regions, where the temperature is over 68° or 70°, and the specific gravity of the water is not lowered by the presence of coast and river water.

"The shape is spherical, from 0·6 to 0·8 mm. in diameter, the colour of the protoplasmic matter is brownish, like that of Diatoms and *Ceratium*. The external capsule is composed of a resistant organic matter containing cellulose. The internal ball or protoplasmic body (cytode) is sometimes separated by a considerable interval from the external capsule, as shown in figs. 336–337; sometimes, however, it is closely applied, and protoplasmic threads ramify over the inner surface of the capsule, or through the internal cavity (fig. 335). In the fresh state the internal ball colours slightly with osmic acid. The nucleus stains easily with carmine solution. Very frequently a number of small pellucid dots are observed over the surface of the external capsule, generally aggregated toward one portion of the sphere. If a little magenta solution be added to the sea water these dots instantly colour, and the organism then presents a very beautiful appearance. The cytode is very often observed in simple division beginning with the nucleus. Sometimes the internal ball divides into four; the outer capsule eventually bursts. The external capsule will persist for days in cold strong nitric acid and caustic potash, but disappears by boiling in the former. When treated with sulphuric acid and iodine solution it becomes blue.

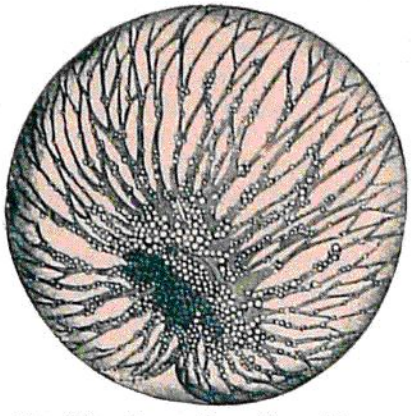

FIG. 335.—*Pyrocystis noctiluca*, Murray; 100 times the natural size.

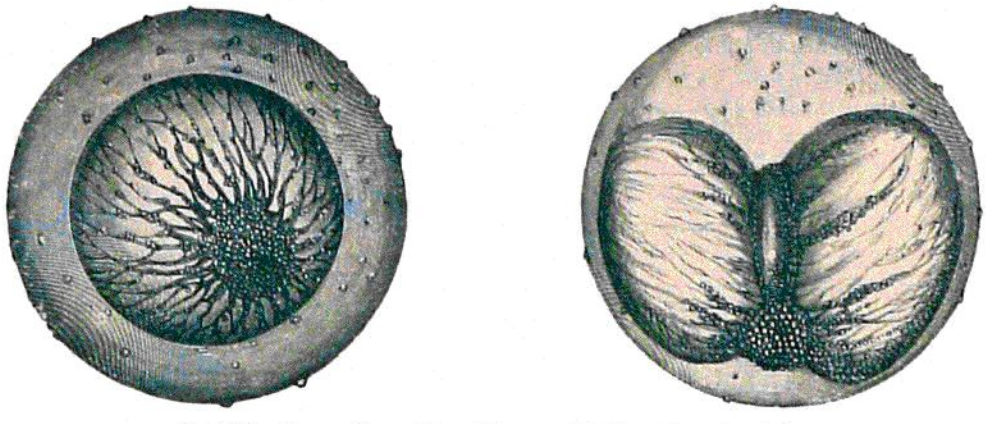

FIG. 336.—*Pyrocystis noctiluca*, Murray; 100 times the natural size.

"*Pyrocystis* is strongly phosphorescent, the light proceeding from the nucleus, and it is the chief source of the diffused phosphorescence of the sea in equatorial regions. It is especially abundant in the warmest waters of the tropics, the most brilliant displays of phosphorescence observed during the cruise being due to its presence in great