A third species of *Leucorhynchia* Crosse, which genus we think sufficiently distinct from *Teinostoma* Ad., although M. Paul Fischer and Mr. Pilsbry hold a contrary opinion. From the type *L. Caledonica* Crosse, it differs in the tricarinate peri-

phery, the middle keel being strong, squarely built, and bold and projecting further from the whorl than the two other keels. Shell much depressed, apex papillary, sunk in the spire ; spiral crenellæ run round the sutures and round the peristomial callosity, this being tongue shaped and well nigh concealing the umbilicus. One specimen only, discovered in the mouth of a larger shell by the Rev. Lewis Shackelford.

Alcyna lifuensis sp. nov. (Pl. XI., fig. 76).

A. testa imperforata, minuta, solidiuscula, parum nitida, anfractibus quinque, quorum apicalibus læte puniceis, tribus ultimis albis, transversim interrupto-lineatis, lineis rubris, ultimo anfractu infra, juxta suturas, squarrosè regulariter albispatiato, et apud peripheriam concinnè rubra linea spatio simili alternato, apertura rotunda, labro exteriorè subexpanso, columella ad basim fortiter unidenticulata, denticulo acuto.

Long., 1.75, Lat., 1 mill.

Smaller than *A. rubra* Pease, and differing from all the forms we have seen of it, and likewise of the Japanese *A. ocellata* A. Ad. in the whorls being plainly five in number, and in the different pattern of the interrupted red lines, the shape being more effuse than *A. ocellata*, and the shell smaller than in *A. rubra*. There seem affinities with *A. lineata* Pease from the Hawaiian Islands, of which we have only seen a description, but here the whorls are fewer, the lip is not thickened out, the apex is pink, not white. Though small, it is a very brightly coloured little shell, being five whorled, the whorls slightly swollen, white, with transverse interrupted red lines encircling it spirally, round the periphery these lines are regularly interrupted, leaving equal white spaces, below the suture on the last whorl are square white spaces left bare, the mouth is round, lip slightly effuse, plain ; the columella having a very strong tooth near the base.

Minolia agapeta sp. nov. (Pl. XI., fig. 77).

M. testa minuta, effuso-conica, albida, solidiuscula, anfractibus quinque, turritis, infra suturas angulatis, spiraliter

distinctè et acuté liratis, interstitiis longitudinaliter tenuissimè striatis, ultimo quoque anfractu apud peripheriam angulato, circà angulum suturalem flammis puniceis depicto, ad anguli peripherialis costam puniceo-punctato minoribus etiam punicei coloris punctis hic illic obscurè decorato, umbilico profundo sed angusto, superficie basali simili modo ac superna spiraliter lirata, apertura rotunda, peristomate crassiusculo, paullum reflexo, ferè continuo, intus puniceo-tincto.

Alt. 4, Diam. 4.50 mill.

A smaller species than the other Loyalty Island species of this genus. The shell is five-whorled, including the apical, white, angled below the sutures and in the last whorl, again at the periphery; also painted round the sutures below with crimson coloured equi-distant flames. At the periphery, the spiral rib is encircled with minute pink dots; the whole shell is beautifully acutely spirally striate, the interstices, with the aid of a lens, appear finely striate longitudinally. The mouth is round, peristome thickened, a little reflexed; umbilicus deep, but narrow. A few specimens. (*ἀγάπητος* beloved, choice).

Solariella (Conotrochus) tragema sp. nov. (Pl. XI., fig. 78).

S. testa conica, albo-calcaria, profunde umbilicata, delicata, anfractibus sex, gradatulo-turritis, unangulatis, undique transversim spiraliter costulatis, costis tornatis, interstitiis alveolato-decussatis, inter suturas et angulum anfractuum regulariter flammis puniceis sparsim decoratis, ultimo anfractu apud peripheriam simili modo unangulato, et infra, quadricostato, apud basim umbilico profundo sed angusto, undique spiraliter costulato, ut supra, interstitiis simili modo decussatis, apertura rotundato, peristomate tenui, simplice.

Long., 2.50, Lat. 1.75 mill.

Eight specimens of a small conical chalky-white *Solariella*, colourless excepting for scattered transverse pink flames round the upper parts of the lower whorls just below the sutures. The shell is profoundly but narrowly umbilicate, whorls six, two being apical, slantingly angled in a gradate manner. The sur-

face is closely acutely ribbed, the transverse decussations somewhat noticeable in the interstices, and these in some specimens give a crenulate appearance to the ribs themselves. The base is spirally costulate, as are the upper whorls; the mouth round, outer lip simple. No doubt this species is nearly allied to *Minolia Holdsworthiana* G. Nevill from Ceylon, and *M. singaporensis* Pilsbry, of which we have only seen figures; but it differs from both these species by several salient characters. We are of opinion this group comes nearer *Solariella* than *Minolia*; perhaps it would be well to separate them generically as *Conotrochus* Pilsbry. (τράγμα a delicacy).

Cadulus viperidens sp. nov. (Pl. XI., fig. 79).

C. testa mediocri, subinflexa, perlævi, apud apicem sicut ad aperturam basalem paullum attenuata, delicata, pellucida, lactea, apertura rotunda, margine tenui, apertura posteriore perparva, margine labialiter acuté bifisso, tenui.

Long., 6.50 mill.

Diam., oris, 1 mill., *sp. maj.*

„ *apicalis*, 0.50 „

Several specimens of a somewhat incurved, perfectly smooth, translucent, milky-tinged *Cadulus*, precisely corresponding with unnamed specimens in the British Museum from the shores of North Australia. In form it slightly recalls *C. colubridens* Wats. from New Zealand ('Challenger' Expedition), but is more uniform in width and less ventricose towards the base. It is likewise smaller than either that species, the common tropical *C. gadus* Montagu, or *C. Jeffreysii* Monterosato. The mouth is simple, round, the posterior or apical orifice, also round in diameter, has its edges labially bisected by a sharply-cut channel. The specific name chosen, "viper-fanged," is self-evident from the form.

Tornatina Hadfieldi sp. nov. (Pl. XI., fig. 80).

T. testa oblonga, levissima, recta, tenui, albo-lactea, anfractibus quatuor, ad suturas canaliculatis, ultimo anfractu oblongo, magno, sub lente spiraliter striolato, supra medium

semipellucidis fenestralibus vittatis catenis spiraliter succincto, apertura oblonga, apud basim latiore, labro extus recto, simplice, margine columellari uniplicato.

Long., 4, Lat., 1.50 mill.

A curious species, which, of plain appearance, is relieved by a spiral band on the last whorl, just above the middle, of semi-pellucid window-like filleted catenations; this is not, so far as we can make out, owing to any less deposit of shelly matter, but the whole substance, while as thick, is rendered semi-transparent by some process that needs further study. We do not know of this character in any other species. Many specimens. To this, one of the most interesting of this consignment, we append the name of the discoverers, the Rev. James and Mrs. Hadfield.



The Shell-Boring of Carnivorous Gastropods.—The statement sometimes made that *Purpura* and other carnivorous mollusca instinctively bore their holes over the *vital* parts of their victims is held to be refuted in the new Cambridge Natural History, by a figure which represents diagrammatically the approximate position of the holes bored by *Purpura* in about one hundred specimens of *Mytilus*. The drawing shows the holes to be distributed with tolerable evenness over all parts of the valves. I have obtained the same evidence from an examination of a large number of *Tellina albinella* similarly bored. The refutation, however, does not seem to be clearly established from the above evidence, seeing that a hole in any part of the shell of a *Mytilus* or *Tellina* would enable a *Purpura* with its long proboscis to reach from one end to the other. If we can find instances of mistakes having been made and labour lost, it will be more conclusive. Woodward in his Manual of the Mollusca, mentions such an instance; the case being that of a fossil-spine of a sea-urchin which has evidently been bored by a Gasteropod. Also, in my own collection, I have a specimen of *Chione lamellata* (Lam.), the lamellæ of which have been bored twice, whilst a third hole has been drilled so near the edge that it, too, would have been useless had it been but $\frac{1}{8}$ of an inch nearer the outside of the shell. It would seem from these cases that *Purpura* bores at random. — LEWIS SHACKLEFORD. (Read before the Conchological Society, March 4th, 1896).

Albino forms of *Littorina rudis* var. *tenebrosa*.—In a creek in Brancaster Bay, near Hunstanton, I came upon several individuals of the above form. As it appears to be new, I would suggest the name *tenebrosa-pallida*. (I am aware that this is somewhat Hibernian, but it seems unavoidable).—LIONEL E. ADAMS, Northampton. (Read before the Conchological Society, Aug. 7th, 1895).

INTERESTING KENTISH FORMS.

BY LIONEL E. ADAMS.

(Read before the Conchological Society, Oct. 2nd, 1895).

I HAVE always regarded Kent as the most interesting county in the British Isles in many respects, and certainly I do not know a richer or more varied hunting ground for the conchologist. Without attempting a detailed list of species taken in the county I think a few notes on some of the more interesting or uncommon forms taken during last August (1895) may interest collectors.

Throughout the month I noticed that all land species were a month behind their usual time in maturing their shells, *Helix virgata* being especially backward. Of course their "usual time" is apt to vary in different parts of Britain, but I judge the shells by my observations in the same locality for several seasons, and I attribute their lateness this season to the continued drought during the early part of the year.

Helix lapicida. This species is very abundant in Ewell Wood, where it may be found, as at Birdlip, on the trunks of beech trees, in company with *H. nemoralis*, *H. aspersa*, *B. obscurus*, and *C. elegans*, and a friend suggested that the shells seek refuge thus from the school picnics which take place in this wood. In 1891 I found a remarkable scalariform individual, which I unfortunately broke, and was very gratified to find another almost in the same spot. Mr. H. Westley of Northampton who was collecting with me was fortunate in finding an example of the rare albino form which he kindly gave me.

H. pomatia. At pretty little Charing, where *H. pomatia* may be picked off the hurdles and in the chalk pits, especially amongst the furze, I found an individual with a con-

siderable portion of the epiphragm still remaining naced over so as to become part of the shell. This formation of nacre parallel with the epiphragm is not uncommon, as I have several specimens to show. I took a specimen in this locality in 1891 with a much thickened inner lip, and a detached pearl nearly spherical $4\frac{1}{8} \times 5\frac{1}{2}$ mm., which is the only instance I know of a land pearl.

- H. aspersa** swarms over the whole county, and though there is a certain "family likeness" in the usual form taken in the county, approaching var. *zonata*, there are many striking varieties found. At the foot of the Shakespeare Cliff there is a colony of small shells (hardly *minor*), and thin when compared with others similarly situated. The *unicolor* Moq. (*grisea* Jeff.), 10040 occurs near Canterbury, and the *exalbida* form is by no means rare. The Rev. J. W. Horsley, with whom I spent a most enjoyable week of collecting, drew my attention to its predilection for the "traveller's joy," some plants of which yielded four or five individuals of this variety.
- H. nemoralis** seemed scarce this year compared with its abundance in the same spots on previous occasions.
- H. hortensis**, however, fully compensated for the short coming of its big brother, the following forms being met with :
- Var. *lutea*, 00300, 10345, 10045, 00045, 12045, 00005, 00050.
- Var. *lutea-fuscolabiata*, 00000.
- Var. *albina-fuscolabiata*.
- Var. *albina*, many extremely diaphanous.
- Var. *citrina-zonata*, 00300.
- Var. *carnea*, translucently banded 00300, *fuscolabiata*.
- Var. *carnea-roseolabiata*, 00300.
- Var. *carnea-roseozonata*, 11233(45).
- Var. *lilacina*. It is worthy of remark that the red, white, and lilac forms are very small and diaphanous, though living directly on the chalk.

- H. arbustorum.** This species is particularly fine in Kent, and especially so in the neighbourhood of Dover. At Ewell I paid my periodic visit to the colony of var. *canigonensis* (the only one I know of), and took several specimens.
- H. cantiana.** This species is well named—in no other county does it attain such a size or such deep colouring. I took several pure white forms where I had never seen them before.
- H. cartusiana** seems to be extending its area, and in some places it is certainly more abundant than I have ever known it before. It now occurs from the S. Foreland interruptedly to Hythe. At Patrixbourne there is a colony of the smallest forms of var. *minor* I know; they average $7\frac{1}{2}$ mm., and there are no full-sized ones among them. At Sandwich the shells on the sandhills matured a fortnight later than those on the East Cliff by Dover. These Sandwich shells are very much darker and thinner than those found on the chalk, indeed, so much so, and so universally, that on the Continent they would have a varietal name; var. *arenicola* would be as appropriate in this case as it is not when applied to *H. hortensis*.
- H. caperata** was extremely scarce this year, in fact I only came across one specimen.
- H. virgata.** The largest British forms have long been known to come from Kent, but this year the conditions must have been particularly favourable, a stubble field near Lydden being covered with monsters. Some I have measure 20 mm. in diameter. I have noticed that the *albicans* form is almost invariably smaller than the type found with it, and in this case the largest measures $16\frac{1}{2}$ mm. in diameter. In a single pasture field at Patrixbourne my genial host and I spent one of the hottest mornings I have ever known in England, engaged in filling our tins with the following varieties:—*leucozona*, *lutescens*, *maculata*, *radiata*, *hypozona*, and a new form banded and marked above the periphery,

white below, which I propose to call *epizona* ; *albicans*, *alba* with and without translucent bands. This field was on the slope of a little hill facing N.W. ; at the bottom the shells were of the usual size, but they diminished as they ascended the slope till some very small ones were found (of all the above vars.) measuring 8 mm. in diameter. At the S. Foreland this species is always abundant, but exceptionally so this year ; the shells were to be seen clustering on the thistle and hemlock stems as thickly as the *H. pisana* on the ragwort at Tenby. At Brookland the *nigrescens* and *rufula-zonata* forms occurred.

H. terrestris. Under the guidance of Mr. Horsley I visited the colony of this southern form, and found it (like *H. cartusiana*, *H. virgata*, &c.) aestivating on blades of grass. Mr. Horsley, who has visited the spot periodically since its discovery, says it is steadily increasing and extending its range.

Pupa and Vertigo do not seem to appreciate Kent ; perhaps they find a difficulty in burrowing into the hard and dry chalk.

Succinea putris. There is a picturesque old marsh between Sandwich and Richboro', where, this year, the *S. putris* have surpassed themselves in size and numbers, many measured 19 mm., and some nearly 20 mm.

Limnæa stagnalis and **L. palustris.** These two species swarm in the marshes and dykes from Brookland to Hythe, and in Minster Marsh. This year they are almost invariably marked with white lines or "growth checks," mentioned in Mr. Taylor's "Monograph," part ii, p. 83. It occurred to me that the dry season might have had something to do with the phenomenon, as in many cases the shells were crawling about on the dry mud. As, however, these marks are upon the upper whorls as much as on the lower, we must suppose that some were formed

last year which was not specially dry. Many examples of *L. stagnalis* are very small, some measuring only 20 mm. although they have the full complement of whorls. *L. palustris* on the other hand run very large, even to 28 mm. and proportionately tumid (they are not, however, the form *corvus*). I have also examples of *P. corneus* and *P. complanatus* showing similar growth lines. It may be that this peculiarity has always existed in these waters, and that my attention was directed to it by the mention of it in the "Monograph," but as I have known of it for years, and have not noticed it in these waters before, I think it is exceptionally marked this season.

Paludestrina Jenkinsii. I have suspected this to occur at Rye, and have searched many miles of dykes around that charming old town in vain. But I came upon a single dead specimen of the var. *carinata* in the Military Canal close to Hythe. As there are many more miles of dykes at Rye to explore it may be found there yet. Baltic timber is still landed and stacked there.

NORTHAMPTON, Sept., 1895.



Planorbis carinatus Müll. monst. *scalariforme*.—I send for exhibition at the May meeting, a remarkable scalariform specimen of *Planorbis carinatus*, taken in the brook which runs through Bradgate Park in the Charnwood Forest district, about seven miles from Leicester. The spot where I found it is at a point where several drains converge and keep back the brook, so as to form small lakes, about seven or eight feet deep. During the dry summer of 1894, they were cleaned out, and the refuse thrown out close to the banks, and it was whilst searching these heaps to see if there were any examples of *Unio* or *Anodon* in the lakes that I came across the *Planorbis*. It was a dead but perfect shell. Although I searched long, both on this and subsequent occasions, amongst the thousands of *Planorbis* bleaching on the refuse heaps I failed to find another specimen showing the slightest approach to the scalariform shape.—THOS. EDWARDS. (Read before the Conchological Society, May 13th, 1896).

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AND
LIST OF MEMBERS
OF THE
CONCHOLOGICAL SOCIETY
OF
GREAT BRITAIN & IRELAND.

- 1.—This Society shall be called “**The Conchological Society of Great Britain and Ireland.**”
- 2.—Its objects shall be the promotion of the science of Conchology, by the holding of Meetings for the reading and discussion of original papers, by the publication of proceedings, and by the formation of a Library and Collections illustrative of the science.
- 3.—It shall consist of Ordinary and Honorary Members.
- 4.—Ordinary Members shall be proposed by two Members at one meeting, and balloted for at the next. They shall pay, in advance, on the 1st January in each year, a subscription of 5/—, or may compound for life by the payment of Three Guineas.
- 5.—Composition Fees shall be invested in Books, Cabinets, or other permanent property, or in such other manner as the Council may think most conducive to the benefit of the Society.
- 6.—The number of Honorary Members shall be limited to ten, and they shall be exempt from all payments and have the privileges of Ordinary Members.
- 7.—It shall be governed by a Council, consisting of a President, four Vice-Presidents, a Treasurer, a Secretary, a Curator, a Recorder, a Librarian, and six other members, who shall be elected annually by ballot; the voting paper issued to be returned to the Secretary, under cover of sealed envelope, addressed to the Scrutineers. The President and Secretary of the Leeds and London Branches and such other branches as may afterwards be accepted at an annual meeting shall, *ex officio*, also be members of the Council of the Society.
- 8.—The Presidency shall not be tenable for more than one year continuously, and the President is expected to give an address.
- 9.—The meetings shall be held monthly, at the time and place fixed by the Council, who shall also have power to arrange such additional meetings as they may think desirable.

- 10.—Three shall be a quorum at all meetings.
- 11.—The Annual Meeting shall be held at such time and place as may be fixed at the previous Annual Meeting, to receive the Reports and Balance Sheet of the out-going Council, and to elect a Council and Officers for the ensuing year.
- 12.—The accounts, before being presented, shall be audited by two members, appointed at a previous meeting.
- 13.—The proceedings shall be published periodically, under the direction of the Council.
- 14.—The Capital and Property shall be vested in two Trustees, elected by the Society.
- 15.—No alterations in the rules shall be made, unless by a majority of three-fourths of the members present at a meeting which has been specially summoned.

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 1893. Clark, James, M.A., Ph.D., Ass.R.C.S., Yorkshire College, Leeds.
 1886. Coates, Henry, F.R.S.E., Pitcullen House, Perth,
 1880. Collier, Edwd., 1, Heather Bank, Moss Lane East, Oxford Road, Manchester.
 1895. Collier, Frank, 1, Heather Bank, Moss Lane East, Manchester.
 1892. Cooper, James Eddowes, 93, Southwood Lane, Highgate, London, N.
 1895. Corker, Jas. S., 59, Darncombe Street, Moss Side, Manchester.
 1886. Coulson, Frank, Greenhead Brewery, Greenhead, Glasgow.
 1888. Cox, Chas. Stanley Bell, B.A., M.R.C.S., San Remo, Chelston, Torquay.
 1892. Cravén, Henry Ernest, West Cliff Pharmacy, Whitby.
 1890. Crawford, James, c/o J. C. Kemsley and Co., Port Elizabeth, Cape Colony.
 1889. Crawshaw, Rev. C., Opal House, Emerald St., Saltburn-by-the-Sea.
 1886. Crick, Walter D., 7, Alfred Street, Northampton.
 1896. Crofton, Rev. Addison, M.A., Linton Court, Settle, Yorkshire.
 1888. Crouch, Walter, F.Z.S., Grafton House, Wellesley Road, Wanstead, Essex.
 1879. Cundall, J. W., 21, Elgin Park, Redland, Bristol.
 1886. DaCosta, Solomon J., 2, Craven Hill, London.
 1888. Dale, (Miss) A. M., Hatherley, Bampfylde Rd., Torquay, Devonshire.
 1892. Daniel, Arthur Trevelyan, M.A., Richmond Terrace, Shelton, Stoke-on-Trent.
 1893. Daniel, Frederic E., M.D., 141, Abbey Road, Barrow-in-Furness.
 1886. Darbishire, Robert D., B.A., Victoria Park, Manchester.
 1889. Dawson, Oswald, Seacroft, Leeds; and Albion Walk Chambers, Leeds.
 1892. Dixon, James Bassett, Ribblesdale House, Preston.
 1886. Dodd, B. Sturges, 67, Beech Avenue, New Basford, Nottingham.

1892. Eccles, John Christopher, 20, Winckley Square, Preston.
 1895. Edwards, J. Sumner, Chadwick Lodge, Crown Point Road, Leeds.
 1895. Edwards, Thos., Cliftonville House, Equity Road, Narborough Road, Leicester.
 1891. Elgar, Hubert, 3, St. Michael's Terrace, Fant Road, Maidstone, Kent.
 1884. Elliot, Edward J., High Street, Stroud, Gloucestershire.
 1888. Evans, (Mrs.) A., sen., Brimscombe Court, Thrupp, near Stroud.
 1894. Evans, Wm., F.R.S.E., 18A, Morningside Park, Edinburgh.
 1886. Eyre, Rev. W. L. W., M.A., Swarraton Rectory, Alresford, Hants.
 1889. Falloon, (Mrs.) Barbara J., Christchurch Vicarage, Dover.
 1891. Farrer, Captain Wm. James, Chapel House, Bassenthwaite, Keswick.
 1890. Fierke, Frederick Wm., 52, Francis Street West, Hull.
 1884. Fitzgerald, Rev. H. Purefoy, Wellington College, Berks.
 1886. Fitzgerald, (Mrs.) J., 10, West Terrace, Folkestone, Kent.
 1892. Fulton, Hugh, 216, King's Road, Chelsea, London, S.W.
 1886. Gain, Wm. Albert, Tuxford, Newark, Notts.
 1895. Gamble, Frederick Wm., M.Sc. (Vict.), The Owens College, Manchester.
 1896. Garnett, Roland, 175, Lee Street, Oldham.
 1896. Garstang, Walter, M.A., Fellow of Lincoln College, Oxford.
 1889. Gaskell, Roger, M.A., 5, The Grove, Highgate, London, N.
 1887. Gerland, Conrad, M.Sc., Ph.D., F.C.S., etc., Accrington, Lancashire
 1886. *Z* Godlee, Theo., Whips Cross, Walthamstow, Essex.
 1886. Greene, Rev. Carleton, M.A., Great Barford Vicarage, St. Neots.
 1890. Gude, G. K., 5, Giesbach Road, Upper Holloway, London, N.
 1892. Guppy, R. J. Lechmere, 26, Queen's Terr., Port of Spain, Trinidad.
 1886. Gwatkin, Rev. Prof. H. M., M.A., 8, Scrope Terrace, Cambridge.
 1891. Hadow, Gerald Elliot, M.A., South Cerney Vicarage, Cirencester.
 1887. Hanley, Sylvanus, F.L.S., Hanley Road, Hornsey Road, London, N.
 1895. Hann, Rev. Adam, 7, Harewood Terrace, Thornaby-on-Tees.
 1895. Hardy, John Ray, The Museum, Owens College, Manchester.
 1895. Hardy, John, 11, Stockton Road, Chorlton-cum-Hardy, near Manchester.
 1887. Hargreaves, J. A., 3, Ramshill Road, Scarborough, Yorkshire.
 1889. Hartley, Alfred, 14, Croft Street, Idle, near Bradford, Yorkshire.
 1887. Harvard, T. Mawson, 16, Radford Road, Hither Green, Lewisham, London, S.E.
 1891. Hawell, Rev. John, M.A., Vicarage, Ingleby Greenhow, Middlesbrough.
 1891. Hawes, Alfred, Penistone, Yorkshire.
 1887. Heathcote, Wm. Henry, F.L.S., 47, Frenchwood Street, Preston.
 1889. Hedworth, Thos. H., 1, Railway Terr., Dunston, Gateshead-on-Tyne.
 1888. Heitland, (Mrs.) M., The Priory, Shrewsbury.
 1878. Hepburn, Frederick, B.A., Sutton, Surrey.
 1896. Herdman, Prof. W. A., D.Sc., F.R.S., University College, Liverpool.
 1887. Hey, Thomas, 8, Bloomfield Street, Derby.

1887. Hey, Rev. Wm. Croser, M.A., Derwent House, West Ayton, Seamer, York.
1895. Hibbert, Charles R. C., Riccard's Down, Abbotsham, Bideford.
1895. Hickson, Prof. Sydney J., D.Sc., M.A., F.R.S., The Owens College, Manchester.
1893. Hill, John, Little Eaton, near Derby.
1886. Hillman, Thomas Stanton, Eastgate Street, Lewes, Sussex.
1888. Hodgson, (Mrs.) Julia, Chalgrave Vicarage, Leighton Buzzard, Bedfordshire.
1886. Holmes, W. J. O., F.L.S., Strumpshaw Hall, Norwich.
1891. Horsley, Rev. J. W., St. Peter's Rectory, Walworth, London, S.E.
1884. Howell, George O., 210, Eglinton Road, Plumstead, Kent.
1892. Howorth, Sir Henry Hoyle, K.C.I.E., M.P., F.S.A., etc., Bentcliffe House, Eccles, Manchester.
1886. Hoyle, W. E., M.A., M.Sc., M.R.C.S., F.R.S.E., Keeper of the Manchester Museum, Owens College, Manchester.
1895. Hudson, Rev. Hy. A., 1, Johnson Street, Cheetham, Manchester.
1886. James, John H., A.R.I. Cornwall, 3, Truro Veau Terrace, Truro, Cornwall.
1891. Jenner, James Herbert Augustus, F.E.S., 4, East Street, Lewes.
1894. Jones, Kenneth Hurlstone, St. Bride's Rectory, Old Trafford, Manchester.
1888. Jones, Wm. Jas., jun., 76, Mayes Road, Woodgreen, London, N.
1889. Jordan, H. K., F.G.S., The Knoll, Clytha Park, Newport, Monmouthshire.
1887. Kew, H. Wallis, F.Z.S., 157, Ferme Park Rd., Hornsey, London, N.
1895. Killingbeck, J. H., Didsbury, near Manchester.
1889. Knight, Rev. G. A. Frank, M.A., Almanarre, Gareloch Head, N.B.
1879. Laver, Henry, M.R.C.S., F.L.S., Head Street, Colchester, Essex.
1894. Lawson, Peter, 11, The Broadway, Walham Green, London, S.W.
1892. Layard, Edgar Leopold, C.M.G., F.Z.S., etc., Otterbourne, Budleigh Salterton, South Devon.
1878. Leicester, Alfd., Buckhurst Farm, near Edenbridge, Kent.
1889. Linter, (Miss) J. E., Arragon Close, Twickenham, Middlesex.
1896. Linton, John, 157, Muntz Street, Smallheath, Birmingham.
1895. Loydell, A., 19, Chaucer Road, Acton, London, W.
1891. Lyons, Lady, Admiralty House, Devonport.
1889. MacAndrews, James J., Lukesland, Ivy Bridge, Devonshire.
1885. McKean, Kenneth, F.L.S., Lloyds, London, E.C.
1886. McMurtrie, Rev. John, M.A., D.D., 5, Inverleith Place, Edinburgh.
1884. Madison, James, 167, Bradford Street, Birmingham.
1885. Marquand, Ernest D., Fermain House, Guernsey.
1887. Marshall, J. T., Sevenoaks, Torquay, Devonshire.
1887. Masefield, John R. B., M.A., Rosehill, Cheadle, Staffordshire.
1888. Mason, Philip Brooke, J.P., M.R.C.S., F.L.S., F.Z.S., Trent House, Burton-on-Trent.
1889. Mayfield, Arthur, Mendlesham, Stowmarket, Suffolk.

1880. Melvill, James Cosmo, M.A., F.L.S., Brook House, Prestwich, Manchester.
1891. Middleton, Robert, Gledhow, near Leeds.
1888. Milne, J. Grafton, Mansfield House, Canning Town, London, E.
1879. Milnes, Rev. Herbert, M.A., The Friars, Priory St., Cheltenham.
1891. Mitchell, James, 240, Darnley Street, Pollokshields, Glasgow.
1891. Morris, Cecil Herbert, Lewes, Sussex.
1891. Moss, William, F.C.A., 13, Milton Place, Ashton-under-Lyne.
1887. Newstead, A. H. L., B.A., Roseacre, Epping.
1891. Newton, Richard Bullen, F.G.S., 7, Melrose Gardens, West Kensington Park, London, W.
1890. Nicholson, John, Chapeltown, Pudsey, Yorkshire.
1891. Norman, Rev. Canon Alfred Merle, D.C.L., F.R.S., F.L.S., etc., Houghton-le-Spring, Durham.
1887. Oldham, Charles, Romiley, Cheshire.
1896. Overton, Harry, Brookdale, Tudor Hill, Sutton Coldfield, Warwickshire.
1882. Parke, George H., F.L.S., F.G.S., St. John's, Wakefield.
1887. Parry, Lieut.-Col. G. S., 18, Hyde Gardens, Eastbourne, Sussex.
1886. Pearce, Rev. S. Spencer, M.A., Long Combe Vicarage, near Woodstock, Oxfordshire.
1896. Percival, A. Blayney, Somerset Court, Brent Knoll, Somerset.
1896. Phillips, Robert Albert, Ashburton, Cork.
1886. Ponsonby, John H., F.Z.S., 15, Chesham Place, London, S.W.
1895. Powell, (Mrs.) A., Nant-y-Velin, Criccieth, N. Wales.
1888. Radcliffe, John, 111, Oxford Street, Ashton-under-Lyne.
1896. Ragdale, John Rowland, The Beeches, Whitefield, near Manchester.
1887. Reader, Thomas W., F.G.S., 171, Hemingford Road, Barnsbury, London, N.
1896. Renshaw, Graham, Sale Bridge House, Sale.
1896. Rhodes, John, F.E.S., 360, Blackburn Road, Accrington.
- O
- Roebuck, Wm. Denison, F.L.S., Sunny Bank, Leeds.
1886. Rogers, Thomas, 27, Oldham Road, Manchester.
1893. Roseburgh, John, 54, Market Street, Galashiels.
1892. Rosevear, John Burman, 113, New King's Rd., Fulham, London, S.W.
1893. Rufford, Philip James, 1, Gloucester Place, The Croft, Hastings.
1877. Scharff, Robert F., Ph.D., B.Sc., M.R.I.A., Curator of the Natural History Museum, Dublin; 9, Leeson Park, Dublin.
1893. Scharff, W. E., c/o Edwards, Scharff & Co., Bradford.
1895. Schill, C. H., Broome House, Didsbury, near Manchester.
1886. Scott, Thomas, F.L.S., 14, Lorne Street, Leith, N.B.
1893. Shackelford, Rev. Lewis John, 14, Edna Street, Crumpsall.
1887. Shaw, Alexander, 145, New City Road, Glasgow.
1892. Shillito, John G., 20, Elmore Road, Sheffield.
1895. Sich, Alfred, F.E.S., Villa Amalinda, Burlington Lane, Chiswick, Middlesex.
1896. Sidebotham, Dr. E. J., Erlesdene, Bowdon, Cheshire.
1884. Skilton, (Mrs.) Mary, 21, London Road, Brentford, Middlesex.

1886. Smart, Rev. R. W. J., M.A., Parkham Rectory, Bideford, N. Devon.
 1886. Smith, Edgar A., F.Z.S., Natural History Museum, S. Kensington, London, S.W.
 1892. Smith, Mrs. Louisa J., Monmouth House, Monmouth Street, Topsham, Exeter.
 1894. Smith, Wm. Chas., Vanston Ho., 7, Vanston Place, Walham Green, Fulham, London, S.W.
 1896. Smith, Wm. Rayson, Harleston, Norfolk.
 1886. L Somerville, Alexander, B.Sc., F.L.S., 4, Bute Mansions, Hillhead, Glasgow.
 1887. Somerville, Rev. James E., M.A., B.D., Castellar, Crieff, N.B.
 1886. Sowerby, Geo. Brettingham, F.L.S., 121, Fulham Rd., London, S.W.
 1892. Span, Bartlet, Heywood Mount, Tenby, South Wales.
 1896. Sparkes, Thomas, 92, Heywood Street, Moss Side, Manchester.
 1886. Standen, Robert, 40, Palmerston Street, Moss Side, Manchester.
 1888. Stanley, Frederick, Rokeby, Edgar Road, Margate, Kent.
 1888. Stirrup, Mark, F.G.S., High Thorn, Bowdon, near Manchester.
 1896. Stonestreet, Rev. W. T., 12, Wellington Street, Higher Broughton, Manchester.
 1888. Storrs, Rev. George Godwyn, B.A., Woking Village, Surrey.
 1885. Storey, J. A., B.A., St. Joseph's, High School, Cardiff.
 1890. Stubbs, Arthur Goodwin, Clevedon Villas, Tuffley, Gloucester.
 1893. Stump, Edward Constadine, 16, Herbert St., Moss Side, Manchester.
 1895. Swanton, E. W., Bratton St. Maur, Wincanton, Somerset.
 1895. Sykes, Robert Dardsley, Lostock Hall, near Preston.
 1888. Sykes, Ernest Ruthven, B.A., 3, Gray's Inn Place, Gray's Inn, London.
 1895. Taylor, Frederick, 38, Landseer Street, Park Road, Oldham.
 1886. Taylor, (Miss) Helen L., Woodside, Rowditch, Derby.
 O Taylor, John W., F.L.S., Spring Bank, Horsforth, Leeds.
 1895. Thompson, Isaac C., F.L.S., 53, Croxteth Road, Liverpool.
 1886. Tomlin, J. R. Brockton, B.A., The Green, Llandaff.
 1896. Tregelles, George Fox, 5, Clarence Place, Barnstaple.
 1886. Turner, Rev. Wm., Lanville, Liberton, Edinburgh.
 1880. Tye, G. Sherriff, 10, Richmond Road, Handsworth, Birmingham.
 1895. Viney, George Shepherd, 197, Moss Lane East, Moss Side, Manchester.
 1891. Walker, Bryant, 18, Moffat Building, Detroit, Michigan, U.S.A.
 1896. Wallace, Harry Simpson, Art Gallery, Newcastle-on-Tyne.
 1890. Warren, (Miss) Amy, Moyview, Ballina, Co. Mayo, Ireland.
 1886. Watson, Rev. Robert Boog, LL.D., B.A., F.R.S.E., F.L.S., Free Church Manse, Cardross, Dumbartonshire.
 1895. Webb, Wilfred Mark, F.Z.S., Ellerie, Crescent Road, Brentwood, Essex.
 1895. Welch, Robert John, 49, Lonsdale Street, Belfast.
 1886. Whitwell, Wm., F.L.S., 4, Thurleigh Road, Balham, London, S.W.
 1895. Wigglesworth, Robert, 13, Arthur Street, Clayton-le-Moors, Lancashire.

1893. Williams, Ernest W., Boif Street, Bridgetown, Barbados, B.W.I.
 1889. Williams, John M., 4, Exchange Alley, Liverpool.
 1891. Williamson, Rev. Charles Arthur, M.A., 14, Upper Mount Street, Dublin.
 1890. Wood, Albert, Midland Lodge, Sutton Coldfield, Warwickshire.
 1886. Woodward, Bernard B., F.G.S., F.R.M.S., 120, The Grove, Ealing, London, W.
 1886. Wotton, F. W., 42, Sotheby Road, Highbury, London, N.
 1895. Wright, Charles East, Orchard View, Kettering.

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OBITUARY NOTICE.

David Robertson, LL.D.

SINCE our last meeting a notable figure has passed away—DAVID ROBERTSON, the “grand old man” of Cumbrae is no more. Born in Glasgow in 1806, his boyhood and youth were a constant struggle against adverse circumstances. Whilst attending classes at the University, he was teaching his landlady’s children and giving other lessons to pay his way. He and his young wife started in business with a capital of only £7, but with a large stock of sterling honesty and determination, and in the end success awaited their efforts. He studied with ardour several branches of natural history, especially the minute fossils of the glacial clays, and the marine fauna of the Firth of Clyde, filling note-book after note-book with the records of his observations, and contributing more sparingly to the proceedings of learned societies. Dr. Robertson’s contributions to malacological science included papers on *Saxicava rugosa*, *Purpura lapillus*, and *Scaphander lignarius*, as well as a series of careful and ingenious observations on the habits of the common Limpet. Even to the last he spent several hours daily at his favourite studies. Simple, kindly, and unostentatious, he made friends of all with whom he came in contact, whilst his merits as a man of science were cordially recognized by such men as Koelliker, Sars, and Dohrn, and eventually by his own University, which recently conferred upon him the degree of LL.D.—W.E.H. (*Abstract of a communication made to the Society, Dec. 9th, 1896*). (Doyle)

CONCHOLOGICAL SOCIETY
OF GREAT BRITAIN AND IRELAND.

—
PROCEEDINGS.
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254th MEETING, OCTOBER 14th, 1896.

Held in the Manchester Museum, Owens College.

Prof. S. J. Hickson, President, in the chair.

Donations to the Library announced and thanks voted :

Transactions Royal Society South Australia, part 3, June, 1896 ; Journal de Conchyliologie, vol. 43, No. 4 ; "*Limnæa peregra*," by Wm. Nelson ; Report of Trustees, Australian Museum, 1895 ; Irish Naturalist, vol. 5, No. 10 ; La Feuille des Jeunes Naturalistes, No. 312, Oct., 1896 ; Annals of Scottish Natural History, No. 20, Oct., 1896 ; New British Mollusca, by H. K. Jordan ; Science Gossip, vol. 3, n.s., No. 29, Oct., 1896 ; The Naturalist, No. 255, Oct., 1896.

Candidates Proposed for Membership :

Messrs. John Linton, and Harold Barke, and Rev. M. T. Stonestreet.

Resignation :

Mr. Henry Crowther.

Papers read :

"Descriptions of eighty new species of marine shells from Lifu, Loyalty Islands," by J. Cosmo Melvill and Robert Standen.

"The mollusca of Plumstead Marshes," by Rev. J. W. Horsley.

Annual Report of Leeds Branch.

Exhibits :

By J. C. Melvill and R. Standen : Eighty new species of marine shells from Lifu (types), to illustrate their paper.

By Rev. J. W. Horsley : A fine series of living *Helix hortensis* from Swanley, Kent, showing many beautiful colour forms—*lilacina*, *incarnata*, *arenicola*, *lutea*, and *roseolabiata*, and the rare band form 00300 ; also living examples of *Helix terrestris* from Dover.

By Edward Collier : *Limnæa* and *Pisidia* from stomach of trout caught in an Irish lough by Mr. E. L. Layard.

By R. Standen : *Limnæa gracilis* from Hamilton, Ontario, *L. peregra* var. *tenera* from Upholland near Wigan, and *Buccinum undatum* monst. *carinatum*.

By the Manchester Museum : A number of rare and very fine shells, recently presented, including two specimens of *Scalardia magnifica*, two *Rostellaria Powisi*, *Lyonsia saxicava* from Vancouver ; *Yoldia thraciaciformis* from Massachusetts and Vancouver ; *Pholas latissima* from Philippines ; *Trigonia pectinata*, *T. dubia*, and *T. Lamarcki* from Tasmania and Australia ; *Cuspidaria chinensis*, *Anatina lanterna* and *Cuttellus maximus* from China ; *Loripes philippinarum* from Australia ; *Glycimeris siliqua* from

Newfoundland; *Modiola vagina* from Moreton Bay; *Raeta undulata* and *R. canaliculata* from S. Carolina; *Platyodon cancellatum* from California; *Gastrochaena gigantea* from Mauritius; *Hemicardium cardissa*, and *Myochama anomoides*.

255th MEETING, NOVEMBER 11th, 1896.

Held in the Manchester Museum, Owens College.

Mr. J. Cosmo Melvill, Vice-President, in the chair.

Donations to the Library announced and thanks voted:

Transactions Royal Society South Australia, vol. 20, part 1, 1896; Insular Land Shell Faunas, especially as illustrated by the data obtained by Dr. G. Baur in the Galapagos Islands, by W. H. Dall; Irish Naturalist, vol. 5, no. 2, Nov. 1896; The Naturalist, no. 256, Nov. 1896; Journal of Malacology, no. 3, vol. 5, Sep. 1896; Science Gossip, new series, vol. 3, no. 30, Nov. 1896; La Feuille des Jeunes Naturalistes, no. 313, Nov. 1896; Armature of Helicoid Land Shells, by G. K. Gude (*from the author*).

New Members elected:

Mr. John Linton, 157, Muntz Street, Smallheath, Birmingham.

Mr. Harold Barke, 195, Upper Brook Street, Chorlton-on-Medlock, Manchester.

Rev. W. T. Stonestreet, 12, Wellington Street, Higher Broughton, Manchester.

Candidate Proposed for Membership:

Mr. Roland Garnett.

Papers Read:

“Notes on the Land Shells of Ballycastle district, county Antrim, Ireland,” by Robert Standen and John Ray Hardy.

“Notes on some Shells dredged off Rathlin Island and Ballycastle, county Antrim, Ireland,” by G. W. Chaster.

Mr. Edward Collier read an interesting letter from Mr. E. L. Layard relating to the *Limnæa* found in some Irish loughs.

Exhibits:

By Messrs. R. Standen and J. R. Hardy: A collection of the Land Shells of Ballycastle, county Antrim, in illustration of their paper.

By Dr. G. W. Chaster: Specimens of the principal species mentioned in his paper, including *Adeorbis* sp. nov., *Portlandia pusilla* Jeff., *Homaogyra polyzona* Brus., and many others.

By Mr. A. G. Stubbs: A fine series of *Helix pisana* from Tenby, *Helix rufescens* type, vars. *rubens* and *alba* from Cooper’s Hill, Gloucester, var. *albocincta* from Waterwynch, and var. *depressa* from Wreck Field, Tenby. These were presented to the Society by Mr. Stubbs, and the thanks of the meeting were voted to him for this valuable addition to the collection.

By Mr. Edward Collier: *Limnæa peregra* var. *lacustris* and *Pisidium pusillum* from stomach of trout taken in an Irish lough, *Limnæa auricularia*

var. *Monnardi* from Lake Constance, and a specimen of var. *alpicola* Westl. named by Westerlund himself, and purchased from the Morelet collection.

By Mr. J. Ray Hardy: A fine series of *Clausilia perversa* from many stations in Kerry, Antrim, Sligo, and elsewhere, showing variability in form from var. *gracilis* in the south to var. *tumidula* in the north.

256th MEETING, DECEMBER 9th, 1896.

Held in the Manchester Museum, Owens College.

Mr. Edward Collier in the chair.

Donations to the Library announced and thanks voted:

The Naturalist, no. 257, Dec. 1896; Journ. and Proc. Roy. Soc. New South Wales, vol. 29, 1895; Journ. and Proc. of the Hamilton Association, no. 12, 1896; Memoirs and Proc. Manchester Lit. and Phil. Soc., vol. 41, part I, and List of Members; The Irish Naturalist, vol. 5, no. 12, Dec. 1896; Armature of Helicoid Land-shells, part 2, by G. K. Gude (*from the author*); La Feuille des Jeunes Naturalistes, series 3, no. 314, Dec. 1896.

New Member elected:

Mr. Roland Garnett, 175, Lee Street, Oldham.

Candidates Proposed for Membership:

Rev. Thos. Cook and Mr. A. S. Kennard.

Resignation:

Mr. A. Chopin.

Papers read:

"Obituary Notice of the late David Robertson, LL.D.," by W. E. Hoyle.

"The Marine Shells of Scilly," by J. T. Marshall.

"Shells collected at Corbeyrier, S. Aigle, Rhone Valley, Switzerland, in September, 1896," by Edward Collier.

Exhibits:

Mr. Edward Collier exhibited specimens of *Hyalinia glaber* var. *Barraudi* Moq., *H. nitidula*, *H. pura*, *H. crystallina*, *H. fulva*, *Helix rotundata*, *H. obvoluta*, *H. personata*, *H. hispida*, *H. aculeata*, *H. villosa*, *H. incarnata*, *H. fruticum*, *H. strigella*, *H. arbustorum*, *H. nemoralis*, *H. hortensis*, *H. sylvatica*, *H. pomatia*, *H. ericetorum*, *H. candidula*, *Buliminus montanus*, *B. obscurus*, *Cionella lubrica*, *Pupa secale*, *P. avenacea*, *Clausilia laminata*, *C. parvula*, *C. cruciata*, *Pomatias septemspiralis* and var. *alba*, in illustration of his paper.

Mr. F. Taylor exhibited *Pisidium fontinale* from Oldham Park, *P. pusillum* from Felton Hill near Oldham, and *Valvata piscinalis*, also an abnormal shell of *Amalia marginata* from the Isle of Man.

Mr. R. Standen exhibited *Acme lineata* and var. *alba*, *Pupa anglica* and var. *pallida*, and *Hyalinia alliaria* var. *viridula* from Helen's Bay, county Down, Ireland, collected by Captain W. J. Farrer.

It was resolved that members should be invited to bring or send to the January meeting examples of Australian *Helices* of the group *H. Fraseri*.

ANNUAL REPORT OF THE LEEDS BRANCH.

Since the last Annual Meeting of the Society a Branch has been formed at Leeds, with Mr. William Nelson as President, and Mr. Henry Crowther as Hon. Secretary, for the first year.

Papers read :

Crossgates meeting, October 10th, 1895, Mr. William Nelson, on "*Limnæa peregra*."

Huddersfield Meeting, January 11th, 1896, Mr. Joseph Whitwham, on "The Distribution and Variation of Freshwater Mussels."

Leeds meeting, February 22nd, 1896, Mr. Hy. Crowther, on "Some Chemical and Physical Properties of Molluscs."

Horsforth meeting, July 4th, 1896, Mr. John W. Taylor, on "The Internal Organisation of *Limnæa peregra*."

The Annual Meeting was held at the Leeds Museum, on Saturday, November 28th, 1896, the President, Mr. Wm. Nelson, in the chair. The annual report, presented by the Hon. Secretary, Mr. Hy. Crowther, dealt with the formation of the new Leeds Society by the original founders of the Conchological Society of Great Britain and Ireland, whose head-quarters are now at the Manchester Museum. Four original contributions had been made to the Society during the year, by Messrs. W. Nelson, J. Whitwham, H. Crowther, and J. W. Taylor, on "*Limnæa peregra* as a species," "Variation of British *Unionide*," "Some Chemical and Physical Properties of Molluscs," and "The Internal Organization of *Limnæa peregra*." Mr. A. G. Stubbs contributed a paper on "*Helix pisana* at Tenby."

The average attendance was twelve.

As the officers are changed annually, those retiring do not seek re-election; Mr. J. W. Taylor was elected President, and Mr. Wm. Nelson Hon. Secretary.

An exhibit of unique British land and freshwater shells was made on behalf of Mr. A. G. Stubbs, of Tenby, which included two double-mouthed shells, one of *Pupa cylindracea* from Tenby, and of *P. secale* from Gloucester. The meeting concluded with a lecture, illustrated by lime-light views, by Mr. Henry Crowther, on "The Yorkshire Home of *Unio margaritifera*."

