

## PLATE 57, FIG. 1.

## BIFLUSTRA PERFRAGILIS (P. MACGIL.).

[Genus BIFLUSTRA (D'ORBIGNY). (Sub-kingd. Mollusca. Class Polyzoa. Order Infundibulata. Sub-ord. Cheilostomata. Fam. Membraniporidae.)

*Gen. Char.*—Polyzoary usually consisting of two layers of horizontal cells placed back to back and easily separable, occasionally of a single adnate layer; cells large, more or less quadrate, with rigid raised margins, and the front partly occupied by a broad, usually granular lamina.]

*DESCRIPTION.*—Cells much elongated, slightly arched above, raised margins minutely granular; the lamina smooth or finely granular, occupying about the lower third of the front of the cell, and extending as a narrow rim a short distance up the sides, leaving an oval or elliptical aperture.

*REFERENCE.*—*B. fragilis*, P. H. MacGillivray, Trans. Roy. Soc. Vict., 1868.

King's Island, Bass's Straits; Port Phillip Heads.

This species is usually found in two layers of cells, the resulting lamina being variously twisted and united so as to form an extremely delicate cavernous polyzoary. This double arrangement is, however, not constant, and I have a specimen of *Eschara mucronata* on the surface of which a single layer has extended from a mass of the ordinary double form. The cells are elongated, usually about three times as long as broad; the raised margins and lamina are nearly smooth or very finely granular. In some specimens, however, the cells are shorter, the ridges and lamina stronger, and the granulations coarser, approximating to the structure in the next species.

## EXPLANATION OF FIGURES.

PLATE 57.—Fig. 1, specimen, natural size. Fig. 1a, portion, magnified. Fig. 1b, single cell from same specimen, more highly magnified. Fig. 1c, two cells from another specimen, with the membrane filling the aperture entire, and showing the mouth at the upper part. Fig. 1d, section, showing the sides of the cells. Fig. 1e, section, showing the ends of the cells.

\* In different descriptions "zoarium" is used for "polyzoary," "zoecium" is used for "cell," and "oecium" is used instead of "ovicell."

## PLATE 57, FIG. 2.

## BIFLUSTRA DELICATULA (BUSK).

DESCRIPTION.—Cells quadrate, usually not more than twice as long as broad; margin very thick and regularly granular or tubercular; lamina thick, granular on the surface and edges, leaving a broadly elliptical aperture.

REFERENCE.—Busk, Crag Polyzoa, p. 72, pl. i., fig. 1.

## Queenscliff.

Like the last, *B. delicatula* usually occurs in two layers, forming a cavernous mass; and of this condition I have fine specimens from Port Curtis, in Queensland. The cells are broader than in *B. fragilis*; the septa and lamina much thicker and more strongly granular; the markings extending almost as short transverse ridges. The only Victorian specimen I have seen occurs in a *Membranipora* form as a single layer creeping over a narrow seaweed. In it the cells are much smaller, but do not otherwise differ from those of the Port Curtis specimens. The serrated denticle at the bottom of the aperture exists only in two or three of the cells of the Queenscliff specimen, and is altogether absent in those from Queensland, but, with that exception, they agree precisely with Busk's description and figure.

## EXPLANATION OF FIGURES.

PLATE 57.—Fig. 2, portion, magnified, of a specimen from Port Curtis, in which the cells were arranged in a double layer, the polyzoary being twisted and cavernous as in fig. 1. Fig. 2a, end view of cells from the same specimen, showing the dovetailed arrangement which frequently, but not always, exists in this species. Fig. 3, specimen occurring in a single layer, encrusting a narrow seaweed. Fig. 3a, portion of the same specimen, magnified to the same extent as fig. 2. Fig. 3b, a small group of cells from the same, more highly magnified; the two large cells show the broad serrated denticle at the bottom of the aperture.

The genus *Biflustra* was proposed by D'Orbigny for a large number of forms, mostly fossil, characterised by having cells similar to those of *Membranipora*, but disposed in two layers placed back to back and easily separable. All the species figured in the

*Paléontologie Française* are either subcylindrical or compressed and ramose. In the Crag Polyzoa, Busk adopts the genus and describes and figures *B. delicatula* from fossil specimens from the Crag, and recent ones from Australia. I believe the genus to be a good one, excluding, however, many forms referred to it by D'Orbigny. Lamarck's *Eschara chartacea* is probably one or both of the species here described.

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The specimens and descriptions of the above species are from Mr. MacGillivray.

FREDERICK MCCOY.

## PLATE 58, FIG. 1.

## CELLULARIA CUSPIDATA (BUSK).

[Genus CELLULARIA (PALLAS). (Sub-kingd. Mollusca. Class Polyzoa. Order Infundibulata. Sub-ord. Cheilostomata. Fam. Cellulariidae.)

*Gen. Char.*—Cells bi-triserial, oblong or rhomboidal, contiguous, usually perforated behind. Without avicularia or vibracula.]

*DESCRIPTION.*—Cells oblong; aperture with the margin thickened and nearly smooth; outer angle of the cells and the summit of the median cell at a bifurcation, produced into a short sharp spine. A single perforation behind.

*REFERENCE.*—Busk, Brit. Mus. Cat. Mar. Polyzoa, p. 19, pl. xxvii., figs. 1, 2.

Queenscliff and other places; common.

Forms whitish, curling tufts, from  $\frac{1}{2}$  inch high upwards, attached to algæ and zoophytes. It is at once distinguished by the pointed process on the upper and outer angle of the cells and by the similar strong cusp on the summit of the median cell at a bifurcation. In old or worn specimens the single posterior perforation cannot usually be distinguished. I have not seen the ovicell, but according to Busk it is smooth.

## EXPLANATION OF FIGURES.

PLATE 58.—Fig. 1, specimen, natural size. Fig. 1a, front view of the same, magnified. Fig. 1b, view of back, magnified; in two cells the posterior perforation is shown.

