the mouth-parts, while in modern Diplopoda two segments are required for this purpose: this peculiarity of the fossil is inferred solely but sufficiently from the fact, perhaps even more remarkable, that every segment of the body (as represented by the dorsal plates), even those immediately following the single head segment, is furnished with *two* ventral plates and bears *two* pairs of legs. As is well known, each of the segments immediately following the head-segments in existing Diplopoda bears only one ventral plate and only a single pair of legs—a fact correlated with the embryonic growth of these creatures, since these legs and these only are first developed in the young diplopod. The mature forms of recent Diplopoda therefore resemble their own young more than do these Carboniferous myriopods—a fact which is certainly at variance with the general accord between ancient types and the embryonic condition of their modern representatives, and one for which we can offer no explanatory suggestion worth consideration.

Unfortunately the preservation of the appendages of the head in these Carboniferous forms is not sufficiently good in any that have yet been found to allow any comparison with modern types. This is the more to be regretted since these parts are those on which we depend largely for our judgment of the relationship of the Myriopoda to other Insecta and to Crustacea. If they were present and sufficiently well defined, we may well suppose that they would afford some clue to the genetic connexion of these great groups.

The structure of the Carboniferous *Euphoberiæ* has thus been shown to differ so much from that of modern Diplopoda that, as stated at the outset, we seem warranted in placing them in a group apart from either of the suborders of modern Myriopoda and of an equivalent taxonomic value.

Cambridge, U.S., January 7, 1881.

XLVI.—*Polyzoa, Cœlenterata, and Sponges of Franz-Joseph Land.* By Stuart O. Ridley, B.A., F.L.S., Assistant in the Zoological Department, British Museum.

[Plate XXI.]

The specimens here to be described were collected by Mr. Grant, the naturalist accompanying Mr. Leigh Smith in his cruise last autumn to Franz-Joseph Land and Spitzbergen. They were presented by the latter gentleman to the British Museum, and form the first collection from the former locality which has yet

been worked out. They were all obtained at one locality, viz. lat. 79° 55′ N., long. 51° 0′ E., or at about the same latitude as the extreme south of Wilczek Island, and the same longitude as Eira harbour, on the south-west coast of Franz-Joseph Land; the station appears thus to have been at some distance from land. The depth is not known. Mr. Miers * has already described the Crustacea and Pycnogonida obtained at the same time.

I had hoped that a study of the above groups of the fauna of this newly-discovered coast might lead to some indication of the connexions which the land bears to the neighbouring arctic lands, Greenland, Spitzbergen, or the land west of Smith's Sound, or to a possible polar sea.

It is known that a rapid current sets down the straits which divide the tract known as Franz-Joseph Land from that called Wilczek Land, and that, probably in consequence of this, the water here is free from ice at an earlier and a later time in the year than is usual in such latitudes. This current may either be due to the remains of that branch of the Gulf-stream which sweeps up the western shore of Spitzbergen, and which, if this hypothesis is correct, would pass on northwards past a north-western angle of Franz-Joseph Land to enter the northern end of its great straits; or it may be due to some polar current derived from an open polar sea. The fact that the current is coexistent with an unusually open condition of water speaks for the theory that it is a *warm*, not a cold one, such as a polar current would be, while the relations of the fauna of the coasts which are bathed by this current appear also to point to the conclusion that its communications are with the eastern (*i. e.* the Spitzbergen and Novaia Zemlia), not the western (*i. e.* Greenland and Smith's Sound) divisions of the polar area, and in consequence do not support the theory of an open polar sea. To arrive at some idea of the faunistic relations of this coast, a Table has been added below to show the relations of its species to those of the other polar tracts. It is seen at once, even with the small number of species (twenty-two) here cited, how nearly most of the arctic seas are related to each other in regard to these branches of the fauna; but Smith's Sound, the main western approach to the Pole, appears to diverge from Franz-Joseph Land more widely than any of the other districts (with the exception of Iceland and East Greenland, from which very few species in all are known), only four species being at present known common to both—a conclusion supporting that which was above favoured, in re-

* Ann. & Mag. Nat. Hist. ser. 5, vol. vii. p. 45.

gard to the non-existence of an open polar sea connecting it with Franz-Joseph Land.

