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ADDITIONS TO THE MIDDLE DEVONIAN AND CARBONIFEROUS CORALS IN THE AUSTRALIAN MUSEUM.

By R. ETHERIDGE, Junr., Curator.

(Plates xxxvii. – xl.)

1. MIDDLE DEVONIAN.

Genus DIPHYPHYLLUM, *Lonsdale*, 1845.

(Murchison's Geol. Russia in Europe, 1845, i., p. 622.)

DIPHYPHYLLUM GEMMIFORMIS,[1] *sp. nov.*

(Plates xxxvii., fig. 1; xxxix., figs. 1 and 2; xl., fig. 1).

Sp. Char.—Corallum composed of fasciculate to sub-compound corallites, forming more or less large globose colonies. Corallites radiating from a common centre, comparatively short, but the heighth of the corallum increased by repeated gemmation; straight or slightly flexuous, often laterally united into clusters by a partial union of the walls, but without exothecal outgrowths, circular when single, imperfectly polygonal when united, and with an average diameter of eight millimetres; walls thin; calices deep. Septal area as a very distinct peripheral ring, from a quarter to one fifth the width of a corallite, forming a flat border around each calice; septa 30 – 40, all primary, proximally straight, distally flexuous, delicate, and at times laterally denticulate, extending inwards for about one quarter the width of the corallites. Interseptal loculi occupied either by complete transverse dissepiments forming several cycles, particularly towards the distal portions of the loculi, or incomplete, forming irregular vesicles within the transverse dissepiments, peripheral portions of the loculi sometimes quite devoid of dissepiments, leaving clear spaces. Tabulate area comparatively large; tabulæ very variable both in their distance apart and in character; they may be moderately close, very close, or distant from one another, horizontal, rather oblique, slightly concave, or inosculating, when vesicles are formed, semilunate, lenticular, or even globular in form. Gemmation parietal and frequent.

[1] Formed of buds.

Obs.—A remarkable species, of a type simulating, on a cursory examination, the growth of a compound astræiform coral, in consequence of the frequent lateral union of the corallites. When in this condition the latter assume, more or less, a polygonal outline, and such clusters are often of considerable extent. In defining the genus Rominger [2] says :—"The stems [corallites] are rarely in intimate contact so as to form astræiform masses," and from its exceptional nature this species is peculiar. The interspaces between these clusters are occupied by ordinary free and generally smaller corallites, cylindrical in form.

The weathered appearance of this coral is one that at once attracts attention, as the tabulate areas stand well above the general surface, simulating thick columellas, and around them are seen the flat septal areas, the weathering out of the interseptal loculi reducing the septa to a ring of strong radii. One specimen, however, exhibits the actual terminal surface of the corallum, and whilst the flat septal area is still maintained, the calices present a rather deep and pit-like appearance. Whenever the corallites assume the composite condition, the lateral union of the walls is generally, although not always, complete, for at times a dividing line of matrix, more or less continuous, is visible in places.

The corallites may be described in general terms as short, the corallum attaining its height by repeated parietal gemmation, from a parent centre. The corallum is, therefore, at first formed by a series of radiating corallites, which assume gradually a vertical line of growth as the colony approaches maturity. Masses at least six inches in height are thus formed, the largest corallite yet measured having a diameter of nine millimetres.

The proper walls and other tissues are represented in sections by dark lines, backed by a lining of lighter secondary deposit, the wall in each corallite being formed by the confluent peripheral or proximal ends of the septa.

Both transverse and longitudinal sections present some points of great interest. In a transverse section one is struck with the bi-structural nature of the endothecal tissue filling the interseptal loculi. In some instances the loculi are comparatively devoid of tissue at their proximal or peripheral ends, but display several cycles of transverse dissepiments at their inner or distal ends. Or, these partitions may occur regularly throughout a series of loculi, the ordinary dissepimental vesicles so formed being again subdivided in an irregular manner by additional tissue producing a supplementary vesicular tissue. The septa are all primary, and present traces of a distinct lateral denticulation, reminding one of the genus *Heliophyllum*.

[2] Rominger—Geol. Survey Michigan—Report Lower Peninsula, 1873-76, iii., 2, 1876, p. 120.

