RECORDS

OF THE

GEOLOGICAL SURVEY OF NEW SOUTH WALES.

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I.—Palæontologia Novæ Cambriæ Meridionalis—Occasional Descriptions of New South Wales Fossils — No. 8; by R. Etheridge, Junr., with plates I–VII.

I.—Univalves from the Devonian of the Isis River, Scone District, New South Wales.

Genus.—Polyamma,* *Eth. fil.*

[Plate II.]

Obs.—Quite recently I described a peculiar and interesting univalve from the Devonian of the Burdekin River, Queensland, to which I gave the name of *Polyamma burdekinensis*. The essential features are a low-conical, or broadly and briefly sub-turreted shell of about five whorls. Along the suture edge of the body-whorl, and slightly along that of the antipenultimate whorl also, is a line of disconnected outstanding tubercles, or, may be, tubular openings, with a similar series of rather larger size around the body-whorl periphery. On the gently convex side of the body-whorl are four equidistant encircling lines of blunt prominences, possibly also low tubercles.

I have had by me for some years a number of univalves collected by the late Mr. Charles Cullen, of the Geological Survey of New South Wales, at the Isis River in the Scone District; these were submitted to me by Mr. W. S. Dun. With two exceptions these are all one and the same species, the exceptions being the two shells to be described first as *Polyamma axionoides*.

* Etheridge.—Geol. Survey, Queensland, Publ. 260. 1917, p. 3, pl. 3, figs. 1 and 2.

The shell is depressed, but little elevated in the spire, discoid or rotiform, of five or, perhaps, six whorls, with a highly concave base. The antipenultimate and upper whorls appear to be flat, or if convex very slighty so. The body-whorl, on the contrary, is shallowly channelled centrally, and is decorated with two rows of tubercles, one around the suture, and the other along the rather prominent and projecting periphery of the body-whorl just as in *P. burdekinensis*. The tubercles are also arranged in a similar manner to those of the type species; the suture is wide and deep. The side of the body-whorl is low, but evenly convex, with traces of encircling lines or ridges, and which to the finger touch lead to the belief in pre-existing nodes or tubercles now worn down. The surface of the base is rounded and widely umbilicate, the aperture in the perfect shell will probably be found to be rhomboidal.

The specific name is given in allusion to the disc or wheel-like appearance. It may be distinguished from *P. burdekinensis* by its much more depressed form, less height in the body-whorl when viewed in elevation, more numerous tubercles, and a deeply sunken and narrower suture.

Loc.—Isis River, Portion 99, Ph. Lincoln, Co. Brisbane.

Genus AMPHELISSA,* *Gen. nov.*

[Plate I.]

Obs.—The shell accompanying *Polyamma axionoides* occurs in considerable numbers, and possesses a very marked appearance. It is depressed turbinate, with a short spire of at least five or, perhaps, six whorls. The apical, or anterior, whorls appear to be nearly flat and coiled in one plane, but this appearance may be due more to pressure and imperfect preservation. The three remaining or posterior whorls are strongly angular, sloping sharply inwards above and almost straight-walled below, separated by pronounced sutures, which thus practically lie in deep gutters. The peripheries of these whorls junction of their upper and lower surfaces) are sharp and upstanding, although along the actual edge narrowly truncate horizontally, but there is no evidence to liken this to a slit-band; base either very slightly inclined inwards to an umbelical centre, or flat. The test sculpture is not clear on account of the state of preservation, but there are traces on straight walled sides of the body-whorls of both revolving ridges, and oblique rugæ or costæ.

This univalve occurs in quantity in a chocolate-coloured shale with conchoidal fracture, and as the individual specimens vary much in their state of preservation it is difficult to select features of a constant character other than those of the strongly angular and usptanding whorls, deeply seated sutures, and nearly flat bases.

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* αμφελισσω = to coil round.

I was at first inclined to consider *Amphelissa isisensis* in some degree related to the *Euomphali*, but the flat and non-telescopic base, and form of the mouth as inferred by the section of the whorls, is so different to any member of the *Euomphalidæ*, the idea was abandoned. In not one of the numerous specimens collected is there an oral termination of the body-whorl preserved, and it equally follows from this we remain in ignorance of the true nature of the narrowly truncated peripheral angles.

Loc.—Identical with that of *Polyamma axionoides*.

II.—Helicopora, Claypole, in the Permo-Carboniferous of the Shoalhaven District New South Wales.

[Plate III.]

Our Permo-Carboniferous collection has contained for some years past a circular, flattened, polyzoarium of the Fenestella type, which is capable of explanation either as simply infundibuliform, or to have originally possessed a spiral form after the type of *Helicopora*, Claypole.*

The specimen was revealed by splitting in half a block of black shale of the Upper Marine Series, and the polyzoarium being of a greyish-white colour shows well against that of the matrix. The now flattened and imperfect expansion (Pl. iii) measures 5 inches across, but as there is more of the network exposed on one side of the axial centre than on the other, viz., $3\frac{1}{4}$ inches, the diameter would, assuming the point of radiation of the rays centrally situated, be nearly 7 inches.

There is satisfactory evidence that the specimen consists of two "cuplets" superimposed one above the other, with 4 millimetres thick of black shale between them. What may be considered the bottom, or lowest expansion, is the largest portion of the organism, and displays the centre of radiation as a small button-like object, or peduncular eminence.

The fineness of the mesh is remarkable; without magnification it appears like a series of pin-holes, and there is no distinction in size between the rays and dissepiments; both are of the utmost fineness and delicacy. It is impossible to estimate the number of the former, but on the average there are three rays within the space of 1 millimetre, or two fenestrules within the same measurement; these latter are quadrangular in outline. The poriferous or zoarial aspect is not visible. I therefore opine the exposed surface of each lamina, or "cup," will be the inner or concave face, as the case may be; there is no evidence of peripheral crumpling, as seen in so many of the infundibuliform species of *Fenestella*, and the like.

* Claypole.—Quart. Journ. Geol. Soc., xxxix, 1883, p. 32.