HENRY CROWTHER, *Hon. Sec.*

LONDON BRANCH.

MEETING, NOVEMBER 6th.

Held at Walham Green, by invitation of Mr. Wm. C. Smith, when a pleasant evening passed in looking over Mr. Smith's collection. This comprised a considerable number of marine species, some very large Uniones (from North America), and a few good Helices. We noticed the curiously-flattened *Tellidora burnetti* Brod. and Sow. from California. The

Rev. J. W. Horsley exhibited, on behalf of Mr. A. G. Stubbs, a very fine series of *Helix virgata* from Tenby. Mr. Cooper showed specimens of *Cardium edule* from Tilbury and Southwold to illustrate the influence of fresh water on the shape and texture of the shell.

MEETING, DECEMBER 10TH.

Held at 2, Craven Hill, W., by invitation of Mr. S. J. DaCosta, who very kindly exhibited a portion of his very fine collection. We particularly noticed the exceedingly good series of *Bulimus* and its allies (chiefly Central American) comprising several types and a number of rare shells. Also worthy of note were a fine series of West Indian *Helices* and a beautiful set of *Cochlostyla*. A drawer full of brilliant *Amphidromi* was much admired, and so was the excellent set of *Opisthostoma*. There were also some of the curious mollusca from Lake Tanganyika. Among the marine shells, some gorgeous species of *Pecten* attracted attention. The *Cyprææ* also were choice, and there was a very pretty set of *Pteropoda*. One evening was quite insufficient to see all the rarities Mr. DaCosta possesses.

J. E. COOPER, *Hon. Sec.*

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The Collector's Manual of British Land and Freshwater Shells,
by LIONEL E. ADAMS, B.A. Second edition. Taylor Bros., Leeds,
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That a second edition of Adams' excellent manual has been called for is a gratifying testimony to the value and usefulness of the work. For the re-issue, the text has been almost entirely re-written and brought fully abreast of the day, and the work now forms a handsome volume, containing 214 pages of text and eleven plates, the frontispiece being a beautifully-executed colotype plate, with enlarged and strikingly-pourtrayed figures of correctly-identified types of the British species of *Pisidium*. Anyone who has laboured to separate the various species of this puzzling group of shells, will appreciate the real help furnished by these large and exquisite representations. Nine plates are devoted to the presentation of faithfully-coloured figures of all the British species, which can hardly fail to greatly aid the identification of doubtful shells, while Plate XI. contains a series of instructive figures explanatory of the more usual terms employed in connection with the animal and shell. The text may be broadly divided into an introductory part, a descriptive and systematic part, and a concluding section, dealing with the comital distribution of the various species. The introductory chapters are chiefly devoted to a concise yet clear and interesting description of the most successful methods and appliances for collecting, and an account of the most suitable and most modern systems to be adopted for the preparation, preservation, arrangement, and display in the cabinet of the animals and their

shells. The systematic arrangement and description of the various families, genera, species, and varieties, with the interesting and often valuable original observations under each species form the bulk of the volume, which is altogether practical in its scope and aim, and will be found of great service to the practised conchologist, and indispensable to the beginner, as Mr. Adams has with conspicuous ability and success compiled with great care a series of six elaborate and thoughtfully-arranged synoptical tables, to facilitate comparison, and to shew at a glance the characters which distinguish the closely-allied species composing those perplexing genera, *Arion*, *Hyalinia*, *Vertigo* and *Pisidium*, and also tabulates the differences separating the various generic groups of slugs. In addition, the author has with great judgment collated and to some extent classified the chief variations to which each species is known to be subject, and with a wise discrimination has omitted many of the species and varieties which have been described of late years. This feature of the book, as shewing a scientific appreciation of the differences impressed on the shell by a varying environment, may also be viewed as a practical response to the earnest call by all enlightened modern students for more precision and accuracy of detail in scientific observations generally, and though we may be unable to perceive the bearing or even the utility of precision in every branch of the subject of our study, yet we may rest assured that the faithful chronicling of observations or even the discrimination of the chief differences exhibited by the various species, and as a necessary convenience their distinction by suitable names, will all contribute to the great storehouse of facts, from which important generalizations will yet be drawn. Following the systematic portion of the work is a very copious and accented glossary of the various scientific and technical terms used in the book, and the work is concluded by a comital census of the distribution of the various species, as verified by the referees of the society. These tables contain under the head of each county or vice-county an enumeration of the species actually known to exist therein, and are the results of many years' patient examination of specimens from every part of the kingdom. A more expeditious progress of this census is very desirable, and it is to be regretted that other competent conchologists do not lend their aid to accelerate its completion. In conclusion, we have much pleasure in recognizing this work as decidedly the best manual upon the subject, and as one which can hardly fail to act as a strong incentive to a more active prosecution of the study of our land and freshwater mollusca.

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ADDITIONS TO "BRITISH CONCHOLOGY."

BY J. T. MARSHALL.

(Read before the Conchological Society February 8, 1896).

IN continuation of my papers published under the above title, I now proceed to give the additional localities and depths for British marine shells which have accumulated since the publication of "British Conchology." I have also noted the range of depth where it differs from that work, which it does in many instances. And I have added some remarks bearing on various species which I hope will be found more or less interesting. Where no authority is given for the localities and depths, they are to be ascribed to the writer.

It will be understood that the following Notes should be read in connection with "British Conchology," as they purport to be only additional or supplemental to that work. Also, that I make no claim in these Papers to put everything and everybody right, but merely as a naturalist to record what I have learnt and what I know. Previous Papers of this series will be found in the Journal of Conchology for October, 1893; April and July, 1894; and January and April, 1895.

BRACHIOPODA.

Terebratula cranium Müll.—Sowerby's figure of this species appears to have been taken from a specimen of *T. vitrea*, judging from the only character that can be observed in an engraved figure—the foramen. Jeffreys' figure, as well as that in "British Mollusca," is correct, and shows a very different foramen, oval and wide, while *T. vitrea* has a small circular one, exactly as in Sowerby's figure. Excepting this difference in the foramen, the two species are very much alike, although *T. vitrea* attains a much greater size.

In Jeffreys' explanation of his generic plate i, at the end of vol. 2, he gives 1a as *T. cranium*, but the plate contains no such figure nor number.

T. caput-serpentis L.—The MacAndrew collection contains specimens from the British Channel, "a new locality if correct, but not astonishing, as it ranges from N. America to Japan" (Cooke). Not confirmed by the "Porcupine" dredgings, though *T. cranium* and *T. septata* occurred there.

Var. **septentrionalis** Couth.—Corea, 35 fath. (H.M.S. "Sylvia")!

Terebratella spitzbergensis Dav. — Færce Channel ("Triton")!

Argiope decollata Chem.—Scilly Islands, 40 f. (Burkill and J.T.M.); off Fermain Bay, Guernsey, 16 f.

A. cistellula S. Wood.—Shelly or gravelly ground, 12—95 f. Scilly, 40 f. (Burkill and J.T.M.); Lynn of Morven, 40 f. (Knight)!; Weymouth Bay (Damon)!; Sound of Sleat, 30—90 f.; Gairloch, 12—30 f.; Loch Boisdale, 20f.; Barra, 45 f. (Somerville and J.T.M.); Eddystone, 30 f.; W. Orkneys, 45 f.

Jeffreys' figure is useless except as an outline, and that varies considerably; but his generic figures are very good. The figure in Sowerby's "Index" is a good one, but the dimensions are double what they should be. The *A. seminulum* of the latter work is an *A. cistellula* with the beak abnormally produced.

Gwynia capsula Jeff.—Low water to 25 fathoms. Iona, 20 f. (Somerville and J.T.M.); various parts of Jersey at extreme low water (Duprey and J.T.M.). In the latter locality they live under large embedded stones, the larger the stone the better the yield. Sometimes these stones are so deeply sunk in the sand as to require a lever to raise them. The specimens are at first very difficult to detect on account of their minute size and the sandy condition of the stone; but the best way to detect them is to turn a likely stone to the sunlight, and dash a handful of water over it. This will clear the stone of sand and grit, and show up the *Gwynia*. The Jersey specimens, minute as they are, are giants compared

with those from Iona and other localities. The former usually attain one-third of a line, but the latter are only one-fourth the bulk. *Gæwynia* does not vary in shape like *Argiope*, but is always uniform.

Crania anomala Müll.—Low water to 90 f. It is difficult to procure the undervalue, as it practically becomes part of the rock to which it attaches itself.

Var. **alba** Jeff.—Oban (Heathcote and Chaster). Adventure Bank, Mediterranean, 92 f.

PELECYPODA.

Anomia ephippium L.—Forbes & Hanley give good figures of vars. *aculeata* and *squamula* in "British Mollusca."

A. patelliformis L.—Low water to 86 f. The var. *striata* occurs in the estuarine deposits of N.E. Ireland (Praeger)!

Pecten pusio L.—Jeffreys quotes "Shetland to Cornwall, 5—85 fathoms," for this species, but it is a well-known Channel Islands' shell, where it lives at low-water mark. It may also occasionally be taken at low water in South Devon.

P. varius var. **purpurea** Jeff.—Bristol Channel. L. 3'0; B. 2'50 in.

P. opercularis var. **tumida** Jeff.—Aberdeenshire (Simpson)!
Var. **elongata** Jeff.—Guernsey, 20 f.; Kilbrennan Sound, 55 f.

P. incomparabilis Risso.—Isle of Man (Leicester)!; Sutherlandshire (Baillie)!; Loch Boisdale, 20—70 f. (Somerville and J.T.M.).

P. striatus Müll.—Eddystone, 30 f. The white form is rare; I have two from Shetland.

P. vitreus Chem.—Off Unst, N.E. from Haroldswick, 90 f., one specimen (A. Brown); S.W. Ireland, 200 f. (Royal I.A. cruise, 1886)! British Channel 567 f. ("Porcupine").

This has a very wide range. The recorded localities of the 'Challenger' Expedition are—West coast of Patagonia, 140—400 f.; S. Japan, 345 f.; Philippines, 100—700 f.

P. maximus L.—The very young are occasionally found under stones at low-water mark in the Channel Islands, attached by a byssus. Up to a quarter-inch in diameter the upper valve is flat, after which it becomes concave, then gradually flat again, afterwards growing convex as it attains maturity. The ribs begin to appear when the shell is a third of an inch in diameter.

Lima subauriculata Mont.—Some specimens approximate in width and length to *L. elliptica* of the same size, and the sculpture of both is variable. The longitudinal central groove is not always outwardly visible in either species, but is plainly visible inside.

Jeffreys' figures of both species are good, but he has given the extreme sizes. Southern and Irish specimens of *L. subauriculata* do not often exceed a line in length. Sowerby's figure of *L. subauriculata* has been taken from *L. elliptica*, and his supplementary figure of the latter is *L. subauriculata*.

L. hians Gm.—"Hastings, a single valve of a young shell, attached to the roots of *Antennularia*," (J. of Conch., vol. 1, p. 90); most probably a stray, or from a northern trawl-boat. Mulroy Bay, Donegal (Darbishire).

Var. **tenera** Turt.—Scilly (Smart and others); Teignmouth, a valve cast ashore in a storm.

Avicula hirundo L.—Off Minehead, Ireland, fragments from trawlers, and S.W. Ireland, 50—60 f. (Wotton); St. Michael's Bay, Cornwall.

Mytilus edulis L.—I have an inequivalve monstrosity taken from a fishmonger's slab, in which one valve is flat and only half the size of the other. Jeffreys records a similar form of *M. barbatus* from the Loscombe collection.

M. modiolus L.—Low water to 120 f. Loch Don, Mull, 110 f. (Coulson); Oban, 120 f. (Somerville)!

Var. **umbilicata** Penn.—Tenby (Span)!

I have never seen a specimen with the epidermis as depicted in Jeffreys' figure; they are usually like Sowerby's. Both these figures differ in shape, but Jeffreys' is the type.

M. barbatus L.—Rothsay, low water (Wotton).

Var. **oblonga** Jeff.—Tenby.

The typical form was dredged in the 'Challenger' Expedition off the coast of Japan in 50 fathoms. *M. modiolus* had previously been known as an inhabitant of the same coast.

M. adriaticus var. **ovalis** Sow.—Scilly (Smart and others).

M. phaseolinus Phil.—Scilly Islands (Smart and others).

Modiolaria costulata Risso.—Scilly (Smart and others); Killala Bay (Miss Warren)!

Among some northern shells sent me by Mr. Baillie from Durness, Sutherlandshire, was a valve of this species. It is more plentiful at Penzance than elsewhere.

M. discors var. **semilævis** Jeff.—Ingoldmells, near Skegness (Dodd)! Cumbrae and Brodick Bay, Arran, in coral-lines, at low water (Somerville and J.T.M.); Penzance, living with the type and *M. costulata*.

There are two forms, one oval and depressed, like Jeffreys' figure, the other narrower and tumid; and the colour is of all shades of yellowish brown. The fry are smooth.

Crenella rhombea Berk.—Scilly (Smart and others); Margate (Cockerell)! a very young specimen; Connemara (Dodd)!

Jeffreys states ¹ that "the fry are so totally dissimilar from the adult that I was misled into describing and figuring the former under the name of *Limopsis pellucida* in the 'Annals' for January, 1859." The shell here alluded to, however, is not the young of *C. rhombea*, nor is it a *Limopsis*, but the next species.

C. pellucida Jeff. — Dr. Jeffreys found two perfect specimens and a valve at Guernsey ; but the Marquis de Monterosato subsequently found it in abundance at Palermo, in mud at 30—90 metres, and described it as *C. pellucida* Jeff.¹ In a subsequent letter he tells me he thinks this little shell may be assigned to Jeffreys' genus *Glomus*. I have often dredged the fry and young of *C. rhombea*, which is shaped almost exactly like the adult, and cannot be mistaken. *C. pellucida*, on the other hand, is a very minute oval shell, and differs from the fry of *C. decussata* in being oval instead of round. A figure of it will be found in Sowerby's 'Index,' pl. viii., fig. 14.

C. decussata Mont.—Groomsport, co. Down. Fossil in the Belfast deposits (Praeger) !

Nucula nucleus L.—Low water in the Channel Islands, double the size of those dredged off the coast.

N. tenuis var. *inflata* Hanc.—Loch Long, 24 f. (Knight) !

N. corbuloïdes Seg. was taken in the 'Porcupine' Expedition of 1869 in the Atlantic off the south and west of Ireland, and in the Atlantic off Scilly ; it is figured in Sowerby's Index. It will have to be added to the British fauna, with a host of other species, if the Atlantic is to be "annexed" to the British seas.

Leda tenuis Phil.—10—86 f. This species ranges from being oval and depressed to tumid and triangular. Neither Jeffreys' nor Sowerby's figures correctly represent it. The former more nearly approaches *L. lenticula* Möll., in which the posterior point is upturned. Sowerby's figure is the best, but double the size it should be.

L. minuta Müll.—15—90 f. There is a form *curta*, intermediate between the type and variety. The finest specimens come from the Doggerbank, 35 f., and measure 7 lines by $3\frac{1}{2}$.

1. Poche note intorno alla Conchiologia Mediterranea, Palermo, 1875.

Fossil in the Belfast deposit (Grainger); erroneously recorded as *L. permula*.

Var. **brevirostris** Jeff.—Generally distributed throughout the Hebrides and as far north as East Sutherlandshire.

The specific name is so absurdly inappropriate that it might well be altered.

L. lucida Lov. was taken in the 'Lightning' cruise between the Hebrides and Færøes, also in the Færø Channel with var. *declivis* ('Triton'), but has not been dredged on the British coasts.

A fine perfect specimen and two valves of *L. arctica* Gray, apparently sub-fossil, were dredged in Loch Torridon during the 'Porcupine' cruise of 1869, and with them were perfect, but dead, perhaps also sub-fossil, specimens of *L. lenticula* Möll. I have a valve of the latter species from Eigg Island, 20 f., which is also probably sub-fossil.

Limopsis aurita Broc.—West of Ireland, 345 f., and Atlantic off Scilly, 690 f., with *L. borealis* ('Porcupine'); Færø Channel 516 f. ('Triton').

Pectunculus glycymeris L.—Low water (Channel Islands) to 90 fathoms. It is eaten in Jersey, and may often be seen in the shell-fish market there. Specimens from the Channel Islands differ from those of the British coast in being orbicular. The largest come from Falmouth, and exceed 3 in. in diameter.

The fry and young resemble *Limopsis*; they are *not* square, but the upper margin is squarish, owing to the hinge-margin being straight and having projecting ears; and the very young are certainly crenulated.

Var. **pilosa** Jeff.—"Not *Arca pilosa* Linné, which is thicker, larger and more globose; the longitudinal striæ are more distinct, the hinge area wider, and the teeth larger and fewer. The synonyms of each have been intermixed."
—(Jeff., 'Lightning' Report).

Var. **nummarius** Turt.—Not *P. nummarius* L., which latter is *P. violascens* Lamk.

Jeffreys' generic figure is the Channel Islands' orbicular form, and his plate figure the oblique, or what is usually considered the typical one; although the former should properly be the type, as it was originally described by Linné "ad insulam Garnsey."

Arca pectunculoïdes Sc.—20—90f. Off the Island of Rona, east of Skye, rather plentiful in one spot (Coulson); the Minch, 20—53 f., valves abundant.

A. lactea L.—Jeffreys was very wide of the mark in giving the range of this species at 15—25 f. It is a well-known low-water mark shell, attached by a byssus to the under-sides of stones. The noted shell-beach of Herm is composed principally of the valves of this species. Jeffreys made another slip in stating that his largest specimen was three-quarters of an inch in *length*—he should have said *breadth*. I have a similar giant from Torquay.

Galeomma turtoni Ed. Z. J.—Scilly, 40 f. (Burkill and J.T.M.); Skerries Shoal, off the Start, S. Devon, 15 f.

The tale recorded by Mr. Clark's boatman will not stand. *Galeomma* does not behave at all in the way indicated. The cupidty of Branscomb was kept alive by the gifts and promises of his generous employer, with the result that *Galeomma* was not the only species he "discovered" that afterwards had to be abandoned as wanting in probability.

For some years *Galeomma* has been steadily disappearing from its Herm *locale*, the original collecting-ground of Turton. This has arisen partly from over-collecting, but principally from the destructive effects of ormer-gathering, by which every stone is being continually turned over and over again. It is now almost extinct in its original home. The one or two fishermen at Guernsey initiated in this species have corrupted the name to "*Gilly-ormer*."

Lepton squamosum Mont.—Low water mark at Salcombe (Norman) to 20 f. Glengariff, dredged alive just off the harbour (Span).

L. nitidum var. **convexa** Ald.—Found everywhere with the type, but scarcer; 10 per cent. is about the average. It is *not* more convex than the type, and the pit-marks vary from fine to coarse.

Var. **pisidialis** Jeff.—Guernsey, 18 f.; Scilly, 40 f.; Torbay; Connemara, 12 f.; Iona, 20 f. This variety depends on its shape; the sculpture is as variable as in the type.

"Differs in the degree and even in the absence of sculpture. The variety *levis* is perfectly smooth; and I must correct or qualify my remark in the 'British Conchology' that this species is invariably sculptured" (Jeffreys, Moll. 'Lightning' and 'Porcupine' Exp.)* The variety *levis* is occasionally found on our coasts; but the difference is so slight from the type, which is always apparently smooth, that I consider the distinction too slight to warrant a varietal name.

The young of *Kellia suborbicularis* var. *lactea* may be mistaken outwardly for *L. nitidum*; but the umbones of the former are more prominent and obtuse.

Jeffreys' plate has a section showing concentric striæ, as in *L. sulcatulum*; but this is incorrect—it has only irregular though very noticeable lines of growth, as in Sowerby's figure.

L. sykesii Chast.—(See J. of Mal., June 1895, vol. 4, pp. 36-7). Mount's Bay (Tregelles and Chaster); Dogs Bay, Connemara (Standen); Killala Bay (Chaster and J.T.M.); off St. Martin's Point, Guernsey, 18 f. (J.T.M.); from sand dredged at Guernsey (Chaster).

L. sulcatulum Jeff.—Isle of Man (L.M.B.C.); Scilly (Burkill and J.T.M.); Jersey, Guernsey, and Herm, in sea-weeds at

* Proc. Zool. Soc., June 7, 1881, p. 694.

low water, and dead in 10—20 f. off Guernsey; Land's End. Also Adventure Bank, 92—120 f.; the Tripoli coast; and Corea, 30—50 f.

L. clarkiae Clark.—Sea-weeds in rock-pools at very low spring tides. Scilly, 40 f. (Burkill and J.T.M.); Puffin Island (L.M.B.C.)!; Iona, 20 f.; Rum Island, 33 f.; Gairloch, 12—30 f.; and Watersay Sound, Barra, 5 f. (Somerville and J.T.M.); Jersey, Guernsey, and Herm, living in weeds at extreme low water and dredged dead in 20 f.; Sennen Cove, St. Ives, and Falmouth in Cornwall; Borough Island; Torbay, in rock-pools, at very low water; Margate; Tenby, Manorbeer, Caldy Island, Laugharne, Freshwater East, Barmouth, Milford, and Towyn, in Wales; off the Smalls; Skegness; Bantry Bay; Connemara; Mayo; Sligo; Bundoran; Aberdeen. I have also a valve from the Atlantic off Scilly, 690 f., dredged by the 'Porcupine.'

All the above dredging localities produced dead specimens only or valves. Jeffreys quotes 18 to 80 fathoms as its habitat; but I consider that to be erroneous. It is more diffused and plentiful than is generally supposed, but difficult to procure alive, as it lives at the extreme verge of low spring tides, and so cannot be procured by the dredge; but its valves are thrown ashore nearly all round our coasts. The animal is undescribed. I have frequently taken it alive in the Channel Islands and South Devon, but the process of steeping the weeds in fresh water is fatal to the animal. One of Turton's habitats for *Montacuta substriata*, "attached to corallines, on the Devonshire coast," I consider applies to this species, as the former is never found away from Echinoderms. It is extremely variable in outline and in the position of the beaks. Some specimens are oval, like a young *Tapes virgineus*; others are triangular, like a young *Nucula nitida*; another form is abnormally oblique, with the beaks much nearer the posterior side; while more

rarely it is suborbicular. Some of the young approximate to *Montacuta dawsoni* outwardly, and may easily be mistaken for that species. The largest come from Jersey and Guernsey; a valve from the latter island is a line in length, by a line and a half in width.

Jeffreys' figure is fairly good, but it should show a slight angularity at the posterior or smaller end, as in Sowerby's; and it is not concentrically striated as his section shows, but has irregular lines of growth, as shown in Sowerby's figure. The latter, however, has the beaks too sharp and prominent.

Scintilla eddystonia Marsh.—(J. of Mal, vol. 4, no. 2, pp. 35-36, fig. 1). Eddystone, Land's End, and Guernsey.

Mr. Chaster, in a note to the above journal for Dec., 1895, endeavours to show that this is the young of *Diplodonta rotundata*; but he is very inaccurate. In the first place, he writes of a *Scacchia eddystonia*, though I have never described any *Scacchia*; what I did describe was *Scintilla eddystonia*, and when he says this is "at once seen not to be a *Scacchia* at all," I quite agree with him. Secondly, he says my shell "closely resembles in shape *Scacchia elliptica*," which it certainly does not. Next, he assumes my description of the dentition to be "incorrect," and states that the "two cardinal teeth are a single cardinal," and the "lateral tooth is another cardinal," notwithstanding which infallible statement the cardinals and laterals I stated are there. Fourthly, as to Jeffreys' figure of *Diodonta barleei* (*Diplodonta* juv.) being "not very good," it could not be better; it corresponds exactly with Barlee's specimens, with Sowerby's figure, and with the umbonal area of adult *Diplodonta*, but not with *Scintilla eddystonia*, the differences in which would strike the most superficial observer.

It is a necessary qualification in criticising a writer for the censor to be himself correct, and though it is quite

possible for *S. eddytonia* to be something else, for I am not infallible, let it be demonstrated in an intelligible manner; it is not sufficient to string together the above inaccuracies and add "I have been able to satisfy *myself* about it."

Montacuta substriata Mont.—Low water to 90 fathoms. Channel and Scilly Islands, at low water of spring tides, on *Spatangus furpleus*; the former are very fine— $1\frac{1}{2}$ lines by $1\frac{1}{4}$. From two to six specimens occur on an individual *Spatangus*. Jeffreys gives a good figure, but erroneously shows the riblets as bifurcating, instead of radiating straight from the beaks. Sowerby's is not like our shell in shape, sculpture, or colour.

Var. *lævis* Jeff.—Doggerbank, 35 f.

M. bidentata Mont.—Low water of spring tides to 70 fathoms. Under stones at Guernsey, of a large size—2 lines by $1\frac{1}{2}$.

Var. *triangularis* Jeff.—Torbay; Milford Haven; Skye; Aberdeen; Dornoch Frith; W. Orkneys, 45 f.; Shetlands. It is rare.

M. tumidula Jeff.—This species lives in muddy sand throughout the Hebrides, in 18—95 f., but is everywhere rare. The following localities and depths I can vouch for:—Off Lochranza, 55 f.; Rum Island, 33 f.; Sound of Sleat, 40—95 f.; and Skelmorlie, 18 f.; (Somerville and J.T.M.); between Iona and Staffa, 38 f.; off Tarbert, 25 f.; off Arran, 25 f.; Loch Fyne, 45—56 f.; Loch Linnhe, 20—30 f.; Loch Hourn, 25 f.; the Minch, 10—40 f.; also in the Atlantic off Scilly, 690 f., two valves ('Porcupine')!

The posterior ends of all my specimens are not so "extremely short and abruptly sloping downwards" as Jeffreys' figure, but are sloping outwards and rounded off, exactly as in *Tapes virgineus* of the same size. Perhaps Jeffreys' figure was taken from a Norwegian specimen, as I have it from Dröbak exactly as portrayed in "British

Conchology"; but all the British specimens I have seen are more regularly rounded and produced at the posterior side. The microscopic sculpture is similar to that of *Lepton clarkia*. Sowerby's figure is more like British specimens, but the beaks are too prominent and acute, and the colour should be pale-horn; they agree in all other respects.

- M. donacina** S. Wood.—Falmouth and Shetlands (Jeffreys); Lough Swilly ('Porcupine'); Torbay.

A very rare species. It is of such a peculiar shape that once seen it would readily be known again. A Coddington lens shows very fine concentric striæ and numerous lines of growth. Searles Wood's figure is a very good one, but Jeffreys' and Sowerby's are only sufficient to indicate the outline.

- M. ferruginosa** Mont.—This species has been previously fully treated by me.¹ Occasionally, and in a good light, interrupted longitudinal rays may be seen, but not nearly so marked as in *Tellinmya nivea* Sars, a variety of this species, which is distinctly rayed. Jeffreys' figure is too angular; it should be more rounded at each end. Sowerby's is too truncate at the smaller end, and it shows a conspicuous brown epidermis round the margins, which is incorrect; it is very often covered with a thick ferruginous deposit, but that is always confined to the upper margin and umbonal area.

Var. **ovata** n. var.—Shell depressed, broadly oval, and shorter; beaks more central and less prominent. Kyles of Bute, 18 f.; Gairloch, 30 f.; Minch off Loch Boisdale. Not *M. ovata* Jeff.

- M. dawsoni** Jeff.—Dingle Bay, 30—40 f. ('Porcupine'); Scilly, 40 f., a perfect specimen (Burkill and J.T.M.); Torbay; Bantry Bay; Donegal coast; Bartra Island; West Orkneys, 45 f. Also Newfoundland (Verkrüzen)!

1. J. of Conch., vol. 6, pp. 399—404.

I discovered this species near Torquay in 1886, in a very limited area of shelly mud at extreme low water, obtaining four perfect but dead specimens and as many valves. Two of these are in the National Collection. Whether living in this habitat or drifted in from the bay, it is impossible to say.

The shell under the epidermis has occasionally a few clear-white streaks radiating from the beaks, as in *Lepton clarkia*, and in outward appearance it is very much like a young specimen of that shell. It has almost the same outline, the same concentric striæ, and sometimes the same longitudinal rays; but the beaks are obtuse and nearer the posterior end, it is not so compressed, and it is more oblique. Inwardly, the dentition is seen to be different; for such a minute shell it has wonderfully strong and prominent teeth. As *Lepton clarkia* varies very much in obliquity, I know of no more certain character to distinguish the two species than the dentition, which cannot be mistaken, for while *L. clarkia* has a cardinal tooth under each beak, *M. dawsoni* has none, the space being filled up with the cartilage when alive.

All the British specimens I have seen are much eroded about the beaks, but those from Davis Straits are only slightly so. The latter are four times as large as British examples; they are less oblique, the umbones are more tumid, and they have a conspicuous yellowish-brown epidermis. The latter form somewhat resembles a young *Nucula nucleus*. Jeffreys has stated¹ that Mr. Dawson's specimens "may be semi-fossil or relics of the glacial epoch", but the additional records I have given above dispose of that. There is no good figure of this species, both Jeffreys' and Sowerby's being useful merely as outlines.

Lasæa rubra Mont.—Alderney, in submerged wooden piles.

1. Ann. and Mag. Nat. Hist., Dec. 1876, ser. 4, vol. 18, pp. 490-1.

Kellia suborbicularis Mont.—Jersey, in rock-pools at low water, attached by a byssus to *Serpulæ* (Duprey and J.T.M.); South Devon, in soft red sandstone at low water, nestling in the dead valves of *Saxicava*.

Sowerby figures an apparently cleaned valve of *Axinus ferruginosus* as *Kellia abyssicola*; but the latter is a very different shell, like a young *Venus linctæ* in shape, though thin and globular. It is the *Kelliella abyssicola* of Sars, and also what Jeffreys holds to be the fry of *Isocardia cor*, as to which see my note under that species.

Loripes lacteus L.—Jeffreys has noticed that the anterior side of the shell of this species is "sometimes indented or sinuous," but does not notice the reason; and Forbes and Hanley, while describing the shell as "devoid of all sculpture," remark "that the upper front corner is peculiarly depressed, as an extremely indistinct, very shallow, and rather broad sulcus, emanating from the beaks, runs close to the dorsal edge and slightly indents the upper part of the front margin at its extremity." But neither of these authors seem to have noticed, nor do their figures show, that there is also a central ridge. Each valve has two transverse irregular ridges—one commencing at the beaks and gradually broadening to the left of the front margin, and another from the beaks to the anterior side, where it forms a sinus in the circumference of the shell; the former ridge is raised, while the latter is depressed. The largest come from near Portland Island, and are $\frac{8}{10}$ ths of an inch in diameter.

L. divaricatus L.—Crow Sound, Scilly Isles, 8—10 f., valves only, abundant (Smart). These are more convex than the valves cast ashore at the Land's End, and but half the size.

Lucina spinifera Mont. — Sculpture, 40—50 concentric ridges. An adult specimen from Shetland has only 18. Jeffreys' dimensions are too large; three-quarters of an

inch is the usual breadth of the largest. Mr. Edgar Smith has recorded it from deep water in the Indian Ocean.

Var. **minor** Jeff.—The Minch off Loch Boisdale, 35—50 f. (Somerville and J.T.M.). These are smaller than the Shetland form.

L. borealis L.—Some specimens have twice as many ribs as others. The very young resemble the same stage of *Loripes lacteus*; but this is angular on the smaller side, while *Loripes* is rounded. The largest come from Scilly, and are nearly two inches in diameter.

Mr. Dawson dredged a fresh valve of *L. pennsylvanica* off Aberdeenshire, thirty miles from land. It is West Indian, and probably came from ballast.

Axinus flexuosus Mont.—Young shells are proportionately less globular than the type, and have a squarish outline. A monstrosity from Jersey has a conspicuous double fold or sinus.

Var. **polygona** Jeff.—Gairloch, 30 f. (Somerville and J.T.M.). Also Corea, 54 f. ('Sylvia')!

The var. *gouldii* Phil. has been taken between the Hebrides and Færoes. It is smaller, rounder, and flatter, without the longitudinal furrow.

A. croulinensis Jeff.—10 to 140 f. Ardlamont Point, 100 f. (Robertson)!; Machrie Bay in Arran, 29 f.; Strachur in Loch Fyne, 16—56 f.; and Onich in Loch Linnhe, 24 f. (Knight)!; Point of Ayr, 20 f.; Kyles of Bute, 12—23 f.; Brodick Bay, 23—40 f.; Sound of Sleat, 40—95 f.; Loch Hourn, 25 f. and 75 f.; and Gairloch, 12 f. and 30 f. (Somerville and J.T.M.); off Lossiemouth (Scotch Fishery Board Report, 1889); Lochranza, 18—70 f.; Lamlash, 15 f.; Tarbert, 20 f.; Loch Broom, 35—50 f.; the Minch, 12—50 f.; Stornoway, 10 f.; Doggerbank, 35 f.

All the specimens from the foregoing localities were living, and it will be observed that Jeffreys' record in

"British Conchology"—"Skye and Shetland, 45—85 f., rare," has been considerably amplified. It is pretty generally distributed throughout the Clyde and Hebrides on very muddy ground, but to obtain it the dredger must not be afraid of laboriously sifting plenty of mud—material which is usually thrown away by him in disgust. The shell is usually encrusted with ferruginous matter on each side of the beaks. It is very constant in form, and does not vary at all except in size.

In 1886, on looking over some young *A. flexuosus* dredged on the Doggerbank ten or twelve years previously, I picked out half-a-dozen *A. croulinensis* from among them. This locality is remarkable as being much further south than the next nearest record, and the only one for the English coast. I regret I did not observe the species when dredging, and so fix the exact locality.

All the Hebridean specimens are of small size, less than one-half the dimensions given by Jeffreys; but the Doggerbank specimens are much larger, corresponding to the Norwegian form in point of size, which is only exceeded by a pair of original Shetland valves given me by Dr. Jeffreys.

A. ferruginosus Forb.—10 to 100 f. in muddy sand. Gairloch, 30 f.; Sound of Sleat, 20—90 f.; Loch Hourn, 25 f. and 75 f. (Somerville and J.T.M.); Tarbert, 20 f.; Inverary and other parts of Loch Fyne, 22—56 f.; Stornoway, 10 f.; the Minch off Barra, 50 f. Abundant in most of these localities.

Mr. Alfred Brown¹ states that this "is one of the dredger's prizes . . . and is exceedingly scarce"; but I have found it far otherwise. It is a gregarious species, and especially abundant in some parts of Loch Fyne. They come up in the dredge like little globules of mud, no part of the shell being visible. The young are unlike the adult shell, and resemble *A. cycladius*.

1. Mollusca of the Firth of Clyde, p. 19.

A. cycladius S. Wood.—Between the Hebrides and Færœs, 570 f. ('Triton')!; West Orkneys, 45 f. Jeffreys' remarks as to *Aximus* being without teeth¹ must now be qualified, as this species has them. Wood's figure certainly shows no teeth, but his description says "one cardinal and no lateral," while Jeffreys' figure² shows two teeth, apparently cardinals, and he states on the next page, "one cardinal and two laterals." Another divergence between these two authors occurs in the latter calling his shell "solidula," while Wood describes his as a "delicate and fragile shell." Still, there appears to be no doubt that they were both describing the same species. The Crag form is "nearly a quarter of an inch," but the recent one does not exceed a line. It is everywhere rare.

Jeffreys' figure (Brit. Conch., vol. 5, pl. 32, fig. 3) is correct as an outline, and so is Sowerby's of *Poromya subtri-gona* (pl. 9, fig. 1*); but his supplementary figure, as *Kellia cycladia* (pl. 25, fig. 15), is too obliquely oval. Jeffreys' original figures in the "Annals" for 1858 are very good.

A. eumyarius M. Sars has been dredged between the Hebrides and Færœs by the "Triton."

Diplodonta rotundata Mont.—Low water to 20 f.

Cyamium Phil.—Mr. Edgar Smith³ disputes the correctness of Dr. Jeffreys' conclusions (Brit. Conch., vol. 2, pp. 257-8) as to the distinctness of this genus from *Turtonia* F. & H. They are in direct issue as to the name and habitat of Philippi's species, and as to the ligament in that species being internal or external; and they both write so positively that it is impossible for a third party to come to a conclusion concerning them.

Cardita aculeata Poli.—A valve has been dredged by the Rev. Frank Knight in the Kyles of Bute, in 50 f., and was

1. Brit. Conch., vol. 2, pp. 245-6.

2. Ann. and Mag. Nat. Hist., ser. 3, vol. 1, pp. 42-3, pl. 2, fig. 1, 1858.

3. J. of Conch., vol. 5, pp. 42-3, 1886.

most probably derived from ballast. It is a common Mediterranean shell.

Cardium aculeatum L.—Abundant and live at Torbay, Teignmouth, and Exmouth, after easterly gales, but from constant rolling in a shallow sea they are almost destitute of spines, which is the chief beauty of this handsome shell. They are in better condition in this respect at the mouths of Torquay and Paignton harbours, though here they are badly stained with mud ; but good specimens may occasionally be had from the Babbacombe and Teignmouth trawlers. The best I have seen were obtained by Dr. Lukis at very low tides at Guernsey, but I do not know what part of the island. These were exhibited at the British Association Meeting of 1862.

Var. **depressa** Marsh. (J. of C., vol. 7, p. 246, 1893).—South Devon. Figured by Jeffreys as the type. Sowerby's is the type form.

C. echinatum L.—Low water (Jersey) to 100 f. The Jersey specimens are the handsomest I have seen, every spine being perfect, even over the umbones to the beaks ; these are longer and more oblique than the type, and live in very fine muddy sand.

The young above the size of a pea are easy to separate from the same stage of *C. tuberculatum* ; they are pure white, broadly oval, the ribs sharper, and their interstices wider. In this stage, they are often mistaken for the young of *C. aculeatum*. The young of *C. tuberculatum* are circular, of a reddish-brown, with only a few tubercles. The very young of these two species gradually approximate until it becomes impossible to separate them.

Var. **expansa** Jeff.—Plymouth Sound ; Torbay ; Pendine ; Doggerbank. Jeffreys figures this variety as the type, but Sowerby's is the type form.

C. tuberculatum L.—Jeffreys' dimensions for this shell apply to var. *suborbicula* Marsh. ; his type-figure is as broad

as long, and should be measured accordingly. The surest guide in separating this from *C. echinatum* is that in the latter the rows of spines are continuous, while the spines in *C. tuberculatum* have spaces between.

There is a long, narrow, and more convex form, corresponding to *C. echinatum* var. *ovata*, occasionally found in various parts of South Devon. The monstrous valve noted in "British Conchology," from the Turton Collection, has occurred to me several times in South Devon.

C. papillosum Poli.—Low water to 20 f. Herm, a live specimen from low water; Scilly, 40 f., a fresh valve; Falmouth Harbour, 19 f., another fresh valve.

C. exiguum Gm.—The very young and fry resemble the same stage of *C. nodosum*; but in the former the sculpture is coarser, and in the latter the posterior side is not truncate but rounded. It is abundant and fine off Trefusis Point, Falmouth; and equally abundant, but small, in Milford Haven.

Var. **subquadrata** Jeff.—Sutherlandshire (Baillie)! Herm, low water; Guernsey, 20 f. This is less gibbous than the type, but the sculpture of the furrows is similar.

C. fasciatum Mont.—This is the most variable of all this genus. Some are broader than long, and *vice versa*. Jeffreys' figure is the type; Sowerby's is too triangular. The very young are less square than those of *C. exiguum*, and have sharp and prominent beaks; the ribs are more numerous and smooth, with only a few tubercles at the sides. They are not "almost flat." Jeffreys' dimensions of half an inch in length and breadth are extreme; the largest are 4 lines by $4\frac{1}{2}$.

Var. **globosa** Jeff.—Sutherlandshire (Baillie)!; off Aberdeen, 50 f. ('Triton')!; Loch Boisdale, 35 f.

Var. **alba** Jeff.—Sutherlandshire (Baillie)!; Scilly Islands.

C. nodosum.—Low water to 145 f. Gregarious in oozy ground in St. Aubin's Bay, Jersey, and at Herm Island;

not half the size of those dredged off the coast in 20 f. It is scarce in Scotland, but somewhat diffused—Firth of Forth (Scott)!; Sound of Sleat, 40 f.; Loch Inver, 25 f.; Barra, 20—45 f. (Somerville and J.T.M.); Kyles of Bute, 14—25 f. (J.T.M.); Loch Linnhe, 24 f. (Knight)!

Both Sowerby's and Jeffreys' figures are good outlines; but the sculpture of the latter is too obscure. In the former, coarse papillæ are indicated as the sculpture of the ribs, instead of curved transverse plates, as in *C. minimum*, though coarser. The figure in "British Mollusca" is perfect. The sculpture commences in the young as rounded tubercles or papillæ, these becoming oblong as the shell increases, and arched as they reach the margins. Occasionally the valves are divided into two zones by a deep line of growth, the upper half having tubercles, and the lower half plates. Specimens from Glengariff are exquisitely sculptured.

Var. *ovata* Jeff.—Sculptured as the type. Guernsey and Herm; Torbay; Bantry Bay; Lamlash Bay, 15 f.; Knapdale Lochs, 10 f.

Var. *rosea* Lamk.—Channel Islands, at low water, with the type.

I have an inequivalve monstrosity of the var. *rosea* from Herm; it resembles *Megerlia* in shape.

C. edule L.—In comparison with the three preceding species, the very young and fry are more oval, the umbones more convex, and the beaks more obtuse and central. In all stages of growth there is a long and a short form.

Var. *rustica* Chem.—A form of this variety, oval and equilateral, is found occasionally on our shores; it is the var. *balthica* of Beck.

C. minimum Phil.—S.W. Isle of Man (L.M.B.A.)!; Scilly, 40 f., many valves; Guernsey, 20 f., a valve; west of

Lundy Island, 60 f. ; off the Smalls, Irish Sea ; West Orkneys, 45 f. Also Atlantic off Scilly, 690 f. ('Porcupine')!

When living in fine sandy mud the delicate sculpture of the ribs is beautifully preserved ; but when on coarser ground, the ribs are flatter and worn almost smooth. Specimens from Portmarnock are fine and clean, but without a particle of sculpture. It appears to be most abundant in the Sound of Sleat, from 25 to 95 fathoms, and in the Minch off Loch Boisdale in 18—35 fathoms ; valves occur here in thousands. The shell is wonderfully true to type, no variation being apparent in hundreds of specimens.

C. norvegicum var. **gibba** Jeff. — Herm and Guernsey ; Weymouth Bay.

Var. **rotunda** Jeff.—Shetlands (Jeffreys) ; Herm ; Torbay.

Var. **pallida** Jeff.—Guernsey and Herm.

Isocardia cor L. — Clyde between Cumbrae and Arran (Robertson and Somerville) ; off Mull, Lismore, and Sound of Sleat (A. Brown) ; Moray Firth (Scott and others) ; Aberdeen trawlers.

The home of this species appears to be the Irish Sea and Bristol Channel, where it is somewhat plentiful. The degree of convexity and the outlines of the shell are extremely variable, the latter character changing perhaps half a dozen times during the growth of the individual, as may be seen by observing the lines of growth, which have varying angles at various stages, so that many variations of form might be made out of it. For an interesting paper indicating some of these forms, and illustrated with outlines, by Mr. F. W. Wotton, see "Science Gossip," Aug. 1894.

Isocardia does not become orbicular until fully adult, when the outer margins are added to and considerably thickened, with the addition of internal ribs and buttresses. Many specimens, especially when half grown, are

subquadrate, and do not always lose this contour; these are analogous to *Cyprina islandica* var. *crassior*. In Jeffrey's generic plate the right and left valves are odd ones; one represents the subquadrate form, and the other the typical one.

Dr. Jeffreys always and persistently affirmed that the fry of this species is what is generally known as *Kelliella abyssicola* Sars, but most conchologists differ from him on that point. It occurs in such profusion in some of the Norwegian fjords as should make the adult common on the same ground, even as dead valves, whereas it is not so; and while thousands of *Kelliella* may be taken up to a line in diameter, and *no larger*, an adult one cannot be found. *Per contra*, in the British seas, numbers of *Isocardia* may be dredged or procured from the trawlers, yet the fry (or *Kelliella*) are never found; they are unknown to me from ordinary dredgings in British waters, although they have been taken in deep water off our coasts by the 'Lightning' and 'Porcupine.' It would be remarkable, therefore, if, as alleged, we find adult *Isocardia* abundant in England, but not the fry, while in Norway and elsewhere the alleged fry are in swarms, and the adult absent. Now, it appears that some time ago I detected among some small shells what I consider to be a veritable baby *Isocardia*, which was dredged in the Hebrides in 24 fathoms. It is less than a line in length and breadth, and looks exactly what one should expect to grow into an adult *Isocardia*. It is not unlike a *Crenella rhombea* of the same size in outline, is thin and gibbous; the beaks are already slightly incurved, and the teeth are identically the same as in the adult. The colour, instead of being pearl-white and semi-transparent, as in *Kelliella*, is dirty-white and opaque, with frosted markings. Its whole appearance is convincing as being a very juvenile *Isocardia*. Sars has described the animal of *Kelliella*, and pointed out marked differences

from that of *Isocardia*; but Jeffreys replies that the "differences observable are perfectly correct, but such differences result from altered conditions of growth." The dentition is also different from *Isocardia*, which Jeffreys ascribes to its being immature. Although I have not seen what Jeffreys called his graduated series of the young and fry of *Isocardia*, I believe he has been misled by a supposed resemblance between *Kelliella* and the beaks of *Isocardia*.

In his Appendix to "British Conchology," the author describes the alleged *Isocardia* fry as "not unlike the young of *Venus lincta* in shape." It is also much more convex, fragile, glossy, and semi-transparent. He has also written that they are "nearly globular," but an examination of the beaks of a juvenile *Isocardia* disproves this.

Sowerby's figure of "*Kellia abyssicola* Forbes; a doubtful species; probably a young shell;" is not this, though meant for it, but apparently a decorticated *Axinus ferruginosus*.

Cyprina islandica L.—St. Aubin's Bay, Jersey, rare.

Var. **crassior** Jeff.—This has the same epidermis and the same degree of solidity as the type. Dr. Jeffreys was always anxious to give his varieties two characters especially, if not three, and this occasionally led him, as I have found in many instances, to attach additional characters to some of his varieties which had no permanent validity.

Doggerbank; Aberdovey; South Devon coast. Fossil in the Belfast deposit, but very rare; one valve is 5 inches broad (Praeger).

Astarte.—Notwithstanding all that has been written as to the specific value of the crenulated margins of the *Astarte*, a respectable body of opinion still supports either side of the question. Mr. Edgar Smith has contributed a valu-

able paper on the genus¹ simultaneously with one from Dr. Jeffreys on the same subject;² and while the former insists on the crenulated margin being "a mark of maturity" and "of importance in the discrimination of species," the latter cites instances to show the contrary. It is notorious that *A. triangularis* has a smooth and a crenulated form, which were originally described as two species by Montagu, and that *A. sulcata* and its var. *scotica* are in the same category; but no one would now separate them. And Mr. Smith cites *A. elliptica* as a good species on account of "the constant absence of crenulations within the margin of the valves in adult specimens." Undoubtedly if the crenulated margin is a specific character, the var. *elliptica* should rank as a species, though it is connected with the type by intermediate forms which may be assigned to either. Another point which militates against the crenulated margins being considered specific, is the fact that some of the *Veneridæ* are crenulated, while others are plain.

