PLATE 45, FIG. 1.

FLUSTRA DENTICULATA (BUSK).

[Genus FLUSTRA (LINN.). (Sub-kingd. Mollusca. Class Polyzoa. Order Infundibulata. Sub-Order Cheilostomata. Fam. Flustridæ.)
Gen. Char.—Cells contiguous, on both sides of the polyzoary.]

DESCRIPTION.—Cells oblong, much elongated; a series of minute incurved denticles along the inner edge of the margin; avicularium large, at the base of a cell, mandible pointed, oblique.
REFERENCE.—Busk, Voy. Ratt., i., 380; Cat. Mar. Pol. Brit. Mus., 49, t. lvi., fig. 7, t. lvii., and t. l., figs. 3 and 4.

Queenscliff and other places.

A very variable species, the only constant character being the minute denticles within the inner edge of the margin of the cells. These can always be detected in some of the younger cells towards the end or sides of the branches. Usually, in addition to the denticles, there is a series of thick, hollow, pointed or blunt processes projecting from the front of the cell margins. These vary much in number, sometimes being only one on each side of the mouth, sometimes two, and frequently a series extending along the whole length of the cell. They are occasionally dentate or bifurcate. The branches of the polyzoary are generally elongated, strap-shaped, dichotomously branched, truncated at the ends. In other specimens they are much broader, more irregularly branched, and rounded at the ends. In a few, the calcareous matter is very deficient, and the frond is so membranous as to present much the color and appearance of a *Carbasea*.

EXPLANATION OF FIGURES.

PLATE 45.—Fig. 1, ordinary specimen, natural size. Fig. 1*a*, broader form, natural size. Fig. 1*b*, membranous form, natural size. Fig. 1*c*, portion of fig. 1, magnified, showing two blunt processes on each side of the mouth. Fig. 1*f*, portion of fig. 1*a*, magnified, showing a series of large pointed processes along the margins of the cells. Fig. 1*e*, cell from near the end of the same specimen, to show the minute sub-marginal denticles. Fig. 1*d*, portion of fig. 1*b*. Fig. 1*g*, cell towards edge of same, showing the sub-marginal denticles.

* In different descriptions "zoarium" is used for "polyzoary," "zoœcium" is used for "cell," and "oœcium" is used instead of "ovicell."

PLATE 45, FIG. 2.

CARBASEA EPISCOPALIS (BUSK).

[Genus CARBASEA (GRAY). (Sub-kingd. Mollusca. Class Polyzoa. Order Infundibulata. Sub-order Cheilostomata. Fam. Flustridæ.)
Gen. Char.—Polyzoary expanded, foliaceous; cells contiguous, on one side only.]

DESCRIPTION.—Cells elongated, more or less cylindrical, contracted below, transversely rugose behind; aperture small. Ovicells mitriform, with a vertical ridge down the centre, and a large opening on each side.

REFERENCE.—Busk, Voy. Ratt., i., 379; Cat. Mar. Pol. Brit. Mus., p. 52, t. xlviii., figs. 1 and 2; t. lv., fig. 3.

Queenscliff; Kings Island, Mr. McGowan.

At once distinguished by the attenuated, cylindrical cells, with the small rounded apertures. The ovicells are very peculiar, presenting a curious resemblance to a bishop's mitre. The polyzoary is dichotomously divided, 2 or 3 inches high, the branches narrow and delicate.

EXPLANATION OF FIGURES.

PLATE 45.—Fig. 2, specimen, natural size. Fig. 2*a*, portion, magnified, showing the front of the cells. Fig. 2*b*, portion of back, magnified. Fig. 2*c*, ovicells, magnified.

PLATE 45, FIG. 3.

CARBASEA DISSIMILIS (BUSK).

DESCRIPTION.—Cells in front pyriform, only a small portion inferiorly filled in; the marginal cells obliquely truncated above, and with the upper and outer angle produced into a blunt spine, which projects beyond the base of the cell next above; the cells sometimes unarmed, frequently, especially towards the centre, with a short spine at each upper angle. Avicularia small, at the base of a cell. Ovicell rounded above.

REFERENCE.—Busk, Cat. Mar. Pol. Brit. Mus., p. 51, t. xlix., figs. 4, 5, 6, 7.

Queenscliff; Kings Island, Mr. McGowan.

This is readily distinguished from the other species by the projecting outer angle of the marginal cells. The presence of a small avicularium at the base of most of the cells is also very characteristic. Some of the cells are unarmed, and others have a small short spine at each upper angle. The ovicells are prominent, round above, smooth. Each ovicelligerous cell has a long hollow process on each side, curved inwards and upwards, which, with the avicularium on the cell above, give a very peculiar appearance.

EXPLANATION OF FIGURES.

PLATE 45.—Fig. 3, specimen, natural size. Fig. 3*a*, front, magnified, to show projecting upper angles of marginal cells and avicularia at base of other cells. Fig. 3*b*, cells from same specimen, showing small spines at upper angles. Fig. 3*c*, back of some cells. Fig. 3*d*, ovicells, showing also the long curved processes of the ovicelligerous cells and the avicularia at the base of the cells above. (The mandible not satisfactorily shown.)

PLATE 45, FIG. 4.

CARBASEA INDIVISA (BUSK).

DESCRIPTION.—Cells broad, oblong or obscurely hexagonal, entirely open in front, minutely granular behind. Polyzoary undivided, expanding above, frequently involute, and with the edges united so as to form a more or less perfect cup.

REFERENCE.—Busk, Cat. Mar. Pol. Brit. Mus., p. 53, t. lviii., 3 and 4; *Carbasea cyathiformis*, P. MacGillivray, Trans. Phil. Instit. Vict., 1859.

Queenscliff; Warrnambool, Mr. Watts; Cape Otway, Mr. J. Payter; Portland, Mr. Maplestone.

This species differs from the other *Carbaseæ* in the polyzoary being undivided. In almost all the specimens I have seen, the lateral margins are more or less involute and united inferiorly. It is frequently cup-shaped (var. *cyathiformis*), of which a very beautiful specimen is figured.

EXPLANATION OF FIGURES.

PLATE 45.—Fig 4, specimen, natural size. Fig. 4*a*, var. *cyathiformis*, natural size. Fig. 4*b*, front of cells, magnified. Fig. 4*c*, back of cells, magnified.

PLATE 45, FIG. 5.

CARBASEA ELEGANS (BUSK).

DESCRIPTION.—Cells oblong, truncate above and below, slightly filled in below. Cells behind oblong, smooth.

REFERENCE.—Busk, Cat. Mar. Pol. Brit. Mus., p. 53, t. lv., figs. 6 and 7; t. lvi., fig. 3.

Queenscliff; Portland, Mr. Maplestone.

A delicate species, forming tufts closely resembling those of *C. episcopalis*, from which, however, it totally differs in the character of the cells. In the specimen figured, the cells were in very distinct oblique lines; usually they are regularly alternate, as in the back view.

EXPLANATION OF FIGURES.

PLATE 45.—Fig. 5, specimen, natural size. Fig. 5*a*, front of branch, magnified. Fig. 5*b*, back, magnified.

PLATE 45, FIG. 6.

CARBASEA PISCIFORMIS (BUSK).

DESCRIPTION.—Cells entirely open in front, pyriform, frequently slightly expanded below; oblong behind, and contracted in the middle. Ovicells marked with radiating lines.

REFERENCE.—Busk, Cat. Mar. Pol. Brit. Mus., p. 50, t. lv., 1, 2; and t. lvi., fig. 6.

Queenscliff; Portland, Mr. Maplestone.

In this species the branches are not much divided, and they are shorter, broader, and more rounded than in the others.

EXPLANATION OF FIGURES.

PLATE 45.—Fig. 6, specimen, natural size. Fig. 6*a*, front of branch, showing also the ovicells, magnified. Fig. 6*b*, back of cells, magnified.

The Flustra and Carbaseæ on this plate have been presented to the National Museum with the above descriptions by Mr. MacGillivray.

FREDERICK MCCOY.

PLATE 46, FIG. 1.

SPIRALARIA FLOREA (BUSK).

[Genus SPIRALARIA (BUSK). Sub-kingd. Mollusca. Class Polyzoa. Order Infundibulata. Sub-Order Cheilostomata. Fam. Flustridæ.)

Gen. Char.—Polyzoary, a narrow and ribbon-shaped lamina spirally twisted round an imaginary axis. Cells in a single layer, opening on the inner surface.]

