

ART. XVIII.—*Notes on New and Aberrant Types of Foraminifera.*

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(With Plate IX.)

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1.—On a New Genus, *Heronallenia*.

(Plate IX, figs. 6-8.)

Henry Bowman Brady in 1884 (pl. xci, figs. 2, 3) figured two forms of "*Discorbina*" under the specific name of *D. biconcava* Jones and Parker. That in fig. 2 represents a typical example of Jones and Parker's species (now *Planulina biconcava* J. and P. sp.), whilst fig. 3 is quite a distinct form. This latter we are now compelled, by further evidence from other related species, to regard as a new generic type.

Brady's fig. 3 is, to our minds, identical with Burrows and Holland's *Discorbina lingulata*, described by them from the Coralline Crag (Gedgravian of the Lower Pliocene) of Sutton, England. Their species was also recorded by them, at the same time, from the Lower beds of Muddy Creek (Oligocene, not "Miocene"), (1895, pl. vii, figs. 33a-c; 1896, p. 297). As regards the fig. 3 by Brady, this appears to be incorrectly drawn, for we have examined Recent material from the same area (off Moncoeur Island, Bass Strait) without detecting anything like the structure of the inferior face shown in Brady's fig. 3b. The ventral surfaces of those we have examined are identical with Burrows and Holland's fig. 33b. The aperture of *D. lingulata* is not described by Burrows and Holland, but is indicated in their figure. It is a strongly reflexed or arched opening towards the inner edge of the inferior face of the last-formed chamber. The under surface of the test is slightly concave, and there is usually a radially striate ornament converging upon the aperture.

The several forms of this type of shell that have been described are as follows:—

- 1895. *Discorbina lingulata* Burrows and Holland (op. cit.). Pliocene; Suffolk, England. Oligocene; Muddy Creek, Victoria.
- 1915. *Discorbis pulvinulinoides* Cushman (p. 23, pl. vi, figs. 3a,b). Recent; off Japan, 59 fathoms.
- 1918. *Discorbina lingulata*, var. *unguiculata* Sidebottom (p. 255, pl. vi, figs. 12-14). Recent; off the coast of New South Wales, 465 fathoms.

1922. *Discorbina wilsoni* Heron-Allen and Earland (p. 206, pl. vii, figs. 17-19). Recent; Antarctic.

1929. *Discorbis kempii* Heron-Allen and Earland (p. 332, pl. iv, figs. 40-48). Recent; off Falkland Islands.

Generic Description.—Test compressed, ovate, plano-convex; superior face gently rounded, inferior, flat to concave. Periphery rounded. Sutures and margin on superior face usually limbate. Chambers comparatively few, concave to slightly inflated on upper surface. Aperture a strongly arched slit situated in a depression on the inner face of the last chamber. Shell surface very finely perforate and polished; exogenous beads sometimes developed on the superior face, or single ones near the suture, when they appear as vesicles. Inferior surface often radially striate.

From *Discorbis* and *Planulina* this genus differs in the position of the aperture, which is a central, short, curved slit in the former, and a curved slit at the base of the last chamber on the periphery in the latter. The finely perforated superior surface further separates *Heronallenia* from *Discorbis*.

Genotype.—*Discorbina wilsoni* Heron-Allen and Earland, 1922. Recent; Antarctic.

Affinities.—This generic type appears to occupy a position near *Discorbis*, in the Family of the Rotaliidae.

This genus is named in honour of Edward Heron-Allen, F.R.S., whose work on the Foraminifera, in conjunction with Mr. Earland, is too well-known to need comment.

2.—On a new Genus, *Howkerina*.

(Plate IX, figs. 1-5.)

Of late years some curious thick-walled forms of Foraminifera have been discovered, some of which, like *Eorupertia* Yabe and Hanzawa, and *Victoriella* Chapman and Crespin, have proved to be free-growing kinds related to the adherent generic type *Carpenteria*. The present genus is a third member of this group.

Generic Description.—Test free, trochoid with a rotaline plan of growth; strongly biconvex, margin rounded, chambers comparatively few, strongly inflated; wall calcareous, thick, laminated, fairly coarsely tubulate, closely papillate above in central portion, inferior face smooth. Aperture cribrate, occupying the umbilical depression.

Dimensions.—Howchin gives the measurements of his specimens as 1/16 inch. The example figured here, from Muddy Creek, measures 2.2 mm. in diameter. The Balcombe Bay specimen has a diameter of 1.6 mm.

Genotype.—*Pulvinulina semiornata* Howchin (1889, p. 14, pl. i, figs. 12a-c). From the Oligocene (Balcombian) of Muddy Creek, Victoria.

In all probability the newly-described *Pegidia* of Heron-Allen and Earland may also prove to be related to the interesting genera comprised in the Family Victoriellidae. We may also refer to what appears to be another and more closely related form of the Victoriellidae, viz., *Pulvinulina decipiens* Heron-Allen and Earland (1928, p. 297, pl. iii, figs. 47-50). This species was described from examples found off Georgia, 440 fathoms. Its points of agreement with *Hofkerina semiornata* are the thick-walled test, tuberculate superior face and the coarsely perforated inferior side, with no apparent oral opening beyond the cribration of the shell-wall. It has also a small number of convolutions, but as compared with *Hofkerina semiornata* it may exhibit a larger number of chambers. As no figure of the shell structure of *Pulvinulina decipiens* is given, we can offer no opinion as to the ultimate relationships of the two species, but their similarity is striking.

