

PLATES 24, 25, 26.

POLYZOA.

The number of observers with the microscope is so considerable in Victoria that it seemed to me particularly desirable to take advantage of the microscopic skill and powers of observation of some of my friends to present the means of readily identifying some of the more easily preserved, beautiful, and interesting of the minute members of the animal kingdom found in the colony. From the *Polyzoa* presenting these recommendations in a high degree, and an exact determination of our living species being likewise of great prospective interest to the geologist, as a necessary preliminary to the right understanding of the numerous species occurring in our Tertiary formations, I several years ago mentioned to my friend Mr. P. H. MacGillivray, so well known for his studies of this group, my desire to publish in this work all that were known on our shores; and I have to express my greatest thanks to him for immediately presenting a series of his specimens to the National Museum, and furnishing me with his notes on them. The specimens I have had most carefully figured, the three following plates giving the species of the genera *Catenicella* and *Membranipora*, represented in all the views that seemed needful for the easy and certain recognition of the species.

 PLATE 24, FIG. 1.

CATENICELLA MARGARITACEA (BUSK).

[Genus CATENICELLA (BLAINV.). (Sub-kingd. Mollusca. Class Polyzoa. Order Infundibulata. Sub-Order Cheilostomata. Fam. Catenicellidæ.)

Gen. Char.—"Cells arising one from the upper and back part of another by a short corneous tube, all facing the same way and forming dichotomously divided branches, of an erect phytoid polyzoary; cell at each bifurcation geminate; each cell with two lateral processes, usually supporting an avicularium. Ovicells either subglobose and terminal, or galeriform, and placed below the opening of a cell in front." The species of *Catenicella* abound in the Australasian seas, to which they are almost confined.]

DESCRIPTION.—Cells widely ovate. Fenestræ 5. Lower lip with a minute rounded notch. Lateral processes large; avicularium large, supporting a widely-open cup-shaped process above. Back of cell finely sulcated.

REFERENCE.—Busk, Voy. Ratt., i., 356; Cat. Mar. Pol. Brit. Mus., t. 6, f. 1, 2, 3.

Forms dense tufts, 2 to 4 or 5 inches high, of a reddish-brown color; common on the Victorian coasts.

This species is readily distinguished by the number of the fenestræ, the slight notch in the lower lip, the form of the lateral processes, with the widely-open, superior, cup-shaped, chamber, and the sulci on the back of the cells.

EXPLANATION OF FIGURES.

PLATE 24.—Fig. 1, natural size. Fig. 1a, front view of a branchlet, magnified. Fig. 1b, back view of ovicell, magnified. Fig. 1c, front view of ovicell, magnified. Fig. 1d, back view of a branchlet, magnified.

The species of this genus may be divided into five well-defined groups. The first, *Fenestratæ** of Busk, is distinguished by the presence of a certain number of marks or fenestræ on the front of the cell, caused by the deficiency of the ectoderm at these points. The species are mostly of large size, and the ovicells are large and terminal. In the second group, *Vittatæ*† of Busk, there are no fenestræ, but there is a narrow lateral or sublateral band or vitta on each side. The ovicells are of two forms, either on the summit of a cell of a series and cemented to the succeeding one, which is sessile, so that the three form a continuous mass; or they are terminal, and situated on the summit of a cell of a geminate pair. They are usually small species. The third group, *Simplices* of Busk, comprising the single species *C. carinata*, has neither fenestræ, vittæ, nor any other appendage, except the peculiar transversely spreading lateral processes. The fourth group, *Auritæ*‡ of Wyville Thomson, has neither true fenestræ nor vittæ, and is distinguished by the presence of several thick blunt hollow processes on the upper edge of the mouth. The fifth group, *Fasciatæ* of Thomson, consists of the single species *C. Harveyi*.

* *Fenestratæ* includes *C. margaritacea*, *plagiostoma*, *ventricosa*, *hastata*, *rufa*, *cribraria*, *alata*, *lorica*, *intermedia*.

† *Vittatæ* includes *C. formosa*, *elegans*, *perforata*, *Buskii*, *Hannafordi*, *crystallina*, *cornuta*.

‡ *Auritæ* includes *C. aurita*, *geminata*.

The lateral processes, the characteristics of which are largely used in the discrimination of the species, can, in many, be seen to consist of three divisions, the middle one being the true avicularian chamber. One or more of the divisions may be largely developed, abortive, or wanting.

In addition to the species here described, *C. amphora* and *umbonata* of Busk, and *castanea* and *Harveyi* of Thomson—which have been found in Bass's Straits—are certain to occur on our coasts; and there is no doubt that a careful search will add several undescribed forms to the list.

PLATE 24, FIG. 2.

CATENICELLA PLAGIOSTOMA (BUSK).

DESCRIPTION.—Cells large, wide. Fenestræ 5, very large. Mouth lofty, directed obliquely to one side of the cell. Lateral processes very wide, consisting of an avicularium surmounted by a wide hollow fringe. Avicularia of two sorts, of moderate size, or very much elongated and exceeding half the length of the cell. The back of the cell with a broad longitudinal band, from which proceed, on either side, two narrow bands, one to the avicularian process, the other across the middle of the cell. Ovicell very large.

Var. *α lævis*.—Back of cell destitute of spines.

Var. *β setigera*.—Back of cell with small setose spines in the intervals between the dorsal band and its branches.

REFERENCE.—Busk, Voy. Ratt., i., 358; Cat. Mar. Pol. Brit. Mus., t. 5, f. 1, 2.

Very common, forming handsome, dense, reddish tufts, 3 or 4 inches high.