With respect to the zoological aspects of the fauna, we miss the familiar Spitzbergen *Hornera*, *Membranipora lineata*, *Menipea ternata*, &c.; and none of the new forms described by Mr. Hincks from the Barents Sea have reappeared here. The only possibly new species is that described provisionally as a variety of the well-known British and arctic *Mucronella ventricosa*. Cœlenterata and Sponges are not more than represented. However, considering that but one station was worked, the results may be said to be interesting as pointing to the existence of a great eastern boreal as distinguished from a small western polar Polyzoan subdistrict.

Polyzoa.

Chilostomata.

Menipea arctica, Busk.

Menipea arctica, Busk, Quart. Journ. Micr. Sci. iii. p. 254, pl. i. figs. 4–6.

In great abundance; no trace of an operculum observed in any specimen; so Smitt must, as Busk (Journ. Linn. Soc. xv. p. 232) implies, have united two species under his *Cellularia ternata*, forma *gracilis*. Number of cells in an internode 4 or 5. A distinct variety occurs with *two* spines on upper margin of cell. The cell in which the root-fibre originates is oval, and from its position, which is usually immediately above the orifice of a cell, is liable to be taken for an ovicell. No ovicells observed. Lateral avicularia not uncommon.

On *Alcyonidium gelatinosum* &c.

Scrupocellaria scabra, Van Beneden.

Cellarina scabra, Van Beneden, Bull. Acad. Roy. Belg. xv. p. 73, pl. i. figs. 3–6.

Scrupocellaria scabra, Hincks, Hist. Brit. Mar. Pol. p. 48, pl. vi. figs. 7–11.

Differs in some important points from the form of this species figured by Hincks, agrees better with Van Beneden's North-Sea specimens; thus the operculum generally covers the entire aperture of the cell, and, with the exception of a tilting-up of the upper edge, the surface is flat, not concave. Two spines are commonly found on the outer edge of the aperture. Internodes short, consisting of either 2, 3, or 4 cells, exclusive of the median cell of the furcation. The anterior avicularia occur, as a rule, only below the lowest cell but one of the internode and the median cell of the furcation.

Vibracular cells and rooting-fibres absent from terminal internodes.

A small colony, 6 millim. high, on *Escharoides Sarsi*.

Gemellaria loriculata, Linné.
(Pl. XXI. fig. 1.)

Cellularia loriculata, Pallas, Elench. Zooph. p. 64.
Gemmellaria loriculata, Van Beneden, Recherches Bryoz. p. 33, pl. v. figs. 1–6.

Has the form depicted in Van Beneden's figures (*l. c.*) : the slight lamina extending across the lower end of the opening, as there given, but omitted in all other representations which I have seen, is present here and adds to the beauty of the species. The cells are long, as in the same figures.

Bugula Murrayana, var. *fruticosa*, Packard.

Menipea fruticosa, Packard, Canad. Nat. viii. p. 409, pl. i. fig. 3.
Bugula Murrayana, var. *fruticosa*, Hincks, Hist. Brit. Mar. Pol. p. 93, pl. xiv. figs. 3, 5.

Some fragments agreeing generally with the best-known form of this variety, viz. that with 2 to 4 series of cells in its dichotomously dividing branches. The outer upper angle of the cells is sharply angular rather than spined; generally a spine on each side a little below the top, never more than one. Avicularia of the smaller size only. The cell-characters agree well with those of Busk's fig. 1, pl. xii., Journ. Linn. Soc. xv.

Flustra carbasea, Ellis & Solander.

Flustra carbasea, Ellis & Solander, Hist. Zooph. p. 14, pl. iii. figs. 6, 7.
Eschara papyrea, Pallas?, Elench. Zooph. p. 56.

A few of the cells are decidedly subrhomboidal as seen from the back of the frond; hence, perhaps, Pallas's description of the cells in his specimen as being rhombic; for the description agrees well in its other points, except that of "apice superiori truncato," with this species.

A fine colony attached to a valve of a bivalve shell.

Flustra securifrons, Pallas.

Eschara securifrons, Pallas, Elench. Zooph. p. 56.
Flustra securifrons, Smitt, Œfv. Akad. Förh. 1867, p. 378, pl. xx. figs. 6–8.

A fine colony. The branches are decidedly dilated at their tips. But one ovicell was observed in the whole colony; so, though probably others were present, they are scarce.

Membranipora Sophiæ, Busk.
(Pl. XXI. fig. 2.)

Membranipora Sophiæ, Busk ?, Quart. Journ. Micr. Sci. iii. p. 255, pl. i. fig. 7.