A. sulcata Da C.—Herm and Scilly Islands—one dredged off the former island by myself, and two others, with some young valves, from Scilly, by Smart and others.

I noticed a perfectly white specimen in Admiral Bedford's collection, dredged off the West of Scotland. The fry are white, smooth, and polished.

Jeffreys' figure is a good one; Sowerby's too triangular, with an insufficient number of ribs. Of the var. *elliptica*, Jeffreys' figure is correct in outline, but the ribs too prominent, while in Sowerby's they are too obsolete, and the beaks too acute.

Var. paucicostata Jeff.—Shape as variable as the type; ribs 20—24.

1. J. of Conch., vol. 3, pp. 196-232, 1881.

2. Moll. 'Lightning' and 'Porcupine,' Proc. Zool. Soc., 1881, p. 711; and J. of Conch., vol. 3, pp. 233-4.

Var. **elliptica** Brown.—Dr. Norman writes that "the Scandinavian naturalists seem agreed that this is Linne's *A. compressa*, and not *A. compressa* Mont."¹ If the Scandinavian naturalists are infallible, this must be so; but are they? Jeffreys says that the "*Venus compressa* of Linne's Mantissa Plantarum is much too indefinite for identification, and no habitat is given."² And Mr. Edgar Smith writes: "The *Venus compressa* of Linne is altogether beyond recognition, and may either belong to this genus, as suggested by some authors, or it may be a species of *Veneridæ*."³

Var. **minor** Jeff.—Much smaller. Sound of Sleat, 20—40 f.; Loch Boisdale, 35 f. (Somerville and J.T.M.).

Var. **trigona** Jeff.—Sloping from the beaks on each side, the lunule on the anterior side being consequently shallower and less curved; it is not unlike *Venus fasciata* in outline. Milford Haven.

Var. **fusca** Poli.—Shape almost as variable as the type, according to habitat; often obscurely rayed. Doggerbank, 20—40 f.

Var. **multicostata** Jeff.—Shape variable; ribs 36—40. Off Aberdeen (Simpson)!; Doggerbank and Aberdeenshire.

A. compressa Mont.—The very young are striated, but the beaks are smooth and polished. In comparison with the same stage of *A. sulcata*, the beaks of the latter are more acute, and the lunule deeper. In aged specimens, the margins are considerably thickened and the beaks separated. The extra-British range of this species is extraordinary—3 to 2,000 fathoms.

Var. **globosa** Möll.—Clyde, 18 f.

A. triangularis Mont.—Locally abundant. They may be dredged in thousands off the Eddystone and at Guernsey.

1. Ann. Mag. Nat. Hist., ser. 6, vol. 12, p. 364, Nov. 1893.

2. Moll. 'Lightning' and 'Porcupine,' Proc. Zool. Soc., 1881, p. 711.

3. J. of Conch., vol. 3, p. 204, 1881.

The fry are roundish, becoming gradually oblique and then triangular.

A. crenata was dredged between the Hebrides and Færøes by the 'Triton,' and I have a specimen taken from a haddock by Mr. Baillie of Brora. As *Nicania crenata* (Gray, 1824) it is prior to *A. crebricostata* (Forbes, 1847), and although considered two species by some authors, the differences are considered by others to be too slight to warrant their separation.

Circe minima Mont.—Young shells closely resemble the same stage of *Venus exoleta*, but are flatter.

Var. **triangularis** Mont.—Guernsey, 18 f.; Loch Linnhe, 40 f.; Loch Boisdale, 30 f., a valve.

Venus.—The very young and fry of the *Veneridæ* are difficult to discriminate. Those of *V. exoleta*, *V. fasciata*, and *V. casina* are almost identical from the fry up to a line in length, having each the same shape and being closely sculptured with fine concentric striæ. In fact, all the species except *V. ovata* are finely striated at first, the characteristic sculpture of each not appearing until afterwards. In *V. exoleta* the fry are broader, coarser, and flatter than in *V. lincta*, but they are very much alike. Those of *V. fasciata* are quite unlike the adult; the striæ are fine and close set, and they are scarcely separable from the same stage of *V. gallina*, but the striæ of the latter are coarser. Those of *V. casina* and *V. fasciata* are alike in sculpture, but the latter are more sharply triangular in shape. And those of *V. verrucosa* are similar to *V. casina*, but the interstitial striæ of the former will always distinguish them.

It may seem superfluous and hardly worth the trouble to study the immature forms of the mollusca. But some of them differ very much from the adult stage, and when investigating and classifying the results of dredgings it is

necessary to know what are small species and what are merely the young of larger ones ; and any one investigating the contents of a single dredge will feel puzzled if they are not conversant with the young shells of different species.

- V. exoleta** L.—This species attains its maximum size in large sandy bays ; those from rough ground are smaller and more solid, sometimes having the margins extra thickened. A dwarf from Guernsey is only half an inch in diameter, and an elongated monstrosity from the same island has its counterpart in *V. lincta*.
- V. lincta** Pult.—The largest come from Guernsey, at extra low spring tides, and exceed $1\frac{1}{2}$ inches in length.
- V. chione** L.—Teignmouth (Burkill) ! ; Jersey, rare ; Torbay, rare. A pair of valves from the latter locality are 4 inches by 3 inches.
- V. fasciata** DaC.—Specimens living between tide-marks have broad and irregular flattened ribs, while dredged examples have strong laminated ridges. The latter form is the var. *brongniarti* of Continental writers.
- Var. **radiata** Jeff.—Herm, low water ; Guernsey, 20 f. ; Scilly (Smart and others).
- V. verrucosa** L.—Low water in the Channel Islands.
- V. ovata** Penn.—Couch has recorded this species as common in deep water off the Cornish coast, attached to the byssus of *Pinna*.
- Var. **trigona** Jeff.—Tarbert, 25 f.
- My cabinet contains an inequivalve monstrosity from Guernsey ; whence also an abnormally elongated form, shaped as *Astarte compressa*, is occasionally dredged in 20 fathoms. Another form, which is compressed and has the posterior side more produced, occurs in the same district and at Loch Inver, 25 f.
- V. gallina** L.—The largest come from Pendine, and measure

$1\frac{3}{4}$ inches by $1\frac{3}{8}$ inches; these are flatter than usual, and have the same outline as *Tapes aureus*.

Var. **laminosa** Mont.—Torbay; Pendine; Doggerbank, 20 f.; Aberdeenshire, 30 f. In this variety the ribs are sharper and fewer. The young, as well as those of the var. *gibba*, differ from the same stage of the type at a very early age, and may be separated without difficulty.

Var. **triangularis** Jeff.—Dorsal margin longer, straighter, and more angular at the base; the shell is also longer in proportion to its breadth. Brora (Baillie)!; Weymouth; Menai Straits; Oban.

Var. **gibba** Jeff.—The author says of this variety, "ribs numerous and irregular," but his figure shows the ribs much less numerous than his type figure, and this character is in fact variable in all the varieties. The shape of his figure is right, and that is its only permanent character; the "ribs confluent or bifurcating on the posterior side" being common to all the forms of this species. The very young are smooth and glossy, the ribs forming at a later stage than in the other varieties. This is *not* the Mediterranean form; the latter has the same triangular outline, but is not gibbous. The Crag form appears to be similar to the Mediterranean one.

Var. **alba** Somerv. — Shell milk-white. St. Bride's Bay. There is also a colourless form of a dirty white.

Venus mesodesma of Quoy and Gaimard was introduced into Little Ferry, N.B., from North America, by the late Duke of Sutherland in 1885; but they soon perished, and the empty shells only are left. A half-grown living one was sent me in 1890 by Mr. William Baillie, which was probably the last. It is a large and handsome species.

"**V. mercenaria** L.—A fine series has been dredged alive in the river Humber. It was first observed in 1864, and again in 1868; it has steadily increased to the present

time, and is now bidding fair to compete with the familiar cockle. This fine *Venus* is commonly known in America as the 'clam,' and is of course an edible species. A number of shells dredged from the river were exhibited by Mr. J. R. Hardy at the Manchester Conchological Meeting."—*Manchester City News*, March 23, 1889.

Tapes aureus Gm.—This is more variable than any of its congeners. I have them of every degree of convexity and compression. The prettiest come from Scilly, and the largest from Guernsey; one from the latter island is just under two inches broad. Occasionally it is pink inside, like *T. virgineus*, and more rarely the inside margins are deep purple.

Var. **quadrata** Jeff.—Herm Island; Helford River, Cornwall; Weymouth.

Var. **ovata** Jeff.—Herm Island.

T. virgineus L.—Very young specimens are squarish, and the fry nearly circular. I have a monstrosity from Guernsey analogous to a similar form of *T. aureus* from the Turton collection, having "an oblique fold extending from the umbonal area to the front towards the posterior side."

Var. **sarniensis** L.—Scilly (Smart and others).

Var. **elongata** Jeff.—Guernsey.

T. pullastra var. **ovata** Jeff.—Guernsey; Torbay.

Var. **oblonga** Jeff.—Guernsey.

T. decussatus var. **quadrangula** Jeff.—Torbay; Dawlish.

Lucinopsis undata Penn.—Dr. Jeffreys writes of this in the 'Lightning' Report: "It is difficult to distinguish this from *Diplodonta rotundata* except by the hinge;" but no difficulty need arise if it is remembered that this is a chalky-white shell, fragile, and brittle, while *Diplodonta* is glassy-white, and not easily broken. The animal is very handsome, snowy-white, with orange tubes; it will live for several days

in fresh water. The largest come from Torbay, and are $1\frac{1}{2}$ inches in diameter.

Var. *æqualis* Jeff.—Herm and Guernsey; Scilly (Smart and others). This variety is smaller and has an angular outline. L. 0.8, B. 0.9.

Tellina balaustina L.—Peterhead, 30 miles off, in 60 f., a fine living specimen and two valves (Dawson); Scilly, 40 f. (Burkill and J.T.M.); the Minch off Loch Boisdale, 45 f.; Dornoch Frith, two young specimens.

The young a line in breadth are depressed, inequilateral, and angular at the posterior side, somewhat resembling the same stage of *T. crassa*, but the sculpture is much finer. It is still more like the young of *Gastrana fragilis*.

T. crassa var. *albida* Jeff.—Equally diffused with the type.

T. balthica L.—Our var. *attenuata* is the Baltic form, and in strict justice should be the type; but it is clearly a local and varietal form, and quite unsuitable for a type shell. Jeffreys' figure is wrongly drawn, the rounded end appears the shortest, while it should be the contrary. Sowerby's is perfect. The largest come from Laugharne and Pendine, and measure $1\frac{1}{4}$ inches in breadth.

Var. *attenuata* Jeff.—Yellowish-white. Cumbrae (Brown); Dornoch Frith.

Var. *nivea* Jeff.—Weston-super-Mare.

T. tenuis DaC.—Sowerby's two figures of this shell are excellent, but Jeffreys' figure has the posterior end too produced; that end should be the shortest.

T. fabula Gron.—Jeffreys' dimensions are extreme, and his figure is too long or deep; it should be like Sowerby's.

These errors of figuring are clearly due to a non-adherence to types, of which sufficient care has not been taken by writers. Even Jeffreys, with all his care, frequently departs from his type figures in his detailed

descriptions, and, stranger still, his plate figures sometimes differ from his generic ones.

Var. *ovata* Jeff.—Dornoch Frith.

Tellina serrata Brocchi.—(Conch. foss. subapp. II., p. 510, t. xii., fig. 1). New to Britain. Dredged off the Menawawr, Scilly Isles, in 40 fathoms. Two valves.

I found one small valve several years ago from the above district, and some recent dredgings from the same ground have yielded another and larger valve, both quite fresh and with the delicate sculpture intact, and I have no doubt whatever that this species is to be found among the Scilly Isles.

T. serrata is unlike any other British *Tellina*. It is thin, obtusely triangular, very compressed, and sculptured with numerous delicate laminar ridges, which become more raised on the posterior ridge.

Its geographical distribution is Brittany, Portugal, Tangiers, Mediterranean, Sea of Marmora, Adriatic, and Canaries. Not a common shell.

T. squalida Pult.—Guernsey and Herm. My largest specimen, from the latter island, is 2 inches by $1\frac{3}{4}$ inches.

T. donacina L.—Half-grown specimens are the prettiest, the rays becoming feebler as the shell becomes older. Now and then the position of the flexuous gape at the posterior end is reversed. Specimens from Guernsey are $1\frac{1}{4}$ inches broad.

Var. *lantivyi* Payr.—There is a variety from Guernsey coloured as this, but it is not "of a thinner texture."

A monstrosity from Guernsey has the posterior end pinched up, reminding one irresistibly of the central feature of a pug dog; and another from the same island has a foliaceous plate extending round the inner margins of both valves.

Var. *distorta* Jeff. (*non* Poli).—"I still believe this to be a variety of *T. donacina*, but in deference to other conchologists I will retain it as a provisional species. The difference seems to consist in the smaller size and greater angularity of the posterior side. It may be as distinct as *T. pusilla*."—(Jeffreys*).

Judging from the few specimens I have seen of this variety, I do not consider the British form to be identical with the Mediterranean one, though it leads up to it. The fact is, that while some specimens of *T. distorta* are deeper from the beaks to the lower margin, other specimens of *T. donacina* are narrower than the type form, and the differences between these two species being founded mostly on their relative proportions, this brings the two so close together that at first sight the extreme forms may easily be taken for one species. But I feel sure that *T. distorta* is not a British shell—what Jeffreys has taken for such being a narrow form of *T. donacina*. I am confirmed in this opinion by finding that the latter has its analogue in *T. pusilla*.

T. pusilla Phil.—Herm Island, low water; off Scarborough, 30 f.; the Minch off Barra, 30—50 f. The latter are very large— $4\frac{1}{2}$ lines by 3.

Admiral Bedford informed me that he once picked up forty dozen on the beach in Sinclair Bay, Scotland.

A perfect specimen and two valves of *T. calcaria* Chem. are in the MacAndrew Collection from Loch Fyne; Doggerbank, an imperfect valve (Jeffreys); Sutherlandshire, from fish stomachs (Baillie)! Aberdeenshire and Sutherlandshire, valves adherent to star-fish. None of the above can be pronounced recent.

Psammobia tellinella var. *gracilis* Jeff.—Smaller, shorter, and not so angular. It has a slight gape at each end, but

* Moll. 'Lightning' and 'Porcupine,' Proc. Zool. Soc., 1881, p. 721.

not more so than in the type. The sculpture is usually, though not always, coarsely impressed concentric striæ. It resembles *P. costulata*, and Dr. Jeffreys must have made a *lapsus pennæ* when he wrote that it "resembles *Galeomma turtoni* in shape." From Sutherlandshire (Baillie)! Minch off Barra, 35 f. (Somerville and J.T.M.).

P. costulata Turt.—Scilly (Smart and others); Barra, 5 f. (Somerville and J.T.M.); Herm Island, living in sand at low water. It seems to have escaped notice that this species is inequivalve. The very young cannot be distinguished from those of *P. tellinella*. My finest are from Guernsey, and are nearly $1\frac{1}{4}$ inches in breadth.

P. ferroënsis Chem.—Guernsey Harbour, rare. A small form from Bantry Bay, collected by Mr. Bartlet Span, is of a uniform deep purple.

Var. **pallida** n. var.—Pure white to pale yellowish white, without rays; epidermis fragile and of a silky texture. Collected at Tenby by Mr. Bartlet Span.

P. vespertina var. **lactea** Jeff.—Guernsey and Herm, rare. The shape of the teeth in this variety is not constant, and should not be considered characteristic, the degree of 'erectness' and 'pointedness' being a question of wear and tear. Half-grown specimens of the type exhibit the dentition ascribed to this variety.

Var. **livida** Jeff.—West of Scotland. This variety does not depend so much on its colour as on its shape.

Donax vittatus var. **nitida** Jeff.—Aberdeenshire.

Var. **truncatus** Marsh. (Irish Naturalist, Jan. 1895, with fig.)—This variety is peculiar, so far as I am aware, to the south and west of Ireland. The umbonal area inside the valves is fretted with deep pit-marks, which I thought might be caused by a parasite, as in dredging the var. *nitida* on the Doggerbank many years ago (which is a similar convex form) I found that fifty per cent. contained

a small parasitic crab; but a subsequent examination of a score of living specimens of var. *truncata* did not disclose the cause of these curious frettings, although they were present in every specimen. Perhaps they may be caused by an epidemic disease, for they are not present in any other species or variety of *Donax* that I have seen.

The type "is very common at Paignton, South Devon, living in the sand, and bearing a curious mark of distinction—small tufts of green ulvæ are frequently met with between tide-marks, growing apparently out of the sand, and these on examination are found to be rooted on the shells of *Donaces*, whose cool retreats are thus revealed alike to shell collectors and sea birds, the latter keen as man to detect the sand-dwelling conchifers."—(Pidgeon).

D. trunculus L.—Jeffreys' figure presents no difference from that of *D. vittatus*; it should be more abruptly truncated at the anterior end, and his *D. vittatus* a little more oblique at that part.

D. politus Poli.—Poole, Dorset (Cooper)!; Weymouth Bay, rare.

Half-grown specimens are beautifully marbled, but the markings tone down in the adult stage. Sometimes the ray is slight or evanescent, and a specimen from Guernsey has this characteristic ray broken up into a dozen fine ones, arranged as in *Tellina donacina*.

Amphidesma castaneum Mont. — Scilly Islands, 40 f. (Smart and others), mostly valves. In one spot these valves may be dredged in thousands, but perfect specimens are rare, although I have several dozen immature ones. It was dredged by the 'Challenger' off Teneriffe, 70 f., and off the Azores, 450 f. and 1000 f. It is variable in length and breadth and in the position of the beaks. A white form occurs at Scilly, as well as another which is abnormally oblong.

(To be continued).

ADEORBIS UNISULCATUS, NEW SPECIES,
FROM THE IRISH COAST.

By GEO. W. CHASTER.

(Read before the Conchological Society, November 11th, 1896).

Adeorbis unisulcatus n.sp.

Shell much depressed, thin, colourless, nearly transparent, composed of about two whorls; sculpture consisting of very numerous spiral rows of minute punctures, more or less obscured by the closely-set, oblique, raised, lines which cover the surface; below the periphery there is a deep spiral groove formed by an infolding of the shell substance, a slight and shallow groove also surrounds the umbilicus; whorls rounded above and rather sharply angulated at the base; nucleus smooth and somewhat obliquely placed; suture deep and channelled; umbilicus very large, exposing the internal spire; mouth quadrangular, very oblique; outer lip retreating above and below, deeply notched by the spiral groove.

Height 0.4 mm., Diam. 0.8 mm.

This species has much the appearance of *A. imperspicuus*

Monts., when viewed as it usually is from above or below. The two are, moreover, frequently associated. From that species it



is distinguished by its invariably smaller size, its more out-spread manner of growth, and especially by the remarkably deep spiral groove. When I noticed the differences and proceeded to separate my specimens of the two species (about one hundred in number) from various localities, I was surprised to find that although *A. imperspicuus* varies considerably, the present form is constant in its characters and very distinct from any variety of the other.

Two dead specimens were dredged off Rue Point, Rathlin Island, in seventeen fathoms. I have it also from Oban, Roundstone, Plymouth (where it is not very rare), and Tangier. A single dead shell of *A. imperspicuus* was found in the same material from off Rathlin Island.

A VISIT TO A SNAIL FARM.

An extract from a friend's letter communicated to the Conchological Society by MR. R. D. DARBISHIRE.

(Read before the Conchological Society, July 7th, 1896).

The Farm consisted of one large meadow fenced in from the road by boards about a foot high. The owner employs people to collect the snails from the neighbouring woods and meadows. They bring in from 1,000 to 2,000 daily, commencing as soon as the snows melt, say, about April.

They are placed at once on one-half of the meadow and left to graze until the month of July, when they are removed to the other half of the field. This is all divided up into squares, like a gigantic chess-board, by boards a foot high. Each square is filled with a thick bed of moss on which the snails are placed, to be fed on cabbages for three months. They become very fat and large and of a greenish-white colour, like the pieces of cabbage. Towards the end of September the snails begin to burrow down through the moss so that they are completely hidden. They lie there with the openings upwards till they have completely closed themselves in for the winter, forming a hard cover over the mouth of the shell. It is in this condition that they are exported, as they can now be kept till required.

The price the farmer gets per 1,000 is 17 francs for the sealed shells, and 10 francs for open ones, which have to be used at once. All had to be despatched to Troyes by the 4th of October, by which time all that were going to close would be sealed, but some always remain open.

They had from sixty to eighty thousand snails on the ground; all exactly alike except that some were slightly darker than others. The farmer assured me that they never varied in any way, and he never came across any unusual growth.

CHALET ST. DENIS,
FRIBOURG, October, 1894.

CONCHOLOGICAL SOCIETY
OF GREAT BRITAIN AND IRELAND.

PROCEEDINGS.

257th MEETING, JANUARY 13th, 1897.

Held in the Manchester Museum, Owens College.

Mr. R. D. Darbishire, Vice-President, in the chair.

Donations to the Library announced and thanks voted:

La Feuille des Jeunes Naturalistes, series 3, no. 315, Jan., 1897; Armature of Helicoid Land Shells, part 3, by G. K. Gude (*from the author*); Trans. Yorkshire Naturalists' Union, part 20, 1896; Science Gossip, vol. 3, n.s., nos. 31 and 32, Dec., 1896, and Jan., 1897; Journal of Malacology, vol. 5, no. 4, Dec., 1896; Irish Naturalist, vol. 6, no. 1, Jan., 1897; Scottish Naturalist, no. 21, Jan., 1897; Journal de Conchyliologie, vol. 44, no. 1, 1896.

New Members elected:

Rev. Thomas Cook, Whinwood, Westcliff Grove, Harrogate.

Mr. Alfred Santer Kennard, Benenden, Mackenzie Road, Beckenham, Kent.

Candidate Proposed for Membership:

Mr. J. Bliss.

Resignations:

Messrs. E. W. Williams, C. Stanley B. Cox, R. J. L. Guppy, J. H. Burkill.

Resolution of the Council:

It was reported that the Council had resolved—"That after the issue of the next number of the Journal of Conchology it will only be sent to those members who have paid their subscriptions for the current year."

Letter read:

The following letter received by the Rev. J. W. Horsley from the Secretary of the General Post Office was read:—

GENERAL POST OFFICE,
LONDON, 12th December, 1896.

SIR,—

In reply to your further letter of the 3rd instant, respecting the transmission abroad of natural history specimens by means of the Sample Post, I beg leave to repeat that this department has no knowledge as to the Customs Duty chargeable in France upon the articles to which you refer; and I would suggest that any further application on the subject should be addressed to the Customs authorities of that country.

With reference to your statement that several years ago you were informed by the Post Office that natural history specimens might be sent by Sample Post, I have to inform you that the circumstances have changed since 1892, when such specimens were allowed

to go forward by Sample Post on the chance of their not being stopped by the Post Office of the countries of destination. At that time opinion and practice in this respect varied in different parts of the Postal Union; but since then the Postal Union decided not to make a rule admitting natural history specimens to the reduced rate of postage for samples, so that there was no longer any doubt as to the irregularity of forwarding the specimens in question at the sample rate; and the Postmaster-General had therefore no alternative but to withdraw the instructions formerly given to the officers of the department to allow them to pass.

I am, Sir,

Your obedient Servant,

W. ROCHE

(For the Secretary).

The Rev. J. W. HORSLEY.

Exhibits:

By Mr. R. D. Darbishire: Some shells brought up on the anchor cable during a recent voyage on the west coast of South America—*Trophon xanthostoma*, *Nassa dentifera*, *Purpura chocolata*, *Turritella cingulata*, *Fissurella picta*, and a particularly fine specimen of *Cypræa nigropunctata*.

By Mr. Wm. Moss: *Pupa Eyriesi* from Trinidad.

By Mr. J. T. Marshall: *Gwynia capsula in situ* from Jersey.

By Mr. Thos. Scott: A series of freshwater shells from Shetland, comprising *Limnæa peregra* and *Planorbis glaber*, from Flossie Loch, Gulberwick; *Planorbis contortus* and *P. nautilus* from Asta Loch, Scalloway; *Limnæa peregra* and *L. truncatula* from Tingwall Loch, Scalloway. Also *Limnæa peregra*, *L. palustris*, *Physa fontinalis*, *Valvata piscinalis*, *Planorbis contortus*, *P. albus*, *P. nautilus*, *P. nitidus*, *Pisidium milium*, and *P. nitidum*, from Rescobie Loch, Forfarshire.

A large number of examples, comprising some fifty species of *Camæna*, *Thersites*, *Hadra*, and allied sub-genera, were exhibited by Rev. J. W. Horsley, Messrs. R. D. Darbishire, R. Cairns, W. Moss, T. Rogers, J. R. Hardy, R. Standen, and the Manchester Museum, and an interesting discussion followed. It appeared that systematic exhibitions of particular groups would be particularly interesting and instructive to the members, and it was therefore decided to exhibit examples of *Glandina* and its allies at the next meeting; and members were requested to bring or send any species they might have for comparison.

25th MEETING, FEBRUARY 10th, 1897.

Held in the Manchester Museum, Owens College.

Prof. S. J. Hickson, President, in the chair.

Donations to the Library announced and thanks voted:

La Feuille des Jeunes Naturalistes, ser. 3, no. 316, Feb. 1897; The Naturalist, nos. 258 and 259, Jan. and Feb., 1897; Irish Naturalist, vol. 6,

no. 2, Feb., 1897; Armature of Helicoid Land Shells, part 4, by G. K. Gude (*from the author*); The Land Mollusca of Ballycastle and District, County Antrim, by R. Standen (*from the author*); Proceedings of the Academy of Natural Sciences of Philadelphia, part 2, April-August, 1896; The Practical Photographer, vol. 8, no. 86, Feb., 1897.

New Member elected :

Mr. Joseph Bliss, Smyrna, Asia Minor.

Members Deceased :

Rev. C. Crawshaw, Saltburn-by-the-Sea; Mr. Fred Hepburn, B.A., Sutton, Surrey.

Appointment of Auditors :

Messrs. J. H. Killingbeck and E. C. Stump were elected Auditors for the current year.

Letters read :

Letters were read from Captain Gordon McDakin relative to the acclimatisation of *Helix elegans* at Dover; and from Mr. Albert Wood on the occurrence of sinistral and turreted specimens of *Planorbis spirorbis* at Sutton Coldfield.

Paper read :

"Descriptions of four new species of marine shells, from Lifu, Loyalty Islands," by J. C. Melvill and R. Standen, forming part of their series of communications on the Hadfield collection.

Exhibits :

By Messrs. Melvill and Standen : The new species of *Olivella*, *Drillia*, *Elusa*, and *Odostomia* described in their paper.

By Mr. Harold Barke : A remarkable specimen of *Clausilia perversa* with the last whorl truncated, from Aberglaslyn.

By Mr. A. Wood : A sinistral specimen of *Planorbis spirorbis* from Hill Hook Mill Pool, Sutton Coldfield; and a fine turreted monstrosity of the same species from an old marl pit at Hill Hook.

By Mr. Wm. Moss : *Diplommatina occidentalis*, *Epiphragmophora coactiliata*, and a specimen of *Helix perplexa* with double mouth—all from Trinidad.

A fine series of *Glandina* was exhibited by Messrs. J. Cosmo Melvill, E. Collier, R. Cairns, W. Moss, and T. Rogers; the Manchester Museum collection was also shown by Mr. R. Standen. Altogether about one-half of the known species were displayed on the table, and an interesting discussion ensued.

It was decided to make a special exhibit at the March meeting of species of *Streptaxidae* for comparison and discussion.

259th MEETING, MARCH 10th, 1897.

Held in the Manchester Museum, Owens College.

Mr. Edward Collier in the chair.

Additions to Library (by subscription) :

Monograph of the Land and Freshwater Mollusca of the British Isles, by J. W. Taylor, parts 2, 3, and 4.

Donations to Library announced and thanks voted :

The Naturalist, no. 260, March, 1897; Science Gossip, vol. 3, nos. 33-34, Feb.-March, 1897; Records of the Australian Museum, vol. 3, no. 1, Jan., 1897; Transactions of the Royal Society of South Australia, vol. 20, part 2, Dec., 1896; from Smithsonian Institution—Report on the Mollusks collected by the International Boundary Commission of the United States and Mexico, 1892-94, by W. H. Dall; Descriptions of Tertiary Fossils from the Antillean Region, 1896, by R. J. L. Guppy and W. H. Dall; and on the genus *Remondia* Gabb, a group of Cretaceous Bivalve Mollusks, by T. D. Stanton; Memoirs and Proceedings of the Manchester Literary and Philosophical Society, vol. 41, part 2, 1896-97; La Feuille des Jeunes Naturalistes, no. 317, March, 1897.

Candidates Proposed for Membership :

Messrs. James Chanter Blackmore, and Arthur Edwin Boycott.

Discontinuance of Summer Meetings :

On the recommendation of the Council, it was resolved: "That no meetings of the Society be held in July and August."

Paper read :

"Note on *Scintilla eddytonia* Marshall," by G. W. Chaster.

Exhibits :

By Rev. Lewis Shackelford : A beautifully-preserved series of *Chitons*, mostly recently-described species, collected by Mr. E. H. Mathews in South Australia, including *Chiton calliozona* Pils., *R. exoptandus* Bed., *C. tricostalis* Pils., *Ischnochiton cariosus* Pils., *I. Tateanus* Bed., *I. ustulatus* Reeve, *I. virgatus* Ang., *I. cuneatus* Matt., *Acanthochiton asbestoides* Pils., *A. Bednalli* Pils., *A. granostriatus* Pils.

A fine series of *Streptaxidæ*, comprising many rare examples of the genera *Streptaxis*, *Ennea*, *Gibbus*, and *Streptostele*, were shown by Messrs. J. C. Melvill, E. Collier, R. Cairns, J. R. Hardy, W. H. Heathcote, T. Rogers, R. Standen, and the Manchester Museum. Two examples of the sinistral form of *Gibbus Lyonetianus* were shown—one in Mr. Collier's collection, and the other in the Manchester Museum, presented by Mr. J. Ray Hardy.

At the April Meeting there will be a special exhibit of the group of *Helices* contained in the section *Obba* Beck.

NOTES ON A COLLECTION OF SHELLS
FROM LIFU AND UVEA, LOYALTY ISLANDS,
FORMED BY
THE REV. JAMES AND MRS. HADFIELD,
WITH LIST OF SPECIES.

PART II. (*continued*).

BY JAS. COSMO MELVILL, M.A., F.L.S., & ROBERT STANDEN
(Assistant-Keeper, Manchester Museum).

(Read before the Conchological Society, February 10th, 1897).

Drillia cygnea sp. nov. (Pl. XI., fig. 82.)

D. testa fusiformi, crassa, lævi, nitida, candidissima, anfractibus sex vel septem, apicalibus . . . ? cæteris perlævibus (sub lente superficialiter striatulis), ventricosulis, longitudinaliter costatis, costis rectis, uniformibus, ad utrumque anfractum octo; apertura ovata, labro extus perincrassato, præcipuè supra, canali brevi, sinu obscuro in speciminibus nostris.

Long. 15, Lat. 7 mill.

A pure white, shining, massive little species, with uniform straight longitudinal ribs, the surface being nearly smooth and shining. Ribs of the last three whorls continuous, and about eight in number. Four specimens.

(*cygneus*, swan-like).

Odostomia versicolor sp. nov. (Pl. XI., fig. 83.)

O. testa subturrita, attenuato-fusiformi, gracillima, delicata, anfractibus novem, quorum duobus apicalibus, pervitreis, cæteris ventricosulis, præcipuè supernis, spiraliter delicatissimè striatulis, et supernis decussatis, ad medium et infra anfractus ante-penultimi et trium superiorum hic aurantio-tinctis, hic pallidè puniceis, illic unicoloribus; ultimo anfractu recto, prolongato; apertura oblonga, labro paullum effuso, tenui, columella uniplicata.

Long. 5, Lat. 1.50 mill.

The shell is very graceful and delicate, attenuate, aciculate, nine whorled, two whorls being apical, the fourth, fifth, and sixth tinged in the lower half with either chestnut, yellow, pale-pink, or left wholly white and unicolorous; the antepenultimate whorl is often similarly tinged, but the last two whorls are white; the last is prolonged and straight. Mouth ovate, oblong; outer lip slightly effuse, thin; columella one-plaited. A few specimens.

Allied to *O. striata* Pease, but the whorls are transversely striate and delicately decussate. It is not a typical *Odostomia*, but our knowledge of that genus and its allies is at present so unsatisfactory, that we do not know precisely where to locate it.

Elusa gradatula sp. nov. (Pl. XI., fig. 84.)

E. testa attenuata, gradata, fusiformi, per-gracili, nivea, lævi, anfractibus decem, turritis, lævibus, longitudinaliter minutè et arcè costulatis, costis nitidis, interstitiis per-lævibus; apertura ovata, labro tenui, columella uniplicata.

Long. 4.50, *Lat.* 1.50 mill.

This shell has some affinity with *Pyrgulina pyrgomella* Melv., described recently from Bombay. The whorls are ten, attenuate, gradate, very slender, white, smooth, uniformly very finely longitudinally costulate. Columella once-plaited.

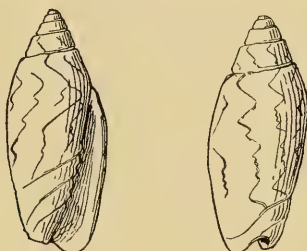
Olivella Williamsi sp. nov.

O. testa fusiformi, polita, anfractibus sex, apud suturas profundè canaliculatis, et excavatis, per-lævibus, anfractu ultimo oblongo, candido, flammis vel lineis fulgetrinis castaneis concinnè decorato, apertura angusta, oblonga, labro incrasato, columella 7-8 plicata.

Long. 15, *Lat.* 7 mill.

A well-marked, exceedingly pretty *Olivella*, which is not to be found either in the British Museum, Mr. Williams' collection, or any of the collections, public or private, we have been able to examine. Nor is any mention made of it in Mr. F. P. Marrat's Monograph of the genus in Sowerby's "Thesaurus Conchyliorum."

Mr. Williams writes us, that though in good condition, the markings in a quite fresh specimen would probably be much clearer and more characteristic. The shell is fusiform, polished, the whorls six, deeply canaliculate and excavate at the sutures; the last whorl and the penultimate are ornamented with clearly-drawn longitudinal zigzag chestnut lines; the mouth is narrow, oblong, outer lip thickened, columella 7-8 plaited.



× 2.

We have very much pleasure in connecting with this little *Olivella* the name of our friend, Mr. J. Michael Williams, of Liverpool, whose collection of Olives embracing as it does, so many types and unique or rare species and varieties, is probably the best extant at the present time, and to whom we have submitted the whole of the genus in our Loyalty Islands' collections.

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“Bibliography: Land and Freshwater Mollusca, 1890 and 1891,” by W. DENISON ROEBUCK. “*Testacella scutulium* at Adel,” by H. CROWTHER.

The Irish Naturalist, vol. 6, nos. 1-3, Jan.-March, 1897.

“The Land Mollusca of Ballycastle and District, County Antrim,” by R. STANDEN [50 spp., noteworthy *Vertigo alpestris*; *Helix aspersa* found in hollows, apparently excavated by itself in the chalk cliffs].

Records of the Australian Museum, vol. 3, no. 1.

“An *Actinoceras* [*A. Hardmani*] from North-west Australia,” by R. ETHERIDGE, JR., with plate 3. “Description of a new Papuan Land Shell [*Thersites septentrionalis*],” by C. HEDLEY, with fig.

ON TWO REMARKABLE ATAVIC SPECIMENS
OF *PLANORBIS SPIRORBIS* Müll.

BY JOHN W. TAYLOR, F.L.S.

(Read before the Leeds Branch of the Conchological Society, March 20th, 1897).

MR. ALBERT WOOD, of Sutton Coldfield, a most enthusiastic and successful conchological student, who is systematically working out the molluscan fauna of his neighbourhood with a view to the eventual preparation of an exhaustive monographic account of the mollusca of the Park, and who, in furtherance of this object, has recently issued for private circulation an interesting epitome of the results he has attained up to the present time, has been fortunate enough to find almost simultaneously the two remarkable shells of *Planorbis spirorbis*, which form the subject of the present note, and are probably by far the most interesting specimens that have up to the present time rewarded his investigations.

These specimens are of great interest, one being sinistrally and the other dextrally coiled; but a careful study of their peculiarities shows both shells to be atavistic or reversions to the ancestral or primitive type of the species, as in this and similar carinate species we are able by a critical examination of the shell to confidently proclaim the mode of organization of the animal forming it, and by applying our knowledge to these two special cases we see the sinistral specimen to be a reversion to the original coiling natural to the species and in accord with its sinistrally organized inhabitant, while the dextral shell is a reversed monstrosity of the orthostrophically sinistral form.

For those who have not studied the subject it may be necessary to state that the *Planorbis* are sinistrally organized animals, primitively possessed of sinistrally coiled shells, but by the peculiar modification or specialization, known as hyperstrophy, the shell has become a dextral one, this change, however, not affecting the sinistral organization of the animal.

In the chapter upon Hyperstrophy in my "Monograph of the Land and Freshwater Mollusca of the British Isles," p. 110 *et seq.*, I have fully discussed the various modes of coiling to which the shells of *Planorbis* are liable, and shown that theoretically there are four possible modes of convolution, viz.: the simply dextral and simply sinistral coiling and the sinistral and dextral convolution due to atavism or reversion.



Diagrammatic figures showing the probable mode by which a sinistrally organized mollusk with a sinistral shell, as the primitive *Planorbis*, may become possessed of a dextrally coiled shell, although the contained animal retains its sinistral organization, as is evidenced by the heart persisting in its position on the right side of the body, as shown in the figures, and also by the sinistral position of the respiratory and other orifices.

The simply dextral or normal form of the species has arisen by hyperstrophic growth from the orthostrophically sinistral ancestor, the simply sinistral form being merely a reversed monstrosity of the type, the animal inhabitants being organized in a manner contradictory to that of their shells, the dextral specimens having sinistrally organized animals, and the simply sinistral monstrosities being tenanted by dextral animals, this anomaly being owing to the hyperstrophic growth which by transposing the relative positions of the apex and base of the shells changes the dextral shells to sinistral ones, and *vice versa*, without affecting the organization of the animal.

The atavic sinistrally coiled shells are reversions to the primitive form, and the atavic dextral shells the reversed monstrosity. These forms are due to a reversal of the hyperstrophic process and results in the original sinistral shell being reacquired and the animal again becoming in harmony with its shell.

Reversal in the direction of the coiling when not acquired by hyperstrophic growth or by atavism, is always accompanied by a corresponding reversal of the organization of the animal; the sinistral and dextral monstrosities of various species that are met with are usually of this character.

The **sinistral** *Planorbis spirorbis* found by Mr. Wood, was obtained early in December, 1896, from the overflow stream of the mill pool at Hill Hook, Sutton Coldfield. This stream is very clear, sustaining a rich vegetation, chiefly water-starwort and watercress, while the bed of the stream is thickly strewn with valves of *Pisidia* and *Sph. corneum*, var. *flavescens*.



Atavic Sinistral
monstrosity of
Planorbis spirorbis
Müll. $\times 6$,
Hill Hook Mill
Stream,
Sutton Coldfield.

A careful study of this sinistral shell shows that it is not simply a reversed corkscrew monstrosity of the ordinary dextral form, with a dextral animal for its occupant, but a specimen whose peculiarities have arisen by a reversal of the hyperstrophic process, and which therefore represents the original orthostrophic form of the species, the animal being a sinistrally organized animal within a sinistrally coiled shell.

The **dextral** turreted specimen was obtained from the waters of an old marl pit, at Hill Hook, about the same time as the sinistral specimen, and is a much more interesting and remarkable shell.

To a superficial observer, the shell might be supposed to be merely a turreted monstrosity of the ordinary dextral form of the species, but like the sinistral specimen, this is also shown on critical examination to owe its chief peculiarity to this reversion to the ancient type, the primitively sinistral coiling having become reversed, as the shell has undoubtedly been formed by a dextrally organized animal, which has thus a shell coiled in harmony with the structure of the animal, proving it to be a dextral monstrosity of the atavic sinistral form.



Atavic Dextral
monstrosity of
Planorbis spirorbis
Müll. $\times 6$,
Marl Pit, Hill Hook,
Sutton Coldfield.

In my discussion of this subject (*t. c.*, p. 112) I pointed out that of the four theoretically possible modes of convolution, only three were at that time known to exist, but this blank in our knowledge is now filled up by the discovery of this atavistically dextral form, which is, so far as I know, quite unique.

ADDITIONS TO "BRITISH CONCHOLOGY."

By J. T. MARSHALL.

(Continued from page 372.)

Amphidesma castaneum var. **subtrigona** Monts.
(Nomenclatura, p. 27, as var. *minor-subtrigona*—New to Britain. Smaller and almost triangular. This is the normal form at Guernsey and Herm, and it is occasionally met with at Scilly and the Land's End. Jeffreys' generic figure is different from that of his plate figure; but the latter is correct.

Mactra solida L.—Exmouth, very large and solid—2 in. by $1\frac{3}{4}$ in.

Var. **truncata** Mont.—Guernsey Harbour.

Var. **elliptica** Brown.—Epidermis conspicuous and persistent. Sowerby's figure is the var. *intermedia*, and not this.

M. subtruncata DaC.—Dredged specimens are usually fully covered with the epidermis, but when taken from between tide-marks it appears on the sides only. The largest come from Southport, and are $1\frac{1}{2}$ in. by 1 in.

Var. **striata** Brown.—Guernsey; Torbay; Weymouth.

Analogous to and resembling *M. solida* var. *truncata*, but this variety has the lunular areas more sharply and deeply defined.

Var. **inæqualis** Jeff.—Torbay; Southport.

Var. **tenuis** Jeff.—Torbay; specimens having the characters of this variety, but broader instead of longer.

Mr. Alfred Brown relates of this species that two of the "carnivora" will attack opposite sides of the same bivalve, and on one occasion he noticed "a singular case of defective instinct in a *Purpura*, which was diligently piercing a hole in a single valve (a much-worn one too) of *Mactra* and had nearly completed its task when interrupted!"

M. stultorum L.—This species is very liable to become incommoded by sand-grains, which enter the shells and are then cemented over by the animal. Among specimens dredged on the Doggerbank, which is comparatively shallow and subject to heavy ground swells after gales, fully 30 per cent. were in this condition. The fry are triangular, like the adult, and *not* oval.

The figures both of Jeffreys and Sowerby are incorrect. If an actual specimen be placed on these figures, it will be seen that they are too triangular, and in Sowerby's figure the beaks are sharp instead of being obtuse.

Var. **cinerea** Mont.—Shell of the same texture as the type.

M. glauca Born.—Jersey, in coarse gravelly sand at low spring tides, and Herm, confined to a small bank of very fine sand which is rarely uncovered by the tides. The Jersey specimens have a dull, dark, and coarse epidermis, owing to the nature of the habitat, but those from Herm are much lighter in colour, and have a beautiful glistening epidermis. The Jersey shells are mostly of a plain cream colour beneath the epidermis, and correspond to the Cornish valves of var. *luteola*.

I am not sure that *M. glauca* has been found at Guernsey, though Jeffreys quotes it on the authority of Dr. Lukis. It is very rare at Herm, but common in the Jersey habitat, where several dozen may be found on a favourable tide by the initiated. The epidermis blisters badly on immersion in hot water, and the best way to extract the animal is to wait until it opens its valves, and then cut the muscles suddenly with a sharp and thin knife. I have kept specimens in a pan of sea-sand, occasionally moistened with sea-water, for six weeks, and they have then been fresh and active.

Lutraria elliptica var. **intermedia** Sow.—I do not know that this variety has been described, but I find the name

and figure in Sowerby's Index, and the name is a very appropriate one. It is not described in "British Mollusca," but the authors say in their Supplement:—"We have two distinct forms, the broad [long] one as figured, and an elongated [short] variety which approaches *L. oblonga*. In the former, the dorsal edges are usually more convex and have a greater declination than in the latter, where they are more or less retuse towards the beaks." This variety is smaller, narrower, and more slender, the front and back margins are almost parallel except for a shallow sinuation in the centre of the lower margin, as in *Unio margaritacea*; the umbones are more prominent, the posterior gape wider, and it is more truncate at that end. L. 2, B. 4. The young of all sizes partake of the same characters as the adult. I have found it at Jersey and Herm, where it is the normal form, living with *L. oblonga* in sand at very low tides; it also occurs occasionally with the type in Torbay and a few other places. Var. *intermedia* is figured in Sowerby's Index (fig. 1) as the type; but fig. 2 is the type form; and it is well figured in Brown's Illustrated Recent Conchology. A valve is also figured by Searles Wood from the Coralline crag, to which valve Jeffreys had written under the table " *L. oblonga*," but Wood says he considers it a variety of *L. elliptica*, and that it resembles a figure by Dr. Hörnes of a variety of *L. oblonga*, but which is also figured by Mayer as a distinct species, *L. hörnesii*. Wood's figure exactly represents this variety.

L. oblonga Chem. lives with *L. elliptica* Lamk., at Herm and Jersey; but while in the former island the proportions are one *L. oblonga* to forty *L. elliptica*, at Jersey these proportions are reversed, and *L. oblonga* is the common form. Both species are subject to the same inconvenience from sand, as mentioned in the case of *Mactra stultorum*, and Dr. Jeffreys' "curious malformation, the specimen having an

inner case or double shell on the posterior side," is by no means rare; I have several similar examples. Some large valves of *L. oblonga* from Falmouth are 5 in. by $2\frac{1}{2}$ in. The young of this and the last are snow white, with a pale silky epidermis which gradually darkens towards the adult stage, aged specimens becoming almost black.

Scrobicularia nitida Müll. — Scilly Islands (Smart and others); Cawsand Bay, Plymouth; Torbay; Aberdeenshire.

S. alba var. *curta* Jeff.—Jersey; Torbay; Skegness.

Var. *oblonga* Marsh. (J. of C., vol. vii., p. 247).—Scilly Islands; Milford Haven; Bantry Bay; Arran, 3of.

A variable shell, both in shape and size. The Rev. Frank Knight has dredged some very large valves at Arrochar, at the head of Loch Long, measuring $1\frac{1}{8}$ in. by $\frac{3}{4}$ in. At this place there is a considerable admixture of fresh water from the surrounding mountains, which would seem to agree with this species. A dwarf form does not exceed $\frac{1}{4}$ in. in width.

S. piperata Bell.—Scilly, rare (Smart and others); Herm Island, very rare.

Solecurtus scopula Turton.—Scilly (Tregelles and others).

Solen pellucidus Penn.—Low-water mark, Jersey (Duprey and J.T.M.).

S. ensis L.—Low-water mark, Jersey and Herm.

S. siliqua var. *arcuata* Jeff.—Found sparingly with the type, although in some localities it is the normal form.

Their mode of living is well exemplified by the manner in which an inch or two of their shells are frequently cut off by the dredge. In Devonshire they are caught at low water by dropping an iron rod down their burrows, on which the valves close and they are drawn to the surface. A pinch of salt, or a hot sunny day, brings them to the surface. My largest, from Sutherlandshire, is $8\frac{3}{4}$ in. by $1\frac{1}{2}$ in., but Mr. Robertson has taken them $10\frac{1}{2}$ in. in

breadth. These large specimens are usually abraded; but some beautiful specimens from Tenby, about 8 in. in breadth, are perfect in this respect.

