

XXVIII.—*Contributions towards a General History of the Marine Polyzoa.* By the Rev. THOMAS HINCKS, B.A., F.R.S.

[Continued from vol. x. p. 170.]

[Plates VI. & VII.]

XI. FOREIGN CHEILOSTOMATA (Australia and New Zealand).

Family Cellulariidæ.

SCRUPOCELLARIA, Van Beneden.

Scrupocellaria obtecta, Haswell. (Pl. VI. fig. 1.)

Zoarium of very stout habit, irregularly branched; internodes of moderate length, containing 7–9 cells. *Zoæcia* in two lines, alternate, rather short, broad above, narrowing downward; area oval, occupying about two thirds of the front; margin well raised, thin, a stout spine on each side a little below the top (one close to the *avicularium*, the other a little above the peduncle of the operculum); a large oblong shield-like operculum completely covering the area, surface smooth and glossy, with a bilobate hand-like pattern upon it, formed by a system of branching canals; peduncle broad; *lateral avicularium* usually small, with pointed mandible, occasionally much elongated, elevated, directed upward in the line of the cells, the mandible large, expanded towards the free extremity, which is carried out into a rather long slender spinous process, flanked by a shorter denticle on each side; just below the area a small, much raised *avicularium*, with pointed mandible directed obliquely downwards; *vibracular cell* erect, broad and rounded below, rising into a point above, the groove (beak) sloping downward from the summit to about the middle of the cell, the lower portion occupied by a very large foramen for the radical fibre, which is furnished with hooks; seta rather long, occasionally of enormous length (about twice the ordinary size). *Oæcium* (?).

Loc. Queensland (*Haswell*); Port Phillip Heads (*J. Bracebridge Wilson*).

I presume that this is the *S. obtecta* of Haswell, though his brief diagnosis, unaccompanied by a figure, is hardly sufficient for certain identification.

It is a fine handsome species, of robust habit, the large figured operculum forming a remarkable feature. A modification of the lateral avicularium, similar to that which I have

noticed in *S. varians*, mihi *, occurs in *S. obtecta*; but here the normal structure preponderates largely.

Scrupocellaria cervicornis, Busk.

Zoarium very slender, transparent, of a delicate pearl-white, branched, the branches very narrow. *Zoæcia* disposed in two lines, alternate, slender, tapering off downwards, surface smooth; aperture oval, with a very slightly thickened rim, occupying less than half the front; 4 or 5 marginal spines above, of which the lowest on the outer side is branched or antler-like (2 or 3 divisions); an operculum covering about two thirds of the area, somewhat enlarged above, narrowing off downwards, and subtruncate below, with a hand-like pattern arranged in a two-lobed figure; *lateral avicularium* very minute, at the base (between it and the margin of the cell) a very tall spine, curved slightly inward; below the area, rising on the inner side of it, a tall columnar process, bearing a much elongated *avicularium*, the slender subspatulate mandible sloping abruptly downwards from the summit (to which the base of the beak is attached), and tending obliquely across the lower portion of the cell towards the side of the branch; sometimes replaced by an *avicularium* of much smaller size and of the more usual form; *vibracular cell* rather slender, erect, not much expanded below, narrowing off towards the blunt upper extremity, groove sloping abruptly downwards from the summit to the base of the cell; seta very long (nearly three cells' length) and extremely slender; foramen small. *Dorsal surface* flattish, smooth, traversed by a very graceful sinuous line, marking the junction of the rows of zoecia.

Loc. Off Cumberland Island (*Busk*); Singapore or Philippines (*Miss Jelly*).

In Busk's figure of *S. cervicornis* the front avicularia are represented as small and of the ordinary character. In the specimen on which the present diagnosis is based they have almost all assumed the very singular form which I have described above. The columnar support on which the appendage is borne is of remarkable height; and the elongate beak, with its spatulate mandible, drops abruptly from the summit to rest on the surface of the cell below. In the presence of the wonderful array of highly organized appendages on the front of the zoarium, we are not surprised to find the lateral avicularia atrophied and almost extinct.

* "Report on the Polyzoa of the Queen Charlotte Islands," *Annals* for December 1882.

