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XXVIII.—The Polyzoa of the St. Lawrence: a study of arctic forms

Rev. Thomas Hincks B.A. F.R.S.
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Many specimens. This species is evidently allied to *P. Bridgii*, Math. (Proc. Zool. Soc. 1886, p. 349, pl. xxxiv. fig. 2), from Treasury Island and the islands of Bougainville Straits, whence we have many specimens. The male differs in having the band of submarginal spots on the primaries more broken, and there are four subapical spots on the underside hardly seen in the allied form. The female differs obviously by having the discal series of spots much more irregular, whereas in the female of *P. Bridgii* they are regular inter-venal streaks. On the secondaries the submarginal row of spots are rounder, less lunate, and further from the margin.

We have a damaged female of this or an allied species from Florida Island; but without male examples we hesitate to decide as to its position.

Papilio laarchus, sp. n.

♀. Alis fuliginoso-nigris; anticis fascia obliqua ultra cellulam flavida venis quadripartita; posticis fascia lata transversa cellulæ finem transducta lactescenti-albida, margine suo interno fere recto externo profunde serrato: subtus anticis ut supra; posticis lunulis rufo-aurantiis submarginalibus notatis, atomis paucis cæruleis inter ramos medianos. Exp. 6·0.

♂ adhuc ignotus.

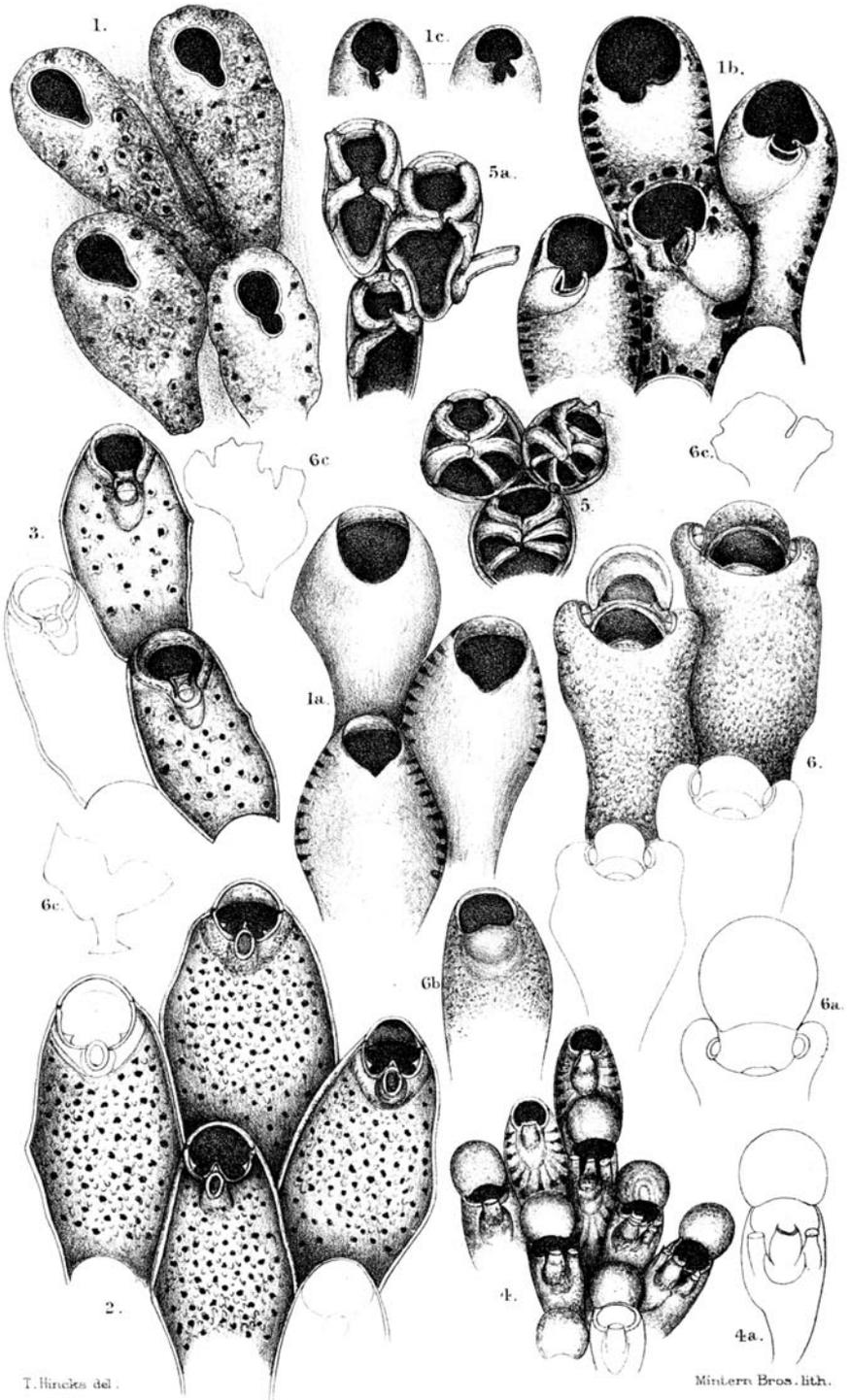
Hab. Rubiana Island (*C. M. Woodford*).

