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## XXI.—Submarine-cable fauna

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## EXPLANATION OF PLATE XV. B.

- Fig. A.* *Pelagonemertes Rollestoni*, from the ventral surface.  $\times 2$  diameters. 1, mouth, with oesophagus; 2, partly protruded proboscis; 3, nerve-ganglia; 4, nerve-cords; 5, ovaries; 6, digestive canal. The sheath of the proboscis is seen through the body lying behind the digestive canal.
- Fig. B.* Sketch of the proboscis-sheath and contained retracted proboscis, from the dorsal aspect: 1, retractor muscles inserted into the commencement of the sheath.
- Fig. c.* 1, one of the polygonal areas, enlarged, showing the wrinkles of integument producing the appearance; 2, peculiar appearance of some of the folds of the integument.
- Fig. D.* Reticular appearance of the integument observed in certain parts of the body. Natural size.

XXI.—*Submarine-Cable Fauna.* By J. GWYN JEFFREYS, LL.D., F.R.S., and the Rev. A. M. NORMAN, M.A.

[Plate XII.]

A NOVEL and unusual method of collecting specimens of the marine Invertebrate fauna is by means of the telegraph-cables which are laid down along so many of the great ocean highways. These cables occasionally need repairs, and must be taken up for that purpose. An opportunity has lately occurred, through the kindness of Sir James Anderson, of observing the animals which were found attached to the Falmouth-and-Lisbon cable, laid in June 1870, and taken up last autumn for repairs between N. lat.  $47^{\circ} 58'$  and  $47^{\circ} 35'$ , and in W. long.  $7^{\circ} 6'$ , at depths ranging from 89 to 205 fathoms on the edge of soundings; bottom sandy. Such depths are now not considered great; but the ground seems to have been hitherto unexplored by the dredge. The accuracy of the communication made by Sir James Anderson is unquestionable, and differs in that respect from the information which misled M. Alphonse Milne-Edwards, when he published a list of the animals attached to a cable which was taken up several years ago between Cagliari and Bône.

The Mollusca thus procured are interesting only for the sake of locality; they will be noticed by Mr. Jeffreys. An account of the other Invertebrates, including some new forms, will be given by Mr. Norman.

Part I. MOLLUSCA. By J. GWYN JEFFREYS.

BRACHIOPODA.

*Terebratula caput-serpentis*, Linné: a small valve.

CONCHIFERA.

*Anomia ephippium*, L., vars. *squamula* and *aculeata*: living.

*Ostrea cochlear*, Poli: living, and moulded on the cable.

This may possibly be a variety of the polymorphous *O. edulis*, owing its peculiar shape and comparative absence of lamination to its remaining attached to corals and other cylindrical substances. I think *O. rosacea*, Deshayes, ought to be united with *O. cochlear*, as it differs only in having a brighter colour.

*Pecten opercularis*, L.: living.

— *similis*, Laskey: valves.

*Lima subauriculata*, Montagu: valves.

— *Loscombi*, Turton: a fragment.

*Avicula hirundo*, L.: living and attached to *Sertularia*.

*Mytilus phaseolinus*, Philippi: a valve.

*Kellia suborbicularis*, Mont.: living.

*Axinus cycladius*, S. Wood: a small valve.

*Cardium minimum*, Ph.: a fragment.

*Astarte triangularis*, Mont.: valves; having the inner margin notched or plain, irrespective of size and apparent age.

*Circe minima*, Mont.: young, one living.

*Venus ovata*, Pennant: valves.

*Tellina pusilla*, Ph.: a valve.

*Macra solida*, L., var. *elliptica*: young, valves only.

GASTROPODA.

*Cyclostrema nitens*, Ph.: dead.

*Trochus millegranus*, Ph.: dead, young.

*Rissoa soluta*, Ph.: dead.

*Triforis perversa*, L.: living and dead, young.

PTEROPODA.

*Spirialis retroversus*, Fleming, var. *Jeffreysi*: dead.

Part II. CRUSTACEA &c. By the Rev. A. M. NORMAN.

CRUSTACEA.

*Ebalia* —?: small fragment of carapace, apparently *E. tuberosa*, Penn.

*Galathea* —?: fragment of carapace, I think *G. dispersa*, Bate.

*Amphithopsis latipes* (Sars) = *Calliope Ossiani* and *C. Fingalli*, B. & W.: abundant. Sars's specific name has precedence of those of Bate and Westwood, whose *C. Ossiani* and *C. Fingalli* are undoubtedly but one species. The late Axel Boeck \* has placed this Amphipod in his genus *Amphithopsis*, separating it from *C. leviuscula*, which remains the type of the genus *Calliopius*, Lilljeborg (= *Calliope*, B. & W.).