There are two explanations, either of which may account for the appearance of this fossil—the infundibuliform, or "cup-shaped," or the spiral—in the first instance, one cup springing from within the other, in the second instance, a spiral mesh revolving round an axial centre, but not necessarily round a solid axis. If the original structure was in accord with the former supposition we at once have a new form of Fenestellid growth, doubly infundibuliform, if not more so. On the other hand, if it was on the spiral principle, then we must take into consideration the genus *Helicopora*.

In the American Palæzoic rocks occur two genera of Fenestellidæ—in one of which the reticulate polyzoarium is wound in an obliquely spiral manner (*Archimedes* Leseuer), round a central screw-like axis, the other without an axis, but still spiral (*Helicopora*, Claypole). The first occurs in the Carboniferous, the second in the Upper Silurian (Niagara Group), and Devonian (Upper Helderberg Series). By some who have studied these types of old marine growth *Helicopora* is admitted to generic rank; others, however hold it to be a "synonym of Fenestella, and distinguished only by the spiral form."* Be this as it may, the spiral habit does distinguish it from the flabellate or fan-shaped forms, of *Fenestella*, as well as the infundibuliform or cup-like, and in this sense serves an excellent purpose. The genus *Helicopora* is admitted both by Dr. E. O. Ulrich† and by Mr. G. B. Simpson.‡

Helicopora was originally described by Prof. E. W. Claypole as possessing an expanded, fenestrate, and spiral polyzoarium, formed of slender, bifurcating rays, poriferous on one face, and connected by non-poriferous bars, forming an open network. The zoœcia, or cells, were arranged in two rows along the rays, one row on each side a median reel. There was no axis, as in *Archimedes*, only the "thickened inner border of the polyzoary, not straight, but forming a spiral rounded, non-poriferous, or slightly poriferous inner margin.

The type is *H. latispiralis*, and is described as possessing a widely expanded polypary, "sometimes as much as 8 inches in diameter, very flat, curving downwards towards the centre as into a funnel. Whorls about half an inch apart, dextral or sinistral. . . . Central axis or shaft very thin or entirely absent, and indicated only by a very slight thickening of the inner margin of the polyzoary."

An examination of Pl. III will at once reveal the two lamina, one above the other, the upper only in part separated, as I have before said, by an interval of black shale matrix. A reference to *Helicopora*, or not, entirely depends on the interpretation of this structure. It is either a spiral, or two flattened-out cups, originally one above the other; if the first it can conveniently be placed provisionally in *Helicopora*, thus extending the range of the genus into the Carboniferous; if

* Miller.—N. American Geol. Pal., 1889, p. 308.
† Ulrich.—Illinois Geol. Survey Report, viii, pt. ii, 1890, p. 396.
‡ Simpson.—"Handbook of the Genera of North American Palæozoic Polyzoa," &c. (14th Ann. Report State Geologist, N. York, 1894 (1895), p. 517, fig. 70.

the second, then as previously hinted, a new type of Fenestellid. Personally, I lean to the *Helicopora* view, but admit that the weak point in this suggestion lies in the absence of any thickening of the "inner border of the polyzoary, and so taking the place of the axis of *Archimedes*. Nevertheless, the provisional reference of this Permo-Carboniferous form to *Helicopora* is borne out to some extent by the apparent bi- (or possibly, *more*) lamination of the network, and the absence of peripheral crumpling.

The question of specific identity is a delicate one. There are many remarkably fine-meshed Fenestellids in our Permo-Carboniferous, some of which have received names, for instance—*Hemitrypa sexangula*, Lonsdale* (fenestrate portion), *Fenestella densa*, Etheridge,† &c. Even in *F. fossula*, Lonsdale,‡ the mesh is very fine, but the fenestrules are longitudinally oval, instead of quadrangular, as in *Helicopora* (?) *australis*, as I propose to call the present form.

A somewhat similar and remarkable instance of a cup-shaped polyzoary was long ago described by Prof. F. von Roemer as *Fenestella infundibuliformis*, Goldfuss.§ The specimen figured by Roëmer was a beautiful, circular-edged, infundibuliform network, probably shallow, with a central depression from which the rays spread outwards, and a slightly crumpled periphery. There is an unmistakeable supplementary "fanlet" apparently emanating from the mesh-work surface and not from the axial centre, and overlapping the margin of the parent expansion. The figure conveys to one the idea of a stage intermediate between an infundibuliform *Fenestella* proper and Claypole's *Helicopora*.

Loc.—Shoalhaven Heads, Illawarra.
Hor.—Upper Marine Series.
Collector.—R. Barnes.

III.—An Upper Silurian *Alveolites*.

Alveolites piriformalis,‖ *sp. nov.*

[Plate IV.]

Obs.—A very conspicuous coral in which the corallum is large, more or less balloon-shaped or expanded-pyriform, broadening upwards from a contracted point of attachment, rounded above, and composed of successive, concentric, superimposed, convex, zooidal laminæ, or variable thickness, but increasing in lateral expansion upwards, and at their respective peripheries partially free and over hanging. The calicular apertures are openly V-shaped, roughly arranged in quincunx, 1 millimetre in transverse diameter, with a single well-developed septal ridge.

* Morris.—"Strezlecki's Phys. Descrip. N.S. Wales," &c., 1845, pl. ix, fig. 4.
† Etheridge.—Quart. Journ. Geol. Soc., xxviii, 1872, pl. xxv, fig. 1.
‡ Morris.—*Loc. cit.*, pl. ix, fig. 1.
§ Roemer.—Verhandl. naturhist Ver. preuss. Rheinl.-Westph., vii, 1850, p. 72, pl. iv.
‖ *Pirum* = a pear, and *alis* = resemblance.

The internal structure is not preserved in the satisfactory state one could wish, as great alteration has taken place and all the details are much obscured. The corallites possess a diameter of millimetres, the tabula complete, and either horizontal or concave, and the mural pores round but few, and distributed far and wide.