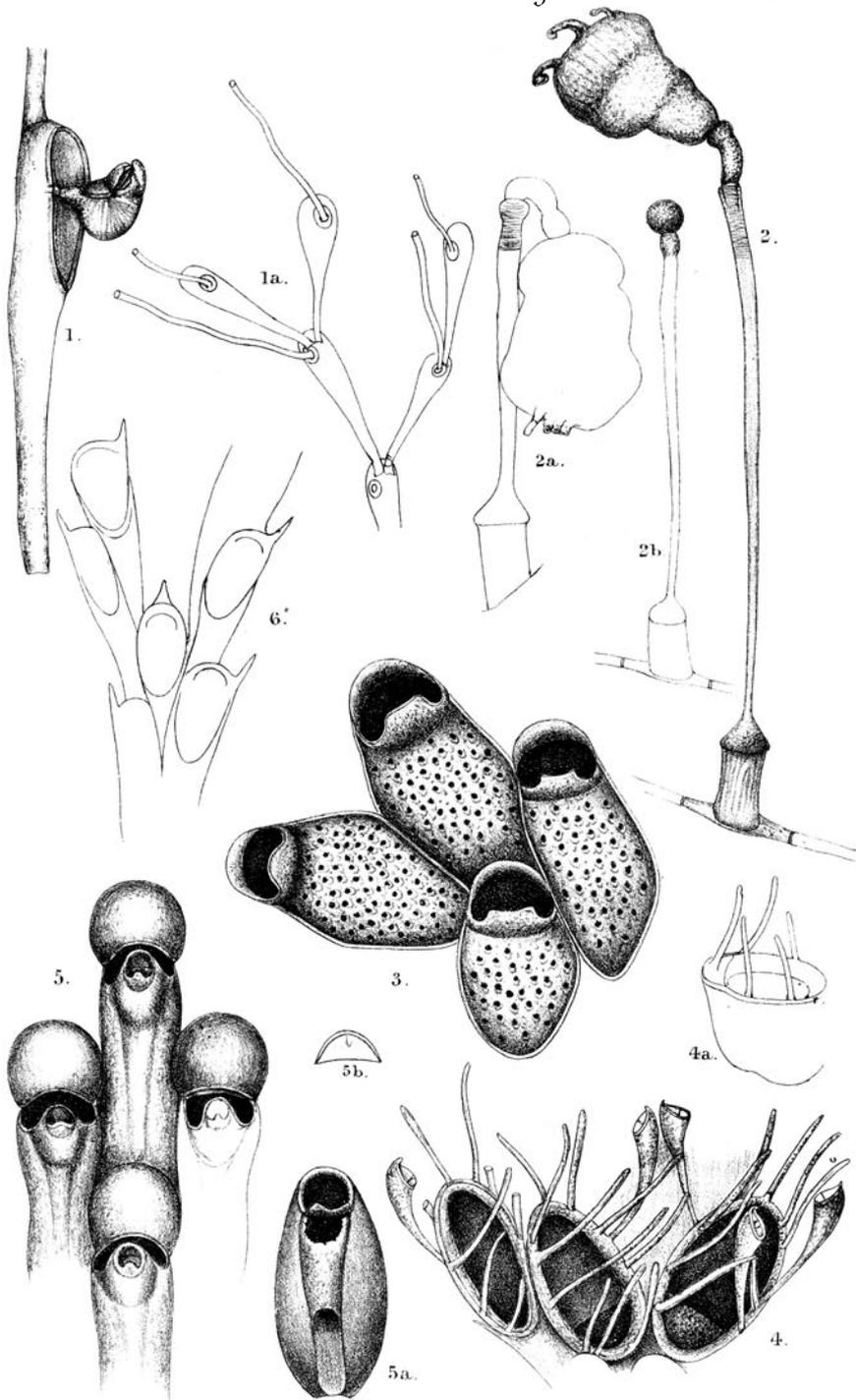
Though we have only a single damaged female specimen before us we can recognize its distinctness from that sex of *P. Woodfordi* of the islands of Bougainville Straits. The marks on the primaries are restricted to an oblique short band beyond the cell, and there are no submarginal spots or any near the anal angle. The band across the secondaries is much wider.

XXVIII.—*The Polyzoa of the St. Lawrence: a Study of Arctic Forms.* By the Rev. THOMAS HINCKS, B.A., F.R.S.

[Plates XIV. & XV.]

