

Brandt has given further accurate information regarding their occurrence, constitution, and physiological significance (L. N. 39, ii. Art., p. 235, figs. 62-73).

77. *The Endoplasm of the Peripylea.*—The intracapsular protoplasm of the SPUMELLARIA or PERIPYLEA is usually distinguished by a more or less complete radial arrangement, which does not occur in the same form in other Radiolaria; it may be regarded as characteristic of this legion, for it probably occurs in all the species at some period of life or other, and stands in a direct causal relationship with the typical structure of the capsule-membrane in all the "PERIPYLEA" (see note A). For as this is commonly perforated by very numerous pores distributed at equal intervals over the whole surface of the capsule, and since a communication between the intra- and extracapsular sarcode takes place through these, the radiate structure of the endoplasm may be readily explained as due to the influence of radial currents which take place continuously or intermittently in the endoplasm. This radiate structure is most obvious when the endoplasm contains no secondary products or only an insignificant amount of these, and thus appears colourless and almost homogeneous, or only finely granular. Under these circumstances, an optical section of the central capsule usually reveals a distinct radial striation; numerous narrow, straight, dark streaks alternating regularly with still narrower clear ones; the latter consist of homogeneous, the former of more or less granular protoplasm (Pl. 20, fig. 1a). Often there may be distinguished in each darker streak a single straight row of strongly refracting (fat?) granules, sometimes several such rows. Occasionally the whole endoplasm becomes divided up into a number of large "radial wedges," club-shaped, conical or pyramidal masses of granular protoplasm, separated by clear divisions of hyaline plasma (e.g., in *Actissa radiata*, p. 14, where in the optical section of the central capsule, between the membrane and the nucleus, twenty-five dark radial wedges of equal size were separated by thick clear partitions of hyaline protoplasm). In the majority of the SPUMELLARIA this radial striation is partially or entirely concealed by the formation of pigment or of other products. Very often it is only visible in the cortical layer, which lies immediately below the capsule-membrane (Pl. 1, figs. 1, 3). The remarkable "centripetal cones" which characterise the Thalassicolloid genus *Physematium*, and were formerly described as "centripetal cell-groups," are probably a special development of these cortical radial wedges; they are conical cortical bodies, regularly distributed on the inner surface of the membrane of the central capsule, and disposed with the apex turned towards the centre (see note B). More rarely than in the cortical layer, a similar radial structure is to be found in the innermost medullary layer immediately surrounding the nucleus. Here the endoplasm sometimes breaks up into fine radial threads, which are anatomically separable and hang down from the free nucleus as thin processes (see note C). In some cases it is also possible to isolate radial rods from the cortical layer of teased out central capsules.