During a very low spring tide at Cumbrae, Mr. David Robertson found three living specimens fixed upright in the sand, with about an inch and a half of the shells exposed, to which two or three mussels were attached in each case, so as to completely prevent the *Solens* slipping down their burrows.

S. vagina L.—St. Aubin's Bay, Jersey, abundant and collected for food. It is also eaten in some parts of Devonshire, though *S. siliqua* is the species usually brought to the markets. My largest, from Guernsey, is $6\frac{1}{4}$ in. by 1 in.

Pandora inæquivalvis L.—Off Teignmouth, a dead specimen; Weymouth Bay; Studland Bay.

The monstrosity recorded in "British Conchology" occurs at Jersey and Guernsey.

Lyonsia norvegica var. **elongata** Gray.—Tenby (Span)!; Loch Boisdale, 35 f. (Somerville and J.T.M.); Clyde, 18 f.

Thracia prætenuis Pult.—Scilly (Smart and others).

T. papyracea Poli.—Guernsey, rare.

Var. **gracilis** Jeff.—Front margin straight. Pendine; off Tarbert, 16 f.; Doggerbank, 40 f. A corresponding form occurs in the var. *villosiuscula*.

Var. **villosiuscula** Macg.—Smaller; beaks nearly central and more prominent. St. Mary's Sound, Scilly (Burkill and J.T.M.).

The young of this variety do not resemble the adult; they are considerably inequilateral, and obliquely and abruptly truncated at the posterior end.

The largest type specimens come from Pendine, and are $1\frac{1}{2}$ in. by $\frac{3}{4}$ in.; the largest of the var. *villosiuscula* from Guernsey, $1\frac{1}{4}$ in. by $\frac{7}{8}$ in.

T. pubescens Pult.—Campbelltown Loch, a fresh valve (Robertson); Babbacombe Bay; Plymouth Sound.

T. convexa W. Wood.—A perfect specimen was found by a lady, washed ashore on Paignton Sands, and Mr. Cundall found another, also perfect, cast ashore in a little bay near Barricane, North Devon. Doggerbank, a young specimen (Jeffreys); Rum Island, 33 f.; Loch Hourn, 20 f. and 75 f.; Stornoway Harbour, 10 f.; Loch Linnhe, 15 f. (Somerville and J.T.M.); Loch Fyne, 20 f.; Torbay, 13 f. All the above dredging records were of the young only. These are triangular in shape, the beaks being more prominent and the dorsal margins more sloping than in the adult. Its habitat is well illustrated by an instance in which Admiral Bedford, when weighing off Mull, brought up six fine living specimens on the flukes of the anchor, embedded in a mass of stiff clay.

This is a typical shell of the Belfast estuarine clays, where in some places they occur in great profusion and in perfect preservation. A specimen found by Canon Grainger is three inches broad.

T. distorta Mont.—Low water at Torbay and Weymouth.

Var. **truncata** Turt.—Torbay; Weymouth. The form of this variety is caused by its occupying the deserted burrows of *Saxicavae*.

Fossil in the Belfast deposit; several large valves, $1\frac{1}{4}$ in. by $\frac{7}{8}$ in. (Praeger).

My largest specimens, from Torbay, are an inch in breadth. The young do not vary in shape like the adult, but are always depressed, subquadrate, and equilateral, the beaks central, acute, and prominent.

Poromya granulata Nyst and W.—Loch Broom, 50 f., a small live specimen.

Neæra abbreviata Forb.—18 to 75 fathoms. Cromarty Bay (Dawson); Barra, 53 f. (Somerville)! Loch Linnhe, 24 f. (Knight)! Southport, a valve in drifted débris (Chaster); Brodick Bay, 40 f.; Kyles of Bute, 18 f.; Loch Alsh, 35 f.; Aberdeenshire.

The shell frequently wants the concentric plaits or folds (Jeffreys).

N. costellata Desh.—12 to 70 fathoms. Loch Fyne, opposite the old castle; Lamash, 15 f.; Tarbert, 20—30 f.; Brodick Bay, 40 f.

N. cuspidata Olivi.—12 to 90 fathoms. Catacol Bay, 25 f., Lochranza, 30 f., and Brodick Bay, in Arran, 20—40 f.; Gairloch, 30 f.; Sound of Sleat, 60—90 f.; off the West of Small Cumbrae, 65 f. (Somerville and J.T.M.); Loch Linnhe, 24 f. (Knight)!; Doggerbank, 75 miles off Scarborough, 35 f.; Loch Fyne, 30 f.

Var. **curta** Jeff.—Doggerbank, 35 f.

Var. **cinerea** Jeff.—East Shetlands, 40 f.

N. rostrata Spengl.—Færœ Channel (Triton).

The Færœ Channel has also yielded *N. obesa* Lovén, a Norwegian species.

Corbula gibba Olivi. — I have a monstrosity from the Hebrides in which the posterior end is abnormally produced, like the rostral beak in *Necera*.

Mya arenaria L.—Drumbeg, Sutherlandshire, very fine, 5 in. by 3 in. I have examples of a small stunted form which were taken from sand being used for building purposes in Great Russell Street, London, near the British Museum, and which were still alive!

M. truncata L.—The young and fry afford another instance in which the shells differ markedly from those of the adult.

M. binghami Turt.—Weymouth Bay, in soft sandstone. From the very young of *M. truncata* it differs in the latter being more regularly oblong. The published figures of this species apply to that form only which lives free and unencumbered in the deserted galleries of *Saxicava*. But numerous individuals will be found in stones, weeds, &c., in which the shell is not conformable to any particular shape, and these give some trouble in separating from *Saxicava rugosa* on the one hand and *Thracia distorta* on the other.

From the former, it differs in having an internal instead of an external ligament; and from the latter, in the texture of that shell being granulated, which is always observable with a lens.

Var. *elongata* Jeff.—Land's End; Torbay.

Panopea plicata Mont.—Mulroy Bay, Donegal (Dorsetshire); Largs, 20 f. (Robertson); Loch Gilp, Clyde, a live specimen (A. Brown); Brora (Baillie)! Loch Long, 24 f. (Knight)! Gairloch, 30 f., and Vatersay Sound, 5 f. (Somerville and J.T.M.); off Scarborough (Jeffreys), an imperfect valve; Knapdale Lochs; Loch Swin; Kyles of Bute; Aberdovey, N. Wales; Doggerbank. Also Corea, 40 f., a small valve, but unmistakable (H.M.S. *Sylvia*).

Saxicava norvegica Speng.—Moray Frith, a valve (coll. Edwards); Aberdeen trawl boat, one specimen (Dow).

S. rugosa var. *cylindrica* S. Wood (J. of C., vol. vii., p. 248).—Dornoch Frith; west coast of Ireland.

The variety *præcisa* is generally diffused, and var. *pholadis* is abundant wherever there is siliceous limestone. Var. *præcisa* differs from *Mya binghami*, which it often closely resembles, in the posterior angle being still more abruptly truncated, and especially in the external ligament. In *M. binghami* the beaks are also more acute and closely interlocked. A figure of the var. *pholadis* will be found in Brit. Moll., iv., pl. vi., fig. 8.

The dimensions given by Jeffreys for the type are very unusual. An inch in breadth by half-an-inch in length is the usual size. The position of the beaks is extremely variable, and the shell is sometimes considerably inequivalve. A monstrosity taken from a lump of limestone dredged in the British Channel by Mr. Bartlet Span has the posterior end extended into a prolonged and upturned beak, similar to a monstrosity of *Corbula gibba* previously noticed.

Venerupis irus L.—Guernsey, rare ; Scilly, rare ; Watersay Sound, Barra, 5 f., a valve.

There are three principal forms of growth — one, occupying the deserted burrows of *Saxicava rugosa* var. *pholadis*, which are very broad, cylindrical, and regular in shape ; the second occupy, and fit themselves into, all sorts of cavities and indentations, and are consequently of the most varied shapes, round, quadrate, triangular, depressed, globose, &c. ; the third is a handsome shell, attains a large size, and lives attached by a byssus either to chinks in the rocks or nestling in the deserted valves of *Pholas dactylus*. It is the latter form which is figured as the type in various works.

Petricola pholadiformis Lam.—This is another American importation, which seems to have gained a substantial footing on the British coasts, several naturalists having taken specimens on our southern shores. Mr. A. S. Kennard, of Beckenham, to whose kindness I am indebted for specimens, writes me that the latter were taken at Herne Bay, "just above low-water mark, where it is rather common though somewhat difficult to obtain." Jeffreys has recorded it from "Valentia, Ireland ; a fragment,"¹ presumably from the Porcupine Expedition of 1869 ; but as he did not further notice it in his report of that expedition, it may either have been an error or a fragment too trivial to mention. See also a note by Mr. J. E. Cooper, with a figure, in *Science Gossip*, 1896, p. 147.

Gastrochæna dubia Penn. — Low water to 20 f. Scilly (Smart and others) ; Torbay, in new red sandstone, at low water, associated with *Pholadidea*. Their burrows here are beautifully enamelled like porcelain, and remarkably solid. Weymouth and Babbacombe Bays, at low water of spring tides, in limestone.

Var. **ovalis** Jeff.—Torbay, with the type.

¹ Moll. Eur. and East. N. America, *Ann. and Mag. Nat. Hist.* (4) x., 1872, p. 329.

Pholas dactylus L.—La Rocque, Jersey, a few feet below high water mark, dead shells only *in situ*. These must be considered sub-fossil, as many years must have elapsed and great changes have taken place in the coast-line—either by a raising of the land or an encroachment of the sea—since *P. dactylus* could live in what is now nearly high-water mark.

Var. **gracilis** Jeff.—Torbay. This is a difficult species to procure alive, as they live lower down than the other *Pholades*, and burrow much deeper.

P. parva Penn.—An inequivalve monstrosity is occasionally found having one valve larger and sometimes broader than the other. The depauperated form (var. *quadrangula*) has been found semi-fossil in hard clay off Gosport by Lord Walsingham, and similar valves are in the National Collection, but without locality.

P. crispata L.—Hoylake (Webster).

Very small valves somewhat resemble those of *Teredo*. Specimens from the Belfast clays are of extraordinary dimensions; I have some valves $4\frac{1}{2}$ in. broad by $2\frac{1}{4}$ in. long, and a perfect specimen would be 8 in. in girth.

Pholadidea papyracea Turt.—Pullaheeney, Mayo, a valve (Miss Warren)! Weymouth Bay (Dodd, *vide* Fowler); Gwyllyn Vase, Falmouth; Alum Bay, Isle of Wight.

Var. **aborta** Jeff.—Torbay, in red sandstone, with the type.

A remarkable monstrosity from Torbay has the smooth area which bulges out on the anterior part of the adult shell, continued right round the margins.

This lives as deep as *Pholas dactylus*, and its burrows are uncovered only at very low spring tides, and for a short time only. The reefs in which they occur on the South Devon coast are generally divided into three layers—*Tapes pullastra* var. *perforans* and *Saxicavæ* occupy the first or top layer, *Pholas parva* the middle one, and *Phola-*

didea will be found underneath these. When they occur in a peat bed, as sometimes happens, there is of course no difficulty in procuring them. In the latter case, they may be easily dug up with a spade; but the former requires a pickaxe and a strong arm, and the greater proportion are broken in the operation. Dr. Farran once found them in abundance at Dungarvan, perforating the remains of a submarine forest.

Xylophaga dorsalis Turt.—Unst to Plymouth Sound and the Scilly Islands.

Teredo norvegica Spengl.—Shetlands to Alderney and Sark. The most variable of the British *Teredines*, the auricles and pallets being especially so.

T. megotara Hanl.—Brora, Sutherlandshire (Baillie)!

Var. **excisa** Jeff.—Guernsey.

Var. **mionota** Jeff.—Jersey and Guernsey. This is the form which invariably drifts to the Channel Islands.

T. fimbriata Jeff.—Southport (Heathcote)! This is figured in Sowerby's Index under the name of *T. palmulata* Lam., but the latter is a different species.

(To be continued.)



A colony of *Cæcilioides acicula* Müll. in Northamptonshire.

—A mile and a half from Kettering, on the Rockingham Road, there are two adjacent quarries. The surface soil, which is less than one foot in thickness, rests on a bed of limestone rock (Lincolnshire Oolite) from three to five feet in thickness; beneath this is a bed of pure sand. During the last twenty years, the skeletons of men and horses have occasionally been discovered, barely covered by the surface soil. Possibly they are relics of the battle of Naseby. While examining one of the human skeletons, which had been cut into, on November 25th, 1896, I discovered a quantity of *Cæcilioides acicula* adhering to the bones, and embedded in the soil and chinks of rock beneath. On a subsequent examination, March 14th, 1897, Mr. L. E. Adams and I found the same abundance of shells all round the cutting, and especially in those spots where skeletons had been found. The shells had penetrated the rock through crevices and holes made by roots to a depth varying from two to four and a half feet. C. E. WRIGHT, Kettering, *March 10th, 1897.*
(Read before the Conchological Society, April 14th, 1897).

NOTES ON A COLLECTION OF SHELLS
FROM LIFU AND UVEA, LOYALTY ISLANDS,
FORMED BY
THE REV. JAMES AND MRS. HADFIELD,
WITH LIST OF SPECIES.

PART III.

BY JAS. COSMO MELVILL, M.A., F.L.S., & ROBERT STANDEN
(Assistant-Keeper, Manchester Museum).

Read before the Conchological Society, June 16th, 1897.

THE present instalment of our work on the Lifu Mollusca contains a second list of the species observed up to the present time. For convenience we have arranged the families in the same order as in our previous catalogue (*antea* pp. 84-132), and we have included in the enumeration the new species described by us (*antea* pp. 273-315, 379-381). These are referred to by the letters "M. & S.," with an indication of the pages where the original diagnosis will be found.

CLASS GASTROPODA.

ORDER PULMONATA.

FAMILY *AURICULIDÆ*.

Melampus crassidens Gassies.—A conspicuous *Melampus*; as the specific name implies, the columellar teeth, and more especially the basal one, are thick and prominent.

Auricula Hanleyana Gassies.—An endemic species.

ORDER OPISTHOBRANCHIATA.

FAMILY *BULLIDÆ*.

Tornatina Hadfieldi M. & S., p. 314, 1896.

Bulla punctata A. Ads.—We can find no appreciable difference between our specimens and those coming from the shores of Panama.

FAMILY *SCAPHANDRIDÆ*.

Smaragdinella glauca Quoy.—One perfect small example, transparent, and pale green. Also from New Ireland.

FAMILY *APLUSTRIDÆ*.

Aplustrum thalassiarchi Mart.—Small, but characteristic.
Only two occurred. Mauritius.

FAMILY *OXYNOEIDÆ*.

Oxynoe Vigourouxi Crosse.—Four examples, quite perfect.

ORDER PROSOBRANCHIATA.

FAMILY *CONIDÆ*.

Conus (Hermes) mitratus Bruguière.—One beautiful and finely-marked specimen. Occurs also in the Philippines.

Drillia cygnea M. & S., p. 379, 1897.

D. ione M. & S., p. 277, 1896.

D. Mariesi Souverbie.—One specimen of a neat dark-brown shell, elegantly noduled with white spiral beading, which agrees with specimens of M. Souverbie's species in our National Collection. From Uvea.

D. Rougeyroni Souverbie = **D. barkliensis** H. Adams.—Our three specimens are a little worn, but we think we are right in the identification. A dark-umber shell, spirally tornate, and noduled.

D. themeropis M. & S., p. 278, 1896.

D. vidualoides Garrett.—A small and very pretty form, perhaps too nearly allied to *D. vidua* Rve. or *D. unizonalis* Lam., with which latter it is united by some authors.

D. xanthoporphyrina M. & S., p. 278, 1896.

D. (Clavus) formosa Reeve = **D. lactea** Hinds.—Of the same character is *D. vidua* Rve. Recorded also from various distant Polynesian stations.

D. (Clavus) gibberulus Hervier, J. de Conch., vol. xliii., p. 143, for 1895 (1896).—Many specimens of an elegant smooth straw-coloured shell, with irregular prominent longitudinal ribs.

D. (Clavus) protentus Hervier.—Too near, in our opinion, to *D. vidua* Reeve.

Borsonia bifasciata Pease.—Exactly agreeing with Sandwich Island types in the British Museum, but surely a *Clathurella*.

B. lutea Pease.—A pale straw-coloured shell, equally well placed as *Glyphostoma*.

B. nigrocincta Montrouzier.—Quite typical, and in good condition. The genus *Borsonia* Bellardi, founded in 1839 on a fossil possessing a columellar plait, has been extended to embrace a few recent N. Caledonian species, but in our humble judgment they intergrade with *Glyphostoma* and other *Mangilia*, and we only keep them separate now for the sake of comparison with Tryon's Manual.

Mangilia agna M. & S., p. 279, 1896.

M. bascauda M. & S., p. 279, 1896.

M. calathiscus M. & S., p. 280, 1896.

M. eumerista M. & S., p. 280, 1896.

M. himerodes M. & S., p. 281, 1896.

M. himerta M. & S., p. 281, 1896.

M. orophoma M. & S., p. 282, 1896.

M. stibarochila M. & S., p. 283, 1896.

M. thalykra M. & S., p. 283, 1896.

M. thiasotes M. & S., p. 284, 1896.

M. (Clavatula) rubida Hinds.—Many specimens. It seems variable, both as to size and form. Some are more oblong than is normal, the ribbing then being not so pronounced. All, however, agree in colour and marking. *M. rubida* is of wide distribution, being recorded from Mauritius, New Guinea, New Ireland, Fiji Islands, and Cook's Island (Tryon).

M. (Clavatula) zonata Reeve.—A prettily-banded species; also recorded from the Philippines.

M. (Cythara) conohelicoides Reeve.—Large and well-marked. Plentiful.

M. (Cythara) euselma M. & S., p. 284, 1896.

- M. (Cythara) gibbosa** Reeve.—Only one example. Allied to *C. interrupta* Reeve in the character of its sculpture and marking, but of a different form. Recorded from the Philippines.
- M. (Cythara) gracilis** Reeve.—Very beautiful, and strikingly marked with orange-brown square spots spirally arranged across the smooth ribs. The form also is attenuate-fusiform, and very graceful. Also a native of the Fiji and Philippine Islands.
- M. (Cythara) interrupta** Reeve.—Conspicuous for its fusiform shape, somewhat attenuate at both ends, with transverse interrupted stretched brown lines between the ribs. Allied to *M. bella* Reeve, and *M. theskela* M. & S. *Mitra cimelium* Rve., also found at Lifu, has the same interrupted linear marking. Of very wide distribution, from Mauritius, throughout Polynesia, to the Sandwich Isles. Also recorded from the Philippines.
- M. (Cythara) matakuaana** Smith.—Conspicuous for robustness of form, and dorsally blotched with burnt-sienna marking.
- M. (Cythara) paucimaculata** Angas.—A handsome orange-mouthed species, which seems variable. The types in the British Museum came from S. Australia.
- M. (Cythara) psalterium** M. & S., p. 285, 1896.
- M. (Cythara) signum** M. & S., p. 286, 1896.
- M. (Cythara) Souverbiei** Tryon.—A beautiful but very variable species, of which we received a dozen specimens. In some, the dorsal brown blotch is almost absent; others are spotted with brown; others, again, unicolorous white.
- M. (Glyphostoma) Aubryana** Hervier. — A wonderful shell. Principally conspicuous for its colouring rather than its form, which is that of a typical incrassate *Glyphostoma*; the ground colour is white; round the upper part of the penultimate whorl runs a bright pink median band,

the lower half of the whorl being white, the antepenultimate suffused pink of a lighter hue, apex pink, the intermediate whorls white or straw colour, the last whorl having just below the suture a narrow straw-coloured band, then a broad white space, and towards the base, again, unicolorous straw colour. Two specimens. We refer to M. Hervier's description for fuller details, *J. de Conch.*, vol. xliii., p. 146, for 1895 (published 1896).

- M. (Glyphostoma) chrysolitha** M. & S., p. 286, 1896.
- M. (Glyphostoma) crassilabrum** Reeve. — A handsome species, occurring rarely in our consignments. It shows some little variation both in form and sculpture. Recorded from the Philippines.
- [**M. (Glyphostoma) cremonilla** M. & S., *J. of Conch.*, vol. viii., p. 96, 1895.—This name has precedence over *M. (G.) lamproideum* Hervier (*J. de Conch.*, vol. xliii., p. 144, for 1895, *published* 1896.) We have also two or three very elegant pink varieties of this species. These are smaller than the type.]
- M. (Glyphostoma) Crosseana** Hervier. — An interesting straw-coloured shell, banded with transverse brown liræ. Four specimens.
- M. (Glyphostoma) dialitha** M. & S., *J. of Conch.*, vol. viii., p. 287, 1896.
- M. (Glyphostoma) globulosa** Hervier.—One specimen of a pale straw-coloured shell, which we assume by the description (*J. de Conch.*, vol. xliii., for 1895, p. 147) to be this new species, though even more globular than is represented in the plate. It seems very distinct.
- M. (Glyphostoma) Goubini** Hervier.—Three specimens. A very elegant little form, light violet with a white transverse band around the last whorl. A very small species, well described by M. Hervier (*J. de Conch.*, vol. xliii., for 1895, p. 149).

- M. (Glyphostoma) infracincta** Sowerby.—An exceedingly beautiful little shell, variable in size, pale flesh-colour pink, with brown transverse banding.
- M. (Glyphostoma) Jousseaumei** Hervier (?)—One or two somewhat doubtful. A pretty orange-pink species.
- M. (Glyphostoma) latirella** M. & S., p. 287, 1896.
- M. (Glyphostoma) melanoxyta** Hervier.—Many specimens of an elegant small fusiform shell, evidently, from the detailed description of the author, the above species (described in *J. de Conch.*, vol. xliii., p. 150).
- M. (Glyphostoma) notopyrrha** M. & S., p. 288, 1896.
- M. (Glyphostoma) ocellata** Jousseaume (*Bull. Soc. Zool. France*, ix., p. 184, 1884).—The most beautiful of all the little *Pleurotomidæ*, in our opinion. Two specimens only. This species is the type of the genus *Lienardia* Jous., which, in our opinion, is a synonym of *Glyphostoma*; white, coarsely ribbed, the interstices being roundly and regularly blotched with pale-straw colour, margined with circular brown lines. A single spiral brown line also crosses the last whorl at the periphery. Mouth oblong, sinus deep, outer lip much incrassate and coarsely toothed. It was with some little difficulty we succeeded in naming our specimens, no example being found in the British Museum, and we believe, till now, only one typical specimen, well figured but not coloured in the publication above referred to, has been discovered, and this was from Mauritius. It is, indeed, one of the special gems of the collection.
- M. (Glyphostoma) rhodacme** M. & S., p. 288, 1896.
- M. (Glyphostoma) strombilla** Hervier.—Two specimens of a small and very angulate form, pale-straw colour, and unspotted.
- M. (Glyphostoma) thalera** M. & S., p. 289, 1896.
- M. (Glyphostoma) theoteles** M. & S., p. 289, 1896.
- M. (Glyphostoma) thepalea** M. & S., p. 290, 1896.

- M. (Glyphostoma) thereganum** M. & S., p. 291, 1896.
- M. (Glyphostoma) thesaurista** M. & S., p. 291, 1896.
- M. (Glyphostoma) thyridota** M. & S., p. 292, 1896.
- Clathurella Blanfordi** G. & H. Nevill.—We cannot separate a little violaceous species from one recorded from Ceylon by Nevill.
- C. caletria** M. & S., J. of Conch., vol. viii., p. 293, 1896.
- C. cavernosa** Reeve.—One specimen. A prettily-coloured but very small shell, pale violet clouded over with ochreous. Recorded from the Philippines and Fiji Isles.
- C. clandestina** Deshayes.—A pale purple species, curiously like *Thala mirifica* Reeve, to outward seeming.
- C. cnephæa** M. & S., J. of Conch., vol. viii., p. 293, 1896.
- C. commoda** Smith.—An exceedingly delicate species, transparent and finely latticed, with here and there orange-brown staining. Described originally from South Africa.
- C. episema** M. & S., J. of Conch., vol. viii., p. 294, 1896.
- C. felina** Hinds.—Small, but typical.
- C. lita** M. & S., J. of Conch., vol. viii., p. 294, 1896.
- C. longa** M. & S., p. 295, 1896.—This name must yield to *M. (Glyphostoma) trigonostomum* Herv., published September, 1896, and consequently having precedence of two months. Judging from the plate, our specimens are not so perfect, especially in the mouth and thickened outer lip, as those in M. Hervier's possession.
- C. Malleti** Recluz.—Small, but brilliant carnation in colour, with a tinge of violet. Recorded from the Navigator and other Polynesian Islands. Extremely abundant, over two hundred specimens occurring; probably a *Glyphostoma*.
- C. polynesiensis** Reeve.—Almost typical. We have lately seen this widely-distributed *Clathurella* from Karachi and the Nubian coast, dredged by Captain Shopland and Mr. F. W. Townsend. Also there are specimens from the Persian Gulf and Fiji in the National Collection. It is

very near, if not identical with, *Glyphostoma parthenicum*, described by M. Hervier (1896).

- Clathurella Reeveana** Deshayes.—Very delicate, attenuate, white, microscopically decussate, with clear receding orange-brown lines, two on each whorl, base dorsally blotched with the same colour. Found also in Mauritius and Isle of Bourbon; also recorded from Polynesia. Connecting *Daphnella* with *Clathurella*, it might be included in either section.
- C. rissoides** Reeve.—A large smooth shell, beautifully spirally filleted with chalky-white beading; outer lip and columella quite smooth. Evidently a very rare form. It has been reported from Ticao Island.
- C. rubicunda** Gould.—Also recorded from Loochoo. Very beautiful, though small; pink, many and close-ribbed, with indistinct white band round the middle of the last whorl. On the border-land between *Clathurella* and *Glyphostoma*.
- C. Rogersi** M. & S., J. of Conch., vol. viii., p. 295, 1896.
- C. rufozonata** Angas.—Peculiar for the spiral red linear banding round the upper whorls, and again twice or thrice similarly banded on the last whorl, the general colour being pale stramineous.
- C. spyridula** M. & S., J. of Conch., vol. viii., p. 296, 1896.
- C. tincta** Reeve.—Only one example, nearly allied to *C. albifuniculata* Reeve, with which Tryon, but we think erroneously, unites it. It is also near our *P. Hadfieldi*, which we at the time of description called a *Drillia*, but which falls more naturally into the section *Clathurella* of *Mangilia*. We obtained several of this latter in the second consignment.
- Daphnella boholensis** Reeve.—A Philippine species extending to the Loyalty group. Very variable in colour, and even form, as some examples are almost turreted in the whorls. All agree in the minute decussation and pale straw colour, the apical whorls often dark brown.

- Daphnella delicata** Reeve.—An exceedingly graceful species, attenuate, finely chased, and spotted with chestnut. Two specimens only.
- D. pluricarinata** Reeve.—An exquisite little shell, the apical whorls (3) dark-brown, and shewing plainly in contact with the straw colour of the remaining whorls. The decussation on the apical whorls is remarkable. Also a Philippine Island shell.
- D. terina** M. & S., p. 296, 1896.
- D. thespesia** M. & S., p. 297, 1896.
- D. varicosa** Sowerby—One specimen only, which seems to meet M. Sowerby's description. We have not seen a type.
- [**D. dulcinea** M. & S., 1895.—Of this species we obtained three or four fresh specimens in the present consignment; we now withdraw it from *Daphnella*, where we provisionally placed it (J. of Conch., vol. viii., p. 95), and consider it a *Mangilia*, allied to *M. agna*].

FAMILY CANCELLARIIDÆ.

- Cancellaria (Trigonostoma) contabulata** Sowerby.—A fair number, identical with Ceylonese examples.

FAMILY OLIVIDÆ.

- Oliva (Strephona) polita** Marratt.—Two examples, almost exactly agreeing with typical West Indian *O. polita*. Mr. J. M. Williams, to whom we referred these shells, says he can find hardly any difference.
- O. textilina** Lam. var. **albina**.—One very fine and beautiful example, of an ivory polished whiteness.
- O. (Strephona) todosina** Duclos.—Identical with Fijian specimens, but all somewhat worn. With a lens, however, traces of the marking are very perceptible.
- Olivella nympha** Adams & Angas.—Also found in Australia, and we believe Bombay specimens recently to hand are a mere variety of Adams and Angas' species.

Olivella Williamsi M. & S., p. 380, 1897.

FAMILY *MARGINELLIDÆ*.

Marginella (Glabella) suavis Souverbie.—Extremely pretty, pure white and shining, with a chestnut yellow spiral band across the centre of the last whorl.

FAMILY *MITRIDÆ*.

Mitra digitalis Reeve.—One small, but beautifully marked example.

M. (Costellaria) Dorotheæ M. & S., p. 297, 1896.

M. (Cancilla) carnicolor Reeve.—Our somewhat worn examples seem to harmonize with Reeve's description. The coloration is exquisite in one example, being white, suffused with the most delicate pink, and the spiral carinæ are pale horn colour, spotted. Also from Chinese seas.

M. (Cancilla) incarnata Reeve.—Also a Philippine species.

M. (Chrysame) Antonii Küster.—Orange examples. Mostly a little worn. Rare; we only obtained four specimens. Mauritius is its head quarters.

M. (Chrysame) caledonica Petit.—A stout handsome brown species.

M. (Chrysame) pellis-serpentis Reeve.—One fresh, fine and typical example.

M. (Chrysame) Ruppelli Reeve.—Small, but we think correctly named. It is allied to *M. Hanleyi* Reeve, from the Red Sea.

M. (Chrysame) tabanula Lamarck.—Typical individuals of a red-brown, and beautifully spirally ribbed. Also from Mauritius.

M. (Chrysame) telescopium Reeve.—One characteristically marked individual.

M. (Chrysame) tornatelloides Reeve.—Also from Philippines.

M. (Strigatella) auriculoides Reeve.—A few typical examples.

- M. (Pusia) aureolata** Swainson.—Bright orange, with white banding. Perhaps a var. of *M. affinis* Reeve. Also found at Mauritius.
- M. (Pusia) cimelium** Reeve.—Many fine specimens of a shell hitherto represented by three small individuals in our National collection. The interrupted spiral chestnut scratched lines between the ribs are characteristic.
- M. (Pusia) rubra** Reeve.—Small, but of brilliant pink, with white spiral banding. The examples in our National collection came from Lord Hood Island.
- M. (Pusia) turturina** Souverbie.—A well marked species, of which we have received but few examples. It appears to be endemic.
- M. (Costellaria) cineracea** Reeve.—Worn examples, agreeing with specimens in J. C. M.'s collection.
- M. (Dibaphus) edentulus** Phil.—One fine example. Also found in Mauritius.
- M. (Thala) mirifica** Reeve.—Two specimens, one much larger than the other. Also recorded from the Philippines. Pale violet; in sculpture much resembling *Clathurella clandestina*, only larger, and, of course, possessing the columellar plaits of the *Mitridæ*. *Thala*, perhaps, is best separated as a genus, on conchological grounds; it might well be considered an intermediate between the *Mitræ* and *Pleurotomæ*, especially as there are traces of sutural sinus.

FAMILY BUCCINIDÆ.

Engina nodicostata Pease. One pretty, but rather water-worn example. Recorded also from Hawaii.

FAMILY NASSIDÆ.

Nassa (Niotha) granulosa Marratt.—Perhaps may be a pale variety of *N. splendidula* Dunker. The author gave no locality with his description.

N. (Niotha) rotunda M. & S., p. 273, 1896.

Nassa (Niotha) splendidula Dunker.—A highly coloured shell, fulvous-chestnut. Also recorded by its author from the Philippine group.

N. (Telasco) ecstilba M. & S., p. 274, 1896.

N. (Telasco) Shackelfordi M. & S., p. 274, 1896.

N. (Hebra) echinata A. Adams.—Typical, but rather worn. Another Philippine species.

FAMILY *COLUMBELLIDÆ*.

Columbella (Mitrella) moleculina Duclos. — A very beautifully marked *Mitrella*, being quite smooth, ochraceous, with round white spaces, and darker filleted spiral interrupted bands between.

C. (Mitrella) sigaloessa M. & S., p. 276, 1796.

Columbella (Conidea) Peasi Martens=**C. varia** Pease *non* Low.—Mr. Stephen Pace kindly named our examples of this variable species. The headquarters are the Sandwich Isles.

C. (Seminella) Stepheni n.n.—Mr. Edgar A. Smith having (Ann. N.H., xvi., p. 5, 1896) described a *Columbella* from Coromandel under the name *C. Pacei*, we suggest the above specific name in place of the one previously given (*antea* p. 275), which will equally commemorate Mr. Stephen Pace.

FAMILY *MURICIDÆ*.

Murex (Ocinebra) brachys M. & S., p. 273, 1896.

FAMILY *TRITONIDÆ*.

Triton (Epidromus) bracteatus Hinds.—One example only.

FAMILY *CYPRÆIDÆ*.

Ovula (Cyphoma) gibbosa Linné.—Only one specimen.

Cypræa contaminata Gray.—Two worn shells we refer to this rare little species.

C. hirundo Linné.—Several specimens, quite typical.

C. (Luponia) Thomasi Crosse.—One very pretty specimen which perhaps is too nearly allied to *C. cernica* Sowb. or

C. spurca L., but the dorsal confluent markings seem characteristic, and the lateral spotting at once separates it from, at all events, typical examples of *C. cernica*.

Trivia exigua Gray=**T. tremeza** Duclos.—Many beautiful and fresh examples of this exquisite species, the most recherchée perhaps of the smaller *Trivia*. It is recorded from the Sandwich Islands, as well as the New Caledonian group.

T. globosa Gray.—Two characteristic specimens. Of wide distribution; we see no difference between the shells from the Eastern, as opposed to those from the Western Hemisphere. It extends from the West Indies, Sandwich Islands, to Australia; it may almost be deemed cosmopolitan within the tropics. It is not, however, very commonly found in collections.

T. grando Gask.—Also recorded from Manila. Apparently typical. Several specimens.

T. pellucidula Gask.—Four examples of what is apparently this species.

T. vitrea Gask.—Several specimens; also recorded from the Philippines.

FAMILY CERITHIIDÆ.

Triforis carteretensis Hinds.—A plain species with grooved plain spiral keels. The British Museum specimens, with which ours have been compared, are from New Ireland.

T. cinguliferus Pease.—Several specimens. Also from the Sandwich Islands.

T. hilaris Hinds.—A variegated species with close receding keels. Several specimens. Also from the Sandwich Islands and the Philippines.

T. obtusalis Jousseau.—An obese black noded shell.

T. ruber Hinds.—Pale violet, not red, as the name would suggest. Exceedingly abundant. It also occurs at New Ireland, Tahiti, and Isle of Bourbon.

Triforis tristoma Blainville.—One beautiful specimen, in fresh condition, and characteristic. Also from Australia.

T. (Ino) collaris Hinds.—Very pretty and striking, with spiral rows of gemmules on a darker body-ground. Many examples. Also from the Hawaiian Islands.

T. (Ino) corrugatus Hinds.—A well-known conspicuous species.

[We have also in the collection many unidentified species of *Triforis*].

Cerithium abbreviatum Brazier.—Many, of ordinary character.

C. (Vertagus) attenuatum Phil.—Perhaps more commonly known under the name of *C. longicaudatum*. It is a handsome form with a conspicuously retrorse canal.

Biltium æolomitres M. & S., p. 298, 1896.

B. albocinctum M. & S., p. 299, 1896

B. marileutes M. & S., p. 299, 1896.

B. uveanum M. & S., p. 299, 1896.

Cerithiopsis adelpha M. & S., p. 302, 1896.

C. aurantiaca M. & S., p. 300, 1896.

C. catenaria M. & S., p. 300, 1896.

C. eutrapela M. & S., p. 301, 1896.

C. Fosteræ M. & S., p. 301, 1896.

C. hedista M. & S., p. 302, 1896.

FAMILY *PLANAXIDÆ*.

Plesiotrochus Souverbianus Fischer.—We (erroneously) included in our first list this species under the name of *Cerithium dubium* Sowb., to which it bears some superficial resemblance. It is a highly interesting species, allied to the Australian *Risellæ*, trochoid in shape, and beautifully crenulated, also mottled with brown bands and lines. A great many specimens.

FAMILY *VERMETIDÆ*.

Vermetus cf. glomeratus Chem.—About half-a-dozen small contorted groups of what may be this Philippine form

judging from their similarity to plate and description.

We have not been able to compare it with any specimens.

Vermetus (Siphonium) maximus Sowb.—We have what is evidently the many-coiled horny operculum of this *Vermetus*, known as a native of the New Caledonian group, but no shells.

FAMILY *TURRITELLIDÆ*.

Mathilda eurytima M. & S., p. 310, 1896.

FAMILY *SOLARIIDÆ*.

Solarium (Philippia) cingulum Sow.—A few examples.
Found also in Philippine, Sandwich, and Fiji Islands.

S. (Philippia) hybridum Linné.—Several, of ordinary character.

FAMILY *LITIOPIDÆ*.

Litiopa limnophysa M. & S., p. 305, 1896.

Alaba zadela M. & S., p. 305, 1896.

FAMILY *RISSOIIDÆ*.

Rissoia joviana M. & S., p. 309, 1896.

R. pyrrhacme M. & S., p. 310, 1896.

R. (Alvania) pisinna M. & S., p. 305, 1896.

Rissoina baculum-pastoris M. & S., p. 306, 1896.

R. catholica M. & S., p. 306, 1896.

R. crassa Angas.—Many of a prettily costate, white shell; recorded both from Red Sea and Australia.

R. enteles M. & S., p. 307, 1896.

R. elegantula E. A. Smith.—A white shell with close-grained longitudinal ribs, very delicate and elegantly formed. Also from S. Australia.

R. nesiotus M. & S., p. 307, 1896.

R. scalaroides C. B. Adams.—A very delicate species, identified by Tryon as synonymous with *R. bryerea* Mtg.; a native of Cuba and Jamaica.

R. sincera M. & S., p. 308, 1896.

R. turricula Pease.—Similar to *R. crassa* in many respects. Our specimens agree with var. *cernica* from Mauritius in

the British Museum. The typical form is from Sandwich Islands and Fiji.

Rissoina variegata Angas. — Abundant, and brilliantly banded in some cases with ochre or fulvous, while other examples are white and plain. We lately received from Mr. Arnold Umfreville Henn this shell from Sydney, N.S.W.

R. zonula M. & S., p. 308, 1896.

R. (Phosinella) Deshayesi Schwartz.—Common. Found also in the Philippines.

R. (Phosinella) quasillus M. & S., p. 308, 1896.

R. (Pyramidelloides) insolita Deshayes.—A curious form with the receding ribs beaded and prominent. The name *insolita* evidently suggests its unaccustomed appearance. The range is wide, embracing the Red Sea, Japan, Mauritius, and Indian Ocean

Barleeia chrysomela M. & S., p. 309, 1896.

FAMILY *NARICIDÆ*.

Vanikoro Gueriniana Recluz.—One example of a beautifully-ribbed and sub-crystalline species in very perfect condition. Also from the Philippine Islands.

V. Souleyetiana Recluz.—Few specimens. A smooth, white, plain *Vanikoro*. We may here call attention to the fact that *Vanikoro* Quoy has precedence over *Narica* Recluz and *Leucotis* Swains. This species is also known from Ceylon and the Paumotus Islands.

FAMILY *LAMELLARIIDÆ*.

Caledoniella Montrouzieri Souverbie.—One specimen only of this very rare and obscure mollusc; allied to *Lamellaria* and *Coriocella*. It is small, and *Vitrina*-shaped, very depressed, translucent, white, and delicate.

FAMILY *SCALARIIDÆ*.

Scalaria angustata Dunker.—A small form of this widely-distributed species. A great many examples.

S. eranna M. & S., p. 276, 1896.

Scalaria exomila M. & S., p. 277, 1896.

S. (Cirsostrema) bicarinata Sow.—Two specimens. The form is abnormal and peculiar.

FAMILY *EULIMIDÆ*.

Stylifer dubius Baird.—Found in a Holothurian stomach by Mr. Hadfield. Two specimens, quite perfect.

Eulima caledonica Morelet.—Many specimens.

E. dentiens Dunker. — Also recorded for the Viti or Fiji Islands. This species seems to us identical with *Rissoina curta* Sow., sometimes known as *Eulima curta*.

E. solida Sow.—Many, but all slightly worn. Also recorded from the Sandwich Isles.

E. (Subularia) aciculata Pease.—Four living shells, taken from stomachs of Holothurians, have been submitted to Mr. E. A. Smith, who considers them to be this species. It is recorded from the Sandwich Islands.

Leiostraca Metcalfei A. Adams.—Beautifully marked with angular and branching interrupted chestnut lines. Quite typical, but not very large. Also recorded from Hawaii. About ten specimens.

FAMILY *PYRAMIDELLIDÆ*.

Obeliscus terebelloides Adams. — Two examples of this prettily chestnut-banded shell, only one of which is fairly perfect.

Syrnola cinctella A. Adams.—Several of this form, some plain, others chestnut-banded round the sutures, but none quite perfect.

S. jaculum M. & S., p. 304, 1896.

S. violacea M. & S., p. 304, 1896.

Elusa gradatula M. & S., p. 380, 1897.

Styloptygma typicum Tryon.—One specimen, not quite perfect at the base, which with some degree of confidence we place under the above name. It is a shell described as *S. stylina* Adams, from the Philippines.

Odostomia bulimoides Souverbie. — Agreeing with the description and figure in everything excepting size, our two examples being only 3 mm. in length.

O. versicolor M. & S., p. 379, 1897.

Pyrgulina gliiriella M. & S., p. 303, 1896.

Turbonilla belonis M. & S., p. 303, 1896.

FAMILY *NERITIDÆ*.

Nerita pica Gould.—A small grey and white mottled shell. Native of Polynesia, and extending as far north as Japan (*N. japonica* Dunker).

Neritina Souverbiana Montrouzier.—Six specimens. A pretty pale fulvous species nearly allied to *N. Rangiana* Recluz and *N. viridissima* T. C.

N. (Vitta) viridissima Tapp. C.—Five specimens, all beautifully fresh, and with characteristic black pencilled markings. The *N. viridis* L., with which this has been confounded, is unmarked, and a native of the Antilles. Tryon associates it with *N. Rangiana* Recluz.

FAMILY *TURBINIDÆ*.

Turbo (Senectus) nivosus Reeve.—A small example.

T. (Senectus) setosus Gmelin.—Worn, but evidently this species.

Alcyona lifuensis M. & S., p. 312, 1896.

FAMILY *TROCHIDÆ*.

Gibbula fasciata Born=**Monilea carneola** Lamk.—Also a native of the West Indies, where one of the authors has collected it. It is strange to find it in Lifu, but we can see no appreciable difference in the appearance of individuals from these shores.

Oxystele suavis Phil.—Endemic in the New Caledonian group of islands. One example only.

Pyramidea histrio Reeve.—Six prettily coloured examples, all small.

Pyramidea nodulifera Lam.—Juvenile examples only. Also from Philippines.

Minolia agapeta M. & S., p. 312, 1896.

M. pudibunda Fischer.—A pretty pink species, exhibiting some variation, and near our *M. glaphyrella*, from which it differs, however, in colour and sculpture. Many specimens.

M. rhodomphala Soubervie.—Very beautiful, with bright crimson suffusion round the umbilicus. Three specimens.

Solariella (Conotrochus) tragema M. & S., p. 313, 1896.

Euchelus favosus M. & S., p. 311, 1896.

FAMILY *DELPHINULIDÆ*.

Liotia crenata Kiener.—A full grown shell, white, and of chaste appearance and sculpture.

FAMILY *CYCLOSTREMATIDÆ*.

Cyclostrema cingulifera A. Adams.—One specimen, agreeing with Japanese types.

Leucorhynchia tricarinata M. & S., p. 311, 1896.

FAMILY *STOMATIIDÆ*.

Gena strigosa Adams.—Two, strikingly zebra-marked, and quite perfect. An Australian species.

Stomatia rubra Lam.—One, in good condition. Also from Corea and the Philippines.

FAMILY *FISSURELLIDÆ*.

Fissurella (Lucapina) singaporensis Reeve.—Apparently this species. Only two, and both perfect, and beautifully clathrate, white, mottled with brown.

Emarginula pulchra A. Adams.—Two specimens in good condition.

FAMILY *ACMÆIDÆ*.

Williamia radiata Pease.—Proc. Zool. Soc., 1860, p. 437. There are specimens in the British Museum from the Sandwich Isles, Cape Verde, and St. Helena. Mr. Edgar Smith informs us he can detect no difference between any of these specimens, and conjectures it is a Pulmonate.

Pilsbry (Man. Conch., vol. xii, p. 154), places it under the "unidentified and unfigured species" of Limpets, as a synonym of *Williamia Gussoni* Costa, and makes no comment except that it is one of the *Siphonariidae*. The fact of this most interesting shell occurring in the Loyalty Isles marks a wide extension of its hitherto known range.

CLASS SCAPHOPODA.

FAMILY DENTALIIDÆ.

Cadulus viperidens M. & S., p. 314, 1896.

CLASS PELECYPODA.

FAMILY SPONDYLIDÆ.

Spondylus rubicundus Reeve.—One dead valve, though very large, and identifiable. A Philippine species also.

FAMILY ARCIDÆ.

Anomalocardia scapha Chem.—One perfect living specimen, full grown. Found also in Philippine Islands.

FAMILY LIMIDÆ.

Lima tenera Chem.—Several imperfect valves.

FAMILY GALEOMMIDÆ.

Scintilla semiclausula Sow.—Characteristic, though not quite perfect. One specimen. Colour pellucid ochreous. Recorded from Borneo.

ADDENDUM.

Mangilia theskela M. & S., p. 97, 1895.—Now that more specimens have come to hand in better condition for examination, we should consider this interesting shell near *M. interrupta* Reeve and *M. bella* Reeve, and therefore coming under the typical section of the genus. We have thought it best, under these circumstances, to give a new figure (Pl. XI., fig. 81), which is all the more necessary, as, owing to a clerical error, the numbers attached to this species and *M. dulcinea* were, unfortunately, transposed.

GENERAL OBSERVATIONS.

IN giving a history of the Hadfield Collections of the Mollusca of the Loyalty Islands, it is necessary just briefly to recapitulate what has been already said in the præfatorial remarks to our first paper on the subject (*antea* pp. 84-132).

It was in 1891-92, the Rev. James and Mrs. Hadfield brought over a considerable assortment, mainly consisting of the larger and more showy species of marine mollusca. By cleaning out the mouths of some of the specimens, however, we discovered certain minute, but very beautiful, shells, some of them hitherto unknown; and this induced us to ask that further consignments of shell-sand might be forwarded.

Very faithfully did our kind friends attend to our request. The next parcels arrived in 1893, to Messrs. W. Moss and R. Cairns, of Ashton-under-Lyne, whose coadjutorship and help have been invaluable to us throughout, and who placed every facility in our way for thoroughly examining this large mass of material.

Whilst the first collection therefore contained mainly the more conspicuous forms, the next composed an assemblage of intermediate size, very rich indeed, as our lists show, in forms of certain attractive genera, *e.g.*, *Mitra*, *Conus*, *Cypræa*, *Columbella*, etc.; but there were still comparatively few of the yet smaller grade we were so anxious to see, and which we were sure, if they could be procured, promised great results so far as novelty was concerned.

