

## V.—Report on the Polyzoa of the Queen Charlotte Islands.

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

[Continued from vol. xi. p. 451.]

[Plates III. &amp; IV.]

## • LEPRALIA (part.), Johnston.

*Lepralia bilabiata*, n. sp. (Pl. III. fig. 1.)

*Zoecia* quincuncially arranged, short, very slightly convex, the sutures little more than incised lines, rounded above (where the cell-wall forms a distinct border round the orifice), widening out at each side, and narrowing off towards the base, which is subtruncate or pointed; surface dense, smooth, of a somewhat waxy appearance and a dark brown colour; orifice large, occupying nearly half of the front surface, rounded above, slightly contracted a short distance above the lower margin, which is arched outwards; peristome unarmed, not elevated; operculum smooth, of a deep black colour, with a slight rim round the edge, the inner surface attached to a bilabiate tubular passage (Pl. III. fig. 1 *b*), through which the polypide issues. *Avicularia* none. *Oœcium* a subtriangular extension of the cell above the orifice, very little raised, a great part of its front surface occupied by a large foramen, closed in by membrano-chitinous material (Pl. III. fig. 1 *a*).

*Zoarium* of a very dark brown colour (almost black).

Houston-Stewart Channel, on shells.

When the zoœcium is open, the orifice is occupied in great part by the entrance to a tubular passage, through which the polypide issues; this entrance is bilabiate, the lower lip consisting of a semicircular chitinous rim, as it were soldered to the inner surface of the operculum; the upper or opposed lip, also chitinous, is movable, and closes upon the opercular lip when the polypide retreats.

The structure of the ovicell in this species is peculiar; it consists of a short extension of the cell upwards, the front wall of which is much depressed, and bears a large foramen, with a chitinous lid or covering. The oœcial chamber is small, and the entrance to it is closed by the operculum of the cell. This is a very distinct modification of the ordinary form of oœcium.

*L. bilabiata* is luxuriant in growth, and forms very large spreading crusts.



*Lepralia claviculata*, n. sp. (Pl. III. fig. 2.)

*Zoæcia* ovate or lozenge-shaped (sometimes irregular in shape and size), regularly quincuncial, depressed; surface glossy, thickly covered with minute circular punctures, which give it a pretty speckled appearance; orifice arched and expanded above, more or less narrowed downwards, contracted by a small acute projection on each side just above the lower margin, which is distinctly curved; peristome not raised. *Avicularia* keyhole-shaped, placed on a distinct area, very much smaller than that of the cell, sometimes immediately above a zoæcium, more commonly in the angle between two zoæcia; mandible directed upwards. *Oæcium* (fig. 2 a) very large, higher than broad, depressed towards the opening, and often grooved longitudinally above the oral arch, rising above into a kind of central knob (but on the whole not much elevated), white, glossy, thickly punctured.

*Zoarium* forming large, spreading, whitish crusts.

Houston-Stewart Channel; Cumshewa, 20 fms.

Cases occur in which the avicularium is situated on an area almost as large as that of the cells, just below the upper extremity, occupying, in fact, the position of the oral aperture. Occasionally two of these appendages occur together, either placed one above the other or side by side.

## PORELLA, Gray.

*Porella concinna*, Busk.

Cumshewa, on shell.

[Britain, Adriatic, Finmark, Norway, Spitzbergen, Franz-Josef Land (*Ridley*), Greenland, Gulf of St. Lawrence, Bass's Straits.]

A beautiful variety occurs in which the whole surface of the cell, except the umbo below the orifice, is covered with rather large punctures; the orifice is ample, and its characteristic features are very distinctly marked. The zoarium is white, and delicate in texture.

*Porella marsupium*, MacGillivray, form *porifera*.  
(Pl. IV. fig. 4.)

This species, which is a common Australian form, occurs abundantly amongst the dredgings. The specimens from the Queen Charlotte Islands differ from those which I have examined from Bass's Straits in one or two points, but they are quite unimportant. On the front of the suboral swelling, which supports the avicularium, are two (or occasionally three)



rather large circular pores, placed side by side. They give a somewhat peculiar appearance to the cell, but do not seem to have any special significance. Frequently too there is a small raised oval avicularium on the front of the cell, besides the oral avicularium, which I have not noticed on Australian specimens. The cell-wall is smooth and entire; the oecium is traversed by delicate radiating lines.

