belonging to all families) separated by a clear, rather wide interval, filled up either by a colourless fluid or by a structureless jelly (Pl. **103**, fig. 1; Pl. **123**, figs. 8, 9, &c.). They are in direct connection only at the openings. In the living PHÆODARIA, however, their distance is very small, or they are in immediate contact without any interval (Pl. **101**, fig. 10; Pl. **102**, fig. 1). According to the observations of Hertwig, the two membranes are always in close contact, and without interspace, in the living PHÆODARIA; and the space between them is an artificial product due to the influence of the preserving fluid or of certain chemical agents. In every case it is very easy to separate both membranes completely, except at the openings, where they are in direct connection. We distinguish both membranes shortly as ectocapsa and endocapsa.

The ectocapsa, or the outer membrane of the central capsule, is rather firm and durable, double-contoured, elastic and difficult to destroy. Its physical and chemical qualities seem to approach those of chitin. It becomes, however, stained red by carmine, and yellow by nitric acid. Usually it appears structureless and refracts the light strongly. In a few cases, however, it exhibits, when examined by strong lenses, a fine punctation; and in some Aulacanthida (especially in some big forms of *Aulographis* and *Aulospathis*) the entire ectocapsa was densely covered with peculiar curved, or S-shaped dark corpuscles (Pl. **114**, fig. 13). They were all of the same length, about 0·01, and seemed to lie on its inner face.

The endocapsa, or the inner membrane of the central capsule, is much thinner than the outer, with which it is in immediate connection only at the openings. It encloses the entire contents of the capsule, and becomes very distinct, as soon as the latter are dissolved by chemical agents, or stained by carmine. In the majority of well-preserved preparations it is irregularly plicated, and resembles a thin, but firm, crumpled paper. Isolated pieces of the endocapsa are completely structureless, but exhibit also a considerable resistance, in spite of their minute thickness.

The openings of the central capsule exhibit in the PHÆODARIA a greater variety than their discoverer, R. Hertwig, supposed. The majority of the legion, certainly, possess the three openings described by him, and are therefore true TRIPYLEA. Some families, however, have only one opening, the astropyle, which is generally present (Challengerida, Medusettida, Castanellida, and *Phæocolla* among the Phæodinida, Pl. **101**, fig. 1). In some other families there is a variable number of accessory openings or parapylæ, one, three, or more, *e.g.*, especially in the Circoporida and Tuscarorida. The former may be called Astropylea, the latter Sporopylea. Thus only a single opening to the central capsule is constant in all PHÆODARIA without exception, and that is the astropyle, or the large main-opening with its peculiar structure.

The astropyle, or the single constant main-opening of the central capsule, is distinguished by a very remarkable structure, and is sufficient of itself to separate the