

of these interesting organs in living PHÆODARIA is required. Usually the sarcode, issuing from the openings of the capsule, forms a stronger cylinder, with peculiar movements.

The phæodium, or the peculiar dark extracapsular pigment-body of the PHÆODARIA, is one of the most important and most characteristic parts of their organisation, and has induced me to derive their name from it; it is not less typical for the whole legion, than the astropyle with its radiate operculum and the proboscis; and both these important parts are always in direct topographical and physiological connection. Whilst I have missed the phæodium in no *Phæodarium* in which the soft body was well preserved, I have not found it in any other Radiolaria; for the similar extracapsular pigment bodies, which are found in some species of *Thalassicolla* and some other Sphærellaria, have a composition and signification different from that of the phæodium—an exclusive peculiarity of the PHÆODARIA.

The typical importance of the phæodium for all members of this legion is proved by the following five facts:—(1) its constant presence in all PHÆODARIA; (2) its constant excentric position in the oral half of the calymma; (3) its constant relation to the astropyle, the operculum and the proboscis of which is always surrounded by it; (4) its constant considerable size, its volume being usually greater than that of the central capsule, the aboral half of which is covered by it; (5) its constant colour and morphological as well as chemical composition. These five facts together demonstrate by their absolute constancy the high morphological and physiological importance of the phæodium for this peculiar subclass of Radiolaria, although its true nature is difficult to make out, and its main function is not yet sufficiently known.

The first remarks that have been made on the phæodium were published in 1862 in my Monograph, where I noticed the peculiar dark brown extracapsular pigment body and its excentric position covering only one-half of the central capsule, in *Aulacantha* (p. 263, Taf. ii. figs. 1, 2), in *Thalassoplancta* (p. 262, Taf. iii. fig. 10), and in *Cælodendrum* (p. 361, Taf. xxxii. fig. 1). Its general presence and peculiar composition were first recognised by Dr. John Murray, who had, during the Challenger Expedition, the first opportunity of examining many big living PHÆODARIA brought up from great depths. He gives in his first Report (1876, *loc. cit.*, p. 536), the following important notice:—"The sarcode of all these deep-sea Rhizopods has many large black-brown pigment-cells. Small bioplasts are scattered through the sarcode. These collect into capsular-like clumps when the animal is at rest, and are quickly coloured by carmine." In 1877 Dr. John Murray sent me the wonderful collection of PHÆODARIA brought home by the Challenger, and I had now the best opportunity for examining the phæodium in hundreds of well-preserved specimens. Supported by these extensive observations, I gave, in 1879, in a preliminary paper,¹ a fuller description of the

¹ Ueber die Phæodarien, eine neue Gruppe kieselschaliger mariner Rhizopoden, *Sitzungsb. med.-nat. Gesellsch. Jena*, December 12, 1879, pp. 3, 4.