Extremely common, on shells &c.

[Victoria (*MacGillivray*); Bass's Straits (*Capt. Cawne Warren*).]

The species described by Mr. Ridley from the Straits of Magellan (Proc. Zool. Soc. Jan. 4, 1881) as *Schizoporella marsupium*, and identified by him with MacGillivray's *Lepralia marsupium*, is, I have no doubt, the *Escharina simplex* of D'Orbigny ('Voyage dans l'Amérique Mérid.'), obtained from "les Iles Malouines." MacGillivray, who has found this species in Victoria, has named it *Schizoporella Ridleyi* (Proc. Roy. Soc. Victoria, Oct. 12, 1882).

We have no alternative, however, but to revert to the earlier designation, and it must stand as *Schizoporella simplex*, D'Orb.

*Porella major*, n. sp. (Pl. IV. fig. 5.)

*Zoæcia* ovate or (sometimes) hexagonal, somewhat elongate, quincuncial, rather depressed, sutures shallow, often with a line of punctures round the margin; surface smooth or slightly roughened, glossy; orifice arched above, lower margin curved inwards, so as almost to appear dentate; peristome thin, unarmed, elevated (in the adult cell), especially above, immediately below the orifice a narrow avicularian swelling, stretching across the front of the cell and bearing in the centre a small oval *avicularium*, mandible directed downwards. *Oæcium* rounded, moderately prominent, surface minutely roughened, the peristome forming a raised rim round the oral arch.

*Zoarium* of a very light brownish colour.

Cumshewa; Houston-Stewart Channel, common on shells.

SMITTIA, Hincks.

*Smittia trispinosa*, Johnston.

Houston-Stewart Channel; off Cumshewa; Virago Sound: abundant.

[Britain, Norway, Arctic regions, St. Lawrence, Mingan Islands, Florida, Mazatlan, Cape Horn, Aden, Adriatic, East Indies (*Dr. Anderson*), Bass's Straits.]

Several varieties occur. As a rule, the avicularian appendages are present in great profusion and of unusual size.



*Smittia plicata*, Smitt.

Houston-Stewart Channel ; off Cumshewa, 20 fms. : not uncommon.

[Spitzbergen, Greenland, 100 fms., Godhavn Harbour, Disco.]

The form which I refer to Smitt's *Cellepora plicata* differs slightly from the description and figures given by that author ; but in essential particulars, I believe, it agrees with them. In the specimens from the Queen Charlotte Islands the avicularium is well within the peristome, and there is little if any trace of the umbo, on which, according to Smitt, it is placed in his *C. plicata*. This, however, may be due to the greater development of the peristome, by which the umbo may have been to a large extent concealed. The cells are often invested by a membranous epitheca.

*Smittia spathulifera*, n. sp. (Pl. IV. fig. 3.)

*Zoecia* large, ovate, quincuncially arranged, very moderately convex, bordered by delicate raised lines ; surface covered with rather large round punctures, which, however, are in great measure concealed by the stout epitheca that clothes the zoarium ; orifice arched above, lower margin straight and within it a large bifid tooth ; peristome much raised (especially above) forming an elongate secondary orifice, produced below into a spout-like sinus, which is occupied by a spatulate *avicularium* ; mandible directed downwards. *Oaecium* large, immersed, closely united to the cell above ; surface roughened, punctured round the edge. *Zoarium* forming a brownish crust.

Houston-Stewart Channel.

## MUCRONELLA, Hincks.

*Mucronella ventricosa*, Hassall.

Virago Sound, in about 20 fms., on shells.

[Britain, France (S.W.), Mediterranean, New Zealand, Bergen, Greenland, Nova Zembla, Kara Sea.]

*Mucronella pavonella*, Alder.

Virago Sound.

[St. Lawrence, Greenland, Nova Zembla, Spitzbergen, Finmark, off Jutland, Britain (north-east).]

*Mucronella prælucida*, n. sp. (Pl. IV. fig. 1.)

*Zæocia* large, ovate, quincuncial, slightly convex, separated



by raised lines; surface thickly covered with roundish punctures, lustrous; orifice arched above, lower margin straight (without denticles), peristome raised, especially at the back and in front, where it rises in the centre into a blunt mucronate projection, which bends slightly inwards; the surface of the peristome smooth, entire, and very glossy. *Avicularia* none. *Oæcium* (?).

