

phæodium, and of the phæodella (or the peculiar dark pigment-granules composing it). At the same time R. Hertwig published his observations on the big living TRIPYLEA examined by him at Messina, and pointed out particularly that the constant presence, composition, and arrangement of this excentric extracapsular pigment-body was most characteristic, and sufficient in itself to distinguish this group from all the other Radiolaria (1879, *loc. cit.*, p. 99).

The most striking peculiarity of the phæodium, and the most important on account of its absolute constancy, is its excentric position, covering only the oral hemisphere of the central capsule, and wholly or partly wanting on the aboral hemisphere. This constant topographical relation to the capsule never fails, and may be always observed at the first glance, when the body is seen from the side (the main axis of the capsule being perpendicular to the axis of the eye of the observer), (compare Pl. 101, figs. 6, 10; Pl. 102, fig. 1; Pl. 103, fig. 1, &c.). The phæodium envelops, therefore, the oral half of the capsule completely, and especially the astropyle in its centre; hence, the radiate operculum and the proboscis arising from the latter cannot be seen usually before the former is removed. The general form of the entire phæodium, in consequence of this excentric position, is concavo-convex (or crescentic in longitudinal section), its concave face embracing the oral or anterior face of the capsule, and its convex face being turned to the surface of the calymma.

The topographical relation of the phæodium to the surrounding shell is also very characteristic in the suborder Phæogromia, or in those PHÆODARIA which possess a peculiar shell-mouth placed on the oral pole of its main axis. Here the capsule is always placed in the aboral half of the shell-cavity, the phæodium in its oral half, separating the astropyle from the mouth of the shell, both of which lie in the main axis; as in the Challengerida (Pl. 99), Tuscarorida (Pl. 100), Castanellida (Pl. 113), Circoporida (Pl. 115), and Medusettida (Pl. 118-120). In this suborder (the Phæogromia), the volume of the phæodium may be, on an average, about as great as that of the central capsule, whilst in the majority of other PHÆODARIA it is much greater than the latter.

A similar topographical relation between the phæodium and the enclosing shell, as in the Phæogromia, also exists in the suborder Phæoconchia, or in those PHÆODARIA, which are distinguished from all the others by the possession of a bivalved shell (Pl. 121-128). The two valves of this curious shell, which resembles that of the Brachiopoda, are dorsal and ventral, and the tripylean central capsule is always so placed between them that its two lateral parapylæ (right and left) lie in the frontal plane of the shell, where a large frontal fissure opens between the opposed margins of the two hemispherical or cap-shaped valves. The phæodium is also placed here on the oral half of the capsule and surrounds its astropyle; but it exhibits some differences in the three families of Phæoconchia.