I have little doubt that two colonies in this collection, the one growing inside the lip of a univalve shell, the other on the base of a specimen of *Alcyonidium gelatinosum*, belong to this species; if so, however, Mr. Busk's figure and those given by Smitt (Œfv. Akad. Förh. 1867, pl. xx. figs. 24, 25, 27) need supplementing by a more detailed one.

In these specimens the zoœcia are large, distinct, with raised edge, oval, or very commonly smaller at the distal than at the proximal end; the area has a very slightly projecting calcareous rim, which is minutely fimbriated. On the edge, at each side of the mouth, are two pointed avicularia on short peduncles, the apices projecting upwards and backwards. One, two, or three pairs of spines occur below these avicularia on the edge. The oœcia are remarkable for singular modifications of form. In the simplest form they are oval, of medium size, smooth, with the exception of some striæ radiating up and backwards from the mouth; the mouth is provided with a very slightly upwardly-projecting lip. In the next stage a longitudinal ridge runs down the surface of the oœcium. In the next the rims of the neighbouring cells, of which the lateral ones touch the oœcium, while the posterior one is some distance off, surround it like a frame, and become prominent, and at the same time a horizontal ridge runs across its surface and joins the two prominent lateral walls; the upper lip of the mouth at the same time becomes much developed. Finally the anterior portion of the oœcium, viz. that enclosed between the lateral rims, the horizontal ridge, and the lip of the mouth, becomes depressed, so that the whole space above the cell appears to be occupied by two rectangular arcæ, and the oœcium itself has become much less convex than at first, and is almost entirely disguised by the structures added to it. The cells radiate regularly from the centre.

Homologies of Parts of the Oœcium.—This oœcium is one of the most complicated in external characters which occur in the Chilostomata; and it would be interesting if the morphological significance of its different parts could be determined. The occurrence of several of what appear to be stages of its progressive development in one specimen seems to afford some opportunity for making deductions on the subject. Probably the large front depression of the last stage, with its surrounding raised margin, represents a rudimentary avicularium, as such is

the condition by which both zoœcia and sessile avicularia first originate. A similar depression, though without the distinct raised margins, occurs in a similar position in *M. Flemingi*, Busk; and the avicularium itself of course appears in *M. Dumerili* and *M. unicornis*, Fleming. Unfortunately Mr. Hincks, when describing (Hist. Brit. Mar. Pol. p. civ) the development of the oœcial ectocyst, does not give that of the oœcium, and I know of no other account; hence the homologies of the different parts of the oœcium can be hardly more than guessed at. The radiating furrows or ridges which are seen in some oœcia, and are indicated in one stage of this one, may perhaps indicate that it is primitively constructed by the growing together of paired trabeculæ similar to those which probably unite to make up the zoœcial cell-front in the Chilostomatous forms (see Hincks, *l. c.* p. 184, on the genus *Cribrillina*, and his description of *transverse striæ* in the primitive covering of the cell of *Mucronella coccinea* at the second developmental stage, p. civ). The oœcium of adult *Reteporæ* has a median cleft; and in one species this is represented by an invagination from the lower edge: this is probably the remains of an embryonic median cleft, common to all typical Chilostomata, and represents the ununited edges of the cell, this stage corresponding to stage 2 of Hincks's history of the zoœcium of *Mucronella coccinea*.

The median ridge or galeate process, seen here in one stage, and also found in *M. aurita*, Hincks, *Micropora coriacea*, Esper, *Chorizopora* (*Lepralia*) *Brongniarti*, Busk, and *Steganoporella Smitti*, Hincks, perhaps represents the point of union of the two edges of the oœcium, strengthened by additional calcareous matter.

Membranipora craticula, Alder.

Membranipora craticula, Alder, Trans. Tyneside Nat. F. Club, iii. p. 144, pl. x. fig. 3.

Two colonies with the typical characters. The one has the surface beautifully hyaline; the other was apparently taken dead, and is consequently granular and deficient in some of its parts. The number of spines is, as a rule, 12 to 14. The bar crossing the surface of the oœcium is well marked; and the lateral or median avicularium is also generally present here, though not invariably. The avicularium below the cell is often very prominent, owing to the mound on which it is placed; this point serves to bring the species still nearer to *M. lineata*, Linn., from which it is now to be distinguished chiefly by the slender characters of shape and position of the

spines; for the *numbers* of these are as often as not 12 in this species, which is the maximum number assigned by Hineks to *M. lineata*.

Anarthropora monodon, Smitt.