In viewing a longitudinal section we observe that the peripheral tier of vesicles is often large, followed by two or three tiers of smaller, or the whole septal zone is occupied by four or five tiers of smaller vesicles, all convex upwards, and as a rule semi-lunate in form, although some are quite globular. So marked is this in some corallites that this external zone presents quite the appearance of a *Cystiphyllum*. In certain corallites, although not in all, the " walls " of the innermost tier of vesicles, or that next to the tabulate area, are thickened, presenting the appearance of an inner mural investment, but which is not very apparent in a transverse section.

The larger mass of each corallite is occupied by the tabulæ. These are very variable in character, and in their distance apart from one another. They may be quite distant, moderately close, or very close, in fact quite approximate, and horizontal, oblique, concave, or inosculating, when large and small vesicles are formed, in shape semi-lunate, lenticular, or even globular. Deflection at the edges, when the tabulæ are horizontal, is occasionally present, but never marked. The result of this variability is that, in a horizontal section, an absolutely clear old visceral chamber is the exception ; generally the plane of the latter is occupied by one or more cut edges of tabulæ. For diversity in form of the tabulæ this is one of the most remarkable corals I know of.

In its mode of growth *D. gemmiformis* is quite distinct from any Australian form of the genus hitherto described. It is a larger species than *D. mitchelensis*, mihi,[3] with a greater development of vesicular tissue, and does not possess septa of the second order. It is also distinct from *D. robustum*, mihi,[4] which is larger and possesses secondary septa.

Two American species at least, referred by W. J. Davis to *Diphyphyllum*, assume a composite form of growth, viz., *D. bellis*, Davis,[5] with the general outward appearance of a *Cyathophyllum*, which is even more composite than *D. gemmiformis*, and *D. conjunctum*, Davis.[6] Both are very large and compound Middle Devonian forms.

Loc.—Taemas Bridge Road, north bank of Murrumbidgee River (Aust. Mus.); T. Hughes' selection, Parish of Warroo, Co. Murray, Murrumbidgee River (*C. Cullen*—Geol. and Mining Mus., Sydney); North of Portion 41, Parish of Warroo, Co. Murray, Murrumbidgee River *(C. Cullen—ibid.)*

Hor.—Cave Limestone—Middle Devonian.

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[3] Etheridge—Geol. Surv. Vict., Progress Report xi., 1899, p. 30, pl. A., f. 6-8 and 12, pl. B., f. 11.

[4] Etheridge—Rec. Geol. Surv. N.S.W., vi., 1899, 3, p. 153, t. 32, f. 1 and 2, t. 37, f. 2.

[5] Davis—Kentucky Fossil Corals, pt. 2, 1885, t. 108, f. 2, t. 116, f. 4.

[6] Davis—*Loc. cit.*, t. 116, f. 1-3.

Genus CYSTIPHYLLUM, *Lonsdale*, 1839.

(Murchison's Sil. System, 1839, p. 691.)

CYSTIPHYLLUM (? MICROPLASMA) AUSTRALASICA, *Eth. fil.*

(Plates xxxix., figs. 3 and 4; xl., figs. 3 and 4).

Cystiphyllum americanum, var. *australasica*, Eth. fil., Geol. Pal. Q'land, &c., 1892, p. 58, pl. 3, f. 13 and 14.

Sp. Char.—Corallum, more or less fasciculate, forming loosely agregated colonies. Corallites long and robust, partially united laterally, or entirely disconnected, with an average diameter of from ten to twenty millimetres, round, oval, or pyriform in section; walls dense and thick, about one to two millimetres. Vesicular tissue strong and copious, filling the entire visceral chambers; vesicles in the peripheral region smaller than those in the centre of the corallites, the former usually sublunate in transverse section, with a long convex face pointing inwards, and two short concave faces outwards, the latter few or many, irregular in size and form, round, oval, or polygonal. Septal striæ sometimes seen on the convexity of the vesicles, more particularly in the peripheral zone.

Obs.—The New South Wales specimens now under description are specifically identical with a coral described by me from the Middle Devonian of Queensland, as above. Of this I am convinced after a re-examination of the type of the latter, and also by an inspection of additional material, both kindly forwarded to me for the purpose by Mr. W. H. Rands.

