

are so abundant as to apparently constitute the main portion of the collenchyma, through which they are evenly distributed; they are also common in the choanosome. Abundantly present along with these problematical cells in the ectosome are examples of a species of Diatomacea. Seen longitudinally (Pl. XV. fig. 19) they present an oblong outline with rounded angles, the largest measuring 0.13 by 0.24 mm., in transverse section (Pl. XV. fig. 18) they are square or oblong with rounded corners. Lying closely along the sides of the test are the remains of diatom bodies, more or less oval in outline, with strongly marked annular margins, measuring from 0.006 to 0.01 by 0.004 mm. in length and breadth; protoplasm in any other form is absent. When first examined in glycerine great perplexity was felt as to the true nature of these structures; the sections did not give clear evidence of the bivalvular structure of the test, and it was taken for a cellulose cell-wall. Schulze's solution, however, gave no cellulose reaction, and the absence of starch in the contained bodies was indicated by iodine. Balsam preparations suggested a siliceous nature for the test, and on boiling out in nitric acid on a glass slide, this suggestion was confirmed; the test was then found to consist of two closely applied valves, which present by this mode of preparation a more oval outline than when mounted in glycerine. The closest examination, however, failed to reveal the slightest trace of any surface ornamentation. The species is apparently new, the genus probably *Amphora*; I propose to name it *Amphora archeri*.

The epithelial surfaces of the sponge are very usually raised into spine-like or hair-like projections, which in glycerine preparations look remarkably similar to sense-hairs or palpocils. Sometimes these projections are less concave in their curvature, and blunter than usual, as represented in Pl. XV. fig. 13. A small nucleus and nucleolus can usually be distinguished within and beneath them, and sometimes a fusiform cell or one of the processes of a stellate collencyte, directed at right angles to the epithelial surface, enters them. On comparing the glycerine with balsam preparations one finds that these spine-like eminences of the epithelium are produced by the actines of the underlying asters; and, from the association of a single epithelial nucleus with each projection, it looks as though only a single epithelial cell took part in the formation of the latter. I was able to trace the continuity of epithelial with underlying mesodermal cells in several instances; in some cases (Pl. XV. fig. 17) the epithelium was retracted into the mesoderm in little funnel-shaped pits, the blind end of which was continued into a densely stained conical cell about 0.006 mm. long, containing a small nucleus, and prolonged inwards as a fine fibril about 0.023 mm. long. In other cases a somewhat pyriform cell, with a large central cavity enclosing a deeply stained nucleus, was seen in immediate contact with the epithelial surface on the one hand, and extended as a slender, deeply stained fibril, 0.028 mm. in length, on the other.

*The Skeleton.*—The spicular fibres are closely packed to form a dense skeleton. They radiate from an excentric origin, indicated near the right hand bottom corner of the cut