## PLATE 58, FIG. 2.

## MENIPEA CRYSTALLINA (GRAY SP.).

[Genus MENIPEA (LAMX.). (Sub-kingd. Mollusca. Class Polyzoa. Order Infundibulata. Sub-ord. Cheilostomata. Fam. Cellulariidae.)

*Gen. Char.*—Cells oblong, abbreviated or elongated and narrowed downwards; imperforate behind; a sessile lateral avicularium (frequently absent) and one or two sessile avicularia (also frequently absent) on the front of the cell. Ovicell globular, immersed in the internode.]

\* In different descriptions "zoarium" is used for "polyzoary," "zoecium" is used for "cell," and "oecium" is used instead of "ovicell."

**DESCRIPTION.**—A pair of cells in an internode, with three at a bifurcation; connecting tubes short and double; aperture nearly circular, largely filled in by a tubercular calcareous plate, usually broader below and leaving a subtriangular opening; 3 or 4 long slender spines articulated to the upper and outer margin of the aperture. Avicularium, when present, with the mandible opposite the calcareous plate filling in the lower part of the aperture. Ovicell deeply immersed.

**REFERENCE.**—Gray, Dieffenbach, New Zealand, ii. 293; Busk, Brit. Mus. Cat. Mar. Pol., p. 28, pl. xl.

Queenscliff and other places.

Forms small curling tufts attached to algæ and polyzoa. The avicularia are frequently wanting in all the cells of a specimen. When present they are small and situated so that the mandible opens opposite the lower edge of the aperture. When ovicells are present there are three cells in an internode, the ovicell being globular and deeply immersed in the upper cell, which is situated to one side and not mesially, as in the tricellular internode of a bifurcation. In this species, as in *M. cervicornis*, in addition to the usual bifurcating branches, one occasionally springs from the front of a cell.

#### EXPLANATION OF FIGURES.

PLATE 58.—Fig. 2, specimen, natural size. Fig. 2a, portion, magnified. Fig. 2b, two internodes, more highly magnified; a deeply immersed ovicell is shown in the upper cell of the upper internode, and the lateral avicularium is seen in the left-hand cell of the lower.

I follow Wyville Thomson, whose generic character I have given, in uniting *Emma* with *Menipea* as I cannot see that there is any sufficient distinction between the two genera. *Emma* is distinguished from *Menipea* by the aperture being contracted by a more or less granular plate, and by the lateral avicularia being situated below the level of the opening. All the species here described certainly belong to the same genus. In *M. cyathus* the granular plate is replaced by a slightly thickened rim, occasionally wider at the lower part; and the situation of the avicularium varies from opening opposite the upper third, as in *M. Buskii*, to opposite the lower edge of the aperture, as in *M. crystallina*.

## PLATE 58, FIG. 3.

## MENIPEA CYATHUS (WYV. THOMSON).

DESCRIPTION.—A pair of cells in an internode, with three at a bifurcation; connecting tube single; aperture of cell oval, oblique; 3 to 6 long spines, several of which are pod-like, articulated to the upper and outer margin; opercular spine springing from the upper and inner margin of the aperture and pointed downwards, divided into two or more processes. Avicularium opening opposite the upper third of the opening.

REFERENCE.—Wyville Thomson, Dublin Natural History Review, vol. v. (1858), p. 143, pl. xv., figs. 10, 10a.

## Queenscliff.

*M. cyathus* differs from the other species here described in the connecting tubes being long and single. The cells project considerably; the aperture is oval or elliptical; the calcareous plate is reduced to a simple marginal ring. From the upper cell there are usually 6 spines and from the lower 4, but the number is not constant. Several are usually very large and pod-like. The opercular spine is directed downwards and outwards from the upper and inner part of the margin; in the upper of the two cells of an ordinary internode and in the median one at a bifurcation it is usually simply bifid, and in the others each branch generally again divides so as to form four points. The avicularium is of considerable size, and opens opposite the junction of the middle and upper thirds of the aperture. Besides the lateral avicularia there is occasionally a sessile avicularium in front between the cell apertures. In the lower part of the front of the upper of two cells of an internode, there is constantly a round mark with an annular margin from which a radicle tube occasionally springs.

## EXPLANATION OF FIGURES.

PLATE 58.—Fig. 3, specimen, natural size. Fig. 3a, small portion, magnified; small sessile avicularia are shown on the front of three of the internodes, and in the internode of bifurcation a radicle tube is also seen. Fig. 3b, single internode, more highly magnified; in addition to the constant round mark there is in this specimen another similar mark immediately below the anterior sessile avicularium.

## PLATE 58, FIG. 4.

## MENIPEA CERVICORNIS (P. MACGILL.).

DESCRIPTION.—A pair of cells in an internode, with three at a bifurcation; connecting tubes double; aperture oblique, partly filled in by a faintly granular calcareous plate; 4 to 6 hollow spines, of which several are generally larger and pod-like, articulated to the outer margin. Opercular spine springing from the inner and lower part of the aperture, enlarged and branched at the extremity. Avicularia large, opening nearly opposite the lower edge of the aperture.

REFERENCE.—*Emma cervicornis*, P. H. MacGillivray, Trans. Roy. Soc. Vict., 1868.

## Queenscliff.

The branched opercular spine, springing from the inner and lower part of the aperture, readily distinguishes this from the other two-celled species. In addition to the branches of bifurcation others frequently rise from the front of a cell, usually the lower in an internode. The openings of these face the cells from which they rise.

## EXPLANATION OF FIGURES.

PLATE 58.—Fig. 4, specimen, natural size. Fig. 4a, portion, magnified, showing, in addition to the details of the cells, also two branches originating from the front of the upper internodes. Fig. 4b, three-celled internode at a bifurcation, more highly magnified.