A curious element of structure (not noticed by Busk) is the line of tall spines which fringes each side of the branch; it may probably act as a protective barrier. In this case all the appendages seem to me to have probably the same general function, and to be charged with the office of defending the polypide in various ways, and securing for it the conditions of healthy life. The opercular shield, the cleansing sweep of the setæ, the flapping of the mandibles, the fence of unyielding spines, all these seem to point in one direction.

In *S. cervicornis*, with its slender habit and delicate colour and texture, with its decorated shield and rich profusion of curious apparatus, we have certainly one of the most beautiful and most admirably equipped of its tribe.

Family Bicellariidæ.

STIRPARIA, Goldstein.

Gen. char.—*Zoarium* consisting of erect segmented stems, chitinous or calcareous, and of celliferous branches, which originate in more or less flabellate tufts close to the summit of the segments. *Zoæcia* of the normal Bicellarian type, turbinate, somewhat free above; aperture looking more or less upward, turned obliquely inwards, inferior portion of the cells subtubular. *Avicularia* articulated.

I have revised the characters of this genus, which was instituted by Goldstein for a remarkable Australian form, that it may include the kindred species which I am about to describe. There are some striking points of difference between the two, but none that would warrant their removal to separate groups. So far as the zoæcia are concerned, they are both typical *Bicellariæ*; the development of erect stems of peculiar structure, on which the celliferous branches are borne, is the one character which differentiates them both from the ordinary members of this genus. In *S. annulata*, Maplestone*, the stems are represented as composed of a "soft corneous" material, and the segments, though distinctly marked out by rather deep constrictions, are said not to be articulated. They are also very prettily annulated through a considerable portion of their length. In the form which I have to describe the stems are calcareous, divided into segments by well-marked corneous joints, and with a smooth surface. The internodes, too, instead of being of uniform length, are alternately shorter and longer; and it would seem that the celli-

* Journ. Microscop. Soc. Victoria, 1879.

ferous tufts are borne, if not exclusively, at least in a very great majority of cases, on the shorter only. These differences are interesting, but they are not of very marked significance.

The segments composing the stem are clearly abortive zoëcia; morphologically the stem is the equivalent of such structures as the stolon in the genera *Aetea* and *Eucratea*. In *Stirparia glabra* a large number of tubular fibres are given off from the lower internodes, originating in each case a little above the base; these, as they pass downwards, become closely attached to the stem, which is often thickly coated with them. At the bottom of the stem they become free and form a multitude of spreading rootlets.

Stirparia glabra, n. sp. (Pl. VI. fig. 2.)

Stems erect, calcareous, smooth, more or less branched, attaining a height of about $\frac{3}{4}$ inch, made up of alternate long and short segments, separated by corneous joints; the larger widening somewhat towards the top, and also slightly enlarged just above the base; surface smooth, polished, traversed on two faces by a fissure, which widens out towards the top, and is filled in by a transparent membranous (?) covering; the interposed smaller segments (about one third the length of the larger) rounded off below, at the top an obliquely truncate orifice on one side (from which celliferous tufts may originate), also furnished with fissures; stems attached by means of numerous tubular fibres given off from the inferior internodes; *celliferous branches* given off from the lateral opening at the top of the shorter segments, forming more or less flabellate tufts; the primary zoëcium in each tuft short, broadly turbinate, with a large terminal aperture and a number of marginal spines; from this two branches arise, which soon bifurcate. *Zoëcia* in two lines, alternate, suberect, turbinate; aperture occupying less than half the length of the cell, turned very decidedly inwards towards the central line, wide above, contracted below; margin raised, thin, the upper lip often extended into a spinous point on the outer side; four or five long, curved spines above, sometimes placed a good way down on the dorsal surface, a single spine near the bottom of the area at one side, tall, curved, bending inward; portion of cell below the aperture slender, tapering downward; a minute, articulated *avicularium* on the margin of the area at the bottom. *Oæcium* (?).

Loc. Geraldton, Western Australia (*Miss E. Gore*).

The *avicularium* is very sparingly present in the speci-

men which I have examined, and is, I think, the minutest which I have seen.