The corallites are either entirely separate or in partial contact, and long (as much as six inches), cylindrical, or slightly curved. In the former condition they are round, with a maximum diameter, so far as observed, of twenty millimetres. When in contact the outline of the corallites becomes modified to oval, or a peculiar sub-pyriform shape, the contact side often becoming truncated, and the free side gradually swelling out to the normal circular outline.

The walls are more or less thickened, and in some of the vesicles there is a stereoplasmic deposit also, but without obliteration of their original tissue. Septa are not present, but are at times represented by irregularly distributed endothecal striæ on the convex faces of the vesicles forming the general visceral tissue. In sections they appear as cut edges of spine-like ridges, but some corallites are entirely without them. A peculiar development is exhibited within the walls in some cases, the nature of which is by no means clear. This consists of a ring, more or less continuous, of conjoined thickened short protuberances, each having distally a blunt pyramidal end. There is no visible median line in any of these, but the structure of each is in divergent layers from an imaginary central line, having much the appearance of the

secondary stereoplasmic thickening one is accustomed to see encasing primary septa in many rugose corals.[7] The absence of this primary line, and the uncertain development of the protuberances, detracts from the latter possessing a septal nature.

The vesicular tissue is clearly separable into an outer and inner tissue. The vesicles forming the peripheral zone are always smaller than those in the centre, and in form are usually semilunar, each with a long convex inner face and two concave outer faces, very much resembling the corallites in some species of *Alveolites*; this peripheral zone is always the wider of the two. Irrespective of their larger size the central vesicles are remarkable for diversity of form, as already explained, the polygonal outline being traceable both in transverse and longitudinal sections.

In one particular corallite there is even a line of demarcation between the two sets of vesicles, caused by the tissue of the inner or convex edges of the innermost circlet of the peripheral vesicles becoming much thickened.

The stereoplasmic investment of the walls when present is dense and structureless, and the same may be said of the layer at times seen within the vesicles, and the line of demarcation in the single corallite just described.

This coral has so far been observed in New South Wales only in limestone masses, from which it has been found impossible to dissassociate it, but Queensland examples from the Reid's Gap Limestone, near Townsville, are sometimes met with in the round and even with traces of the epitheca preserved.[8] This appears to have been concentrically striated. Growth accretion swellings also existed, and at times a sub-pedunculate base.

The relation to *Cystiphyllum* is shown in the highly vesicular nature of the corallites, and the presence of the endothecal spines. On the other hand, if the obtusely conical inward peripheral projections are of a septal nature, hardly possible, however, I think, a transition to *Microplasma* is indicated. The distinction between *Cystiphyllum* and *Microplasma* has been very clearly explained by Dr. Clemens Schlüter, who says that the radially arranged endothecal striations of the former are not the equivalents of the stunted septa around the wall of the latter. If, therefore, the projections described in this coral are not of a septal nature, we are here dealing with a *Cystiphyllum*; if, on the contrary, they partake of the characters of septa, our coral would appear to occupy a position intermediate between the two genera.

Amongst *Cystiphylla* the present species is otherwise allied to *C. cylindricum*, Lonsd. (*non* Edw. and Haime), *C. americanum*, Edw. and H., and similar elongated cylindrical stem-like forms.

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[7] An excellent illustration of this is given by Nicholson (Manual Pal., 3rd Edit., i., 1889, p. 247, f. 127 B. and C.)

[8] Etheridge—Geol. Pal. Q'land, &c., 1892, pl. 3, f. 13.

Loc.—The following localities considerably extend our knowledge of the distribution of this coral:—Fernbrook (Limekilns) near Bathurst (*R. Etheridge*—Aust. Mus.); Isis River, Parish Lincoln, Co. Brisbane (*C. Cullen*—Geol. and Mining Mus, Sydney); Cavan Holding, Parish Cavan, Murrumbidgee River, Co. Cowley (*C. Cullen—ibid.*); Quarter of a mile south of Alum Creek, Parish Warroo, Murrumbidgee River, Co. Murray (*C. Cullen—ibid.*)

Genus SYRINGOPORA, *Goldfuss*, 1826.

(Petrefacta Germaniæ, 1826, i., p. 75.)

SYRINGOPORA SPELÆANUS,[9] *sp. nov.*

(Plates xxxvii., fig. 2; xxxviii.)