This is one of the most peculiar species of the genus. The cells are very broad, the front almost entirely occupied by 5 fenestræ, the real nature of which is here probably better shown than in any other species. The marks on the back of the cell are produced in the same manner as the fenestræ in front, the broad mesial and the narrow diverging bands consisting of the ectoderm which is deficient in the other parts, as it is in the fenestræ in front. The mouth of the cell is very lofty and directed obliquely to one side, which is constant in all the cells of the same series, and follows the same direction as that of the geminate cell from which

it arises—the mouths of the geminate pair being directed towards each other. The form and arrangement of the avicularia present a very marked feature. On all the cells there is a small avicularium with a sharp-pointed mandible, lodged in the edge of one or both lateral processes; while in many cells this position is occupied, on one side, by an avicularium of enormous size, frequently nearly equalling the cell in length. These large avicularia, when present, are situated on that side of the cell towards which the mouth inclines.

The ovicell is of large size, and surmounted by an avicularium sessile on a thick calcareous process. Encircling and forming the upper rim of the mouth is a large semilunar plate on each side, the two being united together in the mesian line.

Of the two varieties the first is very common, the second of much rarer occurrence.

EXPLANATION OF FIGURES.

PLATE 24.—Fig. 2, natural size. Fig. 2*a*, front view of ordinary single and double cells, magnified. Fig. 2*b*, front view of a cell with an ovicell, magnified. Fig. 2*c*, back view of ovicell, also single and double cells, magnified.

PLATE 24, FIG. 3.

CATENICELLA VENTRICOSA (BUSK).

DESCRIPTION.—Cells ovate. Fenestræ 7, pyriform or with a line from the pointed inner extremity. Lower lip entire, notched, or with a small suboral foramen. Lateral processes of moderate size, the upper division generally pointed upwards. Back of cell smooth.

REFERENCE.—Busk, Voy. Ratt., i., 357; Cat. Mar. Pol. Brit. Mus., t. 2, f. 1, 2; t. 3, f. 1–5.

Forms large, dense, brownish tufts, 3 or 4 inches high, and is of common occurrence. It is readily distinguished by the number and arrangement of the foramina, and by the smooth back of the cell.

EXPLANATION OF FIGURES.

PLATE 24.—Fig. 3, natural size. Fig. 3*a*, front view of a branchlet, magnified. Fig. 3*b*, back view of a single and double cell, magnified.

PLATE 24, FIG. 4.

CATENICELLA HASTATA (BUSK).

DESCRIPTION.—Cells ovate. Fenestræ surrounding a scutiform area, and with intermediate fissures radiating towards the median line. Lateral processes very wide, the upper portion with several small perforations. Back minutely sulcate.

REFERENCE.—Busk, Voy. Ratt., i., 355; Cat. Mar. Pol. Brit. Mus., t. 2, f. 3, 4.

Queenscliff, Western Port, Cape Otway, and other localities; frequent.

Forms thick brownish-white tufts, 1 to 3 inches high. It is readily distinguished by the peculiar scutiform arrangement of the fenestræ and intermediate fissures, and by the perforated superior lateral processes.

EXPLANATION OF FIGURES.

PLATE 24.—Fig. 4, natural size. Fig. 4a, front view of a branchlet, showing single and double cells with ovicell also, magnified. Fig. 4c, back views of ovicell with ordinary cells also, magnified. Fig. 4b, drawn by mistake, back of cells with adherent extraneous matter.

PLATE 24, FIG. 5.

CATENICELLA RUFA (P. MACGIL.).

DESCRIPTION.—Cells vase-formed. Front with numerous round fenestræ, the circumferential being the largest. Mouth with a notch in the lower lip. Lateral processes small and pointed. On the back of the cell an elevated band runs up the middle, sending a narrow branch horizontally to each lateral process, and a small band extends up each side. Ovicells large, cribriform, surmounted by two avicularia.

REFERENCE.—P. H. MacGillivray, Trans. Royal Soc. Vict., 1868.

Common, forming handsome reddish-brown tufts, 4 or 5 inches high.

This and the next species, although presenting many points of resemblance, are easily distinguished. The cells in both are of nearly the same size and form, and are cribriform in front. In

both the exterior foramina are of much larger size, and usually form a distinct series round the edge of the cell. Both have frequently a semicircular area beneath the mouth more elevated than the rest, and both are destitute of the upper appendage of the lateral process.

In *C. cribraria* the lower lip is entire, and there is a crescentic pore a short distance beneath it; the avicularia are lodged in deep gaping excavations in the tolerably large lateral processes; and the back is smooth and destitute of any special marks. In *C. rufa*, the lower lip presents a constant notch; the lateral processes are small and pointed, and the notch for the avicularium is very shallow and inconspicuous; and the back of the cell is occupied by a broad mesial band connected inferiorly with two narrow lateral ones, and sending off superiorly on each side a narrow band to join the lateral in the avicularian processes. In this and the next species the fenestræ are probably formed by the opening of small tubercles.

EXPLANATION OF FIGURES.

PLATE 24.—Fig. 5, natural size. Fig. 5*a*, front view of ovicell, with other cells attached, magnified. Fig. 5*b*, front view of a branchlet of cells, magnified. Fig. 5*c*, back view of ovicell, magnified. Fig. 5*d*, back view of branchlet, magnified.

PLATE 24, FIG. 6.

CATENICELLA CRIBRARIA (BUSK).

DESCRIPTION.—Cells oval or subglobular. Surface cribriform, with a suboral lunate pore, the circumferential foramina being largest. Lateral processes destitute of superior appendage, deeply excavated for the reception of the avicularia, and produced inferiorly as a narrow fringe along the side of the cell. Back of cell smooth.

REFERENCE.—Busk, Voy. Ratt., i., 359; Cat. Mar. Pol. Brit. Mus., t. 5, f. 3, 4.

Queenscliff, Sealers' Cove, Western Port, and other localities.

EXPLANATION OF FIGURES.

PLATE 24.—Fig. 6, natural size. Fig. 6*a*, front view of a branchlet of single and double cells, magnified. Fig. 6*b*, back view of cells, magnified.

