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ORIGINAL ARTICLES.

I.—NOTES ON NEW OR IMPERFECTLY KNOWN CHALK POLYZOA.

By R. M. BRYDONE, F.G.S.

(Continued from Decade VI, Vol. I, November, 1914, p. 483.)

PLATE VI.

MEMBRANIPORA SUBACUMINATA, nov. (Pl. VI, Figs. 1, 2.)

Zoarium unilaminate, always adherent.

Zoecia separated by a distinct furrow, which passes into a deep crevice at the junction points, widely rounded below but tapering very considerably and almost to a point above, with areas of the same shape and upright rounded side walls thickening considerably below, and often developing something of an internal front wall; average length of area .28 mm., breadth .2 mm., but marginal *zoecia* often run much larger.

Oecia. No trace of any *oecium* has been observed.

Avicularia vicarious, humble examples of the '*Lesneuri*-type', as although strictly conformable in general structure they are only a little larger than the surrounding *zoecia*; the node at which the very scanty front wall of the lower part splits into two is very inconspicuous, and the internal front wall of the upper part is relatively much wider than usual in proportion to the section of the area which it encloses. (I have always felt that it would be admissible to argue, on the species standing by itself, that these cells were not *avicularia* but ordinary *zoecia* with the addition of a wholly unroofed *oecial* chamber; but I have never doubted myself that they were *avicularia*, and the recently discovered species which follows seems to put this beyond doubt.)

This species is only known to me from the base of the zone of *B. mucronata* at Portsdown, where it is scarce but well distributed.

MEMBRANIPORA STUDLANDENSIS, nov. (Pl. VI, Figs. 3, 4.)

Zoarium unilaminate, adherent.

Zoecia piriform in outline (there being a considerable expanse of flat front wall below the area), and separated only by sutures; areas practically circular, average diameter .28 mm., but occasionally much larger ones occur.

Oecia globular, of the water-bottle type, the constriction at the neck being slight but quite distinct, with a concave free edge falling somewhat back from the areal outline, small in proportion to the *zoecia* and with rather vague outlines, almost invariably present in the type-specimen. Beneath them the areal margin is low and very

thin, but maintains accurately the circular areal outline. This makes it impossible to confuse the base of the damaged oecium with the internal front wall of an avicularium as the latter sets well back from the areal outline.

Avicularia vicarious, resembling very closely those of *M. subacuminata*, but a little larger in proportion to the zoecia and with the nodal points standing out conspicuously.

I have only one specimen, from Studland, of this species; but specimens of any adherent Polyzoa are so exceedingly scarce in the Studland Chalk and the species throws such useful light on the preceding one that I have felt justified in disregarding the general objection to a species founded on a single specimen.

MEMBRANIPORA DEMISSA, nov. (Pl. VI, Fig. 5.)

Syn. *M. Britannica*, var. *demissa*, Bryd., GEOL. MAG., 1910, p. 77, Pl. VIII, Fig. 6.

I am convinced that I was wrong in ignoring the doubts I felt at the time and treating this form as a variety of *M. Britannica*. Subsequent experience shows clearly that the front wall habitually developed in *M. Britannica* solely as a platform for the oecium or avicularium of the preceding zoecium never approaches in size or systematic nature that of *M. demissa*, while the bold sub-triangular areas of *M. demissa* are also quite distinctive. The specimen which I now figure—from Studland, of all unlikely places—is practically the only one I possess which shows clearly and perfectly the very fragile oecia. There are six perfect examples in the Figure. They are merely gentle and vaguely outlined swellings, with free edges which are marked off by a faint constriction and coincide exactly with the normal areal outline, and they form a strong contrast to those of *M. Britannica*, which are very bold. *M. demissa* first appears in rare small forms in the base of the zone of *B. mucronata*, but is represented by normal forms as soon as the higher Chalk of the Isle of Wight and Studland is reached.

The same treatment should be accorded to the other form described at the same time as a variety (var. *præcursor*) of *M. Britannica*, and this form must stand as a new species, *M. præcursor*. It is now known to range down to the zone of *M. cor-testudinarium*, and though upwards it ranges into the zone of *B. mucronata*, it does not appear to reach the Weybourne Chalk, and as *M. Britannica* does not appear to range down into the Weybourne Chalk, they never even meet. It would be interesting to know the exact range of *Reptofustrella Meudonensis*, D'Orb.,¹ which looks like a relation of *M. Britannica*, though clearly distinguished by its avicularia.

MEMBRANIPORA WOODWARDI, Bryd.,² var. *PINGUESCENS*, nov.
(Pl. VI, Fig. 6.)