Houston-Stewart Channel, not uncommon on shells.

*Mucronella prælonga*, n. sp. (Pl. IV. fig. 2.)

*Zoæcia* long and (usually) slender, quincuncially disposed, somewhat wider above than at the base (elongate-ovate, sometimes appearing almost subtubular), convex, depressed below, rising towards the oral extremity; surface thickly covered with minute punctures, shining (the glistening appearance due to the presence of an epitheca); orifice suborbicular, peristome elevated round it, carried out in front into a very prominent process, often much thrown back and greatly elongated, sometimes simply pointed, sometimes bi- or trimucronate, on the inner side of it near the base a single, small, sharply-pointed denticle; the upper margin produced in the centre into a tall spinous process, broad at the base, attenuated and membrano-calcareous above. *Avicularia* none. *Oæcium* (?). *Zoarium* forming a whitish subcircular crust.

Houston-Stewart Channel, on shell.

A very picturesque form, distinguished by the remarkable processes on the upper and inferior margins of the peristome. The mucro in front is sometimes very greatly elongated, and, in such cases, the upper portion seems to be formed of very delicate membrano-calcareous material. The spinous extension of the peristome on the upper margin, which is much attenuated above, is also made up, to a great extent, of similar material. The subtubular character of the zoæcia is a striking feature, though occasionally, and especially near the growing edge of the colony, they assume a more distinctly ovate form.

*Mucronella spinosissima*, Hincks, form *major*.  
(Pl. III. fig. 3.)

*Zoæcia* broad-ovate, short, arranged in quincunx, very convex, sutures deep, surface smooth, subhyaline in the younger cells, opaque in the older, a number of slender tubules immersed in the cell-wall immediately beneath the surface, and radiating from the margin towards the centre, the aperture opening out apparently on the surface, but closed by a calcareous diaphragm; the oral extremity of the cell much



raised, contracted, suberect, forming a neck which bears the orifice; orifice suborbicular, a small mucronate projection in the centre of the lower margin, the rest of the peristome occupied by 6-10 tubular spinous processes, a denticle within the peristome on the lower primary margin. *Avicularia* none.

*Oæcium* (fig. 3*b*) rounded, developed behind the neck-like peristome (the orifice, with its full armature of spines, rising before it), sometimes traversed by a number of the immersed tubules.

*Primary cell* (fig. 3*a*) small, ovate; aperture occupying about two thirds of the front surface, surrounded by a raised border, which bears about 8-10 spines; the orifice nearly semicircular, occupying the upper portion of the aperture, the lower part closed in by a delicate membrano-calcareous covering; portion of the cell below the aperture smooth and solid.

*Zoarium* forming very large cream-coloured crusts on shells.

Extremely abundant; probably the commonest species amongst Dr. Dawson's dredgings.

[Bass's Straits (*Capt. Cawne Warren*).]

I have ranked this interesting form as a variety of *M. spinosissima*, a species which I have described and figured in my report on the Polyzoa of Bass's Straits ('Annals' for Aug. 1881). In all the principal elements of structure there is an exact correspondence between the two; but there are also one or two differences, which materially affect the general appearance, and, at the first glance, few probably would be likely to identify them. In the present variety the cells are very much larger than those of the Australian form. The latter are small and delicate, while those of the variety *major* are ample, broadly ovate, massive, and strongly built. But the chief difference between them lies in the system of tubules, more or less immersed in the cell-wall and showing as white striæ on the glossy surface, which gives so distinctive a character to the North-Pacific form. Of this tubular structure I have been unable to detect any trace in the Australian specimens which I have examined. Possibly the condition of the stony crust may be such as to conceal it; but this hardly seems probable, as in the finest colony which has come under my notice calcification has evidently not proceeded far. It may also be noted that the cells of the Australian variety have a well-marked row of punctures round the margin.

At present, looking to the close structural agreement between the two forms, and in the absence of any precise knowledge as to the development and function of the tubules, I prefer to include them in one specific group.

The tubules appear as delicate white lines through the subhyaline crust, radiating from the circumference towards



the centre of the zoëcium. They vary much in length, some being almost rudimentary, and others extending nearly or quite to the centre of the cell. Not unfrequently short tubes alternate with the longer ones; and commonly the latter seem to be composed of several short tubules, which originate one from the other, a little below and behind the orifice. In the younger zoëcia the tubules are, I believe, *on the surface*; but they are soon overgrown by the calcareous crust, and in older states they are completely concealed by it. In highly calcified colonies this feature disappears, and the cells present a uniform opaque surface. The tubules traverse the neck-like portion of the cell, and the numerous oral spines seem to be nothing more or less than their free extremities projecting beyond the margin of the peristome.