PLATE 24, FIG. 7.

CATENICELLA ALATA (WYV. THOMSON).

DESCRIPTION.—Cells pyriform. Fenestræ, 5–7. Lateral processes very large, extending as a broad flat fringe the whole length of the cell. Back of cell minutely sulcate.

REFERENCE.—Wyville Thomson, Dublin Natural History Review, April 1858, quoted in Microscopical Journal, 1859, p. 143.

Queenscliff.

Forms small tufts of a pinkish color, about an inch high, growing on polyzoa and algæ. It is at once distinguished from the other species by the enormous width of the lateral processes, each of which is as large as the cell. The avicularian chamber is a long narrow tube, expanding in the outer half and contracting at the orifice. There is a constant pyriform or triangular opening in the process immediately above the avicularian chamber, and generally one or more irregular ones in the lower part of the fringe.

EXPLANATION OF FIGURES.

PLATE 24.—Fig. 7, natural size. Fig. 7a, front view of cells, magnified. Fig. 7b, back view of cells, magnified.



PLATE 24, FIG. 8.

CATENICELLA LORICA (BUSK).

DESCRIPTION.—Cells elongated, truncated at both ends. Fenestræ, 3, two below the mouth, and one median much larger. Lateral processes of considerable size. Back of cell minutely sulcate.

REFERENCE.—Busk, Voy. Ratt., i., 358; Cat. Mar. Pol. Brit. Mus., t. 1, f. 1–3.

Queenscliff and elsewhere; not common.

Forms tufts one or two inches high, of a dirty reddish-white color. Beneath the third division of the lateral process, which is

very wide and covered by a thin membrane, is another similar closed compartment extending almost to the base of the cell. This gives to the cell a peculiar hexagonal or rhomboidal figure, which, with the constant three foramina, at once distinguishes this from the other species. The ovicell is of large size, surmounted by a single avicularium.

EXPLANATION OF FIGURES.

PLATE 24.—Fig. 8, natural size. Fig. 8a, front view of cells, with ovicell, magnified. Fig. 8b, back of cells, magnified.

PLATE 24, FIG. 9.

CATENICELLA FORMOSA (BUSK).

DESCRIPTION.—Cells pyriform or subglobular; in front covered with numerous papillæ; a broadly linear or elliptical vitta extends up each side. Lateral processes large, straight or nearly so above, produced downwards as a narrow fringe, a round perforation at the base of each. Avicularia small, lodged in shallow excavations. Back of cell smooth.

REFERENCE.—Busk, Voy. Ratt., i., 360; Cat. Mar. Pol. Brit. Mus., t. 7, f. 1, 2.

Queenscliff, Cape Schanck, Rivoli Bay, and other places.

This, the largest as yet known of the vittate division, forms handsome dusky-brown tufts. The cells are broadly pyriform or subglobose. The front is covered with minute, pointed, papillæ, and has, on either side, a broad vitta, extending from the base to nearly the level of the lower lip. The lateral processes are large, straight above, generally projecting a little upwards, and produced inferiorly into a narrow fringe usually running to the base of the cells; on each process there is at the base nearly opposite the lower lip a constant round opening; the avicularium is of small size, and lodged in a shallow excavation in the edge of the lateral process.

EXPLANATION OF FIGURES.

PLATE 24.—Fig. 9, natural size. Fig. 9a, front view of cells, magnified. Fig. 9b, back view of cells, magnified.

PLATE 24, FIG. 10.

CATENICELLA ELEGANS (BUSK).

DESCRIPTION.—Cells ovate, papillose in front. Vittæ sublateral, extending about half-way up the cell. Lateral processes large, projecting slightly forwards, blunt, with an excavation under the point for the small avicularium. Ovicell superior, projecting on the surface of the cell above, with which it is incorporated, with a smooth margin.

REFERENCE.—Busk, Voy. Ratt., i., 361; Cat. Mar. Pol. Brit. Mus., t. 9, f. 3, 4.

Forming small glassy tufts, 1 to 2 inches high; frequent.

This is distinguished from the other small vittate species by the short sublateral vittæ and imperforate lateral processes. The ovicell is of similar structure to that of *C. Buskii*, but the upper edge is smooth. Thomson's *C. Dawsoni*, judging from his description and figure, and from specimens which seem referable to it, I believe to be a form of this species.

EXPLANATION OF FIGURES.

PLATE 24.—Fig. 10, natural size. Fig. 10a, front view of a branchlet of cells, magnified. Fig. 10b, back view of cells, magnified.

PLATE 24, FIG. 11.

CATENICELLA PERFORATA (BUSK).

DESCRIPTION.—Cells elongated, minutely papillose in front. Vittæ narrow, lateral, extending the whole length of the cell. One or both lateral processes usually large, triangular, pointed forwards, perforated at the base, or forming a blunt cupped process. Ovicell galeate, sessile on one of the cells of a geminate pair, terminal, smooth, or slightly tuberculate.

REFERENCE.—Busk, Cat. Mar. Pol. Brit. Mus., t. 8, f. 1, 2.

Not uncommon.

In most of the specimens with ovicells the lateral processes are very small.

EXPLANATION OF FIGURES.

PLATE 24.—Fig. 11, natural size. Figs. 11a and 11c, front view of cells, magnified. Fig. 11b, front view of double cell with ovicell, magnified. Fig. 11d, back view of cells, magnified. Fig. 11e, back view of ovicell, magnified.

PLATE 24, FIG. 12.

CATENICELLA BUSKII (WYV. THOMSON).

DESCRIPTION.—Cells very much elongated, narrow. Vittæ very narrow and extending the whole length of the cells. Ovicell galeate, superior, projecting on the surface of the cell above, with which it is incorporated, with a beaded border.

REFERENCE.—Wyville Thomson, Dublin Natural History Review, April 1858.