DESCRIPTION.—The only species.

REFERENCE.—Busk, Mic. Journ., vol. i., new ser., p. 153.

Queenscliff and other localities ; not uncommon.

This beautiful species forms tufts from 1 to 3 or 4 inches high. It consists of a narrow lamina, spirally twisted round an imaginary axis. The branches spring from the margin of the lamina, are from a quarter of an inch to an inch and a half in length, and are usually attenuated at either end. The cells are arranged in a single layer, opening on the inner or upper surface of the lamina. They are irregularly ovoid, generally much narrowed below, separated by raised margins, along each side of which is a row of minute aculeate spines or denticles. The mouth is shallow, wide, arched above, straight or hollowed below. At one side of the mouth there is a digitiform or club-shaped blunt process. The back of the lamina is marked by narrow raised lines running from the base to the margin, and connected by similar cross ribs. These divide the surface into narrow oblong spaces, having no relation to the true cells, than which they are much smaller. There are two forms of avicularia. All the complete cells at the margin are terminated by sessile avicularia. These are very large, occupying the whole width of the cells, and projecting beyond the free edge of the lamina. The mandibles all open towards the same side. There are other smaller sessile avicularia situated on the front of many of the cells. In some specimens those on the cells approaching the margin are larger, and approximate in structure and size to the large projecting terminal ones.

EXPLANATION OF FIGURES.

PLATE 46.—Fig. 1, specimen, natural size. Fig. 1*a*, a small portion of the inner or upper surface of the lamina magnified. Fig. 1*b*, back of the same, showing the division by narrow raised lines into oblong spaces.

* In different descriptions "zoarium" is used for "polyzoary," "zoœcium" is used for "cell," and "oœcium" is used instead of "ovicell."

PLATE 46, FIG. 2.

DIACHORIS MAGELLANICA (BUSK).

[Genus DIACHORIS (BUSK). (Sub-kingd. Mollusca. Class Polyzoa. Order Infundibulata. Sub-Order Cheilostomata. Fam. Flustridæ.)
Gen. Char.—Polyzoary erect or decumbent. Cells disposed in a single layer, disjunct, each connected with 6 others by regularly arranged tubes.]

DESCRIPTION.—Cells remote, boat-shaped, semi-erect; mouth arched above and straight or hollowed below, with a slightly thickened rim; margin unarmed. A capitate avicularium on each side above, directed nearly vertically, and opening horizontally forwards.
REFERENCE.—Busk, Voy. Ratt., i., 382; Cat. Mar. Pol. Brit. Mus., p. 54, pl. lxvii., figs. 1, 2.

Portland, Mr. Maplestone.

D. Crotali, of which I have specimens, but not received in time for illustration in the present plate, is distinguished by the different form of the avicularium, which is represented by a lanceolate process without any mandible.

EXPLANATION OF FIGURES.

PLATE 46.—Fig. 2, specimen, natural size. Fig. 2*a*, small portion, magnified, showing the front of the cells. Fig. 2*b*, the same, viewed from behind.

PLATE 46, FIG. 3.

DIACHORIS SPINIGERA (P. MACGIL.).

DESCRIPTION.—Cells elongate-oval; 2 or 3 long, straight spines springing from the margin above, and a series, usually about 5, of long slender incurved spines arising from the margin on either side. A large pedunculate avicularium on one side near the mouth.
REFERENCE.—P. H. MacGillivray, Trans. Roy. Soc. Vict., 1859.

Queenscliff; Wilson's Promontory, Baron von Mueller; Portland, Mr. Maplestone.

Busk's *D. costata*, of which I have recently received beautiful specimens dredged at Queenscliff by Mr. J. B. Wilson, differs in its smaller size and greater number and length of the spines, which extend more than half way across the apertures, those of opposite sides interdigitating.

EXPLANATION OF FIGURES.

PLATE 46.—Fig. 3, specimen, natural size. Fig. 3*a*, front view of cells, magnified. Fig. 3*b*, back view of same.

PLATE 46, FIG. 4.

DIMETOPIA SPICATA (BUSK).

[Genus DIMETOPIA (BUSK). (Sub-kingd. Mollusca. Class Polyzoa. Order Infundibulata. Sub-Order Cheilostomata. Fam. Gemellariidæ.]

Gen. Char.—Cells joined back to back; each pair arising from the next below, and placed at right angles to it. Cells of the pair at a bifurcation disjunct, and each giving origin to the first pair of a branch.]

DESCRIPTION.—Cells funnel-shaped, contracted below, expanded above. Aperture nearly horizontal or oblique, margin slightly thickened and occupied by a series of stout articulated spines. Ovicell rounded, situated at the upper and inner part of the cell, and projecting above the aperture.

REFERENCE.—Busk, Voy. Ratt., i., p. 384; Cat. Mar. Pol. Brit. Mus., p. 35, pl. xxix., fig. 1.

Queenscliff; Cape Otway; Portland, Mr. Maplestone; not uncommon.

Forms handsome, dense, whitish tufts, 1 to 2 inches high. The cells are of considerable size, infundibulate. The aperture is nearly horizontal, or sloping obliquely outwards and downwards; its margin is occupied by a thickened band, and has a series of usually 4 or more articulated spines; of these, the outer or median is frequently much larger than the others. The ovicell is rounded or ovoid, and situated above and to the inner side of the aperture.

EXPLANATION OF FIGURES.

PLATE 46.—Fig. 4, specimen, natural size. Fig. 4*a*, portion, magnified. Fig. 4*b*, small portion, to show the ovicells.

PLATE 46, FIG. 5.

DIMETOPIA CORNUTA (BUSK).

DESCRIPTION.—Cells with the aperture very oblique, wider above and nearly triangular; margin thickened, with a spine at each upper angle and 1 or occasionally 2 at the lower. Ovicells nearly globular, above and to the inner side of the aperture.

REFERENCE.—Busk, Voy. Ratt., i., p. 384; Cat. Mar. Pol. Brit. Mus., p. 35, pl. xxix., figs. 2, 3.

Queenscliff; Sealer's Cove, Baron von Mueller; Portland, Mr. Maplestone.

This is of considerably smaller size than the last species. The cells are much smaller; the opening is very oblique, and much wider above; the margin is thickened, but not with the same deep band as in *D. spicata*, and there are usually 3 spines, 1 from each angle superiorly, and 1, or occasionally 2, from the middle in front. The ovicell is small, round, and situated above and to the inner side of the aperture.

EXPLANATION OF FIGURES.

PLATE 46.—Fig. 5, specimen, natural size. Fig. 5*a*, portion, magnified. Fig. 5*b*, small portion, showing an ovicell.

PLATE 46, FIG. 6.

DIDYMIA SIMPLEX (BUSK).

[Genus DIDYMIA (BUSK). (Sub-kingd. Mollusca. Class Polyzoa. Order Infundibulata. Sub-Order Cheilostomata. Fam. Gemellariidæ.)

Gen. Char.—Cells joined side to side, all facing the same way, each pair arising from the pair next below it; aperture large, wholly anterior; at a bifurcation cells not disjunct, and each giving origin to a pair.]

DESCRIPTION.—The only species.

REFERENCE.—Busk, Voy. Ratt., p. 383; Cat. Mar. Pol. Brit. Mus., p. 35, pl. xxxix.

Queenscliff; Portland, Mr. Maplestone.

Forms handsome, whitish, or brownish-white curling tufts. The cells are very large, with a thick margin, the upper and outer angles of which form sharp conical processes; mouth arched above and straight below. The ovicells are very peculiarly situated. At certain bifurcations, a cell is intercalated between the two ordinary ones of a pair; it is pyriform and slightly anterior, with the upper extremity produced into a process directed upwards and forwards; the large mouth is situated at or below the middle of the cell, and in a separate compartment above this the large rounded ovicell is seen through the membrane.

Additional view of ovicell of *D. simplex*, as shading of plate is indistinct.

EXPLANATION OF FIGURES.

PLATE 46.—Fig. 6, specimen, of natural size. Fig. 6*a*, portion, magnified, showing arrangement of cells, bifurcation, and ovicells.

PLATE 46, FIG. 7.

CALWELLIA BICORNIS (WYV. THOMSON).

[Genus CALWELLIA (WYV. THOMSON). (Sub-kingd. Mollusca. Class Polyzoa. Order Infundibulata. Sub-Order Cheilostomata. Fam. Gemellariidæ.)

