

XIII.—*Report upon the Tunicata dredged during the Cruises of H.M.SS. "Porcupine" and "Lightning," in the Summers of 1868, 1869, and 1870.*
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(Read 7th January 1884.)

A few years ago the late Sir C. WYVILLE THOMSON gave me for examination some specimens of Ascidians which had been obtained during the cruises of the "Porcupine" and "Lightning," and last summer I received from Mr JOHN MURRAY the remainder of the Ascidiae Simplicis and two species of the Ascidiae Compositae from the same deep-sea dredging expeditions.* Some additional specimens of the "Porcupine" Ascidiae Compositae have been placed in my hands during the last few days (January 1, 1884). The present paper contains a detailed account of the Simple Ascidians alone; the Compound forms will be worked up along with the "Challenger" Ascidiae Compositae, and will be described and figured in the second part of my Report upon the *Tunicata* of the "Challenger" Expedition. It may, however, be useful to state here that the "Porcupine" Compound Ascidians include:—

Distaplia rosea, Della Valle.

One colony from Tangier Bay; 35 fathoms.

Aplidium fallax, Johnston.

Two small colonies from Loch Foyle; 10 fathoms.

Leptoclinum, sp.

One colony from Station 12 ("Lightning," 1868, Færøe channel); 530 fathoms.

Leptoclinum, sp.

Several colonies; locality unknown.

Leptoclinum albidum.

Several colonies from Tangier Bay; 35 fathoms.

* In the summer of 1868 H.M.S. "Lightning" explored the region of the North Atlantic lying between the Hebrides and the Færøes. In 1869 H.M.S. "Porcupine" made three cruises, the first off the north-west and west coasts of Ireland, the second off the south and south-west of Ireland, and the third off the north of Scotland as far as the Færøes. In 1870 the "Porcupine" dredged down the west coasts of France and Spain and in the neighbourhood of Gibraltar Strait, and explored the African coast of the Mediterranean as far east as Sicily.

Leptoclinum, n. sp.

One colony from Tangier Bay ; 35 fathoms.

Didemnum, sp.

One colony from Station 54 (Færøe channel, "cold area"); 363 fathoms.

Botryllus, sp.

One colony from Tangier Bay ; 35 fathoms.

Botryllus, sp.

One colony from Station 54 (Færøe channel, "cold area"); 363 fathoms.

Some of these possess an interest, apart from their morphological peculiarities, on account of the considerable depths from which they were obtained.

ASCIDIÆ SIMPLICES.

Family ASCIDIIDÆ.

This family is represented in the collection by three species of *Ascidia*. The common *Ciona intestinalis* was apparently not dredged at any of the localities visited.

Ascidia scabra, O. F. Müller.

About thirty specimens of this well-known species, most of them attached to Lamellibranch valves, were dredged in Lough Foyle, Ireland, from a depth of 10 fathoms, during the first cruise of the "Porcupine" in 1869. Most of them are small. They range from 5 mm. to 25 mm. in greatest length. The shape varies considerably. The small individuals are ovate and much flattened; the larger ones are usually irregularly orbicular, but a few are oblong, and resemble the typical form of *Ascidia virginea*. The mantle is strong, and the muscle bands run very irregularly.

In some remarks upon this species published in 1880, I showed how variable the branchial sac might be in the arrangement of the stigmata.* The "Porcupine" specimens exhibit this irregularity, and, in addition, show in some places an imperfect development of the internal longitudinal bars, which is frequently observed in *Corella parallelogramma*, and which I have figured in *Ascidia triangularis*.† In 1880 I described the meshes in *Ascidia scabra*

* "Notes on British Tunicata," *Journ. Linn. Soc. Zool.*, vol. xv. No. 85, p. 274.

† *Loc. cit.*, pl. xvi. fig. 6.

as being usually transversely elongated, and as containing each about twelve stigmata; but in some of the "Porcupine" specimens the meshes are occasionally square, and have only 6-7 stigmata. Here and there at the angles of the meshes very short hemispherical papillæ may be found on the internal longitudinal bars, otherwise the "Porcupine" specimens agree with the description and figure in the *Journal of the Linnean Society*.

The large tentacles are rather stouter than those in my former figure,* but the arrangement is the same. The dorsal tubercle is somewhat variable in this species, but is always very simple. Two of the "Porcupine" specimens have it intermediate in shape between those figured by myself in 1880† and by JULIN‡ in 1881.

In several of the specimens large masses of ova are present in the peribranchial chamber.

Ascidia plebeia, Alder, var. nov. (?) (Plate XXXV. figs. 1-3).

External Appearance.—The body is irregularly ovate or pyriform, greatly compressed laterally, and attached by the posterior half, or more, of the left side. The anterior end is narrow and produced, the posterior considerably wider. The dorsal and ventral edges are irregular, but nearly equally curved; both sides are flattened. The branchial aperture is terminal and prominent; the lobes are well marked. The atrial aperture is from one-third to half way down the dorsal edge, prominent, projects laterally, and has well-marked lobes.