## PLATE 58, FIG. 5.

## MENIPEA TRICELLATA (BUSK).

DESCRIPTION.—Cells three in an internode, narrowed downwards, elongated; connecting tubes short and double; aperture small, with a granular thickened margin; 4 or 5 long slender spines articulated to the upper and outer margin; opercular spine simple, springing from the inner margin. Avicularia opening nearly opposite the lower edge or middle of the aperture.

REFERENCE.—Busk, Voy. *Rattlesnake*, i., 373; Brit. Mus. Cat. Mar. Polyz., p. 28, pl. xli.

## Queenscliff.

This species is easily distinguished from *M. Buskii* by the simple opercular spine, as well as by the cells being much more elongated and narrow. The avicularia are frequently absent.

## EXPLANATION OF FIGURES.

PLATE 58.—Fig. 5, specimen, natural size. Fig. 5a, portion, magnified. Fig. 5b, internode (of bifurcation), more highly magnified.

## PLATE 58, FIG. 6.

## MENIPEA BUSKII (WYV. THOMSON).

DESCRIPTION.—Cells three in an internode; connecting tubes short and double; cells short and wide; aperture round, with a thickened, granular, calcareous margin, straightened below; usually 4 spines at the upper margin, of which the second or second and third from the outer edge are much larger and thicker, and there is frequently another smaller one on the inside. Opercular spine attached to the inner and lower part of the aperture, clavate. Avicularium opening opposite the middle or upper third of the aperture.

REFERENCE.—Wyville Thomson, Dublin Nat. Hist. Review, vol. v., p. 144, plate xii., fig. 1.

## Queenscliff.

Forms small tufts adhering to algæ and zoophytes. Readily distinguished by the three cells in an internode and the peculiar clavate opercular spine. I have not seen ovicells, but they are described by Thomson as being "spherical, with a richly granular surface, imbedded among the cells, on the cavity of two of which it encroaches.

## EXPLANATION OF FIGURES.

PLATE 58.—Fig. 6, specimen, natural size. Fig. 6a, portion, magnified. Fig. 6b, internode, more highly magnified.

I am indebted to Mr. MacGillivray for the specimens and descriptions illustrated by this plate.

FREDERICK MCCOY.

PLATE 59, FIG. 1.

## BICELLARIA TUBA (BUSK).

[Genus BICELLARIA (BLAINVILLE). (Sub-kingd. Mollusca. Class Polyzoa. Order Infundibulata. Sub-ord. Cheilostomata. Fam. Bicellariidæ.)

*Gen. Char.*—Branches continuously celluliferous; cells biserial, turbinate, more or less free above, aperture directed upwards and forwards, with several marginal or submarginal spines.]

**DESCRIPTION.**—Cells elongated, considerably narrowed downwards; aperture nearly round, looking obliquely upwards and forwards; 3 or 4 long submarginal spines, and one short thick process at the anterior and outer part, with 3–6 long spines articulated to its summit. Avicularium very long and trumpet-shaped, with a minute mandible on the summit. Ovicell globular, placed at the summit of a cell.

**REFERENCE.**—Busk, *Voy. Ratt.*, i., 373; *Cat. Mar. Pol. Brit. Mus.*, p. 42, pl. xxxi.

Queenscliff; Western Port; Portland, Mr. Maplestone.

This species forms large, handsome dense tufts, sometimes 5 or 6 inches high. It is usually of a delicate pink color, but sometimes of a silvery grey; the cells in the latter being rather smaller and more slender, but not otherwise differing. It is readily distinguished by the peculiar thick process, springing from below and behind the anterior and outer part of the margin, to the outer extremity of which 3–5 long processes are articulated. The avicularia are very peculiar. They are trumpet-shaped, very narrow, considerably longer than the cells, to the back of which, a little below the margin, they are articulated; a minute mandible is situated in a transverse cup-shaped hollow on the summit. One of the spines is frequently lower down the back than the others. A branch sometimes rises by a spirally twisted stem.

## EXPLANATION OF FIGURES.

PLATE 59.—Fig. 1, fragment, natural size. Fig. 1a, front view, magnified, showing the thick process with its digitiform spines and several long trumpet-shaped avicularia. Fig. 1b, back of portion of same. Fig. 1c, ovicell. Fig. 1d, portion of a branch originating by a spirally twisted stem; shows also an avicularium with its small mandible.

\* In different descriptions "zoarium" is used for "polyzoary," "zoecium" is used for "cell," and "oecium" is used instead of "ovicell."

## PLATE 59, FIGS. 2 AND 3.

## BICELLARIA GRANDIS (BUSK).

DESCRIPTION.—Cells large, much expanded above, spreading outwards, with a large nearly horizontal aperture. A variable number of spines from the outer edge.

REFERENCE.—Busk, Voy. Ratt., i., 374; Cat. Mar. Pol. Brit. Mus., p. 42, pl. xlv.

Queenscliff; Cape Otway, Mr. J. Payter.

*B. grandis* differs from the other species in the large size of the cells, in their being very narrow below and expanded widely above, and in the large, nearly horizontal, elliptical opening. There are two marked varieties. In the one there are several spines rising separately immediately behind and below the aperture, some of which occasionally originate together from a wide prolongation of the cell. In this form there is constantly a separate spine about half-way down the back of the cell. The aperture is frequently pointed at its inner end. I have not seen the avicularia. This is the form described and figured by Busk. In the other, the cell is prolonged immediately below the outer margin into a broad process, to the end of which all the spines are attached. There is no posterior spine. The avicularia are similar to those of *B. tuba*, but are shorter and stouter. I was at first inclined to consider them as distinct species, but as in the first variety the spines frequently spring from a production of the outer part of the cell, and in our ignorance of the structure of the avicularia the only constant difference is in the presence of the posterior spine, I think it is better, for the present at least, to unite them. The second form may be called var. *producta*.