Lepralia monodon, Busk, Quart. Journ. Micr. Sci. viii. p. 213, pl. xxix. figs. 3, 4.
Anarthropora monodon, forma *minuscula*, Smitt, Œfv. Akad. Förh. 1867, Bihang, pp. 7, 64, pl. xxiv. figs. 20–24.

In one of the four colonies which occur in this collection the cells are subrhomboidal, and have in some cases a small pore on the raised area above as well as below the mouth. The rhomboidal shape is not confined to the cells of this colony. The connexion between the special pore of the Porinidæ and the oral sinus of the Myriozoidæ is instructively illustrated by examples of some of the younger cells, which show the gap connecting the infraoral pore with the mouth not yet closed, and, in fact, represent a Myriozoid stage of a Porinid cell.

The pores never become converted into avicularia as in Smitt's "forma *majuscula*."

Myriozoum subgracile, Smitt.

Myriozoum subgracile, D'Orbigny ?, Paléontologie Française, iii. p. 662; Smitt, Œfv. Vet. Förh. 1867, Bihang, pp. 18, 119.

It appears to me that the species described by Packard (Canad. Nat. viii. p. 411) is rightly assigned to this species, but that he does wrong in calling attention to the annulate character of the branches as showing its identity with *Millepora truncata*, Fabricius; for this is too slight, in both the present and all other specimens which I have examined, to have been noticed by Fabricius, whose description seems to me to refer to *M. coarctatum* of Sars. A portion of a colony occurs here, presenting the characters usually found in arctic specimens; the diameter of the branches is a trifle more than 1 millim.

Myriozoum crustaceum, Smitt.

Myriozoum crustaceum, Smitt, Œfv. Vet. Akad. Förh. 1867, Bihang, pp. 18, 114, pl. xxv. figs. 88–91.
Leieschara crustacea, id. ibid. 1878, p. 20.

Four colonies, one of which has the central part stained pink, the marginal parts remaining pale yellowish white. Cancelli very large and evident in the lateral cells, where they are much extended longitudinally and are larger than those of Smitt's figs. 88, 89; scarcely developed in those of the

centre. Limits of younger cells undefined, those of the older cells more evident, owing to their greater convexity. Mouth of cell well represented by Smitt's figures; in one case the form was that of fig. 77*a* on the same plate (*Eschara secundaria*); the hinder part is deeply sunk. Lateral avicularia may be absent or only one to a cell, generally distinct and elevated on prominences which are distinctly tubular and more prominent than those of Smitt (fig. 91), who finds them only in the more calcified cells. Avicularian opening round or slightly oval. No oœcia present.

One colony occurred on frond of *Flustra carbasea*, Ell. & Sol., the others on a univalve shell, &c.

Mr. Hincks (Ann. & Mag. Nat. Hist. [5] vi. p. 274) refers this species to "*Schizoporella plana*, Dawson;" but I am unable at present to find the description alluded to.

Schizoporella cruenta, Norman.
(Pl. XXI. fig. 4.)

Lepralia violacea, var. *cruenta*, Busk, Cat. Mus. Brit. ii. p. 69, pl. cx. fig. 1.
Lepralia cruenta, Norman, Ann. & Mag. Nat. Hist. (3) xiii. p. 88.
Schizoporella cruenta, Hincks, Hist. Brit. Mar. Pol. p. 270, pl. xxx. fig. 5.

Two dead colonies, and one very fine colony taken when mostly alive; the latter measures 23 millim. by 19 millim. The differences of colour in the different parts of the latter specimen are striking. In the centre, which had died before the specimen was taken, it is dirty white; immediately outside is a zone of cells of a pink colour (not *deep* red); the margin is formed by a broadish band of cells of a bright brown colour, shading into pink towards the centre. The different forms of the zoœcium correspond well with those given in Hincks's figure (*l. c.*); but the oral sinus is well marked in most, even old cells. The surface thickenings represented in Busk's figure do not occur to any thing like the extent there given; but in the older cells the margin of the mouth is thick and prominent, and between some of the cells occur very prominent boundary-lines. *Oœcia*, early stages of which resemble those cells in Busk's figure which have a semicircular supraoral thickening, occur in abundance, showing all stages of transition, from the large open hood with slightly projecting rim to the perfect form, which is slightly elevated, circular, subglobose, minutely punctate, and somewhat uneven; they are inconspicuous and readily overlooked. Traces of the original wide space in the front of the hood are frequently left in the form of a pointed slit in its lower edge,

bearing some resemblance to an avicularian hollow. The brown colour of the margin of the colony is evidently due to the important part played by the chitinous part of the ectocyst in the young cells, appearing as it does in the wide fenestræ of the front wall of the cell, the margin of the mouth, &c.

