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XXIV.—Report on the Polyzoa of the Queen Charlotte Islands

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Ophiuridæ.

73. *Ophiura simillima*.

Ophiura simillima, Guénée, Noct. iii. p. 266 (1852).

Amboina.

Margarodidæ.

74. *Glyphodes? Ledereri*, sp. n.

Glyphodes actorionalis, Lederer (nec Walker), Wien. ent. Monatschr. vii. pl. xiv. fig. 4 (1863).

Amboina.

Walker's species comes nearer to Lederer's *G. Zelleri*. I am not satisfied that *G. Ledereri* is a true *Glyphodes*.

XXIV.—*Report on the Polyzoa of the Queen Charlotte Islands.*

By the Rev. THOMAS HINCKS, B.A., F.R.S.

[Concluded from page 58.]

[Plate IX.]

Suborder CYCLOSTOMATA.

Family Crisiidæ.

CRISIA (part.), Lamouroux.

Crisia cornuta, Linnæus.

Houston-Stewart Channel; Virago Sound; common.

[Norway, Britain, Brittany, Mediterranean.]

Crisia eburnea.

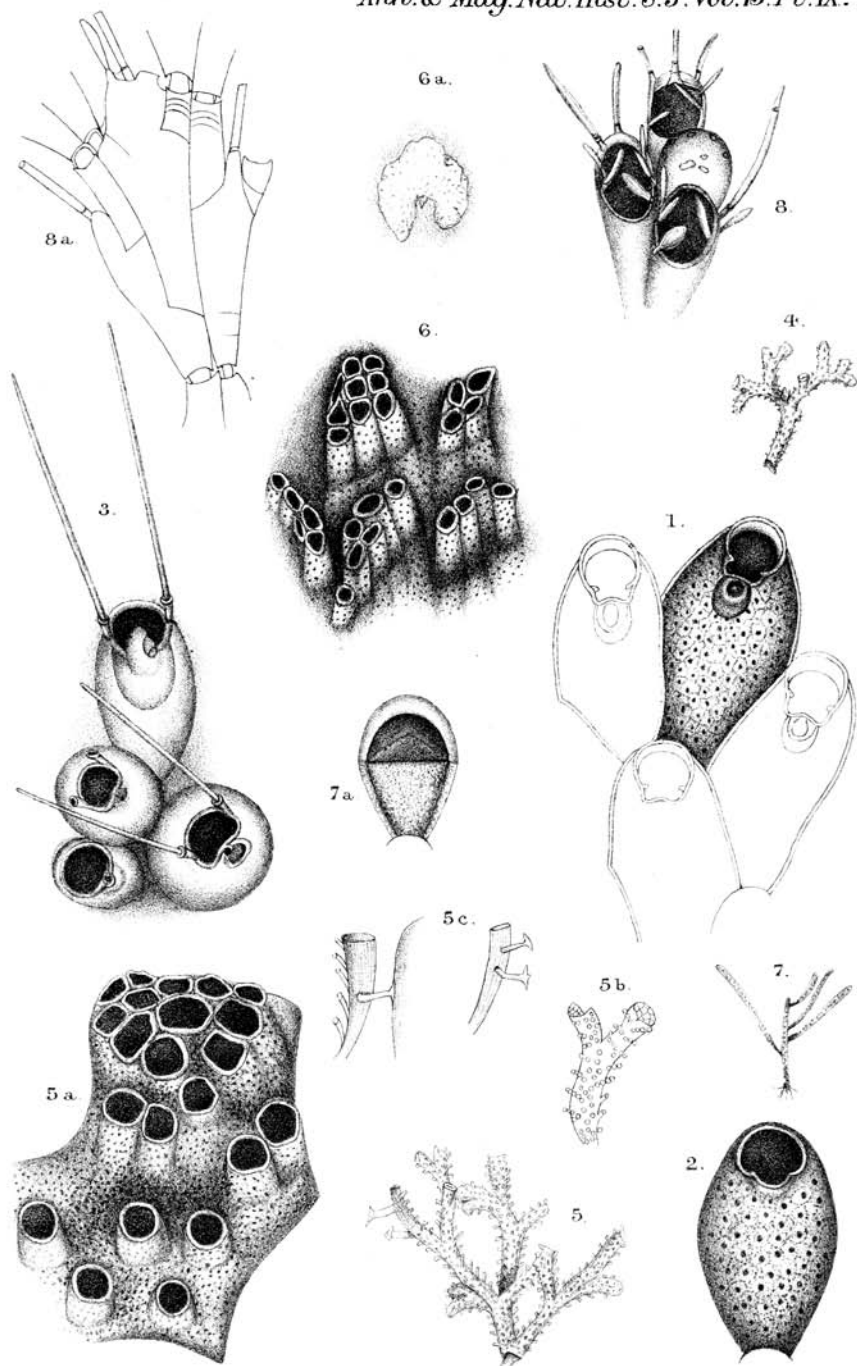
Virago Sound.