## EXPLANATION OF FIGURES.

PLATE 59.—Fig. 2, fragment, natural size. Fig. 2a, portion of typical form, magnified. Fig. 2b, back of same, showing the posterior spines. Fig. 3, front view of portion of var. *producta*, magnified, showing the broad spiniferous extension of the cell and an avicularium. Fig. 3a, back of the same.

## PLATE 59, FIG. 4.

## BICELLARIA CILIATA (LINN.).

DESCRIPTION.—Cells very small; outer margin with about 6 long slender spines; a small spine on the front of the cell immediately below the aperture, and another a short distance down the back. Avicularia small, capitate, attached to the outer part of a cell. Ovicells small, round, on the inner margin of the aperture.

REFERENCE.—Busk, Cat. Mar. Pol. Brit. Mus., p. 41, pl. xxxiv.

Queenscliff; Portland, Mr. Maplestone.

Of the form now described I have only seen two or three small fragments; in all of them the spine in front is simple, and I can see no difference between it and the European *B. ciliata*. Busk's *B. gracilis* differs in the form of the cells, and in the presence of a fine double spine in front. I had specimens with a double spine which I referred to it, but they have unfortunately been lost, and I have no description or figure.

## EXPLANATION OF FIGURES.

PLATE 59.—Fig. 4, specimen, natural size. Fig. 4a, front view, magnified. Fig. 4b, back of same. Fig. 4c, a single cell, more highly magnified, showing a small capitate avicularium.

## PLATE 59, FIG. 5.

## BICELLARIA TURBINATA (P. MACGILL.).

DESCRIPTION.—Cells turbinate, elongated, much contracted below, upper part scarcely free; aperture nearly circular, with 3 or 4 long submarginal spines from the upper and outer margin.

REFERENCE.—P. H. MacGillivray, Trans. Roy. Soc. Vict., 1869.

Queenscliff.

Of this species, I have only a single tuft. It is quite distinct, and easily recognisable by the long, slightly expanded, turbinate cells, the nearly circular aperture, and the 3 or 4 submarginal spines.

## EXPLANATION OF FIGURES.

PLATE 59.—Fig. 5, portion, natural size. Fig. 5a, front view, magnified. Fig. 5b, back view.

## PLATE 59, FIG. 6.

## STIRPARIA ANNULATA (MAPLESTONE).

[Genus STIRPARIA (GOLDSTEIN). (Sub-kingd. Mollusca. Class Polyzoa. Order Infundibulata. Sub-ord. Cheilostomata. Fam. Bicellariidæ.)

Gen. Char.—Celluliferous branches attached in regular tufts to a bare, annulated, corneous common stem. Cells biserial, turbinate, aperture looking upwards and forwards and with marginal spines.]

DESCRIPTION.—This species forms beautiful tufts about three inches high. Each branch is formed of a soft corneous stem, narrowed at intervals of about an eighth of an inch. The narrow parts are regularly and distinctly annulated, but not articulated; the annulations extend, especially in the older portions, to a greater or less extent on the swollen fusiform parts, more prominently at their bases. The lower parts of the stems have no cell-bearing branches. These are attached regularly, one on each side at the summit of a spindle-shaped portion, by a short annulated stem, which swells at the top and bifurcates, the divisions again rapidly bifurcating, so as to form beautiful fan-shaped tufts. The cells are turbinate. The aperture is large, opening upwards and forwards. There are usually 4 very long, incurved spines articulated closely together to the outer edge, a separate spine from the inner part of the aperture passing behind the cell above, and another separate spine on the front of the cell below the aperture. The cells are distinct behind, and each has a peculiar bifurcate mark on the back. The ovicells are cucullate, attached to the outer edge of the margin of the aperture.

REFERENCE.—*Bicellaria annulata*, Maplestone, Journ. Microp. Soc. Vict. 1879.

Cape Otway, Mrs. George Caldwell; Portland, Mr. Maplestone.

## EXPLANATION OF FIGURES.

PLATE 59.—Fig. 6, branch, natural size. Fig. 6a, front view, magnified, showing the arrangement of the spines and ovicells. Fig. 6b, back view, showing the peculiar bifurcate mark. Fig. 6c, portion of the common stem, magnified.

## PLATE 59, FIG. 7.

## BUGULA NERITINA (LINN.).

[Genus BUGULA (OKEN). (Sub-kingd. Mollusca. Class Polyzoa. Order Infundibulata. Sub-ord. Cheilostomata. Fam. Bicellariidæ.)

*Gen. Char.*—Cells bi-multiserial, closely contiguous, aperture very large, directed forwards, the margins not at all or very slightly thickened.]

*DESCRIPTION.*—Cells biserial, elongated, upper edge straight, with the angles projecting; aperture large, occupying nearly the whole front. No avicularia. Ovicells large, situated at the upper and inner angles of the cells.

*REFERENCE.*—Busk, *Cat. Mar. Polyz. Brit. Mus.*, p. 44, pl. xliii.

Hobson's Bay; Queenscliff; Warrnambool, Mr. Watts.

*Bugula neritina* is readily distinguished from the other Victorian species. It forms small tufts of a brownish color. The cells are straight above, each angle projecting as a short spine; the aperture is very large, the margin very slightly thickened. I have never seen avicularia. The ovicells are large, rounded, situated at the upper and inner angles of the cells. They are pearly white (in dried specimens) and are very conspicuous against the brown of the rest of the polyzoary.

## EXPLANATION OF FIGURES.

PLATE 59.—Fig. 7, portion, natural size. Fig. 7a, cells, magnified, front view. Fig. 7b, cells magnified, back view. Fig. 7c, small portion to shew ovicells, magnified. Fig. 7d, single cell, viewed from the outside, showing attachment and opening of an ovicell.

The specimens and descriptions of the above *Bicellariidæ* were presented by Mr. MacGillivray.

FREDERICK MCCOY.