In *Alveolites* there may be three septal "teeth," but this number is often reduced to one, and it is fortunate that, in the present instance, the one septal tooth, which characterises this species is so plainly visible in some of the weathered calices. The presence of this single septal tooth indicates an alliance with the Devonian *A. suborbicularis*, Lamarck, whilst the corallites reclining at various angles, and the oblique calice orifices are features common to most species of the genus; similarly the arrangement of the corallites in superimposed layers or laminæ. The walls of the corallites are thin, so are the tabulæ; there is no trace of septal opines.

The corallum is attached to a *Heliolites*, and from the curling over of the laminæ at their edges it is impossible to say whether or no an epitheca existed on those portions of the under surfaces exposed. It follows, from this curling over, that the calices on these peripheral portions of the laminæ are not only oblique, but their apertures open, or are looking downwards.

The genus *Alveolites* comprises species of more than one form of growth—massive encrusting, or ramose. *A. piriformalis*, although not strictly massive in the sense of *A. niagarensis*, Rominger, or *A. squamosus*, Billings, will probably fall within the group typified by these species.

The macroscopic appearance of this coral is not unlike that of *Alveolites alveolaris*, De Koninck, sp.,* of the Murrumbidgee Devonian, but the form of the calice openings, and the internal structure of the two corals are quite distinct. A single septate form has been recorded from the Victorian Upper Silurian by Mr. F. Chapman, who likewise alluded to the presence of a "thick septum in one or two, recalling a similar feature in *Alveolites suborbicularis*, Lam." †

Loc.—The precise locality in the Yass neighbourhood is doubtful. The specimen may be from one of four spots. Two of these are close together a short distance below the bridge at Yass, in the river bank; the third is at the Yass racecourse, a little over a mile from the bridge localities. The fourth possible locality is on Forest Creek, Portion 27, Parish Boambola, close to a road from Yass to the Murrumbidgee, of which Forest Creek, with Spring Creek, is an affluent. The specimen originally formed a portion of Mr. Charles Jenkins' collection, and all four localities bearing the same distinguishing mark (or what should be a distinguishing mark), it is difficult to differentiate between them. They are, however, all in the Upper Silurian of the area in question. Prof. T. W. E. David informed me that in all probability the three first localities were actually on the same horizon.

* De Koninck.—*Billingsia alæolaris*, Foss. Pal. Nouv. Galles du Sud, pt. 2, 1877, p. 75, pl. 2, fig. 4.

IV.—Clathrodictyon in the Upper Silurian of the Trundle District, New South Wales.

[Plate V.]

Amongst the many interesting forms of "Stromatopora" that have come to ight of late years, none are more so than examples of a *Clathrodictyon* from the lneighbourhood of Trundle, brought under my notice by Mr. W. S. Dun.

Clathrodictyon is a typical Upper Silurian genus, and was originally described by Messrs. H. A. Nicholson and J. Murie* from North American material of the Clinton and Niagara formations, and later from the Wenlock Series of Europe. It is also, to a limited extent, met with in the Devonian.

In this genus the cœnosteum is either laminar or massive, attached by a small base, and provided with a basal epitheca. It is composed of minutely undulated concentric laminæ, and crumpled, "so as to give rise to successive layers of oval or rounded cells or vesicles, which are usually distinct, but at other times open into one another by the imperfection of their lateral boundaries." The surface of the cœnosteum is either granular or vermiculate, and is described as not rising in "marked prominences or mamelons."

The internal structure is similar to that of the genus *Actinostroma*, but the radial pillars are incomplete, *i.e.*, they are not continuous from lamina to lamina, "but confined strictly to the interlaminar spaces in which they take their origin," hence is accounted for the successive layers of rounded or oval vesicular cells, already referred to, seen in a "vertical" or longitudinal section. In slices cut at right angles to the latter, or "horizontal," the cut ends of the radial pillars are shown as a series of black dots.

The specimen from parish Trundle is clearly but a portion of a much larger cœnosteum, and is, therefore, included amongst the massive forms. The structural details are beautifully preserved, but the first feature to catch the eye is the surface rising into numerous cone-like mamelons, which, although not an essential feature of *Clathrodictyon*, occurs to a limited extent in at least one of its species, *C. variolare*, Rosen.† These mamelons are a very remarkable feature, varying in size from small to large, each perfectly cone-shaped, rising to a perforate apex, smooth on the exterior, without channels or grooves, and scattered over the cœnosteal surface like volcanic cones rising from a plain, hence the name I have applied to this fossil, *Clathrodictyon conophoroides*.‡ A similar effect is to some extent seen in Nicholson's figure of [*Stromatopora*] *mammillata*,§ but the most exaggerated form is seen in *Clathrodictyon ostiolata*, Nicholson.‖ Another interesting point is the occurrence of young cones in different degrees of development

* Nicholson and Murie.—Journ. Linn. Soc., Zool., xiv., 1879, p. 220.
† Nicholson.—Mon. Brit. Stromatoporoidea, pt. ii, 1899, pl. xvii, fig. 4.
‡ κωνοφορος = cone-bearing, and *oides* = resemblance.
§ Nicholson.—Ann. Mag. Nat. Hist., xii (4), 1873, pl. iv, fig. 4.
‖ *Ibid.*, pl. iv, fig. 5; *Ibid.*, xix, (55), 1887, p. 11.

seated on the flanks of the larger prominences. A general idea of the appearance of this fossil's surface may be gained from Nicholson's figure of *Actinostroma stellulatum**, but with a lesser degree of mamelon development. The individual mamelons closely resemble those of *Actinostroma verrucosum*. Goldfuss, sp.,† but they are hardly sufficiently crowded together.

The cœnosteal structure is very remarkable as seen in a longitudinal section, consisting of successive, superimposed, strongly undulated lati-laminæ, sometimes crowded together, but normally from 1 to 3 millimetres apart, rising into cone-like eminences followed by corresponding valleys, in a regular or irregular sequence. Between the lati-laminæ occurs the characteristic semi-vesicular tissue of *Clathrodictyon*, with incomplete radial pillars. Both the outline and size of the vesicles are too variable to be of any value as specific characters.