A small species growing on other polyzoa; rare. Readily distinguished from the other small species by the long, entirely lateral vittæ, and the adnate beaded ovicell.

EXPLANATION OF FIGURES.

PLATE 24.—Fig. 12, natural size. Fig. 12a, front view of a branchlet of cells with ovicell, and showing the side view also of some cells, magnified. Fig. 12b, another series of cells, front view, magnified. Fig. 12c, back view of cells, magnified.

PLATE 24, FIG. 13.

CATENICELLA HANNAFORDI (P. MACGIL.).

DESCRIPTION.—Cells wide, ovoid or subglobular. Lateral processes large, gaping, directed forwards, usually equal on both sides. Vittæ narrow, entirely lateral, extending the whole length of the cell. Anterior surface smooth, or very finely papillose; posterior surface faintly sulcate.

REFERENCE.—P. H. MacGillivray, Trans. Royal Soc. Vict., 1868.

Lady Bay, Portland, adhering to algæ; Mr. Hannaford.

This species may be distinguished by the large gaping avicularian processes, directed a good deal forwards, and almost surrounding the mouth and the narrow entirely lateral vittæ.

Its closest ally is *C. ringens*, which I have not seen.

EXPLANATION OF FIGURES.

PLATE 24.—Fig. 13, natural size. Fig. 13a, front view of a branchlet, showing single and double cells, magnified. Fig. 13b, back view of ditto, magnified.

PLATE 24, FIG. 14.

CATENICELLA CRYSTALLINA (WYV. THOMSON).

DESCRIPTION.—Cells pyriform. Lateral processes wide, extending as a broad fringe the whole length of the cell. Vittæ narrow, reaching as high as the mouth. Anterior surface smooth or with small papillæ. Back of cell sharply ridged.

REFERENCE.—Wyville Thomson, Dublin Natural History Review, April 1868.

This species occurs in small glassy tufts on other polyzoa. It is readily distinguished from all the other vittate species by the very wide lateral processes which extend as a wide hollow fringe the whole length of the cell. There is generally a minute avicularium in a small cup-shaped depression, and there is usually an arched opening or mark in the fringe opposite the cell mouth.

EXPLANATION OF FIGURES.

PLATE 24.—Fig. 14, natural size. Fig. 14a, front view of a branchlet of cells, magnified. Fig. 14b, back view of a portion of ditto, magnified.

PLATE 24, FIG. 15.

CATENICELLA CARINATA (BUSK).

DESCRIPTION.—Cells pyriform. Lateral processes very much produced horizontally on either side. A minute denticle on either side of the mouth at the junction with the lower lip. A thin horny membranous area, below the lip, supports three small conical elevations. Back carinate. "Ovicelliferous cells geminate."

REFERENCE.—Busk, Voy. Ratt., i., 363; Cat. Mar. Pol. Brit. Mus., t. 6, f. 4, 5, 6.

Forms small brownish tufts, rare.

At once readily distinguished from all the other species by the peculiar horizontally spreading lateral processes, and the prominently ridged and umbonate back of the cell. In old specimens the suboral horny part is thickened and the protuberances are worn off, and there is then the appearance of three fenestræ.

EXPLANATION OF FIGURES.

PLATE 24.—Fig. 15, natural size. Fig. 15a, front view of a branchlet, showing side view of cells also, magnified. Fig. 15b, back view of single and double cells, magnified.

PLATE 24, FIG. 16.

CATENICELLA AURITA (BUSK).

DESCRIPTION.—Cells ovate or sub-globular. Front tuberculate, the larger tubercles towards the centre. Lower lip deeply notched. On each side of the mouth above are two or three thick, hollow, blunt processes, the upper the larger. Lateral processes large, with gaping avicularia.

REFERENCE.—Busk, Cat. Mar. Pol. Brit. Mus., t. 4, f. 1, 2, 3.

Occurs in small whitish tufts, about half an inch or an inch high, attached to zoophytes and algæ.

In this species the appearance of the cell varies very much, according to the age and state of preservation of the specimen. In good specimens the front is richly tuberculate, and there are no perforations, or at most one suboral. With age or attrition the lateral tubercles disappear and the central larger ones are opened. In old specimens, as commonly seen, we have the appearance of 4 or 5 fenestræ surrounding a large, raised, suboral opening, as figured and described by Busk. The ovicell is situated on the summit of a single cell, and has a gaping avicularium on either side. The avicularium is generally much smaller or abortive on one side.

EXPLANATION OF FIGURES.

PLATE 24.—Fig. 16, natural size. Fig. 16a, front view of a branchlet of single and double cells, magnified. Fig. 16b, front view of two cells, one with ovicell, magnified. Fig. 16c, back view of single and double cells, magnified.

PLATE 24, FIG. 17.

CATENICELLA GEMINATA (WYV. THOMSON).

DESCRIPTION.—Axial cells geminate. Front tuberculate. Mouth surrounded above by several (4 or 5) blunt hollow processes. Lower lip deeply notched. From one cell of each geminate pair, except at a bifurcation, springs a single terminal wedge-shaped cell, surmounted by two hollow blunt processes.

REFERENCE.—Wyville Thomson, Dublin Natural History Review, April 1858.

Forms very small brownish-white tufts about half an inch high. Queenscliff, and probably in other localities.

This very curious species is readily distinguished from *C. aurita*, the only form to which it has any resemblance. All the axial cells in a branch are geminate. The bifurcations are numerous, at every third or fourth cell. From the secondary cell of each geminate pair, except those of bifurcation, springs a small wedge-shaped cell.

The mouths of the ordinary geminate cells are surrounded above by a series of 4 or 5 hollow blunt processes; the wedge-shaped peripheral cells are always surmounted by a pair of long, slightly diverging processes directed upwards.

EXPLANATION OF FIGURES.

