

larger forms it is often filled by numerous large alveoles, which are usually absent in the smaller forms. These extracapsular alveoles are most strongly developed in the calymma of the *Phæocystina*, or the *PHÆODARIA* with incomplete skeleton, embracing the three families *Phæodinida*, *Cannorrhaphida* and *Aulacanthida* (Pls. 101–104). Usually the calymma is here very voluminous and entirely filled up by large alveoles, which are either spherical, irregularly roundish, or polyhedral by mutual compression. These alveoles or vacuoles have no peculiar wall, but are only cavities in the homogeneous substance of the jelly, and are filled by a clear aqueous fluid. Between these the network of the anastomosing pseudopodia is expanded. They exhibit, therefore, the same shape, as was first observed in *Thalassicolla* and in the *Polyctaria* (*Collozoida*, *Sphærozoida* and *Collosphærida*).

The relation of the calymma to the skeleton is in the *PHÆODARIA* of the same importance as in the other *Radiolaria*, and we may also here distinguish a primary and a secondary calymma. The primary calymma is that on the surface of which at a certain period of life (in the “shell-building period”) the fenestrated shell is secreted in the majority of *PHÆODARIA*. The secondary calymma, however, is formed after this period, and envelops the shell itself as well as its apophyses externally. Usually the entire skeleton seems to be enveloped by the secondary calymma.

The parts of the extracapsular body, which are enclosed in the gelatinous calymma, possess a peculiar importance in the *PHÆODARIA*; these are firstly the sarcomatrix and the pseudopodia arising from it, and secondly the phæodium. The sarcomatrix, or the layer of extracapsular sarcode (ectoplasm), which immediately surrounds the central capsule, is very thick and more strongly developed in all *PHÆODARIA* than in all other *Radiolaria*. Its extraordinary size has been already mentioned by Hertwig (1879, *loc. cit.*, p. 99). It is in direct connection with the intracapsular sarcode (or the endoplasm) only by the openings of the central capsule, and mainly by the astropyle. Very numerous radial pseudopodia arise everywhere from the sarcomatrix and run to the surface of the calymma, usually forming a rich network in it by means of numerous branches and anastomoses (compare Pl. 101–104). On the surface of the calymma the meshes of this network are very numerous, and there arise from its nodal points the terminal pseudopodia, which float freely in the surrounding water. The metamorphoses of this network of sarcode, the perpetual changes in the number and size of its meshes, and the movements of the sarcode streams as well as of the small granules running in it, are always very manifest in the *PHÆODARIA* and in the big forms of this legion (mainly in the *Aulacanthida*) they are better observed than in the majority of other *Radiolaria*. In many *PHÆODARIA* (and perhaps in all) a part of the pseudopodia seems to have undergone a local differentiation, for special physiological purposes; and Hertwig has described a peculiar conical contractile body, which arises in *Cælodendrum* between the two parapylæ (*loc. cit.*, p. 100, fig. 3). Further examination