The surface is somewhat irregular, but not rough. There are adhering sand and shell fragments at the posterior end and over part of the left side.

The colour is yellowish-grey.

Length of the body, 4.2 cm.; breadth, 1.9 cm.

The test is moderately thick and strong, of a firm gelatinous consistency, translucent, smooth, and glistening on the inner surface, and richly supplied with blood-vessels. The left side and posterior end are thickened and made stiff by the presence of many imbedded sand grains and fragments of shells.

The mantle is moderately strong. The musculature is well developed on the right side and the anterior end of the left, but is very slight over the visceral part of the body. The sphincters are fairly strong.

The branchial sac is slightly plicated longitudinally. The transverse vessels are all of the same size. The internal longitudinal bars are strong, and bear large curved and sometimes forked papillæ at the angles of the meshes, and smaller simple ones between. The meshes are slightly elongated vertically, and

* *Loc. cit.*, pl. xvii. fig. 2.

† *Loc. cit.*, pl. xvii. fig. 1.

‡ "Recherches sur l'organisation des Ascidies Simples, &c.," *Archives de Biologie*, t. ii. fasc. 1, pl. iv. fig. 2.

contain each four to six stigmata. The horizontal membranes are slight; there are none between the smaller papillæ.

The dorsal lamina is slightly ribbed transversely, and has small denticulations on the free margin.

The tentacles are numerous, and so closely placed that their bases touch. There are 30 or 32 large, with about the same number of intermediate smaller ones.

The dorsal tubercle is small and simple, ovate in outline, and with the narrower end anterior. The aperture is anterior, with the right horn rather longer than the left, but neither of them curved. No peritubercular area is present.

Locality.—Two specimens, one large and one small, were obtained, during the second cruise of the "Porcupine," at Station 33, 20th July 1869, lat. 50° 38' N., long. 9° 27' W.; depth, 75 fathoms; bot. temp., 9°·8 C.

These specimens are exceedingly like the common *Ascidia plebeia*, Alder, but differ from it in some details. They have no trace of the greenish tinge so characteristic of *Ascidia plebeia* even after preservation in alcohol, and the test is firmer and stiffer. The general shape, however, and the positions of the apertures (see Pl. XXXV. fig. 1) recall the characters of *Ascidia plebeia*. The measurements in the above description are those of the larger specimen; the smaller one is 2·6 cm. in length and 1·4 cm. in breadth. In the smaller specimen the atrial aperture is not distant from the branchial, and is turned forwards.

The body, when the test is removed, is long and narrow, and the branchial sac extends slightly beyond the viscera posteriorly (see Pl. XXXV. fig. 2). The stomach is large and the intestine rather wide. It is covered with renal vesicles and the reproductive cæca. The ovary forms thick swollen masses, and the spermary small dendritic tubules scattered chiefly over the anterior part of the intestine. The oviduct and the vas deferens are both greatly distended in the larger specimen, and form conspicuous curved tubes on the left side of the body (see Pl. XXXV. fig. 2). Large quantities of ova were found in the peribranchial chamber.

The branchial sac resembles that of *Ascidia plebeia* in every particular.* The primary papillæ are large (Pl. XXXV. fig. 3), and in some cases bear pinnæ or small tubercles on the sides. Smaller transverse vessels connecting the intermediate or secondary papillæ appear never to be present.

The tentacles are numerous and closely placed, more closely than I have found before in *Ascidia plebeia*, and I can only distinguish two sizes, with an occasional very much smaller one here and there. The dorsal lamina is very slightly ridged and denticulated. The prebranchial zone is papillated all over,

* Compare description in *Journ. Linn. Soc. Zool.*, vol. xv. No. 85, p. 288.

and rather wide. There is no peritubercular area, and the dorsal tubercle is small and simple, just as in *Ascidia plebeia*. It only occupies about one-fourth of the breadth of the prebranchial zone.

After taking all the characters into consideration, I am inclined to refer the specimens to *Ascidia plebeia*, Alder, of which they may be considered as a variety until more is known about the range of variation in the species.

Ascidia, sp.

A torn test of a single individual of the genus *Ascidia* was found adhering to some fragments of Annelide tubes dredged at Station 45, lat. $35^{\circ} 36'$, long. $2^{\circ} 29'$; "Porcupine" 1870; depth, 207 fathoms; bot. temp., $12^{\circ} 4$ C.

As the test only is present, it is, of course, impossible to identify the species, but there can be no doubt as to the genus. I consider it worthy of record simply on account of the depth from which it was obtained.

Family CYNTHIIDÆ.

No members of the sub-families CYNTHINÆ and BOLTENINÆ are in the collection, but the STYELINÆ are represented by the common *Styela grossularia*, van Beneden, and four species of *Polycarpa*, three of which appear to be undescribed. One of these is from the Mediterranean, one from the Færøe channel, and the other from the North Atlantic S.W. of Ireland, and from outside the Strait of Gibraltar, in rather deep water.