We felt, however, that the time had come for a catalogue of these two consignments, and this was published in the present volume, pp. 84-132, in the summer of 1895 (July-Oct.).

In this article, to which we would refer those who may be interested in the subject, we drew attention to the favoured geographical position of the Loyalty Islands, which are situated

due east of the large island of New Caledonia, and not very far within the tropics, namely long. 168° E. lat. 22° S.

They occupy a very central position in the great Indo-Pacific province, if we may still be allowed to consider Australia a portion of that region. They belong to France, and to French conchologists, notably MM. Crosse, Fischer, Souverbie, Gassies, Lambert, Montrouzier, and now Hervier, we are indebted for our knowledge of their mollusca, M. Crosse, for instance, has only lately (Journ. de Conch., vol. xliii.) concluded his exhaustive list of the terrestrial mollusca of the New Caledonian region; but, so far as we could gather, no catalogue existed of the marine mollusca of the Loyalty Islands, which include the three islands of Lifu, Maré, and Uvea. This led to our publishing a list, as complete as we could make it, consisting *only* of those species found in the Hadfield collections, which number nearly 630 species. We now regret having mentioned the terrestrial mollusca, which were insignificant in number, and of no novelty; but it was far otherwise as regarded the marine portion, more particularly the *Gastropoda*.

In this enumeration twenty-one new species were described, in one or two cases from single or but two or three specimens. It is very gratifying, therefore, to be able to say, now that the third consignment has been thoroughly examined and overhauled, that some of the species are represented in considerable numbers, *e.g.*, *Minolia glaphyrella*, many; *Mitra nitidissima*, many, including a crimson-red variety, the normal form being pitchy shining black; *Mangilia theskela*, a great number; *Murex (Ocinebra) benedictus*, twenty specimens; but on the other hand it is curious that *Diala Hardyi*, of which there are many in the former collections, is entirely absent from this assortment.

This third consignment was forwarded to Mr. R. D. Darbishire, early in 1896, and consisted of a large packing-case, filled with partly-sifted shell-sand. When treated to further sorting through a sieve, the richness of the material

became evident. Shells new to us appeared every moment, all minute, but all exquisite either in colour, design, or detail of form.

They could not all, of course, be called specimens in the highest state of perfection, as in hardly any cases is the operculum present, or traces of the animal, proving they had been collected as recently thrown up drift, but in the majority of instances, so far as the actual shells are concerned, they are in as good as a living condition.

We forthwith determined to lose no time, but devoted the best part of five or six months to the elucidation of these little forms. It was no slight labour to sort the material, but this was effected more rapidly than we had considered possible ; and that done, and the published literature on the subject well examined, one or other of us took all the species about which there was the least doubt for close comparison with the vast collections of the British Museum, South Kensington, and it is, we must admit, no mean task to take stock of what our national stores possess in such genera as *Rissoa*, *Odostomia*, or the *Pleurotomidæ*.

Very detailed investigation into the Philippine species was carried out for comparison ; especial attention was also given to Mauritian species, for although separated by nearly three thousand miles in distance, there seems much of cognate character in the molluscan fauna of both these localities. Two instances will suffice. The original type of *Mitra fulvosulcata* Melvill, was collected in Mauritius ; it has been found common in Lifu. And, secondly, we believe that Dr. Jousseume's original and hitherto unique type of *Lienardia ocellata* was Mauritian ; we have found two (one of which we have sent to the British Museum) of this most exquisite of all shells, in our Lifu material.

We had already drawn up descriptions of some forty species, when Father J. Hervier's first communication, enumerating several *Pleurotomidæ*, from Lifu and New Caledonia,

mainly collected by Father Goubin, S.M., was published. We found that in those accurate and lengthy diagnoses, several we had signalized as new were already described, *e.g.*, *Clavus gibberulus*, *Glyphostoma Aubreyanum*, *G. Crosseanum*, *G. strombillum*, and *G. melanoxytum*, and we are glad that we were thus spared the reduplicating of names, by the appearance of M. Hervier's article just before the publication of our own.

Since then,* this author has issued descriptions of new *Clathurellæ* and *Daphnellæ*, some of which may possibly be identical with ours, but as none of them are figured, it is difficult to form an opinion.

We think it of such importance for future malacologists, who in days to come may be studying or monographing the *Pleurotomidæ*, to have a clear understanding as to actual dates of publication of species, described about the same time, as influencing the law of priority, that no apology is needed on our part for calling attention to the fact that must already have been noticed with regret by many, that the *Journal de Conchyliologie* is now antedated by exactly one year.

The *actual* date of publication of M. Hervier's first communication, with descriptions of species of *Drillia*, *Clavus*, *Surcula*, and *Glyphostoma*, was June, 1896 (*J. de C.*, vol. xliii., no. 3, pp. 141-152) dated (erroneously) as "1 Juillet, 1895." The date of 1895 has been subsequently given (*op. cit.*, vol. xlv. no. 1, pp. 51-96) by M. Hervier in his résumé of these same species, whereas none were described, as already said, till the following year, the first portion (vol. xliii. no. 3) in June, the second (*op. cit.*, no. 4) in September, 1896. His next instalment dealing with certain new *Clathurellæ* and *Daphnellæ*, appeared in *J. de C.*, vol. xlv., no. 2, pp. 138-151, and was published April 1897, five months *after* the appearance of our descriptions of eighty new species from Lifu, including nine of these two genera, on November 12th, 1896 (*J. of Conch.*, vol. viii., pp. 273-315).

* *Journ. de Conch.*, vol. xlv., no. 2, for April 1, 1896, published April, 1897.

We are ignorant of the causes which have led to the *Journal de Conchyliologie* so falling into arrears of date, but it is all the more important to call attention to this fact *now*, as when the volume is bound up, no sign would appear from internal evidence in the serial itself, that it *was* antedated.

For ourselves, our first communication on Lifu shells was published October 15, 1895; our second, November 12th, 1896; and our third, with description of *Drillia cygnea*, April 1, 1897.

The extraordinary wealth of these islands is evidently very far from being exhausted, as is evidenced by our having described 106, and M. Hervier 43 new species in so short a period, and there is scope, we feel sure, for many an investigator in the future, as some of these endemic little shells are decidedly local. We should like, for example, to see collections from the island of Maré. We may add, that of the genus *Triforis* we have many species, but have not ventured to identify them, without submitting them to M. Jousseume, who has monographed the genus.

The total number catalogued by us in our two lists amounts to the respectable total of 860; mainly, as we have said, in marine *Gastropoda*, for the *Pelecypoda* are not at all well represented nor are they in such good condition.

In conclusion, we must acknowledge that Mr. Tryon's "Manual of the Mollusca" has been of much service to us, especially in the reproduction of figures, otherwise difficult of access. The arrangement we have adopted, and in the main adhered to, is that of the late Dr. Paul Fischer in his admirable "Manuel de Conchyliologie," 1887.

Our best thanks are due to Mr. R. D. Darbishire, primarily and especially, for allowing us such free access to the collection; to the Rev. Lewis Shackleford and Mr. J. Ray Hardy for aiding us materially in the sorting and investigation; and to Mr. Edgar A. Smith for the painstaking kindness invariably

extended by him to all who ask for help in their researches at our Natural History Museum, S. Kensington.

We may add, that so far as was possible, our National Collection has been supplied with examples of the new species, many of which are also contained in Mr. Darbishire's and our own private collections. The original types are *all* in the Manchester Museum, Owens College.

A Preliminary Note on the Genitalia of *Hyalinia* (*Zonitoides*) *nitida* Müll. and *Hy. excavata* Bean.—The examination of a number of specimens of *Hyalinia nitida* Müll. and *Hy. excavata* Bean, gathered at Bardsley, near Ashton-under-Lyne, in March and April last, has disclosed the existence in both species of a remarkable organ hitherto believed to be unknown, except in the section *Cochlicella* of *Helix*.* Both species possess darts which have been described and figured by the late Mr. Ashford in this Journal, 1883-85. Mr. Ashford figures the dart of *Hy. nitida* as mature with hesitation, since out of about one hundred specimens obtained from Hampshire in July and August, only one had a dart. Out of a large series of *Hy. excavata* examined by Mr. Ashford, scarcely ten per cent. produced darts. Eleven of my specimens of *Hy. nitida* gathered in March and April yielded three darts, and eleven *Hy. excavata* yielded exactly the same number of darts. So far as could be ascertained, all the Bardsley shells are mature; no immature darts were found. The dart sac of the specimens destitute of darts was finger-shaped, without any trace of the peculiar lobe of the dart-bearing forms. Several mounts of the genitalia of both species were prepared for the purpose of photographing the darts *in situ*. The photo-micrographs revealed a dark patch in the region of the penis where the calcareous organ is found in *Helix* (*Cochlicella*) *acuta*. On examination, the penis was found to contain a very minute channel-shaped calcareous organ, bearing a distinct rim or collar at one end. All the dart-bearing specimens possessed the calcareous organ, and none of the specimens destitute of darts contained the calcareous organ. The genitalia of the dart-bearing forms are very much more developed than those of the others, the difference in size alone being very conspicuous, and as no immature darts or transitional dart sacs have yet been found, this point awaits further elucidation. The spermatheca of both species is very peculiar. Instead of being composed of a single duct, there is a distinct bifurcation, one branch seems to pass behind the penis, whilst the other and smaller appears to take the usual course. Whether both these branches are ducts, or whether one is only a muscular attachment, has not yet been verified. Mr. J. W. Taylor informs me that although the bifurcation of the spermatheca is not figured by Mr. Ashford, he refers to it in his MS. notes and unpublished drawings. These notes are merely preliminary, as continuous observations are intended throughout the year, prior to dealing more exhaustively with the subject.—W. Moss. (*Read before the Conchological Society, May 12, 1897*).

* Moss and Paulden, Reproductive Organs of *Bulimus acutus* (*Helix acuta*), Trans. Manch. Micr. Soc., 1892.

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A Monograph of the Land and Freshwater Mollusca of the British Isles, by J. W. TAYLOR. Parts 2, 3, and 4, 1895-97.

Since the publication (*J. of Conch.*, vol. 7, 1894, p. 432) of our notice of part 1 of the Monograph, three additional numbers have been issued. Part 2 deals with variation in structure, in colour, and in the thickness of the shell, and also with the bands, with monstrosities, and with the operculum. The drawings are mostly excellent, but the principal feature is the coloured plate, which contains some real works of art (figures 2 and 3). It is to be regretted, though, that the author persists in adhering to the objectionable and unscientific practice of bestowing Latin names on every form of monstrosity, such as *Helix nemoralis* monst. *scalariforme* Taylor, *Planorbis carinatus* monst. *sinistrorsum* Taylor.

After reading more than one hundred pages on the molluscan shell, and after the careful treatment of its variation in size and colour, we should have expected to hear something concerning these points in the animal, especially in those forms among the British terrestrial mollusca (slugs), where the shell is almost structureless, and only of secondary importance. Dr. Simroth's views on the colour of slugs and the interesting observations which have been made to determine the cause of the colouration, should have been fully discussed. But, though seven pages in part 3 are devoted to the animal, these important points are not even alluded to. We have here a real grievance which is all the more palpable as the author now enlarges, to what seems an unnecessary extent, on anatomical details.

No less than nineteen pages are filled with minute descriptions of the internal structure of *Helix aspersa*, and about the same space is allotted to *Anodonta cygnea*. All this might easily have been dispensed with, since we are promised (p. 184) a still further account of their various organs later on, of which a portion is contained in part 4. It is true that in the pages referred to, students of malacology, still unacquainted with the beautiful drawings of the masterpieces of dissection by Professor Howes, are given an opportunity of seeing his choicest works rendered in excellently executed prints. But it must be remembered that it still remains for the author of the Monograph to acquaint us fully with the development, origin, past history, geographical distribution, and habits of the British mollusca before he can begin the description of the individual species, and it would be well to expedite the issue of the succeeding parts.

Having now dealt with a few points in this work which seemed to us to call for criticism, it gives us much pleasure in conclusion to express our sense of the value of the work as a whole. The author has evidently spared no pains in ransacking zoological literature in order to find suitable original figures of all the parts and organs of our British species, with the result that no malacological work, we believe, has ever been published containing such a wealth of admirable illustrations and printed in such good style, whilst the author throughout expresses himself well and clearly.

"Preliminary Outline of a New Classification of the Family *Muricida*," by F. C. BAKER, *ex*, Bull. Chicago Acad. Sci., vol. 2, no. 2, 1895. [Classification based on shell, animal, operculum, and radula; definitions given of sub-families, genera, sub-genera, and sections].

"Archivos do Museu Nacional do Rio de Janeiro," vol. 8, 1892.

"Descripcao e anatomia da *Peltella*," by Dr. H. VON IHERING. [*Peltella* is closely allied to *Bulimulus*, if indeed it be not a direct modification of this genus].

Proceedings of the U.S. National Museum, nos. 1109-1111.

"On the Genus *Remondia* Gabb., a Group of Cretaceous Bivalve Mollusks," by T. W. STANTON. "Descriptions of Tertiary Fossils from the Antillean Region," by R. J. LECHMERE GUPPY and W. H. DALL [many n.spp. figured]. "Report on the Mollusks collected by the International Boundary Commission of the United States and Mexico, 1892-94," by W. H. DALL [7 n.spp. with figs.].

Report of the Horn Expedition to Central Australia—Mollusca, by RALPH TATE, with an Appendix on Anatomical Characters, by C. HEDLEY, p. 181-226, pl. 17-19, 1896.

[Prior to the Horn Expedition, only three species of land shells were known from this region; the number has now been increased to twenty-five, though there are no new genera; in the fluviatile mollusca thirteen species were found, whereas only one had been known before. The new genus *Isiaorella* is proposed for *Physa newcombi* Ad. & Ang., and some half-dozen other species. Mr. Hedley's anatomical appendix treats of *Bithinia australis*, *Microphyura hemiclausula*, *Thersites setigera*, *Liparus spenceri* and several species of *Xanthomelon*].

Proceedings of the Academy of Natural Sciences of Philadelphia, 1896, part 2.

"A remarkable Central American Melanian," by H. A. PILSBRY [*Pachycheilus Dalli*, figured]. "Catalogue of the species of *Cerion*, with descriptions of new forms," by H. A. PILSBRY and E. G. VANATTA [4 subgg. *Eostrophia*, *Cerion*, *Strophioops*, *Diacerion*, 70 spp. catalogued, 11 n.spp., and some old described and figured]. "Revision of the North American Slugs, *Ariolimax* and *Aphallarion*," by H. A. PILSBRY and E. G. VANATTA [*Ariolimax columbianus* Gld., *A. californicus* Coop., *Aphallarion* n.g. for *A. buttoni* n.sp., all fully described and figured, with anatomical details]. "Insular Land-shell Faunas, especially as illustrated by the data obtained by Dr. G. Baur in the Galapagos Islands," by W. H. DALL [an important discussion of the faunistic relations of these islands, with list of species and figures of many forms].

Part 3, Sept.-Nov., 1896.

"New and interesting Eocene Mollusca from the Gulf States," [with 6 plates], by G. D. HARRIS. "Contributions to the Zoology of Tennessee, no. 4, Mollusks," by H. A. PILSBRY and S. N. RHOADS [169 spp., several new]. "New species of Freshwater Mollusks from South America," by H. A. PILSBRY [7 n.spp. and varr. figured].

Journal de Conchyliologie, vol. 44, no. 1 (dated "1er Janvier, 1896," received Dec. 21st, 1896).

"Observations sur quelques *Cochlostyla* des Philippines," by J. G. HIDALGO. "Sur l'habitat du *Cypræa aurantium* Martyn, ou *aurora* Solander," by J. G. HIDALGO [neighbourhood of Yap, Western Caroline Is.]. "Additions à la Faune malacologique terrestre et fluviatile de la Nouvelle-Calédonie et de ses dépendances," by H. CROSSE. "Descriptions d'espèces nouvelles de Mollusques, provenant de l' Archipel de la Nouvelle-Calédonie," by J. HERVIER [Figures and full descriptions of forms previously diagnosed, cf. Melvill and Standen, p. 419, *antea*].

Vol. 44, no. 2 (dated "1er Avril, 1896," received 12th April, 1897).

"Descriptions des coquilles de quelques espèces nouvelles ou peu connus des *Pleurobranchides*," by A. VAYSSIÈRE [*Bouvieria* n.subg. allied to *Berthella*; 4 n.spp. figured; list of known *Pleurobranchidæ*]. "Descriptions d'espèces nouvelles de Mollusques, provenant de l' Archipel de la Nouvelle-Calédonie (suite), by J. HERVIER [14 n.spp.].

Vol. 44, no. 3 (dated "1er Juillet, 1896," received 28th May, 1897).

"Études comparatives sur la coquille des *Lamellibranches—Condylocardia*, type nouveau de *Lamellibranche*," by F. BERNARD. "Note sur le genre *Pterosoma* de Lesson," by H. CROSSE [historical]. "Observations sur quelques *Cochlostyla* des Philippines," by J. G. HIDALGO. "Description d'une nouvelle espèce de *Cassis* [*C. crossei*]," by J. G. HIDALGO. "Note sur la distribution géographique du *Cypræa achatidea* Gray (*C. physis* auct., non Brocchi), dans la Méditerranée," by H. CROSSE [with figs.]. "Description de deux espèces nouvelles de *Bulimulus*," by PH. DAUTZENBERG [*B. Bouvieri* Pernambuco; *B. Moniezi* hab.? figured].

Transactions of the Royal Society of South Australia, vol. 20, part 2, 1896.

"Descriptions of New Species of Marine Mollusca of South Australia," by J. C. VERCO [11 n.sp., figured].

Science Gossip, vol. 3, nos. 31-35, Dec., 1896-April, 1897.

"Armature of Helicoid Landshells," by G. K. GUDE [five parts continued]. "Foreign varieties of British Land and Freshwater Mollusca," by T. D. A. COCKERELL [*Hyalinia* and *Vitrina*]. "The Channel Islands," by A. H. BASTIAN [records of *Murex erinaceus*, *Purpura lapilius*, and *Tapes palustra* (*sic*)]. "The Eggs of the Pearly *Nautilus*" [Note on Willey's discovery]. "The value of Specimens" [Notes on the Cholmondeley Sale].

La Feuille des Jeunes Naturalistes, année 27, nos. 315-319, Jan.-Mai, 1897.

"Revue de paléonconchologie," by M. COSSMANN. "Les plages de la Manche: mollusques recueillis entre Bénerville et la Dives (suite)," by A. DOLLFUS [Notes on and figures of several Pelecypods]. "Culture des huîtres chez les Romains" [Notice of Günther, J. Mar. Biol. Assoc., March, 1897].

The Annals of Scottish Natural History, nos. 21, 22, Jan., Apr. 1897.

"*Helix lamellata* in East Lothian," and "*Vertigo substriata* in Midlothian," by WM. EVANS.

The Irish Naturalist, vol. 4, nos. 4, 5, April, May, 1897.

"A Day's Dredging off Ballycastle, Co. Antrim," by G. W. CHASTER [list of about 180 spp., *Leda pusilla*, *Homalogyra polyzona*, new to Britain; *Adeorbis unisulcatus* n.sp., cf. p. 373 *antea*].

The Journal of Malacology, vol. 5, no. 4, Dec. 31, 1896; vol. 6, no. 1, May 3, 1897].

"List of the *Clausiliæ* of S. America, with the description of a new species" [*Cl. evæ*, figured], by E. R. SYKES. "Supposed new varieties," by T. D. A. COCKERELL. "To cook snails," by F. STEPHENSON. "On the anatomy of *Bulinus sinistrorsus* Deshayes," by W. MOSS and W. M. WEBB [with plate i.] "A few notes on slugs," by T. D. A. COCKERELL. "On the specific name of *Helix ericetorum* Müller," by A. S. KENNARD [this name is preferred to *H. itala*]. "Some observations on certain species of *Arion*," by W. E. COLLINGE [with plate ii]. "Some sciagraphs of shells" [plate iii]. "Some French methods of cooking snails," by F. STEPHENSON.

Memoirs and Proceedings of the Manchester Literary and Philosophical Society, vol. 41, part 3.

"Descriptions of new species of Brachiopoda and Mollusca from the Millstone Grit and Lower Coal Measures of Lancashire," by H. BOLTON. "Descriptions of thirty-four species of Marine Mollusca from the Arabian Sea, Persian Gulf, and Gulf of Oman," by J. COSMO MELVILL [with 2 pls.].

CONCHOLOGICAL SOCIETY
OF GREAT BRITAIN AND IRELAND.

PROCEEDINGS.

260th MEETING, APRIL 14th, 1897.

Held in the Manchester Museum, Owens Collège.

Mr. J. Cosmo Melvill, Vice-President, in the chair.

Donations to the Cabinet Fund announced and thanks voted :

From Mr. J. Hill, 5s.

Donations to the Library announced and thanks voted :

The Naturalist, no. 261, April, 1897; Manchester Microscopical Society's Transactions and Annual Report, 1895; Irish Naturalist, vol. 6, nos. 3-4, March-April, 1897; Annual Report of the Smithsonian Institution, to July, 1894; Scottish Naturalist, no. 22, April, 1897; Journal de Conchyliologie, vol. 44, no. 2, 1897; Mollusca of the Horn Expedition, by Ralph Tate (from W. E. Hoyle).

New Members Elected :

Jas. Chanter Blackmore, F.G.S., Falkirk, Whatley Rd., Clifton, Bristol.
Arthur Edwin Boycott, The Grange, Hereford.

Candidates Proposed for Membership :

Rev. Ellerton Garside Alderson, M.A., Messrs. Thomas Bird Hall and Henry J. West.

Resignation :

Miss Amy Warren.

Alteration of Time of Meeting :

On the recommendation of the Council it was resolved : "That the September meeting and the succeeding meetings commence at 7 o'clock, and the Council meeting at 6-30."

Paper Read :

"Note on a Colony of *Cæcilioides acicula* Müll. in Northamptonshire," by C. E. Wright.

Exhibits :

By Mr. R. D. Darbishire : Some remarkable varieties of *Cypræa tigris*, from the collection of the late R. Cholmondeley, Esq.

By Mr. L. E. Adams : Living examples of *Cæcilioides acicula*, from Kettering, in illustration of Mr. Wright's paper ; also a series of drawings illustrating the peculiar manner in which the animal carries its shell.

By Mr. Edward Collier : Specimens of *Helix Rivollii* and *H. erronea*, from which he had removed a portion of the outer whorl to show the internal lamellæ.

By Mr. W. Moss : Micro-photographs of the genitalia of *Hyalinia nitida*, showing the dart *in situ*.

By Mr. G. B. Sowerby : About ninety species of rare and interesting land shells, including *Helix imperator*, *H. sobrina*, *H. apollo*, *H. alauda*, and a fine series of varieties of *H. picta* ; *Trochatella regina* ; *Helicina constellata* and *H. bellula* ; *Chondropoma egregium* and *C. majusculum* ; *Choanopoma hystrix* and *C. echinus*—two very remarkable species ; *Cylindrella Elliotti*, *C. porrecta*, *C. fastigiata*, and *C. Brookesiana* ; *Melaniella acuticostata* ; and many species of *Macroceramus*.

By the Manchester Museum : A fine series of *Anostoma ringens*, *A. Verreauxianum*, and *A. globulosum* ; *Tomigerus clausus* and *T. turbinatus*, from Brazil ; also *Strophostoma anostomæforme* and *S. tricarinatum*, fossils from Miocene of Normandy and Frankfort, allied to *Anostoma*.

A large number of species of *Obba*, and allied groups, were shown by Messrs. R. D. Darbishire, J. C. Melvill, R. Cairns, T. Rogers, and Edward Collier. The principal features of the groups, and the more recent subdivisions created by Tryon, were discussed and criticised.

It was decided to make a special exhibit of the Madagascar *Helices* (sections *Ampelita*, *Helicophanta*, and *Panda*) at the next meeting.

261ST MEETING, MAY 12TH, 1897.

Held in the Manchester Museum, Owens College.

Prof. Sydney J. Hickson, President, in the chair.

Donations to the Library announced and thanks voted :

New British Mollusca, and Report on Species of the genus *Buccinum*, by H. K. Jordan (*from the author*) ; Proceedings and Transactions Nova Scotian Institute, vol. 9, 1896 ; La Feuille des Jeunes Naturalistes, no 319,

May, 1897; The Naturalist, no. 262, May, 1897; Irish Naturalist, vol. 6, no. 5, May, 1897; Armature of Helicoid Land-Shells, part 5, by G. K. Gude (*from the author*).

Donations to Cabinet announced and thanks voted :

By Mr. A. G. Stubbs : A further instalment of marine, land, and fresh-water shells from Tenby, all beautifully mounted, and choice specimens.

Donations towards Expenses of Publication :

The Editor reported that he had received the sum of £17 6s. 6d. from anonymous donors towards this object.

New Members Elected :

Mr. Thomas Bird Hall, Larch Wood, Rock Ferry.
 Rev. Ellerton Garside Alderson, M.A., Coxhead Farm, Gateacre.
 Mr. Henry J. West, 21, Willow Walk, London, S.E.

Candidates Proposed for Membership :

Lieut.-Col. H. Godwin-Austen, M. Louis Vignal, Sir Rawson W. Rawson, Major-General Linnæus Tripe, and Rev. Edward Percy Blackburn.

Member Deceased :

Mrs. G. Linnæus Banks.

Letter Read :

A letter was read from Mr. G. A. Stubbs, relating to the occurrence of very large *Tellina balthica* at Tenby.

Paper Read :

By Mr. W. Moss : "Preliminary Note on the Genitalia of *Hyalinia (Zonitoides) nitida* Müll. and *Hy. excavata* Bean."

Exhibits :

By Mr. A. G. Stubbs : Series of very large *Tellina balthica*, from Pendine; *Hyalinia cellaria* and var. *albina*, *Hy. alliaria* and var. *viridula*, *Hy. nitidula*, *Hy. Draparnaldi*, *Succinea elegans* var. *ochracea*, *Cochlicopa lubrica*, *Carychium minimum*, *Valvata cristata*, *Physa hypnorum* and var. *major*, *Pisidium pusillum* and *P. fontinale*, from various localities about Tenby; also *Valvata piscinalis* from Ratcliffe-on-Trent, Notts.; and *Succinea putris* from Gloucester.

By Mr. Thos. Rogers : *Dentalium abyssorum*, *Siphodentalium quinquangulare*, *Cadulus subfusiformis*, *Pecten vitreus*, *P. septemradiatus* var. *Dumasii*, *Axinus croulinensis*, *Arca pectunculoides*, *Leda lucida*, *L. pygmaea*, *Lepton nitidum*, *Scissurella crispata*, *Cardium minutissimum*, and *Kelliella miliaris*, all from Dröbak; *Montacuta Dawsoni*, *Chiton albus*, *Rissoa globulus*, *R. arenaria*, *R. castanea*, and *Pleurotoma pyramidatus*, from Greenland; *Axinus flexuosus* and *Crenella decussata*, from Reykjavik, Iceland; *Trochus helacinus*, from Vadsö; *Lima Loscombi* and *Cylichna nitidula*, from Norway.

By Mr. W. Moss : Photo-micrographs of genitalia of *Hyalinia nitida* and *Hyalinia excavata*, and specimens of their darts and "calcareous organs," in illustration of his paper.

By Mr. F. Taylor : *Anodonta anatina*, *Unio pictorum*, *U. tumidus*, and *Paludina vivipara*, from Marple, showing various stages of growth.

By Mr. W. H. Heathcote: A sinistral specimen of *Helix obvolvata* (supposed to be from Ditcham, Surrey).

Fine series of the large Madagascar *Helices*, belonging to the sections *Panda*, *Helicophanta*, and *Ampelita*, were shown by Mr. Edward Collier, Mr. R. Cairns, and the Manchester Museum.

262nd MEETING, JUNE 16th, 1897.

Held in the Manchester Museum, Owens College.

Mr. Thos. Rogers in the chair.

Donations to Cabinet announced and thanks voted:

By Mr. A. G. Stubbs: A further instalment of shells from Tenby, mounted in glass-topped boxes, comprising *Helix granulata*, *Clausilia bidentata*, *Pupa cylindracea*, and vars. *curta* and *albina*, *Balea perversa*, varieties of *Linnæa peregra* and *L. palustris*, *Physa fontinalis*, *Planorbis albus*, *P. nautilus*, *P. spirorbis*, *Pisidium fontinale*, *P. annicum*, *P. milium*, and *Sphærium corneum*, also varieties of *Linnæa peregra* from Gloucester, and *Helix excavata* from York.

Donations to Library announced and thanks voted:

Journal of Malacology, vol. 6, no. 1; Transactions of the Royal Society of Queensland, vol. 12; Proceedings of the Academy of Natural Science of Philadelphia, part 3, 1896; Journal de Conchyliologie, vol. 44, no. 3; 39th Annual Report of the Chicago Academy of Science; Bulletin of the Chicago Academy of Science, no. 1; Memoirs and Proceedings of the Manchester Literary and Philosophical Society, vol. 41, part 3; The Naturalist, no. 233, June, 1897; La Feuille des Jeunes Naturalistes, no. 320; Shell-colouration in British Extra-marine Mollusca, by A. E. Boycott (*from the author*); Irish Naturalist, vol. 6, no. 6, June, 1897.

New Members elected:

Lieut.-Col. H. H. Godwin-Austen, F.R.S., Shalford Park, Guildford.
M. Louis Vignal, 28 Avenue Duguesne, Paris.
Sir Rawson W. Rawson, K.C.M.G., C.B., 68, Cornwall Gardens, London, S.W.

Major-Gen. Linnæus Tripe, 3, Osborne Villas, Stoke, Devonport.

Rev. E. P. Blackburn, The Manse, Tendring, near Colchester, Essex.

Candidates Proposed for Membership:

Miss G. M. Harrison, Messrs. C. G. Barrett, W. C. Blake, J. C. Dacie, W. H. Dall, C. Fielding, H. B. Preston, B. Stracey, and Rev. R. A. Bullen.

Papers Read:

"Notes on a Collection of Shells from Lifu and Uvea, Loyalty Islands, formed by the Rev. James and Mrs. Hadfield, with List of Species (Part III)," by J. Cosmo Melvill and R. Standen.

"Description of *Helix Watsoni*, a new species of land shell, discovered at Madeira, by Senhor J. M. Moniz, by J. Yate Johnson, C.M.Z.S.

"*Helix aspersa* m. *sinistrorsum* at Lewes," by C. H. Morris.

Exhibits :

By Mr. Roland Garnett : A beautiful series of *Limnæa peregra* var. *oblonga*, from Boggart Hole Clough, near Manchester.

By Mr. R. Standen : Living specimens of *Arion subfuscus*, *Helix nemoralis*, *H. rotundata*, *Hyalinia cellaria*, *Hy. nitidula*, *Hy. alliaria* var. *viridula*, and *Pupa cylindracea* var. *curta*, collected recently by Prof. W. Boyd Dawkins, on the Great Skellig, west coast of Ireland. Also, on behalf of the Manchester Museum, a series of the genus *Sagda*, from Jamaica, with specimens sectioned, to show the remarkable lamellar ridge, which runs from the mouth to the columella on the second whorl ; some remarkably fine examples of *Pedum spondyloideum*, young and adult, together with a specimen *in situ* on a piece of madrepora from the Red Sea ; and two fine specimens of *Orbicula lamellosa*, from Peru, illustrating its peculiar habit of collecting together in masses, old and young living in company. He also exhibited the marine mollusca from Lifu, treated upon in the paper read.

By Rev. Canon Norman : Specimens of *Helix coronula* Lowe, *H. coronata* Desh. recent and fossil, *H. tiarella* Lowe, and *H. Watsoni* n.sp., in illustration of Mr. J. Yate Johnson's paper, all from Madeira.



DESCRIPTION OF *HELIX WATSONI*,
A NEW SPECIES OF LAND SHELL, DISCOVERED
AT MADEIRA, BY SENHOR J. M. MONIZ.

BY JAMES YATE JOHNSON, Corr.M.Z.S.

(Read before the Conchological Society, June 16th, 1897).

Helix Watsoni n.sp.—This shell belongs to Lowe's group *Coronaria*, of which *H. tiarella* Webb forms the best known and most conspicuous member. Its station, like that of *H. grabhami* Woll., is between *H. tiarella* and *H. coronula*. It is nearer to *H. grabhami* than to either of the others, and as Mr. Wollaston gave a full description of that shell, it will be sufficient if I point out the chief differences between the two shells, with occasional references to other shells of the group.

H. Watsoni is smaller and darker than *H. grabhami*, with a less elevated spire, although this is not depressed, as in *H. coronula*. The beading on the three lower whorls, which is the chief feature of the shells of this group, consists in all of them of a regular series of white sub-triangular or trapezoidal saliences alternating with depressions, and situate on each whorl imme-

diately under the preceding whorl. Below the braiding on the lowest whorl of this shell, and on its underside, are about seven spiral costæ, and these are crossed at right angles by numerous feebler ridges, thus forming a cancellated surface. The highest of the spiral costæ forming a carina is crenate as in *H. tiarella*, whilst in *H. grabhami* it is entire. Sometimes the underside of the lowest whorl is only partly sculptured into continuous ribs, the rest of the surface being studded with short discontinuous ridges, arranged spirally. In one of the eight specimens in my possession, the whole of the under-surface is rough, with such short discontinuous ridges distributed in a confused manner as are often seen in the sub-fossil shells of *H. tiarella*. The umbilicus is not so wide and open as that of *H. grabhami*.

The shell is usually of a dark-brown colour. It has only five whorls; it measures from 5.5 mm. to 6.5 mm. in diameter, and 3.5 mm. in height.

Specimens of the shell here described were detected several years ago by the observant eye of Senhor J. M. Moniz, on that rocky islet at the east end of Madeira which bears the name of Ilheo dos Embarcadores, but as he omitted to note the exact locality, he was never afterwards able to find other specimens. This is another instance of the narrow limits within which some of the species are confined, both in Madeira and Porto Santo.

The name of this shell has been given to it in compliment to one of the most careful investigators of the molluscan fauna of Madeira, the Rev. R. Boog Watson, LL.D.



Note on *Tellina balthica*.—My largest specimen (a white one) is $1\frac{3}{8}$ -inch in breadth. This mollusc is a great favourite with the gulls; they "line-up" at the water's edge at the time of the incoming-tide, seize any living specimen of *T. balthica* or *V. gallina*, place it in safety, and when the shell gapes, insert the beak to prevent its closing, break out a piece and devour the contents at leisure. They care very little for *M. stultorum*, *L. undata*, *T. papyracea*, *T. tenuis*, and *T. fabula*, but sometimes attack *D. vittatus* and *S. ensis*, and always, so far as can be seen from a distance, treat *T. balthica* and *V. gallina* in the above-mentioned manner.—A. G. STUBBS. (Read before the Conchological Society, May 12th, 1897).

THE MARINE SHELLS OF SCILLY.*

BY J. T. MARSHALL.

(Read before the Conchological Society, Dec. 9th, 1896).

As supplementary to a list of the "Marine Mollusca of Cornwall," published recently in this journal, the following additions are offered pertaining to Scilly only, as the compiler of that list does not appear to have known what has been done in that district for the last few years, and to have missed much that has been written thereon. Those additions which pertain to the Cornwall coast are being published in my "Additions to 'British Conchology.'"

Of the thirteen species cited by Mr. Tregelles as peculiar to Scilly, only eight are so, five of them having been found by me on the mainland; while some other species which are truly Scillonian appear to be unknown to him. And his summary of the number of species, both for Scilly and Cornwall, requires amendment.

It should also be stated that Mr. Clifford Burkill is not responsible for any of the records attributed to him by Mr. Tregelles; he did not work out any of the Scilly shells, nor write a line thereon. The addition of his name to the papers was purely complimentary, as the pioneer in a series of dredgings among the Scilly Islands in which three other gentlemen have taken part, one of them twice—Mr. A. Somerville, F.L.S., the Rev. Dale Roberts, and Mr. John Lane. I have besides obtained various independent dredgings from the Menavawr or Atlantic side of the Scilly Islands, a locality which, I venture to predict, will yield many more new species to the adventurous dredger who will essay this stormy part of the ocean.

The following are all new to Scilly, and those with an asterisk are new to Britain:—

* Previous Papers under this heading will be found in J. of C. for Jan., 1885; April, 1886; Jan., 1889; and April, 1891.

- Anomia patelliformis* L.
Lepton nitidum var. *pisidialis* Jeff.
Cardium papillosum Poli.
C. fasciatum var. *alba* Jeff.
**Tellina serrata* Brocchi.
**Amphidesma castaneum* var. *subtrigona* Monts.
Chiton cinereus var. *rissoi* Jeff.
Tectura virginea var. *conica* Jeff.
Emarginula fissura var. *subdepressa* Jeff.
Calyptrea chinensis L.
**Phasianella pullus* var. *pulchella* Récl.
**Rissoa striatula* v. *ecarinata* Monts.
**R. subsoluta* Arad.
R. semistriata var. *pura* Jeff.
R. cingillus var. *graphica* Turt.
Hydrobia ulvæ Penn.
H. ulvæ var. *minor* Marsh.
Barleeia rubra v. *unifasciata* Mont.
B. rubra var. *pallida* Jeff.
Skenea planorbis var. *hyalina* Jeff.
Scalaria trevelyana Lch. (confimd.)
Odostomia albella v. *subcylindrica* Marsh.
O. rissoïdes var. *nitida* Ald.
O. pallida var. *crassa* Thomp.
O. warreni var. *intermedia* Marsh.
O. innovata Monts.
O. acicula var. *obeliscus* Jeff.
O. ventricosa Forb.
**Eulima petitiana* Brus.
E. intermedia Cant.
- *E. perminima* Jeff.
E. philippii var. *gracilis* F. & H.
**E. monterosati* De Bourg.
- **E. bilineata* var. *albida* n. var.
Natica catena DaC.
N. glaucina var. *subovalis* Jeff.
**Adeorbis subcarinatus* var. *interrupta*, n. var.
Cerithiopsis tubercularis v. *acicula* Brus.
C. tubercularis m. *clarkii* Jeff.
**C. barleei* var. *scalaris* Monts.
**C. barleei* m. *interrupta*, n.f.
C. metaxæ var. *alba* Marsh.
C. metaxæ var. *angustissima* Forb.
Trophon muricatus var. *lactea* Jeff.
T. truncatus Str.
Nassa incrassata v. *simulans* Jeff.
Defrancia linearis v. *alba* Marsh.
D. reticulata v. *formosa* Jeff.
Pleurotoma costata v. *coarctata* Forb.
Pleurotoma brachystoma Ph.
P. nebula var. *elongata* Jeff.
Marginella levis var. *oblonga* Jeff.
Utriculus truncatulus var. *pellucida* Brown.
Philina angulata Jeff.
Cylichna nitidula Lov.
Limacina retroversa var. *macandree* F. & H.

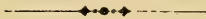
It may be of interest to enumerate here some of the more remarkable species dredged on the Atlantic slopes off Scilly by the 'Porcupine' in 1870, which have been worked out since the publication of the 'Porcupine' report. The dredgings in this region were very prolific in all branches of marine zoology, the species of mollusca exceeding 200, mostly from 690 and 717 fathoms, and about 150 miles from the Scilly Islands:—

<i>Terebratella spitzbergensis</i> Dav.	<i>O. scalaris</i> v. <i>rufescens</i> Forb.
<i>Dacrydium vitreum</i> Möll.	<i>O. ventricosa</i> Forb.
<i>Leda sericea</i> Jeff.	<i>Eulima stenostoma</i> Jeff.
<i>L. lucida</i> var. <i>declivis</i> Jeff.	<i>Admete viridula</i> Fab.
* <i>L. pusilla</i> Jeff.	<i>Læocochlis granosa</i> S. Wood.
<i>Lepton clarkie</i> Clk.	<i>Fusus fenestratus</i> Turt.
<i>Montacuta tumidula</i> Jeff.	<i>Taranis mörchii</i> Malm.
<i>Siphodentalium lofotense</i> Sars.	<i>Defrancia teres</i> Forb.
<i>Propilidium ancyloides</i> Forb.	<i>Pleurotoma carinata</i> Biv.
<i>Iphitus tuberatus</i> Jeff. (a second specimen).	<i>P. hispidula</i> Cr. & Jan.
<i>Rissoa deliciosa</i> Jeff.	<i>Ringicula leptocheila</i> Brugnon.
<i>Aclis walleri</i> v. <i>minor</i> Jeff. =	<i>Cylichna alba</i> Br.
<i>A. exigua</i> G. O. Sars.	<i>Scaphander punctostriatus</i> Mi. & Ad.
<i>Odostomia eximia</i> Jeff.	<i>Actæon exilis</i> Jeff.
<i>O. lactoides</i> Monts. MS.	<i>Utriculus globosus</i> Lov.
<i>O. praelonga</i> Jeff.	<i>Philine nitida</i> Jeff.
	<i>P. quadrata</i> S. Wood.

In addition to the foregoing, there remain various new species still undescribed among the *Pleurotomidæ*, *Cypræidæ*, *Bullidæ*, &c.

The characters of the forms marked as new in the above list will be found in my paper entitled "Additions to 'British Conchology,'" now in the press.

SEVENOAKS, TORQUAY,
December, 1896.



Limax cinereo-niger Wolff in Derbyshire.—Although this local species usually affects logs and fungus-grown tree stumps, it occasionally, at any rate, like its congeners, *L. maximus* and *L. marginatus*, inhabits the crevices of stone walls. In the early part of this month (July), 1897, I collected eleven examples of the var. *luctuosa* on a wall of Millstone Grit, which encloses a small wood of beeches and sycamores, near the L. and N. W. Railway Station, at Chapel-en-le-Frith, July 12th, 1897.—CHARLES OLDHAM. (Read before the Conchological Society, July 14th, 1897).

* This species, recorded from the Antrim coast (Chaster, Irish Nat., vol. vi., p. 124), also occurred in these 'Porcupine' dredgings, as well as at the entrance to the British Channel, in from 257 to 717 fathoms, but not in the "S. and S.W. of Ireland," as there stated.

CONCHOLOGICAL SOCIETY
OF GREAT BRITAIN AND IRELAND.

PROCEEDINGS.

263rd MEETING, JULY 14th, 1897.

Held in the Manchester Museum, Owens College.

Mr. W. E. Hoyle, Hon. Sec., in the chair.

Donations to the Library announced and thanks voted :

Transactions and Annual Report for 1896 of the Manchester Microscopical Society; Proceedings of the Philadelphia Academy of Natural Sciences, part 1, 1897; Some Observations by English Naturalists on the Fauna of Rathlin Island and Ballycastle District, by R. Standen and others; Journal de Conchyliologie, vol. 44, no. 4; The Naturalist, no. 264; La Feuille des Jeunes Naturalistes, no. 321; The Irish Naturalist, vol. 6, no. 7; The Scottish Naturalist, no. 23; Bibliography of North American Conchology, by W. G. Binney (*from Dr. Chaster*).

New Members Elected :

Miss G. M. Harrison, Nightingale House, 8, Manchester Rd., Southport.

Mr. Chas. Golding Barrett, F.E.S., 39, Linden Grove, Nunhead, S.E.

Mr. Wm. Charles Blake, 2, Acacia Villas, Ross, Herefordshire.

Rev. Robert Ashington Bullen, B.A., F.G.S., Loughrigg, Somers Road, Reigate.

Mr. John Charles Dacie, 105, Upper Richmond Road, Putney, S.W.

Mr. William Healy Dall, Smithsonian Institution, Washington, U.S.A.

Mr. Clement Fielding, Clover Hill, Halifax, Yorkshire.

Mr. Hugh Berthon Preston, Gampoha Estate, Uda Pussellawa, Ceylon.

Mr. Bernard Stracey, University Union, Edinburgh.

Candidates Proposed for Membership :

Miss M. Loddee, Mrs. A. F. Kenyon, Messrs. D. D. Baldwin, H. Clifden Burnup, and Rev. Amos B. Kendig,

Resignations :

Messrs. A. E. Baker and P. W. Abbott.

Papers Read :

"Land and Freshwater Mollusca of Trinidad," by E. A. Smith.

"Additions to 'British Conchology'" (part II.), by J. T. Marshall.

"New form of *Helix terrestris* Penn.," by C. E. Wright.

Exhibits :

By Mr. John Hill : Living specimens of *Testacella haliotideae*, from a garden near Derby.

By Mr. Charles Oldham : *Limax cinereo-niger* Wolff, from Derbyshire.

By Rev. J. W. Horsley : *Valvata alpina*, and an acuminate variety of *Limnæa peregra* from Hinterburg See (5,000 feet altitude); also a small form of *Helix arbustorum* v. *flavescens*, with numerous strongly-corrugated growth lines, from top of the Brunig Wylerhorn (6,580 feet altitude).

By Mr. R. Welch : *Planorbis albus*, from Avonell, Belfast.

UPON THE PRINCIPLES OF
NOMENCLATURE,
AND THEIR APPLICATION TO THE
GENERA
OF RECENT MOLLUSCA.

(The Presidential Address delivered at the Annual Meeting, September 19th, 1896).

BY J. COSMO MELVILL, M.A., F.L.S.

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SEVEN years have elapsed since I last had the honour of addressing the Members of this Society from the Presidential chair, and in reviewing the interval I have much pleasurable satisfaction in noting the steady growth, increase, and general vitality pervading not only this community and this Society, but likewise kindred institutions whose aim and *raison d'être* are identical.

Imprimis, the Malacological Society of London, called into being three years and a half ago—in February, 1893—has given a direct stimulus to southern conchologists, especially those resident in the Metropolis, who, while still in the majority of cases, retaining their membership of our Northern Society, are unable, owing to the distance, to participate personally in our meetings.

Speaking, in the second instance, of our own Society, it had been increasingly felt of late years that, compared with Manchester, Leeds presented a narrower field of action, and a less favourable position as centre of the Society, but it was naturally considered that any proposals for a change should emanate from Mr. J. W. Taylor, as Founder of the Society, that he, with Messrs. W. Denison Roebuck and W. Nelson, deserved the utmost consideration, and that their wishes with regard to the Society's future must be respected. It was accordingly with great satisfaction that an amicable arrangement was entered into, and the headquarters of the Conchological Society transferred from Leeds to this city. This transference took place now fifteen months ago, the Manchester Branch existing only in suspense, whilst the Leeds Centre became a Branch.

The collections and books have likewise been removed to the Society's headquarters in the Manchester Museum, Owens College. We owe our thanks to the Museum authorities for having shewn the Society so much consideration.

Before leaving this part of my subject I should like to say a few words to enlist the support of all malacologists in behalf of the journal started in 1890 by Mr. W. E. Collinge, under the title of "The Conchologist," and now edited by Mr. Wilfred Mark Webb, as "The Journal of Malacology." The main articles deal with the anatomical and physiological side of the sciences, but the journal includes an especially valuable bibliography, reviews all important works and papers, and publishes up-to-date lists of articles on both recent and fossil mollusca. The magazine has thus accomplished much useful work, and has doubtless a great future before it.