THE material on which the present Report is founded has been entrusted to me by Sir J. W. Dawson, F.R.S., of McGill College, Montreal, Mr. J. F. Whiteaves, of the Canadian Geological Survey, and the authorities of the Mon-





treas. Museum, who have placed in my hands for examination their collection of the Hydroids and Polyzoa of the St. Lawrence. Circumstances have hitherto prevented me from making much progress with the work, and I have to apologize for a delay which I did not anticipate and much regret. As it would only lead to further delay to defer publication until the whole of the material has been examined, I propose to commence at once with studies of new forms as they occur, and such as from any cause seem to require further illustration, reserving the complete systematic list of species and general conclusions for the close of the Report.

Subclass CHEILOSTOMATA.

Family Bicellariidæ.

CORYNOPORELLA, n. gen.

Generic character. Stems slender, consisting of cells disposed in single series and facing one way, dichotomously branched; zoecia more or less clavate, each cell originating from the dorsal surface of the one beneath it, immediately below the summit, elongate, the inferior portion (from a little below the aperture) much attenuated, tubular; aperture at the top of the cell, occupying a small proportion of its length. Avicularia articulated, attached to the side of the aperture.

Corynoporella tenuis, n. sp. (Pl. XV. figs. 1.)

Zoarium minute, transparent; *stems* slender, bifurcating at intervals. *Zoecia* subclavate, much elongated, slightly expanded towards the upper extremity which is rounded, the inferior portion very slender; aperture extending down rather less than a third of the length of the cell, occupying its entire width above, and tapering off to a rounded point below, margin thin and destitute of spines, upper wall wholly membranous; orifice arched above, straight below; on the margin at one side less than halfway down the cell a rather large articulated avicularium, the dorsal surface sloping abruptly upwards from the peduncle (which is short) and very protuberant, the top flattish, terminating in a long beak-like extremity, not abruptly bent; surface smooth, the whole structure (viewed laterally) somewhat wedge-shaped. Fibrils given off from the dorsal surface of the cell, a little below the summit towards one side. *Oœcium* (?).

Hab. Forming small tufts attached to other Polyzoa.

The cells of this species bear a strong general resemblance to those of the genus *Brettia*, but the articulated avicularium is a link connecting it with *Bugula*. Its place, I think, is in the Bicellularian series. At the same time it possesses characters which probably entitle it to generic rank. Too much importance must not be attached to the uniserial habit; but the small aperture, so unlike that of the true *Bugula*, and the tubular prolongation of the cell below are structural features of considerable moment. In the form and position of the avicularia this species agrees with *Bugula*. The genus *Bugulella*, instituted by Verrill for a species which he obtained on the coast of North America, seems, so far as we can judge in the absence of a figure and specimens, to be founded on a different type.

Family Cellulariidae.

CELLULARIA, Pallas.

Cellularia Peachii, Busk. (Pl. XV. fig. 6.)

I have figured this well-known species from a St.-Lawrence specimen to show the cusp on the median cell at the bifurcation of the branches, which it shares with the Australian *C. cuspidata* of Busk. It is true that it is frequently absent (in both species I believe), but there is no doubt that it occurs in the North-European as well as the Australian species, and is not by any means a distinctive character*.

Family Cribrilinidae, Hincks.

MEMBRANIPORELLA, Smitt (part.).

Membraniporella crassicosta, n. sp. (Pl. XIV. figs. 5.)

Zoecia ovate, disposed (rather irregularly) in lines; front wall composed of a few (about six or seven) broad, flat, and rather massive ribs, usually more or less separated by considerable interspaces; no distinct sternum; orifice (secondary) suborbicular, enclosed by two stout rib-like processes which unite in front; oral spines wanting. *Avicularia* none. *Oecium* (?).

Hab. Spreads in reddish-brown patches over various kinds of Polyzoa (*Escharoides Sarsii* &c.).

The species to which the present form makes the nearest

* See Busk's 'Challenger' Report, part 1, p. 17. Mr. Busk suggests the propriety of recurring to his original name, *Cellularia monotrypa*, in place of *C. cuspidata*, if the presence of the cuspidate point should prove to be also a character of *C. Peachii*.