Styela grossularia, van Beneden.

A large number of small individuals of this species were found attached to specimens of *Polycarpa pomaria*, dredged near Belfast on 4th August 1869, at a depth of 70 fathoms.

They vary from 2 mm. to 3 mm. in greatest length. Although they are so small, all of those I have examined are sexually mature and contain ripe ova, and in some cases tailed larvæ, in the peribranchial cavity.

Also half a dozen small specimens of this species were found on a fragment of shell from Station 54, lat. $59^{\circ} 56'$ N., long. $6^{\circ} 27'$ W., during the third cruise of the "Porcupine" in 1869; depth, 363 fathoms; bot. temp. $-0^{\circ} 3$ C.

They are of the blister-like form, flattened antero-posteriorly, and with expanded margins. So far as I am aware, this is the greatest depth at which *Styela grossularia* has been obtained. It is usually regarded as a shallow water species, and in some localities extends up between tide marks further than any other species of Tunicate.

There are also in the collection one large and six small specimens, labelled " 'Lightning,' off Valentia."

Polycarpa pusilla, n. sp. (Plate XXXV. figs. 4-6).

External Appearance.—The body is spherical, ellipsoidal, ovate, or pyriform, is not compressed, and is unattached. The anterior end is narrower if not the same as the posterior, which is wide and rounded. When the shape is ellipsoidal, the long axis is dorso-ventral. The apertures are not distant, on the anterior end; in some cases prominent, in others sessile and inconspicuous; no lobes are visible.

The surface is even, but completely covered by an incrusting layer of fine sand. Hair-like processes are present on the posterior half or so of the body, and bear sand grains.

The colour is light brown.

Length of body (in an average sized specimen), 5 mm.; breadth, 6 mm.; thickness, 4 mm.

The test is moderately thick and tough, completely concealed externally by the sand, and smooth internally, it is continued posteriorly into the hair-like processes bearing sand grains.

The mantle is rather strong. The muscle bands are numerous, though fine, and form a close network. Most of them compose a strong longitudinal layer internally, and a weaker circular layer externally. The sphincters are well developed.

The branchial sac has four folds upon each side. The internal longitudinal bars are very broad, ribbon-like membranes; there are four or five on each fold, and one or two in the interspace. The meshes are rather large and square, and contain each five or six stigmata. In the mature sac the stigmata are long and narrow, and each mesh is divided transversely by a narrow horizontal membrane.

The tentacles are of two sizes, with occasional smaller ones between. There are usually upwards of fifty altogether in the circle.

The dorsal lamina is a narrow membrane with slight transverse ribs, which begin a short way from the anterior end. The edge is thickened, but has no denticulations.

The dorsal tubercle is simple, and ovate in outline; the aperture is directed anteriorly and to the left. The horns are not coiled, but almost touch; the long axis is vertical.

Locality.—Thirty-five specimens of this species were obtained 40 miles off Valentia, at a depth of 110 fathoms in the North Atlantic; and one specimen was obtained at Station 31, "Porcupine" 1870, lat. 35° 56' N., long. 7° 6' W., at a depth of 477 fathoms; bot. temp., 10°·3 C.

This is a curious little species, in external appearance bearing considerable resemblance to *Polycarpa pilella*, a species discovered during the "Challenger" Expedition at Bahia, in shallow water. The present species is usually spherical,

and most of the specimens look like little rough bullets covered with sand (see Plate XXXV. fig. 4, e. and f.). They feel quite hard, the test being rather firm. The specimens collected vary from 2 mm. to 9 mm. in greatest diameter. Most of them are small. In the majority, the apertures are not visible externally, and it is impossible to distinguish the ends and sides without dissection. In a few, however (see Plate XXXV. fig. 4, a and b.), the apertures are prominent, terminating short conical projections from the anterior end of the body. No lobes are visible, but when the test is removed the apertures are seen to be distinctly cross-slit.

The mantle does not adhere to the test, and consequently the body can be readily shelled out. The musculature is well developed all over, and consists of two distinct layers, the internal longitudinal, starting anteriorly in bundles of fibres radiating from the apertures, and the external circular. Besides these, there are also a few oblique and irregularly running bundles.

The branchial sac appears variable. In small (young) specimens (see Plate XXXV. fig. 6), the stigmata are short and rounded, and the transverse vessels very wide; while in the larger specimen examined, the stigmata are long (see Plate XXXV. fig. 5) and closely placed, and the transverse vessels all very narrow. The internal longitudinal bars are wide and ribbon-like. In the part of the sac of the large specimen examined (see Plate XXXV. fig. 5) there were five bars on each of two folds next the endostyle, and only a single bar in the interspace, while the two rows of meshes formed by this bar with the adjacent folds had from five to six stigmata in each mesh. The series next to the endostyle was wider, each mesh containing nine or ten stigmata. In the young specimen examined and figured (Pl. XXXV. fig. 6) the first or dorsal fold (*br. f. I.*) has seven bars, and is separated by a single row of meshes from the dorsal lamina, and by four rows of meshes from the second fold—hence this interspace has three bars. The second fold (*br. f. II.*) has three bars, and is separated from the third by three rows of meshes, hence this, the second interspace, has two bars only. The third fold (*br. f. III.*) has five bars, and is separated from the fourth by three rows of meshes, hence this third interspace has also two bars. The fourth fold (*br. f. IV.*) has also five bars, and is separated from the endostyle by two rows of stigmata, or an interspace with one bar. The stigmata in this sac are all short and rounded, and placed far apart. There are usually three or four in a mesh.