Gen. Char.—Cells joined back to back, each pair at right angles to those above and below; the cells of each pair connected by tubes with the pair next but one below; cells at a bifurcation not disjunct, and each giving origin to the first pair of a branch.]

DESCRIPTION.—The only species.

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

Queenscliff.

Of this species, I have only seen a few small fragments growing on other polyzoa, and it was difficult to find a portion sufficiently perfect for illustration. The connection of the cells is very peculiar, and is similar to what occurs in the European *Notamia bursaria*. Each pair of cells is connected with the next but one below by tubes, which pass round and in the hollow between the cells of the

intermediate pair. The mouth is nearly horizontal, and on each side of it the cell is produced into a thick, conical, hollow process. The small round ovicells are situated above and behind the aperture. In some specimens the ovicells are smooth, in others they are more or less distinctly marked like a miniature Clam-shell, as described and figured by Thomson. It is quite possible that there may be more than one species, but the specimens in my possession are not sufficiently perfect to enable me to say with certainty.

EXPLANATION OF FIGURES.

PLATE 46.—Fig. 7, specimen, natural size. Fig. 7*a*, portion, magnified; the lower part has been a little twisted. Fig. 7*b*, showing two ovicells. The specimen was not sufficiently perfect to show the markings described by Thomson.

The descriptions and specimens of the Polyzoa on this plate have been contributed to this work and the National Museum by my friend Mr. McGillivray.

FREDERICK McCOY.

PLATE 47, FIG. 1.

DICTYOPORA CELLULOSA (P. MACGIL.).

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

Gen. Char.—Polyzoary stony, expanded, foliaceous, fenestrate, articulated by a flexible stem; cells horizontal, opening on both sides.]

DESCRIPTION.—Polyzoary expanded, proliferous, and cavernous; fenestræ round, narrower than the interspaces; cells distinct, mouth nearly circular; a large avicularium on the front of each cell below the mouth, with the mandible pointed obliquely upwards and outwards.

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

Queenscliff.

Of this handsome species, the largest specimen I have seen is the one figured, which is 9 inches high by 16 in circumference at its thickest part. In young specimens the color is deep brown, but this becomes much lighter with age. The flexible stem by which the polyzoary is attached is short, and is marked by narrow, transverse, broken, coriaceous ridges, which are joined by masses of short, tubular, vertical fibres. In old specimens the stem becomes more rigid, from the deposit of calcareous matter. The polyzoary is expanded, foliaceous, proliferous, and variously twisted to form a cavernous mass like a large Retepore. The cells are distinct, with a small circular mouth, with a thickened margin. The avicularia are very large, usually on the front and side of the cell, pointed obliquely upwards and outwards, and with the mandible reaching to opposite the middle of the cell-mouth. At the lower part of the polyzoary the surface is occasionally elevated into obscure rounded ridges, extending for a short distance upwards. The fenestræ are round, variable in size, but always narrower than the interspaces. The size of the compartment formed by the twisting and junction of the lamina varies, in some specimens the polyzoary being flatter and with very few divisions.

Lamouroux founded the genus *Adeona* to contain two Australian zoophytes, characterised by the stony expanded frond being sup-

* In different descriptions "zoarium" is used for "polyzoary," "zoœcium" is used for "cell," and "oœcium" is used instead of "ovicell."

ported by a flexible stem. One species, *A. foliacea*, Lamx. (*A. foliifera*, Lamck.) is described as entire, and the other, *A. grisea*, Lamx. (*A. cribriformis*, Lamck.), as cribriform, or perforated by round foramina. These two forms ought evidently to be referred to distinct genera, and the latter would come under the present genus. Adopting the name *Dictyopora* for the fenestrate species, the generic name *Adeona* might be retained for the species with the polyzoary entire.

Since the above description was written, I have received, through the courtesy of the author, an early copy of a valuable memoir on *Adeona* by Dr. Kirchenpauer of Hamburg. He describes eight species, and considers that one (*A. intermedia*) shows the transition between the entire and the fenestrated forms, and therefore combines them all in the same genus. From an examination of his description and figures, I am, however, unable to agree with him, as it seems to me that the fenestræ of *A. intermedia* are merely formed by the accidental and irregular overlapping and coalescence of the branches, and that the structure is essentially different from what occurs in the regularly fenestrate species. A similar irregular inosculation occasionally takes place in Eschara, and is shown in *E. platalea*, plate 48, fig. 4, of the present Decade.

Mr. J. B. Wilson has recently presented to the Museum specimens of *D.* (*Adeona*) *grisea*, and another species which seems to be identical with Kirchenpauer's *Adeona albida*. They were dredged off Queenscliff, and will shortly be described and figured.

EXPLANATION OF FIGURES.

PLATE 47.—Fig. 1, specimen, natural size. Fig. 1*a*, small group of cells, magnified. Fig. 1*b*, two cells, more highly magnified. Fig. 1*c*, two old cells, denuded of ectoderm, magnified to the same extent as the last figure. Fig. 1*d*, section, showing the cells arranged in a double layer.

Fine specimens of this grand form have been presented to the Museum with the above description by the discoverer, Mr. McGillivray.

FREDERICK McCOY.

PLATE 48, FIG. 1.

ESCHARA OBLIQUA (P. MACGIL.).

[Genus ESCHARA (RAY). (Sub-kingd. Mollusca. Class Polyzoa. Order Infundibulata. Sub-Order Cheilostomata. Fam. Escharidæ.)

Gen. Char.—Polyzoary foliaceous or lobed, not perforated. Cells with the walls complete in front, opening on both surfaces, coalescent, placed back to back, and horizontal to the plane of the axis.]

DESCRIPTION.—Polyzoary foliaceous; cells obliquely rhomboidal, separated by raised smooth lines; surface tubercular and perforated; mouth arched above, with a considerable sinus in the lower lip. Ovicell large, granular, and perforated, and traversed by smooth raised lines like those separating the cells.

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

Schnapper Point; a single specimen.

In the only specimen I have seen, the cells form series in an arched direction laterally. They are mostly obliquely rhomboidal, with the mouth in the upper angle; the surface is tubercular, with numerous small perforations among the tubercles. The ovicells are large, spreading over more than one cell, and with raised lines, marking the limits of the cells beneath. The mouth of the ovicelligerous cell is much wider, and the sinus in the lower lip much shallower.

EXPLANATION OF FIGURES.

PLATE 48.—Fig. 1, specimen, natural size. Fig. 1*a*, portion, magnified. Fig. 1*b*, two cells and outline of another, more highly magnified; in one cell the mouth is obliterated by the deposition of calcareous matter.

PLATE 48, FIG. 2.

ESCHARA DISPAR (P. MACGIL.).

DESCRIPTION.—Polyzoary small, divided into thick lobes; cells immersed, slightly projecting, and rounded above; mouth lofty, projecting, and spout-like above, with a sinus below. An avicularium on one side of the mouth, with the acute mandible pointed upwards.

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

* In different descriptions "zoarium" is used for "polyzoary," "zoœcium" is used for "cell," and "oœcium" is used instead of "ovicell."

Queenscliff.

I have only seen a single small perfect specimen of this species. It is divided into short, thick, branched lobes. The cells are immersed, the upper part convex and bulging forwards ; the mouth is lofty, arched, the upper part much deeper and spout-like, in consequence of the bulging forwards of that part of the cell. The lower lip has a deep sinus. The cells are wholly or partially separated by fine faintly raised lines. The surface is faintly granular, some of the cells having a few slightly projecting elevations round the mouth, and many of the old cells towards the base being areolated. The cells at the apex of the lobes have no avicularia ; most of the others have one below and to the side of the mouth, with the long pointed mandible directed upwards. Towards the base of the polyzoary the cells are indistinct, deeply areolated, no mouths in some parts apparent, but only a few scattered avicularia. This change is due to the increased deposition of calcareous matter in the older cells as takes place in other stony Escharæ.

EXPLANATION OF FIGURES.

PLATE 48.—Fig. 2, specimen, natural size. Fig. 2*a*, portion, magnified. Fig. 2*b*, a few cells, more highly magnified, to show the form of the mouth and the situation and form of the avicularia.

PLATE 48, FIG. 3.

ESCHARA GRACILIS (LAMX.).

DESCRIPTION.—Polyzoary forming thick, narrow, rounded, branches; cells deeply immersed, bulging above; mouth rounded, with a thickened lip, and frequently a projecting process or denticle inside the lower lip; a round pore on the front of the cell below the mouth. Avicularia small, broad, with a short rounded mandible. Ovicells immersed.

