

PHÆODARIA from all the other Radiolaria, and from the other Rhizopoda in general. It is always placed on the oral pole of the main axis, forming here a peculiar cap-shaped or flatly conical elevation, the centre of which is prolonged into a short, cylindrical tubule; we call the latter shortly a proboscis, and the former an operculum. To understand better the different forms which these important parts assume in the different families, compare Pl. 101, figs. 1-6; Pl. 102, fig. 1; Pl. 103, fig. 1; Pl. 104, figs. 1-3; Pl. 111, fig. 2; Pl. 123, figs. 1-9; Pl. 127, figs. 4-6; Pl. 128, fig. 2, &c. Compare also the first very accurate figures which R. Hertwig has given in 1879 (*loc. cit.*) in his Taf. x.

The operculum of the astropyle, the most important part of this main opening ("der Oeffnungshof der Hauptöffnung," in the description of Hertwig), is a circular convex plate, always more strongly vaulted than the surrounding part of the capsule membrane, and is sharply separated from it by a circular, often thickened and double-contoured margin. The operculum covers the main-opening like the lid of a tea-kettle, and the proboscis arising from its centre is comparable to the handle of that lid. The diameter of the circular operculum is usually about half as long (rarely as long) as the radius of the central capsule, therefore in the majority of PHÆODARIA 0.03 to 0.06, sometimes 0.1 and more. Its form is sometimes more conical, sometimes more like a mamma. Its height is usually about equal to half its diameter. It always exhibits a very distinct radial striation, produced by numerous prominent radial ribs, which arise in the centre and end at the circular sharply truncated margin. The usual number of these radial ribs may be, in the operculum of smaller capsules, from thirty to fifty, in those of medium size from sixty to ninety, and in the largest two hundred to three hundred or more. Usually the ribs are simple (Pl. 101, figs. 1, 2, 6, 10; Pl. 127, figs. 4-6; also in all figures given by Hertwig); but sometimes, mainly in the biggest Aulacanthida, they are distinctly branched in a centrifugal direction (Pl. 114, fig. 13; Pl. 115, fig. 3). Hertwig is of the opinion that the radial ribs are thickened ridges of the endocapsa ("leistenartige Verdickungen der inneren Membran"), and that the ectocapsa covering it is structureless (compare his figs. 1 and 1a, in Taf. x.). But I am convinced now, by numerous experiments and observations, that the radiate operculum is a part of the outer, not of the inner membrane. That part of the latter which lies immediately beyond the former, and which may be called the "inner operculum," also exhibits usually a fine radial striation; but this is probably only the cast of the stronger and much more prominent radial ribbing of the "outer operculum" belonging to the ectocapsa. The latter exhibits a large circular opening with thickened margin, when the radiate operculum is taken from it. The operculum becomes stained intensely red by carmine, yellow by nitric acid, corresponding to the ectocapsa, the main-opening of which is closed by it.

The proboscis, or the cylindrical tubule, which arises in the centre of the