The last seven years have likewise exhibited great activity in various other fields connected with the Mollusca. Time does not allow me to more than allude to the new classification of the *Pelecypoda*, as proposed by Pelseneer, the revision of the *Helicidae* by Pilsbry, the completion of the Gastropodous section of Tryon's "Manual of Conchology," by the same author; further researches into the deep sea fauna, by Dall and others; the publication of the volume of the Cambridge Natural History devoted to Mollusca, by the Rev. A. H. Cooke, a book which, it may be said, has not a dull page in it; the "Mollusca of Japan" as collected by R. E. C. Stearns, by H. A. Pilsbry; the first three parts of J. W. Taylor's "Monograph of the Land and Freshwater Mollusca of the British Isles"; and the second edition issued of L. E. Adams' work on the same subject. So far as this country is concerned, there is no doubt that the existence and example of our two Societies† exercise a highly stimulating effect in this direction.

And, as Bibliography is of paramount importance in these days of scattered papers and widely diffused literature on a given subject, Dr. Herbert Haviland Field's* scheme of issuing a card catalogue of zoological literature, deserves more than a passing notice.

The subject upon which I have elected to say a few words this evening is one which has been recently brought to our notice in a very prominent manner. A question which for some years, at all events in this country, had laid dormant, and by whose existing code of rules British zoologists and botanists had, since the revision in 1865, been content to abide, has again been brought to the fore, and discussions, often tending to exhibit great divergences of opinion, as well as articles in various

† For an almost exhaustive summary, shewing the great activity now being exhibited all over the world in the study of Malacology, refer to the two last Annual Addresses of Professor G. B. Howes, F.R.S., President of the Malacological Society of London, 1896-97 (*Proc. Mal. Soc.*, vol. ii., pp. 57, 203).

* *c.f.* Bouvier, E. L., *Rapport sur le projet de réforme bibliographique de M. H. Haviland Field*, Paris, 1895.

serials, have abounded on the subject. It is evident that I am alluding to the law of Priority as affecting Zoological Nomenclature. Our great dramatist says: "What's in a name?" and this quotation, if somewhat hackneyed, is no doubt true in a sense as applied to nomenclature.

I.—HISTORICAL SKETCH AND SUMMARY OF PRE-LINNÆAN AUTHORS.

It will be, I think, well to trace briefly and yet succinctly, the gradual growth of the study of the science of Malacology from the earliest times, giving cursory mention of the leading writers on the subject, until the time of Linnæus.

Genera were more or less recognized by many of the pre-Linnæan writers, but till the time of Lang, 1722, each species was designated by a description, couched in general words, often lengthy, and forming a sentence by itself, and although generic terms were more stable, there was no actual recognized form of arrangement, and authors altered, annulled, or superseded the work of their predecessors without let or hindrance. Scientific nomenclature therefore, by degrees, lapsed into a condition of chaos.

With the introduction, however, of the binary system, trinomial under very especial circumstances, e.g., *Cypræa caput serpentis*, *Auricula auris Midæ*, matters assumed at once a less complex phase, and the brevity and convenience of the system caused its universal adoption throughout the civilized world, and at once raised the great Carl von Linné to the pinnacle of fame, from which he will never be deposed.

392 B.C. ARISTOTELES, in the fourth century before the Christian era, the celebrated philosopher, whose Mæcenas was no less a personage than Philip and, subsequently, his son Alexander, of Macedonia, may be said to be the father, systematically speaking, of Malacology, as of other natural sciences, but

passing by his time, and excepting the Roman, C. PLINIUS SECUNDUS, the Elder (ob. A.D. 79), we find that until fourteen centuries later little advance was made in any of these branches of science. These might indeed be called the "dark" ages. A.D. 79

VINCENTIUS BELLOVACENSIS and ALBERTUS MAGNUS, in 1494-95, both published treatises, in which mention of a few shells occurred. 1494-95

Fifty-five years later, GESNER, RONDELET and BELON came on the scene. The first of these, Conrad Gesner, divides shells into four classes, *Univalvia*, *Bivalvia*, *Turbinata* and *Anomala*; the first section constituting only the *Patellæ* and *Haliotis*, the third most of our Gastropoda, the last, star-fish, Medusæ, and the like, long since expunged from the "Testacea." 1550

BELON, in 1553, published a work termed "De Aquatilibus," containing a few figures of shells. RONDELET, a doctor at Montpellier, issued a treatise, "Universa aquatiliū historia," containing many representations of Testacea. 1553
1555

In the following century, the great Aldrovandus, a few of whose generic names have been adopted by binomial writers, flourished, and in 1606 his well-known work, "De Mollibus Crustaceis, Testaceis et Zoophytis," saw the light. He classified molluscs in three sections, *Univalvia*, *Turbinata*, and *Bivalvia*, mixing up Echini, Lepades, and such like with the Gastropods or Turbinata. The Univalves comprised, as in Gesner's method, *Haliotis* and *Patella*. 1606

FABIUS COLUMNA in 1616 published a work on the Purple-dye Fish, entitled "De Purpura ab animali testaceo fusa, de hoc ipso animali, aliisque rarioribus testaceis quibusdam." 1616

Several writers, almost forgotten in Conchology, whose names are commemorated however in Botanical Science, e.g., BASIL, BESLER and CHIOCCO followed, the latter publishing at Verona a full account of the shells of Signor Calceolari in the "Museum Calceolarium." This would appear to be the earliest museum catalogue extant, so far as natural science is

- concerned. There were two Beslers, the younger brother,
 1642 M. P. BESLER, published in 1642 "Gazophylacium rerum
 naturalium," including a few figures of shells.
- 1653 D. OLAUS WORMIUS in 1653 published an account of his
 private museum, figuring the *Lepas anatifera* on p. 256 of
 the work.
- 1657 JOHNSTON, of Amsterdam, in 1657, gave to the world his
 "Historia naturalis de exsanguibus aquaticis," figuring some
 leading shells, and he followed this up with another work,
 "Thaumatographia naturalis," 1665.
- 1667-68 DE ROCHFORT, in Paris, 1667, and ADAM OLEARIUS, in
 1668, both published conchological treatises, the former on the
 shells of the Caribbees, with figures of a few species, the latter
 the "Museum Gottorpiam," a quarto work, containing an
 account of the collection of the Duke of Holstein-Gottorp,
 with fine plates of shells, referred to by Linnæus in his
 "Systema Naturæ."
- The celebrated "Pinax rerum naturalium Britannicarum"
 was next to see the light, published in London by MERRET in
 1667. This is the earliest catalogue extant of the natural
 history of our country. The conchological portion, however,
 is extremely scanty.
- DR. CHARLETON, or CARLETON, author of the "Onom-
 asticon zoicum," 1668, followed Aldrovandus, and Johnston of
 Amsterdam, to whom we have just alluded, in his arrangement
 of Testacea. He admits ten univalve genera, and several
 bivalve, these latter being most artificially and unsuccessfully
 separated by their rough or smooth surfaces, as *conchae laeves*
 and *conchae asperae*.
- 1675 D. MAJOR, the annotator of the work of Fabius Columna,
 published his "Dictionarium Ostralogicum" in 1675. He
 divides all shells into two classes only, *Univalvia* and *Plurivalvia*,
 the second divided into two sub-sections, the latter being
Lepadæ. Lovell Reeve, in his introduction to the "Conchologia
 Systematica," considers him one of the most important fore-
 runners in the science.

LEGATI, of Bologna, published the account of the 'Museo Cospiano' in 1677; it contains the collection of Signor Ferdinand Cospi, and includes that of Aldrovandus. 1677

Dr. NEHEMIAH GREW, 1681, gave, in an account of the Museum of the Royal Society, about thirty-five figures of shells, with their English vernacular names. Linnæus named the genus *Grewia*, in botany, in his honour. 1681

The important work of BUONANNI, 1681, follows. Originally printed in Italian, it was republished in Latin under the title "Recreatio mentis et oculi in observatione animalium testaceorum." Linnæus often quotes the 550 figures of shells in his "Systema." This makes the work of Buonanni valuable for reference. His arrangement and descriptions are much criticized by Bergen and others. A want of uniformity is perceptible throughout, and also a lack of power of classification.

At this period two of our countrymen brought to light some conchological matter, the first in the "Scotia illustrata" of Sir Robert Sibbald. Here the land and freshwater shells are separated, as a different class, from the marine. 1668-69

MR. W. COLE also published in 1689 a treatise on the *Purpura* (*Buccinum lapillus* L.) in the Transactions of the Royal Society. DR. MARTIN LISTER, a third, and more distinguished British subject now follows. His chief work, "Historia sive synopsis methodica conchyliorum," was begun in 1685, and concluded in 1692. It was the outcome of many shorter essays and pamphlets published previously. He divides his treatise under four heads:— 1685-92

(a) *De turbinibus terrestribus.*

(b) *De turbinibus aquae dulcis et bivalvibus aquae dulcis.*

(c) *De bivalvibus marinis et conchis anatiferis.*

(d) *De patellis dentalibus et de buccinis marinis.*

There are many plates and figures executed by Susannah and Anne Lister, his daughters, with much boldness and fidelity.

Another work by the same author, which is especially interesting to Englishmen, is his 'Historia animalium Angli-

corum.' This gives figures of our native shells. There was a good republication of these great works of Lister's in 1770, under the direction of the Rev. W. Huddesford, then keeper of the Ashmolean Museum, the plates having been bequeathed by the author to the University of Oxford.

1700 At the dawn of the next century PETIVER published "Gazophylacium naturæ et artis," containing figures of shells referred to occasionally by Linnæus; and LEEUWENHOEK, the great microscopist, also published a treatise on the internal anatomy of shell-bearing mollusks.

1705 The great RUMPHIUS now appears on the scene. He must have travelled widely, and found in Amboyna the most choice assortment of natural history objects, sufficient to publish a large and expensive work, "Amboinsche Rariteitkamer." Over half of the total number of plates are devoted to pictorial representations of shells, and Linnæus owes much to this author, as the frequent references in the "Systema" amply testify. Rumphius lived at a time when, especially in Holland, the mania for collecting and giving extravagant prices for shells was at its acme; it was in these days that the wealth of a collector was often centred in the possession of a wentle-trap, a cone, or a thorny oyster. The unique and magnificent *Pleurotoma Rumphii* Stimpson, of which the only specimen is to be found in the Royal Museum, Holland, has been aptly named in his honour. Another writer of less note than Rumphius, but of the same nationality, and flourishing at the same time, was LEVIN VINCENT, who published a description of his museum under the title of "Woondertooneel der Natuur," 1706.

1708 It was JOSEPH PITTON DE TOURNEFORT, the great leader of botanical research in France, who died 1708, to whose intellect and sagacity the dawn of modern classification may be traced. Himself the principal scientist of his time in the branches which he had studied, it was not long before his death that he began to turn his attention to Zoology.

The treatise he had prepared on this subject remained unpublished till 1742, when it was given to the world by Gualtieri, incorporated in his "Index testarum conchyliorum quæ adservantur in Musæo Nicolai Gualtieri." This was published at Florence, and contained over one hundred plates of shells. No one can peruse the system adopted by Gualtieri, who had become possessed of the MS. of Tournefort's work, without at once perceiving the fount from which Linnæus sought, and obtained, inspiration. 1742

Following the date of the death of Tournefort, we next in chronological order, arrive at REAUMUR, who published in 1715-17 some physiological works on testaceous animals, including the formation of pearls in the oyster. 1715-17

Several conchologists of less note, BARRELIER, RUYSCH, VALENTINI, and others, followed, until in 1722 the appearance of a most important work created quite an epoch in the science. 1722

This was the "Methodus nova testacea marina in suas classes, genera, et species distribuendi" of CAROLUS NICOLAS LANG or LANGIUS, and was a quarto work published at Lucerne. Dr. Maton, to whose disquisitions on the subject of these pre-Linnæan authors we are all indebted, says truly of him that "his system, so far as Marine Testacea are concerned, and of these alone he treats, certainly glances at the great clue to simplicity, which was afterwards so successfully and admirably seized by the great reformers of natural history in general." In this work great stress was laid upon

- (a) The hinge of Bivalves.
- (b) The mouth of Univalves.

Langius divides shells into three classes:—

- (a) *Testacea marina univalvia, non turbinata.*
- (b) *Cochleae marinae.*
- (c) *Conchæ marinæ.*

These again are sub-divided into several sections:—(a) into two; (b) into six; (c) into three. These again are divided into many genera: one hundred and ten in all.

1725 Sir HANS SLOANE in his "History of Jamaica," 1725, alludes to the molluscan productions of that island. He was the founder of the British Museum.

1728 In 1728 J. E. HEBENSTREIT published an ambitious dissertation on shells, "De ordinibus conchyliorum methodica ratione instituendis," but it was not so concise or valuable as that of Langius, from whom, however, he took many hints, and to whose bases of classification he adhered.

1732 BREYNIUS in 1732 gave to the world "Dissertatio physica de polythalamis," an arrangement of shells, recent and fossil. He, with Langius and Klein, is considered to be the principal pioneer of Linnæus, Tournefort always excepted.

Several molluscan writers now came to the fore. DU HAMEL and SWAMMERDAM both writing on the *Purpura*, PLANCUS, on the minute shells collected in the Adriatic Sea near Rimini.

1728-40 KUNDMANN a year or two previously, 1728, had published "Promptuarium rerum naturalium et artificialium." He followed Buonanni exactly in his method of classification. Now comes a work much quoted by Linnæus—D'ARGENVILLE'S "La Conchyliologie," which went through three editions, and possessed
1742-80 a series of plates, with copious figures.

1744 Almost the first, if not quite the first North American publication on the subject was that of BARTRAM, who in 1744, issued his "Observations concerning the Salt Water Muscle, the Oyster Banks, and the Fresh Water Muscle of Pennsylvania."

1750-53 JOHN THEODORE KLEIN published in 1750, at Leyden, "Descriptiones tubulorum marinorum," containing nine plates of shells, followed in 1753, by his far-famed "Tentamen methodi

ostralogicæ sive dispositio naturalis cochlidum et concharum in suas classes, genera, et species.”

DR. MATON says about this author’s work “It has been objected that the general divisions, forming parts, sections, classes, and genera are too numerous, and, what is worse, that species are constituted, in some instances, without being referable to any genus, and that in one of the parts there is a solitary genus without any class.”

A short summary of Klein’s arrangement may not be considered out of place here :—

He tabulates four divisions :

I.—COCHLIDES.

§ *a*. *Cochlis simplex*. §§ *b*. *Cochlis composita*.

Under § *a* come *Nautilus*, *Nerita*, *Trochus*, *Strombus*, *Buccinum*, *Turbo*.

Under §§ *b* come *Bulla*, *Porcellana* (*Cypræa*), and *Murex*.

II.—CONCHÆ.

§ *a*. *Monoconchæ*. §§ *b*. *Disconchæ æquales*.

§§§ *c*. *Disconchæ inæquales*.

In § *a* are comprised *Patella* and allies.

In §§ *b* are comprised *Ostrea*, *Spondylus*.

In §§§ *c* are comprised *Terebratula* and other *Brachiopoda*.

III.—POLYCONCHÆ.

This includes the *Lepades* and *Chitones*.

IV.—NIDULI TESTACEI.

This includes *Balani*.

This work is of supreme importance ; indeed many writers, principally of the French school, advocate Klein as the father of the binomial system, and do not consider that his genera should be superseded or overlooked because not utilized by Linnæus. They were all utilized and recognized by H. and A. Adams in their “*Genera of Recent Mollusca*,” 1853-58.

1755 Between 1750 and 1760 flourished COHANSEN, of Frankfort, the author of "Conspectus sciographius Testaceorum;" NICOLAS GEORGE GEVE, of Hamburg, editor of an illustrated periodical devoted to sea productions, and GUETTARD, 1756, who published in the Memoirs of the French Academy some new genera of shells, several of which are still recognized, having been adopted by subsequent binomial authors. His principal work was styled "Sur la rapport qu'il ya entre les coraux et les tuyaux marins."

1756 Our countryman, DR. PATRICK BROWNE, in 1756, published "A Civil and Natural History of Jamaica." Some of his genera are still adhered to.

1757 The immediate predecessor of Linnæus in mollusca was the famous MICHAEL ADANSON, whose chief work "L'histoire naturelle du Senegal," was published in 1757. He was born in Provence in 1727. The above work contained an enumeration of Mollusca, both generic and specific, many of the names preferred being not classical, *e.g.*, Mesal, Nifat, Mutel, Tafon, Sigaret, etc. He was just one year behind the date of the tenth edition of the "Systema Naturæ," which certainly interfered with the permanence of his work. His memory has, however, always been highly honoured, especially by the naturalists of Europe. Linnæus named in his honour the most famous perhaps of all trees, the Baobab Tree of Africa (*Adansonia digitata*), and MM. Crosse and Fischer have also described the superb *Pleurotomaria* from Guadaloupe, a specimen of which adorns our National Museum at South Kensington, as *P. Adansoniana*.

1735-58 CARL VON LINNÉ, commonly known as LINNÆUS, was born May 13th (old style), 1707, at Rashault, province of Swaland, Sweden. Putting aside his labours and fame as a Botanist and Zoologist in other branches than the mollusca, we find that in 1746 he gives an account of many species of shells in the "Fauna Suecica." This was followed in 1747 by the results of

his travels in Gothland, "Wästgöta resa förrättad år 1746," which gives figures of shells observed on his journey. He next described the contents of three museums :—

- (a) Museum Tessinianum, 1753.
- (b) „ Adolphi Frederici Sueciæ regis, 1754.
- (c) „ Ludovicæ Ulricæ reginæ, 1764.

The first two contain hardly any allusion to Conchology, but the last makes up for this defect, no less than 434 figures being given.

Two or three dissertations and pamphlets now followed, e.g., the "Mantissa altera," containing thirty-five descriptions of shells, the "Fundamenta Testaceologiæ," and others.

Linnæus has been much, and adversely, criticised for the portion of the "Systema Naturæ" which refers to the mollusca.

Although only the tenth (1758) and the twelfth (1767) 1758-67 editions of this work are quoted as forming the starting point for Zoological nomenclature, it must not be thought that the genera of shells had been overlooked in the earlier editions. But that the classification was most imperfect, is shown by the fact that in the first edition of the "Systema," 1735, only seven genera are mentioned :—Cochlea, Nautilus, Cypræa, Haliotis, Dentalium, Concha and Lepas.

It is therefore urged against Linnæus, and with some show of reason, that he adopted a retrograde step in this particular science, in wilfully ignoring the previous work of authors who had made testaceology a special study, and declining to recognize their genera. More especially is this observable in the later editions of his work. There can be no doubt that his investigations among the shells were not so original or first-hand as his other—more particularly his botanical—researches. Surely it is given to no one man to excel in all branches of a science, how much less of two sciences, and there is but little doubt that Lang, Lister, Klein and Adanson were better con-

chologists than he, who has the great and abiding honour, nevertheless, of being recognized as the founder of the binomial system.

II.—CAUSES LEADING TO NECESSARY REVISIONS IN ZOOLOGICAL NOMENCLATURE.

But this new system, perhaps through its very straightforwardness and simplicity, opened the flood-gates to a horde of new describers and systematists. At this early period, when intercommunication was naturally difficult, men were often working upon some subject in utter ignorance of other authors similarly employed, thereby unconsciously duplicating names, with or without proper descriptions, and bringing about an unpleasant condition of synonymy and confusion. It was this increasingly intolerable position of things that caused the inauguration of the proposed "Rules for the revision of Zoological and Botanical Nomenclature" in 1842, and while much has been done to remedy the defects of that period of eighty-four years or so, much, especially as regards the species, remains to be done.

Indeed, the only effort that had meanwhile been made to establish and keep up such rules, was in 1813, when M. A. de Candolle applied himself to the task in the interests of Botany alone. He made a code, on the same lines as Linnæus, whose system he thus served to strengthen. He was especially rigid on the subject of the maintenance of specific terms, excepting in certain cases, which he summarized, always adhering to the law of priority.

It may not be known to many of us, or perhaps be a forgotten fact, that Manchester was the city in which the British Association held their famous and memorable meeting of June, 1842. Famous and memorable chiefly because a committee which had been selected the previous year to discuss the vexed question of a revision of Zoological and Botanical Nomencla-

ture, had meanwhile finished their labours, and submitted to the approval of the Association, to use their own words, a "Series of propositions for rendering the nomenclature uniform and permanent." The committee originally consisted of the following eight persons: Prof. Henslow, Rev. Leonard Jenyns, Mr. W. Ogilby, Dr. Richardson, Messrs. Charles Darwin, J. Phillips, H. E. Strickland (reporter), and Mr. J. O. Westwood, to which names were subsequently added the following five: Messrs. W. J. Broderip, W. E. Shuckard, G. R. Waterhouse, W. Yarrell, and Professor R. Owen. It was accordingly an exceedingly representative list.

The rules will be found in the Report of the Twelfth Meeting of the British Association (1842), pp. 105—121. They were revised, as will be presently explained, in 1864, and at the request of the General Committee of the British Association at the Plymouth Meeting in 1878, they were again reprinted and edited by Dr. Philip Lutley Sclater, F.R.S.

I think it will not be amiss here to give a short outline of what is known as the 'Stricklandian Code,' especially as with the few emendations and additions, shortly to be summarised, it is still in vogue, and will, we believe, always remain in force, at all events in this country. And since I have just alluded to the scene of the labours of this committee, it is especially interesting for us to be, fifty-four years later, gathered together in the same city to examine and taste for ourselves the splendid fruit of the seed sown here in 1842.

III.—HEADS OF THE STRICKLANDIAN CODE, 1842.

(I). The plan to be limited to *systematic*, as opposed to *vernacular*, nomenclature.

Priority to be considered the only possible basis, as well as the only just and equitable starting-point, and the date of the commencement of Binomial Nomenclature to be that of the XII Edition of the "Systema naturæ" of Linnæus, 1767.

(II). Pre-Linnæan authors, as not being binomial, not to be considered.

(III, IV, V). The generic name, as given originally to an assemblage which might be subsequently divided, not to lapse, but to be allowed to be used for the most typical of the newly-constituted genera, *i.e.*, that species which the author considered most typical. Should no type have been indicated by the author the original name to be kept for the subsequent sub-division that first received it.

(VI, VII). A later name for the same genus to be reduced to a synonym, provided the genus be retained as one individual whole. If, however, it be subsequently divided by authors who have selected as types the sections now raised to the dignity of two genera, both the names to be kept.

(VIII). A later name, however, embracing several earlier ones, not to stand by any pretence whatsoever.

(IX). Should a genus be extended, so as to embrace one or two already defined and named, the earlier name to be chosen for the whole number of species.

(X). No two genera to bear the same name. If by inadvertence this has occurred, the older to stand.

(XI, XII). A name, given under mistaken ideas, to be allowed to be changed, as also names not clearly defined or described.

(XIII). When a specific name is adopted as a new generic term, the species, to avoid tautology, to be re-christened.

(XIV). Latin terms and words to be used, or else Latinized Greek. Rules are given for Græco-Latin terminology.

In addition, the following recommendations were given for the improvement of nomenclature:—

Genera to be substantives, not adjectival in their derivation.

Geographical names only to be recommended if the object be endemic there.

Barbarous names and mythological terms, applied without reason, are deprecated.

Comparative names, with the affix *-ides*, *-oides*, *-formis*, etc., to be avoided as much as possible.

Generic and specific names from persons to be used with care, and only when the persons have deserved such commemoration.

Hybrid and corrupt names derived from Latin and Greek, English and Latin, etc., to be severely discountenanced, as also names too nearly resembling each other, though not quite identical. Nonsense names likewise come under this category.

Synonyms had better not be resuscitated again as new genera, as this would cause confusion.

Generic names to be written with a capital, and all specific names, even those derived from persons, with a small letter.

The name of the author of the species to follow in abbreviated form, whether written or printed, and it is recommended that the authority for a specific name when not applying to the generic name also, should be followed by the distinctive expression "sp.," or be placed within brackets.

IV.—REVISION OF THE STRICKLANDIAN CODE, 1864.

In 1864, at the Meeting of the British Association at Bath, a committee was appointed to report on any revision it might be necessary to make in the above rules, as drawn up by Mr. H. E. Strickland.* Unfortunately that gentleman had died eleven years previously. The ten surviving members of the original committee had already been re-appointed, with Sir William Jardine, Bart., as reporter, as long ago as the Oxford Meeting in 1860, to consider this question, but nothing had been done in the matter, mainly owing to the extreme difficulty of bringing such a committee together. Accordingly, a new

* Hugh Edwin Strickland, F.R.S., born 1811, accidentally killed at Clarborough, near Gainsborough, 14th September, 1853, *vide* "Memoirs," by Sir W. Jardine, Bart., 1858, "Athenæum," 1853, p. 1125.

committee was appointed, at the Meeting in Newcastle in 1863, consisting of Sir W. Jardine, Bart., Messrs. A. Russel Wallace, C. Spence Bate, Philip P. Carpenter, J. E. Gray, C. Babington, D. Francis, Philip Lutley Sclater, Sir J. D. Hooker, J. H. Balfour (of Edinburgh), H. T. Stainton, J. Gwyn Jeffreys, A. Newton, T. H. Huxley, G. J. Allman, and G. Bentham.

The actual work of revision seems to have been carried out by four of these gentlemen, viz. Gwyn Jeffreys, A. R. Wallace, P. L. Sclater, and Sir Wm. Jardine as reporter.

The chief alterations and emendations, as given on p. 28 of the Report of the British Association for 1865, held at Birmingham, are as follows:—

(I.) That Botany should not be introduced into the Strickland rules and recommendations.

(II.) That the permanency of names and convenience of practical application being the two chief requisites in any code of rules for scientific nomenclature, it is not advisable to disturb by any material alterations the rules of Zoological nomenclature which were authorized by Section D at the meeting of the British Association in Manchester in 1842.

(III.) That the Committee are of opinion, after much deliberation, that the XII edition of Linnæus's "Systema Naturæ," 1767, is that to which the limit of time should apply. But as the works of Artedi and Scopoli have been already extensively used by entomologists and ichthyologists, it is recommended that the names contained in or used from these authors should not be affected by this provision. This is particularly requisite as regards the generic names of Artedi used by Linnæus himself.

Besides these three recommendations, it was proposed that (a) it was extremely injudicious to adopt a specific name as a generic, but that when this had been done, it was the generic name, not the specific, which should be thrown aside, and that the Stricklandian rule as to this should be altered.

(b) Sixteen classes of objectionable names were given, with a view to the improvement of Zoological nomenclature in future. These will be found on pp. 37 *et seqq.* of the Report for 1865.

It was also (c) recommended that specific names might or might not be written with a small initial, just as the author thought fit.

V.—REPORT OF THE COMMITTEE ON NOMENCLATURE TO THE AMERICAN ASSOCIATION, AT NASHVILLE, AUGUST 31ST, 1877.

In August, 1877, the Report of the Committee on Zoological Nomenclature, appointed by the American Association for the Advancement of Science, was issued. It was drawn up by that eminent scientist and conchologist, Mr. William Healey Dall, the sole member of the committee.

The report,* which I have perused very carefully, is thus the compilation of only one man, but he, being the leading exponent of matters conchological in the United States, is especially deserving of a hearing by British conchologists.

Mr. Dall obtained the written opinion of forty-five leading scientific men in U.S.A., having asked them twenty-seven questions in connection with the subject. Of these, the following are the most important, numbered as in order given:—

(I.) What date shall be taken as the commencement of the binomial era in nomenclature?

Answer: For Edition X. 18 votes.

For Edition XII. 17 votes.

1736, 1 vote (Botanists, 1753, 2 votes).

(II.) Shall phrases of two words which may appear in the publications of naturalists whose works preceded, or who did not in such works adopt the binomial system of nomenclature, be considered as binomial names?

* Proc. Amer. Assoc. for the Adv. of Science, xxvi Meeting, Aug., 1877, pp. 7-56.

Answer : No. 32 votes.

Yes. 5 votes.

- (V.) Does the reading of a paper before a scientific body constitute a publication of the descriptions, or names of animals or plants contained therein ?

Answer : No. 39 votes.

Doubtful. 2 votes.

Yes. 4 votes.

- (VI.) Is a name in the vernacular of the publishing author, or a vernacular rendering from a classical root unaccompanied by a Latin or Greek form of the name, entitled to a recognition, except in Bibliography ?

Answer : No. 36 votes.

Doubtful. 2 votes.

Yes. 4 votes.

Four questions follow, VII., VIII., IX., X., mostly overwhelmingly negatived, asking whether generic terms founded without proper specification of characters, description, or diagnosis should be admitted or recognized, and whether names once given should be arbitrarily changed, on assumptive evidence only of some error in derivation or the like, by a subsequent author.

- (XI.) Should a generic name, otherwise properly constituted, but derived from the specific name of its typical species, or similar to that of one of the species included under it, be rejected on that account ?

Answer : No. 40 votes.

Doubtful. 4 votes.

Yes. 1 vote.

- (XII.) Shall a subsequent author be permitted in revising a composite genus (of which no type was specified when it was described) to name as its type a species not included by the original author of the genus ?

Answer : No. 37 votes.

Doubtful. 2 votes.

Yes. 5 votes.

[The Linnæan genus *Chiton* is given as example, none of Linnæus' four species now being included in the typical genus.]

Questions XIII.—XVII. refer to the authorship of genera, and rules and regulations in connection with them.

(XVIII.) When a generic name has lapsed from sufficient cause into synonymy, should it be thenceforth entirely rejected from nomenclature? or should it be still applicable to any new and valid genus?

Answer : Reject. 19 votes.

Accept. 23 votes.

(XIX.) Should a name which has been once used in one subkingdom, and has lapsed into synonymy, be considered available for use in any other if not entirely rejected from nomenclature?

Answer : No. 20 votes.

Doubtful. 1 vote.

Yes. 18 votes.

Questions XX.—XXIV. principally refer to the possibility of inappropriate names being changed, statute of limitations as to fixity of tenure of well-known names, objected to after a term of years, etc.

(XXV.) Question asked whether it be desirable to adopt any classification of periodical literature by which certain exclusive channels of publications of descriptive papers on Natural History shall be designated for use by authors who desire to secure the rights of priority for new names preferred by them?

Answer : No. 26 votes.

Yes. 8 votes.

Desirable but impracticable. 9 votes,

Mr. Dall includes Botanical Nomenclature as well as Zoological in his lengthy report which follows; for the former largely quoting and adhering in the main to De Candolle.*

With regard to the date of the starting point of Binomial Literature and Nomenclature, he conforms, as regards Zoology, to the date of the XII. Edition of the "Systema Naturæ," 1766-67. In Botany, the date of the "Species Plantarum" of Linnæus, 1753.

The following restrictions, as concerning Zoology, now follow:—

(i). That specific names shall in no case antedate the promulgation of the Linnæan rules ("Philosophia Botanica," 1751), that (ii) until the formal notice by publication of the decision of such associated specialists (in such manner as may be by them determined upon) shall be decisively promulgated, the adoption of the epoch as starting point recommended by the Committee of the British Association in 1842, viz.:—the XII. Edition of the "Systema Naturæ" shall be taken as the established epoch for all Zoological Nomenclature.

It is pointed out by Prof. Verrill and others how much better the date of the tenth edition would have been, as especially in Arachnida and Entomology, certain authors are in danger of having their names repudiated, who published between 1758 and 1767.

It is likewise shewn that some authors, such as Mr. G. R. Gray in his "Genera of Birds," adopt the I. Edition of the "Systema," (1735) for genera, the X. for specific names (1758).

VI.—LA SOCIÉTÉ ZOOLOGIQUE DE FRANCE, 1881.

In 1881 the Société Zoologique de France published the results of the Commission appointed by that body to investigate the question of nomenclature. This Commission was composed of Messieurs E. Simon, F. Lataste, L. Chaper, Künckel

* A. de Candolle, *Lois de la nomenclature botanique, rédigées et commentées*, Paris, 1867.

d' Herculais, Dr. Blanchard, Dr. Jousseau, Dr. Jullien, and the Report was prepared by M. Chaper.

Certain changes from the proposals of the British and N. American Reports are recommended.

One important rule suggested for the future is that the genitival termination shall be used for personal names.

And, as regards the law of priority, it is pointed out that Tournefort de Pitton, in 1700, consistently applied for the first time the binomial principle in his "Institutiones rei herbariæ," that the same author towards the close of his life, in 1708, attempted to apply the same rule to the mollusca, and that Gualtieri, in 1742, published this posthumous work.

It is also shewn that Lang, in 1722, published his "Methodus nova et facilis testacea marina in suas debitas classes, genera, et species distribuendi." Here Groups, Families, and Orders are not signalized, but to some extent Genera and Species are handled.

J. T. Klein, 1731—1753, is next mentioned as still further perfecting the system, especially as regards the mollusca.

Breyn is shewn, in 1732, to have expressly mentioned, at the head of the first chapter of his treatise, that he contemplated treating "Speciatim de methodo testas in classes genera et species distribuendi."

Linnæus is then quoted, with regard to the first edition (1735) of his "Systema Naturæ;" genera also here being unequivocally dealt with, and no species being cited. Lang, it is further argued, had, thirteen years previously, solved the question Linnæus had hardly begun to work out.

As regards Mollusca, the published names of genera and species of J. T. Klein and Adanson are then brought forward, and it is urged that they should be all adopted in preference to the Linnæan or Lamarckian. It is shewn that Klein had established the genera *Tympanotonos* and *Vertagus*; Adanson

Cerithium ; but that Linnæus had failed to comprehend these, and retrograded in placing such molluscs in the genus *Murex*.

Such is in abstract the report of the French Commission, which has been since upheld and augmented by that of the *International Geological Congress, which met at Bologna, 1881, under the secretaryship of M. H. Douvillé. In this the question of the genitival case for specific proper names was confirmed, and the question of the law of priority still further discussed.

VII.—COMMENTS BY VARIOUS WRITERS ON THE
SUBJECT OF NOMENCLATURE.

Dr. R. H. Traquair's‡ remarks on Binomial Nomenclature, contained in his introductory address delivered 19th November, 1884, before the Royal Physical Society of Edinburgh, are well worth perusal, and we think many British naturalists will agree with his criticisms as to the alteration of an old specific name when the generic name becomes homologous with it, with the date-of-publication question, and with his remarks on priority.

He likewise discusses trinomialism, of which he says "there are two kinds. The first works by the institution of *sub-genera*. When the species of a large genus can be arranged in subordinate groups, *sub-generic* titles are instituted for these ; and each of the species, excepting those of the typical sub-division, comes to have three names, the first generic, the second, sub-generic in parentheses, the third specific."

"To this I feel quite averse, as being an unnecessary interference with the shortness, conciseness, and convenience of the binomial system."

* * * * * * *

* Règles à suivre pour établir la nomenclature des espèces. Rapport du Secrétaire de la Commission, H. Douvillé, Congrès Géologique International, Compte Rendu de la 2me Session, Bologne, 1881-82.

‡ Remarks on Biological Nomenclature, Proc. Roy. Phys. Soc. Edinburgh, vol. viii., pp. 275-295, 1885.

“But there is a trinomial system not connected with *sub-genera* but *sub-species*. . . . These sub-species belong to a different category from accidental varieties or sports, being characteristic of geographical regions where they breed true, and they are in fact, in the eye of the evolutionist, species between which the links have not been lost.”

“Hitherto the word variety, contracted var., has been given to them, and another way has been long ago preferred and used by some naturalists, especially Dr. Coues, the author of the ‘Key to North American Birds.’ This plan consists in omitting the term var., the sub-specific term being simply added, so as to become an integral part of the name of the organism, which accordingly becomes *trinomial*, or composed of three words.”

This is, to my own mind, the most euphonious and proper thing to do. The addition of the true specific name would ensure perfect clearness and obviate such errors as have occurred of late years ; for instance certain *Lepidoptera diurna*, that are evidently only local or island races, have been described as entirely distinct species, without any reference to the name of their near ally and probably original parent, and thus confusion has become worse confounded. In the year 1888, I myself made some allusion to the subject in the “Survey of the genus *Cypræa*,”* and advocated such a plan for all varieties.

Dr. Paul Fischer, † in his “Manuel de Conchyliologie” pp. 316–322, refers to the question of nomenclature, and gives a sketch of its history, from the time of Tournefort, 1656–1708, to 1887. He also gives some valuable notes on synonymy, as also on the laws of heredity, selection, and variability of species.

In 1890 Mr. Edgar A. Smith selected for his valedictory address as president of this society the nomenclature of certain

* Mem. and Proc. Manchester Lit. and Phil. Society, (4), vol. i., p. 208, 1888.

† P. Fischer, Man. Conch. pp. 316–322, Paris, 1887.

genera of land and freshwater shells, in which he gave reasons for:—

Viviparus <i>Montf.</i> 1810	supplanting	Paludina <i>Lam.</i> 1812.
Paludestrina <i>D'Orb.</i> 1840	„	Hydrobia <i>Hartm.</i> 1821. <i>non Leach</i> (Coleoptr.).
Vitreia <i>Fitzinger</i> 1833	„	Zonites <i>Gray</i> 1840.
Cæcilioides <i>Fer.</i>	„	Cionella <i>Jeff.</i> 1829. Cochlicopa <i>Risso.</i> 1826. Zua <i>Turton</i> 1840. Azeca <i>Leach</i> 1828. etc. etc.
Acicula <i>Hartm.</i> 1821	„	Acme <i>Hartm.</i> 1821.

Mr. Smith has also elucidated the proper nomenclature of the genera hitherto known under the names of Triton, Oniscia, Cassidaria, etc., for which work systematists should be much indebted to him.

In 1893 Dr. Raphael Blanchard* presented his “Deuxième rapport sur la nomenclature des êtres organisés,” in which all the questions contributed to the former meeting are discussed still more freely, and the report of the Société Zoologique de France, of which M. Blanchard was a member in 1881, upheld in every particular. M. Blanchard is even more emphatic than M. Chaper in his views as to Tournefort de Pitton, Lang, Klein and Adanson. “It is to Tournefort,” he remarks, “that the glory undoubtedly accrues of having founded the principle of binary nomenclature.” Every plant, says Tournefort, in his “Institutiones rei herbariæ,” 1719, which is designated by a generic name should have a specific attached as well. * * One ought, so to speak, to abstain from employing the numbers 1, 2, 3, 4, 5, etc., as so many Botanists have done, to the species.” He then adds that the “specific name should be chosen in particular reference to some peculiarity of the plant, either with

Blanchard, R., Deuxième rapport sur la nomenclature des êtres organisés; Rapport présenté au deuxième Congrès international de Zoologie réuni à Moscou du 10/22 au 18/30 Aout, 1892, Paris, 1893.

regard to its flowers, leaves, or fruit; and, finally, that it is of importance that the specific name should be very brief and concise."

Tournefort applied these principles mainly to Botany, and very many of his names are adopted by Linnæus, who fully recognized the great value of his work.

M. Blanchard next emphasizes again very strongly the claims of C. N. Lang as the author of the Binomial system as regards Mollusca, and his immediate followers, Klein and Adanson. It introduces no matter of interest that had not been already dealt with at the former convention.

The Rev. T. R. R. Stebbing, F.R.S., published in Nov., 1894, and April, 1896, two very interesting articles,† which have since been reprinted as separate pamphlets, on the "Rules of Nomenclature in Zoology" and on "Random Publishing and Rules of Priority."

In the paper on "Random Publication," he suggests the possibility of one central medium for each science, e.g., that all new Mollusca (p. 343) should be published in France or Germany. I am afraid this very Utopian scheme is impracticable; were it possible, I, for one, should vote for the Mollusca being published in British journals,

In his pamphlet on the "Rules of Nomenclature in Zoology," Mr. Stebbing criticizes the recent meeting of the Zoological Society of London, to which we have already alluded, and their discussion on the revision of the Stricklandian Code and that of the German Zoological Society. The author seems to agree with the alterations proposed, as indeed do I, and it would be a very great satisfaction if this concession—for concession it is—on the part of the biologists of our country should tend in part to unite scientists of different countries more closely, and enable them to frame in unison an indisputable code that admits of no question and of no doubt. "Natura

† "Natural Science," vol. v., Nov., 1894, and vol. viii., April, 1896.

non facit saltum." The whole array of animated nature is before us, awaiting patiently a valid enrolment and arrangement, systematically and physiologically, and the day is sure to dawn when this will be done.

Two other codes of nomenclature, mainly referring to birds, have been published, one being the "Check List of American Birds," adopted by the American Ornithologists' Union, New York, 1886; and the other "Regeln für die Zoologische Nomenclatur, angenommen von der Allgemeinen Deutschen Ornithologischen Gesellschaft zu Berlin auf der XVI. Jahresversammlung in Frankfurt-am-Main," 1891.

VIII.—CODE OF THE GERMAN ZOOLOGICAL SOCIETY, 1896.

Lastly, and most important of all since the original code was drawn up, the rules suggested by the German Zoological Society must be noticed. The rules of the German Zoological Society most affecting those already in existence are—

Rule 1.

(a) Zoological Nomenclature includes extinct as well as recent animals, but has no relation to Botanical names.

Rule 5.

(b) The same name may be used for the generic and specific name of a species.

Rule 7.

(c) The application of the law of priority begins with the X. Edition of Linnæus' "Systema Naturæ (1758)."

Rule 19.

(d) The author's name of the species shall be placed in parentheses when the original generic name is replaced by another.

Rule 20.

(e) Hybrids shall be designated either by a horizontal cross between the parents' names, or by their names being placed one above the other with a line between.

Rule 21.

(*f*) Sub-species and other deviations from the type, and also constant local forms and varieties requiring special names, should have them placed after the specific name.

It was the publication of these rules that caused Mr. P. L. Sclater, F.R.S., the Secretary of the Zoological Society of London, in the spring of this year (1896), to introduce the subject and invite a discussion, at which those proposed clauses which sought to revise and alter certain existing rules of the Stricklandian Code were especially criticised.

These rules* were mainly framed with a view to aid the compilers of the gigantic synopsis of the animal kingdom now being entered upon by German specialists, about which I shall shortly say a few words, and the chief points raised, as seeking to subvert the existing laws, were

(*a*) May Zoological names be, in certain cases identical with those employed in Botany or not?

(*b*) May the same term be used for the generic and specific name of any individual?

(*c*) Is the tenth (or twelfth) edition of the "Systema Naturæ" of Linnæus to be employed as a starting point of all Nomenclature in Zoology?

After a prolonged discussion in which Sir William Flower, Prof. Ray Lankester, Mr. Elwes, Dr. Sharp, Mr. W. T. Blanford, Messrs. Forbes, Kirby, and others addressed the meeting, although no formal resolution was adopted, it appeared that the general feeling of the meeting was on the whole not adverse to the proposed changes.

With regard to (*a*), the new rule is, in my opinion, an equitable one, and its being passed as law would save much unnecessary change.

As regards Malacology, however, it would not signify very much whether the terms used in Botany be allowed or not.

* Regeln für die wissenschaftliche Benennung der Thiere zusammengestellt von der Deutschen Zoologischen Gesellschaft, Leipzig, 1894.

If they be disallowed the following names will have to be changed:—

Castalia <i>Lamarck</i> 1819 antedated by <i>Castalia Salisbury</i> 1805 [= <i>Nymphæa</i> L. in parte] (<i>Nymphæaceæ</i>).	
Dacrydium <i>Torrell</i> . 1859 „	Dacrydium <i>Solander</i> 1786 (<i>Coniferæ</i>).
Modiola <i>Lam.</i> 1801 „	Modiola <i>Moench</i> 1794 (<i>Malvaceæ</i>).
Trigonia <i>Brug.</i> 1781 „	Trigonia <i>Aublet</i> 1775 (<i>Vochysiaceæ</i>).
Verticordia <i>S. Wood</i> 1844 „	Verticordia <i>D. C.</i> 1826 (<i>Myrtaceæ</i>).

(b) The alteration of date from 1767 to 1758 likewise has no palpable effect upon Conchological specific nomenclature. But 814 species are propounded (including *Serpulæ*, *Lepades*, and *Sabellæ*), in the twelfth, as against 703 in the tenth edition. At the same time, it seems to me to cast a slur upon Linnæus' memory. He laboured to attain a standard of perfection, and we who honour his memory must remember that he brought his work to a high pitch of excellence, and bequeathed it to posterity in as complete a form as possible. To take the tenth edition as a starting point is to deprive ourselves of many of the great benefits of his vast experience, extended and enhanced in every edition.

(f) This rule is calculated to call forth much divergence of opinion. If it be true that by its becoming law many old-established genera (not many however in Mollusca) will fall, I shall advocate it being left alone. Personally, I think the *Scomber scomber* tautology not the reverse of pleasing. I certainly prefer *Gemma gemma* to *Gemma Totteni*.

The Molluscan Branch of Zoological Nomenclature, as regards the genera, seems to be in better case than many of the other sciences, more especially Botany, now so assailed by the questionable lucubrations of Dr. Otto Kuntze.

I have now touched upon, and given the main heads of all the leading codes of nomenclature of Zoology that have been propounded.*

DAS TIERREICH.

The rules of the German society were drawn up especially with a view to the compilation of "Das Tierreich," the forthcoming synopsis of all animal nature, now begun in Germany, a work whose importance it is impossible to gauge at once if it be well carried out. It is to combine a comprehensive series of volumes, or rather Encyclopædias, each volume of which will deal systematically with a given order of animals. While it is certain the work will be thoroughly and most efficiently carried out, the wish is still allowable that such a 'magnum opus' could have assumed an *international* character.

The general editorship has been given to Dr. F. E. Schulze, who will be assisted by a committee. Every division of the animal kingdom has its editor. We will only now cite two : for Brachiopoda, associated with Mollusca, Professor F. Blochmann, of Rostock, and for Mollusca Dr. W. Kobelt, of Schwannheim. Here we can only congratulate ourselves that the work will fall into such good hands, and we would wish the talented authors all success in so vast an undertaking. I may incidentally mention that Dr. David Sharp, F.R.S., in estimating known species of the animal kingdom at 386,000, puts the mollusca at 50,000. I cannot help thinking this an excessive figure. It may be that so many have been described—it is not so probable that they are all distinct. There may, however, be 35,000 to 38,000 undoubted species of recent mollusca.

It is proposed, with regard to "Das Tierreich," to enumerate all the insufficiently described and doubtful forms, varieties, and sub-species, with the geographical distribution, likewise giving the synonymy, which will be made as complete as possible.

* Since the above words were penned, the "Merton" Code of Rules of Zoological Nomenclature has been published (in November, 1896), by Lord Walsingham, F.R.S., and Mr. Hartley Durrant.

Indeed were it only possible to give a faithful representation of each species and variety, the work would suffice for all time. Indices will be drawn up of a comprehensive kind; the whole work will be in the German language. We should have thought the Latin medium would have been more useful. The work will be published in parts, of which we are told the mollusca will consist of fifteen, and the completion of so large a scheme will in all probability take a quarter of a century. It will be possible to obtain each part separately, at an average cost of 9d. per sheet. I have seen a sample copy of "Das Tierreich," dealing with the *Heliozoa*; in print and substance it seems to leave hardly anything to be desired. When the name of the publishers, R. Friedlaender & Sohn, in Berlin, is mentioned, and when it is known they have guaranteed its production so far as funds are concerned, it will be seen what an important epoch-making venture this will, in all probability, become. All naturalists of every country must wish success to so bold and arduous a scheme.

X.—LIST OF LINNÆAN GENERA OF SHELLS,*

GIVING DERIVATIONS AND REFERENCÉS TO ANCIENT GREEK AND ROMAN AUTHORS.