REFERENCE.—Busk, Cat. Mar. Pol. Brit. Mus., p. 91, t. cviii., figs. 5, 6, 7.

Queenscliff.

The only specimen I have seen is the one figured. The cells are immersed and indistinct. The surface is marked with close

areolations ; at the growing apex these are seen to be the openings of close-set tubes, which give that part of the polyzoary a spongy or honeycomb appearance ; further towards the base they become filled with calcareous matter. In some cells there are one or more rounded elevations in the neighborhood of the mouth ; these are plain, or have what seems to be an avicularium on the side of the apex. In almost all the cells there is a round pore below the mouth. The avicularia are very small, short, and broad, and are usually situated on the interstices between the cells or on the prominences round the mouth. The ovicells are deeply immersed, indistinguishable from the other cells except for the larger projection upwards.

EXPLANATION OF FIGURES.

PLATE 48.—Fig. 3, specimen, natural size. Fig. 3*a*, a portion, magnified, showing the ovicells at the upper part. Fig. 3*b*, single cell and ovicell, more highly magnified, showing also the minute avicularia. Fig. 3*c*, part of a young cell, showing the mouth and elevations surrounding it, on the outer part of several of which is what seems to be a small avicularium.

PLATE 48, FIG. 4.

ESCHARA PLATALEA (BUSK).

DESCRIPTION.—Polyzoary dividing into flat, thick lobes, branching and sometimes anastomosing; cells ovate; mouth arched above, straight below; a simple, round pore in a depressed area below the mouth. Avicularia of two sorts: small, and usually situated below the mouth and to one side, or replacing a cell, very large, and with a long, spatulate mandible.

REFERENCE.—Busk, Cat. Mar. Pol. Brit. Mus., p. 90, t. cv., figs. 1, 2, 3; cviii., fig. 4.

Queenscliff.

In this species the polyzoary is stony, disposed in flat lobulated branches, which sometimes anastomose together so as to leave linear or elliptical foramina. The junctions of the branches can be readily distinguished, and they frequently overlap. The cells are usually ovate. The mouth is rounded above, and straight or rounded below. There is generally a simple round pore at the bottom of a depression below the mouth. The surface is smooth, granular, or

areolated. The cells at the margins of the foramina are generally considerably larger. In one specimen, those on the extreme growing edge are perforated or fenestrate, and without the suboral pore; those adjoining, however, present the usual structure. As in other Escharæ, the openings of the cells towards the base of the polzyoary become overgrown. The avicularia are of two sorts. In many cells there is a small avicularium, on one or both sides, below the mouth, with the pointed mandible directed more or less outwards. The other avicularia are very large, and take the place of a cell. In them the mandible is spoon-shaped, and of enormous size. They frequently occur grouped two or three together, and in the specimen figured are especially abundant at the edges of the openings formed by the anastomoses of the branches. In some of these the mandible is shorter and occasionally pointed, and the supporting basis is very prominent when seen in profile.

E. platalea is distinguished from the other Victorian stony species with which I am acquainted by the narrow, flat, anastomosing lobes, the simple suboral pore, the size and shape of the large, scattered, spoon-shaped avicularia, and the situation of the small ones on the front of the cells.

EXPLANATION OF FIGURES.

PLATE 48.—Fig. 4, specimen, natural size. Fig. 4*a*, portion, magnified. Fig. 4*b*, cluster of cells, more highly magnified, showing the small avicularia and a single, large, spatulate one. Fig. 4*c*, small group, to show 2 large cells towards the edge of a lobe and a smaller one to the side.

PLATE 48, FIG. 5.

ESCHARA QUADRATA (P. MACGIL.).

DESCRIPTION.—Polyzoary expanded, foliaceous, convoluted; cells quadrate, separated by narrow raised lines and arranged in longitudinal linear series; surface granular and perforated; mouth arched above, lower lip arched upwards and projecting, a minute, curved denticle sometimes on each side of the mouth immediately above the angles. Avicularia, when present, situated at the side of the mouth. Ovicell large, granular, with lines on the surface similar to those separating the cells.

REFERENCE.—*Eschara elegans*, P. H. MacGillivray (not Milne Edwards), Trans. Roy. Soc. Vict., 1868.

Queenscliff; Portland.

The only Victorian species at all resembling this is *E. obliqua*, the polyzoary of which is thicker. The situation and form of the mouth also, as well as the shape of the cells, are different. The avicularia are very rare; they are small, short, broad, and situated on each side below the mouth, directed downwards; they seem to be more frequently present on the cells supporting the ovicells. The ovicells are similar to those of *E. obliqua*, and, like them, are traversed by raised lines.

EXPLANATION OF FIGURES.

PLATE 48.—Fig. 5, specimen, natural size. Fig. 5*a*, portion, magnified; two avicularia are shown on the cell supporting the ovicell (they should appear more distinct from the raised margin, with a downward direction).

PLATE 48, FIGS. 6 AND 7.

ESCHARA MUCRONATA (P. MACGIL.).

DESCRIPTION.—Polyzoary stony, expanded, laminate or lobed; cells ovate, with a stellate pore or group of pores in the middle; mouth rounded above. An avicularium below the mouth, the mandible directed vertically upwards, and the beak usually projecting above the lower lip.

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

Queenscliff and Schnapper Point.

What may be taken as the typical young cell of this species is ovoid, smooth, or minutely granular. There is a vertical avicularium immediately below the mouth, the mandible pointing directly upwards, and the beak very calcareous and frequently projecting as a mucro over the edge of the lower lip, with which it is incorporated. There is a small, round group of stellate pores on the middle of the cell. The cells are indistinct, or separated by fine lines. In some of the small cells there is a series of perforations along the edge. In older specimens, and removed from the growing edge, the cells become much altered, principally by the deposition of

calcareous matter. This frequently accumulates largely round the suboral avicularium, in an agglomeration above the mouth, and in rounded elevations along the sides of the cells. In those cells there are usually several round perforations on the outer edges of the lateral nodules. The cells are also separated by distinct raised lines. In some specimens a certain number of cells, frequently grouped in close proximity, are very much larger. These large cells differ also in having the mouth much wider and shallower, and in the stellate pores not being confined to a small group, but being more numerous and scattered over the whole of the central part of the cell. They are frequently covered with rounded calcareous masses along, but separated from, the edges, similar masses being heaped up about the avicularium, which is sometimes completely obscured by them, and also above the mouth. It is difficult to say what these cells are, unless they are connected with the ovicells. Besides the suboral, vertical avicularia, there are, in some specimens, a few others very large and taking the place of cells, as happens in *E. platalea.* The mandible is large and triangular. They are mostly situated among the calcareous cells, and their basis assumes the same appearance.

E. mucronata may be always distinguished by the vertical suboral avicularium and the central group of stellate pores.

Explanation of Figures.

Plate 48.—Fig. 6, the specimen described as *Lepralia mucronata*, natural size. Fig. 6*a*, a portion of the same, magnified. Fig. 6*b*, a few cells, more highly magnified, showing the simplest form. Fig. 6*c*, cells from the same specimen, showing the perforated margin.

Fig. 7, another specimen, natural size. Fig. 7*a*, a portion, magnified (the same extent as 6*b* and 6*c*), showing a large solitary avicularium; the cells are unusually large, and the upper one approaches the characters of the very large ones. Fig. 7*b*, small group, to show two of the very large cells; in these there is a large deposit of calcareous matter obscuring the suboral avicularium; the wide mouth and scattered pores are shown; the smaller cells show the accumulation of calcareous matter about the avicularium, which in the lowest is completely covered over. Fig. 7*c*, cells from another large specimen; in many cells of this it was difficult to make out with certainty the stellate pores, owing seemingly to the presence of epidermis, but in a considerable number they were quite apparent as figured; throughout, the calcareous matter was mostly accumulated on the avicularia and above the mouth. Fig. 7*d*, a separate avicularium from the same specimen, showing an increased deposit of calcareous matter.

PLATE 48, FIG. 8.

CALESCHARA DENTICULATA (P. MACGIL.).

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

Gen. Char.—Polyzoary expanded, foliaceous, erect, not perforated. Cells horizontal, opening on both surfaces, separated by raised lines, and depressed in the centre. Front calcareous, except a small part anteriorly, which is membranous.]