The tentacles (Plate XXXV. fig. 6) are rather irregular. Three sizes are present, but members of the third order are often absent, as seen near the endostyle at the left hand end of the figure. The polycarps are fairly numerous. Some are male, others female, and others hermaphrodite. The endocarps are rare. The stomach is globular, and deeply sulcated.

Polycarpa curta, n. sp. (Pl. XXXVI. figs. 7-11).

External Appearance.—The body is ovate, ellipsoidal, or elongated transversely; not compressed laterally, and unattached. The anterior end is wide and convex, the posterior is usually still wider, and flat or irregular; the dorsal and ventral edges are short and similar. The apertures are rather far apart, being placed at the opposite extremities of the anterior end. They are equally anterior, and are sessile and inconspicuous. There are no apparent lobes.

The surface is smooth, and fairly regular, but is slightly incrustated with small sand grains.

The colour varies from yellowish-grey to light brown.

Greatest length of the body, dorso-ventrally (in an average specimen), 9 mm.; breadth (antero-posteriorly), 7 mm.; thickness, (laterally), 5 mm.

The test is thin, but very tough and leathery. It is quite opaque. The outer surface is slightly sandy, and the posterior end has a few hair-like prolongations, to which sand grains are attached.

The mantle does not adhere to the test. The apertures are slightly cross-slit, and the sphincters surrounding them are strong. The musculature elsewhere on the mantle is well developed, the muscle bands forming a close network not clearly divided into longitudinal and circular layers.

The branchial sac has four well-marked folds on each side. The most dorsally placed is larger than the others, and has about twelve internal longitudinal bars. The rest of the folds have about six bars each, and there are two bars in each interspace. All the internal longitudinal bars are flat, ribbon-like membranes of considerable width. The transverse vessels are all of the same size. The meshes are about square, and contain each four or five stigmata.

The dorsal lamina is a narrow membrane, with no ribs and no denticulations.

The tentacles are not very numerous. There are eighteen or twenty large tentacles, and the same number of smaller intermediate ones.

The dorsal tubercle is simple. It is fusiform in outline, with the long axis vertical. There is an irregular slit down the middle, but there is no curvature, hence no horns are present.

Locality.—Sixteen specimens of this species were dredged at Station 12; "Lightning," 1868; lat. 59° 36' N., long. 7° 20' W.; depth, 530 fathoms; bot. temp., 6°·4 C.

This species is allied to *Polycarpa pusilla*, but differs both in external appearance and in internal structure. It is not so much incrustated with sand, and the shape, though variable in both species, is here more decidedly elongated dorso-ventrally (Plate XXXVI. figs. 7 and 8), the result being the apertures come to be placed far apart at the opposite extremities of the wide anterior end (see Plate XXXVI. fig. 7). The greatest length is always dorso-ventrally, and this ranges in

This is collected from 5 mm. to 13 mm.

resemblance to

Expedition at Bahia, 1868.

The branchial sac has the folds (Plate XXXVI. fig. 9) better developed than in *Polycarpa pusilla*. In one sac examined the arrangement, starting from the dorsal lamina along the right hand side, was—one row of wide meshes containing 8 to 10 stigmata, then the 1st fold with 12 bars, then the 1st interspace with 2 bars, then the 2nd fold with 7 bars, then the 2nd interspace with 2 bars, then the 3rd fold with 7 bars, then the 3rd interspace with 3 bars, then the 4th fold with 6 bars, and then a row of wide meshes separating the ventral fold from the endostyle. Figure 10 on Plate XXXVI. shows the narrow dorsal lamina and the wide row of meshes separating it from the commencement of the first fold on the left side of the sac. A large number of fine muscle fibres are present in the branchial sac, chiefly in the transverse vessels.

The peritubercular area (Plate XXXVI. fig. 2) is large and triangular in shape. It is almost perfectly symmetrical. The tubercle is very different from that of *Polycarpa pusilla*. It is comparatively simple, since the slit, though irregular in shape, is not curved to form horns or spirals (see Plate XXXVI. fig. 11, *d. t.*). The polycarps are irregularly rounded; they are hermaphrodite. Endocarps are not numerous.

Polycarpa pomaria, Savigny.

Twelve moderately large specimens of this common species were dredged on August 4, 1869, near Belfast, at a depth of 70 fathoms. The largest individual measures 3 cm. in length and 2 cm. in breadth.