Sp. Char.—Corallum large, composed of loosely aggregated clusters of corallites. The latter are long, at least five inches, often contiguous, parallel to or diverging from one another, united by endothecal outgrowths, or by lateral union of their walls; diameter five and a half to six and three quarter millimetres. Endothecal outgrowths strong and short, with a diameter of one millimetre. Septa small and numerous (at least sixty in a cycle), short, dentate, terminating in fine filaments. Visceral chambers oval or round. Tabulæ very numerous, infundibuliform, the invagination long and deep, very unsymmetrical in section. Lateral budding plentiful.

Obs.—A remarkable and peculiar *Syringopora*, in all probability forming large colonies, the largest specimen seen being a mass seven inches by five and a half. The corallites are either close to one another, or separated by considerable intervals, and are either parallel to or diverge from one another at various angles. They are long (five inches at least), occasionally united by endothecal outgrowths, but more commonly by lateral union of their walls. The diameter is considerable even for a *Syringopora*, from five and a half to six and three quarter millimetres, hence the colonies possessed a strong and robust appearance. Similarly the endothecal outgrowths when present were strong and robust, although short.

Both the septa and tabulæ are numerous, the former peculiar in that, for the diameter of the corallites, their size is remarkably small. The wall of each corallite being rather thickened, the septa present the appearance of very numerous short teeth, each terminating in a short fine filament. Disintegration, apparently before fossilisation, had often removed these acicular terminations, giving to the corallite inner edges a ragged appearance, and reducing the septa to a series of tooth-like projections. The precise number of septa in a cycle is uncertain, but there are certainly

[9] Association with a cave.

sixty at least. The tabulæ are numerous and strictly infundibuliform, the invaginations being deep, and the "onion-like" rings very unsymmetrical when seen in section.

Lateral union between the corallites by conjunction of the walls is more prevalent than by endothecal outgrowths. Such unions, however, are seldom entirely complete between any two corallites, for union took place irregularly, leaving free interspaces. I figure a good instance of five corallites, more or less united in a chain, but no inter-communication by means of mural pores has been noticed. (Plate xxxviii.)

Like all, or at any rate the majority of the fossils from the Cave Flat Limestone, the tissues of this coral have undergone great change, a point I have elsewhere previously referred to in connection with many of our Palæozoic fossils, particularly corals.

The absence of connecting floors at once readily distinguishes this *Syringopora* from *S. bellensis*, mihi.[10] *S. porteri*, mihi,[11] like its ally *S. auloporoides*, De Kon.,[12] is of a totally different habit and size, to say nothing of the greatly thickened walls and the narrow undivided tube-like visceral chambers. *S. novæ-cambrensis*, mihi,[13] is a Carboniferous form of exceedingly regular growth, with a quantity of equally regular endothecal outgrowths, and is quite distinct from *S. spelæanus*. Lastly *S. syrinx*, mihi, although possessing some points in common with the former, is at once distinguished by the limited number of septa present in its corallites.

In size, and to a certain extent also in mode of growth, there is a resemblance to the Devonian *Syringopora abdita*, De Vern., but the septa in our form are far more numerous.

The exteriors of the corallites are densely covered with Beekite "rosettes," and in consequence the characters of the epitheca are effaced.

Lateral budding is copious, the young corallites immediately assuming the characters of the parent, and in the general mass of the corallum becoming undistinguishable from the more mature tubes.

This form is noteworthy amongst our *Syringoporæ* for the size of its corallites.

Loc.—Cave Flat, Murrumbidgee River (Aust. Mus.)

Hor.—Cave Limestone—Middle Devonian.

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10 Etheridge—Rec. Geol. Surv. N.S.W., v., 1898, 4, p. 149, t. 16.

11 Etheridge—*Ibid*, vi., 1899, 3, p. 176, t. 18, f. 3, t. 31, f. 1 and 2.

12 De Koninck—Foss. Pal. Nouv. Galles du Sud, 1877, 1, p. 76, t. 3, f. 1.

13 Etheridge—Rec. Geol. Surv. N.S.W., vi., 1899, 3, p. 177, t. 18, f. 4 and 5, t. 29, f. 1, t. 33, f. 1 and 2.

Genus DESMIDOPORA, *Nicholson*, 1886.
(Geol. Mag., [3], iii., 1886, p. 289.)

