

indeed in the same species under different circumstances they may be either blunt or pointed.

The ectosarc is essentially granular; that is to say, it consists of a motile hyaline protoplasm, not differentiated from the ectosarc, except in its less consistence and in the thorough diffusion of conspicuous granular elements. These occur in all gradations of size, from those which are immeasurably fine and indistinct up to the largest granules which are more or less darkly defined, and resemble oil-molecules. Besides the more generally diffused granular constituents, the endosarc contains variable proportions of larger spherical corpuscles, clear or finely granular, and mostly colorless or pale yellowish, but in some species usually of a bright green color, and apparently of the nature of chlorophyl.

An important element of the endosarc is the nucleus, a comparatively large spherical or compressed spherical corpuscle, colorless, and mostly clear, but sometimes finely granular, or more distinctly coarsely and uniformly granular. In the naked forms of the Lobosa, while in motion, the nucleus usually occupies a position at the posterior part of the body, or at least is placed back of the centre. In most of the shell-covered forms it occupies a corresponding position; that is to say, in the part most remote from the mouth of the shell,—in the fundus or upper part of the body. In some forms, as in *Arcella*, there are two or more nuclei occupying a position on each side of the fundus.

Another element of the endosarc, usually situated at its confines and encroaching on the ectosarc, is the contractile or pulsating vesicle. This appears as a clear, colorless, or pale roseate sphere, which is observed very slowly to enlarge, then rather abruptly to collapse and for the moment disappear, again to reappear, commonly in the same position. The successive movements of the vesicle occur with a certain degree of regularity, or rhythm, whence the name of pulsating vesicle. It appears to be due to a gradual concentration of water from all parts of the sarcode mass of the body, forming a drop, which when it reaches a certain size excites contraction and is expelled. The phenomenon is remarkable, and is in a measure subservient to a respiratory as well as to an excretory function.

In the naked Lobosa, the contractile vesicle usually occupies a position posterior to the nucleus or at the back of the body near the surface. In the shell-covered kinds of flask- or vase-like shape, there are commonly