PLATE 24.—Fig. 17, natural size. Fig. 17a, front view of a small branchlet, showing the axial double cells and the small lateral cells, magnified. Fig. 17b, back view of cells, magnified.

CATENICELLA CORNUTA (BUSK).

DESCRIPTION.—Cells elongated, papillose in front. Vittæ lateral, extending the whole length of the cell. One or both lateral processes long, pointed, and recurved, with a small aperture at the base. Ovicell galeate, sessile on one of the cells of a geminate pair, terminal, surmounted by a sharp spine.

REFERENCE.—Busk, Voy. Ratt., i., 361; Cat. Mar. Pol. Brit. Mus., t. 10, f. 1, 2, 3.

Forms small greyish tufts, 1 to 2 inches high. Queenscliff.

The only species with which this is likely to be confounded is *C. perforata*, from which it may be distinguished by the retrocedent spinous lateral processes, and by the spine on the summit of the ovicell.

CATENICELLA INTERMEDIA (P. MACGILL).

DESCRIPTION.—Cells large, wide. Mouth vertical or nearly so. Front of cell with five large fenestræ. Lateral processes very wide, usually abortive on one side. Back of cell smooth.

REFERENCE.—P. H. MacGillivray, Trans. Royal Soc. Vict., 1868.

Queenscliff.

From *C. plagiostoma*, to which it is closely allied, it may be distinguished by the following characters :—The mouth is straight, or nearly so ; the anterior foramina, although arranged in the same manner, are of smaller size ; there are none of the peculiar enormous spoon-shaped avicularia ; the back also is smooth. The large lateral process, with its tolerably large avicularium, usually exists only on one side of the cell.

Mr. Goldstein has furnished me with some notes and sketches of the animal of *C. margaritacea* observed by himself and Mr. Maplestone, of Portland, but wishes to confirm the observations before publication. The descriptions are from my friend Mr. MacGillivray. The two last species are given here to complete the series of species of *Catenicella* in the collection from our shores, although there was not room on the plate to figure them. I hope to figure them on another plate hereafter with some other additions.

FREDERICK MCCOY.

PLATES 25 AND 26.

PLATE 25, FIG. 1.

MEMBRANIPORA MEMBRANACEA (LINN. SP.).

[Genus MEMBRANIPORA (Blainville). (Sub-kingd. Mollusca. Class Polyzoa. Order Infundibulata. Sub-Order Cheilostomata. Fam. Membraniporidae.)

Gen. Char.—Polyzoary spreading, encrusting or occasionally suberect. Cells contiguous, irregular, quincuncial or in transverse and longitudinal series, separated by raised margins, front more or less membranous.]

DESCRIPTION.—Cells oblong, much longer than broad, straight or slightly rounded above, straight below, separated by raised margins; a short, blunt spine at either angle superiorly. Front entirely occupied by a thin membrane.

REFERENCE.—*Flustra membranacea* (Linn.) Systema, 1301; Busk, Cat. Mar. Pol. Brit. Mus., p. 56, t. lxxviii., f. 2.

The cells are of large size, 2 to 3 times as long as broad, nearly rectangular, and separated by prominent smooth, or slightly crenulated margins. They are arranged in lines, which frequently bifurcate and radiate, so as to give the whole cœnœcium a rounded or semilunar form.

Of frequent occurrence everywhere on our shores, creeping over broad seaweeds, on which it occasionally forms lace-like patches several inches in diameter.

EXPLANATION OF FIGURES.

PLATE 25.—Fig. 1, specimen, natural size. Fig. 1a, same, magnified. Fig. 1b, cells, more highly magnified.

PLATE 25, FIG. 2.

MEMBRANIPORA PERFORATA (P. MACGILL.).

DESCRIPTION.—Cells very irregular in shape, generally obscurely hexagonal or pyriform; mouth narrow, with slightly thickened lips, and a stout spine at either side superiorly; front of cell minutely cribriform, with a large round opening on either side, close to the margin. Ovicell large, galeate, widely open beneath, granular. Avicularium usually at the base of a cell, mandible triangular, acute.

REFERENCE.—P. MacGillivray, Trans. Phil. Instit. Vict., 1859.

Readily distinguished from all other species by the large circular opening on each side of the cells.

On algæ, frequent at Queenscliff and other places.

EXPLANATION OF FIGURES.

PLATE 25.—Fig. 2, specimen, natural size. Fig. 2a, same, highly magnified, showing the irregular form of the cells, the two sharp spines and several of the ovicells on the upper part of the figure, and the triangular avicularia on some of the cells.

PLATE 25, FIG. 3.

MEMBRANIPORA CILIATA (P. MACGILL.).

DESCRIPTION.—Cells oval; front almost entirely occupied by a calcareous granular membrane. A series of (4–7) long hollow spines articulated round the upper end of the cell.

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

It is at once distinguished by the series of long, thick, hollow, articulated spines, which are so large as to be distinctly visible without a lens, and frequently obscure the whole front of the cell. In the figure the cells are rather too prominent and the spines too small.

Occurs frequently in small patches on algæ at Queenscliff and Williamstown.

EXPLANATION OF FIGURES.

PLATE 25.—Fig. 3, specimen, natural size. Fig. 3a, same, highly magnified, showing the numerous long spines to aperture.

PLATE 25, FIG. 4.

MEMBRANIPORA MAMILLARIS (P. MACGILL.).

DESCRIPTION.—Cells oblong, arranged in longitudinal series, alternate; front entirely occupied by a thick membrane; mouth with a hollow, blunt spine on either side. Avicularium large, situated at the base of a cell, mandible triangular, much elongated, directed obliquely upwards.

REFERENCE.—P. MacGillivray, Trans. Phil. Instit. Vict., v. iv., p. 165, 1860.

It may readily be distinguished by the uniformity of size and alternate arrangement of the cells and by the size and obliquity of the avicularia.