DESMIDOPORA NICHOLSONI, *sp. nov.*
(Pl. xl., fig. 2)

Sp. Char.—Corallum apparently forming irregular, lobate, or sub-massive colonies of medium size, presenting on the weathered surface a roughened or rasp-like appearance. Corallites long, tube-like, approximately straight, but here and there gently curved; walls firmly united, slightly thickened, but not incrassated nor the primordial walls visible. Calices either slightly oblique, semilunar to transversely elongate, irregularly curved or polygonal, occasionally sub-triangular and definitely circumscribed, or as winding and to some extent sinuous grooves, when they often become confluent; shorter diameter one third of a millimetre, longer diameter a half to one millimetre, but often reaching two millimetres, and in some instances as much as five. Tabulæ numerous but distant, complete, horizontal or concave, seldom oblique, on the same line in contiguous corallites or not. Mural pores large and very irregularly distributed. Fission of tube walls frequent.

Obs.—Desmidopora nicholsoni is one of the most interesting Palæozoic corals it has been my good fortune to examine, and is the means of introducing into Australian Palæontology a very unlooked for genus.

The form of the corallum is not fully known, as all the specimens so far observed are fragmentary. The external characters do not appear to have been of a striking nature, but it is in a transverse section that its very peculiar features become apparent. The eye is at once struck with the diversity of form of the corallites. Some are semilunar or sub-triangular, others polygonal, with a longer diameter of half to one millimetre, and definitely circumscribed. Interspersed with these are others of an extraordinary irregularity of outline, becoming more or less extensively confluent, entirely loosing their circumscribed outline, and becoming winding and sinuous, looking like several normal calices run into one; externally such calices present a more or less vermiculate appearance. These attain a longest diameter of three millimetres, and in some instances of five millimetres. On the other hand the shortest diameter in all the corallites is one-third of a millimetre. Amongst the circumscribed corallites some are triangular, with a long convex and two short concave sides; others with a convex long side, and two short straight sides of about equal length, interspersed with almost truly quadrangular, lenticular, and sublunar corallites, but always with one diameter greatly exceeding the other.

One remarkable peculiarity was noticed in this coral, a tendency to form spots or areas of small dimensions, from three to four millimetres in diameter, in which the corallites are more than ordinarily irregular, but around which the others do not show any tendency to revolve.

The walls of the corallites are somewhat thickened, but I have not succeeded in detecting any definite trace of a primordial wall.

In a transverse section the fission of the walls is at times very apparent, and is indicated by a projecting inwards of the newly formed wall into the visceral chamber of an old corallite.

In a longitudinal section the oblong visceral chambers are filled with clear calcite, with here and there chalcedonic blebs along the walls. The eye is also struck with the variable diameter of the tubes, arising from causes already explained.

The mural pores are large and very irregularly distributed, and have a longest diameter of one third of a millimetre. The pores appear as oval openings whenever the plane of the section is coincident with that of one or more of the walls, or as gaps in the latter indicated by a break in their continuity.

The tabulæ are, as a rule, distant and variable in direction, being either horizontal, concave, or less frequently oblique. They may be on the same level in contiguous tubes, or strictly alternate, but no satisfactory evidence exists of a tendency on the part of any of them to become vesicular, as in *D. alveolaris*, Nich., "when the section happens to intersect one of the rows of confluent corallites in any direction except a directly transverse one."

I have quite failed to detect any trace of septa, nor have I seen anything at all analagous to the peculiar moniliform structure depicted in one of Nicholson's sections. I would suggest the possibility, nothing more, of these circular or oval bodies being blebs of chalcedony. A similar appearance is at times seen in some of our Palæozoic corals.

Desmidopora was proposed by Nicholson for a Wenlock Limestone coral, nearly related to *Alveolites*, but differing from the latter and other known genera of Favositidæ as follows:—(1.) The primordial wall is entirely wanting. (2.) Some of the corallites are united in sinuous serial rows by a deficiency of their walls on corresponding sides, the calices becoming winding labyrinthine grooves. (3.) Absence of septa, or septal spines. (4.) In the circumscribed corallites the tabulæ are simple, but in the serially united corallites they become vesicular. (5.) Increase by fission.

The Australian coral, I now refer to this genus, agrees with all the above characters, except that the evidence of vesicular tabulæ is not clear.