In a transverse section we observe a series of concentric figures, round, oval, or irregular in outline, representing the cut edges of both the lati-laminæ and mamelons, the former distinctly visible as meandering dark lines. An apt simile would be to compare these and the severed mamelon circumferences to contour lines on a topographical map. The vesicles and radial pillars can also be distinguished, the latter as dark dots,; some of the mamelons are perforate at their centres.

In many Stromatoporoids occur structures to which the name astrorhizæ has been applied. These are "shallow grooves arranged in definite stellate systems upon the surfaces of the concentric laminæ." Each consists of a "stellate group of comparatively large-sized shallow gutters, which spring from a central point and branch as they radiate outwards, diminishing at the same time in diameter, and giving off more or less numerous lateral branches."‡ They are visible, when present, on the successive concentric laminæ of the cœnosteum. Now, there are some Stromatoporoids in which these astrorhizæ open at the surface on nipple-like prominences, or "monticules,"§ occasionally of large size,‖ when they become the "mamelons" of the present specimen from Trundle. These eminences may, or may not, be provided with a central vertical canal, and when so, each monticule is said to correspond "with the centre of an astrorhizal system"; and in such cases each is perforated at its summit by one or more comparatively large apertures.¶

It is noteworthy that in the present *Clathrodictyon*, monticules, or mamelons, are present of the most advanced type, with the orthodox central canal, but not a vestige of any astrorhizal canals radiating therefrom. It would appear at first sight

* Nicholson.—Mon. Brit. Stromatoporoidea, pt. ii, 1880, pl. xv.
† *Ibid.*, pl. xvi, fig. 4.
‡ *Ibid.*, pt. *i*, 1885, pl. iv, fig. 2.
§ *Ibid.*, pl. xvi, fig. 4.
‖ *Ibid*, pl. iii, fig. 6.
¶ *Ibid.*, pl. iii, figs. 4 and 6.

we have here tubed mamelons with the absence of astrorhizal canals. "The possession of perforated monticules is a phenomenon which is specially characteristic of such Stromatoporoids as have astrorhizæ in regularly superimposed groups; each vertical series having a central canal from which the astrorhizæ of successive laminæ spring, and which ultimately open on the surface."* Here, on the contrary we meet with the anomaly of monticules opening at the surface, but no apparent astrorhizæ.

Is it a *per contra* case to that stated by Nicholson in these words ?—"It is, however, to be noted that there are, on the other hand, certain types having well developed astrorhizæ arranged in more or less regular vertical rows, but not having the surface covered with monticules corresponding with the centres of the astrorhizæ,† in other words, monticules or mamelons, and not astrorhizal canals If so, what then are the longitudinal or vertical tubes leading down from the openings at the mamelon apices? "

"In a vertical section of such Stromatoporoids as possess astrorhizæ the cut ends of the astrorhizal canals appear in the section as larger or smaller round apertures."‡ Such circular canals, or cut ends so like Nicholson's figures, that I cannot tell them apart, are visible in longitudinal sections of *Clathrodictyon conophoroides*, but, as I have already said, I have quite failed to detect any trace of radiating astrorhizal canals on the weathered surface, or in horizontal sections.

Loc.§—Twenty-five chains south-east of Trundle, on the Condobolin Road, in Portion 4, Parish Trundle, County Ashburnham.

Hor.—Upper Silurian.

Coll.—L. J. Jones.

A Cœnites from Hatton's Corner, Yass River, New South Wales.

Cœnites pinaxoides,‖ *sp. nov.*

[Plate VI, figs. 1–3.]

The corallum occurs in tabular masses of moderate size and thickness. The specimen from which these notes are derived is $3\frac{1}{2}$ inches by $2\frac{3}{4}$ inches, and about seven-eighths in thickness; even in this condition it is imperfect. The base is partially flattened, partially hollowed, and covered with a longitudinally-ribbed epitheca. From the gradual deepening of the basal hollow, and a slight puckering in of the surface, I opine this coral was attached to some foreign body.

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* Nicholson.—Mon. Brit. Stromatoporoidea, pt. i, 1886, p. 61.
† *Ibid.*, pt. i. 1886, p. 61.
‡ *Ibid.*, p. 54, pl. v, fig. 6.
§ Mr. F. Chapman has detected a *Clathrodictyon* in the Upper Silurian rocks of the Deep Creek, Wallalla, Victoria, which he identifies with *C. regulare*, Rosen. (New Silurian Fossils of Eastern Victoria, pt. iii, Rec. Geol. Survey Vict., iii, pt. 3, 1914, p. 311, pl. lxi, fig. 37.
‖ πτγαξ = a tablet; and *oides* = resemblance.

The tissues were remarkably fine and delicate when not thickened by a deposition of sclerenchyma. The external surface is roughened, or rather, rasp-like, arising from the slightly projecting, or outstanding oblique, narrow, transversely elongated, and at times, semi-lunar calicular openings, and which, to the eye aided by a pocket lens, assume a delicate vermiculate appearance. These transversely elongate calicular apertures averaging 0·35–0·49 mm. (although there is a rough parallelism) do not open at the surface in anything approaching regular or serial order, but at all angles to one another.

In both transverse and longitudinal sections a very interesting feature is displayed, what appears to be the initial growth, or commencement of a group of corallites. In Pl. F., fig. 3, can be seen more than one of these initial foci as a clear calcite line, or sometimes a dark line (? lamina), on which repose more or less quadrangular vesicles arranged like masonry in a cyclopean wall, from one to three tiers, as the case may be, abutting against one another without the intervention of any sclerenchyma. From these cells arise the corallites; but apparently these initial zooids had but a life of short duration, for within from 1·00–2·25 mm. a new life was commenced, and so on. This tier above tier almost assumes the aspect of an arrangement in "lati-laminæ." At one point in the longitudinal section this arising of the corallites from their initial cells is very beautifully shown. Again, we observe in the same section how from one line of initial cells another may branch off. It may also be seen that in some instances the new corallite on first commencing its existence remains prone. Both these prone portions and the initial vesicles are free from sclerenchyma. Throughout the coral, otherwise, there is a copious development of this sclerenchyma, which appears to descend to a much greater depth in the corallum than is usual in *Canites*.