Three or four of the specimens differ somewhat in appearance from the rest; their tests are thinner and smoother, but otherwise they appear to be exactly the same.

A single individual of this species was also obtained in 1870 in Tangier Bay from a depth of 35 fathoms. The test is stiff, giving a solid appearance and feel to the specimen, and the exterior is somewhat incrustated with sand. The difference in external appearance between this individual and those with smooth thin tests from near Belfast is very considerable, but the species is a variable one, and intermediate forms are common.

Polycarpa formosa, n. sp. (Plate XXXVI. figs. 1–6).

External Appearance.—The body is elongated antero-posteriorly, and varies from pyriform to oblong in shape. There is almost no lateral compression, and attachment is by the posterior extremity. The anterior end is moderately wide, but narrower than the middle of the body. The posterior end is narrower than the anterior. The widest region is usually a little behind the middle of the body. The apertures are both anterior, and not distant. They form slight papillæ, and are each distinctly four-lobed.

The surface is even, but considerably incrustated with sand grains, especially

at the posterior end, where there are also root-like prolongations of the test, to which sand is attached.

The colour is light grey where the test is exposed; reddish-brown from the sand elsewhere.

Length of the body (average specimen), 1·5 cm.; breadth, ·7 cm.; length of the root-like appendages, 1 cm. to 2 cm.

The test is thin, but moderately tough. It is translucent where free from sand. The posterior end from which the sandy prolongations spring is somewhat thickened.

The mantle is rather slight. The muscle bands are feeble, and not very numerous; they form an open irregular network.

The branchial sac has four folds upon each side. Each fold is formed by the aggregation of from six to twelve internal longitudinal bars. There are two to four bars in each interspace. The transverse vessels are of two sizes, alternating regularly. The meshes are much elongated vertically, and contain about three or four stigmata each. The stigmata are long and narrow, and the meshes are divided transversely by a narrow horizontal membrane.

The dorsal lamina is rather wide, and has irregular and partial transverse ribs; the margin is smooth.

The tentacles are numerous, and closely placed. They are large, and all of much the same size.

The dorsal tubercle is a simple, slightly-curved band, with the extremities directed posteriorly.

Locality.—Six specimens were dredged in Tangier Bay, on the 5th August 1870, from a depth of 35 fathoms.

There is a characteristic appearance about the specimens of this species, although they all differ somewhat in shape (see Plate XXXVI. figs. 1–3). In all, the apertures are closely placed at the anterior end, the body is elongated antero-posteriorly, and the posterior end is prolonged into a mass of branched projections covered with sand. The dimensions of the six specimens are as follows:—

	A.	B.	C.	D.	E.	F.
Length of body alone, . . .	2·0 cm.	1·5 cm.	1·5 cm.	1·6 cm.	1·0 cm.	1·4 cm.
Length of posterior projections, . . .	1·1 cm.	0·7 cm.	2·2 cm.	1·0 cm.	1·4 cm.	2·5 cm.
Breadth of body,	1·1 cm.	0·9 cm.	0·7 cm.	0·7 cm.	0·6 cm.	0·5 cm.

The folds in the branchial sac (Pl. XXXVI. fig. 5), although they have a con-

siderable number of internal longitudinal bars, do not project much into the cavity. The sac, as a whole, is very similar in structure to those of *Styela oblonga*, *S. flava* and *S. glans*.*

The dorsal tubercle is very simple, the prebranchial zone is narrow (Plate XXXVI. fig. 6), and the peritubercular area small, and not occupied by the tubercle. The tentacles are of considerable size, and have large bases.

Polycarps are not very numerous. They are scattered over the inner surface of the mantle (Plate XXXVI. fig. 4, *g.*). They are unisexual. The male polycarps are deeply cleft into lobes.

The alimentary canal lies on the dorsal part of the left side of the body. The stomach is pyriform, and is strongly ribbed externally; the intestinal loop is moderately open, and the rectum is long and narrow (see Plate XXXVI. fig. 4, *r.*).

Family MOLGULIDÆ.

This family is represented in the collection by two species of *Molgula* and the common *Eugyra glutinans*.

Molgula, sp.

A single small specimen of a *Molgula*, slightly torn, was found adhering to one of the specimens of *Polycarpa pomaria* from near Belfast; 70 fathoms.

The shape is nearly globular; 8 mm. in diameter, and slightly compressed laterally. Short hair-like processes project all over, and have a few grains of sand and other foreign bodies attached to them, but there is no incrusting coat. The test is moderately thin, soft, and nearly transparent. The colour is light yellowish-grey. Possibly this may be *Molgula nana*, Kupffer.

Molgula ampulloides, van Beneden.

One specimen of this rather widely-diffused species was dredged in Lough Foyle, during the first cruise of the "Porcupine" in 1869, from a depth of 10 fathoms. It measures 1.7 cm. in length, and 1.4 cm. in greatest breadth.