DESCRIPTION.—Polyzoary small, foliaceous, convoluted. The cells are wide and rounded above, contracted below, separated by raised, smooth, or minutely crenulated margins. The front is depressed in the centre, and is covered by a membrane, through which the deeper calcareous layer may be obscurely seen. When this is removed, as it frequently is by attrition or decay, the edges are seen to be bevelled inwards, and about a sixth or a fourth part of the front within the bevelled portion is entirely membranous; the arched mouth is situated at the upper part of this. The rest of the front is calcareous, except a large slit on each side. At the junction of the membranous anterior part there is an increased deposit of calcareous matter, forming a thickened convex band, the anterior edge of which is smooth or finely denticulate, or tubercular. The outer edge of the slit-like opening corresponds to the inner bevelled margin. It is granular, like the bevelled part. The inner edge is produced into a series of minute, pointed, horizontal denticles. The lamina between the slits slopes backwards on each side, and is occupied by numerous pores or small tubercles. In some cells there is a small, rounded prominence in the angle above the mouth which might be mistaken for a minute ovicell. The ovicelligerous cell is very large, and the ovicell is wide, little projecting, and incorporated with the cell above, which also is of unusual size.

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

Queenscliff; Schnapper Point; Warrnambool, Mr. Watts.

This differs from the old genus Eschara in the anterior part of the cell being membranous, and the front depressed in the centre. The membranous part varies considerably in extent, and in some cells the mouth seems to occupy the whole aperture, the thickened calcareous band resembling a lower lip, while in others the operculum occupies only a small portion. All the specimens I have seen have been cast on the beach and been dried, so that it is impossible to say whether the anterior membranous layer is closely adherent to the calcareous lamina.

Explanation of Figures.

Plate 48.—Fig. 8, specimen, natural size. Fig. 8*a*, portion, magnified. Fig. 8*b*, small portion, more highly magnified, one cell still covered with the membranous layer, the other showing the calcareous lamina and denticulate openings. The small round prominence above the cell on the left has the margin too distinctly rimmed. Fig. 8*c*, group, to show the ovicell. The cells, except the anterior part of that with which the ovicell is incorporated, are still covered with membrane, and the large operculum of the large cell is seen projecting below the opening of the ovicell. Fig. 8*d*, small group, to show the anterior membranous part. There is frequently a much larger portion occupied by membrane than is here represented.

All the *Escharidæ* on this plate have been described, and specimens of each presented to the National Museum, by Mr. MacGillivray.

Frederick McCoy.

PLATE 49, FIG. 1.

CELLARIA FISTULOSA (LINN.).

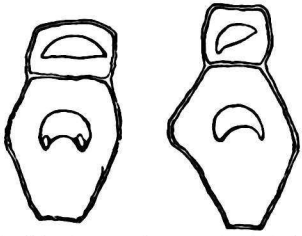
[Genus CELLARIA (LAMX.) = SALICORNARIA (CUVIER). (Sub-kingd. Mollusca. Class Polyzoa. Order Infundibulata. Sub-Order Cheilostomata. Fam. Salicornariidæ.)
Gen. Char.—Cells distinct, separated by raised margins, much depressed in front; no aperture.]

DESCRIPTION.—Internodes long and thick; cells in a series contiguous, usually elongated and six-sided, straight or slightly arched above and below; surface finely granular or nearly smooth; separating margins smooth or finely crenulated on the edges; mouth central, arched above, lower lip arched upwards and forwards, with frequently a minute rounded denticle inside each angle. Avicularia placed between two cells in a longitudinal series, mandible shallow, wide, rounded above, and directed upwards. Ovicell opening by a round pore.

REFERENCE.—*Salicornaria farciminoides*, Busk, Cat. Mar. Pol. Brit. Mus. p. 16, t. lxiv., figs. 1, 2, 3; t. lxv. (*bis*), fig. 5; Hincks, Brit. Mar. Polyzoa, p. 107, pl. xiii., figs. 1–4.

Queenscliff; Portland, Mr. Maplestone; on roots of algæ.

The internodes are of large size, sometimes three-quarters of an inch long, and thick, containing numerous series of cells. The usual form of the cells is elongated hexagonal, straight or slightly arched above and below; occasionally they are rhomboidal or five-sided. The surface is minutely granular. The mouth is generally central, but in some portions, especially at the growing extremities, it is nearer the upper end of the cell. The upper lip is arched, smooth or minutely crenulate; the middle of the lower lip usually projects forwards and upwards, and there is frequently a small denticle on either side. The ovarian pores are round, sometimes elongated longitudinally or transversely. The avicularia do not take the place of cells, but are placed between those of a longitudinal series, and are distinct from them; the mandible is very wide, shallow and convex above, and is directed upwards.



Additional views of cells and avicularia of *C. fistulosa*, magnified fifty diameters, as shading in plate is not satisfactory.

* In different descriptions "zoarium" is used for "polyzoary," "zoœcium" is used for "cell," and "oœcium" is used instead of "ovicell."

There has been great confusion about the European species *C. fistulosa* and *C. sinuosa*, and, judging from the descriptions and figures, I thought this a distinct species, and had marked it *C. australis*. *C. sinuosa* is distinguished by the large, frequently oblique avicularium, with a triangular, acutely pointed mandible directed downwards. According to Busk (Crag Polyzoa, p. 23) the mandible in *C. fistulosa* is small, semicircular, blunt; and it is so figured in the British Museum Catalogue, where the two species are united. Smitt describes the mandible as semicircular, and figures it as very small. Hincks, however, in his recently published British Marine Polyzoa, describes the mandible as being very shallow and arcuate, and one of his figures (pl. xiii., fig. 3) differs from our form only in being rather narrower. The Australian specimens seem to be stouter, with a larger number of series in the cylinders, and might be named var. *australis*.

There is no doubt that the generic name of *Cellaria*, as defined by Lamouroux, ought to be retained for the present genus, and it is equally proper that the specific name *fistulosa*, originally given by Linnæus, although in reality incorrect, should be adopted.

Explanation of Figures.

Plate 49.—Fig. 1, specimen, natural size. Fig. 1*a*, portion of an internode, magnified. Fig. 1*b*, 2 cells, more highly magnified, showing the ovarian pores. Fig. 1*c*, group of cells from another portion of the same specimen. Fig. 1*d*, single cell, showing a large, oval, ovarian pore. Fig. 1*e*, 2 cells, with an avicularium between them; in each cell a small rounded ovarian pore is shown situated towards one side of the upper part. (The avicularium is not properly shaded.)

Plate 49, Fig. 2.

CELLARIA HIRSUTA (P. MacGil.).

Description.—Cells in a series contiguous; surface granular; mouth central, lower lip arched upwards, usually with a minute denticle at either side internally; a long corneous tubular process from the base of the cell. Avicularium replacing a cell; mandible very large, semicircular. Ovicell opening by a lunate pore.

Reference.—*Salicornaria id.*, P. H. MacGillivray, Trans. Roy. Soc. Vict., 1868.

Queenscliff; Portland, Mr. Maplestone; frequent.

Forms tufts 1 to 2 inches high. The cylinders frequently present, towards the superior extremity, swollen portions corresponding to the situation of the immersed ovicells. The form of the cell varies, being hexagonal, rhomboidal, with the upper and lower edges straight, or the upper arched or pointed; frequently the upper end is arched, and the lower part much contracted. The forms of the cells are very similar to those described in the last species. At the base of each cell there is generally a long, hollow, corneous process; in some specimens each cell has 2; and occasionally they are wanting, but never from all the cells of a polyzoary; they are distinct from the radical tubes, which may be occasionally seen arising from the same cells at the base of an internode. The ovicell is totally immersed; the ovarian pore is widely lunate, at the summit of an ordinary cell. The avicularium is of great size. It takes the place of a cell in a series; it is larger than the adjacent cells and of a similar form; the mandible is very large, semicircular, and occupies about a third of the cell.

EXPLANATION OF FIGURES.

PLATE 49.—Fig. 2, specimen, natural size. Fig. 2*a*, portion of internode, magnified. Fig. 2*b*, small portion of a series, more highly magnified, showing above an avicularium, and in the lower cell an ovarian pore.

PLATE 49, FIG. 3.

CELLARIA TENUIROSTRIS (BUSK).

DESCRIPTION.—Polyzoary small, formed of long narrow cylinders; cells in a series distant, elongated, usually hexagonal and pointed above and below, sometimes wide and arched above; mouth arched above, lower lip arched forwards, and sometimes with a minute denticle at either side. Ovicell deeply immersed, opening by a round pore at the upper part of a cell. Avicularium replacing a cell, mandible very long, narrow, and pointed upwards.