*Gammaropsis erythrophthalmus*, Lilljeborg, = *Eurystheus erythrophthalmus*, B. & W.: one specimen.

*Probolium* (= *Montagua*, Bate): fragment, too imperfect for identification.

*Ægina phasma* (Montagu) = *Protella phasma*, Bate.

*Munna*: fragment.

*Loxoconcha multifora* (Norman).

*Cytheropteron nodosum*, Brady.

*Schlerochilus contortus* (Norman).

*Paradoxostoma variabile* (Baird).

— *ensifforme*, Brady.

#### POLYZOA.

*Diastopora obelia* (Fleming).

*Idmonea atlantica*, Forbes.

*Salicornaria farciminoïdes* (Ellis & Sol.).

*Hippothoa catenularia* (Jameson).

— *divaricata*, Lamx. The typical form.

— *divaricata*, var. *carinata*, Norman. Pl. XII. figs. 4-7.

A remarkable form, procured from this source, and which I have also dredged in Birterbuy Bay, is worthy of a name, and is figured (Pl. XII. figs. 4-7). It has all the cells, as well as the intercellular tubules, strongly carinated, and

\* The death of this able Scandinavian naturalist at an early age is a great loss to science. His contributions to the study of the Crustacea Amphipoda and Copepoda are all most valuable. The prodomus ('Crustacea Amphipoda borealia et arctica') which he published in 1870 marks a new starting-point in the investigation of this subclass, and contains by far the most scientific arrangement of the sessile-eyed Crustacea which has as yet appeared. The first part of his larger work, 'De Skandinaviske og Arktiske Amphipoder,' 1872, raised hopes of a most complete monograph on the subject on which it treats; but death has stepped in to rob us of the fulfilment of those hopes. Herr Axel Boeck's executors inform me that the MS. and drawings will be, it is hoped, capable of arrangement so as to allow the issue of a second part of this Monograph; but although a mass of other drawings remain, there are not the MS. or notes to enable them to be utilized.

thus presents as strongly marked features as many of the allied so-called species of *Hippothoa*.

*Eschara rosacea*, Busk.

*Lepralia ventricosa*, Hassall.

— *microstoma*, Norman.

— *ciliata* (Linn.).

— *innominata*, Couch.

— *Brongniartii* (Aud.).

#### ECHINODERMATA.

*Antedon rosaceus* (Linck) : fragment.

*Echinocyamus angulosus*, Leske.

#### HYDROZOA.

*Eudendrium rameum*, Pallas.

#### Genus ACRYPTOLARIA, Norman, n. g.

Zoophyte ramose, irregularly branched, branches composed of several tubes; hydrothecæ rather distant, subspirally or alternately arranged, tubular, not contracted at the base and prolonged into the branch itself; mouth somewhat patulous.

*Acryptolaria exserta* (Busk), = *Cryptolaria exserta*, Busk, Quart. Journ. Micr. Sci. vol. vi. (1858), p. 130, pl. xix. fig. 3. Pl. XII. figs. 1 & 2.

In the fifth volume of the 'Quart. Journ. Micr. Sci.' p. 173, pl. xvi., Busk established a genus *Cryptolaria* for the reception of a New-Zealand Hydrozoon, which had the peculiarity of having the "cells completely immersed in a cylindrical poly-pidom composed of numerous tubes." In the following year he described another Hydroid from Madeira under the name *Cryptolaria exserta*; but this species was devoid of the very characters on which the genus *Cryptolaria* had been established, the hydrothecæ being much exserted, and standing out at a considerable angle from the stem. Many specimens of this Madeiran form are among the cable-scrapings; and they agree in every respect with Busk's description and figures, except that they are much less regularly branched than is represented in his plate xix. fig. 3. It is impossible that this species can remain in the same genus with *C. prima*; and I therefore constitute a new genus, of which it will be the type. It seems to find its nearest relation in *Grammaria abietina* (Sars), a species which I cannot think Mr. Hincks has done right in placing in the genus *Salacia* of Lamouroux, the type of which has

the hydrothecæ in regular verticils, and the branchlets contracted in a very remarkable manner at their junction with the branches.

Genus SCAPUS, Norman, n. g.

Zoophyte in the form of a spongy mass rolled in cylindrical form round the stems of branching Hydrozoa (*Acryptolaria*), and consisting of a series of somewhat closely packed subquadrate hydrothecæ, closed in above, except at the centre, where the hydrotheca projected in the form of a short, simple, cylindrical horny tube.