approach is *Flustra Aragoi* of Audouin; but apart from other differences the latter is at once distinguishable by the peculiar structure of the oral extremity of the cell and the remarkable lobed appendage on each side of the orifice. It is difficult to meet with a perfectly formed cell of *M. crassicaosta*. Amongst the St.-Lawrence dredgings it is far from uncommon, and I have had the opportunity of examining a good many specimens; but scarcely a cell has occurred in which the full complement of ribs was present. In a large proportion of cases only the oral ring and the first pair of the rib-like processes are developed, so that the colony presents a most unfinished appearance. The ribs are flat and massive and expanded at the base; their points meet in the centre and unite without much regularity, and there is consequently no straight median line of junction, as in the British *M. nitida*. In the early stages of development the cell is destitute of all covering but the membranous front wall, and is furnished with a plain thickened margin, on which no trace of the rib-like spines is yet visible. The first to appear are the two oral appendages, which originate on each side just below the top, and as they increase in length bend round towards the front and meet in the centre, forming the oral margin, on each side of which there commonly rises a mucronate projection. The first pair of ribs are developed immediately below the margin, to which they are generally closely united throughout a large portion of their length. A second pair originate lower down on each side, and pass diagonally towards the centre, where they unite with the others; and usually one or two ribs more pass upward from the lower margin towards the same point. This is the general plan, but there are many irregularities. The ribs are for the most part separated by rather large lacunæ, so that in this case the protective covering is an open framework and not a solid wall. The reddish-brown colour of the crust seems to be a constant character in fresh specimens.

Other species of this genus are *M. nitida* and *M. melolontha* (Brit.), *M. distans* (Austr.), *M. sceletos* (Madeira), *M. Agassizii* (Florida), *M. Aragoi* (? Medit. or Red Sea).

Family Membraniporidae.

MEMBRANIPORA, De Blainville.

Membranipora cymbiformis, Hincks. (Pl. XV. figs. 4)

Membranipora spinifera, Smitt, Krit. Förteckn. öfver Skandin. Hafs-Bryoz. pt. 3, pl. xx. fig. 32.

This form was first noticed by Smitt, but he referred it to

M. spinifera, from which it differs in many important particulars. Omitting the differences in the number and character of the spines and the disposition of the zoœcia (though these are sufficiently distinctive) the structure of the cell itself is quite dissimilar in the two forms. In the present species the zoœcium is short, massive, enclosed by comparatively high walls, and furnished with a solid calcareous floor (Pl. XV. fig. 4 a). The lower portion of the aperture is covered in by a calcareous lamina*. In these points it presents a contrast to that of *M. spinifera*. Another striking feature of *M. cymbiformis* is the tall pedicellate avicularium. There are commonly two of these appendages on a cell placed one on each side. At the top of the cell there are usually three tall spines.

This form was described as long ago as 1877 †, but no figure accompanied the description. It seemed desirable to supply one, as Smitt's figure, though strictly accurate as far as it goes, is on too small a scale and does not show some of the important characters.

M. cymbiformis seems to be abundant in the northern seas. In the St. Lawrence it occurs in small patches incrusting Hydroids and Polyzoa.

Range. Northern and Arctic seas (18–60 fath.). [Kara Sea, on *Sertularia* and Algæ (*Levinsen*); Jan Mayen, on *Alcyonidium* and *Pycnogonidæ* (*Lorenz*).]

Family **Escharidæ** (part.), Smitt.

ESCHAROIDES, Smitt (= *Escharopsis*, Verrill ‡).

Escharoides § *Sarsii*, Smitt. (Pl. XIV. figs. 1.)

Cellepora cervicornis, var., Sars, Reise Lofoten og Finmark. p. 28 (sep.).

Eschara rosacea, Sars, Beskr. N. Polyzoa, 1862, p. 3 (sep.).

Eschara Sarsii, Busk, Linn. Soc. Journ., Zool. xv.

Escharopsis lobata (Lamx.), Verrill, Proc. U. S. Nat. Mus.

This interesting form has been investigated by M. Sars

* This character was correctly given by Prof. Smitt, but escaped my notice, and was not included in my description.

† "Polyzoa from Greenland and Labrador," Ann. & Mag. Nat. Hist. for January 1877. The species credited in this paper (through a mistake) to Iceland were really obtained in Davis Straits.

‡ Bull. Nat. Mus. U. S. no. 15, p. 149 (1879). There seems to be hardly sufficient reason for superseding the name adopted by Smitt for this group from Milne-Edwards, and which has found its way into general use. It has been employed by Busk in his 'Challenger' Report.

§ Smitt, in one of his later papers ("Bryoz. of Novaja Semlja," 1878), has referred this species to his genus *Discopora*, a group which is com-

and Smitt, and it might almost seem superfluous to discuss it further. But Sars's account is unaccompanied by figures, and is so far unsatisfactory. Smitt has supplied this deficiency, and would have left little to be desired if his figures had been drawn on a larger scale. The difficulties of the Swedish language may probably prove a more serious obstacle to the student, and it may not therefore be useless to give a brief account of the development of the zoecium.

It would be a waste of time to consider whether Lamouroux's *Eschara lobata* ('Exposition Méthodique') was founded on the present form. It may have been; but neither his description nor his figure affords the means of settling the question with certainty. It is only an adequate diagnosis or figure that gives to any name a claim to adoption, and it must be accounted an injury to science to burden its records with merely speculative identifications.

Prof. Verrill refers *Lepralia producta* of Packard to this species; but unless he had the opportunity of examining an authenticated specimen he would find it difficult, I think, to prove his point. Packard's description, even when supplemented by his figure, is quite inadequate.