REFERENCE.—*Salicornaria id.*, Busk, Cat. Mar. Pol. Brit. Mus., p. 17, pl. lxiii., fig. 4.

Queenscliff; Sealer's Cove and Cape Le Febre, Baron von Mueller.

This species forms small glassy tufts. The internodes are narrow, and consist of a few series of cells. The cells are usually nearly hexagonal and pointed above and below; the separating margins are much raised, generally smooth; the surface also is smooth or very obscurely granular. The mouth is situated rather above the middle; the upper lip is lofty and arched; the lower lip is also arched upwards, and frequently has a small denticle at either end. In some specimens the cells are much wider and rounded above. These are more frequently found in the expanded portions where the deeply immersed ovicells are situated. The ovarian pores are small, and situated at the upper part of a cell. The avicularia take the place of cells in a series; the mandible is very long and narrow.

EXPLANATION OF FIGURES.

PLATE 49.—Fig. 3, specimen, natural size. Fig. 3*a*, an internode, magnified. Fig. 3*b*, small portion, more highly magnified, showing 2 avicularia. Fig. 3*c*, small portion of the form with the wider cells rounded above, and showing the ovarian pores.

PLATE 49, FIG. 4.

CELLARIA GRACILIS (BUSK).

DESCRIPTION.—Polyzoary small; cells in a series distant, elongated, hexagonal, usually pointed above and below; surface minutely granular; mouth at or above the middle, arched above, lower lip also slightly arched upwards. Avicularium replacing a cell, mandible very large and semicircular.

REFERENCE.—*Salicornaria id.*, Busk, Cat. Mar. Pol. Brit. Mus., p. 17, pl. lxiii., fig. 3; pl. lxv. (*bis*), fig. 2.

Queenscliff; Sealer's Cove, Baron von Mueller.

In this and the preceding species, the size and habit of growth, and the size and appearance of the cells, are very similar, and in the absence of the avicularia it would be impossible to distinguish them with certainty. These organs, however, are very characteristic. In both they take the place of cells in a series. In *C. tenuirostris* the mandible is long, narrow, and pointed upwards, while in

C. gracilis it is very broad and semicircular. I have not seen the ovarian pores in the present species.

EXPLANATION OF FIGURES.

PLATE 49.—Fig. 4, specimen, natural size. Fig. 4*a*, an internode, magnified. Fig. 4*b*, small portion, more highly magnified, showing an avicularium. Fig. 4*c*, outline of 2 cells and profile of avicularium, to show the projection of the rostrum.

PLATE 49, FIG. 5.

NELLIA OCULATA (BUSK).

[Genus NELLIA (BUSK). (Sub-kingd. Mollusca. Class Polyzoa. Order Infundibulata. Sub-Order Cheilostomata. Fam. Salicornariidæ).
Gen. Char.—Cells distinct, convex in front, aperture large.]

DESCRIPTION.—Cells quadriserial, few in each series (about 4 or 5), projecting above, of nearly uniform width; aperture large, of same width throughout, rounded above and below, and with a thickened margin; 2 small, hollow, rounded processes below the aperture, perforated at the summit by 1 or 2 minute openings, which are occasionally occupied by avicularia.

REFERENCE.—Busk, Cat. Mar. Pol. Brit. Mus., p. 18, pl. lxiv., fig. 6; pl. lxv. (*bis*), fig. 4.

Parasitic on algæ and zoophytes, Queenscliff.

Forms small glassy tufts. It is readily recognised by the shape of the aperture, and the presence of the 2 rounded hollow processes at the base of the cell. These processes are pierced by 1 or occasionally 2 small apertures on the summit. According to Smitt (Floridan Bryozoa), these apertures are occupied by small avicularia, and in a few instances I have been able to detect them. The upper part of the cell, when seen in profile, forms a marked projection below the submarginal processes of the cell above.

EXPLANATION OF FIGURES.

PLATE 49.—Fig. 5, specimen, natural size. Fig. 5*a*, internode, magnified. Fig. 5*b*, the same, more highly magnified.

PLATE 49, FIG. 6.

TUBUCELLARIA HIRSUTA (BUSK).

[Genus TUBUCELLARIA (D'ORBIGNY) = ONCHOPORA (BUSK) in part. (Sub-kingd. Mollusca. Class Polyzoa. Order Infundibulata. Sub-Order Chielostomata. Fam. Salicornariidæ.)

Gen. Char—Cells convex, ventricose, confluent, indistinct; mouth produced into a tube; no raised margin, and no aperture.]

DESCRIPTION.—Polyzoary of rather short internodes; mouth prolonged forwards into a slightly projecting tube; on each side below the tubular portion a long, hollow, jointed, tubular process is articulated.

REFERENCE.—*Onchopora id.*, Busk, Mic. Journ., vol. iii., p. 320.

Queenscliff; Western Port, Sir George Verdon; Cape Otway, Mr. J. Payter; Portland, Mr. Maplestone.

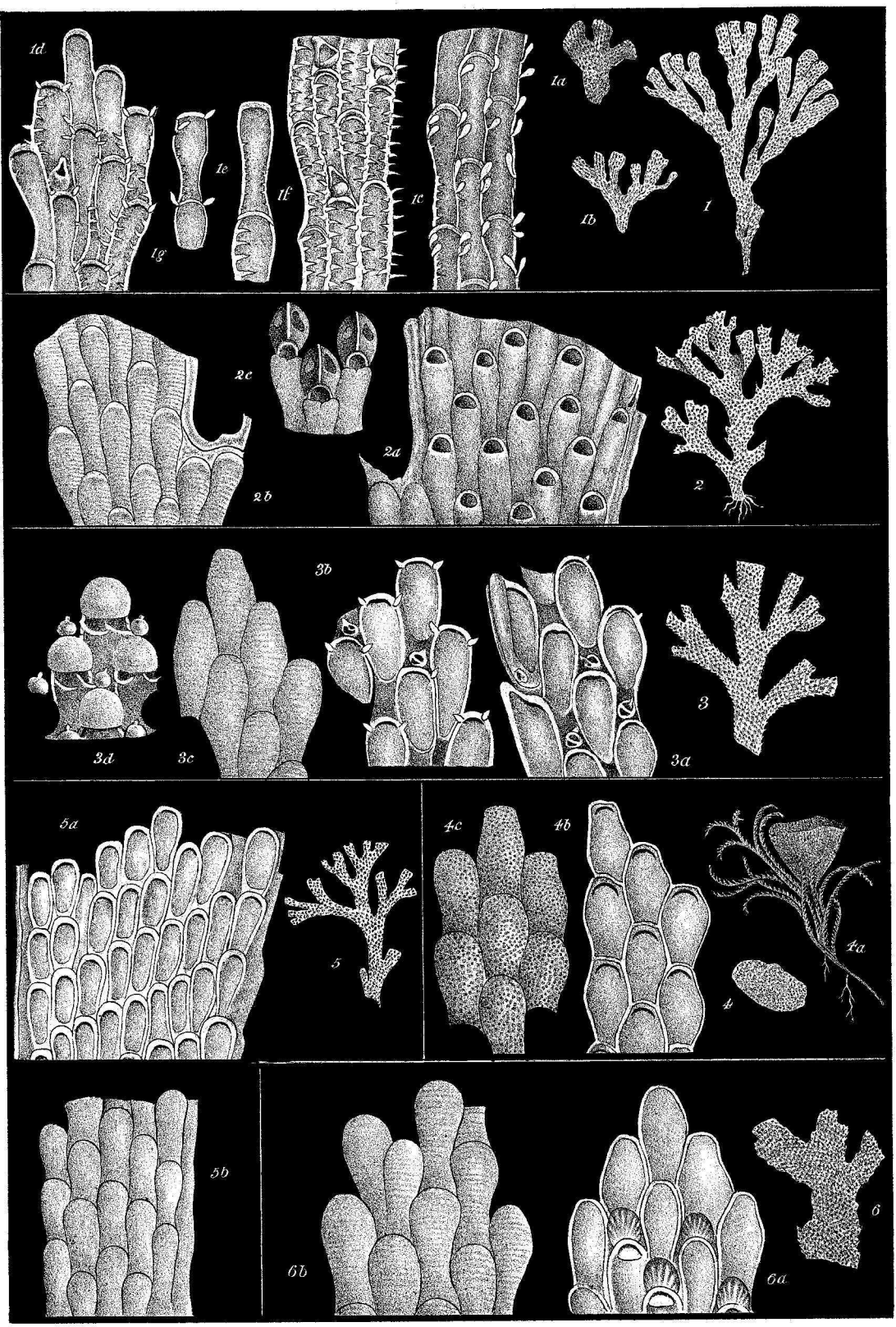
This very peculiar species occurs in tufts, 1 to 2 or 3 inches high. The internodes are short and thick. The cells are of large size; the surface (in dried specimens) divided into minute areas bordered by chain-like rows of small punctations. The mouth of the cell projects slightly in a tubular form, and on each side, at the commencement of this projection, is a long, hollow, jointed corneous process. This is quite different from the radical processes, which are of about the same thickness, and may be occasionally seen at the base of an internode, twisted cable-like and curled at the ends. There is in many cells a small round or oval, raised pore below the mouth. This is frequently wanting, and is probably an avicularium.

