Chapter III.—THE EXTRACAPSULUM.

(§§ 81–100).

81. *The Components of the Extracapsulum.*—The extracapsulum or extracapsular malacoma, under which name are included all those parts of the soft body which lie outside the central capsule, consists of the following constant and important constituents:—(1) The *calymma* or extracapsular jelly-veil; (2) the *sarcomatrix* or layer of exoplasm immediately surrounding the membrane of the central capsule; (3) the *sarcodictyum* or network of exoplasm, covering the surface of the calymma; (4) the *pseudopodia* or radial fibres of exoplasm, which may again be subdivided into intracalymmar pseudopodia, uniting the sarcomatrix and sarcodictyum, and extracalymmar pseudopodia, radiating freely into the water outside the calymma.

82. *The Calymma.*—The calymma or extracapsular jelly-veil of the Radiolaria is always the most voluminous portion of the extracapsulum, and in spite of its simple structureless constitution is of great morphological and physiological importance. In all Radiolaria this gelatinous mantle completely surrounds the central capsule, but is separated from its outer surface by a continuous, though thin, layer of exoplasm, the sarcomatrix. The pseudopodia radiating from the latter pierce the calymma, form the sarcodictyum at its surface, and radiate from its nodal points freely into the surrounding water. The calymma is rarely visible in living freshly captured Radiolaria, examined in sea-water, for its gelatinous substance is perfectly hyaline, colourless and pellucid, and possesses the same refractive index as sea-water; but when the object is removed from this fluid and transferred to carmine solution or some other colouring matter, the extent and figure of the calymma become apparent, for the staining fluid does not at first penetrate into the gelatinous material. When this has taken place, however (after a longer or shorter time), and the gelatinous material has become coloured, its form and size may be observed by the converse experiment; the object is transferred once more to water and the outlines of the calymma become as clear as those of the central capsule. The same is the case with dead specimens in which the sticky surface of the calymma has become covered with dust.

The jelly-veil of the Radiolaria was recognised even by the earliest observers of the group, Meyen (1834), and Huxley (1851), and compared with that of the Palmellaria; the former noticed it in *Physematium* and *Sphærozoum* (L. N. 1, p. 283), and the latter in *Thalassicolla* and *Collosphæra* (L. N. 5, p. 433). In all these Spumellaria, both in the monozootic *Thalassicolla* and in the polyzootic *Sphærozoum* and *Collosphæra*, the calymma is very voluminous and filled with large alveoli. Meyen called them "muco-gelatinous masses, in the interior of which are contained small equal-sized vesicles"; Huxley likewise found clear vesicles in the jelly and compared them with Dujardin's vacuoles. Johannes Müller observed the jelly-veil in many different Radiolaria, in particular in the Acanthometra, first discovered by him, but erroneously believed that it only originated