The changes which the zoecium passes through in this species are very striking, and show in a very forcible way the necessity of a careful study of the Polyzoan colony through all the phases of its growth.

The young marginal cell presents a smooth or slightly wrinkled surface, perforated round the edge.

The orifice is suborbicular, perfectly simple, and not elevated above the cell-wall (Pl. XIV. fig. 1 *a*). In this stage the cells are convex and the sutures well defined.

The first change consists in a slight sinuation of the lower margin of the orifice, which is accompanied by an elevation of the peristome. In the second row (from the margin of the colony) a rather deep and somewhat irregularly shaped sinus has been developed, bounded by two denticular processes (Pl. XIV. fig. 1 *b*), within which an avicularium has originated, the mandibular portion of which is placed obliquely along one side of the sinus, whilst the avicularian chamber (a pouch-like inflation of the surface) lies between it and the

posed, as it seems to me, of somewhat heterogeneous elements. Verrill has dismembered it and retains the name *Discopora* for forms "having both median and lateral avicularia, with the former (or both) often raised on a prominence in front of the zoecial aperture" (Proc. U. S. Nat. Mus.). These changes cannot be discussed here, but I see no reason for merging the genus *Escharoides* in any other group.

boundary of the cell. The pointed mandible of the avicularium is directed upwards. At the same time the elevation of the peristome has been proceeding, and a secondary orifice has been formed which differs widely from its predecessor. The subsequent changes, which produce a marked effect on the appearance of the species, are in great measure due to the progress of calcification. The new features which have been added are to a large extent obliterated by the rapid accretion of calcareous matter. The cells lose their convexity, the sutures all but disappear, the punctures become indistinct, the orifice on which the avicularium was developed is no longer on the surface, but deeply sunk beneath it, and at last the avicularium becomes undistinguishable. The adult orifice is rounded above and produced in front into a rather long pointed sinus (Pl. XIV. fig. 1). In the more advanced stages of growth a dull, minutely granulose, flattish crust covers the zoecia. The structural elements to which most interest attaches are probably the sinus on the secondary orifice and the associated avicularium. Their development proceeds *pari passu*, and the shape of the sinus is more or less determined by the avicularium.

In this case the sinus seems to be simply a provision for the reception of the avicularium, and, indeed, it is probable that it is in large measure due to the growth of the avicularium along the edge of the secondary orifice. It has therefore a distinctive significance and is not comparable with the (apparently) similar structure amongst the Myrizoidæ. The development of *Escharoides rosacea*, Busk, runs parallel to that of the present species*, and its structural features are almost identical.

I think we may recognize in *Escharoides* the characters of a natural group.

E. Sarsi appears to be abundant in the St. Lawrence and generally in the northern and arctic seas. It forms large coral-like growths composed of many massive branching segments springing from a common base, foliated, contorted, expanding upwards, and terminating above in numerous smaller segments.

Range. Antarctic seas (*Sir J. Hooker*); Tromsö, 20-60 fath. (*Sars*); Spitzbergen, Greenland, Nova Zembla (*Smitt*); Jan Mayen (*Lorenz*); Kara Sea, 49-65 fath. (*Levinsen*).

* 'British Marine Polyzoa,' i. pp. 337, 338.

PORELLA, Gray.

Porella Skenei, Ellis & Sol., form *plana*, n. var.
(Pl. XIV. figs. 6.)

Zoarium erect, bilaminate, compressed, forming broad flattish expansions, slightly divided into segments at the top, which lie very much in the same plane, edged by a smooth border composed of aborted cells; surface smooth. *Zoecia* large, arranged with much regularity in quincunx, elongate, of about equal width throughout, subcylindrical, convex, distinct, slightly tumid below the orifice (not suberect above), surface shining, minutely granulated; orifice (primary) semi-circular; adult orifice subquadrangular, peristome elevated, so as to conceal the primary opening, destitute of spines, lower margin slightly curved outwards, in the centre of it a rounded *avicularium*, facing inward and just visible above the margin; on each side a stout erect process, somewhat enlarged above and rounded at the top, where it curves slightly inward, bearing immediately below the top, looking into the opening of the cell, a small rounded *avicularium*. *Ooecium* ample, rounded above, closely united to the neighbouring cells, often subimmersed, surface granular, closed in front by a smooth white porcellaneous plate, which stretches down into the cavity of the cell. Circular *avicularia* often thickly scattered over the zoarium.