EXPLANATION OF FIGURES.

PLATE 49.—Fig. 6, specimen, natural size. Fig. 6, small portion, magnified.

All the specimens of *Salicornariæ* figured on this plate have been presented with the above descriptions by Mr. MacGillivray.

FREDERICK McCOY.



J. Ripper del.
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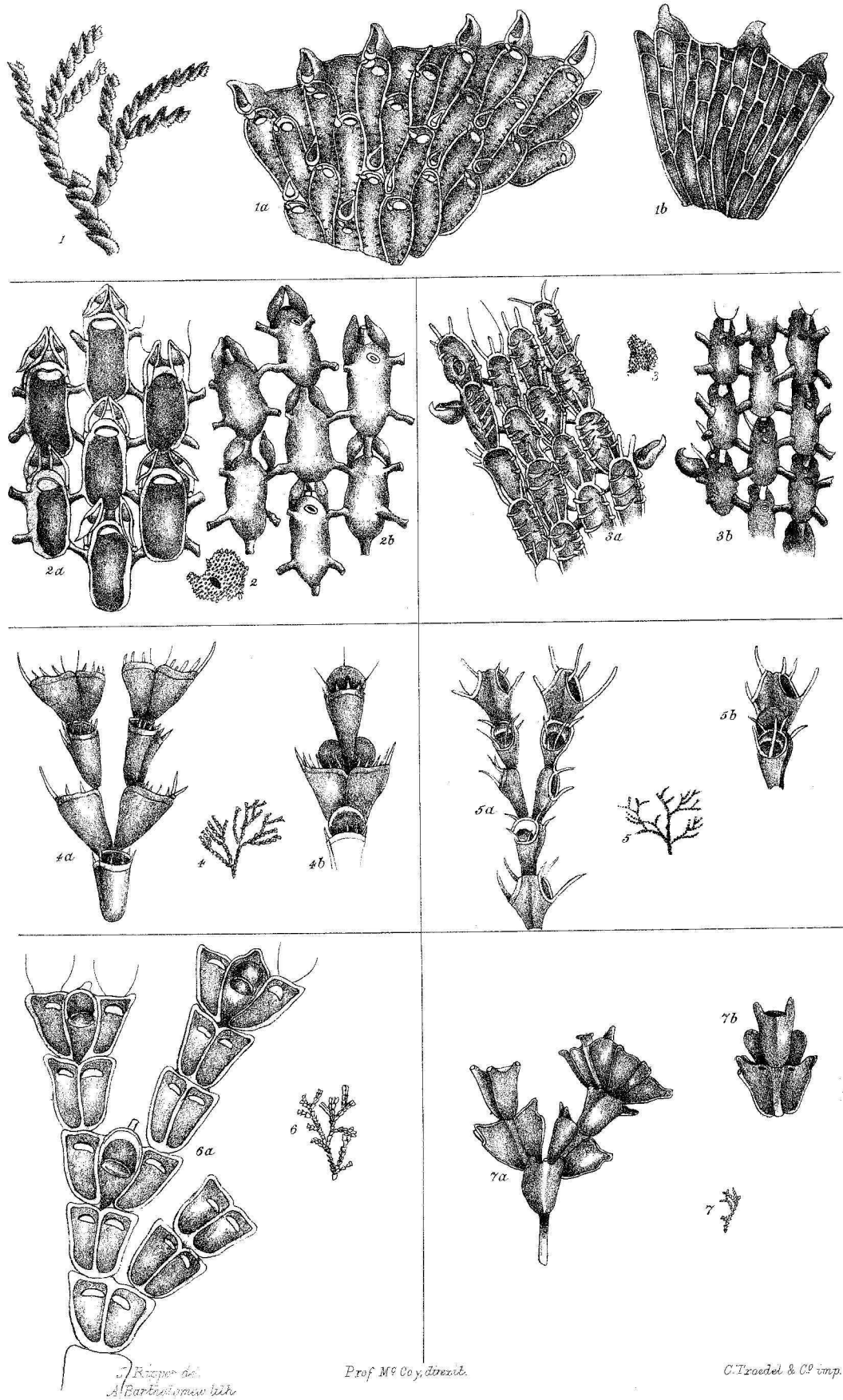
C. Troedel & Co imp.



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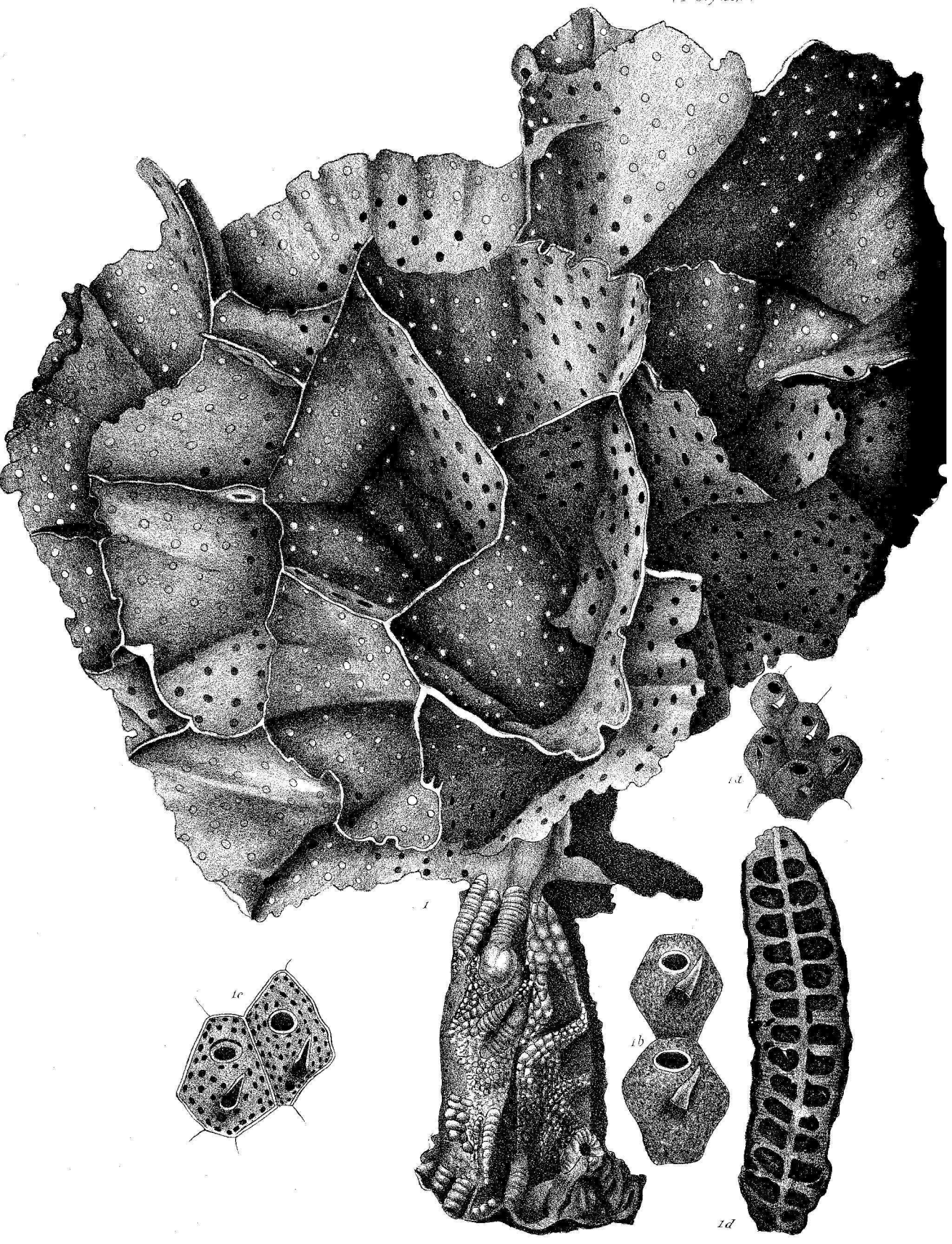