FROM time immemorial we find certain generic names, in use to-day, in vogue then as now, and nearly all of them, so far as we can tell, applied to the same series of mollusks. I have ventured to draw up a short catalogue of Linnæus' genera, which are but few in number, quoting likewise *Purpura* Lam. and *Pecten* Lam., which were hardly Linnæan terms, with references appended thereto of ancient Greek and Roman writers who have quoted them. Naturally, Aristotle and Pliny come most largely into the field, but there are other writers besides, whose names are not so familiar to us.

It is extremely interesting to trace the dawn of the nomenclature of our day, and to note, for instance, that Epicharmus of Syracuse, the comedian, alluded five hundred years before the birth of Christ to our razor fish and sunset shells under the names they still bear, *Solen* and *Tellina*.

Chiton:—no allusion. χίτων Gr. 'a coat of mail,' 'tunic.' Heb. 'kethoneth.'
Pholas:—used by Hesychius the Lexicographer. φώλας 'a borer,' Athenæus, 88a (B.C. 210).

* *Lepas*, *Serpula*, and *Sabella* are here omitted, and *Purpura*, *Pecten*, and *Linax* added

- Mya*:—Plinius, N. H., ix., 35-36. (A. D. 69). μῦς Aeschines. (B. C. 345), 22. Philyll. Poll. i. 'a gaper.' μῦαξ Xenocrates, p. 12. Plinius, 32-31.
- Solen*:—Plinius, 32, 11, 53. 10, 69, 88. 11, 37, 52, etc., as 'the razor fish.' σῶλην Epicharmus, (B. C. 500), p. 22. Philyllius (Comicus vet.). (B. C. 392). Poll. i.
- Tellina*:—Epicharmus, p. 65. (B. C. 500). τελλίνη Sopater Rhetor. ap. Ath. 86a; (A. D. 550).
- Cardium*:—no allusion. Gr. κάρδια Latin (cor.), 'the heart.'
- Mactra*:—'a kneading trough.' Gr. μάκτρα with no particular reference to a shell.
- Donax*:—Plinius, N. H., 32, 11, 53. (A. D. 60). A wedge-shell, δόναξ cf. Athenæus, 90d. Xenocrates (A. D. 50).
- Venus*:—"Conchæ venereæ," Plinius, N. H. 9, 33, 52-32, 11, 53 fin.
- Spondylus*:—M. Valerius Martialis vii., 20. (A. D. 100). L. Annæus Seneca, Ep. 95. (A. D. 65). 'The knuckle-bone oyster.' Aur. Theodosius Macrobius, s. 2, 9. (A. D. 395). Columella 8, 16, 7. (A. D. 42). Plinius, 32, 11, 43. (A. D. 69). Gr. σπόνδυλος 'attic,' Gr. σφόνδυλος 'spinal vertebra.'
- Chama*:—Plinius, 32, 11, 53. 'a gaper.' Gr. χήμη Philyllius, Poll. i. (B. C. 392). Aristotle, H. A. 5, 15. (B. C. 347). Aelianus, Hist. Naturalis, 15, 12. (A. D. 200).
- Strombus*:—Plinius, N. Hist., 32, 10, 39, and 11, 53. στρόμβος Aristotle, H. A., i, 11, i. Lycophron Iambographus (Alexandrinus). (B. C. 260) 250. Plutarchus, 2, 713 b. (A. D. 80).
- Murex*:—Plinius, 9, 36, 60. 'The purple fish (rock).' Horatius, Sat., 2, 4, 32. (B. C. 9). "Tyrioque ardebat murice læna," Virgil Æn., 4, 262. Martial, 3, 82. Ovid, Met., 8, 563, etc.
- Purpura*:—Lam., 'The purple fish.' πόρφυρα Sophocles, Fr. 438. (B. C. 468). Aristotle, H., 4, 1, 2. Æschylus, Agamemnon (B. C. 494), 959. Herodotus, 3, 22 (B. C. 443). Isocrates, 240 d. (B. C. 236). Plinius, N. H., 9, 36.
- Trochus*:—Gr. τρόχος 'a top or hoop.' Not alluded to as a shell amongst the ancients, but apparently adopted by Rondelet in 1554.
- Turbo*:—Gr. 'a top.' The same remark applies here. Gr. βέμβιξ etc., used by Tournefort, 1742.
- Helix*:—ἐλίξ cf. Aristotle, H. A., 5, 15. Gr. 'a coil,' and ἑλική Aristotle, derived from ἐλῶ 'volvo,' H. A., 4, 1, 18.
- Limax*:—Columella, Poët. 10, 323. (A. D. 42). L. 'a slug,' "implicitus conchæ limax." Plinius, 29, 6, 36, and 18, 17, 44. "lactucis innascuntur limaces et cochleæ." Plinius, 19, 10, 57.
- Nerita*:—Plinius, 9, 33, 52. L. and Gr., 'a sea-goddess, shell of a sea-goddess.' νηρίτης Aristotle, H. A., 44, 31; 5, 15. Parthenius (B. C. 50).
- Arca*:—no allusion. L. 'a chest,' 'ark'; arceo, 'I enclose'. Type *Arca Noë*, the 'Noah's Ark shell' of Linnæus.
- Ostrea*:—Lucretius, Plautus, Cicero. 'The oyster.' ὄστρεον Plinius, 9, 54 79. ὄστρακον Theocritus 9, 25 (B. C. 280). Horatius, Sat., 2, 4, 33. Ovidius, Fasti, 6, 173. (A. D. 9) Aristotle, H. A., 1, 6.

- Pecten*:—‘a comb.’ “pectinibus patulis jactat se molle Tarentum.” Horatius, Sat., 2, 4, 34. Plinius, 9, 33, 51, etc. κτεΐς, κτένες Philyll. Poll. i Archippus, ἰχθ., 5. (250 B.C.) Anaxandridas, Comicus (376 B.C.) πρωτ. 1, 61.
- Anomia*:—Gr. ἀνόμια ‘lawlessness,’ ‘irregularity of form,’ no references to a mollusk found.
- Mytilus*:—‘The mussel fish.’ Plinius, 9, 51, 71. Horatius, Sat., 2, 4, 27. μυτιλος of Athenæus, 85 e. μνίσκη Xenocrates, Aquat. 86 μνίσκος Plinius 32, 53.
- Pinna*:—Cicero, Fin. 3, 19, De Nat. Deorum, 2, 48, 123. Plinius, 9, 42, 66. πίννη Athenæus, 93 e.
- Argonauta*:—no allusion; genus included in the next by ancient writers.
- Nautilus*:—Plinius, 9, 29, 47. ναύτιλος Aristotle, H.A., 4, 1, 28. Callimachus, Ep., 5, 3. (B.C. 256.) Athenæus, 317 f.
- Conus*:—κῶνος not referred to as a shell amongst the ancients.
- Bulla*:—‘a bubble’; also an ornament worn by the Roman youth, but not alluded to as a mollusk.
- Voluta*:—L., ‘the capital of a Corinthian column.’ Volvo, ‘I roll,’ as ἐλιξ, ἐλίσω, εἶλω; Gr.
- Buccinum*:—(vel prop. *Bucinum*), ‘a sea trumpet.’ Plinius, 9, 36, 61. Ov. Met., 1, 335, 337.
- Haliotis*:—Gr. ἅλις, οὖς, ὄτις, ‘sea ear.’ οὖς Ἀφροδίτης Antigonus Carytius ap. Ath. 88a (B.C. 247). οὖς θαλάσσιον Aristotle, H.A., 4, 4, 26.
- Patella*:—patina, dim. *patella*, ‘a platter.’
- Dentalium*:—dens, ‘a tooth,’ L. dentalia, ‘a ploughshare.’ These two genera not mentioned in ancient writings.
- Teredo*:—Plinius, s., 48, 74, etc. ‘the ship worm.’ τερῆδων Aristophanes, Equites, 1308. (B.C. 427).

XI.—GENERA (OF MARINE GASTROPODA AND PELECYPODA ONLY). ABOUT WHOSE NOMENCLATURE SOME DIFFERENCE OF OPINION HAS EXISTED.

The names in heavy type are those which I regard as valid, those in lighter type are synonyms.

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|---------------------------------------|--|
| Pleurotoma Lamk., 1799. | Tritonofusus Beck, 1847. |
| Turris Boltz & Humphrey, 1797-8. | Sipho (Klein) Mörch, 1852 (non Fabr., 1823). |
| Pleurotomus Mfz., 1810. | |
| Clathurella Cpr., 1857. | Melongena Schum., 1817. |
| Defrancia Millet, 1826 (n. præocc.) | Galeodes Martini, 1771. |
| Clavilithes Swm., 1840. | Cassidulus Humph., 1797. |
| Clavella Swm., 1835 (non Oken, 1815). | |
| Cyrtulus Hinds, 1840. | Pisania Bivona, 1832. |
| Chrysodomus Swm., 1840. | Pusio Gray, 1833. |
| Neptunea Boltz., 1798. | Pollia Gray, 1839. |
| Atractus Agassiz (præocc.) 1837. | Polliana M. E. Gray, 1842. |

- Tritonidea** Swn., 1840.
Cantharus Boltén, 1798 (*H. & A. Adams*, 1853).
Distortrix Link, 1807.
 Distorsio, Bolt., 1798.
 Persona Mft., 1810.
 Distorta Perry, 1811.
 ***Aquillus** Mft., 1810.
 Lotorium Mft., 1810.
 Lampusia Schum., 1817.
 Tritonium Bolt., 1798.
 Tritonium Link, 1807 (non Müll., 1776).
 Triton Mft., 1810.
Gyrineum Link, 1807.
 Rana Humph., 1797.
 Bursa Boltén, 1798.
 Bufo (Buffo) Mft., 1810.
 Ranella Lamk., 1812.
Dorsanum Gray, 1847.
 Pseudostrombus Klein, 1753.
Bullia Gray, 1835.
 Anolax Bonson (non Brongn.), an Ancillaria? 1824.
 Leiodomus, 1840.
 Buccinanops, 1841.
Cyclonassa Swn., 1840.
 Neritula Plancus, 1739.
 Cyclops Mft., 1810 (non Müll., 1785).
 Cyclope Risso, 1826.
Acanthina F. de Waldh., 1807.
 Monoceros Lamk., 1809 (non Meusch. 1707, nec Bl. Sch., 1801, Pisces).
Sistrum Mft., 1810.
 Pentadactylus Klein, 1753.
 Ricinula Lamk., 1812.
 Morula Schum., 1817.
Concholepas (d'Arg., 1757) Lam. 1801†
 Conchopatella Chem., 1788.
Rapella Swn., 1840.
 Rapa Klein, 1753.
 Bulbus Humph., 1797.
 Pyrula Lamk., in pte., 1799.
Pyrella Swn., 1835.
 Tudicla Boltén, 1798.
 Spirillus Sowb., 1842.
Nassaria Link, 1807.
 Hindsia H. & A. Ad., 1853.
Oliva Brug., 1789.
 Dactylus Klein. 1753.
Ancilla Lamk., 1799.
 Dipsaccus Klein. 1753, in pte.
 Eburna Lamk., 1801 (non 1822) in pte.
 Anaulax Roissy, 1805.
 Ancillaria Lamk., 1811.
Latrunculus Gray, 1847.
 Dipsaccus Klein, 1753, in pte.
 Eburna Lamk., in pte. 1822 (non 1801)
Fasciolaria Lamk., 1799.
 Colus Boltén, 1798.
Pseudoliva Gray, 1846.
 Gastridium Sowb., 1842 (non Modeer, 1793).
 Macron H. & A. Ad., 1853.
Fulgur Mft., 1810.
 Busycon Bolt., 1798.
 Pyrula Lamk., in pte., 1799.
Turbinella Lamk., 1799.
 Mazza Klein, 1753.
 Xencus Boltén, 1798.
Cynodonta Schum., 1817.
 Vasum Boltén, 1798 (non Link, 1807).
 Scolymus Swn., 1835.
Cymba Brod. & Sow., 1826 (non Q. and G., 1827).
 Cymbium Klein, 1753 (non Gualtieri, 1742, nec Mft., 1810).
 Yetus Adanson; 1757.
Melo Humph., 1797; Reeve, 1841.
 Cymbium Mft., 1810, non Klein, 1753
 †**Vulpecula** Blainv., 1824.
 Turricula Klein, 1737.
 Vexillum Boltén, 1798.
 Turris Mft.; 1810, non Bolt., 1797.
 †**Imbricaria** Schum., 1817.
 Conohelix Swn., 1840.
Conidea Swn., 1840.
 Pyrene Boltén, 1798.
Marginella Lamk., 1799.
 Porcellana Adanson, 1757 (non Rumph. nec Kl.).
 Pterygia Link., 1807.
 Marginellus Mft.; 1810.
 Phænospira Hinds, 1840.

* cf. G. F. Harris, Cat. Test. Moll. in Geol. Dep. Brit. Mus., part 1, p. 161, 1897. The author discards *Aquillus* Mft. type *cutaccus* L., owing to similarity of sound to *Aquila* in Ornithology, and prefers to use *Lotorium*, also of Montfort, which comes next in sequence. Personally, I cannot see why *Aquillus* should not stand. It is probably derived from *Aqua*, there is a species *aquatilis*, and we have both *Nucula* and *Nuculana*, for instance, admitted, and other similar sounding terms.

† I prefer to make these genera entirely sub-generic to *Mitra*.

- Cypræa** *L.*, 1758.
Porcellana Rumph. 1705, *Kl.*, 1753.
- Amphiperas** *Gron.*, 1781.
Semiporcellana Da Costa, 1776.
Ovula Brug., 1789.
Ovulus Mft., 1810.
- Ultimus** *Mft.*, 1810
Cyphoma Bolten, 1798.
Binovoluta Schlut., 1837.
Carinea Swm., 1840.
- Radius** *Mft.*, 1810.
Volva Bolten, 1798.
Rhizorus Mft., 1810, *Quid?*
Birostra Swm., 1840.
- Simnia** *Risso*, 1826.
Scymnia Leach, 1838.
Calpurna Fleming, 1828.
- Volvaria** *Lamk.*, 1801.
Hyalina Schum. (non *Gray*), 1817.
Volvarius Mft., 1810.
- Cadium** *Link*, 1807.
Malea Val., 1833.
- Ficula** *Swm.*, 1835.
Pyrula Lamk., in *pte.*, 1799.
Ficus Rouss., 1846.
Sycotypus H. & A. Ad., 1853
 (non *Browne*).
- Polynices** *Mft.*, 1810.
Mamma Klein, 1753.
Uber Humph., 1797.
Albula Bolten, 1798.
- Mamilla** *Schum.*, 1817.
Ruma Chem.
Naticina (Guild.) Swm., 1840.
Naticaria Swm., 1840.
- Euspira** *Desor & Agassiz*, 1837.
Ampullina Lamk., 1821, *Desh.*, 1830
 (non *Faujus S. Fond*, 1803).
Cernina Gray, 1840.
- Sigaretus** *Lamk.*, 1801.
Catinus Klein, 1753.
Stomatia P. Browne, 1756.
Sigaret Adanson, 1757.
Cryptostoma Blainv., 1818.
- Lamellaria** *Mont.*, 1815.
Marsenia Leach, 1847.
- Coriocella** *Blainv.*, 1824.
Cryptothyra Mhe., 1850.
- Eulima** *Risso*, 1826.
Melanella Bowdich, 1822, non *Swm.*,
 1840, nec *Borg.* (*Polygastrina*) 1824
- Scalaria** *Lamk.*, 1801, *Link*, 1807.
Scala Klein, 1753.
Cyclostoma Lamk., 1799 (non. ident.
auct. subseq.).
Scalarus Mft., 1810.
- ***Odostomia** *Flem.*, 1810-28.
Odontostoma Turt., 1829 (non *D'Orb.*,
 1841).
Odontostomia Jeffr., 1837.
- Turbonilla** *Leach*, 1826 (*Risso*).
Chemnitzia D'Orb., 1839.
Pyrgiscus Phil., 1841.
- Pyrgulina** *H. and A. Ad.*, 1863.
Noemia de Folin, 1870.
Parthenina Bucq., Dautz. & Dollf.,
 1883.
Parthenia Lowe, in *pte.*, 1840.
- Morio** *Mft.*, 1810.
 †*Galeodea Link*, 1807 (n. *præocc.*).
Echinora Schum., 1817.
Cassidaria Link, 1824.
- Lambidium** *Link*, 1807.
Hystrix Hup., 1797.
 †*Morum Bolten*, 1798.
Oniscia Sowb., 1824.
- Solarium** *Lamk.*, 1799.
Architectonica Bolten, 1798.
- Heliacus** *D'Orb.*, 1842.
Torinia Gray, 1840 (in *syn. Solarii*).
- †**Homalaxis** *Desh.*, 1830.
Omalaxis Desh., 1830.
Bifrontia Desh., 1832.
Discohelix Dunk., 1847.
- Pterocera** *Lamk.*, 1799.
Harpago Klein, 1753.
Pteroceras Mft., 1810.
Pteroceras Lamk., 1825.
- Rostellaria** *Lamk.*, 1799.
Gladus Klein, 1753.
Rostellum Mft., 1810.

* I have failed to find the first edition of Sir David Brewster's Edinburgh Cyclo-pædia, in which the original description by Fleming occurs.

† Edgar A. Smith, Notes upon the generic terms *Cassidaria* and *Oniscia*, Journ. Mal., vol. iv., no. 1, March, 1895.

† ὁμαλος being aspirated, *Homalaxis* must be taken as the correct term.

- Seraphs** *Mtft.*, 1810.
Terebellum *Klein*, 1753, *Lamk.*, 1799
 (non *L.*, 1767).
Serapis *Link*, 1807.
Terebellopsis *Leym.*, 1844.
Tylospira *G. F. Harris*, 1897.
Pelicaria *Gray*, 1857. (syn. *Struthio-*
larix Lamk.).
Chenopus *Phil.*, 1836.
Aporrhais *Aldrovandus*, 1618, *Da*
Costa, 1778, *Dillwyn*, 1823, *Gray*,
 1835 (red. in syn.)
Halia *Risso*, 1826.
Pryamus *Beck*, 1837 (*Pryamus Sismonda*)
Vertagus *Klein*, 1753, *Link*, 1807.
Aluco *Link*, 1807.
Rhinoclavis *Swn.*, 1840.
Newtoniella *Cossm.*, 1893.
Lovenella *Sars*, 1873 (non *Hincks.*)
Cerithiella *Verr.*, 1882 (non *M. & L.*)
Newtonia *Cossm.*, 1892 (non *Schlegel*,
 1866).
Batillaria *Benson*, 1842.
Lampania *Gray*, 1847.
Triphoris *Desh.*, 1824.
Tristoma *Blainv.*, 1824.
Triforis *Desh.*, MS., 1825.
Triphora *Swn.*, 1840.
Tectarius *Val.*, 1833.
Pagodus *Gray*, 1839.
Fossarus *Phil.*, 1841.
Fossar *Adans.*, 1757.
Naticella *Munster*, 1841.
Vermicularia *Lamk.*, 1799.
Vermetus *Adams*, 1757.
Scolessidium *Reinh.*
Tenagodes *Guett.*, 1770.
Siliquaria *Brug.*, 1789.
Tenagoda *Cuv.*, 1800 *cf. Desh.*
Agathirses *Mtft.*, 1810.
Tenagoda *H. & A. Ad.*, vol. i.,
 p. 360, 1853.
Serpulorbis *Sassi*, 1827.
Lementina *Risso*, 1826.
Hatina *Gray*, 1842.
Xenophora *Fisch. de Waldheim*, 1807
Onustus *Humph.*, 1797.
Phorus *Mtft.*, 1810.
Tetranemia *Mörch*, 1859.
Calyptrea *Lamk.*, 1799.
Calyptra *Klein*, 1753.
Ancile *Meuschen*, 1787.
Galerus *Humph.*, 1797, in *pte.*
Mitralaria *Schum.*, 1817.
Crepidula *Lamk.*, 1799.
Crypta *Humph.*, 1797.
Proxenula *Perry*, 1811.
Sandalium *Schum.*, 1817.
Capulus *Mtft.*, 1810.
Galerita *Brongn.* (non *Fabr.*, 1801).
Pileopsis *Lamk.*, 1812.
Hipponyx *Defr.*, 1819.
Cochleolepas *Klein*, 1753.
Vanikoro *Q. & G.*, 1832.
Merria *Gray*, 1839.
Leucotis *Swn.*, 1840.
Narica *Recluz*, 1841.
Neritina *Lamk.*, 1809.
Neritella *Humph.*, 1797.
Septaria *Fér.*, 1807.
Catillus *Humph.*, 1797.
Navicella *Lamk.*, 1809.
Cymba *Mtft.*, 1810.
Phasianella *Lamk.*, 1804.
Eutropia *Humph.*, 1797.
Phasianus *Mtft.*, 1810 (non *L.*).
Leptothyra (Carpenter MS.) *Dall*,
 1871
Collonia *Phil.* (non *Gray*), 1850.
Leptonyx *Cpr. & Ad.*, 1864 (n.
preocc.)
Astralium *Link*, 1807.
Imperator *Mtft.*, 1810.
Hercoles *Mtft.*, 1810.
Calcar *Mtft.*, 1810.
Stella *Klein* (non *Link*), 1733,
Sol Klein, 1753, *Humph.*, 1797.
Cyclocantha *Swn.*, 1840.
Cyclostrema *Marryat*, 1817.
Delphinoidea *Brown*, 1827.
Umbonium *Link*, 1807.
Globulus *Schum.*, 1817.
Rotella *Lamk.*, 1822.
Delphinula *Lamk.*, 1804.
Angaria *Bolten*, 1798 (non *Angarius*
Mont., 1773, nec *Meusch.*, 1807).
Cyclostoma *Drap.* (non *Lamk.*) 1801.
Calliostoma *Swn.*, 1840.
Zizyphinus *Gray*, 1840.
Conulus *Nardo*, 1841 (non *Geoff.*,
 1764, nec *L.*, 1735).
Cantharidus *Mtft.*, 1810.
Elenchus *Humph.*, 1797.
Cantharis *Fér.*, 1821.
Elenchus *Swn.*, 1840.

- ***Valvatella** *Gray*, 1857.
Margarita Leach (nom syn.) 1819.
Margarites Leach (nom syn.) 1819.
Eumargarita P. Fischer, 1885.
- Osilinus** *Phil.*, 1847.
Trochocochlea Klein, 1753.
Trochinus Gray (Leach MS.) 1847.
- Danilia** *Brusina*, 1865.
Olivia Cantr. (non *Berth.*, 1835)
Craspedotus Phil., 1847 (non
Schoenl)
- Stomatia** *Hellbling*, ad *Lamk.*, 1799
(non *Hill*, 1752, nec *Browne*,
1756).
Haliotideia Humph., 1797.
Stomax Mft., 1810.
- Haliotis** *L.*, 1758.
Auris Klein, 1753.
- Scissurella** *D'orb.*, 1823.
Anatomus H. & A. Ad. (Mft.), 1810).
- Fissurella** *Brug.*, 1789.
Larva Humph., 1797.
Fissurellus Mft., 1810.
- Diodora** *Gray*, 1821 (in Lond. Med.
Repository).
Cemoria Leach, MS. 1820 (non *Risso*,
1826).
Puncturella Lowe, 1827.
- Scutum (-us)** *Mft.*, 1810 (non
Klein, 1734).
Parmophorus Blainv., 1817.
- Acmaea** *Eschl.*, 1828.
Tectura Audouin & M. Edwards, 1830
Patelloidea Q. & G., 1833.
Lottia Gray, 1834 (an *Scurrie* subg. ?)
- Scutellina** *Agassiz*, 1841.
Scutella Brod., 1834 (non *Lamk.*, 1816)
Iothia Forbes (in *Athenæum*) 1841.
Scutellaria Gray, 1847.
- Actæon** *Mft.*, 1810.
Tornatella Lamk., 1812.
Speo Risso, 1826.
Myosota Gray, 1847.
- Solidulus** *F. de W.*, 1807 (vel *Solidula*
F. de W., 1807).
Pupa Boltén, 1797.
Dactylus Schum., 1817.
Buccinulus H. & A. Ad., 1854.
- Adelactæon** *Cossm.*, 1895.
Myonia A. Ad., 1860 (non *Dana*, 1847).
- Diaphana** *Browné*, 1833.
Amphisphyra Lovén, 1846.
- Bullinella** *R. B. Newton*, 1891.
Bullina Risso, 1826 (non *Fér.*, 1822).
Cylichna Lovén, 1847 (non *Burm.*, 1844)
- Smaragdina** *A. Ad.*, 1848.
Linteria Ad., 1850.
Glaucanella Gray, 1850.
- Acera** *Müll.*, 1776 (non *Akera* auct.
emend.).
- Philine** *Ascanius*, 1772.
Bullæa Lamk., 1801.
- Tethys** *L.*, 1758 (*secus Pilsbry*).
Aplysia Gmel. (*L.*, 1767).
Lerneæ L., 1767.
- Umbraculum** *Schum.*, 1817.
Acardo Lamk., 1801, *Quid?*
Umbrella Lamk., 1819.
Gastroplax Blainv., 1820.
Operculatum L., 1753 (non. nom.
binom., *H. & A. Ad.*, 1854).
- Pterotrachea** *Forskaal*, 1775.
Firola Brug., 1772.
- Spirialis** *Eyd. & Souleyet*, 1840.
Heterofusus Flem., 1825, sine descr.
- Cavolinia** *Abildgaard*, 1791.
Hyakea Lamk., 1799.
- Triptera** *Q. & G.*, 1824.
Cuvieria Rang., 1827.
- Brechites** *Guett.*, 1770.
Penicillus Brug., 1789.
Verpa Boltén, 1798.
Aspergillum Lamk., 1818.
[*Aquaria Perry*, 1811].
- Gastrochæna** *Spengler*, 1783.
Fistulana Brug., 1789.
- Rocellaria** *F. de Bellevue*, 1802.
Gastrochæna Lam., 1818.
- Siliqua** *M. von Muhlf.*, 1811.
Leguminaria Schum., 1817.
Solecurtoides C. des Moul., 1832.
Machæra Gould, 1841.
- Pharus** *Leach (f. Gray)*, 1840.
Polia d'Orb., 1843.
Ceratisolen F. & H., 1848.
Artusius Leach, 1852.
- Solenocurtus** *Blainv.*, 1824.
Solecurtus Blainv., emend. 1824
Psammobia Risso, 1826 non *Lamk.*, 1818
Macha Oken, 1835.
Cyrtosolen Herm., 1847.

* Type *V. helicina*. For this and many other suggestions with regard to this list, I am indebted to Mr. E. Ruthven Sykes, F.Z.S., Secretary of the Malacological Society of London, who has much aided me in the compilation thereof.

- Cyrtodaria** *Daud.*, 1799.
Glycimeris Lamk., 1801 non 1799
- Saxicava** *F. de Bellevue*, 1802.
Hiatella Daud. in Bosc, 1802.
Diodonta Schum., 1817 (non *Desh.*, 1846).
Byssomya Cuvier, 1817.
Biapholius Leach, 1818-1819.
Rhombus Blainv., 1818 (*Rhomboides*, 1824).
Agina Turt., 1822.
- Glycimeris** *Lamk.*, 1799 non 1801
Glycimeris Klein, 1753.
Panopæa M. de la Groye, 1807.
- Cuspidaria** *Nardo*, 1840.
Neera Gray, 1833 (non *Robineau Desvoidy*).
- Nuculana** *Link.*, 1807.
Leda Schum., 1817.
- Crassatellites** *Krüger*, 1823.
Crassatella Lamk. (in syn.), 1799.
- Kellya** *Turton*, 1822 (v. *Kellia*).
Oronthea Leach, 1852.
Chironia Desh., 1839.
- Lasæa** *Leach*, 1827.
Poronia Recluz, 1843.
Cycladina Cantr., 1835.
- Pandora** *Brug.*, 1792.
Calopodium Bolten, 1798.
- Chamostrea** *Roiissy*, 1825.
Cleidothærus Stutchb., 1829.
- Rangia** *C. des Moul.*, 1832.
Gnathodon Gray, 1834.
- Asaphis** *Modeer*, 1793.
Capsa Lamk., 1801.
Capsella Schum., 1817.
Isarcha Gistel, 1848.
- Sanguinolaria** *Lamk.*, 1818.
Lobaria Schum., 1817 (non *O. F. Müller* 1776).
- Gari** *Schum.*, 1817.
Lux Chemnitz, 1769.
Psammobia Lamk., 1818.
- Hiatula** *Modeer*, in pte, 1793.
Soletellina Blainv., 1824.
Aulus Oken, 1815, in pte.
- Gastrana** *Schum.*, 1817.
Diodonta Desh., 1846.
Fragilia Desh., 1848.
- Iphigenia** *Schum.*, 1817.
Capsa Lamk., 1818.
- Scrobicularia** *Schum.*, 1817.
Arenaria Muhlf. 1811 (non *Briss.*, 1760)
Lavignonus Cuv. & Fér., 1817.
Listera Turton, 1822
- Syndosmya** *Recluz*, 1843
(v. *Syndesmya*).
Abra Leach, 1818 (sine descr.).
- Semele** *Schum.*, 1817.
Amphidesma Lamk., 1818.
- ***Paphia** *Lamk.*, 1801.
Eryx Swm, 1840.
- Anomalocardia** *Schum.*, 1817
(v. *Klein*, 1753).
Cryptogramma Mörch, 1853.
- Meretrix** *Lamk.*, 1799.
Cytherea Lamk., 1806 (non *Bolten*, 1798).
- Sunetta** *Link.*, 1807.
Cuneus Muhlf., 1811.
Meroë Schum., 1817.
- Tivela** *Link.*, 1807.
Trigona Muhlf., 1811.
Trigonella Da Costa, 1837.
- Dosinia** *Scop.*, 1777.
Arthemis (Artemis) Poli, 1791.
- Petricola** *Lamk.*, 1801.
Rupellaria F. de Bellevue, 1802.
- Irus** *Oken*, 1815.
Venerupis Lamk., 1818.
- Libitina** *Schum.*, 1817.
Trapezium Muhlf., in pte., 1811.
Cypricardia Lamk., 1819.
- Glaucomya** *Woodw.*, 1854.
Glauconome Gray, 1828 (non *Goldfuss*).

* *Paphia* Lamk. Some authors doubt the possible retention of this name, as Bolten had already used it in 1798, for a mixture of *Venerida*. The genus of Lepidoptera so long known by this designation (given in 1807 by Fabricius) has, by common consent, been changed to *Anæa* Hübner, 1816, in consequence of Lamarck having previously adopted the term for the genus under discussion.

- † *Arctica* Schum., 1817.
Cyprina Lamk., 1812 (nom. nudum);
 1818 cum descr., non *Linn.*, 1767
- Sphærium** Scop., 1777.
Cyclas Brug., 1792.
Nux Humph., 1797.
Musculium Link, 1807.
- Musculium** Link, 1807.
Pisidium Pfr., 1821.
Pera Leach, 1832.
- Cyrenella** Desh., 1835.
Cyrenoida Joannis, 1835.
- Cardissa** Muhlf., 1811.
Hemicardia Klein, 1753.
Hemicardium Cuv., 1817.
- Isocardia** Klein, 1753, Lamk., 1799
Glossus Poli, 1795.
Glossoderma Poli, 1795.
Bucardia Schum., 1817.
Bucardium, *M. von Muhlf.*, 1811.
- Hindiella** Stoliczka, 1871.
Hindsia Desh., non *H. & A. Adams*,
 1853.
Vasconia Fischer, 1873.
- Tridacna** Brug., 1789.
Chamætrachea Klein, 1753.
- Axinus** *J. Sowb.*, 1821.
Thyatira Leach, 1818 (nomen).
Cryptodon Turt., 1822.
Clausina Jeff., 1847.
Ptychina Phil., 1836.
- Corbis** Cuv., 1811.
Gafrarium Bolten, 1797.
Fimbria Muhlf., 1811.
Idothea Schum., 1817.
- Diplodonta** Bronn, 1831.
Mysia Leach, in pte, 1827.
- Astarte** *J. Sowb.*, 1816.
Tridonta Schum., 1817.
Crassina Lamk., 1818.
- Cardita** Lamk., 1799.
Actinobolus Klein, 1753.
- Dipsas** Leach, 1814.
Barbala Humph., 1797.
Cristaria Schum., 1817.
Dianisotis Raf., 1831.
- Anodonta** Lamk., 1799.
Anodon Oken, 1815.
- Mutela** Scop., 1777.
Iridina Lamk., 1819.
- Hyria** Lamk., 1819.
Triquetra Klein, 1757.
Paxyodon Schum., 1817.
Diplodon, *Triplodon* Spix, 1827.
- Mülleria** Fér., 1823.
Acostæa d'Orb., 1851.
- Modiolus** Risso, 1799.
Perna Adanson, 1757.
Modiola Lamk., 1801.
- Lithophagus** *M. von Muhlf.*, 1811.
Lithophaga Bolten, 1798.
Lithodomus Cuvier, 1817.
- Dreissena** *P. v. Beneden*, 1835.
 (*Dreissensia* form. subsq.).
Tichogonia Rossm., 1835.
Dythalmia Jay, 1836.
Mytilina Cantr., 1837.
- Margaritifera** *P. Browne*, 1789.
Unionium Link, 1807.
Margaritophora Muhlf., 1811.
Meleagrina Lamk., 1812.
Margarita Leach, 1814.
- Septifer** Reclus, 1848.
Septiger Mörch.
- Perna** Brug., 1792.
Isognomon Klein, 1753.
Melina Retz., 1788.
Sutura Muhlf., 1811.
- Anadara** Gray, 1847.
Anomalocardia Klein, 1753.
- Trisis** Oken, 1815.
Parallelepipedum Klein, 1753, in pte.
Trisidos Bolten, 1798.
- Axinæa** Poli, 1795.
Glycimeris Humph., 1798.
Pectunculus Lamk., 1799.
- Limopsis** Sassi, 1827.
Pectunculina D'Orb., 1844.
Trigonocælia Q. & G., 1835.
- Pecten** Müll., 1766 (*Lamk.*, 1799).
Vola Klein, 1753.
Chlamys Bolten, 1798.
Argus Poli, 1795.
Janira Schum., 1817.
- Lima** Brug., 1789.
Radula Klein, 1753.

† *Arctica* Schum., 1817. Both in this instance and in that of *Solidula* F. de Waldheim and *Ultimus* Mtf., I have some doubts whether the admission of such adjectival generic terms is strictly permissible.

In the foregoing list only those genera have been mentioned which have a varied synonymy, or about which there is the least doubt, but we have not included either the *Cephalopoda*, freshwater *Gastropoda*, or the *Pulmonifera*, but these last have been or are being so skilfully handled by Mr. H. A. Pilsbry in his monumental work on the 'Classification of the *Helicidae*,' as to render it unnecessary to recapitulate them here. This is by far the most thorough and complete investigation into the alliances and physiology of this enormous assemblage of mollusks, which have their species in every land, and whose number is legion. Great and radical changes in nomenclature, especially generic, have, naturally, been found necessary. The result is a masterpiece of lucidity, and the arrangement is one that should be adopted at once in collections, both public and private. A rigid adherence to the law of priority has been followed in almost every particular.

This list has no pretensions to be considered infallible, and I shall at any time be pleased to receive criticisms upon it; needless to say, the examination of the works of Hermannsen, Agassiz, Marshall, and Scudder, place any compiler of such catalogues as these under a deep sense of obligation to those authors.

XII.—OBSERVATIONS ON PARTICULAR GENERA.

SCALARIA *Lamk.*, 1801.

Scala Klein, 1753; *Humphrey*, 1797.

Epitonium Bolten, 1798.

Cyclostoma Lamarck, 1799. *Type* *C. scalare Lamk.* = *Turbo scalaris L.*

Scala Lamk., 1801. *Type* *Scala pretiosa Lamk.* = *Turbo scalaris L.*

Scala Link, 1807.

Scalarus Mift., 1810.

Aciona Leach, 1815.

Cyclostoma Schumacher, 1817.

SUB-GENERA.

§ 1 *Clathrus Oken*, 1815. *Type* *T. clathrus L.*

§ 2 *Cirsostrema Mörch*, 1852. *Type* *S. varicosa Lamk.*

§ 3 *Opalia H. & A. Adams*, 1853. *Type* *S. australis Lamk.*

§ 4 *Amæa H. & A. Adams*, 1853. *Type* *S. magnifica Sowb.*

§ 5 *Acirsa Mörch*, 1857. *Type* *S. Eschrichtii Holb.*

§ 6 *Constantia A. Adams*, 1860. *Type* *S. elegans Ad.*

§ 7 *Psychrosoma T. Canefri*, 1876. *Type* *S. Gouldi Canefri.*

§ 8 *Janthoscala Mörch*, 1876. *Type* *S. modesta C. B. Adams.*

§ 9 *Turbona Browne*, 1876. *Type* *S. lamellosa Lamk.*

I had worked out the synonymy of the above so far, when, upon referring to the 'Report on the Mollusca dredged by the U.S. Coast Survey Steamer *Blake*,' by W. H. Dall,* I accidentally came across his masterly summary of the nomenclature of this genus.

Throwing out as untenable the name proposed by Bolten, and the authority of Humphrey, as both being 'nomina nuda,' Prof. Dall gives his

* Bull. Mus. Comp. Zool., vol. xviii., pp. 299-306, 1889.

reasons for, in this instance, retaining the Kleinian name of *Scala*, in preference to *Cyclostoma* Lamk., which latter he rightly assumes, has priority. Cuvier and Bosc, indeed, almost immediately adopted *Cyclostoma*, and it was understood that *Turbo scalaris* L., the precious wentletrap, was the typical form, a shell which by no possibility could be mistaken for any other, and the demand for which amongst the wealthy virtuosi of the end of the last century and commencement of the present was so keen that on more than one occasion three hundred guineas was the price paid for a specimen.

Notwithstanding this, we find Lamarck two years later proposing new names, both generic and specific, viz.: *Scalaria pretiosa*, for this shell, relegating the term *Cyclostoma* to the old *Turbo delphinus*, 1801; and, again, another two or three years later, following Draparnaud, who had added to *Cyclostoma* a considerable number of terrestrial and fluviatile forms, he makes *C. elegans* the type, eliminating *T. delphinus*, for which the genus *Delphinula* was created.

This was followed by Duméril and Montfort (1810) under the masculine termination *Cyclostomus*, while *Scalaria* was universally given to the Wentletrap family, and though sub-divided from time to time, it was not till the 'Genera of Recent Mollusca' appeared, by Messrs. H. and A. Adams, 1853-58, that *Scala* Klein was reimposed.

I quote Dall's remarks as to which name he considers should be adopted. He says: "It is evident that *Scalaria* is out of the question. Klein can by no stretch of courtesy be called a binomial author. His names, when adopted by someone who recognises the Linnæan nomenclature, may stand, but not so of Klein, who opposed Linneus and all his works. Humphrey was the first to adopt the Kleinian *Scala* for the genus, and, though he gave no definition, yet in this case there is no doubt as to the species referred to. It would seem, therefore, as if the interests of science would be better served by adopting the name of Humphrey, than by stickling for the exact letter of the law. This is the course I have decided to follow" (p. 306).

Personally, I should be glad if this could be done; but I do not see that Humphrey's name can be consistently used here, if all his other names are unrecognised. It would be argued at once that all should be reinstated, and many familiar terms would be thus jeopardised and superseded, for Humphrey, though not a describer, was a prolific namer of genera.

Then, again, *Cyclostoma*, the next name to be considered on the list (for of course Bolten is disallowed), is thrice over a synonym. One of the riders in the rules as to the law of priority is directed against synonymous terms, and it would surely be a grievous pity, and antagonistic to the true interests of science, to allow *Cyclostoma* to be used for this marine genus. *Scalaria* therefore will we hope stand, and be reinstated on a firm basis.

Regarding the terrestrial genus *Cyclostoma* Lamk., *Pomatias* undoubtedly has priority, being created by Studer in 1789 with type *elegans*. *Hartmannia* has accordingly (1891) been proposed by Mr. Bullen Newton for the genus hitherto known as *Pomatias* Hartm.

Students of Henry and Arthur Adams' work on 'Recent Mollusca,' 1853-58, will notice their preference for the use of Humphrey and Bolten's generic names, as well as those of Klein and Adanson. We have already given an account of the two latter; the particulars of the two former are as follows:—

In 1797 was published the 'Museum Calonnianum' of GEORGE HUMPHREY; it specified the contents of the magnificent collection of natural history objects collected by M. de Calonne, consisting of specimens entomological, conchological, ornithological, and mineralogical, etc. Many genera were propounded, but only insufficiently defined.

In 1797 JOA. FRIED. BOLTEN published at Hamburg his 'Museum Boltenianum sive Catalogus cimeliorum ex tribus regnis Naturæ quæ olim collegerat. Pars prima continens animalia in spiritu vini adservata classibus cunctis item siccata quædam integra et fragmenta zoologica.'

Both of these authors proposed many genera, both suffer in not being properly descriptive; and the names of both, unless adopted by Lamarck or other subsequent authors, must fall into desuetude.

EULIMA *Risso*, 1826.

Melanella Dufresne, mss., Bowdich (Elem. of Conch., p 27). 1822 (non Swm., 1840).

Eulima Risso, 1826.

Pasithea Lea, 1835.

Balcis Leach, 1847.

§ 1 *Leiostraca H. & A. Adams*, 1853. *E. subulata Donovan*.

§ 2 *Bacula H. & A. Adams*, 1863. *E. striolata H. & A. Adams*.

§ 3 *Vitreolina Monterosato*, 1884. *E. incurva Renieri*.

§ 4 *Acicularia Monterosato*, 1884. *E. intermedia Cantraine*.

§ 5 *Haliella Monterosato*, 1878. *E. stenostoma Jeffreys*.

§ 6 *Arcuella Nevill*, 1874. *A. mirifica Nevill*.

Melanella Duf. has priority of four years, but, as Prof. Dall, remarks, its type *M. Dufresnii* is subgeneric, possessing a distorted spire. Accordingly *E. polita* L. is still retained as the type of Risso's genus, and *Melanella Duf.* can be relegated as sectional, unless we sever the genus into two. I can only hope this process will be possible. To apply the term *Melanella* to a genus of shells of a pure ivory whiteness would be typical of the 'lucus a non lucendo' principle of derivations. We are indebted to Prof. Dall for calling attention to this.

XIII.—THREE SUGGESTED RULES FOR SYSTEMATISTS.

I have confined my remarks at present mainly to the genera of mollusca, as any questions touching the species are far more complicated and involved. But there are three

“riders” which might, I think, with reason be considered in future as binding upon all describers of shells:—

- (a) That no new species should be given to the world without being also figured in a proper and intelligible manner.
- (b) That, if possible, the type specimen should ultimately, if not immediately, be relegated to the principal museum of that country to which the author belongs.
- (c) That no periodical should be allowed to issue its number bearing a date that is not the actual date of publication, With quarterly serials it occasionally happens that, for some reason or other, the subject matter gets into arrear; and in one particular case the said serial is just now nine months late, and, notwithstanding this, it continues to publish sp. nov. as with the earlier date of issue. This, it will be seen at once, may bring insuperable difficulty into the field, as regards the law of priority.

XIV.—SUMMARY.

Lastly, it is satisfactory to be able to record that, at all events, *generically* speaking, the nomenclature of Malacological science is founded upon a very strong and, practically, unassailable basis. Speaking *specifically*, the question is, as I have already remarked, not to be so easily solved, but, at the same time, it must be argued with some degree of assurance that those few genera which have been most minutely monographed during the past few years, with every attention given to priority in specific names, have passed through the ordeal with comparatively little change. It augurs well for the remainder.

It is to be hoped, however, that a still greater “rapprochement” than has hitherto existed will be brought about between the students of recent and of fossil mollusca. Thanks, especially, to the Malacological Society of London, this is being arranged

in the Metropolis. I cannot help suspecting the identity of many more recent molluscs with those of the Tertiary formations than is commonly supposed to be the case, not so much among the larger species as the smaller, and especially in such a family as the *Pleurotomide*.

Of all the molluscan families, this more sorely needs a competent monographer than any other. From every point of view, specifically, bathymetrically, or in whatever other way they are considered this assemblage is of surpassing and marvellous interest. The multitudinous variety of form, the extensive abysmal distribution, the bizarre colouring of some, and sculpture of others, the large proportion, in comparison with the species, that are found of the "minutiora" of this family on some tropical shores, e.g., Lifu, which Mr. Standen and I are now engaged in working out, and the great quantity of new forms that are continually cropping up, all of exquisite grace and beauty, force one to the conclusion that here is congregated the most attractive assemblage in the whole range of marine shells.

The day may be far off before such questions are fully worked out and finally solved, and few of us, if any, will probably live to see it, but whenever the labour be accomplished, and a monumental task it will be, it will be seen how naturally every form dovetails, as it were, into its place, how beautifully the law of evolution extends, how the great Author of all things created and uncreated, magnifies, if one may so speak, His powers in the calling into being of the lesser branches of animated nature, and we shall all echo the words, so long ago written, of the great Roman naturalist, Caius Plinius Secundus, "In his tam parvis, quam inextricabilis perfectio." *



* Plin., N. H., 11, 2, 1.

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La Collection néogène de Hongrie, de Croatie, de Slavonie et de Dalmatie à l'Exposition de Budapest, by S. BRUSINA, *z.* Societas Historico-Naturalis Croatica, ix., 1896 [list of 253 species, with prefatory remarks].

The Irish Naturalist, vol. 6, no. 7, July, 1897.

"Some Observations by English Naturalists as to the Fauna of Rathlin Island and Ballycastle districts," including (1) General Observations, by R. STANDEN; (2), Land and Freshwater Mollusca of the Ballycastle district, by LIONEL E. ADAMS [list of species from Rathlin Island and the mainland]; (3), Notes on the Marine Mollusca of Rathlin Island, by G. W. CHASTER [*Turbonilla pusilla*, *Pyrgostelis interrupta*, and *Neolepton obliquatum*]. "Land and Freshwater Mollusca from County Westmeath," by G. P. FARRAN [*Helix arbustorum* and other species].

La Feuille des Jeunes Naturalistes, année 27, nos. 320-321, Juillet, 1897.

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Journal de Conchyliologie, vol. 44, no. 4 (dated "1er Octobre, 1896," received July 1st, 1897).

"Note sur le bras hectocotylisé et sur le dimorphisme de *Sepia Orbignyana* Ferrusac," by H. FISCHER (8 pls.). "Catalogue des espèces du genre *Cochlostyla* Ferrusac qui vivent dans les Iles Philippines," by J. G. HIDALGO [list of works in which Philippine species are figured, with corrected nomenclature; alphabetical list of 226 species; distribution in different islands; and synopsis of classification by different authorities]. "Description de deux espèces nouvelles de Pleurobranchidés," by A. VAYSSIÈRE [*Pl. Crossci* Antilles, *Pl. Giardi* Camiguin Is., woodcuts]. "Description de coquilles fossiles des terrains tertiaires inférieurs (*suite*)," by C. MAYER-EYMAR [many n. sp. figured in pls. 9 and 10]. "Description d'un sous genre nouveau du genre *Cardita*," by C. MAYER-EYMAR [*Cossmanella* for *C. aegyptiaca* Fraas].

Proceedings of the Academy of Natural Sciences of Philadelphia, 1897, part 1.