[North and Arctic Seas, St. Lawrence, Labrador, St. George's Banks, California, Fiji Islands, New Zealand and Australia, Madeira, Mediterranean, Britain.]

Crisia denticulata, Lamarck.

Houston-Stewart Channel.

[Kara Sea, Norway, Spitzbergen, Grand Manan, Britain, Adriatic, Madeira, South Africa.]



Family Tubuliporidae.

STOMATOPORA, Bronn.

Stomatopora major, Johnston.

On shell, rare.

[Bergen, Britain, Brittany.]

Stomatopora diastoporides, Norman.

On shell.

[Entrance of Baffin's Bay, Gulf of St. Lawrence, Britain.]

Stomatopora incrassata, Smitt.

A specimen occurs exhibiting the anastomosing habit which is characteristic of British examples of this species.

Cumshewa; Houston-Stewart Channel.

[Spitzbergen, Nova Zembla, Kara Sea, Britain.]

TUBULIPORA, Lamarck.

Tubulipora lobulata, Hassall.

Houston-Stewart Channel, on shell.

[Scandinavian coasts, Britain.]

Tubulipora perfragilis, n. sp.

Zoarium adnate, white, and composed of very delicate material, consisting of a short stem, widening upwards, which divides dichotomously into two principal branches, these again subdividing dichotomously, the lower segments curving downwards so as almost to surround the point of origin and the stem, and giving to the whole colony a flabellate form; branches slender at the base, expanding upwards, thickly covered with the cells, occasionally a second expansion originating from the summit of the first, to which it is connected by a narrow base. *Zoecia* crowded on the branches, radiately disposed, very slender, with a speckled surface, a large portion of the length free and subhorizontal, sometimes connate and in companies of 2-4, sometimes single and detached; orifice orbicular, unarmed. *Gonocyst* an irregular inflation of the surface of the branch, minutely punctate.

On shell.

This form has some points of resemblance to *Tubulipora capitata*, mihi ('Annals' for August 1881, "Contributions

towards a General History of the Marine Polyzoa"), an Australian species; but there are differences in the habit of growth and in some of the details of structure which probably entitle it to a distinct name. The present species is exceedingly delicate and of most graceful form. The branches seem to be slightly attached and are commonly free towards the extremities; the tubes are remarkably slender, and the free portions are horizontally inclined rather than erect. *T. perfragilis* bears much resemblance to D'Orbigny's figure of his *Idmonea cenomana* (Pal. Franç., Terr. Crétacés, vol. v. Atlas, pl. 633. fig. 2).

Tubulipora Dawsoni, n. sp. (Pl. IX. fig. 5.)