This adherent form, which I know only from Trimingham, deserves a recognition which seems properly limited to varietal. The roundness of its areas and oecia, the slenderness and flatness of its

¹ Pal. Terr. Crét. Franç., vol. v, p. 572, pl. 731, figs. 19–21.

² GEOL. MAG., 1910, p. 258, Pl. XXI, Figs. 1–3.

avicularia, and its general sleekness of appearance are points which effectively distinguish it from the typical and abundant free-growing form of the zones of *A. quadratus* and *O. pilula*, but are hardly of specific value, indicating rather a stage in the development of a single persistent form. To emphasize the range of evolution in this species I have added a figure of the form of the zone of *M. cor-testudinarium*, which is practically the earliest known.

MEMBRANIPORELLA PONTIFERA, NOV. (Pl. VI, Fig. 8.)

Zoarium unilaminate, adherent.

Zoecia slightly pyriform; areas oval with flattened upper end, average length .35 mm., breadth .2 mm.; side walls broad and bearing about six pairs of stout imperforate tubercles; in three instances in the type-specimen the area is bridged between a pair of tubercles by a broad arched bar without any lateral connexion or even suggestion of it.

Oecia only known from damaged specimens, apparently of globular type; at the point of attachment to the front wall they generally absorb part of the highest pair of tubercles.

Avicularia small, interstitial, mandibular, with a slender transverse bar occasionally preserved quite perfect.

The figured specimen is of course very imperfect, as it must be assumed that in a perfect specimen all or nearly all the pairs of tubercles would be connected by bars in every zoecium; but it could only be by the merest chance that such a specimen would be secured, and no amount of waiting would guarantee it. The species is an obvious warning against hasty diagnosis of forms that look like spiny *Membranipora*; but it is probably a safe rule, as the front wall elements of *Membraniporella* were presumably always fixed, that that genus is not in question when any of the tubercles are perforate and presumably bases of movable spines.

The species occurs very rarely in the zone of *M. cor-testudinarium* in Hants and the zone of *M. cor-anguinum* at Gravesend.

MEMBRANIPORELLA OBSCURATA, NOV. (Pl. VI, Figs. 9, 10.)

Zoarium adherent, almost always more or less multilaminate.

Zoecia very small, average length .4 mm., with heel shaped to horseshoe-shaped apertures (the outline depending a good deal on the amount of encroachment of avicularia), the lower lip of which is a straight thickened bar generally bearing a distinct median denticle; the slightly arched front wall should be pierced by four or five pairs of radiating slits, as seen in Fig. 10, but it is only rarely that this structure can be detected, although the general aspect is so emphatically Cribrilinid that I never doubted that it would prove to belong to that family.

Oecia. No trace observed.

Avicularia small, probably mandibular, scattered in abundance along the interzoecial furrows, which they almost wholly obscure and often fill up to above the level of the zoecial front walls.

This species appears to be confined absolutely to the zone of *M. cor-testudinarium*, in which it is fairly common in Sussex and occurs also in Hants and Kent. Its general indistinctness is, of course,

partly due to its exceptional smallness and perhaps also in part to the relative intractability of the Chalk it inhabits, but it must also be due in part to secondary calcification. It is clearly one, and apparently the first, of the group which includes *M. castrum*,¹ Bryd., and *M. pustulosa*,² Bryd., and which is otherwise, except for a very brief interval at the base of the zone of *B. mucronata*, strictly unilaminate.

EXPLANATION OF PLATE VI.

(All figures magnified 12 diams.)

FIG.

- 1, 2. *Membranipora subacuminata*. Zone of *B. mucronata*. Portsdown.
3. *M. Studlandensis*. Zone of *B. mucronata*. Studland.
4. *M. Studlandensis*. Another part of the same specimen showing broken oecia.
5. *M. demissa*. Zone of *B. mucronata*. Studland.
6. *M. Woodwardi*, var. *pinguiscens*. Trimmingham.
7. *M. Woodwardi*. Zone of *M. cor-testudinarium*. Seaford.
8. *Membraniporella pontifera*. Zone of *M. cor-anguinum*. Gravesend.
- 9, 10. *M. obscurata*. Zone of *M. cor-testudinarium*. Seaford.

(To be continued.)

II.—A REMARKABLE STRUCTURE IN *LOVENIA FORBESI* FROM THE MIOCENE OF AUSTRALIA.

By HERBERT L. HAWKINS, M.Sc., F.G.S., Geological Department, University College, Reading.