It is with some hesitation that I refer this form to *P. Skenei*. There are many striking differences between the two. In the first place there is a remarkable dissimilarity in habit. In the present form the zoarium is much larger* and more massive than in the normal *P. Skenei*, the segments are broader, much in the same plane, and much less numerous than in the other, and not so regularly truncate at the extremity. Specimens present a flattish, smooth, expanded surface, glossy and of a whitish colour; they rise from a small circular disk composed of aborted cells, narrow and stem-like for a short distance above it and then widening out (Pl. XIV. fig. 6 c). *P. Skenei*, so far as I have seen, originates in an irregularly spreading crust, largely composed of normal cells, and its surface bristles with tall *mucronate* processes. The latter are *totally* wanting in the variety, and with them the most characteristic feature of the normal form disappears. The central *avicularium* is placed within the margin of the peristome and is barely visible. In *P. Skenei*, n., the whole

* Every element of structure is on a larger scale in the present form than in the normal *P. Skenei*.

of the cell-wall immediately below the orifice is elevated, and the central portion rises into the very prominent mucro; in the present form the front surface is almost uniform throughout. The lateral aviculiferous processes, which form so remarkable a feature of the variety, are placed one on each side of the orifice at the very top of the cell. They curve inward a little above, and the avicularium is situated just below the top on the inner face. In the var. *bicornis* (*Lepralia bicornis*, Busk) there is a cylindrical process on each side of the orifice, bearing an avicularium on the apex; but this would hardly be a correct description of the analogous processes on the present form. In the var. *tridens* (Busk) two processes are developed *in a line with* the central mucro; in both these cases, however, the *general* characters are those of the normal *P. Skenei*.

On the whole, I think, this form must be regarded as a very remarkable variety of that species. Amongst the partially developed cells on the crustaceous base of the latter the mucro is undeveloped, and occasionally a pair of lateral processes may be met with which closely resemble those of the form *plana*. The *oæcium*, which has some peculiarities, seems to be alike in both. At the same time the amount of divergence from the ordinary type of the species and the change in external aspect which accompanies it are certainly exceptional.

In my 'History of British Polyzoa' *P. Skenei* is ranked in the genus *Palmicellaria*, Alder; but I am now convinced that its true affinity is with *Porella*.

Loc. Gulf of St. Lawrence, Trinity Bay, 96 fath.

Porella elegantula, D'Orbigny. (Pl. XV. figs. 5.)

Eschara elegantula, D'Orb. Pal. Franç. Terr. Crét. v. p. 102; Packard, Southern Labrador Animals, Canad. Nat. & Geol. viii. (1863); Smitt, Kritisk Förteckn., Öfvers. K. Vetensk.-Akad. Förhandl. 1867, p. 24; Dawson, J. W., Postpliocene Geol. Canada, 1872, Canad. Nat. n. s., vi.; Busk, North Polar Polyzoa, Journ. Linn. Soc. xv. 1880; id. Chall. Rep. pt. i. p. 141.

Eschara saccata, Busk, Pol. Norway and Finmark, Ann. & Mag. Nat. Hist. ser. 2, xviii. p. 3; Sars, M., Norsk. Pol. 1863 (sep.).

Eschara glabra, Hincks, Pol. Barents Sea, Ann. & Mag. Nat. Hist. October 1880.

Porella elegantula, Levinsen, Bryoz. f. Kara-Havet. Dijnphna-Togtets zool.-botan. Udbytte, 1886.

Lepralia elegantula, Lorenz, Pol. v. Jan Mayen, 1886.

I am inclined to agree with Levinsen in referring this interesting species to the genus *Porella*. In essential structure it resembles the latter, but the resemblance is somewhat

masked by the great extension of the avicularian chamber, which ultimately covers a large proportion of the front of the zoecium. Before its appearance the latter is very moderately convex, the peristome not elevated, the surface smooth, the orifice arched above and slightly curved below. In most of the marginal cells the avicularium is already outlined. At the top it is of equal width with the orifice; from this point it tapers off for a short distance, and then continues subtubular to the base (Pl. XV. fig. 5 a). When it is fully developed and enlarged by the progress of calcification the zoecium appears cylindrical. In later stages, when there has been a large accretion of calcareous matter, the divisions between the cells become inconspicuous, the surface is nearly level and uniformly granular, and the avicularium, so prominent at first, is deeply sunk in the shaft-like cavity of the orifice. In the lower portion of the zoarium and for a considerable distance above the base the cells are almost wholly obliterated, and the surface is smooth and glossy.

Concurrently with the growth of the avicularium the peristome rises and the secondary orifice is formed. If the "pouch-like" avicularium is not a generic distinction (and the course of its development agrees very closely with that of the corresponding structure in *Porella*) there is nothing to separate this form from the last-named genus.

The variety (*rostrata*) in which the anterior portion of the avicularium is free and rises into a prominent rostrum overhanging the orifice (Pl. XV. fig. 5) occurs in the *St. Lawrence*. The species seems to be common in this region, and, so far as we know, is confined to the northern and arctic seas. It forms light and very elegant coral-like growths, which originate in a small spreading base, on stones &c., much branched, the main branches somewhat antler-shaped, springing from a little above the point of attachment, divided and subdivided into numerous branchlets, which terminate above in more or less expanded subtruncate segments.