Eugyra glutinans, Möller (Plate XXXVI. figs. 12-14).

Eighteen specimens of this common and apparently gregarious species were dredged in Donegal Bay, Ireland.

None of the specimens are large. They range from 4 mm. to 12 mm. in greatest diameter. The incrusting sand is very fine and comes off readily, the result being that most of the specimens have very little left, and in some the delicate test is almost completely exposed.

* See Report upon the Tunicata dredged during the voyage of H.M.S. "Challenger," Part I. Plate XX. figs. 4, 8, and 11.

In the branchial sacs of several of these specimens, the vessels forming the apices of the spiral infundibula are considerably swollen, attaining as much as twice their normal calibre (Plate XXXVI. figs. 12 and 13); and the epithelium on the edges of the corresponding stigmata is greatly thickened (see Plate XXXVI. fig. 14).

POSTSCRIPT, *May* 30, 1884.—Since the above paper was written and the plates finished, I have received, through the kindness of Dr P. HERBERT CARPENTER, three specimens of an interesting and apparently undescribed Molgulid, which was dredged from a depth of 440 fathoms in the Færøe channel during the third cruise of the "Porcupine" in 1869. This species will be described and figured in the Report on the "Challenger" Tunicata, Part II.

EXPLANATION OF THE PLATES.

The following system of lettering has been adhered to in all the figures :—

- at.* Atrial aperture.
- br.* Branchial aperture.
- br. f.* Fold in the branchial sac.
- d. l.* Dorsal lamina.
- d. t.* Dorsal tubercle.
- en.* Endostyle.
- g.* Genital organ.
- h. m.* Horizontal membrane of the branchial sac.
- i. l.* Internal longitudinal bar of the branchial sac.
- m.* The mantle.
- p., p'.* Papillæ of the branchial sac.
- p. p.* The peripharyngeal bands.
- r.* The rectum.
- sg.* The stigmata of the branchial sac.
- st.* The stomach.
- tn., tn'.* The tentacles.
- tr., tr', tr''.* The transverse vessels of the branchial sac.
- z.* The prebranchial zone.

PLATE XXXV.

Figs. 1-3. *Ascidia plebeia*, Alder, var. nov.

Figs. 4-6, *Polycarpa pusilla*, n. sp.

Fig. 1. *Ascidia plebeia*, var., seen from right side; natural size.

Fig. 2. *Ascidia plebeia*, var., the test removed, body seen from the left side; natural size.

- Fig. 3. Small part of the branchial sac of *Ascidia plebeia*, var., seen from the inside ; magnified 50 diameters.
- Fig. 4. a.—f. Six specimens of *Polycarpa pusilla*, n. sp. ; natural size.
- Fig. 5. Small part of the branchial sac of *Polycarpa pusilla*, seen from the inside ; magnified 50 diameters.
- Fig. 6. Right half of the anterior part of the branchial sac, showing also the tentacles, the endostyle, the dorsal tubercle, the prebranchial zone, &c.; magnified 50 diameters.

PLATE XXXVI.

Figs. 1–6. *Polycarpa formosa*, n. sp.

Figs. 7–11. *Polycarpa curta*, n. sp.

Figs. 12–14. *Eugyra glutinans*, Möller.

- Fig. 1. *Polycarpa formosa*, from the right side ; natural size.
- Fig. 2. Another specimen of the same species.
- Fig. 3. Group of one small and two large specimens of the same species ; natural size.
- Fig. 4. Specimen of *Polycarpa formosa*, dissected from the left side to show the alimentary canal, &c.; slightly enlarged.
- Fig. 5. Small part of the branchial sac of *Polycarpa formosa*, seen from the inside ; magnified 50 diameters.
- Fig. 6. Dorsal tubercle, &c., of *Polycarpa formosa* ; magnified 50 diameters.
- Fig. 7. Specimen of *Polycarpa curta* ; natural size. The arrows indicate the branchial (inhalent) and atrial (exhalent) apertures.
- Fig. 8. Two other specimens of the same species.
- Fig. 9. Small part of the branchial sac of *Polycarpa curta*, seen from the inside ; magnified 50 diameters.
- Fig. 10. Small part of the dorsal lamina and branchial sac of *Polycarpa curta*, from inside ; magnified 50 diameters.
- Fig. 11. Dorsal tubercle and peritubercular area of *Polycarpa curta* ; magnified 50 diameters.
- Fig. 12. Centre of a spiral from branchial sac of *Eugyra glutinans* ; magnified 50 diameters.
- Fig. 13. Centre of another spiral from the branchial sac of *Eugyra glutinans* ; magnified 50 diameters.
- Fig. 14. Another similar spiral from *Eugyra glutinans* ; magnified 300 diameters.