The corallites are long, narrow, and broom-like, often deviating from a straight and direct course, approximately 0·19–0·24 mm. in diameter. The proper walls are delicate and regular. Tabulæ are well developed, complete, concave and distinct, being about 0·22–0·57 mm. apart. The mural pores are round, and irregularly and distinctly scattered.

Loc.—Hatton's Corner Escarpment, Yass River, parish Yass, county King; collected and presented by Mr. A. J. Shearsby.

Hor.—Upper Silurian.

A Spiral Syringopora.

[Plate VI, fig. 4, 5; Pl. VII.]

Syringopora (? Microplasma) trupanonoides,* *sp. nov.*

This singular coral appears to have grown as shrub-like masses, but the complete macroscopic details of the corallum are unknown. We are only acquainted with it in compact limestone masses or on weathered surfaces of the same, in neither condition lending itself to outward description.

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* τρύπανον = a gimlet, and *oides* resemblance.

The corallites are longitudinally spiral, gimlet or corkscrew-like, of unknown length, but so far as seen, about 30 millimetres, and with a diameter of 2 millimetre sub-parallel to one another, close, but apparently not actually in contact, and without lateral outgrowths or connecting processes. On weathered surfaces, the corallites through their broken up condition, have the appearance either of small spiral or curved vermiform bodies.

An epitheca has not been observed, and even the theca is very thin; there are no septa. Infundibuliform tabulæ as a series of invaginated cones, such as are seen in *Syringopora abdita*, De Verneuil,* do not exist.

In a truly cut transverse section, the "tabulæ" present the more or less partially concentric appearance common to many species of the genus,† owing to the presence of severed cystoid vesicles. The innermost of these vesicular spaces is always larger than the others, but not necessarily central in position. Or, this largest space is enclosed by regularly-formed cystoid vesicles only, the concentric formation being to a great extent lost.

The absence of invaginated cones becomes more marked in a longitudinal section and the cystoid nature more apparent. The cysts are of variable size, oblique, with their convex aspects looking inwards, similar to those of a *Cystiphyllum*, and surrounding the central space already referred to. This extends for some distance through a corralite longitudinally, and in two instances horizontal tabulæ were observed traversing it. This central space must not be confused with the "central-cylindrical tube occupying the axis of the visceral chamber," seen in many Syringopora.

Although the corallites are often flexuous, and sometimes geniculate, in *Syringopora* a spiral, or twisted condition appears to be very uncommon, if not actually new. That the corallites are twisted is not only apparent on weathered surfaces, but is also visible in sections. In the hollow of the twist, or concave side of the coralium, the vesicles are always crowded together.

There is a total absence of connecting processes, and although the corallites appear to have grown very close to one another, they do not appear to have been in actual contact, or, if so, to a very limited extent.

In some respects there is a resemblance to the genus *Microplasma*, Dybowski, particularly in the presence of the central tissue, but unlike this genus, our fossil is quite devoid of septa.

Loc.—First limestone on Taemas Bridge Road, from Yass, Ph. Boambolo, Co. Murray (*Etheridge*).

* Edwards and Haime.—Mon. Brit.
† *e.g.*, *S. reticulata*, Goldfuss—*See* Nicholson, Tab. Corals Pal. Period, p. 211. f. 30*b*.

PLATE I.

Amphelissa isisensis, *Eth. fil.*

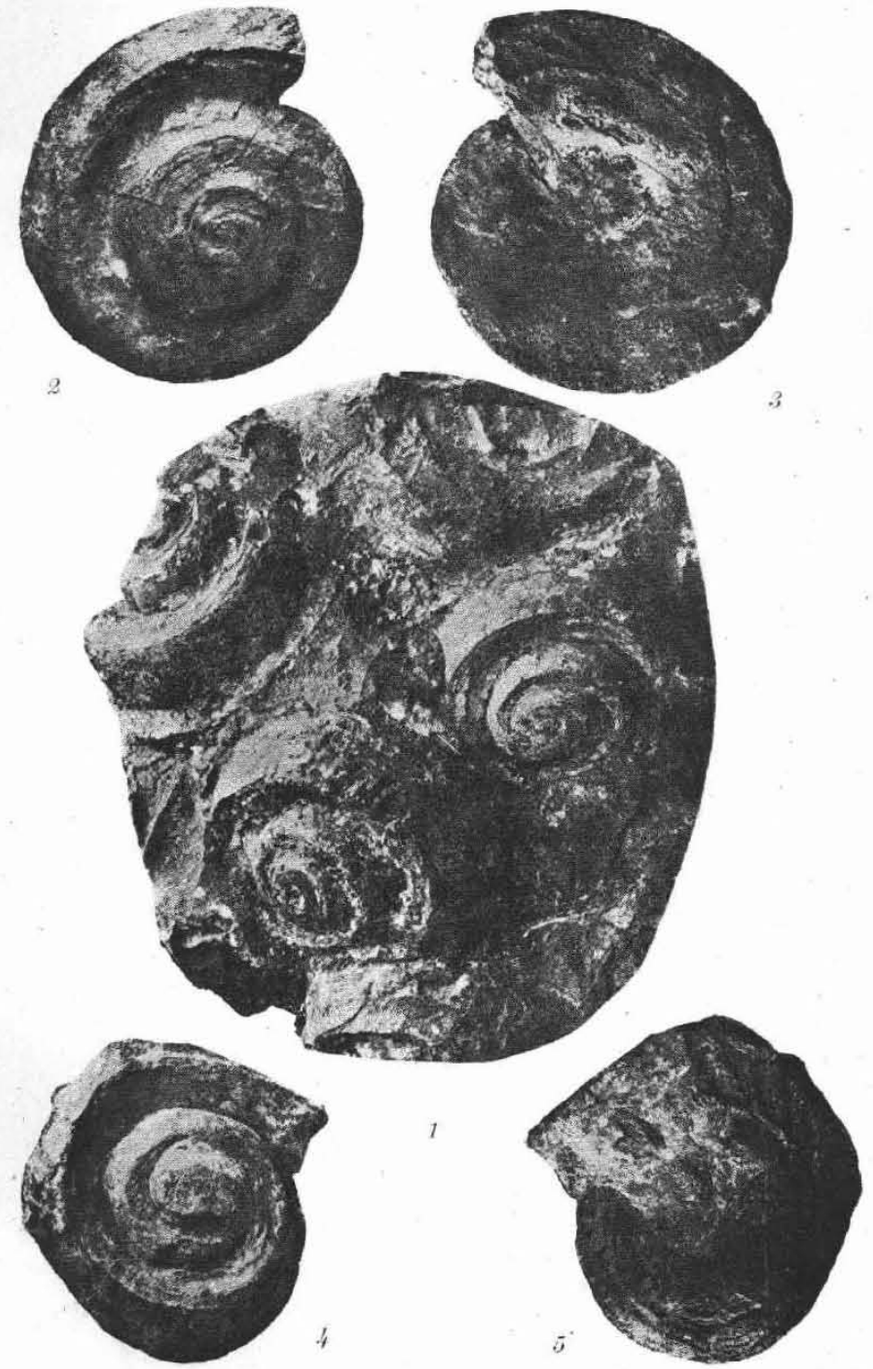
Fig. 1.—Block with portions of five specimens. In this figure the steep, almost straight-walled sides of the body-whorls are quite apparent.