Named in honour of the late Prof. H. A. Nicholson, M.D., &c.

Loc.—Cave Flat, Murrumbidgee River (Aust. Mus.)

Hor.—The Cave Limestone—Middle Devonian.

CARBONIFEROUS.

Genus LITHOSTROTION *(Lhuid), M. Edwards and Haime*, 1851.
(Polyp. Foss. Terr. Pal., 1851, p. 432.)

LITHOSTROTION ? COLUMNARE, *Eth. fil.*

Lithostrotion ? columnare, Eth. fil., Bull. Geol. Survey Q'land, No. 12, 1900, p. 18, pl. i., f. 1, pl. ii., f. 1 – 5.

Loc.—Horton River, between Eulowrie and Pal-lal, Co. Murchison *(D. A. Porter*—Aust. Mus.)

Hor.—Carboniferous. ? Gympie Series.

Genus SYRINGOPORA, *Goldfuss*, 1826.
(See *ante.*)

SYRINGOPORA SYRINX, *Eth. fil.*

Syringopora syrinx, Eth. fil., Bull. Geol. Survey Q'land, No. 12, 1900, p. 6, pl. i., f. 6 – 9, pl. ii., f. 11.

Loc.—Pal-lal Station, Horton River, Co. Murchinson (*D. A. Porter*—Aust. Mus.)

The occurrence of the two foregoing species in the Horton River beds is a point of much interest, as it tends to indicate a relation between the latter and the Lion Creek Limestone, at Stanwell, near Rockhampton, Queensland.[14] The two corals now recorded are accompanied by a second *Lithostrotion*, intermediate in its structure between *L. ? columnare*, Eth. fil., and *L. ? arundineum*, Eth. fil.[15] It is a fasciculate form, generally resembling the last named, but with a much larger number of septa, and these invariably united in pairs, each primary with its secondary. The columella is of the type of *L? columnare*, rather than that of *L. ? arundineum*. It may be only a local growth of the former, in which case the characters of *L ? columnare* will require to be enlarged, or, on the other hand, a closer study, when time permits, may prove it to be quite distinct.

I am indebted to Mr. E. R. Waite for the micro-photographs from which the figures are reproduced.

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[14] Etheridge—Corals from the Coral Limestone of Lion Creek, &c., *Bull. Geol. Survey Q'land*, No. 12, 1900.

[15] *Ibid*, p. 19, pl. i., f. 3 and 4, pl. ii., f. 6.

EXPLANATION OF PLATE XXXVII.

Diphyphyllum gemmiformis, Eth. fil.

Fig. 1. The corallum exhibiting sub-compound and single corallites, seen from above.

Syringopora spelæanus, Eth. fil.

,, 2. Corallites seen protruding from a mass of limestone.

