

the flagellated chambers in shape and size, and frequently occupy the place that would otherwise be taken by these chambers, but sometimes they project beyond the general surface of the sponge-lamella into the sinus of a canal.

In their earliest observed stage they exist as single, finely granular, deeply stained oval cells situated in the mesoderm, and about 0·0197 by 0·0158 mm. in size (Pl. XLI. fig. 13). This primitive oval cell by repeated segmentation gives rise to cells continually increasing in number and diminishing in size, till the mature spermatozoa are produced. The sperm-clusters lie within definite cavities of the mesoderm, lined by so-called endothelium; they are not provided with a "cover cell." The cavities are mostly larger than the clusters, owing to shrinkage consequent on preservation in spirits. The largest cluster of mature spermatozoa observed measured 0·045 mm. in diameter, the containing vesicle 0·064 mm.

Some of the commoner stages represented furnish the following characters. In a cluster 0·032 mm. in diameter, the cells are spherical granular bodies 0·0079 mm. in diameter, with a clear vesicular nucleus and small deeply stained spherical nucleolus. In more advanced clusters 0·04 mm. in diameter, the cells have diminished to 0·004 mm. in diameter, the general protoplasm is much diminished in quantity, the nucleus with its darkly stained nucleolus constituting the greater part of the cell. In still more advanced stages scarcely anything but nucleus and nucleolus remain, the little spherical cells now measure 0·002 mm. in diameter. Finally we meet with the mature spermatozoa, the heads of a round or oval outline, 0·001 mm. in diameter, furnished with tails, the length of which it was not found possible to measure (Pl. XLI. fig. 20). The head has every appearance of being the transformed nucleolus.

*Problematical Body* (Pl. XLI. fig. 21).—Occupying a position similar to that in which the sperm clusters occur, and deceptively similar to them in structure, is a curious little body of which a series of sections were obtained, one of which is shown in the figure. It is a spherical cluster of cells, each of which measures about 0·008 to 0·01 mm. in diameter; their outline is circular or oval, and they consist of very faintly stained protoplasm, embedding a large oval deeply stained nucleus, 0·003 mm. in diameter, and one or more small, deeply stained granules, which are surrounded by a clear spherical space. That this is not a cluster of developing sperm-cells, is shown by the presence of a structureless, colourless, transparent membrane, within which the cell-aggregate is enclosed. By this feature also the possibility of its being a segmenting ovum of the sponge is excluded; and it would appear to be a stage in the segmentation of the ovum of some other organism foreign to the sponge.