

surrounds the oral half in the form of a voluminous concavo-convex cap, hiding the astropyle at its basal pole so completely that the latter is rarely visible until the phæodium has been removed (Pls. 99–104; Pl. 115, fig. 8; Pl. 123, &c.). The central capsule is generally almost completely embedded in the phæodium, so that only its aboral pole (with the two parapylæ in the TRIPYLEA) projects. In the PHÆOGROMIA, in which the lattice-shell possesses a special opening and the central capsule lies excentrically in the aboral portion of its interior, the phæodium occupies the oral aspect, between the capsule and the aperture (Pls. 99, 100, 118–120, &c.). In the peculiar family Cœlographida (Pls. 126–128) a special receptacle (galea with its rhinocanna) for the phæodium is developed outside the bivalve shell, within which the central capsule lies. The proboscis, which in all PHÆODARIA arises from the centre of the astropyle, lies in the vertical axis of the phæodium, and is entirely surrounded by it. The volume of the phæodium in the majority of the PHÆODARIA may be said to be about as great as that of the central capsule, although in some species it is considerably larger. Its colour is always dark, usually between green and brown, commonly olive-green or blackish-brown, rarely reddish-brown or black. The phæodellæ or pigment-granules which make up the greater part of the phæodium (see note B) are irregular in form and unequal in size and show no definite structure; usually they are spherical or ellipsoidal, and exhibit fine parallel striæ which run transversely or obliquely (Pl. 101, fig. 3, 6, 10; Pl. 103, fig. 1, &c.). Between the larger granules is usually found a thick dust-like mass of innumerable very small grains. The physiological significance of this peculiar phæodium is still unknown, but is probably considerable, judging from its large size and especially from its constant topographical relation to the astropyle; the latter consideration would lead to the supposition that it plays an important part in the nutrition and metastasis of the PHÆODARIA (see note C).

A. The phæodium of *Aulacantha*, *Thalassoplaneta*, and *Cœlodendrum* was first described in 1862, in my Monograph, as an excentric extracapsular mass of pigment of blackish-brown or olive-green colour (pp. 87, 262, 264, 361, Taf. ii. iii. xxxii.). Since then John Murray, who investigated many living PHÆODARIA during the Challenger expedition, has shown its general distribution in this legion (Proc. Roy. Soc. Lond., vol. xxiv. p. 536, 1876). From the constancy of its presence I gave the legion the name PHÆODARIA in 1879 (L. N. 34).

B. With regard to the special composition of the phæodium and the constitution of the phæodellæ, see the general description of the PHÆODARIA, pp. 1533–1537.

C. Perhaps the phæodellæ are to some extent symbiontes with the PHÆODARIA; the xanthellæ present in most other Radiolaria are absent in this legion.

90. *The Extracapsular Xanthellæ.*—Xanthellæ or Zooxanthellæ, symbiotic “yellow cells,” are very commonly found in the extracapsulum of the Radiolaria, especially in many SPUMELLARIA and NASSELLARIA; whilst in the ACANTHARIA similar yellow cells usually only occur within the central capsule, and in the PHÆODARIA their