*Scapus tubulifer*, Norman, n. sp. Pl. XII. fig. 1, a, & fig. 3.

Zoophyte growing in little roll-like masses round the larger stems of *Acryptolaria exserta* (Busk), almost every specimen of which was the bearer of this parasitic species, though none of the other zoophytes procured at the same time and place showed a vestige of it. The roll-like mass has a soft spongy character, the external crust being harder. It consists of a large number of hydrothecæ, which, on a section being made, prove to be subquadrate in form, and packed closely together without any interspaces; the hydrotheca is closed in above except at the centre, where it is raised in the form of a short tubular orifice, rising from the mass of the hydrozoary; this tube is often slightly, but never much bent.

At first sight this species bears a strong resemblance to *Coppinia arcta*, from which, however, we at once know it by the more elongated and delicate character of the rolls and by the much shorter tubuli. In organic structure, however, the two species are very distinct from each other. In *Coppinia* the basal mass consists of chitinous cells rendered polygonal by mutual pressure, these cells are the gonothecæ; while the slender-tubed hydrothecæ pass through the mass to the base of the hydrozoary, and are of equal diameter from the base to their free extremities (see a paper on the structure of *Coppinia* by Allman, Brit. Assoc. Report, 1868, p. 87, published subsequently to Hincks's work). In *Scapus* the basal mass consists of the hydrothecæ, which are bottle-shaped, expanded below and forming the mass, and contracted above into narrow projecting tubes.

*Sertularella polyzonias* (Linn.).

— *Gayi* (Lamx.).

*Diphasia pinaster* (Ellis & Sol.).

— *alata* (Hincks).

*Thuiaria articulata* (Pallas).  
*Aglaopenia tubulifera* (Hincks).  
 — *myriophyllum* (Linn.).

## FORAMINIFERA.

- Cornuspira foliacea*, Philippi: the form *invovens*.  
*Triloculina trigonula*, forma *angulata*, Karrer, Sitzungsber. d. k. Akad. d. W. math.-naturw. Cl. Bd. iv. Abth. 1, 1867, pl. ii. fig. 6. The only *Triloculina* found seems referable to the *angulata* of Karrer, which is certainly not worth distinguishing by a name, but is so far interesting that it is a representative near our shores of a *group* of so-called species which have received names from D'Orbigny, Reuss, Karrer, &c.
- Quinqueloculina subrotunda* (Montagu).  
*Valvulina conica*, D'Orb.
- Lagena Lyellii*, Seguenza. Mr. H. B. Brady figures this form, Ann. & Mag. Nat. Hist. ser. 4, vol. vi. pl. xi. fig. 7. It is undoubtedly nothing more than a separated single cell of a form of *Nodosaria scalaris*, Batsch. I have a series which completely proves this statement.
- *marginata*, W. & J.  
*Nodosaria scalaris*, Batsch.  
*Cristellaria rotulata*, Lamk.  
*Polymorphina lactea*, W. & J.  
 — *compressa*, D'Orb.  
*Uvigerina angulosa*, Will.
- *irregularis*, H. B. Brady, Nat. Hist. Trans. Northumb. and Durham, vol. i. (1867), p. 100, pl. xii. fig. 5. A single and not well-marked specimen has been submitted to Mr. H. B. Brady, who has confirmed my opinion in referring it to this form.
- Orbulina universa*, D'Orb.  
*Globigerina bulloides*, D'Orb.
- *inflata*, D'Orb. Foram. Canar. p. 134, pl. ii. figs. 7-9; Parker and Jones, Phil. Trans. 1865, p. 367, pl. xvi. figs. 16 & 17. Now first recorded as occurring so near our shores; but I have previously found it abundantly in sand from 112 fathoms dredged, in Mr. Jeffrey's yacht 'The Osprey' in 1870, 30 miles west of Valentia Island.
- Textularia sagittula*, DeFrance.  
 — *pygmæa*, D'Orb.  
 — *abbreviata*, D'Orb. Foram. Foss. Vienna, p. 249, pl. xv. figs. 7-12; Parker and Jones, Phil. Trans. 1865, p. 369, pl. xvii. fig. 76.  
 — *agglutinans*, D'Orb. Foram. Cuba, p. 144, pl. i. figs. 17