1

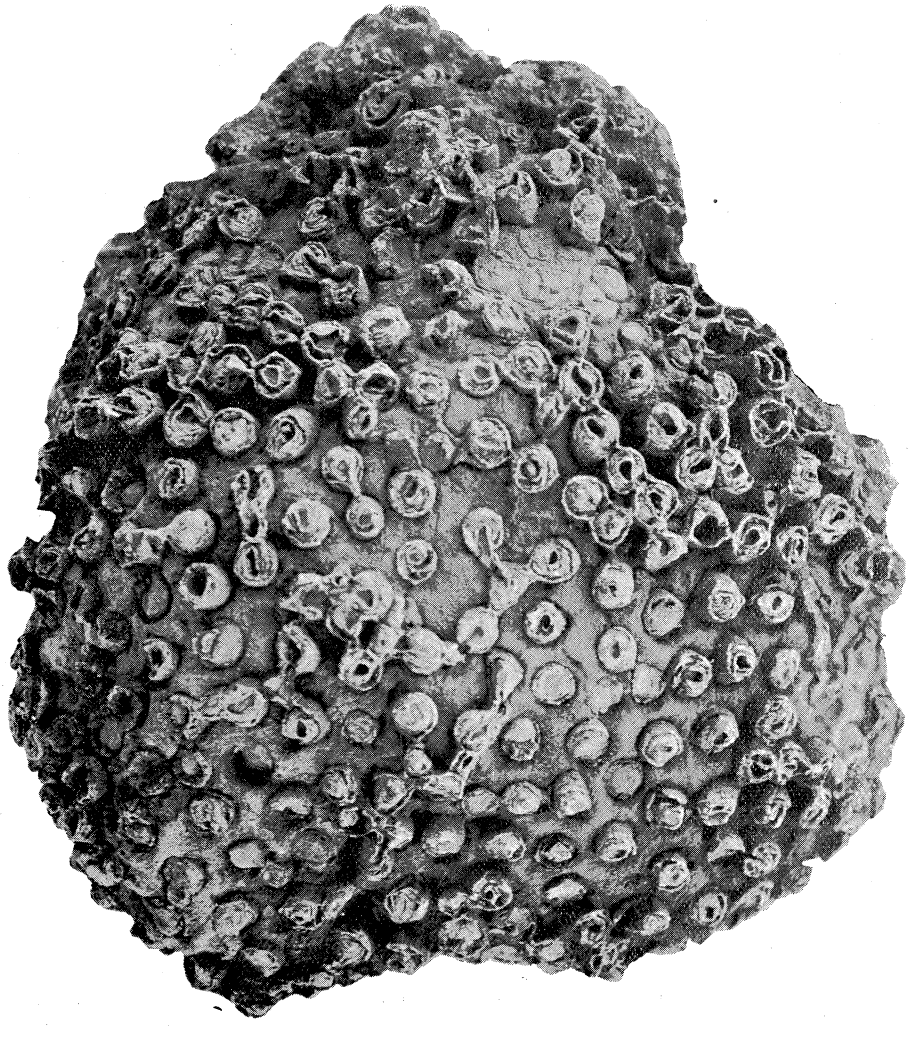
2

H. BARNES, Junr., Photo. Australian Museum.

EXPLANATION OF PLATE XXXVIII.

Syringopora spelæanus, Eth. fil.

A large colony, seen from above.



H. BARNES, Junr., Photo. Australian Museum.

EXPLANATION OF PLATE XXXIX.

Diphyphyllum gemmiformis, Eth, fil.

Fig. 1. Transverse section of a corallite, exhibiting the septal and tabulate areas. In the former the interseptal loculi are seen to be filled with both forms of tissue. In the latter, cut edges of tabulæ are visible. x 4.

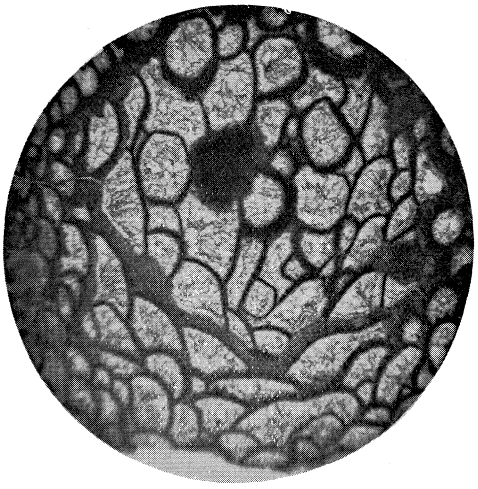
,, 2. Longttudinal section exhibiting the peripheral vesicles, and the tabulæ. x 4.

Cystiphyllum (? Microplasma) australasica, Eth. fil.

,, 3. Transverse section of a corallite. A few septal spines are visible. x 4.

,, 4. Transverse section of a corallite with very large central vesicles. Around the edge are the conjoined thick protuberances. x 4.

[Reproduced from microphotographs by Mr. E. R. Waite].



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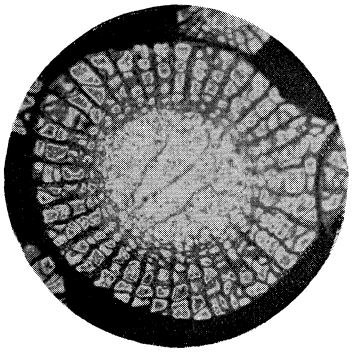