This species occurs in small purplish patches on algæ at Queenscliff.

EXPLANATION OF FIGURES.

PLATE 25.—Fig. 4, specimen, natural size. Fig. 4a, same, highly magnified, showing the form and arrangement of the cells, aperture, and spines, with one avicularium near middle of lower part of figure.

PLATE 25, FIGS. 5, 6.

MEMBRANIPORA UMBONATA (BUSK).

DESCRIPTION.—Cells irregularly oblong or elliptical; margins scarcely raised; mouth arched above, straight below, frequently contracted about the middle, giving it a trifoliate appearance; a spine on either side. An avicularium on the summit of a thick cylindrical process on the front of each cell. Ovicell rounded or elongated, encroaching on the cell above.

REFERENCE.—Busk, Cat. Mar. Pol. Brit. Mus., p. 57, t. lxxiii., f. 6, 7.

Distinguished at once by the peculiar avicularium on the front of the cell, which is well shown in Fig. 6a.

On algæ, Queenscliff.

EXPLANATION OF FIGURES.

PLATE 25.—Fig. 5, portion, natural size. Fig. 5a, same, magnified. Fig. 5b, avicularium, magnified. Fig. 6, another specimen, natural size. Fig. 6a, same, highly magnified.

PLATE 25, FIG. 7.

MEMBRANIPORA PILOSA (LINN. SP.).

DESCRIPTION.—Cells elongated, narrow inferiorly, lower half filled in by a calcareous punctate expansion; margins of the opening bearing several (usually three on each side) short, pointed spines; a very long articulated vibraculum situated on the calcareous expansion immediately beneath the open part of the cell; mouth small, lunate.

REFERENCE.—*Flustra pilosa* (Linn.) Systema, 1301; Busk, Cat. Mar. Pol. Brit. Mus., p. 56, t. lxxi.

This, one of the most beautiful species of the genus, may at once be distinguished by the cribriform, calcareous lamina, and the long articulated vibraculum, which is usually so large as to be

distinctly visible to the unaided eye. The marginal spines are generally three on each side, short and pointed.

Common on algæ; everywhere on our shores.

EXPLANATION OF FIGURES.

PLATE 25.—Fig. 7, specimen, natural size. Fig. 7a, portion of same, highly magnified, showing the immensely lengthened vibraculum.

PLATE 25, FIG. 8.

MEMBRANIPORA CERVICORNIS (BUSK).

DESCRIPTION.—Cells oblong or oval, lower part filled in by a calcareous expansion; on either side of the aperture superiorly is a large branched process. Ovicell shallow, galeate, frequently surmounted by a small avicularium.

REFERENCE.—Busk, Cat. Mar. Pol. Brit. Mus., p. 60, t. c. f. 3.

This species is at once distinguished by the peculiar processes, branching like stags' horns. The Australian form differs slightly from that described and figured by Professor Busk. It has no marginal spines besides the superior branched ones, the branches of which are more slender and do not inosculate with those of the opposite spine, and the color of the polyzoary is white or brownish-white.

Williamstown, on *Sargassum*; plentiful.

EXPLANATION OF FIGURES.

PLATE 25.—Fig. 8, specimen, natural size. Fig. 8a, same, magnified. Fig. 8b, portion of same, more highly magnified to show more clearly the branching processes. Fig. 8c, ovicell magnified.

PLATE 26, FIG. 1.

MEMBRANIPORA DISPAR (P. MACGILL.).

DESCRIPTION.—Cells oblong, of two sizes, arranged in concentric series, a row of large cells being followed by two rows of short; mouth arched; a thick, blunt, hollow spine on each side of the mouth, in the larger cells of enormously disproportionate size.

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

The characters of this species are so peculiar that it is impossible to confound it with any other. The arrangement of the cells is very remarkable. They are of two sorts, the one form about twice the length of the other. One row of long cells is succeeded by a double row of short ones. In the short cells the oral processes are of nearly equal size, while in the long ones we have on one side of the mouth a small or moderate sized spine, and on the other a large bullate process.

Portland Bay, on algæ, a single specimen ; Rev. J. E. Tenison-Woods.

EXPLANATION OF FIGURES.

PLATE 26.—Fig. 1, specimen, natural size. Fig. 1a, portion of ditto, magnified. Fig. 1b, portion of same more highly magnified, showing the discrepancy of size in the rows of cells and the singularly large size of the hollow spines on the larger cells.

PLATE 26, FIG. 2.

MEMBRANIPORA WOODSII (P. MACGIL.).

DESCRIPTION.—Cells oblong, arranged in longitudinal and transverse series; front entirely occupied by a thick membrane; mouth large, arched above, concave below, with a blunt hollow spine on either side. Avicularium at the base of a cell, mandible broadly triangular, with the point rounded.

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

In the only two specimens I have seen, this species is readily recognized by the peculiar arrangement of the cells, diverging in slightly curved transverse rows from the mesial line, as shown in the plate. It may be distinguished from *M. mamillaris* by the marks pointed out under that species, and from the *M. dispar* by the cells being of uniform size, by the hollow lower lip of the mouth, and by the oral spines, although frequently differing in size, not presenting the same great disproportion.

Portland Bay, on algæ ; Rev. J. E. Tenison-Woods.

EXPLANATION OF FIGURES.

PLATE 26.—Fig. 2, specimen, natural size. Fig. 2a, portion of same, magnified to show the arrangement of the cells. Fig. 2b, portion, more highly magnified, showing the mouth, spines, and two of the broad avicularia near the middle of figure.

PLATE 26, FIG. 3.

MEMBRANIPORA LINEATA (LINN. SP.).

DESCRIPTION.—Cells oval; margin with a series of spines, usually 5 on either side and one inferiorly, bending close over the aperture. Avicularia scattered, with a large spoon-shaped mandible. Ovicell galeate, obscurely carinate, and frequently with the lower half separated, anteriorly, by a slightly prominent semilunar ridge.

