

vesicles" (see note A, below), "albumen spheres" (see B), "gelatinous spheres" (see C), "alveolar cells" (see D), &c. Some of these spheres are perfectly transparent, structureless and of varying refractive power, producing the impression of drops of fluid; others contain various formed constituents, such as oil-globules, fat-granules, pigment-granules, concretions, crystals, &c. From a morphological point of view they may all be divided into two categories, membraneless vacuoles and vesicular alveoles. The *vacuoles* are simple spherical drops of fluid or of gelatinous material, devoid of a special envelope, but immediately surrounded by the endoplasm. The *alveoles*, on the other hand, are true vesicles with a thin spherical envelope, enclosing a drop of fluid or jelly. This envelope is commonly very thin, homogeneous, and often scarcely discernible, so that in practice a sharp line of demarcation cannot be drawn between alveoles and vacuoles; the former are usually somewhat larger than the latter. The fact is, nevertheless, certain that the hyaline spheres, which may be isolated on rupturing the central capsule of many Radiolaria, in certain cases, particularly in large species, possess a clear, anatomically demonstrable membrane, whilst in others no such appearance is presented. It may be assumed that the vesicular alveoles are developed from the drop-like vacuoles by increase in size, and by the precipitation of a delicate envelope from the endoplasm. The character common to all these hyaline spheres, whether vacuoles or alveoles, is found in their aqueous, not adipose, constitution, and in their clear transparent appearance, which allows of no structure (the above-mentioned contained bodies excepted) being recognised. Their refractive power and consistency vary somewhat, and probably their chemical constitution still more. Sometimes they are strongly refractive and shining, and sometimes feebly refractive and pale; their consistency shows all intermediate stages between a thin fluid, which readily disappears in water, and a firm, insoluble jelly. As regards their chemical composition (which is probably very variable), the hyaline spheres may be best divided into two groups, the organic and inorganic. The *inorganic hyaline spheres* are simple drops of saline solution without any carbonaceous constituent; the *organic*, on the other hand, contain a small quantity of organic matter dissolved in the watery fluid, and may be either albuminous or gelatinous spheres. The formed contents which are commonly present are of very various natures, usually small fat-granules, more rarely larger fat-granules or pigment-granules, sometimes concretions or crystals. In many groups, especially among the large PHÆODARIA and COLLODARIA, the numerous hyaline spheres are remarkable for their equal size and even distribution throughout the endoplasm (Pl. 1, figs. 1, 4; Pl. 104, fig. 2, &c.). In some genera belonging to the Thalassicollida the alveoles are of enormous size (Pl. 1, figs. 2, 3); they then become flattened by mutual pressure into polyhedra and distend the central capsule to unusual dimensions (in *Physematium* and *Thalassolampe* 8 to 12 mm.).

A. The "*spherical hyaline vesicles*," which I described in my Monograph (1862, p. 71) as among the most important and constant contents of the central capsule, are partly vacuoles,