Several stemmed Cheilostomatous forms, some of which are extremely curious, have been brought to light in comparatively recent times; they are *Kinetoskias*, Kor. & Dan., also a Bicellarian group with four species, and *Rhabdozoum*, mihi, which is referable to the Eucratean family, in addition to the present genus. In most of these forms the stem probably represents a modification and adaptation of the structure known as the "radical fibre;" in the present case, as I have already stated, it is composed of aborted cells.

STOLONELLA, nov. gen.

Gen. char.—*Zoarium* consisting of a creeping stolon, and zoecia distributed upon it. *Stolon* chitinous, free in itself, but attached at intervals by adhesive branching disks, which originate from short stolonetic offsets, jointed, more or less branched. *Zoecia* erect, scattered, always developed close to a joint, attached to the stolon by the pointed lower extremity of the dorsal surface, subcalcareous, boat-shaped, aperture occupying the whole front, closed in by flattened spinous ribs, united together; orifice terminal.

The true stoloniferous character of this form seems to call for its separation from *Beania*, as represented by our British *B. mirabilis*. The cells in the latter species are borne at the extremity of a slender pedicel, which takes its origin on the dorsal surface of a neighbouring cell; and it is in this way only that the members of a colony are united. There is no common stolon to which the individual zoecia are jointed. Each cell is *attached* by means of a radical tube emitted from its dorsal surface, which spreads itself out into a fibrillated disk and holds it to its place. But in *Stolonella* the plan of structure is quite different and much less simple. The zoecia are borne on a distinct stolon, as in *Eucratea* or *Valkeria*, and are attached by the extremity of the dorsal surface to a slight prominence on the creeping stem. The stolon is not adhesive, as in the genera just mentioned, but is fixed by a special apparatus of disks developed at intervals along its course. It is regularly jointed, and close to the joint a branch is given off at right angles on each side. These branches are occasionally both of them very short, bearing at the extremity an adhesive disk; more commonly one only is arrested in development and carries a disk, the opposite one lengthening out into a jointed stolon, like that from which it originates, and bearing a line of cells. This structure is evidently a derivative from

the simpler and more primitive form which we have in *Beania mirabilis*.

The zoecium of *Stolonella* bears a general resemblance to that of *Beania*; but there has been an important modification of one element. The spines are converted into flattened ribs, which bend in over the aperture, meeting in a central line, and are united by a membranous or membrano-calcareous expansion, so as to form a continuous wall.

Stolonella clausa, n. sp. (Pl. VII. fig. 6.)

Stolon jointed at regular intervals, opposite branches given off close to each joint, one (usually) rudimentary and bearing a branched disk at its extremity, the other celliferous and itself branched. *Zoecia* originating close to the lateral branches, jointed to a short process, elongate, erect, boat-shaped, slender as seen in front, and tapering slightly towards the base; dorsal surface smooth and highly glossy, curved outward below; on each side of the aperture 11-14 flat and rather broad spinous ribs, which bend in over the opening and meet in the centre, united together laterally, the enlarged bases of the spines forming a kind of pattern running the length of the cell; on each side of the orifice two stout, erect, pointed spines.

Loc. Creeping over *Fucus*, Geraldton, West Australia (*Miss E. Gore*).

The cells of *S. clausa* bear a certain amount of superficial resemblance to those of *Beania australis*, Busk (B. M. Cat. pl. xvi. figs. 1-3). The diagnosis of the latter is useless for identification in such a case, as it merely gives the number of the costæ; but if we are to trust the figure in the 'Catalogue,' the two forms are undoubtedly distinct. The cells of *B. australis* (to take a single point) are represented as attached by the whole of a rather broad base to a decumbent stem; whereas those of the present species are jointed by the extremity of the dorsal surface, which terminates in a blunt point, to a process from the stolon. The contour of the two below is quite dissimilar. A suberect tubular process is also figured by Busk as rising from the stem near the base of the cell; but nothing of the kind is present in *Stolonella clausa*.

The adhesive disks are a very marked characteristic of the present form, and would hardly have escaped the notice of so practised an observer as Mr. Busk. They are commonly bilobed, consisting of two disks joined together.

Sometimes the branching is luxuriant and the zoecia are rather densely clustered. The lateral offshoots exhibit exactly the same structure as the main lines of stolon, and give off in the same way their branches and disk-bearing processes.