Porella concinna, Busk.

Lepralia concinna, Busk, Cat. Brit. Mus. ii. p. 67, pl. xcix.
Porella lævis, Smitt, Öfv. Vet. Förh. 1867, Bihang, pp. 21, 134, 217, pl. xxvi. figs. 117, 118.
Porella concinna, Hincks, Hist. Brit. Mar. Pol. p. 323, pl. xlvi.

Several colonies. They agree with Busk's figs. 1, 3, 4, 5, and the two cited figures of Smitt better than with any others designed to represent this species. The marginal punctures are constant. The cells are generally separated by a prominent and undulating line. The inferiorly enlarged peristome which encloses the avicularium is sometimes almost as prominent as in *P. struma*, Hincks (Norman). In some young cells a semilunar hollow in front of the mouth marks its future position, showing that it owes its character to the avicularian chamber which it contains, and which is afterwards perfected by the extension over this hollow of the surrounding calcareous margin, just as the zoœcium itself is formed by calcareous growths from its margin. The avicularian chamber is liable to become accidentally detached; and then it leaves a round space below the mouth of the adult cell: this condition appears to be represented by two of the upper cells of Busk's fig. 5 (*l. c.*).

A small circular incrusting colony is also referred, but with doubt, to this species. It has an umbo immediately below the lower lip, but apparently no avicularium there. The cells are convex and distinguished from each other by their convexity; but there is no bounding line. No spines. The front of the cell is covered, excepting the base of the umbo, with coarse foramina. Cells slightly rhomboid. The intraoral denticle is rectangular. No oœcia.

A large spreading colony 24 millim. in extreme diameter is apparently also referable to this protean species. On one side the front of the cell is almost entirely occupied either by an immense and very salient rostrum, in the oral side of which lies the avicularium, or by a large depressed space, oblong or semilunar, beneath which the wall of the cell is thin. The cells with these spaces evidently constitute an earlier stage than the rostrated cells; and the rostrum, when it occurs, together with its contained avicularium, is evidently developed over

such a space. At the opposite side of the colony the cells are flattish, with a central rather minutely tuberculated area; the sides of the cells are formed by smooth spaces containing a few coarse perforations; there is a slight approach to a rostrum immediately below the mouth. This form is well represented by the two left-hand cells of Busk's pl. xcix. fig. 4. A broad rounded denticle lies within the mouth in all these forms; the oœcium is globose, tuberculate, slightly prominent.

Hab. On large univalve shells.

The numerous variations exhibited by this species are, as Hincks remarks (*loc. cit.* p. 324), mainly due to superficial differences; the form of the mouth, the denticle (except in the doubtful specimen, in which it is rectangular), the infraoral avicularian rostrum (or the depressed space representing it), the marginal punctures maintain the same general characters throughout. No spines, or traces of them, however, were observed in any cells; but as Hincks only figures them in one case and Busk not at all, they must be regarded as very rarely occurring.

The possibility of the presence or absence of avicularia in different specimens of the same Polyzoan species would be a striking fact if it were determined to be a real possibility; it would, however, be interesting to determine whether, as in this case, the absent avicularium is not generally represented by the rudiments of a chamber in the surface on which it should normally occur. Occlusion of the avicularium by thickening of the cell-wall must also be allowed for when it is stated to be absent in any given species.

Mucronella ventricosa, Hassall, var. *connectens*, n. var.
(Pl. XXI. fig. 6.)

Discopora coccinea, forma *ventricosa*, Smitt?, pars, Œfv. Akad. Förh. 1867, Bihang, p. 172, pl. xxvii. fig. 167 only.

A small colony without oœcia, unless the remarkable prominence figured in fig. 6 *b* is an abnormal oœcial hood. It agrees neither with *M. Peachii*, Johnst., nor with *M. ventricosa*, but has several points which appear to connect the two species. The cells are large, glistening, and convex, marked with radiating tuberculated lines and a marginal row of perforations; they are arranged in regularly radiating series, separated by deep furrows. The mouth is constant in the possession of six spines; the denticle is broad, with more or less prominent lateral points, and is well represented by those given in Smitt's figure cited above. There is a considerable space, containing variously shaped fenestræ, in continuation with the mar-

ginal row of perforations, above the mouth; one pair of these fenestræ in particular resembles a pair of avicularian frames; and if they are avicularia they would appear to connect the form with *M. coccinea*. It appears to have no connexion with *M. simplex*, Hincks, of the Barents Sea.