Zoarium forming a spreading, irregularly shaped, intricate, coral-like mass, composed of many branches, much divided and subdivided dichotomously, which radiate from the point of origin and anastomose freely; branches massive, of considerable width, somewhat compressed, flattened in front, expanding upwards, bifid or trifid at the extremities, which are cellular, recumbent or suberect, never adnate, but attached by numerous calcareous offsets from the dorsal surface to the shell or stone on which the colony grows. *Zoecia* arranged (in part) in transverse rows (two to five in each), which slant slightly downwards, connate, with a large suborbicular orifice, increasing in height from the inner side outwards, so as to give a serrated appearance to the edge of the branch; the rows sometimes extending to the centre of the branch, but not separated by any distinct mesial line, sometimes (and more commonly) ranging along the sides, the centre being occupied by many detached cells irregularly distributed, with a suborbicular orifice, which is usually scarcely raised above the surface; walls thickly and minutely punctate; the dorsal surface rounded, lineated longitudinally, punctate, often with transverse furrows.

Common amongst the dredgings; on shells and stones.

In this fine species the disposition of the cells connately in transverse rows is very much confined to the sides of the branch, and a striking characteristic is the crowd of scattered cells which very commonly fills the centre. The latter are generally very slightly raised above the surface of the zoarium. The rows vary in length and occasionally extend to the centre of the branch; but usually the condition is as I have described it. The zoecia composing them increase in height from within outwards, and the tallest form a conspicuous line along the margin of the branch. The branches are for the

most part broad and compressed, and inosculation takes place freely. A peculiarity which at once arrests attention is the large development of dorsal appendages for the purpose of attachment: these are short, cylindrical, calcareous processes, which are given off in great number from the under surface of the branches, and become firmly soldered to the body on which the polyzoon grows (Pl. IX. fig. 5 a).

I have great pleasure in naming this form, which is a very characteristic member of the Polyzoan fauna of the Queen Charlotte Islands, after Dr. G. M. Dawson.

Tubulipora fasciculifera, n. sp. (Pl. IX. fig. 6.)

Zoarium flat, thin, closely adnate, flabellate. *Zoæcia* free and erect above, depressed below, the free extremities disposed in short, disconnected, more or less divergent series, which range in radiate fashion (but somewhat irregularly) towards the margin, the series sometimes composed of a single line of connate tubes, sometimes of two lines placed side by side, sometimes of clusters (or fascicles) of tubes; orifice orbicular, unarmed; surface thickly speckled. *Gonocyst* an inflation of the zoarium, usually placed near the margin, involving a number of the zoecial tubes; surface covered with minute disks closely packed together.

On shell.

The fasciculate arrangement of the zoæcia is the most distinctive character of the present species, but many single lines of cells mingle with the composite series. It grows in flabellate patches, which sometimes give off long linear or subclavate lobes. The free portion of the cell is much elevated and more than suberect.

So far as the character and arrangement of the zoecial series are concerned, the Cretaceous *Multifascigera Campicheana*, D'Orbigny, curiously resembles the present form (see Paléont. Franç. vol. v., Atlas, pl. 762. fig. 8).

DIASTOPORA (part.), Lamouroux.

Diastopora patina, Lamarek.

Cumshewa, on *Tubulipora* and *Myriozoum*.

[North and Arctic Seas, South Labrador, Britain, France (S.W.), Adriatic.]

Diastopora sarniensis, Norman.

Off Cumshewa, 20 fms.

[English coasts (south-west and south-east), Mediterranean (probably).]

Diastopora suborbicularis (?), Hincks.

[= *D. simplex*, Busk.]

On shell.

[Greenland, Finmark, Britain, Naples.]

A single specimen occurs, imperfectly developed, which seems to have the characters of this species. A larger portion of the cell is free than is usual in *D. suborbicularis*; but there is always much diversity in this respect, due to difference of habitat. The margin of the zoarium is slightly lobate, but this may be owing to the immature condition of the specimen.

Family **Lichenoporidae**.

LICHENOPORA, Defrance.

Lichenopora hispida, Fleming.

On shell.

[Norway, Finmark, Greenland, South Labrador, Britain, France (S.W.), Naples.]

Lichenopora verrucaria, Fabricius.

Virago Sound, on *Sertularella*.

[Norway, Arctic Seas, Bay of Fundy, St. George's Banks, Britain (North and West).]

Suborder CTENOSTOMATA.

Family **Alcyonidiidae**.

ALCYONIDIUM, Lamouroux.