Stolonella clausa may safely be pronounced one of the loveliest of Polyzoa.

Family Cellariidæ.

FARCIMIA, Pourtales.

Gen. char.—*Zoarium* calcareous, erect, branching; stem and branches composed of segments united by corneous joints. *Zoecia* arranged in series round an imaginary axis with elevated margins and a depressed area, which is more or less covered in with membrane.

The genus, instituted by Pourtales and adopted by Smitt*, includes forms with a Cellarian habit and a Membraniporidan cell. The type species is the *Farcimia cereus* of Pourtales.

Farcimia appendiculata, n. sp. (Pl. VII. fig. 4.)

Zoarium erect, dichotomously branched, internodes of moderate length (usually containing four cells on each face), narrowed at the base, joints composed of two corneous tubes. *Zoecia* arranged in four series, alternate, arched above, subtruncate below, expanded at the sides, margin raised and thin; the whole aperture covered by a transparent membrane, except a small portion at the base, which is closed in by a rather stouter material. On each side, just below the top, an *avicularium*, occupying the space between the raised margins of the contiguous cells, elongate, subimmersed, tapering off below, stretching obliquely downwards, the upperside occupied by a slightly depressed area, covered in by membrane, at the top the beak and mandible, the former small, very slightly bent at the tip, mandible bluntly triangular, directed outwards—the *avicularia* of the neighbouring rows forming a line between the cells; commonly the membranous covering of the avicularian area extended into an erect process, broad at the base and running out into a sharp point above (Pl. VII. fig. 4*b*). *Oecium* terminal, rounded, immersed.

Loc. Port Phillip Heads (*J. Bracebridge Wilson*).

The avicularia are the striking feature of this species. In structure they seem to resemble the lateral appendage of the genus *Scrupocellaria*. They are remarkable for their size; and from the alternate disposition of the cells they fall into regular longitudinal rows, intercalated between the series of zoecia. The membranous appendages are present in large numbers; but the examination of dead specimens merely does not afford the means of determining their function.

* 'Floridan Bryozoa,' part ii. p. 2.

Family **Myriozoidæ** (part.), Smitt.

SCHIZOPORELLA, Hincks.

Schizoporella cinctipora, n. sp. (Pl. VII. fig. 3.)

Zoæcia ovate, quincuncial, flattish, divided by raised lines; surface reticulate, strongly calcified, glossy (the sheen due in great part to the shining membranous covering of the reticulations); orifice of about equal height and width, arched above, lower margin straight, with a small rounded loop-like sinus in the centre, the entrance guarded by two raised points; peristome much elevated and slightly thickened, forming an enclosure round the primary orifice (which appears immersed); close to the lower margin of the primary orifice at one side a rather large round *avicularium*, placed on the summit of a low rounded mamilla, with smooth surface. *Oæcium* rounded, broader than high, often subimmersed, surface smooth and silvery or slightly roughened, with a number of large circular punctures, the arch of the secondary orifice carried across the front of it.

Loc. New Zealand (*Miss Jelly*).

Family **Escharidæ** (part.), Smitt.

LEPRALIA, Johnston (part.).

Lepralia foraminigera, n. sp. (Pl. VII. fig. 1.)

Zoæcia ovate (much irregularity in shape), quincuncial, very slightly convex, sutures distinct but not deep; surface perfectly smooth, the front wall pierced by several foramina, varying in shape, size, and disposition—sometimes of large size, sometimes minute, the openings of which are closed in by a chitinous membrane and have a slight edging; orifice broader than high, arched above, a constriction on each side a short distance above the lower margin, which is curved outward and very slightly prominent; the oral operculum stout, dense, and of a rather dark horn-colour; peristome not elevated. *Avicularia* none. *Oæcium* rounded, not prominent; surface smooth, dense, waxy, the upper part occupied by a large foramen with membranous covering.

Primary (or *central*) *cell* expanded below, narrowing towards the oral extremity, the whole area covered in by a dark dense membrane; no spines.

Loc. New Zealand, forming large suborbicular brown crusts (*Miss Jelly*).

The marginal cells in an early stage have the front wall wholly membranous, with the oral valve at the top of it. A thin calcareous covering gradually forms over the membrane, the calcification, which is feeble, being interrupted by frequent lacunæ.