## PLATE 60, FIG. 1.

## STEGANOPORELLA MAGNILABRIS (BUSK SP.).

[Genus STEGANOPORELLA (SMITT). (Sub-kingd. Mollusca. Class Polyzoa. Order Infundibulata. Sub-ord. Cheilostomata. Fam. Steganoporellidæ.)

*Gen. Char.*—Polyzoary expanded, formed of a single layer of cells, or of two united back to back; cells with calcareous raised margins; a membranous layer stretched across the front of each cell and separated from the receding calcareous layer, so as to leave a space or chamber between the two; operculum of outer wall very large, orifice of inner nearly circular.]

*DESCRIPTION.*—Polyzoary rigid, expanded, usually sub-erect; cells quadrate, arranged in linear and alternate series, in a single layer or in two placed back to back; margins raised, calcareous. A separate membranous layer, stretched tightly across the front of the cell; operculum very large, attached on each side to a projecting process of the cell-margin and strengthened by a narrow corneous band. Inner wall a calcareous, punctured lamina, extending forwards and downwards so as to leave a chamber between it and the outer membrane; it opens by a nearly circular mouth, with projecting margin, behind which a broad square plate, with the sides turned down and united to the lamina, rises to the articulating base of the operculum.

*REFERENCE.*—*Membranipora magnilabris*, Busk, Cat. Mar. Pol. Brit. Mus., p. 62, pl. lxv., fig. 4 = *Steganoporella elegans*, Smitt, Floridan Polyzoa, Part ii., p. 15, pl. iv., figs. 96–101.

Portland, attached to piles, Mr. Maplestone; Queenscliff.

I have only seen dried specimens of this very peculiar species, the structure of which it is to be hoped will ere long be examined in the living state. It seems to be identical with Smitt's *S. elegans* described from the Gulf of Florida, and no doubt Smitt is correct in considering Busk's *Membranipora magnilabris* as the membranipora form of the same species. The only difference I can detect in the Australian specimens is that the ordinary cells are more quadrate, and that the large rounded opercula are usually denticulate on the margin. The fossil *Eschara elegans* of Milne Edwards is considered by Smitt to be the same species, but I think that determination doubtful, and I have therefore adopted Busk's specific name.

It is found as a single layer encrusting other objects, or partly free and foliaceous; at other times it consists of two layers united

\* In different descriptions "zoarium" is used for "polyzoary," "zoocium" is used for "cell," and "oecium" is used instead of "ovicell."

back to back. The specimens are sometimes of considerable size, and one presented to the Museum by Mr. Goldstein forms an irregular foliaceous mass measuring about 13 inches long by 9 inches wide and 6 inches high.

The cells are large, mostly quadrate, the margins thick and raised, and with the external membrane tightly stretched across the aperture. The movable lip is very large, occupying about half the aperture, and is of two forms. Most of the cells are quadrate at the anterior extremity, and in these the square operculum is strengthened by a fine band at a little distance from and nearly parallel to the margin. Other cells, usually of a larger size, and frequently situated at the bifurcation of a series, are rounded in front; in these the operculum is strengthened by two bands, which converge from the base in an arched form, and when close to the margin slightly diverge again, becoming blended with the marginal corneous rim. This form of operculum is generally finely denticulate at the margin. When the outer membrane is removed, the margins of the cells are seen to be thick, calcareous, the portion behind the attachment of the operculum bevelled inwards, the bevelled surface being finely granular; the part corresponding to the margin of the operculum forms a smooth, deeply vaulted arch, the posterior angles of which are produced into a tubercle on each side for the attachment of the corners of the lip. The inner wall is a thin calcareous lamina, pierced by numerous white-bordered pores; it recedes downwards and forwards, the anterior part being very abrupt, and opens by a nearly circular sloping mouth, with raised cylindrical margins. Immediately behind this opening a square plate extends upwards and backwards to the articulating base of the operculum, its lateral edges being turned down and united to the lamina so as to form a sort of recess or pouch. The posterior part of the raised inner orifice is united to this plate.

#### EXPLANATION OF FIGURES.

PLATE 60.—Fig. 1, specimen, natural size. Fig. 1*a*, portion, magnified, showing membranous layer, two sorts of cells, the one quadrate with smooth-edged opercula, strengthened by a square-shaped horny band, parallel to and at a little distance from the margin, the other rounded anteriorly, with rounded denticulate opercula and different shaped strengthening bands. Fig. 1*b*, portion denuded of membrane, magnified. Fig. 1*c*, two quadrate cells from the same, more highly magnified, showing the raised bevelled edges, the receding perforated calcareous wall, the internal mouth and the plate to the articulating base of the operculum with its edges turned down and continuous with the front of the lamina.

## PLATE 60, FIG. 2.

## PETRALIA UNDATA (P. MACGIL.).

[Genus PETRALIA (P. MACGIL.). Sub-kingd. Mollusca. Class Polyzoa. Order Infundibulata. Sub-ord. Cheilostomata. Fam. Escharidæ.)

*Gen. Char.*—Polyzoary stony, expanded, erect, fenestrate, formed of a single layer of cells placed horizontally side by side and distinct throughout the whole thickness of the polyzoary.]

**DESCRIPTION.**—Fenestræ broadly elliptical, margins tubercular, and with one or two large avicularia at the base of each in front. Cells quadrate, expanded above, slightly narrowed at the middle and below, separated by narrow raised lines; front tubercular and perforated; mouth circular, with a short broad transverse avicularium immediately below the lower lip. Behind, the cells are quadrate, deeply areolated and separated by channels, at the bottom of which is a narrow elevated ridge. Ovicells large, globular, closely punctate; frequently one or more immovable processes, surmounted by sessile avicularia, rise from various parts of the ovicell.

**REFERENCE.**—P. H. MacGillivray, Trans. Roy. Soc. Vict., 1868.

Portland, Miss F. Birkett; Queenscliff.