Range. Newfoundland, Labrador, Finmark, Greenland, Spitzbergen, Barents Sea, Kara Sea, off Hare Island, Baffin's Bay, Nova Zembla.

Canadian Postpliocene (*Sir J. W. Dawson*).

Porella proboscidea, n. sp. (Pl. XIV. figs. 4.)

? = *Eschara verrucosa*, Smitt, form 2, *Kritisk Förteckn.* 1868, p. 142, pl. xxvi. fig. 135.

Eschara cervicornis, forma *verrucosa*, Bryozoa from Nova Zembla, *Cefversigt af Kongl. Vetensk.-Ak. Förhandl.* 1878, no. 3; *Recensio animal. Bryozoorum quæ ad peninsulam Kola invenit F. Trybom, ibid.* 1878, no. 7.

Zoecia ovate, quincuncial, decidedly convex, depressed below, and rising rather abruptly towards the oral region; surface white and shining, smooth (in young cells) or slightly roughened, in some states areolated, delicate costæ passing upward from the margin to the base of the avicularian umbo; primary orifice semicircular; immediately below it, placed centrally, an erect process, expanded below, narrowing slightly upward and bending in towards the orifice (which it sometimes overhangs slightly), bearing on its summit a circular *avicularium*, immediately behind which rises a short mucro; peristome in the adult cell elevated, especially in front, embracing the avicularium. *Oœcium* prominent, rounded above, broader than high, flattened in front, surface minutely pitted over (in the young state smooth, glassy, emarginate), commonly a small elongate fissure on the front.

Var. With a smaller avicularian process on each side of the central one and close to it, or sometimes only on one side (Pl. XIV. fig. 4).

Hab. On shells and Hydroida, in small patches.

The *Eschara verrucosa* of Smitt is certainly not identical with the *Lepralia verrucosa* of Johnston, Busk, &c., to which he at first referred it. The latter is a much larger species, with an orifice of a totally different structure. He subsequently ranked it as a form of *Eschara cervicornis* (= *Porella compressa*, Sowerby).

I am by no means sure that I am right in identifying it with the present species. Prof. Smitt has given us a very brief description of it, and unfortunately his figure is too small to be of much service. At the same time I think it more than probable that the two are identical. The present form is clearly a *Porella*. It differs indeed from most of the species of this genus in the costate condition of the front wall of the zoœcium (though we meet with it in *P. struma*, Norman); but in all essential points its structure allies it to this group. One of its most distinctive characters (as a species) is the elevated avicularian rostrum, which may remind us of the similar structure in *Umbonula verrucosa*. The delicate texture, the silvery whiteness, the elevated front wall with the radiating ribs (not always present) are also characteristic features.

Loc. St. Lawrence, Orphan Bank and off Cap Rozier, 38 fath. If I am right in identifying *P. proboscidea* with Smitt's species, it has also occurred in Spitzbergen, Nova Zembla, and the Peninsula of Kola.

MUCRONELLA, Hincks.

Mucronella prælucida, Hincks. (Pl. XV. fig. 3.)

This species was described and figured in my "Report on the Polyzoa of the Queen Charlotte Islands"*. It is figured again in the present paper because the St.-Lawrence specimen differs in some respects from the North Pacific, and notably in the absence of the peculiar projections, placed one on each side of the cell at the base of the raised peristome. These have much the appearance of avicularia, but are not really such. The diminutive zoecium in the present figure is probably one of those which lie about the primary cell; but all the cells are smaller in the St.-Lawrence than in the Pacific specimen. In the Queen-Charlotte Report I ventured to conjecture that the new forms described in it would probably not be to any great extent arctic. There can be little doubt, however, that *Mucronella prælucida* at least has followed the usual course of migration from the extreme north along both the Atlantic and Pacific coasts of America.

SMITTIA, Hincks.

Smittia Landsborovii, Johnston, form *porifera*, Smitt.
(Pl. XIV. fig. 2.)

The only form referable to the above species which has yet occurred to me amongst the St.-Lawrence dredgings would rank under Smitt's *Escharella porifera*. This must, I think, be accounted a "form" of *S. Landsborovii*; the differences between them are hardly of sufficient moment to warrant their separation. They may be briefly summed up. In *S. porifera* the zoecia are ovate or (frequently) rhombic, very thickly punctured over the entire surface, and of a dull white colour; the peristome is less elevated than in the normal *S. Landsborovii*, the avicularium is larger and rather more elongate, and stands out very prominently below the inferior margin, so as to have a rostriform appearance. The central denticle is sometimes wanting, and when present is less conspicuous than in the ordinary form, owing to the larger size and greater prominence of the avicularium; it is sometimes small and pointed. The orifice is subcircular, whilst in the latter it is more correctly described as "rotundato-

* Ann. & Mag. Nat. Hist. ser. 5, vol. xiii. pl. iv. Reprinted for the Geol. & Nat. Hist. Survey of Canada, 1884, p. 26 (sep.), pl. iv. fig. 1.

quadrangularis." In some forms of *S. Landsborovii* the peristome is much more elevated in the ovicelligerous cells than it is in the present, and forms a deep channelled sinus, at the extremity of which the avicularium is placed. In this condition the secondary orifice is subtriangular.