It is difficult to form a conjecture as to the precise import of the tubular system, and the more so as there has been no opportunity thus far of tracing the growth of the cell-wall and the mode in which the tubules originate.

The primary cell of *Mucronella spinosissima* closely resembles that of *M. Peachii*.

#### RETEPORA, Imperato.

##### *Retepora Wallichiana*, Hincks.

Houston-Stewart Channel, 15–20 fms.

[Spitzbergen, 20–80 fms., Finmark, Godhaab, 150 fms.]

This form was first described by Smitt\* as a variety of *R. notopachys*, Busk, a Crag fossil. Some years later the examination of specimens obtained by Dr. Wallich in Davis Straits convinced me that it was a distinct species, and it was accordingly described as such ('Annals' for Jan. 1877, p. 107), with the name which Mr. Busk had already assigned to it in MS.

*R. Wallichiana*, when fully developed, forms intricate convoluted and chambered masses of considerable size. It is one of the many arctic species which have migrated to the Queen Charlotte Islands.

#### Family Celleporidæ.

##### CELLEPORA (part.), Fabricius.

##### *Cellepora incrassata*, Lamarck.

Houston-Stewart Channel; Virago Sound, incrusting the stems of Hydrozoa.

\* "Kritisk förteckn. öfver Skandinavien's Hafs-Bryozoer," *Öfvers. Kongl. Vetensk. Akad. Förhandl.* 1867, Bihang.



[Finmark, Spitzbergen, Greenland, Banks of Newfoundland.]

*Cellepora*, ? sp.

*Zoarium* incrusting, of a rather dark brown colour. *Zoæcia* (towards the centre of the colony) erect, crowded, barrel-shaped, some elevated, some immersed; surface smooth, more or less punctured round the margin; orifice arched above, lower margin slightly curved outwards (suborbicular), and having in the centre a small notch, rounded below and contracted at the opening by two minute denticular projections; operculum arched above, straight and entire below; peristome raised in front, embracing a short and stout rostrum, placed immediately below the oral notch, and bearing an *avicularium* on one side close to the top, with rounded mandible directed upwards; two very tall articulated marginal spines, placed one on each side of the orifice above. Large *avicularia* scattered amongst the cells with a broad subspatulate mandible, the beak elevated at the extremity into a hood-like projection, not denticulate. *Oæcium* (?).

Incrusting Retepora and shells.

I cannot identify this form with any of the described species known to me; but I am by no means prepared at present to say that it is new to science. It does not appear (so far as I can judge in the absence of the figures) to be included amongst the 'Challenger' *Celleporæ* characterized by Busk (Journ. Linn. Soc. vol. xv. 1881, p. 341, &c.). If it should prove to be (as I suspect) undescribed, I should propose for it the name of *Cellepora brunnea*.

ADDITIONAL.

Family Porinidæ.

LAGENIPORA, Hincks.

This genus, as originally constituted\*, was formed for a Porinidan species in which the cells are more or less immersed in a calcareous crust. But I am now convinced that this character cannot properly be made the foundation of a generic group, and I propose to apply the name to such forms as possess a lageniform cell with a free orbicular orifice and are destitute of a special pore. The original type of the genus, *L. socialis* mihi, will hold a place in the reconstituted group,

\* 'Annals' for September 1877; 'Hist. Brit. Marine Polyzoa,' vol. i. p. 235.



along with *Phylactella lucida* mihi, a Madeiran species (see 'Annals' for July 1880), and a kindred form from the Queen Charlotte Islands, which I shall now describe.

*Lagenipora spinulosa*, n. sp. (Pl. III. fig. 4.)

*Zoæcia* lageniform, rather irregularly disposed, the lower portion adherent, ovate, thickly covered with punctures (sometimes almost obliterated, when the surface appears roughened or subgranulous); the oral extremity free, tubular, much produced, suberect, the surface perfectly smooth and subhyaline, slightly expanded upwards; orifice terminal, suborbicular, the front margin plain or trimucronate, and more or less elevated above the rest, somewhat everted, on each side a raised process bearing a small *avicularium* of the *Scrupocellaria* type, with minute pointed mandible directed outwards, on the upper (or hinder) margin several spinous processes. *Oæcium* small, rounded, smooth, placed far down at the back of the tubular portion of the cell.