The polyzoary forms an expanded wavy frond, probably of considerable size, as all the specimens I have seen are broken on the edges. The avicularia occur in three different forms. Immediately below the mouth of each cell is a short transverse sessile avicularium, and at the lower edge of each foramen one or two large sessile avicularia take the place of ordinary cells. In addition to these the ovicells have usually one or more calcareous processes on various parts of the surface, each surmounted by a small sessile avicularium. The ovicells are crowded in patches, frequently united to each other, and on the cells supporting them are numerous sessile avicularia, usually on raised calcareous bases and generally arranged along the margins and round the mouths.

The only other genus of *Escharidæ* with a foraminate polyzoary, the cells of which are disposed in one plane, is *Retepora*. The arrangement of the cells, however, is very different in the two genera. In *Retepora* they are oblique and rest on a common calcareous basis, while in *Petralia* there is no such basis, but the cells are horizontal and as distinct on the back of the polyzoary as in the front.

## EXPLANATION OF FIGURES.

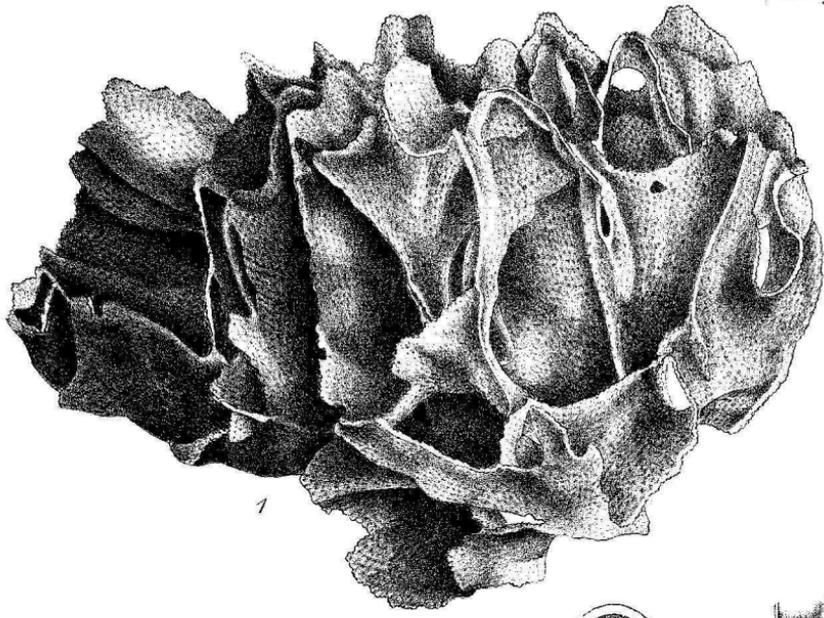
PLATE 60.—Fig. 2, front view of specimen, natural size. Fig. 2*a*, back view of same. Fig. 2*b*, portion of front, magnified, showing a foramen with tubercular margins; at the base are seen two large avicularia replacing cells. Fig. 2*c*, portion of back, magnified, showing the distinct areolated cells, separated by raised ridges at the bottom of channels. Fig. 2*d*, small portion, magnified, showing three ovicells, one of which is studded with avicularia; numerous sessile avicularia, mostly on calcareous bases, are seen on the cells with which the ovicells are connected. Fig. 2*e*, fractured edge of polyzoary, to show the cells distinct throughout the whole thickness; the fracture was obliquely across the cells.

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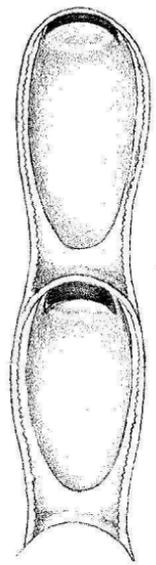
I am indebted to my friend Mr. MacGillivray for the specimens and descriptions of the two Polyzoa on this plate.

FREDERICK MCCOY.

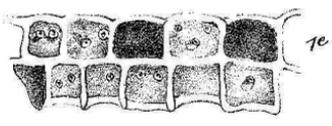
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1



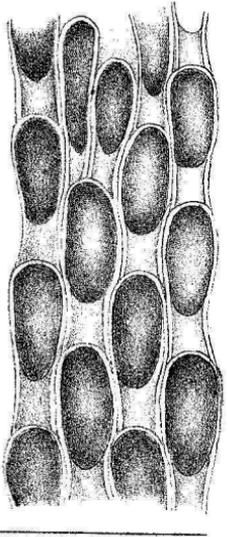
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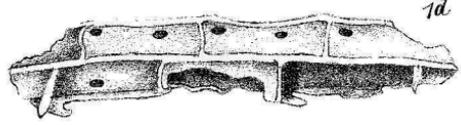
1e



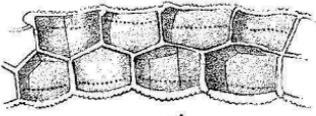
1b



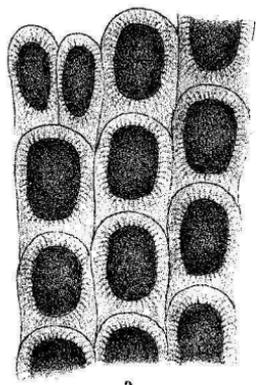
1d



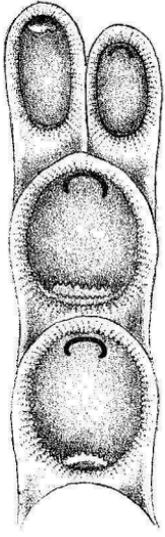
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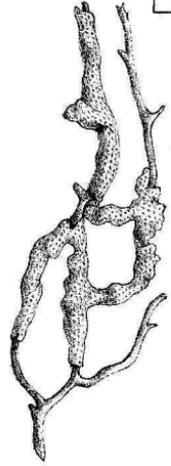
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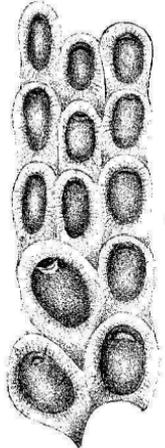
2