REFERENCE.—*Flustra lineata* (Linn.) Systema, 1301; Busk, Cat. Mar. Pol. Brit. Mus., p. 58, t. lxi., f. 1.

Schnapper Point; Port Fairy, Mr. Castwood; rare. The specimen figured, which is on a calcareous nodule attached to the root of a *Laminaria*, is a good deal worn, and most of the spines have been rubbed off. In other specimens they are perfect, arch forwards and almost entirely cover the aperture.

EXPLANATION OF FIGURES.

PLATE 26.—Fig. 3, specimen, natural size. Fig. 3a, same, highly magnified, showing the ovicells over the mouths in the middle of the figure, and the characteristic spines on the sides and lower part of the aperture, looking, when broken, like tubercles, as shown on the right-hand side of the figure.

PLATE 26, FIG. 4.

MEMBRANIPORA ROSSELLII (AUDOUIN SP.).

DESCRIPTION.—Cells oval, separated by raised finely beaded margins; lower part of cell filled in by a calcareous, granular expansion.

REFERENCE.—Busk, Cat. Mar. Pol. Brit. Mus., p. 59, t. c. f. 2.

Encrusting earthy nodules attached to the roots of algæ. A small elegant species. The calcareous expansion generally occupies about two-thirds of the cell, and is minutely granular, the granulations diminishing in number towards the upper part.

I have considerable doubt in referring this to *M. Rosselii*, and am not satisfied that it is not a form of *M. Lacroixii*.

EXPLANATION OF FIGURES.

PLATE 26.—Fig. 4, specimen, natural size. Fig. 4a, same, highly magnified.

PLATE 26, FIGS. 5, 6.

MEMBRANIPORA LACROIXII (SAVIGNY SP.).

DESCRIPTION.—Cells oval or elongated; margins thick, strongly beaded; usually a short, blunt spine at either side superiorly.

REFERENCE.—*Flustra Lacroixii* (Savigny), Egypt, t. 10, f. 9; Busk, Cat. Mar. Pol. Brit. Mus., p. 60, t. lxix., t. civ., f. 1.

In some specimens of this species the lower part of the cell is filled in by a thick calcareous expansion (Fig. 6a), which extends a considerable distance up the sides, while in others it is entirely wanting, or limited to the inferior angles. Although at first sight these two forms might appear to belong to distinct species, it is not difficult to trace all the gradations between them. In specimens dredged from the ledge of sandstone rocks, off Brighton, some have the front of the cell entirely occupied by a thin membrane (Fig. 5a), others have merely the lower angles filled by a thicker expansion, while others present the appearance shown in Fig. 6a. The spines on the upper part of the cell are by no means constant; sometimes they are quite distinct, at other times they appear as slight prominences on the cell-margins, and frequently they are altogether absent.

On shells at Queenscliff and Point Cook, and on sandstone rocks, in 4–6 fathoms, off Brighton.

EXPLANATION OF FIGURES.

PLATE 26.—Fig. 5, specimen, natural size. Fig. 5a, same, highly magnified, of the variety wanting the thickening at base of cells. Fig. 6, another specimen, natural size. Fig. 6a, same, highly magnified, showing the calcareous thickened margin at base of cells of the variety.

The above descriptions of *Membraniporæ* have been kindly furnished to me by my friend Mr. P. H. MacGillivray. I have spared no trouble to render the plates as perfect as possible, and the species can be identified from them with ease and certainty.

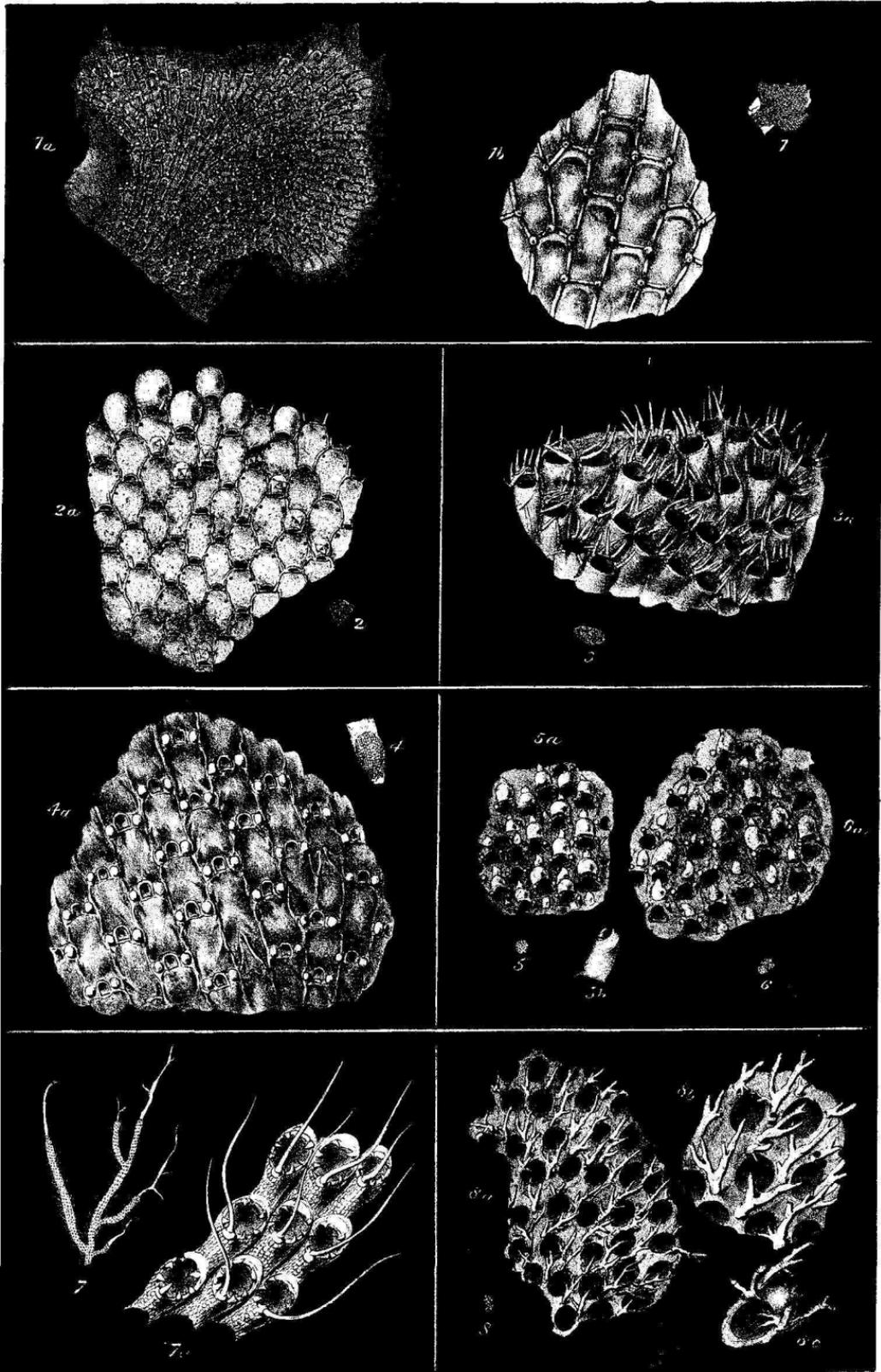
FREDERICK MCCOY.