Alcyonidium gelatinosum, Linnæus.

Virago Sound.

[North and Arctic Seas, North America, Britain, Natal.]

Family **Vesiculariidae**.

BOWERBANKIA, Farre.

A member of this genus occurs on Sertularians from Virago Sound, which is probably referable to *B. imbricata*, Adams, form *densa*, Farre.

[White Sea, Caspian Sea, Britain.]

Family **Buskiidæ**.

BUSKIA, Alder.

Buskia nitens, Alder.

Virago Sound, on a Sertularian ; also creeping over *Cellaria*.
[Davis Straits, White Sea, Barents Sea, Britain.]

Family **Cylindræciidæ**.

CYLINDRÆCIUM, Hincks.

Cylindræcium giganteum, Busk.

In the specimens which I refer to this species, the cell is of more slender habit than in British examples and the ectocyst less opaque ; but these differences are of slight moment, and I have little doubt that the Pacific form is specifically identical with our own.

[Britain.]

[Group **ENTOPROCTA**.]Order **PEDICELLINEA**.Family **Pedicellinidæ**.

PEDICELLINA, Sars.

Pedicellina gracilis, Sars.

Virago Sound.

[Norway, Spitzbergen, White Sea, Britain.]

APPENDIX.

Family **Cellulariidæ**.*Menipea ternata*, Ellis & Solander.

The form occurs in which the two lower cells in the triplet are much elongated and attenuated, and the habit in consequence is much more slender and graceful than in the normal condition. Smitt has recorded this variety from the north.

Menipea compacta, n. sp., form *triplex*.
(Pl. IX. fig. 8.)

[Described in 'Annals' for December 1882, p. 461.]

Only a small and imperfectly developed example of this species occurs amongst Dr. Dawson's dredgings ; but very

fine specimens from California (where it seems to be extremely abundant) and Vancouver Island enable me to correct my description of it in one or two particulars.

I find that on the same colony internodes composed of three cells are mingled with others bearing five or six, so that it is incorrect to designate the triple condition as a distinct form. We have a similar variation in *Menipea ternata*. The operculum is not "acicular," as described, in its fully developed state, though always very moderate in size. It is usually, in its perfect condition, clavate, expanding slightly above.

M. compacta grows in luxuriant bushy tufts, which bristle with spines.

Family Cellariidæ.

Cellaria mandibulata, n. sp. (Pl. IX. fig. 7.)

[Described in 'Annals' for December 1882, p. 463.]

The figures represent the avicularium, which exhibits probably the least specialized form of the appendage in the Cellarian series, and a shoot of the natural size, in which there is a curious departure from the usual dichotomous ramification. The branches are given off from the stem at intervals on each side, instead of forming a fork at the joints. This peculiarity, however, does not appear to be characteristic of the species.

Family Membraniporidæ.

Membranipora velata, Hincks.

This Californian species occurs on shells dredged off Cumshewa; but the specimens from the Queen Charlotte Islands are destitute of the large avicularia. (See 'Annals' for August 1881, p. 130.)

Membranipora acifera, MacGillivray, form *multispinata*.

['Annals' for December 1882, p. 465, pl. xix. fig. 4.]

In a previous portion of this Report I have referred a *Membranipora* from the Queen Charlotte Islands to the *M. acifera* of MacGillivray*, of which it seemed to me to be a variety. But in a paper read before the Royal Society of Victoria, October 12, 1882, MacGillivray states that further examination has led him to identify this species with his *Membranipora serrata*, which is certainly quite distinct from the North-Pacific form. I shall therefore characterize the latter as

* Described and figured in a paper read before the Royal Society of Victoria, December 9, 1881.

Membranipora pallida, n. sp.

Zoæcia elongate-oval, front wall wholly membranous, quincuncially disposed, margin thin, smooth, usually slightly elevated at the top; an erect spine on each side above and from six to eight slender pointed spines down each side, which incline inward; generally at the bottom of the cell, on a small quadrate area, an *avicularium* with an expanded base (occupying the area) and a very long, slender, tapering beak, which stretches upward along the margin; mandible triangular below, above setiform. *Oæcium* (?).