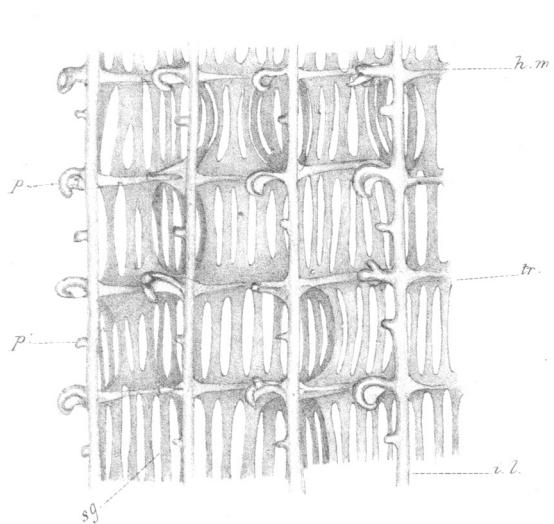


Fig. 3

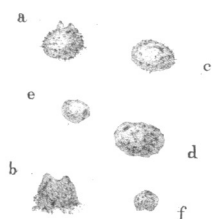


Fig. 4.

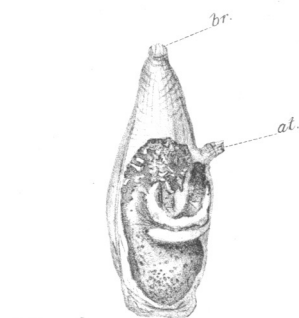


Fig. 2.

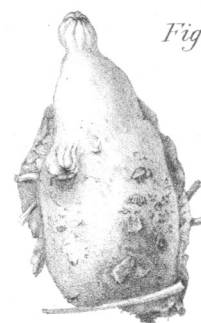


Fig. 1.

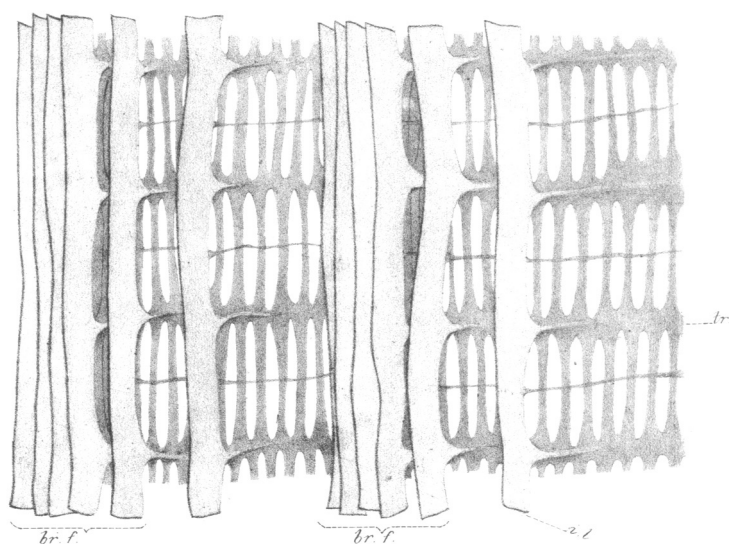


Fig. 5.