Obs. The form is certainly nearer to *M. ventricosa* than to *M. Peachii* in both its general and more special characters; it is to be hoped that more adult specimens may be obtained to decide the questions raised by its peculiarities.

Escharoides Sarsi, Smitt.

Eschara rosacea, Sars, Förh. Vid.-Selsk. Chr. 1862, p. 141.
Escharoides Sarsii, Smitt, Œfv. Akad. Förh. 1867, Bihang, pp. 24, 158, pl. xxvi. figs. 147–154.

A fine tip of an Escharoid colony, closely resembling that depicted in Smitt's fig. 147 (*loc. cit.*); reddish brown in colour. The mouth is well represented in Smitt's fig. 150. The avicularium within the mouth was the only one observed.

CYCLOSTOMATA.

Crisia denticulata, Lamarck.

Cellaria denticalata, Lamarck, Anim. s. Vert. (2) ii. p. 182.
Crisia denticulata, Milne-Edwards, Ann. Sc. Nat. (2) ix. p. 201, pl. vii. fig. 1.

Several small colonies, not exceeding 8 millim. in height. Fronds broad, from two to four zoœcial tubes in the breadth. Internodes sometimes short; joints between them inconspicuous, often brown-coloured. Openings of cells almost round.

Oœcia numerous; rings surrounding oœcium seldom perceptible; openings of oœcia rare or absent.

Lichenopora verrucaria, Fabricius.
(Pl. XXI. fig. 5.)

Madrepora verrucaria, Fabricius, Fauna Grœnlandica, p. 430.
Lichenopora verrucaria, Hincks, Hist. Brit. Mar. Pol. p. 478, pl. lxiv. figs. 4, 5.

Seven colonies. Lip frequently bidentate. On *Flustra carbasea* &c.

Septal Structures in Lichenopora.—In one of the older colonies the zoœcia exhibit a very distinct horizontal diaphragm crossing their cavity at various depths; it is perforated in the centre by a small orifice. This structure is apparently represented, though somewhat indistinctly, by Smitt (Œfv. Akad. Förh. 1866, pl. xi. fig. 3); but the zoœcial tubes which contain it are taken by him for oœcial funnels; hence his

somewhat puzzling statement that eight such funnels exist in the specimen figured, the normal number being two or three. These structures probably represent the "diaphragmes transverses" of Haime (Mém. Soc. Géol. France, 2e sér. v. p. 210), the "septa" of Busk (Crag Polyzoa, p. 122, pl. xix. fig. 6), Waters (Journ. Roy. Micr. Soc. ii. p. 390) shown to occur in *Heteropora*, and called "tabulæ" by Nicholson (Ann. Nat. Hist. ser. 5, vol. vi. p. 338). The spines of the zoœcial tubes of some *Heteroporæ* and of the cancelli of some *Lichenoporæ*, together with the perforated diaphragms which replace the latter in other species of *Lichenopora*, are probably all homologous with each other and with the present structures in the zoœcia of *L. verrucaria*. I have not seen them elsewhere mentioned as occurring in this genus, and have therefore thought them worthy of a figure.

Two small specimens have the cancelli and the bases of the zoœcial tubes obscured, apparently by an overgrowth of calcareous matter resembling that described by Hincks (*loc. cit.* p. 479) as an outgrowth of the oœcium.

Heteropora pelliculata, Waters?
(Pl. XXI. fig. 3.)

Heteropora pelliculata, Waters?, Journ. Roy. Micr. Soc. ii. p. 391, pl. xv. figs. 1–4, 7.

Two very young colonies of what I have little doubt is this species, though their extreme youth renders it almost impossible to speak with certainty. They consist of dome-shaped, hemispherical incrusting growths, the one $2\frac{1}{2}$, the other 4 millim. in diameter, occurring on a univalve shell.

The surface of the colony, at a point halfway between the centre and edge, has polygonal zoœcial orifices at regular intervals, each surrounded by a more or less regular circle of small cancelli, as in fig. 7 *b* of Waters's plate (*loc. cit.*); at the edge, however, the number of cancelli is much smaller and they are larger than at the centre: they originate just in the same way as the zoœcia themselves; and the outermost ones resemble closely the earliest stage of the zoœcia in *Lichenopora* (*Discoporella*). At the actual centre the zoœcial orifices themselves are larger than those near the edge; the cancelli are larger than in the halfway zone.