Lepralia rectilineata, n. sp. (Pl. VII. fig. 5.)

Zoæcia large, elongate, rectangular, disposed in regular linear series, moderately convex; surface whitish and silvery, punctured, the punctures disposed in lines which run from the sides towards the centre, sometimes separated by stony ridges; orifice large, expanded and suborbicular above, constricted a short distance above the lower margin by two prominent points, below the constriction much contracted, lower margin nearly straight, slightly raised in the centre; peristome scarcely elevated; six (normally) marginal spines, disposed three on each side above; the opercular plate filling in the lower part of the orifice (beneath the constriction) much thickened and prominent; sometimes a small raised *avicularium* a little below the inferior margin, with somewhat elongate and rounded mandible directed downwards, often several similar *avicularia* scattered over the front wall; on each side of the orifice at the top a small *avicularium* of the same kind, the mandible directed towards the side, sometimes replaced by a much elongated form (Pl. VII. fig. 5 a) with a slender subspatulate mandible. *Oæcium* (?).

Loc. New Zealand (*Miss Jelly*).

MUCRONELLA, Hincks.

Mucronella bicuspis, n. sp. (Pl. VII. fig. 2.)

Zoæcia ovate, quincuncial, very prominent, the wall sloping steeply up from the sides to the suboral region, sutures deep, surface smooth; orifice very large, subquadrangular, with a slightly raised thin margin, bearing on each side just above the lower margin an oval *avicularium*, with rounded mandible directed upward, a denticle projecting inward on each side just under the *avicularium*, and in the centre of the lower margin a broad bicuspid process; immediately behind it rises a tall sharply pointed mucro, the spreading base of which is inclosed by a white line; the lower portion of the cell usually with a line of large punctures placed a little within the margin, areolated, the punctures sometimes irregularly scattered. *Oæcium* of a beautiful pearly white, almost semicircular, somewhat flattened in front, thickly covered with minute

granulations, a raised line round the base, the front margin slightly prominent.

Loc. Hawkes Bay, New Zealand (*Miss Jelly*).

The following species are not included in Hutton's 'List of New Zealand Polyzoa':—

Catenicella crystallina, Wyville Thomson.

Bluff Harbour, south of Otago, low-water mark (*Prof. Coughtrey*).

Caberea grandis, Hincks.

Otago (*Prof. Coughtrey*).

EXPLANATION OF THE PLATES.

PLATE VI.

Fig. 1. Scrupocellaria obtecta, Haswell. Front view of zoecia. 1 *a*. Dorsal surface. 1 *b*, 1 *c*, 1 *d*. Lateral avicularium, showing modifications. 1 *e*. Natural size.

Fig. 2. Stirparia glabra, n. sp., highly magnified, showing the stem and a celliferous tuft *in situ*. 2 *a*. Portion of stem, showing bifurcation. 2 *b*. Portion of a celliferous branch. 2 *c*. Natural size.

PLATE VII.

Fig. 1. Lepralia foraminigera, n. sp.

Fig. 2. Mucronella bicuspis, n. sp. 2 *a*. Zoecium with ovicell.

Fig. 3. Schizoporella cinctipora, n. sp.

Fig. 4. Farcimia appendiculata, n. sp. Portion of an internode.

Fig. 4 a. Farcimia appendiculata, n. sp. Natural size. 4 *b*. One of the membranous processes connected with the avicularium.

Fig. 5. Lepralia rectilineata, n. sp. 5 *a*. One of the elongate avicularia.

Fig. 6. Stolonella clausa, n. gen. and sp.

XXIX.—Description of a new Genus of Cœciliæ.

By G. A. BOULENGER.

EPICRIONOPS, g. n.

Squamosals separated from parietals. Two series of teeth in the lower jaw. Tentacle minute, flap-shaped, close to the anterior border of the eye*. Latter distinct. Cycloid imbricated scales imbedded in the skin.

* I could not give a better representation of this tentacle than the figure 1 (representing a larva of *Ichthyophis glutinosus*!) of the plate accompanying Peters's memoir on the Cœciliæ, in Monatsb. Berl. Acad. 1879.



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