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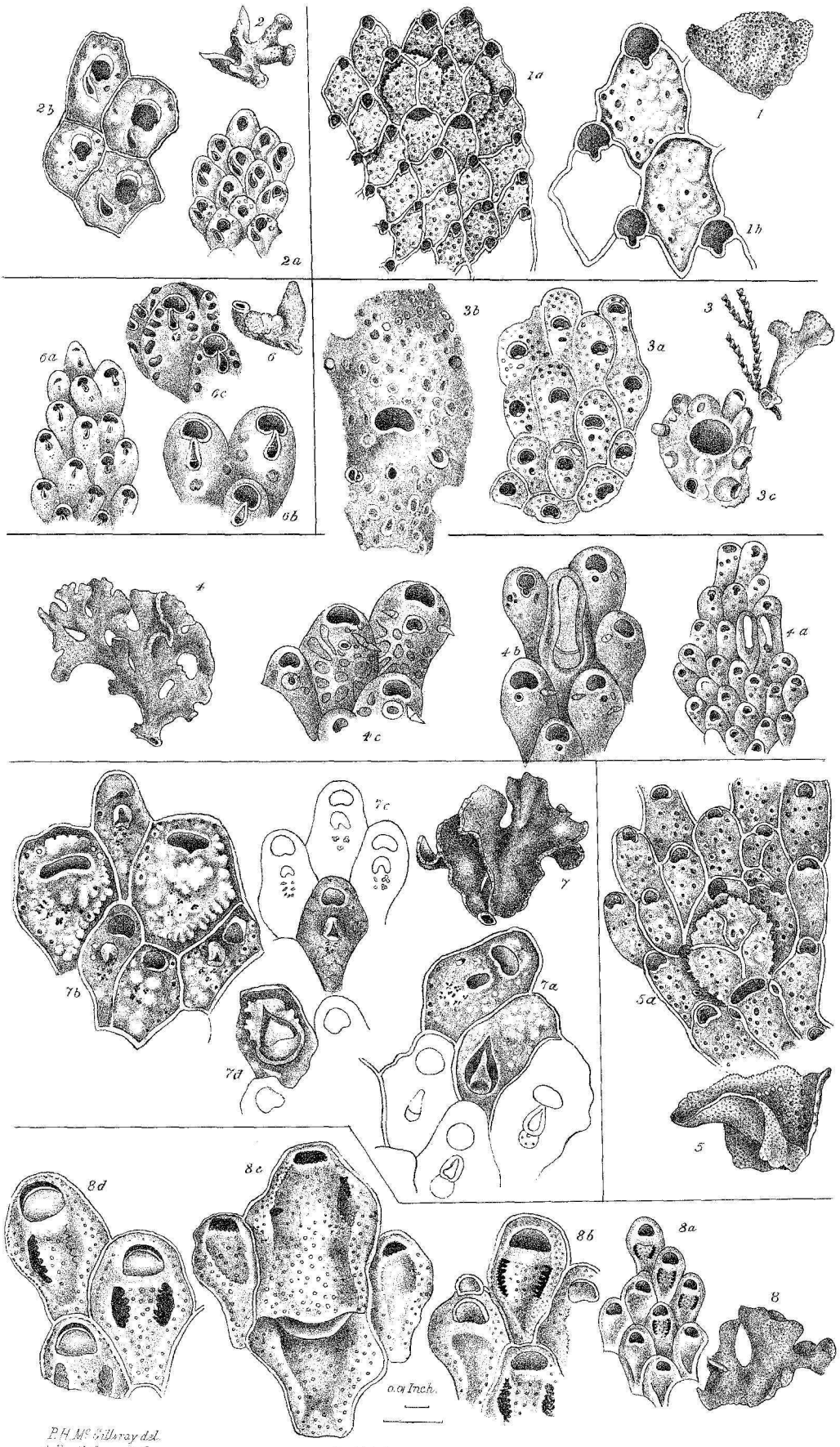

P.H. McGillivray del.
A. Bartholomew lith.

Prof. McCoy direxit.

C. Troedel & Co. imp.

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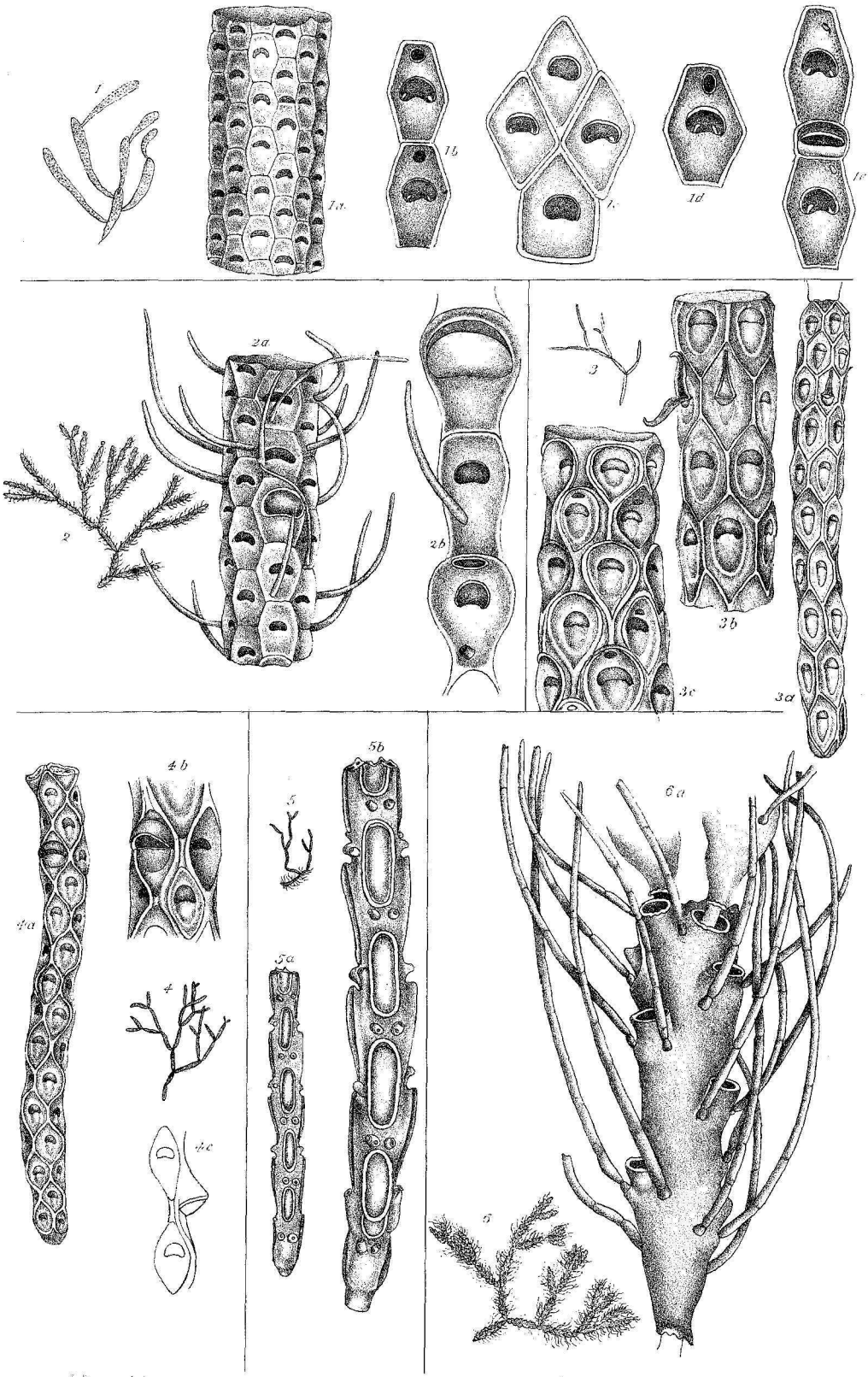

J. Kruger del.
J. Burbidge new. lith.

Prof. H. Gray direx.

C. Troedel & Sons imp.