- & 18; Parker and Jones, Phil. Trans. 1865, p. 369, pl. xv fig. 21. I have previously found both this and the last species in the very fine collection of British Foraminifera bequeathed to me by my late friend Mr. E. Waller; the specimens are from off Valentia Island. *T. agglutinans* I have also from my Shetland dredgings.
- Bulimina Buchiana*, D'Orb. Foram. Foss. Vienna, p. 186, pl. xi. figs. 15-18; Parker and Jones, Phil. Trans. 1865, p. 374, pl. xvii. fig. 71: abundant. This strongly characterized species is also in the Waller collection, from 112 fathoms, off Valentia.
- *punctata*, D'Orb.
- Discorbina globularis*, D'Orb.
- Planorbulina Haidingerii*, D'Orb.
- Truncatulina lobatula*, Walker.
- *refulgens*, Montfort.
- Planulina ariminiensis*, D'Orb.; Parker, Jones, and Brady, Ann. & Mag. Nat. Hist. ser. 4, vol. viii. pl. xii. fig. 131. Several specimens of this highly interesting Mediterranean form.
- Anomalina coronata*, Parker & Jones.
- Pulvinulina repanda*, F. & M.
- *elegans*, D'Orb.
- *Micheliniana*, D'Orb. Mém. Soc. Géol. de France, vol. iv. pl. iii. figs. 1-3; Parker and Jones, Phil. Trans. 1865, p. 369, pl. xiv. fig. 16, & pl. xvi. figs. 41-43. British examples of this very gibbous *Pulvinulina* were previously in my collection from Shetland and also Valentia (Waller's collection).
- *canariensis*, D'Orb. Foram. Canar. pl. i. figs. 34-36; Parker and Jones, Phil. Trans. 1865, p. 395, pl. xvi. figs. 47-49.
- *Menardii*, D'Orb. Modèles, no. 10; Parker and Jones, Phil. Trans. 1865, p. 394, pl. xvi. figs. 35-37.
- Rotalina orbicularis*, D'Orb.
- Polytrema miniaceum*, Linn., = *Millepora miniacea*, Linn., 1789, Syst. Nat. edit. 12 (Gmelin), vi. p. 3784, = *Polytrema coralina*, Risso, Hist. Nat. de l'Europe Mérid. p. 340, pl. v. figs. 45, 46; *Millepora rubra*, Lamk. ii. p. 202. no. 8; *Polytrema rubra*, Carpenter, Introd. Study Foram. p. 235, pl. xiii. figs. 18-20. A young specimen growing on a valve of *Pecten*. It is very interesting finding this remarkable Mediterranean Foraminifer so near our coast. The genus *Polytrema* was established by Risso, not by Blainville, who is credited with it by Carpenter.
- Operculina ammonoides*, Gron.

## PORIFERA.

Small fragments of a sponge occurred on the stems of a zoophyte. Not recognizing it, I forwarded it to Dr. Bowerbank, who pronounced it new, and has characterized it as below. There was also a mass of siliceous root-fibres, reminding one strongly of those of *Holtenia Carpenteri*; but they are not referable to that species, inasmuch as there were no hamate spined spicules (*vide* Thomson's plate lxviii. fig. 5), and the simple spicules were of two sizes—the one much larger than those of *H. Carpenteri*, the other very much more slender. I am not able, therefore, to refer this "beard" to any known sponge. I should add, however, that Dr. Bowerbank thinks they belong to *Holtenia*; but I cannot agree with him, for the reasons I have stated, in thinking so.

*Isodictya funalis*, Bowerbank, n. sp.

"Sponge massive, sessile. Surface smooth, but uneven. Oscula simple, dispersed, minute. Pores inconspicuous. Dermal membrane pellucid, spiculous; tension-spicula acerate, slender, subfasciculate, rather few in number; retentive spicula bi- and tridentate equianchorate, rather few in number, and rarely palmato-tridentate equianchorate; also simple and contort bihamate spicula, minute and very slender, rather few in number. Skeleton: spicula acute, stout, rather short, basally incipiently spinous; primary lines tri- or quadrispiculous, rarely more; secondary lines mostly unispiculous, rarely more than bispiculous. Interstitial membranes sparingly spiculous; spicula same as those of the dermal membrane.

"Colour, in the dried state, milk-white.

"*Hab.* On one of the Atlantic cables, 150 miles from the Land's End (*Sir James Anderson*).

"Examined in the dried state."

## EXPLANATION OF PLATE XII.

*Fig. 1.* *Acryptolaria exserta*, Busk, with *Scapus tubulifer*, Norman, parasitic at *a*: natural size.

*Fig. 2.* A portion of *Acryptolaria exserta*, magnified.

*Fig. 3.* A portion of the surface of *Scapus tubulifer*, Norman, magnified.

*Figs. 4-7.* *Hippothoa divaricata*, var. *carinata*, Norman, magnified.