*Zoarium* forming small lobate patches.

On *Tubulipora* (especially) and shells; not uncommon.

This form is nearly related to *L. lucida*, mihi, but is, I have no doubt, distinct. There is a marked difference between the *avicularia* of the two species. In *L. spinulosa* there are two, one on each side of the orifice, resembling very closely the form which is characteristic of the genus *Scrupocellaria*. In *L. lucida* there is only a single minute, oval *avicularium*, which is borne on a stout process, in the centre of the lower margin. *L. spinulosa* is altogether stouter in habit than the Madeiran species, and in the normal state the adherent portion of the cell is thickly punctured, whereas it is entire and smooth and subhyaline in the latter. It differs from *L. lucida* in another point. On each side of the free tubular portion of the cell there is a very distinct line, running the whole length of it, which seems to mark the junction between the front piece and the rest of the tube. The strongly marked groove at the base of the neck-like extension in *L. lucida* is wanting in the present form, which is also characterized by a peculiar habit of growth.

*Microporella Malusii*, Audouin.

A variety of this species occurs, in which there is a very prominent umbo below the pore.

*Schizoporella biaperta*, Michelin.

In a variety of this widely distributed species from the



Queen Charlotte Islands the lateral avicularia have a pointed mandible instead of the normal rounded one. Smitt has noticed the same thing in Floridan specimens.

### EXPLANATION OF THE PLATES.

#### PLATE III.

- Fig. 1. Lepralia bilabiata*, n. sp. 1 *a.* A zoecium with ovicell. 1 *b.* Zoecium with the operculum thrown back, showing the entrance to the tubular passage.  
*Fig. 2. Lepralia claviculata*, n. sp. 2 *a.* Oecium.  
*Fig. 3. Mucronella spinosissima*, Hincks, form *major*; group of cells, showing the tubules in the front wall. 3 *a.* Primary cell. 3 *b.* Zoecium, showing the position of the ovicell behind the tubular orifice.  
*Fig. 4. Lagenipora spinulosa*, n. sp.

#### PLATE IV.

- Fig. 1. Mucronella prælucida*, n. sp.  
*Fig. 2. Mucronella prælonga*, n. sp.  
*Fig. 3. Smittia spathulifera*, n. sp.  
*Fig. 4. Porella marsupium*, MacGillivray, form *porifera*.  
*Fig. 5. Porella major*, n. sp.

### VI.—*Lepidoptera* from the Island of Nias. By ARTHUR G. BUTLER, F.L.S., F.Z.S., &c.

THE following species from the Island of Nias have recently been added to the collection of the British Museum :—

#### *EUPLÆINÆ.*

##### *Caduga funeralis*, sp. n.

Nearly allied to *C. Banksii*, Moore (from Sumatra), but differing much as *Parantica eryx* does from *P. agleoides*, the wings being of a narrower and more elegant form, with the whole of the greenish-white markings much narrower; the abdomen a little browner. Expanse of wings 86 millim.

##### *Salatura eurydice*, sp. n.

Primaries above most like *S. nubila* of Gilolo, but the reddish area of the primaries of a lurid mahogany-red colour, more restricted, divided into three well-marked areoles by the median vein and its first branch, which are very broadly black-bordered, and bounded on costa and inner margin by



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 Tubuliporidæ.

## 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. *Zoæcia* 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. *Zoæcia* 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 zoæcia 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. 5a).

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. *Zoecia* 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 zoecia 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*, Lamarck.

Cumshewa, on *Tubulipora* and *Myrionozoum*.

[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 Cyindræciidæ.

## 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 *zoæcia* 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 *oæcium* 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 zoæcium. 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 Myriozoidæ (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<sup>e</sup> 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 oœcia 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.)

*Zoœcia* 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.

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*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 Sphice*, *Smittia plicata*, *Retepora Wallichiana*, *Cellepora incrassata*, and *Myriozoum 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. 5 a. Portions of the stem showing the offsets from the dorsal surface, by which the zoarium is attached. 5 b. Portion of a branch, showing the disposition of the zoecia. 5 c. 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. 6 a. A colony, nat. size.

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

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