Zoarium whitish, texture delicate.

Virago Sound; spreading luxuriantly over shell.

Membranipora exilis, n. sp.

[Described in 'Annals' for December 1882, p. 466.]

On further examination of this species I find that it agrees with *M. radicifera*, Hincks, in being attached (in some cases at least) by radical tubes given off from the dorsal surface. It is not closely adnate to the surface on which it grows, as most of the *Membraniporæ* are, but is furnished with special organs of attachment. The first specimen which came under my notice (and on which my description was based) is growing on *Cellaria borealis*, the stem of which it loosely invests; in this case I have not been able to detect any of the dorsal appendages. But on a colony which spreads over a *Tubulipora* they are present in great numbers, and there can be no doubt that it is anchored by the radical tubes and not adhesive. In both cases the dorsal surface of the cells is convex and rounded, and clearly unfitted for direct attachment. Probably the presence or otherwise of the appendages is dependent on the nature of the habitat.

I have already ('Annals' for July 1881, p. 5, under *Membranipora radicifera*) drawn attention to certain links connecting the Membraniporidan series with such forms as *Bugula* and *Diachoris*. We have another such link in the present species. A *Membranipora* which, from the nature of its habitat, had ceased to be adherent and had developed radical fibres as a means of attachment, would have made a very decided advance towards the Bugulan type.

Family Porinidæ.

Lagenipora spinulosa, n. sp.

[Described in 'Annals' for January 1884, p. 57.]

When I first described this species I had only met with

small incrusting colonies, and was under the impression that they represented the mature and perfect form. I now find, however, that this is by no means the case. When fully grown the zoarium of *Lagenipora spinulosa* is erect and ramose (Pl. IX. fig. 4), consisting of a cylindrical stem, which divides and subdivides dichotomously, the branches terminating above in short bifid segments. The *zoecia* are arranged longitudinally in six lines along the stem and branches, those in neighbouring lines alternating; the oral (or neck-like) portion free and projecting, the lower immersed. The surface of the cell is covered with very large foramina, which are closed in by membrane. *Primary orifice* elliptical, slightly narrowed below. The surface of the *oecium* is smooth, and entire behind; a raised line arches across it towards the front, and the portion in advance of this line is covered with minute disks closely packed together.

In its perfect condition this species bears a close resemblance, so far as habit and general appearance are concerned, to an *Entalophora*.

The wall of the cell is built up of tubes placed longitudinally and closely appressed to one another; this curious structure may be best observed in the erect neck-like portion of the zoecium. The superficial foramina are probably the openings of the tubes.

The lateral avicularia are supported on a tubular structure, which may be traced stretching down the inner wall of the oral cylinder (neck) and tapering off finely below. *Lagenipora spinulosa* would seem to be abundant where it occurs; it must be accounted one of the most interesting forms which Dr. Dawson's dredgings have yielded.

Family Myrionozoidæ (part.).

Schizoporella cruenta, Norman.

This species must be added to the list of North-Pacific forms. The single specimen which occurs is in fine condition, and has the oral sinus much more strongly marked than the British examples which I have examined. The deep-red colour of the zoarium when fresh has given place to a uniform black.

[Nova Zembla, Greenland, Britain, from Shetland to the Channel Islands.]

Schizoporella biaperta, Michelin.

A specimen has occurred in which the oral avicularia as-

sume both the round and spatulate form, as is commonly the case in the allied *Schizoporella armata*, mihi.

Schizoporella Dawsoni.

[Described in 'Annals' for June 1883, p. 449.]

The species described under the above name I have now no doubt is identical with *Escharina torquata* of D'Orbigny ('Voyage dans l'Amérique méridionale,' tome v. 4^e partie, p. 11, = *Flustra torquata*, Lamouroux). *Schizoporella torquata* must therefore take the place of *S. Dawsoni* in the Report. I have, however, much pleasure in dedicating a fine species of *Tubulipora* (which I trust will prove to be undescribed) to the able investigator to whom we are indebted for our knowledge of the marine fauna of the Queen Charlotte Islands.

