

A great part of the PHÆODARIA, and usually the bigger forms of Aulacanthida, Cannorrhaphida, Cœlodendrida, Cœlographida, &c., exhibit a peculiar structure of the larger phæodella, viz., a fine parallel striation (Pl. 101, figs. 3, 6; Pl. 102, fig. 1; Pl. 103, fig. 1; Pl. 104, figs. 1-3, &c.). In each phæodellum may be counted about ten to twenty such fine parallel stripes (more in the greater, less in the smaller forms); and in the ellipsoidal phæodella the stripes are either transverse rings, perpendicular to their main axis, or ascending obliquely; they often resemble the convoluted spiral filament of a thread-cell or nettle-cell of an Acaleph. Sometimes these parallel transverse stripes are very striking. Another structure is seen in larger phæodella, namely an aggregate or cluster of smaller globules, often of equal size, resembling a small morula. All these minute structures of the phæodella as well as their changes in the living PHÆODARIA, require a far more extensive examination (by means of strong lenses and different chemical reagents), than I could, unfortunately, devote to them.

The physiological signification of the phæodella, therefore, is at present not yet known; but the general facts quoted above, their constant presence, position, volume, and composition, make it probable that their physiological value in the PHÆODARIAN organism is very great. The following hypotheses may be taken provisionally into consideration:—A. The phæodella are peculiar symbiontes, or unicellular algæ, comparable to the xanthellæ or zooxanthellæ of the other Radiolaria. This hypothesis is probably correct for those phæodella which are true nucleated cells; and the more so, as the majority of PHÆODARIA do not exhibit those common yellow xanthellæ, which are usually found in the SPUMELLARIA and NASSELLARIA. It is even possible that the latter are absent in all PHÆODARIA. B. The phæodella are dark pigment-bodies, which absorb light and heat in a manner similar to the simple "pigment-eyes" of many lower animals, and may therefore be optical sense-organs of the PHÆODARIA. This hypothesis may be supported by a comparison with the large-eyed unicellular Protist, *Erythroopsis agilis*, described by R. Hertwig. C. The phæodella are organs of nutrition of the PHÆODARIA and active in their metastasis ("Stoffwechsel"). Regarding them from this point of view, we may suppose that the phæodella are secreted products which serve for digestion, acting like the bile or the saliva of higher animals. Perhaps they too act like the venomous matter produced in the thread-capsules of the Acalephæ. The suggestion that they are mere excretions, or half-digested matters, as Hertwig supposes ("halb assimilirte Nahrungsbestandtheile," 1879, *loc. cit.*, p. 99) seems less probable. The most important fact illustrating their high signification for the processes of nutrition, digestion and for effecting changes on matter, seems to be the close relation of the phæodium to the astropyle; the radiate operculum of the latter, and the proboscis arising from it, being constantly covered and completely hidden by the central main mass of the phæodium.