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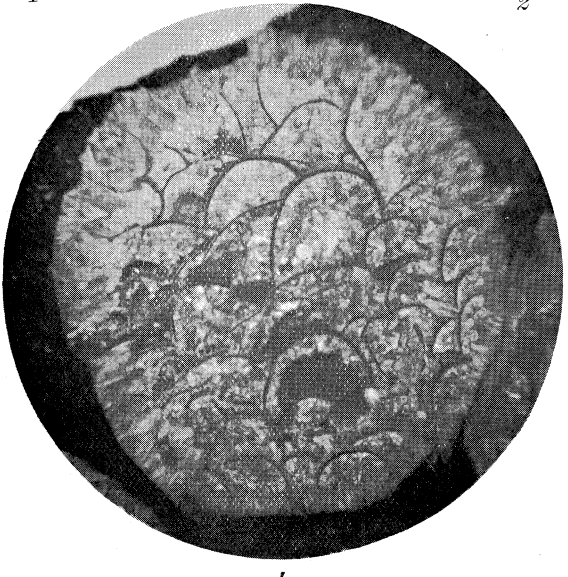

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EDGAR R. WAITE, Micro. photo. Australian Museum.

EXPLANATION OF PLATE XL.

Diphyphyllum gemmiformis, Eth. fil.

Fig. 1. Transverse section of a corallite, with a comparatively small amount of tissue in the interseptal loculi. x 4.

Desmidopora nicholsoni, Eth. fil.

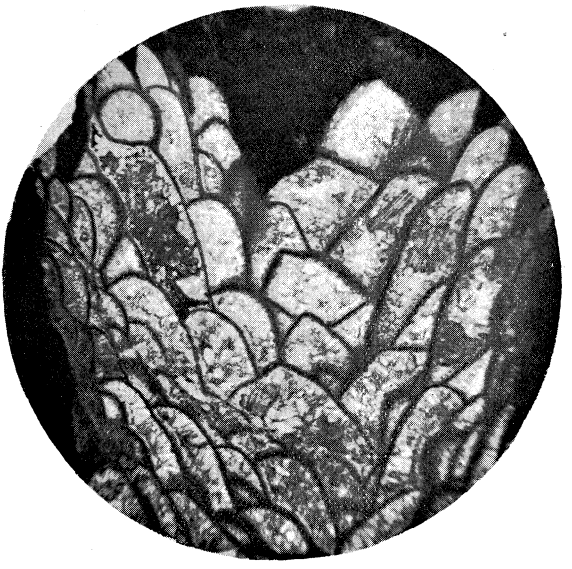
,, 2. Transverse section of part of a corallum exhibiting the characteristic calices. x 4.

Cystiphyllum (? Microplasma) australasica, Eth. fil.

,, 3. Longitudinal section (in part) of a corallite. x 4.

,, 4. Transverse section of a corallite. 4.

[Reproduced from microphotographs by Mr. E. R. Waite.]



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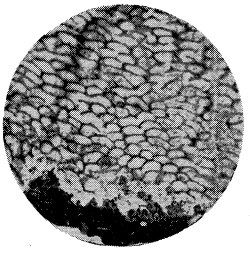

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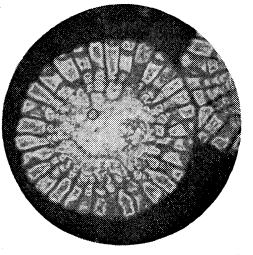
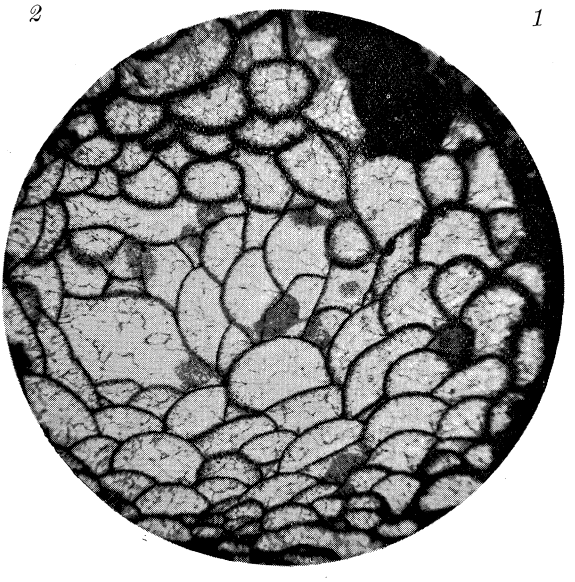


1



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EDGAR R. WAITE, Micro. photo. Australian Museum.