There seems to be a large amount of variability in the characters of the peristome as well as in the size and shape of the zoëcium itself*. The present form has the leading features of the specific type, with a moderate amount of variation in detail, and there hardly seems to be sufficient reason for separating it from *S. Landsborovii*. (Pl. XIV. fig. 3).

Range. Spitzbergen, Hammerfest, Jan Mayen, Peninsula of Kola, Nova Zembla; South Devon †.

Subclass HOLOBRANCHIA, Lankester.

Family Pedicellinidæ, Hincks.

BARENTSIA, Hincks.

Barentsia major †, n. sp. (Pl. XV. figs. 2.)

Zoarium consisting of a rather stout, creeping, and branched stolon, jointed at intervals, along which the pedicels supporting the polypides are distributed; *pedicels* of great length, extremely slender below, expanding considerably towards the summit, delicately ringed, of a very light horn-colour, rising from a stout cylindrical base, conical above and of a whitish colour, not annulated; *polypides* large, white, expanding from the base upward, slightly gibbous on one side, tentacles numerous, the fleshy peduncle or stalk connecting them with the pedicel comparatively long, enlarged immediately below the base of the polypide.

This species is allied to *B. gracilis*, Sars, but is of very much larger size. The pedicels for a great proportion of their length are very slender, tubular, rigid, but towards the upper extremity they widen out considerably and appear to be com-

* See Hist. Brit. Mar. Pol. plate xlviii. figs. 6-9.

† The South-Devon specimen agrees very closely with Smitt's figures of his *Escharella porifera* (*op. cit.* plate xxiv. figs. 30, 31).

‡ Busk has substituted, in his 'Challenger' Report (part 2, p. 40), the MS. name *Ascopodaria* for *Barentsia*. As I am unable to recognize the propriety or legality of this change, I have retained the latter, which was the first published designation of this remarkable pedicelline group. I hope to find an opportunity of discussing the grounds of this change on some future occasion.

posed of a membranaceous material. The muscular cylinder is tall and stout, decidedly conical above, and of a whitish colour. The length of the fleshy stalk immediately supporting the polypide and by which it is attached to the pedicel is a distinctive character. It is dilated below the body of the polypide, which is large and pretty regular in shape. The pedicels are developed in great numbers on the stolon; at the point where each originates opposite branches are given off.

Loc. St. Lawrence.

EXPLANATION OF THE PLATES.

PLATE XIV.

- Fig. 1. Escharoides Sarsii*, Smitt. Adult zoecia from the older portion of a colony. 1 *a.* Zoecia in the earlier stages of development. 1 *b.* Zoecia, showing the development of the oral avicularium. 1 *c.* Early stages in the growth of the avicularium.
- Fig. 2. Smittia Landsborovii*, Johnston (sp.), form *porifera*, Smitt.
- Fig. 3. Smittia Landsborovii*, Johnston, normal.
- Fig. 4. Porella proboscidea*, n. sp. [This figure and also 5 and 5 *a.* are less highly magnified than the rest of the Plate.] 4 *a.* A single zoecium.
- Fig. 5. Membraniporella crassicosta*, n. sp. 5 *a.* Immature zoecia.
- Fig. 6. Porella Skenei*, Ellis & Sol., form *plana*, n. var. 6 *a.* Ooecium. 6 *b.* Marginal zoecium, showing the primary orifice and early stage of the avicularian chamber. 6 *c.* Zoarium, nat. size.

PLATE XV.

- Fig. 1. Corynoporella tenuis*, n. gen. and sp. A zoecium, drawn to the usual scale. 1 *a.* Portion of the zoarium, less highly magnified, showing the dorsal surface, the mode in which the cells are connected, and the position of the fibrils.
- Fig. 2. Barentsia major*, n. sp. A single pedicel and polypide. 2 *a.* Ditto, showing the mobility secured to the polypide by the fleshy stalk by which it is attached to the pedicel. 2 *b.* A pedicel on which a new polypide is in course of development.
- Fig. 3. Mucronella prælucida*, Hincks.
- Fig. 4. Membranipora cymbiformis*, Hincks. 4 *a.* Marginal zoecium.
- Fig. 5. Porella elegantula*, D'Orbigny, var. *rostrata*. 5 *a.* Young zoecium, showing an early stage in the development of the avicularium. 5 *b.* The avicularian mandible.
- Fig. 6. Cellularia Peachii*, Busk, showing the cusp on the median cell at a bifurcation.