Fig. 2.—A fully-grown individual seen from above displaying the deeply-seated position of the suture.

Fig. 3.—Base of specimen represented by Fig. 2.

Fig. 4.—Another example seen from above, similar to Fig. 2.

Fig. 5.—Base of specimen represented by Fig. 4.



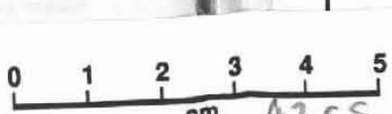


PLATE II.

Polyamma axionoides, *Eth. fil.*

Fig. 1.—Shell seen from above; the tubercles are visible around the edge or periphery of the body-whorl, and more distinctly around the suture.

Fig. 2.—Base of specimen, Fig. 1.

Fig. 3.—Side view of body-whorl. The undulation of the periphery caused by the tubercles is visible.

PLATE III.

Helicopora (?) australis, *Eth. fil.*

Two laminæ, one above the other, differentiated by the broken black edge of matrix curving across the specimen. In the centre of the superimposed lamina is visible an apical centre.

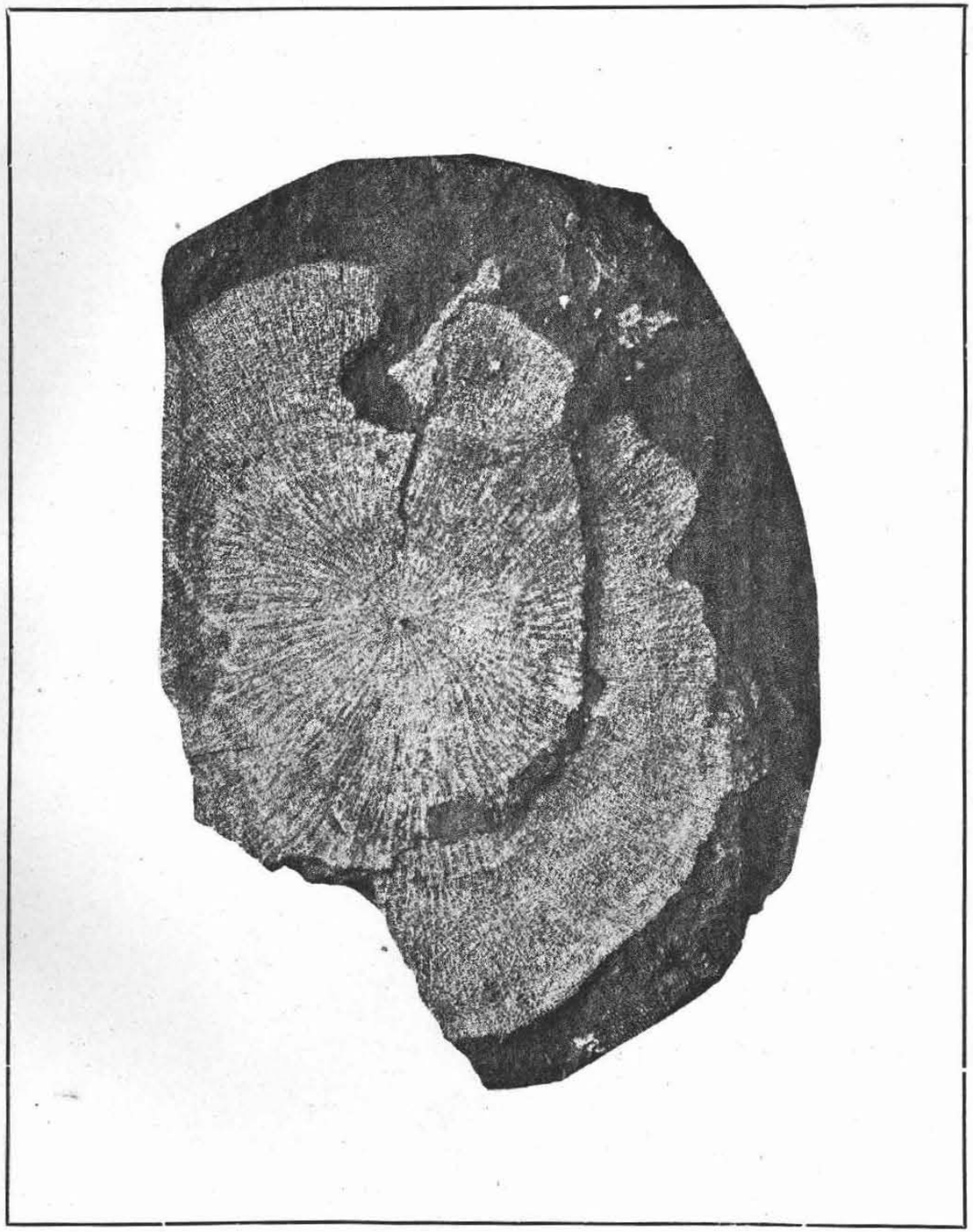


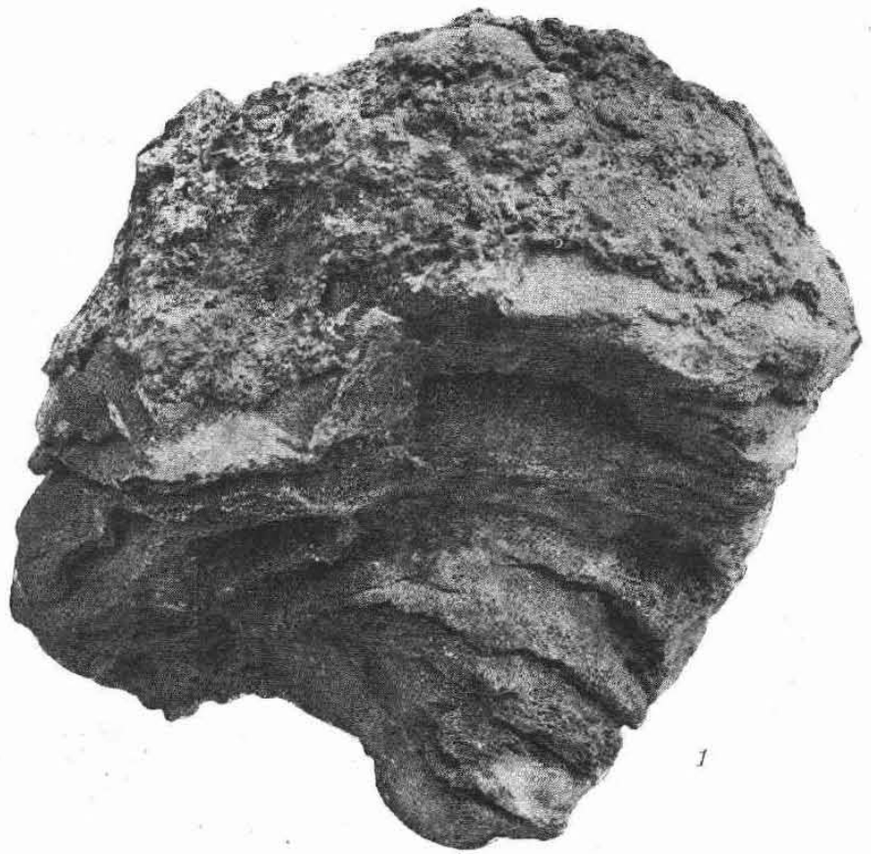
PLATE IV.

Alveolites piriformalis, *Eth. fil.*

Fig. 1.—The expanded pyriform corallum exhibiting the superimposed, more or less, concentric laminæ. The specimen measures approximately 4½ inches each way.

Fig. 2.—A portion of one of the laminæ displaying the calicinal orifices. X 2 diams.