General Observations.—The relationship of *Hofkerina semiornata* with the Victoriellidae is apparent, when the shell structure is examined. The tubulations of the shell-wall are coarse as in the adherent type of *Carpenteria*, and this character is maintained throughout the free-tested genera of *Victoriella* and *Eorupertia*.

Hofkerina differs from *Victoriella* in the rotaline form of the test and the cribrate apertures.

Occurrence.—From the Oligocene (Balcombian), of Muddy Creek and Balcombe Bay, Victoria.

3.—On an Anomalous Specimen of *Homotrema rubrum* (Lamarck).

(Plate IX, figs. 9, 10.)

Dr. H. J. Carter in 1876 (p. 188, pl. xiii, fig. 6) described and figured, as *Polytrema miniaceum*, an interesting foraminiferon which in its main characters conformed to the generic type established by Prof. S. J. Hickson (1911, p. 445, 454, pl. xxx, fig. 2; pl. xxxi, fig. 9; pl. xxxii, figs. 19, 22, 28), although in other respects showed a relationship with *Polytrema*.

Carter describes his specimen in the following terms:—"Presenting a variety of surface-patterns, according with the age of the structure, locally and generally, viz., at first, or in the earliest period, a foraminated groundwork in which there may be a few unforaminated dimples or depressions (fig. 6 *g,g,g*); then the dimples may be united by limited, branched, linear, unforaminated areae, somewhat narrower than the foraminated part, so as often to present together a submeandriniform appearance (fig. 6 *h,h*); or the dimples may be expanded into circular foraminated areae, surrounded respectively by an unforaminated ring, the whole being set in a foraminated groundwork (fig. 6 *i*); or, lastly, over

the thickest parts of the fully developed test, the foraminated groundwork may give place to a subhexagonal or polygonal unforaminated reticulation, whose interstices *only* are foraminated (fig. 6 k)."

Later, in 1911, Hickson, in describing his *Homotrema* (op. cit., p. 446) remarked that "Carter evidently examined a large number of specimens which he considered to be *Polytrema miniacum* from the Red Sea and from other parts of the world. His figure 6 of the species appears to me a composite production, the upper part being taken from a true *Polytrema*, and the lower part from a *Homotrema*. . . . Both his figures and descriptions appear to have been composed from notes taken from the examination of a number of specimens of a mixed collection of the two genera."

In a collection of rough coral fragments from the Island of Ambrym, in the New Hebrides, given us by our friend Mr. J. Searle, of Melbourne, we found some typical examples of *Homotrema rubrum*, attached to the surface of the broken coral. With these was one exceptionally well-preserved specimen, exhibiting the typical *Homotrema*-like structure in the lower part of the test. This portion showed the perforated areolae of *Homotrema*, but many were less regular in shape than usual. Above this, the amount of imperforate shell-growth increases, and the size and number of the areolae become much less. The areolae become more irregular than previously, and are smaller. Above this, again, the whole surface becomes perforated, as in the earlier areolae, while the areolae are replaced by open pits, still retaining, however, the imperforate border.



FIG. 1.—Structure in abnormal *Homotrema*.—I. of Ambrym.

In this specimen we have, therefore, a transitional structure, from the typical perforated plate bordered by a shelly, limbate wall, to an expanded structure, of similar elements, but where the perforated plates have expanded to an intermediate, perforated structure between the irregular meandrine non-perforated shell. Moreover, the normal perforated surface plates become depressed pits, through which the perforated plates of the previous shell layer are visible. It thus, at first sight, simulates *Polytrema*, but

still retains, in most respects, the typical *Homotrema*-like characters. Hofker has suggested (1927, p. 33) that the perforated plates are resorbed each time a new shell layer is added.

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Explanation of Plate IX.

- Fig. 1.—*Hofkerina semiornata* (Howchin). Inferior aspect. Oligocene (Balcombian). Muddy Creek, Victoria. $\times 13$.
- Fig. 2.—*H. semiornata* (Howchin). Superior aspect. Ditto. $\times 13$.
- Fig. 3.—*H. semiornata* (Howchin). Inferior aspect. Oligocene (Balcombian). Balcombe Bay, Mornington. $\times 21$.
- Fig. 4.—*H. semiornata* (Howchin). Superior aspect. Ditto. $\times 21$.
- Fig. 5.—*H. semiornata* (Howchin). Median section of test. Oligocene (Balcombian). Muddy Creek, Victoria. $\times 53$.
- Fig. 6.—*Heronallenia lingulata* (Burrows and Holland). Oligocene (Balcombian). Muddy Creek, Victoria. $\times 22$.
- Fig. 7.—*Heronallenia wilsoni* (Heron-Allen and Earland). Miocene. Marl above limestone. Filter Quarry, Batesford, Victoria. $\times 26$.
- Fig. 8.—*H. wilsoni* (H.-A. and E.). Recent. Off the Snares, New Zealand, 60 fathoms. $\times 21$.
- Fig. 9.—*Homotrema rubrum* (Lamarck). On coral. Ambrym Island, New Hebrides. Coll. J. Searle. $\times 5/4$.
- Fig. 10.—Ditto. Surface enlarged to show pore-plates and pits. $\times 18$.



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