The genus is already known from New Zealand, Australia, and the Japanese Seas, and in the fossil state; its recent distribution is now extended to the Arctic regions. Some of Mr. Busk's figures of *Heteropora* in the 'Crag Polyzoa' appear to represent young colonies of branching forms; but the present

specimens represent an earlier stage still, and serve to show by their general appearance how little really separates the genus from such forms as *Lichenopora*. If there were not such good reason to regard them as but a young stage of a branching form, they would fall naturally into the connecting genus *Heteroporella*, Busk.

Ctenostomata.

Alcyonidium gelatinosum, Linné.

Alcyonium gelatinosum, Linné, Syst. (12) p. 1295.
Alcyonidium gelatinosum, Johnston, Brit. Zooph. (2) i. p. 358, pl. xxviii. figs. 1–3.

Two very distinct forms, the one including seven specimens, elongated, finger-like, not branching or proliferating, rising from a very thin pedicel; a thick firm cortex, which is of dark colour in strong spirit. The central parenchyma contained numerous embryos in one of the specimens. The other group is composed of much narrower stems, generally rounded, but tending to become palmate, profusely branched; the cortex is thin and flexible, and the colour a pale brown in strong spirit; ten to twelve specimens of this form occurred.

One specimen belonging to the first form appeared to have lived free and unattached; and the deeply constricted condition of another of the same series of specimens appears to indicate that the distal ends of such colonies may become detached in life by natural fission.

Anthozoa.

Peachia, sp.

This genus appears to be not uncommon in the Arctic seas (*cf.* Lütken, 'Arctic Manual and Instructions'); but drawings taken on the spot are required for satisfactory identification of the species.

Two specimens in spirit occur in this collection, one contracted, and the other expanded but injured, each $5\frac{1}{2}$ millim. in height. Column cylindrical, height about the same as breadth, tapering slightly to posterior end, which is rounded and has an orifice; the margin bears the single cycle of tentacles; no apertures on surface, but minute warts (?) in fine longitudinal ridges; colour dull flesh-tint at present. Tentacles apparently in one cycle on margin, few, short, thick, blunt; of pale flesh-colour on external, cream-coloured on oral aspect. Disk flat, cream-coloured. Margin of mouth thrown into a complicated system of several deeply separated projecting tentaculoid lobes (conchula) of a decided

yellow colour. The tentacles and surface of column were examined for thread-cells, none of which were discovered. In its coloration and the characters of the conchula this species appears to be related specially to *P. hastata*, Gosse.

Hydrozoa.

Sertularella tricuspidata, Alder.

Sertularia tricuspidata, Alder, Trans. Tyneside Nat. F. Club, iii. p. 111, pl. iv. figs. 1, 2.
Sertularella tricuspidata, Hincks, Brit. Hydr. Zooph. p. 239, pl. xlvii. fig. 1.

Several pieces, representing three or four colonies at least; robust, with the exception of one rather thin-walled colony; one colony attained a height of $2\frac{5}{12}$ inches (61 millim.). A few gonothecæ occurred, but all wanting their uppermost end. The time of year (late summer) at which they were collected evidently accounts for this agreement in the incipient dissolution of these bodies, and points to the time at which reproductive activity ceases in this species in this latitude.

Spongiida.

Calcarea.

Clathrina coriacea, Montagu.

Spongia coriacea, Montagu, Wern. Mem. ii. p. 116.
Grantia coriacea, Johnston, Brit. Spong. p. 183, pl. xxi. fig. 9.
Ascetta coriacea, Häckel, Kalkschwämme, ii. p. 24, pls. iii. & v. fig. 2.

A fragment, apparently torn from a *Soleniscus*-growth; the diameter of the tube must have been about 1·5 millim. Colour opaque white. The spicules have the somewhat inequiradiate character which I have recently found in those of a specimen from South America; their rays measure respectively ·10135 by ·0079, ·076 by ·0079, ·076 by ·0079 millim. average maximum dimensions, and should therefore be described as "sagittal" according to Häckel's nomenclature. The difference in length between the rays is not so great in some of the spicules.

Dr. Gray's genus *Clathrina* (P.Z.S. 1867, p. 557) has the priority of Häckel's *Ascetta*, published in 1872.