E. Gilks del. et lith.

Prof. Mc Coy, direct

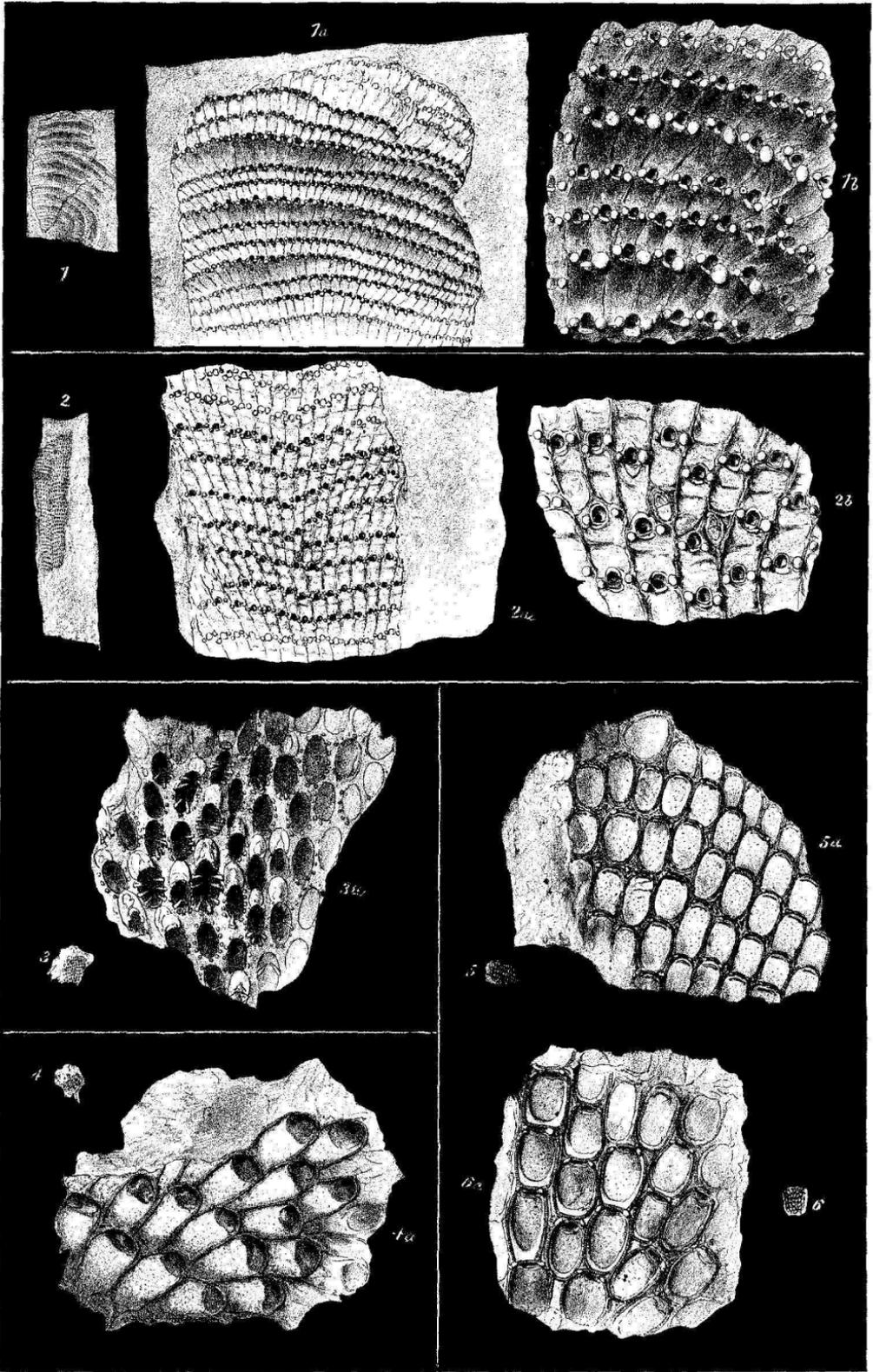
J.M. Ferguson, imp.



E. thales vol. 20. lith.

Pror. A. C. Coy. direct.

J. M. Ferguson. imp.



E. Giles del et lith.

Præp. M^s Coy. direct^s

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