Schizoporella torquata (D'Orbigny), Lamx.
(Pl. IX. fig. 2.)

Virago Sound, on shell.

[Bay of Rio, on dead shells.]

Schizoporella linearis, Hassall, form *inarmata*.

The only specimens amongst the dredgings which are referable to this species are totally destitute of avicularia. In other respects they agree with the typical form, and must be regarded as an unarmed variety.

[Scandinavia, South Labrador, Mediterranean, Britain, France (S.W.).]

*

Family **Escharidæ** (part.), Smitt.

Lepralia cleidostoma, Smitt, var.

A variety of this species occurs which is destitute of avicularia. There is frequently a small knob on each side of the orifice, and always a stout mucro immediately below it. The oecia do not exhibit the striæ which Smitt describes, but are smooth and polished. The only specimen, however, which I have examined is strongly calcified and has a highly varnished surface, and in this condition the striæ may be obliterated. An Australian variety has already been described with circular instead of pointed avicularia ('Annals' for August 1881, p. 122).

? *Porella argentea*, n. sp. (Pl. IX. fig. 1.)

Zoörcia ovate, quincuncial, rather depressed (sutures shal-

low), surrounded by raised lines, surface thickly covered with punctures; orifice expanded above and well arched, contracted below; peristome slightly raised, especially above, a very prominent hinge-denticle on each side a little above the lower margin; immediately below it an umbonate swelling, bearing on its inner aspect an *avicularium*, with rounded mandible, directed upwards. *Oæcium* rounded, not prominent, surface somewhat roughened, usually a circular pore on the front. *Zoarium* white and silvery.

Houston-Stewart Channel, on shell.

Mucronella spinosissima, Hincks.

On further examination I find that in the younger cells there are two or three lines of pores forming a belt round the margin; and it seems probable that the curious tubular system which I have described ('Annals' for January 1884, p. 53) owes its origin to these. At least I can only explain it by supposing that, as calcification proceeds, it is arrested by the pores, and only extends round them and not over them; so that they continue open, and form at last tubular shafts piercing the stony crust which has been piled up about them.

Retepora Wallichiana, Hincks.

This species has been obtained in Vancouver Island.

General Remarks.

The number of species recorded in the present Report from the Queen Charlotte Islands is 96, of which 36 appear to have been hitherto undescribed. Of the 60 species known to science more than a third (24 at least) seem to be distinctively Arctic forms, and of these 17 occur in the British seas*. Migration has taken place on the side of Davis Straits and Behring Straits: on the one the circumpolar species have distributed themselves along the North-American coasts and more or less widely along those of the British Islands; on the other they have colonized the nearer portions at least of the North Pacific. In the comparatively warm waters which

* The seven Arctic species which occur in the Queen Charlotte Islands but not in Britain are *Cellaria borealis*, *Flustra membranaceo-truncata*, *Membranipora Sphæa*, *Smittia plicata*, *Retepora Wallichiana*, *Cellepora incrassata*, and *Myrioecium coarctatum*. The whole number of species common to the Islands and Britain is forty-three.

bathe the shores of the Queen Charlotte Islands they evidently find a congenial home and are finely developed. There is nothing to show that they are unfavourably affected by the change of climate. Of these northern forms only one seems to reach the Mediterranean ; a few are widely distributed in the British seas, while the rest are pretty much confined to Shetland and the north-east and north-west coasts. In Prof. Verrill's 'Check-List of the Marine Invertebrata of the Atlantic coast, from Cape Cod to the Gulf of St. Lawrence' (1879) thirty-one species are included which occur in the Queen Charlotte Islands, and of these nineteen are Arctic ; so that the results of the northern migration have been much the same on both sides of the continent.