This widely spread species has already been recorded from the Arctic regions, viz. by Mr. Carter ('Annals,' ser. 4, vol. xx. p. 38) from Smith's Sound, and from the European side of the Pole (Barents Sea) by Von Marenzeller (Denk. Ak. Wien, xxxv. p. 371).

Distribution of Franz-Joseph-Land Polyzoa in the Arctic Area.

	Finmark[1].	Spitzbergen[1].	Barents Sea[2].	Novaia Zemlia[1].	Kara Sea[1].	Smith's Sound[3].	Greenland (without locality)[1].	West Greenland[4].	East Greenland[5].	Iceland[6].
Polyzoa Chilostomata.										
Articulata.										
Gemellaria loriculata	*	*	*	*	*					
Bugula Murrayana, var. fruticosa	*	..	..	..	..	*	..	*		
Scrupocellaria scabra	*	*	..	*	*	*	..	*	..	*
Menipea arctica	..	..	*	..	..	..	..	*	*	
Inarticulata.										
Flustra carbasea	..	*	..	*						
—— securifrons	*	*								
Membranipora Sophiæ	*	*	*	..	..	..	..	*		
—— craticula	*	*	*	*	*	..	..	*		
Anarthropora monodon										
Myriozoum crustaceum	*	*	..	*	*	..	*			
—— subgracile	..	*	*	*	*	*	*	*		
Schizoporella cruenta	*	..	..	*	..	..	..	*		
Porella concinna	*	*	..	..	..	..	*			
Escharoides Sarsi	*	*	*	*	*	..	*	*		
Mucronella ventricosa, var. connectens										
Cyclostomata.										
Crisia denticulata										
Lichenopora verrucaria	*[6]	*	*	*	*	..	..	*	*	*
Heteropora pelliculata?										
Ctenostomata.										
Alcyonidium gelatinosum	*	*	*	*	*	..	..	*	*[5]	
Hydrozoa.										
Sertularella tricuspidata	*[5]	*[5]	*[6]	..	..	..	..	*[6]	*[5]	*[6]
Anthozoa.										
Peachia, sp.										
Spongida.										
Clathrina coriacea	..	..	*[7]	..	..	*[8]				

It should be noticed that more than half these species range southwards to the British seas.

[1] Smitt. [2] Marenzeller and Hincks. [3] Busk. [4] Fabricius, Hincks, Norman, and Busk. [5] Kirchenpauer. [6] Hincks. [7] Marenzeller. [8] Carter.

EXPLANATION OF PLATE XXI.

Fig. 1. *Gemellaria loriculata*, zoœcium. × 68 diam.
Fig. 2. *Membranipora Sophiæ*, various forms of the oœcium from one colony. × about 60 diam.
Fig. 3. *Heteropora pelliculata*?: *a*, young colony, from above; *b*, same, from side. × 15 diam.
Fig. 4. *Schizoporella cruenta*, oœcia, the upper one immature. × 40 diam.
Fig. 5. *Lichenopora verrucaria*, broken zoœcia, showing perforated diaphragms. × 93 diam.
Fig. 6. *Mucronella ventricosa*, var. *connectens*: *a*, zoœcia; *b*, zoœcium, showing tooth within lip, and process of doubtful nature above mouth. × about 60 diam.

XLVII.—*On some Indian Coleoptera, chiefly from Travancore.*

By Charles O. Waterhouse.

Lucanidæ.

Odontolabis Burmeisteri, Hope.

Some very fine examples of this species have just been received from Travancore. The fully developed male resembles that figured by Hope (Tr. Ent. Soc. iii. pl. xiii.); the figure, however, does not represent the angle behind the eye as sufficiently prominent. The coloration is constant as in the figure above referred to, the suture of the elytra being narrowly lined with black as compared with *O. cuvera*. The female examples measure 24 lines; the black at the suture of the elytra, instead of being triangular in outline, as in *O. cuvera*, narrows immediately on leaving the base, and continues parallel-sided for some distance, narrowing again at the apex.

Buprestidæ.

Catoxantha cuprascens, n. sp.

Obscure cuprea; thorace crebre punctato, singulis elytris plaga obliqua flava ornatis, apice truncatis; corpore subtus purpureo olivaceo tincto; abdomine flavo.
Long. 16 lin.

General form of *C. opulenta*, Gory, but with narrower thorax, and quite differently coloured and sculptured. Head very closely and strongly punctured in front, the vertex with a longitudinal median carina. Thorax rather flat, moderately narrowed in front, not very much enlarged at the hind angles; strongly punctured, the punctures separated on the disk,