DURING the preparation and arrangement of a series of *Lovenia forbesi* from the Australian Miocene (presented to the Geological Department by Professor F. J. Cole), a peculiar interambulacral structure was displayed. Two of the specimens are severely weathered, with the result that their surfaces are smooth (except for the areolæ of the large tubercles), while the sutures are clearly outlined in dark brown across the pale background of the plates. In this way there is revealed the surprising fact that plate-crushing and resorption, of a type similar to that often found in Echinoid ambulacra, occur in four of the interambulacral areas. There is no corresponding development in the ambulacra.

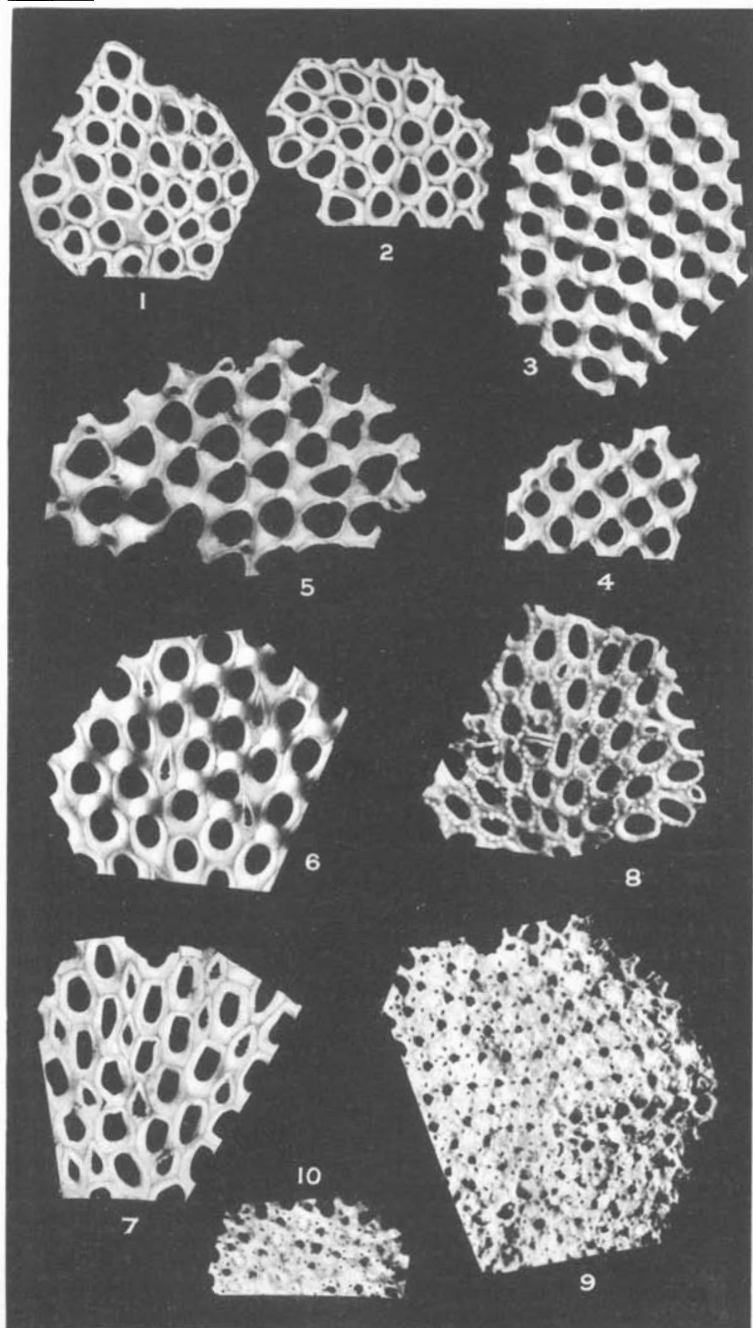
As far as I am aware, this peculiar condition has not been described previously in the species under notice, nor in any other Euechinoid, whether Regular or Irregular. Apart from its intrinsic interest, this apparently unique development throws much light upon the mechanism whereby the more usual ambulacral plate-crushing is produced. Hence a brief description of the specimens seems desirable; and the description is followed by a discussion of the problem as solved by this new evidence.

The following description is based solely on the two weathered specimens referred to above. They are registered in the Palæontological Collection of University College, Reading, under the numbers 546 A and B. Their dimensions (in millimetres) are as follows:—

	Ant.-Post. Diam.	Transverse Diam.	Height.
A	21.1	20.8	12.2
B	23.0	24.0	11.2

¹ GEOL. MAG., 1909, p. 398, Pl. XXII, Figs. 4, 5.

² GEOL. MAG., 1910, p. 483, Pl. XXXVI, Fig. 9.



R. M. Brydone phot.

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