Fig. 3.—A portion more highly magnified than that seen in Fig. 2. X 4 diams.



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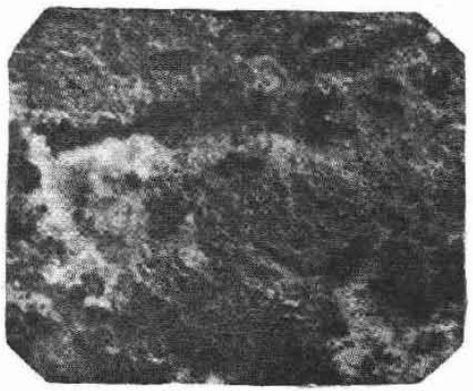

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PLATE V.

Clathrodictyon conophoroides, *Eth. fil.*

Fig. 1.—Surface of portion of a specimen exhibiting numerous cone-like mamelon with apical perforations.

Fig. 2.—Transverse, or horizontal, section, displaying the cut edges of both lati-laminæ and laminæ, cellular tissue and severed ends of radial pillars as black dots. In more than one instance at the apices of the mamelons the vertical canals are visible. X 2 diams.

Fig. 3.—Longitudinal, or vertical, section, wherein may be seen the waving lines of the lati-laminæ (dark), the interspaces filled with the vesicular lamina; the cone-like convexities representing the mamelons, the depressions, the valleys, or general surface between them. X 2 diams.

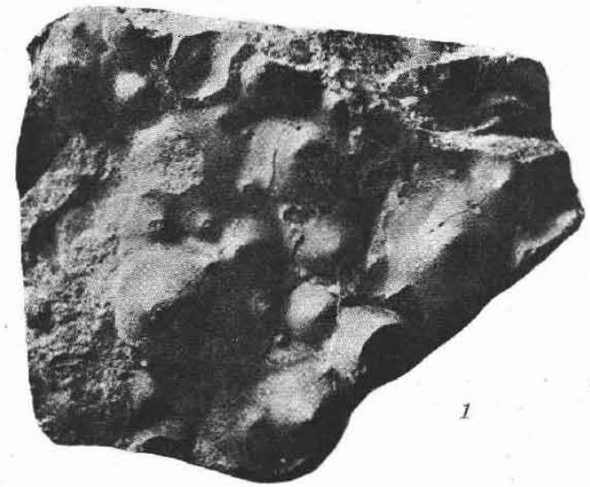

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PLATE VI.

Cœnites pinaxoides, *Eth. fil.*

Fig. 1.—Surface of the corallum displaying the vermiculate calicular openings.

Fig. 2.—Transverse or horizontal section exhibiting the transversely elongate and more or less parallel calicular openings. X 2 diams.