3b

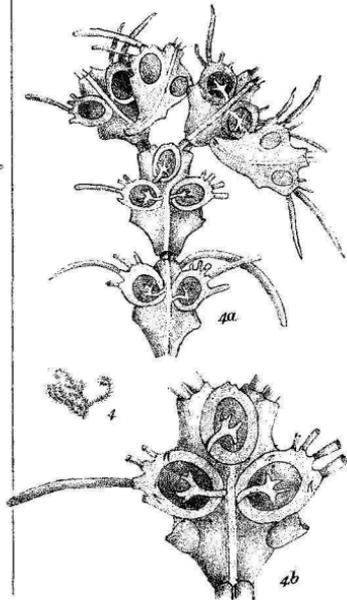
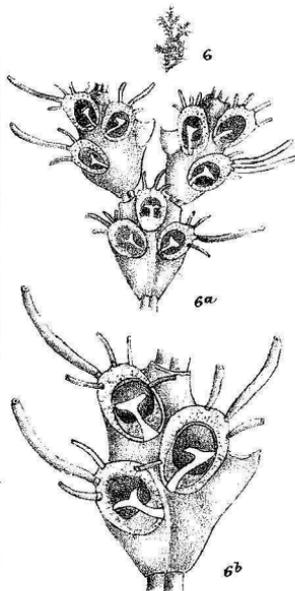
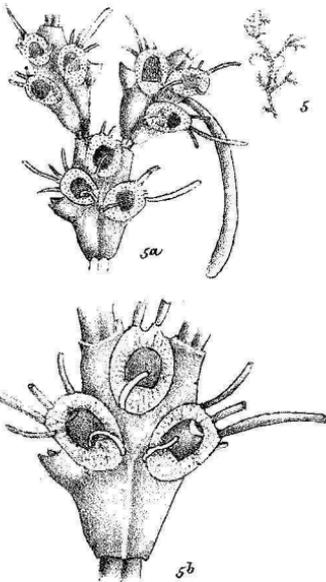
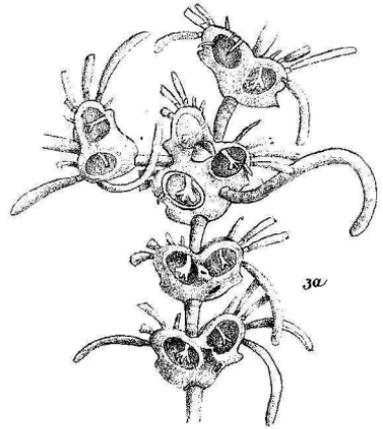
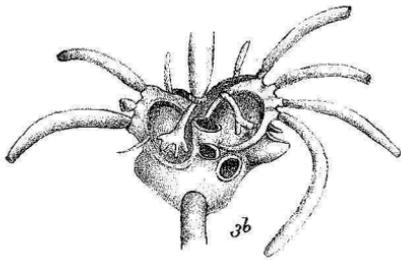
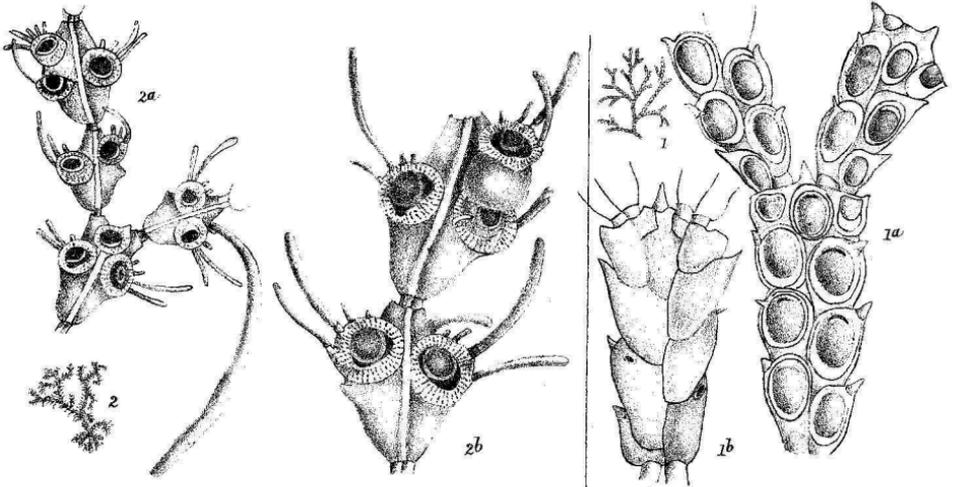