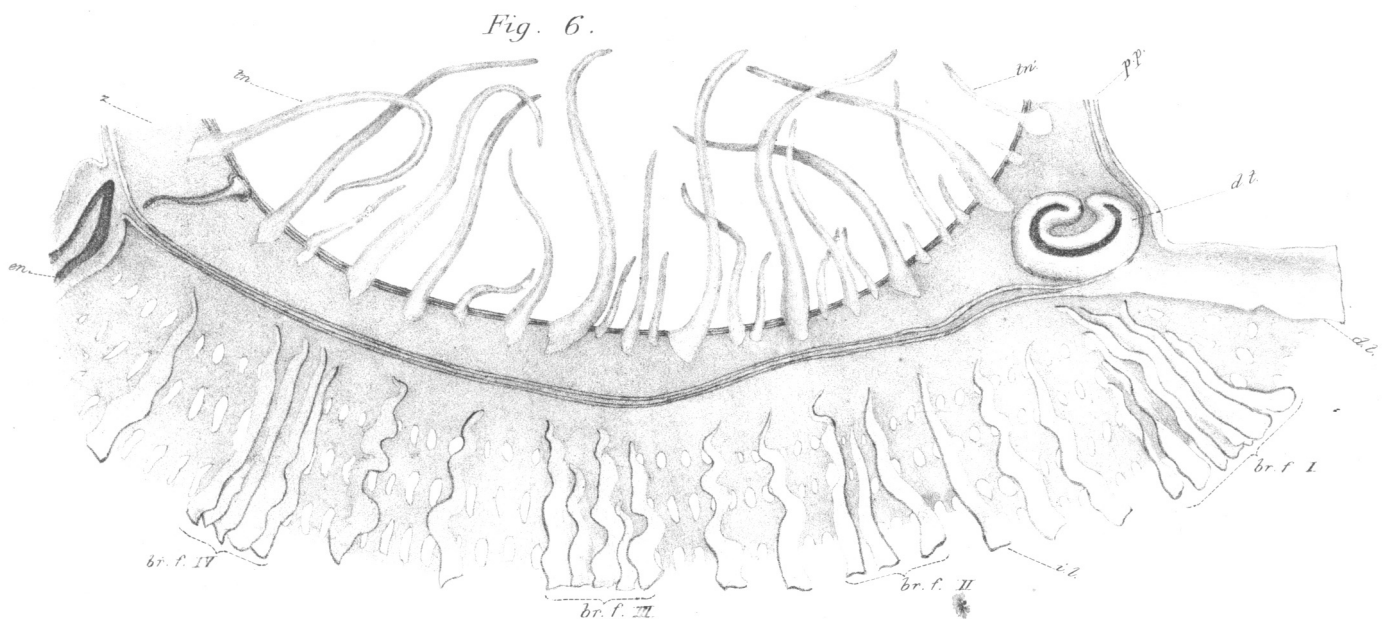
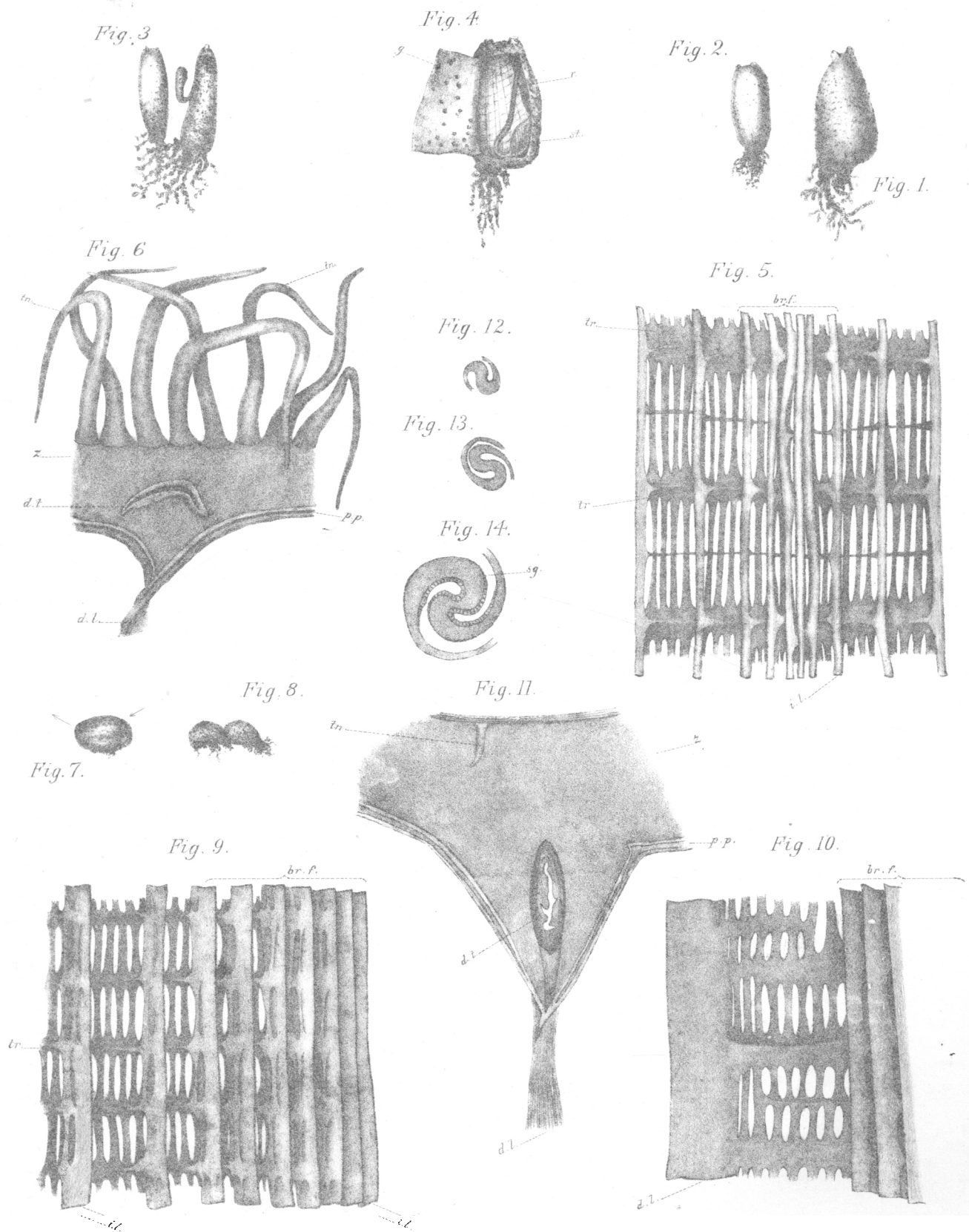


Fig. 6.



Figs 1-6. *POLYCARPA FORMOSA* n. sp.

Figs, 7-11. *POLYCARPA CURTA* n. sp.

Figs, 12-14. *EUGYRA GLUTINANS*. Möller.