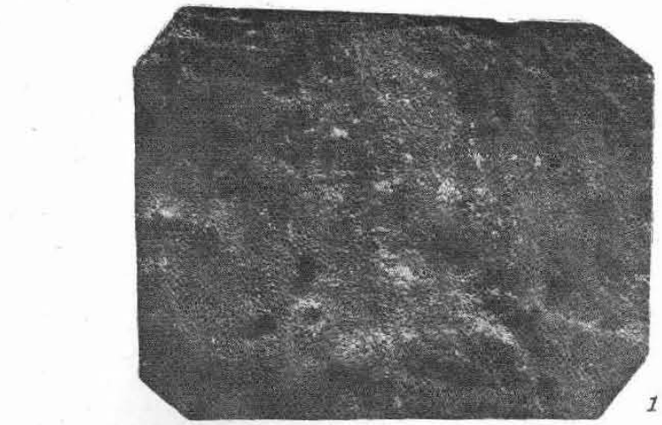
Fig. 3.—Longitudinal or vertical section. A careful study of this micro-photo.-print will reveal the lines of more or less quadrangular cells arranged in tiers, and from which directly arise the corallites, or do so after occupying a recumbent position; tabulæ are also visible. X 2 diams.

Syringopora (? Microplasma) trupanoides, *Eth. fil.*

(See also Pl. vii.).

Fig. 4.—Another surface view displaying the same characters as in Pl. vii., fig. 1.

Fig. 5.—Transverse section exhibiting similar characters to those shown in the enlarged section, Pl. vii., fig. 1.



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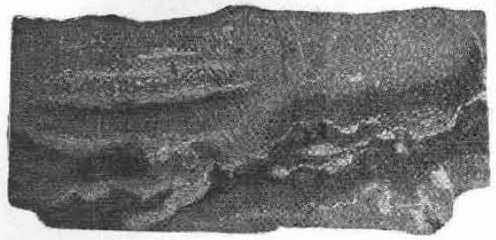

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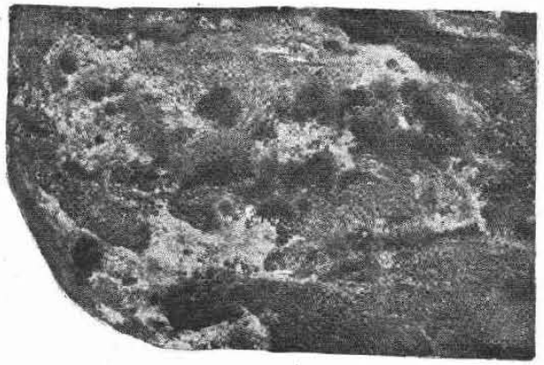

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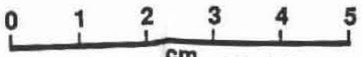
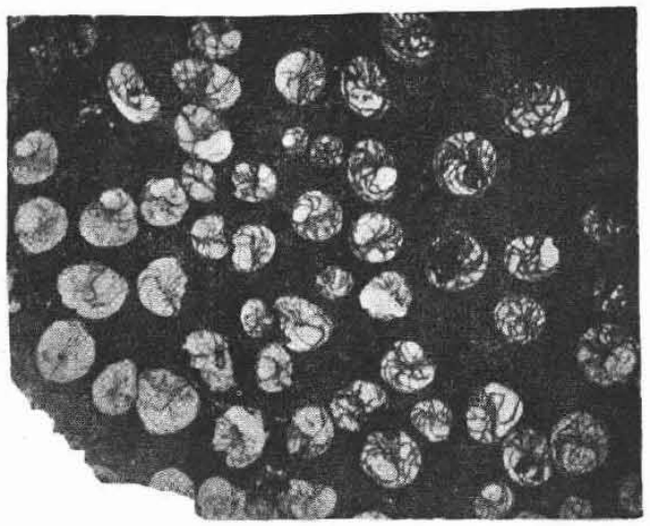


PLATE VII.

Syringopora (? Microplasma) trupanoides, *Eth. fil.*

Fig. 1.—Transverse micro.-section exhibiting the concentric cut edges of the tabulæ or cystoid vesicles; the innermost always larger than the others. X 2 diams.

Fig. 2—Longitudinal-oblique micro.-section. In the centre is visible a more or less characteristically twisted corallite. X 2 diams.



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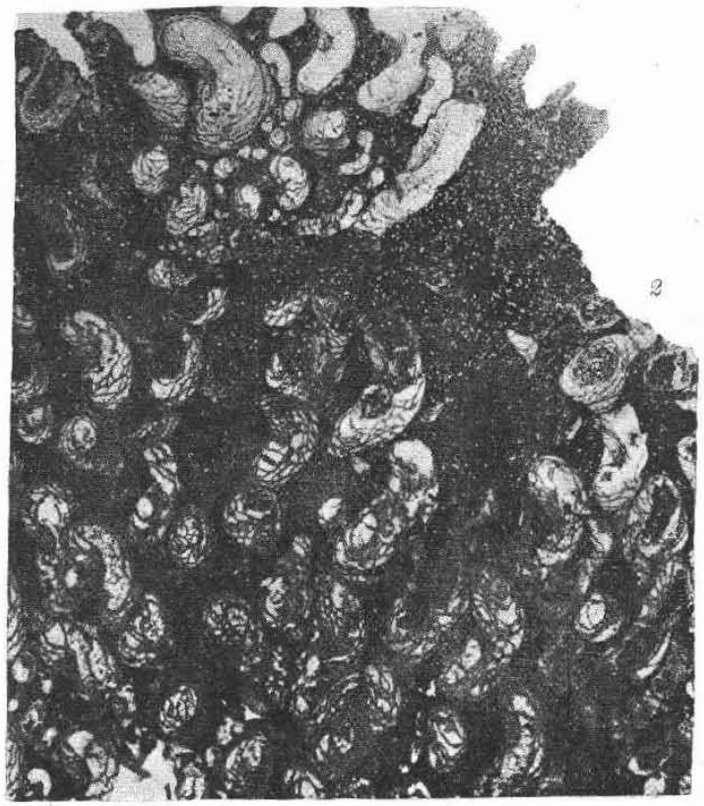

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