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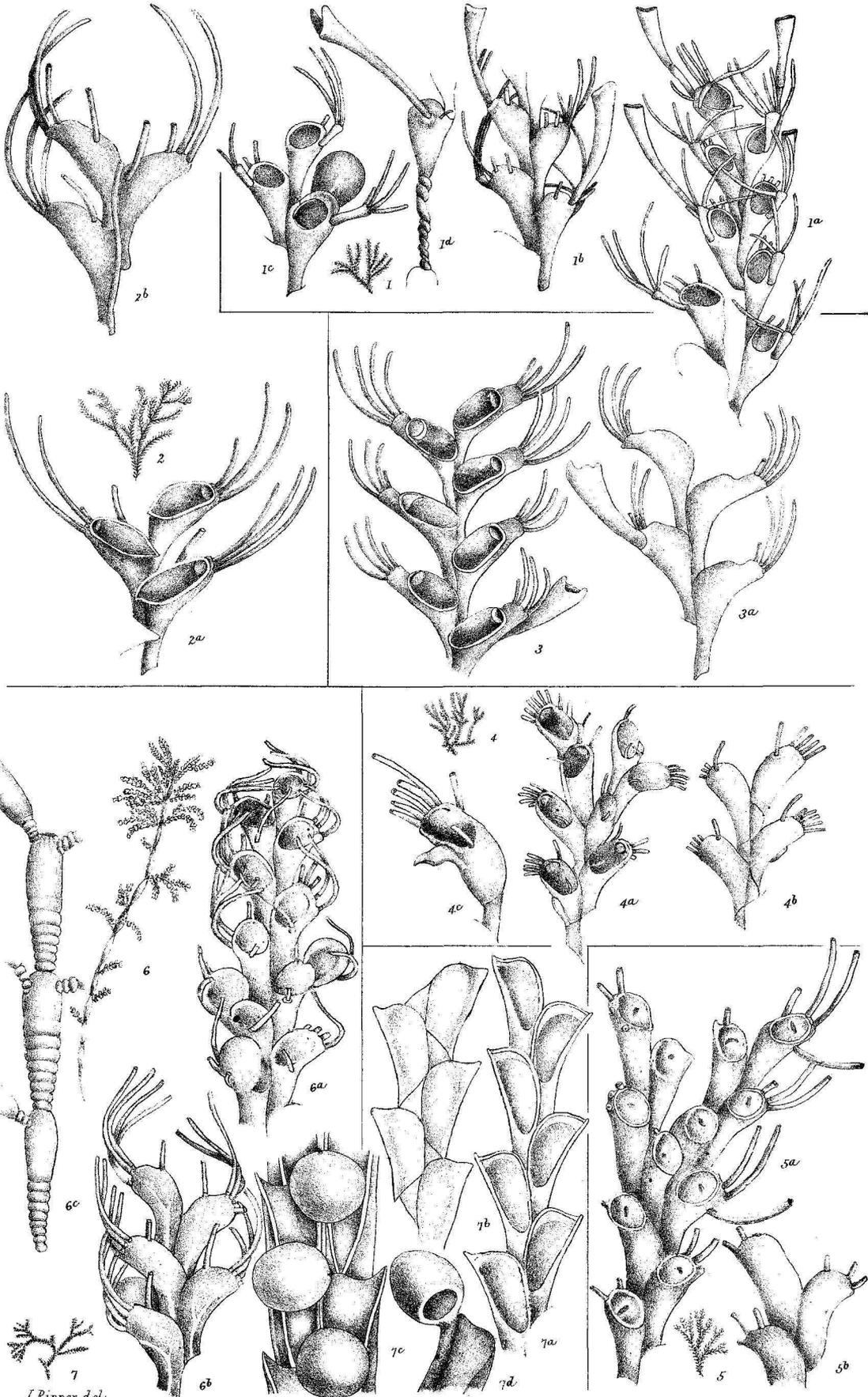


3a

(Polyzoa)



(Polyzoa)

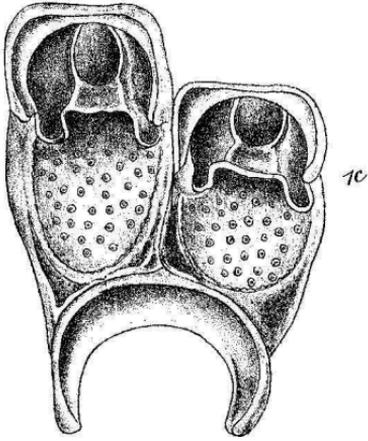


J. Ripper del.  
A. Bartholomew lith.

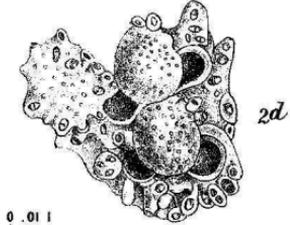
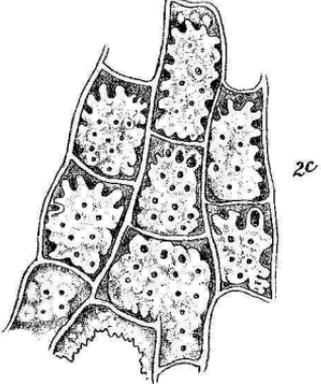
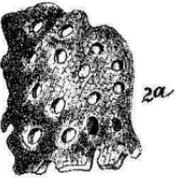
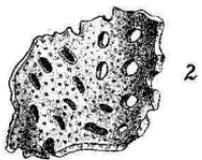
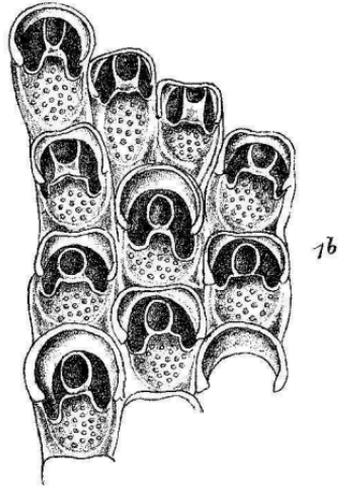
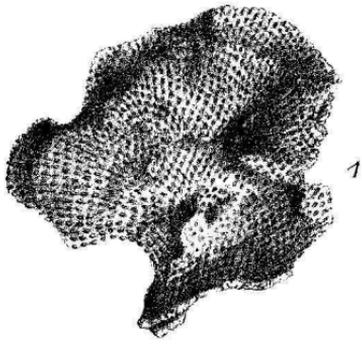
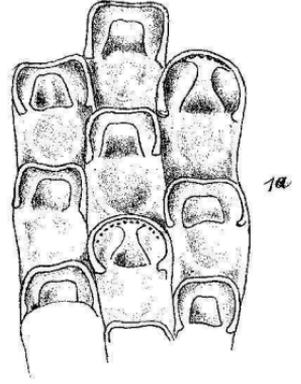
Prof. McCoy direct

Steam litho, Govt. Printing Office.

(Polyzoa)



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0 . 01 |