The remaining species obtained by Dr. Dawson constitute a somewhat miscellaneous company. They include a small group of cosmopolitan forms which occur in almost all latitudes, and are expected, as a matter of course, to be present wherever Polyzoa are found. Such are *Microporella ciliata* (perhaps the most widely distributed species in the class), *Schizoporella hyalina* (which almost equals it in this respect), *Smittia trispinosa*, and perhaps *Hippothoa distans*. A few species occur which have been found as far up the Pacific coast of America as California and Vancouver Island, but which are not known as Arctic forms. These are no doubt southern species which have travelled so far northwards. Indeed the Queen Charlotte Islands are, in a remarkable degree, the meeting-ground of northern and southern forms. *Membranipora Rosselii*, *M. tenuirostris*, *Cribrilina radiata*, *Schizoporella Cecillii*, *S. sanguinea*, *S. torquata*, and *Diastopora suborbicularis* are essentially southern.

Seventeen species are common to the Islands and Australia, and of these thirteen are also European : nine of them occur in the Arctic seas. Two have only been found, so far, in Australia and the Queen Charlotte Islands (*Porella marsupium* and *Mucronella spinosissima*). *Lepralia cleidostoma* has occurred in these two localities and off the coast of Florida.

It may be noted here that of the whole number of Queen Charlotte Islands species only nine are not also European.

Some of the ascertained facts respecting the distribution of the Polyzoa are sufficiently perplexing, and we must wait for a larger accumulation of data before we may hope to explain them satisfactorily. The way in which certain species are strewn, as it were, at haphazard over the surface of the globe is a difficulty of which the solution is not apparent. We must, I think (as I have suggested before), make large allowance for the agency of man, and of currents, floating weed and

timber, &c., in the diffusion of the species, apart from the general laws which preside over the distribution of life.

Further light will no doubt be thrown on the relations of the Polyzoan fauna of the Islands when we know more of the history of the group of new forms recorded in this Report. We may venture, I think, to say, that they are not to any large extent Arctic. Are they southern coast-line emigrants, or do they occupy their original home?

EXPLANATION OF PLATE IX.

Fig. 1. ? *Porella argentea*, n. sp.

Fig. 2. *Schizoporella torquata* (D'Orbigny), Lamx.

Fig. 3. *Cellepora*? n. sp. (*brunnea*); a cluster of zoecia, showing one of the marginal decumbent cells.

Fig. 4. *Lagenipora spinulosa*, n. sp.; erect form, nat. size.

Fig. 5. *Tubulipora Dawsoni*, n. sp., nat. size. 5a. Portions of the stem showing the offsets from the dorsal surface, by which the zoarium is attached. 5b. Portion of a branch, showing the disposition of the zoecia. 5c. The extremity of a branch, showing the cellular capitulum and several of the scattered central zoecia.

Fig. 6. *Tubulipora fasciculifera*, n. sp.; portion of the zoarium, showing the arrangement of the zoecia. 6a. A colony, nat. size.

Fig. 7. *Cellaria mandibulata*, n. sp.; avicularian cell. 7a. Nat. size, showing a peculiarity in the ramification.

Fig. 8. *Menipea compacta*, n. sp.; front view of an internode. 8a. Dorsal surface.

XXV.—On *Schizoporella Ridleyi*, MacG., and *Schizoporella simplex*, D'Orbigny and Johnston. By J. J. QUELCH, B.Sc. Lond., Zoological Department, British Museum.

THE *Schizoporella Ridleyi*, MacGillivray, was originally described as *S. marsupium* by Mr. Ridley, who identified it with *Lepralia marsupium*, MacG., having been misled by the short and incomplete description of this species, which was, moreover, as stated since by Mr. MacGillivray, drawn up from a bad specimen. And certainly, if excuse were needed for such an identification, I may state that the agreement between the type specimen of the 'Alert' collection described by Mr. Ridley, and the description and figures of *L. marsupium* given by Mr. MacGillivray in the Prodr. Zool. Vict. decade iv., seems to me much closer than is the agreement between the figures given since by Mr. MacGillivray (Roy. Soc. Vict. 1882) for *Porella (Lepralia) marsupium* and his previous description and figures of the same species.

The 'Alert' species, being found by Mr. MacGillivray to