"The Affinities of Floridian Miocene Land Snails," by H. A. PILSBRY [*Hyperaulax* n. subg. of *Bulimulus* for *B. Rialeyi* Smith]. "The Gastropod *Radula*," by H. A. PILSBRY [brief abstract only]. "Descriptions of new South American *Bulimuli*," by H. A. PILSBRY [9 n.sp. not figured].



HUGH CUMING, 1791—1865.

EXPLANATION OF PLATE II.

Fig. 1.	— <i>Haminea Cairnsiana</i> sp. nov.	p. 89
„ 2.	— <i>Terebra (Myurella) nectarea</i> sp. nov.	„ 91
„ 3.	— <i>Cerithiopsis sinon</i> Bayle... ..	„ 116
„ 4.	— <i>Engina zatricium</i> Melvill	„ 106
„ 5.	— <i>Cerithium dichroum</i> sp. nov.	„ 115
„ 6.	— <i>Engina mundula</i> sp. nov.	„ 105
„ 7,8.	— <i>Cypræa Rashleighana</i> Melvill	„ 111
„ 9.	— <i>Diala ludens</i> sp. nov.	„ 118
„ 10.	— „ <i>Hardyi</i> sp. nov.	„ 118
„ 11.	— „ „ β <i>prolongata</i> var. nov.	„ 118
„ 12.	— <i>Engina spica</i> sp. nov.	„ 105
„ 13.	— <i>Murex (Ocinebra) benedictus</i> sp. nov.	„ 108
„ 14.	— <i>Mitra (Costellaria) exasperata</i> var. <i>Hadfieldi</i> var. nov.	„ 102
„ 15.	— <i>Mangilia (Glyphostoma) Aliciæ</i> sp. nov.	„ 95
„ 16.	— <i>Syrnola Mossiana</i> sp. nov.	„ 122

Plate II.



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EXPLANATION OF PLATE III.

Fig. 17.	— <i>Mitra (Volutomitra) honesta</i> sp. nov. ...	p. 101
„ 18.	— <i>Minolia glaphyrella</i> sp. nov.	„ 125
„ 19.	— <i>Mitra (Costellaria?) nitidissima</i> sp. nov. ...	„ 102
„ 20.	— <i>Engina iodosia</i> Duclos... ..	„ 104
„ 21.	— <i>Mangilia (Glyphostoma) calcicincta</i> sp. nov.	„ 95
„ 22.	— <i>Barleeia Chasteri</i> sp. nov.	„ 120
„ 23.	— <i>Pleurotoma (Drillia) Hadfieldi</i> sp. nov. ...	„ 94
„ 24.	— <i>Mangilia (Glyphostoma) Emmæ</i> sp. nov. ...	„ 96
„ 25.	„ (<i>Glyphostoma</i>) <i>theskela</i> sp. nov. ...	„ 97
„ 26.	„ (<i>Daphnella</i>) <i>dulcinea</i> sp. nov. ...	„ 98
„ 27.	— <i>Engina sinensis</i> Melvill	„ 106
28, 29.	— <i>Cypræa clandestina</i> Linné var. <i>Artuffeli</i> Jous.	„ 112
„ 30.	— <i>Kellia fidelium</i> sp. nov.	„ 128
„ 31.	— <i>Mangilia (Glyphostoma) cremonilla</i> sp. nov.	„ 96
„ 32.	— <i>Mitra (Chrysame) fulvosulcata</i> Melvill ...	„ 101
„ 33.	— <i>Cerithium armatum</i> var. <i>lifuiensis</i> var. nov. ...	„ 115



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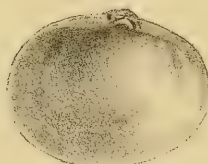
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G.M.Woodward del.et lith.

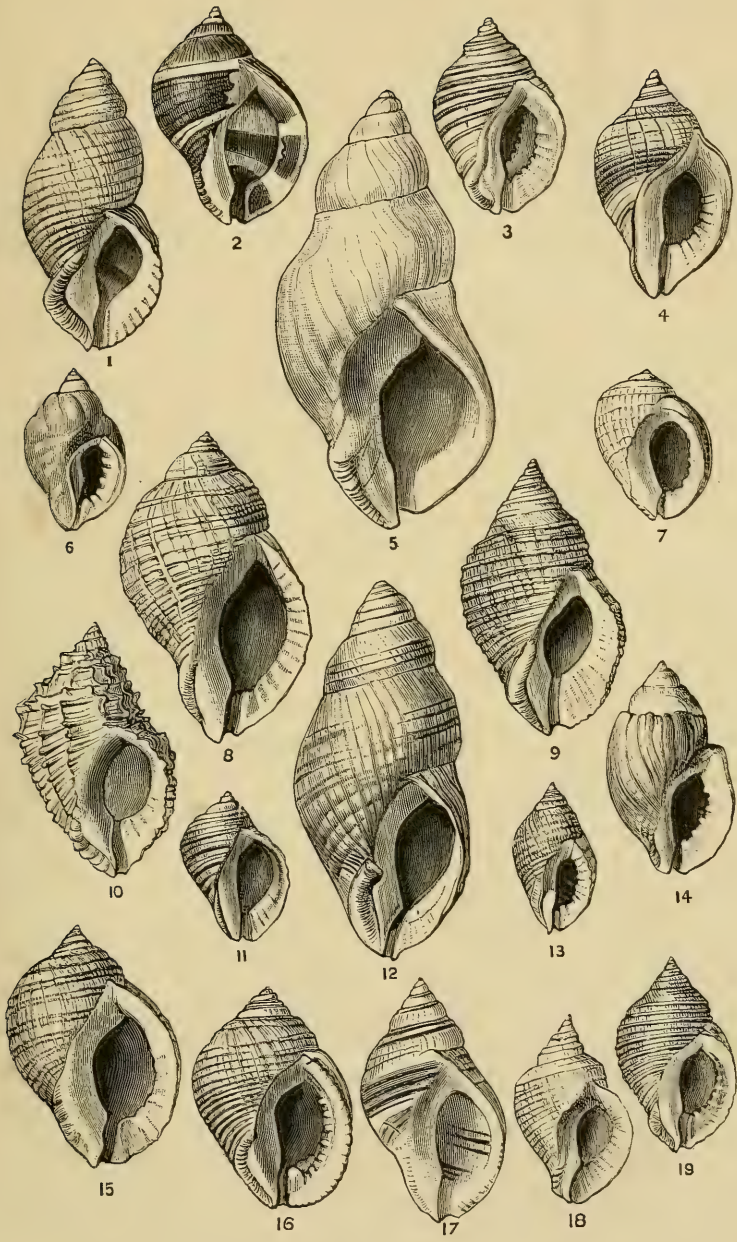
West, Newman imp.

EXPLANATION OF PLATE IV.

Purpura lapillus L., illustrating variation.

- Fig. 1.—Felixstowe, sheltered coast.
,, 2, 3.—Newquay, on veined and coloured rock.
,, 4.—Herm, rather exposed.
,, 5.—Solent, very sheltered.
,, 6.—Land's End, exposed rocks, small food supply.
,, 7.—Scilly, exposed rocks, fair food supply.
,, 8.—St. Leonard's, flat mussel beds at extreme low water.
,, 9.—Robin Hood's Bay, sheltered under boulders, good food supply.
,, 10.—Rhoscollyn, an oyster bed, 4-7 faths. (Macandrew).
,, 11.—Guernsey, rather exposed rocks.
,, 12.—Conway Estuary, very sheltered, abundant food supply.
,, 13, 14.—Robin Hood's Bay, very exposed rocks, poor food supply.
,, 15, 16, 17.—Morthoe, rather exposed rocks, abundant food supply.
,, 18.—St. Bride's Bay.
,, 19.—Lough Swilly, sheltered but small food supply.

(Reproduced from the 'Cambridge Natural History.')



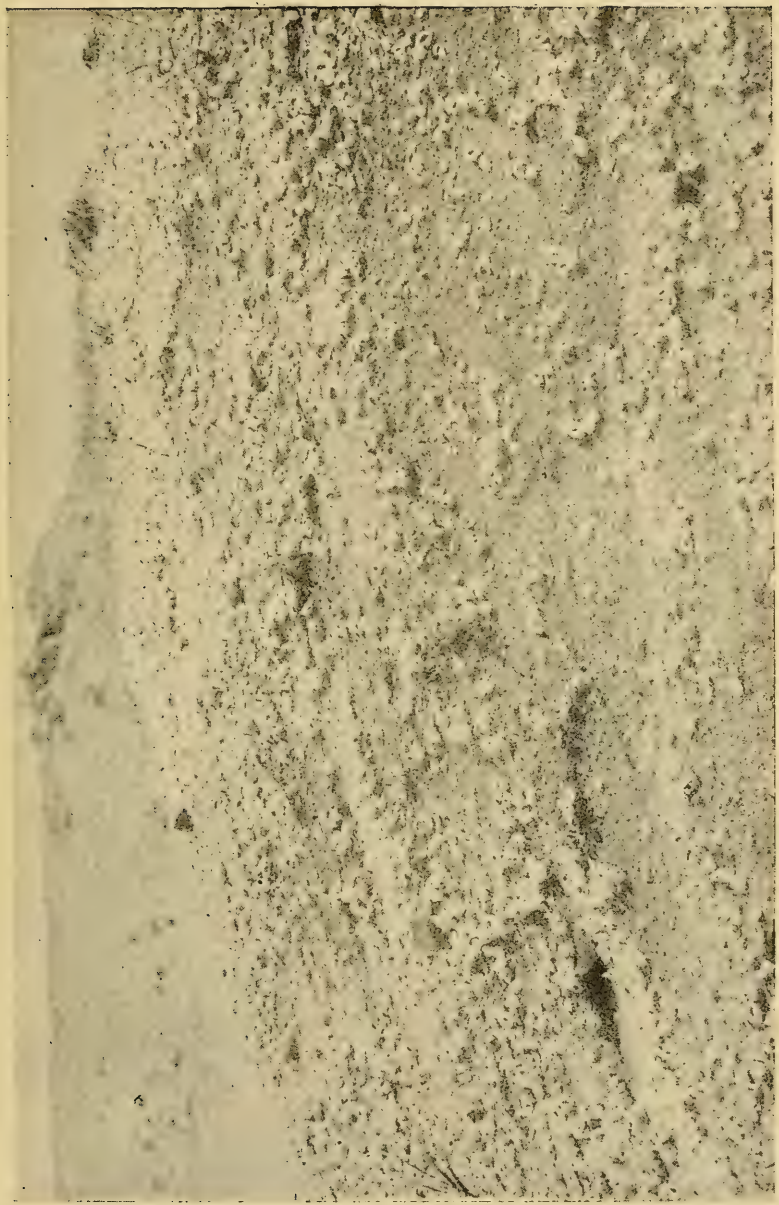
VARIETIES OF *PURPURA LAPILLUS*.

(FROM THE "CAMBRIDGE NATURAL HISTORY.")

EXPLANATION OF PLATE V.

Shell-mound of *Purpura lapillus* L., at the pre-historic settlements at Portnafeadog (Dog's Bay), near Roundstone, Connemara, all broken by means of rude stone hammers, it is supposed, in order to obtain the body of the animal for the production of a purple dye, highly prized by the ancient Irish. —(See page 188).

(From a photograph by R. Welch, reproduced, from Proceedings of the Royal Irish Academy, ser. 3, vol. 3, no. 5).

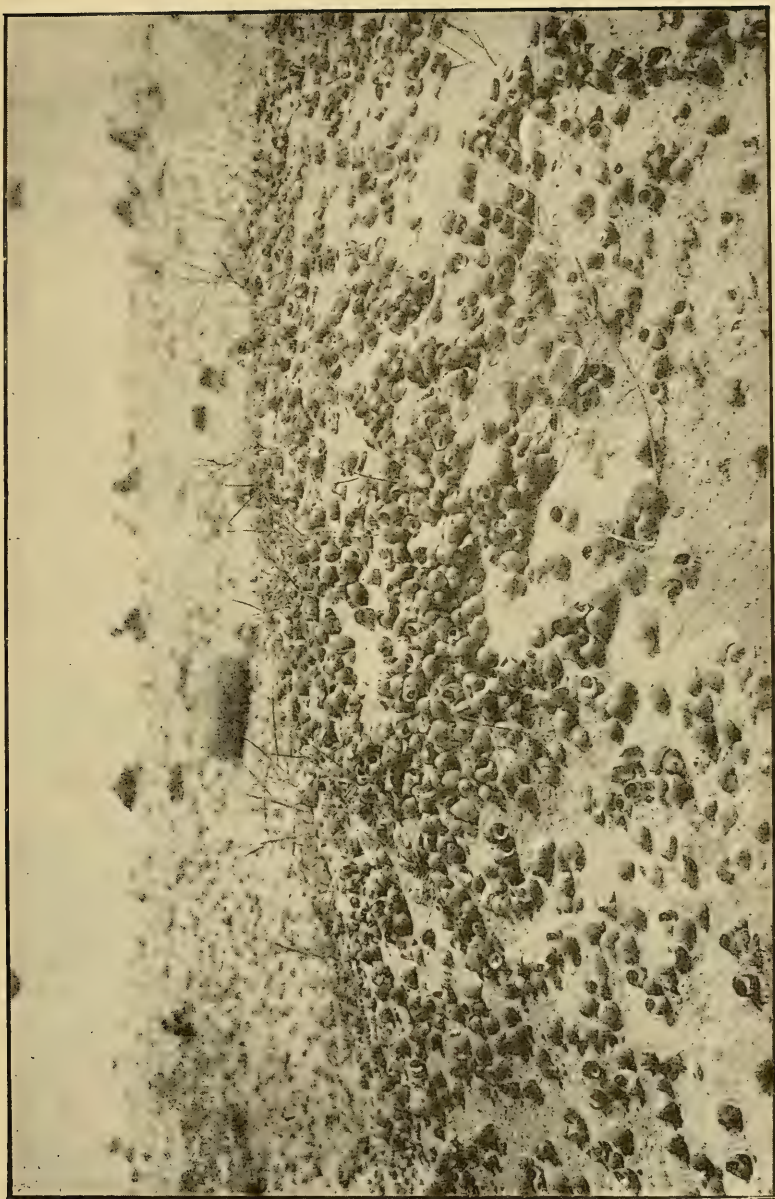


SHELL MOUND OF PURPURA LAPILLUS.

EXPLANATION OF PLATE VI.

Shell-mound of *Littorina littorea* L., at the pre-historic settlements at Portnafeadog (Dog's Bay), near Roundstone, Connemara. The shells have a cracked appearance, as if they had been laid upon a hot surface; if the shells had been treated in this manner, the animals could easily have been extracted for food or bait.—(See page 187).

(From a photograph by R. Welch, reproduced from Proceedings of the Royal Irish Academy, ser. 3, vol. 3, no. 5).

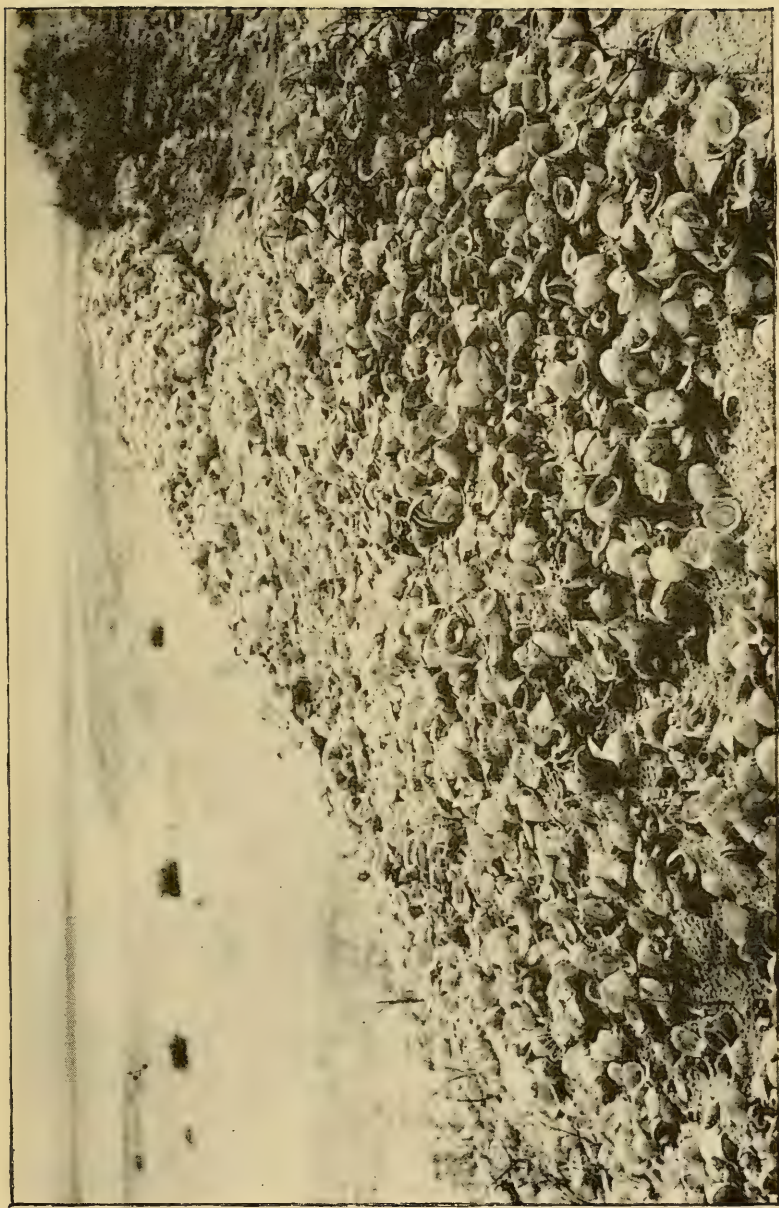


SHELL MOUND OF LITTORINA LITTOREA.

EXPLANATION OF PLATE VII.

Shell-mound of *Patella vulgata* L., at the pre-historic settlements at Portnafeadog (Dog's Bay), near Roundstone, Connemara. Probably a refuse heap, or "kitchen-midden," made by the accumulation of shells of animals used for food.—(See page 187).

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SHELL MOUND OF PATELLA VULGATA.

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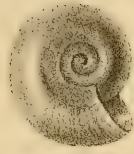
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3



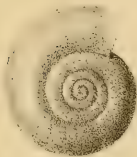
3a



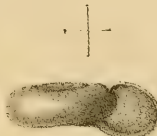
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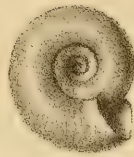
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4



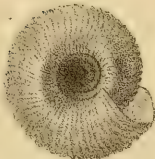
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4b



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5a



6



8



7



7a



9



10

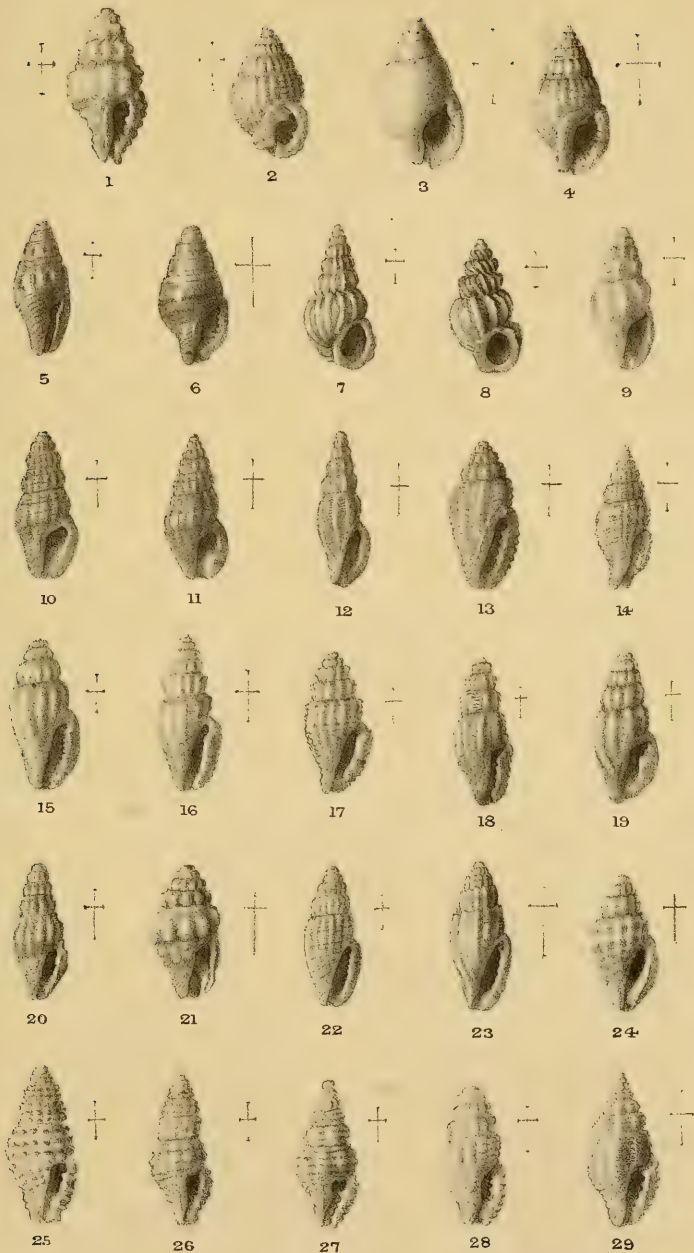
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LAND SHELLS OF TRINIDAD.

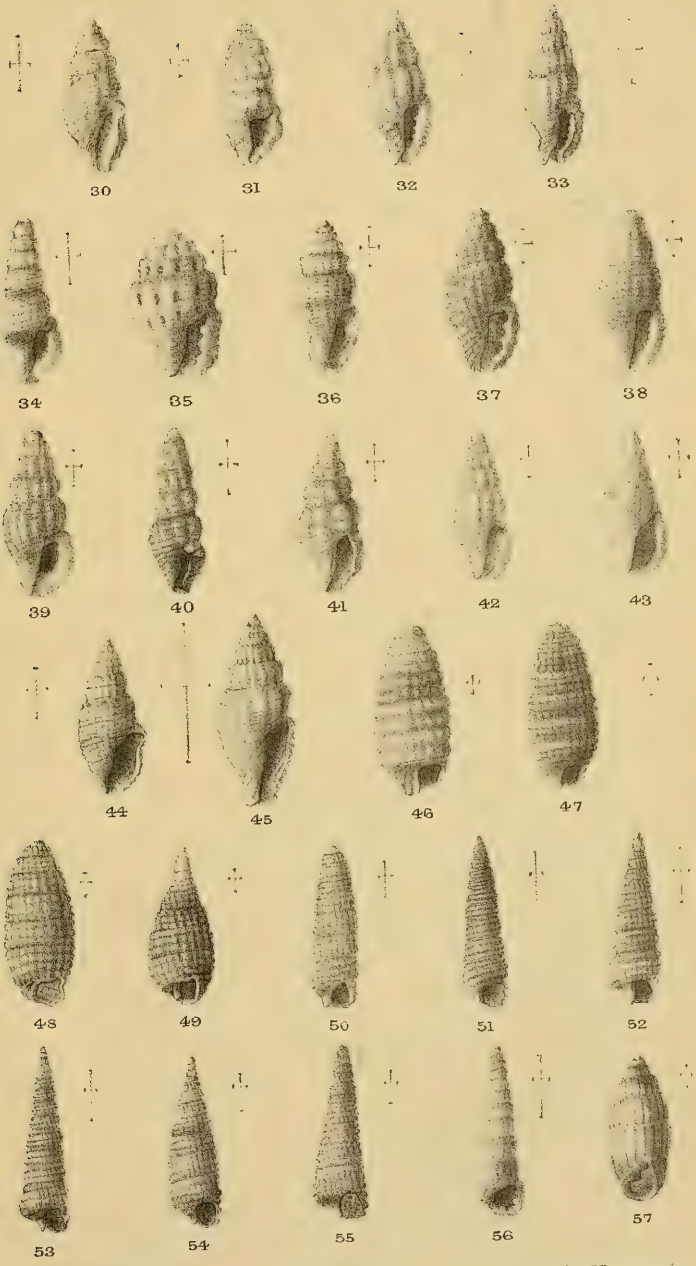
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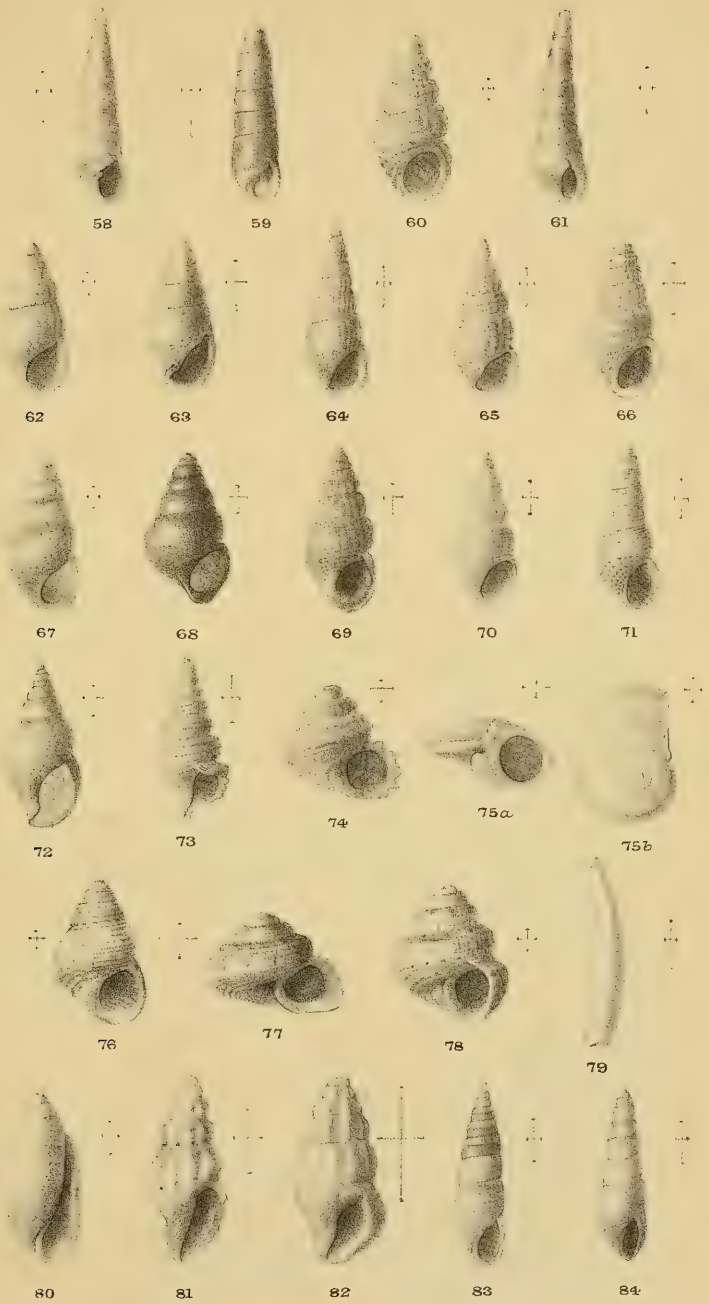
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Can any member tell me the derivation of *Analia*, *Cacilioides*, and *Gibilmanica*?—
 LIONEL E. ADAMS.

Analia (Moq.-Tand., Moll. France, p. 19, 1855) is given without derivation, but as it is a not uncommon feminine proper name, it was probably chosen in honour of some friend or relative. — *Cacilioides* is from *cæcus*, blind, the animals being blind and nocturnal. The name was altered to *Cacilianella* by Bourguignat (Rev. & Mag. Zool. (2), viii., p. 378, 1856), on the ground that Férussac's name (spelt by him wrongly *Cacilioides*) being an adjective, was inapplicable as a generic name. It is an open question whether this is an adequate cause for change. Férussac presumably avoided *Cacilia* because it was pre-occupied in Amphibia. — *Gibilmanica* is probably a Sicilian geographical term, but I have not yet succeeded in finding its whereabouts.—P.K.F.

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Can any member tell me the derivation of *Gibilmanica*?—LIONEL E. ADAMS.

The name *Gibilmanica* clearly refers to some mountain, "gibel" being the Arabic "Jebel," and recalling the occupation of the Saracens. I find "Gibelliformi" a hill close to Palermo, and "Gibellina" a larger hill in the western corner of Sicily.—H. R. M.

All the specimens of *Vivipara vivipara* which I have taken, amounting to many hundreds, have contained young. As it is stated that the animals are dioecious it would appear that the males must be very rare. Can any reader inform me whether any season or any mode of capture is more likely to be favourable for taking them than another?—R. C.

Can any member tell me whether *Acicula lineata* (Drap.) is viviparous or not?—W. J. FARRER.

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 President of the Conchological Society of Great Britain and Ireland,
 Editor of "The Journal of Conchology,"
 etc., etc.,

WITH THE ASSISTANCE OF
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 AND OTHER WELL-KNOWN CONCHOLOGISTS.

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ENQUIRY COLUMN.

I should be glad of an answer to the following question, viz: Is bog water prejudicial and inimical to the ordinary British mollusca—*Limnea*, *Paludina*, *Bythinia*, &c., &c.? Perhaps some readers who have collected these shells can inform me. I am interested in some Irish fishing. The common brown Trout (*T. Fario*), though abundant, run small—a fish of a pound weight is a *rara avis*! (sue now! I write of Irish fish) and it has occurred to me that *want of food* is the real reason. We know that the great abundance of food found by the common trout introduced into New Zealand waters, was the main cause of their attaining a colossal size, some have been taken out over 40 lbs. weight!! Could I not increase the size of the Lough trout where I fish by the introduction of the mollusca on which they feed, for, on examining the loughs, I could not find a single specimen of any of our freshwater shells. I then remembered that I never saw any mollusca in the Lochs of South Uist or Harris, which are the products of the drainage of bogs. Of course, the question at once arose, is it of any use to go to the expense and trouble of importing living molluscs if they will not survive and increase in these waters? Will some of my brother conchologists, who have sought for these shells in Great Britain and Ireland, help me to a solution of the problem? I shall be infinitely obliged to them.—E. L. LAYARD, Otterbourne, Budleigh Salterton.

Can any member give me the the derivation of "osphradium" and "rhizophore"?—L. E. A.

Recd May 2.

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ENQUIRIES.

Will "H. R. M.," or some other learned brother, kindly give me the derivation of *Azeca* and *Canigonensis*?—L. E. A.

ANSWERS.

In answer to Mr. Layard's query, I give my experience. In pure peat water few pond weeds flourish and fewer snails. Where other soil is mixed with the peat (e.g., the "Curragh," Isle of Man) shells are found, though usually small. Irish peat drains contain no snails (so far as my experience goes). I should not think an importation would be a success, but much would depend on whether weeds will live in Mr. Layard's water.—LIONEL E. ADAMS.

In reply to Mr. Layard's query in the January number of the Journal, I should say, judging from my own observations only, that bog and peat water, although most decidedly detrimental to the existence of many molluscan species, is on the other hand beneficial to some few, notably *Limnaea peregra*. Up here, in the Lake District of England, the greater portion of the soil is of a peaty nature, and the ditches and tarns heavily charged with decaying vegetable matter, yet in all of them, up to a certain altitude, *Limnaea peregra* is abundant. A lurking idea of my own is that the altitude of a body of water, and the consequent lowering of temperature, has more to do with the absence of mollusca in the peaty regions of our country than its boggy nature and this seems proved by the fact that in no instance have I found any aquatic shell-bearing mollusca above an altitude of 1,500 feet. This is a subject worthy of being worked up, and I should certainly like to hear the views of other, and better informed, conchologists on the matter. Last Spring I paid a visit to the Outer Hebrides for the purpose of collecting sea birds' eggs, and so paid little attention to the mollusca; but I did find time for a small hunt, and found *Limnaea peregra*, *Limnaea truncatula*, *Ancylus fluviatilis*, and *Physa fontinalis* quite common in the ditches and lochs about Lochboisdale, Castlebay, and on the Island of Barra. At the latter place, too, dead shells of *Helix acuta* and *H. rufescens* were plentiful; we found no living specimens. Finally, I have no doubt that *Limnaea peregra* introduced into Mr. Layard's tarn will do well and increase in numbers, always providing the altitude is not too great—say not exceeding 1,000 feet above sea level.—W. J. FARRER.

OSPIRADIUM, Greek ὄσφράδιον, from ὀσφραίνομαι, 'to smell,' the name applied by Lankester (Encycl. Brit., ed. 9, Mollusca, p. 636) to Spengel's olfactory organ, a small papilla in the neighbourhood of the gill, which tests the water passing over it for respiratory purposes.

RHINOPHORE, Greek ῥίς, ῥίνος, 'nose,' and φέρω 'to bear,' the name given to an olfactory tentacle.—P. K. F.

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ENQUIRIES.

Where could I obtain a list of exporters and importers, dealers or buyers, of sea shells, more especially Escallop shells, in Britain, France, Germany, or elsewhere?
J. WALLIS.

ANSWERS.

All my efforts to find an etymology for *Aseca* have failed; not improbably it is a fancy name.

As regards *Canigonensis*, I have a strong suspicion that it ought to be *Canigouensis*, and is derived from Mount Canigou in the Eastern Pyrenees. The original description appears to be in "Bulletin d'histoire naturelle de France," ed. Boubée, Paris, 8vo., 1835; but there does not seem to be a copy in London.—P.K.F.

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ANSWERS.

J. WALLIS will find the names and addresses of a large number of dealers in Friedlaender's "Zoologisches Addressbuch," recently published, price 10/-.—A.F.

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The Plates will be issued so soon as they are ready, probably with the number for April, 1897.

A large number of errors having remained uncorrected on page 263, owing to Mr. Collier's absence on the continent, a reprint of that and the following page will be issued at the end of the volume.

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1.—Can any reader furnish me with references to literature on the use of shells as money, or better still, with the loan of the works themselves? Stearn's "Ethno-Conchology" is particularly desired.—M. T. BALDWIN, 50, Hackford Road, North Brixton.

2.—Is there such a shell as the *Aulone*, and where can a description of it be found?—M. T. BALDWIN.

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FOR Exchange, *Acicula lineata* and var. *alba*, *Vertigo antivertigo*, *Pupa anglica*, var. *alba*, *L. alliaria* var. *viridula*. Also fine *Trochus zizyphinus*—all Irish specimens. Wanted, var. *unicolor* of *H. aspersa*, vars. of *H. lapicida*, *H. cartusiana*, and var. *albina* of *H. arbustorum*, etc.—W. J. FARRER, Sheridan Lodge, Helen's Bay, co. Down, Ireland.

THE
JOURNAL
 OF
CONCHOLOGY.

PUBLISHED UNDER THE DIRECTION OF
 THE COUNCIL OF THE CONCHOLOGICAL SOCIETY
 OF GREAT BRITAIN AND IRELAND.

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FOREIGN Land & Freshwater Shells offered for others not in collection. Wanted especially *Cochlostyla*, *Bulimi*, and *Operculata*. Foreign exchanges specially desired.—EDWARD COLLIER, Moss Lane East, Manchester.

STYLODONTA *studeriana* and *Achatina panthera* from the Seychelles, in Exchange for foreign Helices.—Rev. J. W. HORSLEY, St. Peter's Rectory, Walworth, S.E.

WANTED *Buccinum undatum* and its varieties, and many other British Marine Shells, also *Vertigo angustior*, *V. minutissima*, *V. moulinsiana*, *Succinea oblonga*, *Limnea involuta* and others. Can offer local and rare British shells and Foreign shells.—A. HARTLEY, 14, Croft Street, Idle, near Bradford, Yorks.

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WANTED, for microscopical work, *living* specimens of many of our more local species (L. F. W.); also any foreign species. Send for List and particulars.—E. W. W. BOWELL, Sissinghurst, Cranbrook, Kent.

No. 13].

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CONCHOLOGICAL SOCIETY
OF GREAT BRITAIN AND IRELAND.

PROCEEDINGS.

25th MEETING, JUNE 10th, 1896.

Held in the Manchester Museum, Owens College.

Mr. J. C. Melvill, President, in the chair.

Donations to the Library announced and thanks voted :

Science Gossip, Nos. 24 and 25, Feb. and June, 1896 ; Irish Naturalist, vol. 6, No. 6, May, 1896 ; The Naturalist, Nos. 250 and 251, May and June, 1896 ; Journal de Conchyliologie, vol. 42, No 3 ; Naturalists' Journal, No. 48, June ; La Feuille des Jeunes Naturalistes, Nos. 308 and 309 ; Devonia, part, 4, 1896 ; Proceedings Royal Society of Queensland, part 2, vol. xi. ; Proceedings Academy of Natural Science of Philadelphia, part 3, Oct.-Dec., 1895.

New Members elected :

Rev. Addison Crofton, M.A., Linton Court, Settle, Yorkshire.

Mr. Harry Simpson Wallace, Art Gallery, Newcastle-on-Tyne.

Exhibits :

Mr. C. Oldham exhibited *Helix nemoralis* v. *albo-labiata*, Deep Dale, Buxton, *Arion ater* v. *albo-lateralis*, *Limax maximus* v. *ferrussaci*, *Helix itala*, *Hyalinia nitida*, *Limnea peregra* v. *maritima*, *Planorbis glaber*, *Pl. spirorbis* (with epiphragm), *Vertigo antivertigo*, *V. substriata*, *V. pygmaea*, all from Abersoch, Carnarvonshire.

Mr. Lewis Shackelford exhibited a very fine series of *Voluta*, including *V. undulata*, *V. Angasi*, *V. pacifica* (very fine), *V. Güntheri* (the only one in England), *V. Kreuslere*, and *V. fulgetrum*.

Mr. J. C. Melvill exhibited *Voluta pulchra*, Australia ; *V. festiva* Australia ; *V. aulica*, Sooloo Archipelago ; *V. delessertiana*, West Indies ; *V. junonia*, Mexico.

The Manchester Museum showed seventy species of marine shells from Sydney, lately received from Mr. Arnold Henn, of Sydney, including *Drillia angasi*, *D. beraudiana*, *Mangilia jacksoniana*, *Cantharus australis*, *Mitra rhodia*, *Crosseia concinna*, *Scalaria Jukesiana*, *Syrnola tinctoria*, *Olivella triticea*, *O. nympha*, *Neritula lucida*, *Nassa glans*, and many others.

Mr. E. Collier exhibited *H. (Chlorea) thersites* Pfr., Mindoro ; *H. (Papuina) Tayloriana* Bttg., New Guinea ; *H. (Papuina) Rollesiana* Sm., New Guinea ; *H. (Papuina) Louisiadiensis* Forbes, Louisiade Islands ; *H. (Obbina) columbaria* Sow., Philippine Islands ; *H. (Mollendorffia) trisinuata* Mrts., China.

251ST MEETING, JULY 8th, 1896.

Held in the Manchester Museum, Owens College.

Mr. Thos. Rogers in the chair.

Donations to the Library announced and thanks voted :

Annals of Scottish Natural History, No. 19, July, 1896 ; Journal of Malacology, vol. 5, No. 2, June, 1896 ; Science Gossip, vol. 3, No. 26, July, 1896 ; The Naturalist, No. 252, July, 1896 ; Transactions and Annual Report, 1895, Manchester Microscopical Society ; Transactions of Academy of Science of St. Louis, vol. 6, No. 7 ; Annual Report, Geological Survey of Canada, vol. 6, 1892-3 ; Annual Report, Chicago Academy of Science, 1895 ; Bulletin, Chicago Academy of Science, vol. 2, No. 2 ; "Preliminary Outline of a new Classification of the family Muricidæ," by F. C. Baker ; Proceedings of the Royal Physical Society, 1894-5 ; Bihang till Kongl Svenska Vetenskaps Akademiens Handlingar, part 4 ; Jahreshft des Natur. Ver. des Trencsiner Comitates, 1894-5 ; Archivos do Museu Nacional do Rio de Janeiro, vol. 8 ; from the Smithsonian Institution, U.S. National Museum : "Classification and Geographical Distribution of the Pearly Freshwater Mussels," by C. T. Simpson—"Diagnosis of New Tertiary Fossils from the Southern United States," by W. H. Dall—"Diagnosis of New Species of Mollusks from the West Coast of America," by W. H. Dall—"Diagnosis of New Mollusks from the Survey of the Mexican Boundary," by W. H. Dall—"Description of four New Triassic Unios from the Haked Plains of Texas," by W. H. Dall ; from Mr. W. J. Webb, "The Museum," No. 7, vol. 2, Catalogue of W. J. Webb, 1896 ; "Yorkshire Carboniferous Flora," fifth report ; from the Authors, "Further Conchological Notes from the West of Ireland," by E. Collier and R. Standen.

Letter read :

The following letter to the Editor was read :—

"SISSINGHURST VICARAGE,

"CRANBROOK, KENT,

"DEAR SIR,

July 4th, 1896.

"I do not know whether it is possible so to do, but I should think I ought to have some opportunity (if you will kindly permit) of replying to the criticism of my paper in 'Devonia,' which has just appeared in the 'Journal of Conchology,'

"'In the present state of nomenclature,' the writer would appear to think, varieties ought to be inaugurated publicly and privately, without any compunction. Or is it possible that his sibylline sentence means that I am not acquainted with 'the present state of nomenclature' ?

"If I distinctly state in the immediate context that I do not desire anyone to add these to the number of existing synonyms, surely the person who does so is from my point of view 'incomprehensible.'

"The utility of such MS. names, or temporary varietal names, surely does not need elaborate proof. It would be well, in my

opinion, if a great many of the 'authorized' varietal names were submitted to a wider scrutiny. It is strange, for example, that roseolabiate forms should rank as varieties, now that the term variety has practically come to mean 'sub-species;' strange, too, that there should be instances (as in *L. peregra*) of two or three 'varieties,' which are transitional forms only, and together make up but one sub-species.

"It is obviously a very good thing to have an 'authorized list' as this Society has; but to set up the very best catalogue as an infallible guide to those who have and those who have not been concerned in its publication, appears to me slightly unreasonable, not to add unscientific. I am bound to make this slight protest, because I am convinced that the method of treating 'species and varieties' now in vogue is an entirely misleading one, and has merely grown up by custom, without reference to any philosophical considerations. The French system is only a little more absurd.

"Yours faithfully,

"E. W. W. BOWELL"

Paper read:

"A Snail Farm in Switzerland," by Mr. R. D. Darbshire.

Exhibits:

Mr. Moss exhibited several specimens of different sizes of the extremely rare *Paryphanta Hochstetteri*, also specimen of *Rhytida Greenwoodi*, all recently received by him from New Zealand.

Mr. R. Wigglesworth sent for exhibit subscalariform *Limnæa palustris* from Cricket Pit, Accrington, and *Valvata piscinalis* from Clayton-le-Moors.

On behalf of the Manchester Museum was exhibited a fine set of *Bartlettia stephanensis*, collected by Mr. Bartlett on the Upper Amazon and river Ucayali, Eastern Peru, and *Mülleria lobata*, from the river Magdalena, Bogota, New Granada, recently presented to the Museum.

Mr. J. Ray Hardy exhibited specimens of *Iridina nilotica*.

Mr. J. E. Cooper, of London, sent for exhibit *Cardium edule*, *Tellina balthica*, and *Scrobicularia tenuis* all from brackish ditches at Southwold, *Scrobicularia piperata* from river Blyth at Walberwick, *Helix hortensis*, a clouded var. and *Planorbis spirorbis* from Blythburgh, *Hyalinia nitidula*, *H. alliaria*, and *Helix hispida* from Southwold—all the above are from Suffolk East.

252nd MEETING, AUGUST 12th, 1896.

Held in the Manchester Museum, Owens College.

Mr. J. C. Melvill, President, in the chair.

Donations to the Library announced and thanks voted:

Science Gossip, vol. 3, No. 27, Aug., 1896; The Naturalist, No. 253, Aug., 1896; The Irish Naturalist, vol. 5, No. 8, Aug. 1896; La Feuille des Jeunes Naturalistes, No. 310, Aug., 1896; "New British Mollusca," by H. K. Jordan; "Label List of British Five-Banded Land Shells," by

J. T. Carrington; Memoirs and Proceedings of the Manchester Literary and Philosophical Society, vol. 10, 4th series; Proceedings of the Academy of Natural Science of Philadelphia, part 1, 1896.

Resignation of Member:

Mr. Tom Petch, B.A., Hedon near Hull.

Papers read:

"*Helix pomatia* (L.) not extinct in Northamptonshire," by C. E. Wright.

"*Amalia gagates* (Drap.) in Northamptonshire," by L. E. Adams, B.A.

"*Spiralis retroversus* in Killala Bay," by Miss Amy Warren.

Exhibits:

Mr. J. C. Melvill exhibited a specimen of *Orthalicus powisianus* (Petit), also another recently described as *O. approximata*, both from the Andes of Peru, altitude 8,000 feet. Mr. Melvill also exhibited extremely fine specimens of *Natica* (*Lematia*) *Lewisii*.

Mr. R. Standen exhibited *Spiralis retroversus* and *Lepton Sykesii* from Killala Bay; *Adeorbis imperspicuus* and *Eulima incurva* from Plymouth; *Trochus occidentalis* from Aberdeen; *Cima cylindrica* and *Eulima microstoma* from Delos, Aegean Sea; *Scalaria Cantrainei* from Bay of Eleusis; series of *Ovula patula* and *Scalaria clathratula* showing embryonal stages; *Hyalinia crystallina* from Merionethshire; and live *Vertigo angustior* from Killanley Marsh, county Sligo—all from Dr. Chaster's collection.

253rd (or ANNUAL) MEETING, SATURDAY, SEPTEMBER 19th, 1896,

Held at the Manchester Museum, Owens College. At 4 p.m. there was an exhibition of specimens by members:—

Exhibits:

By Mr. J. C. Melvill:—A selection of describers' "types" and other rare shells, many unique, including *Voluta Prevostiana*, *V. aulica*, *V. junonia*, *V. festiva*, *V. piperita*, *V. pulchra*; *Conus cedo-nulli*, *C. Bockii*, *C. Brazieri*, *C. malaccanus*, *C. sindon*, *C. gracilis*, *C. omaicus*, *C. euetrois*, *C. cervus*, *C. Du Saveli*, *C. catenatus*, *C. racemosus*, *C. gloria-maris*; *Mitra gigantea*, *M. Belcheri*, *M. Rossia*; *Harpa imperialis*; *Cerithium nobile*; *Cypræa guttata*; *Rostellaria Powisi*, *R. Martini*; *Corbis Sowerbyi*; and *Pholadomya candida*.

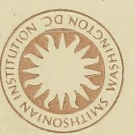
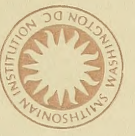
By Mr. A. G. Stubbs:—A fine collection of the land shells of Tenby district, showing especially handsome variation in *Helix pisana*, *H. virgata*, *H. caperata*, and *H. rufescens*.

Mr. L. Shackelford exhibited a fine series of Volutes collected by him in South Australia and New Zealand, including particularly large and beautiful *V. fulgetrum* and *V. pacifica*, and examples of two extremely rare species—*V. Kreuzerae* and *V. Güntheri*.

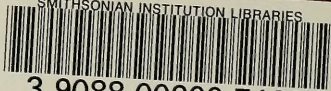
Mr. W. Moss exhibited eggs, and series of shells from newly hatched young to the fully adult, of *Paryphanta Hochstetteri*; *Paryphanta Bushyi*; and a fine series of other land shells from New Zealand.



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