

invested by the outer epithelium, below which, as in the adult sponge, is a single layer of minute spherasters. Beneath the ectosome lie the subdermal cavities (Pl. XVI. fig. 15), about 0.161 mm. high, measured radially, and of very various widths. The pillars between the adjacent cavities are in many cases devoid of flagellated chambers, in others the chambers extend more than halfway into them; the boundary between the ectosome and the choanosome is therefore inconstant and ill defined. All the forms of spicules which the sponge will at any time possess are already developed, but the oxyasters are very rare, and are evidently later developments than the spherasters; the other spicules also, except the spherasters, are very much smaller than in the adult, and of quite different proportions. The dichotriænes, the cladomes of which already support the ectosome, have thus a very different appearance from that which they present later, but almost precisely resemble the young dichotriæne of *Thenca*. The smallest measured presented a rhabdome 0.039 mm., protocladi 0.013 mm., and deutero-cladi 0.045 mm. in length; thus the deutero-cladi alone are longer than the rhabdome, and an entire dichocladus is almost twice as long. In the fully grown sponge, on the other hand, the rhabdome is about seven times the length of the dichocladus; in other words, while the dichocladus increases in length about seven times, the rhabdome increases almost ninety times in passing from the young to the adult state; at the same time the protocladi increase in length relatively to the deutero-cladi; in the young sponge the latter are about three times the length of the former, in the adult not more than twice.

In this stage the young sponge forcibly reminds one of a *Thenca*, and from a young *Thenca* only essentially differs in the characters of the asters, and in the presence of a sarcenchymatous mesoderm.

The young sponge (Pl. XVI. fig. 17)¹ next to be described was very fortunately orientated with regard to the plane of the razor, and, owing to this, reveals in the clearest manner the relation of the chones and subdermal cavities to each other, as well as the nature of the canal system generally. It was considerably larger than the preceding, about 1.1 by 1.27 mm., but still approximately spherical. The ectosome forms a continuous layer of unequal thickness, about 0.1 mm. on an average, entirely surrounding the sponge; within it the choanosome is seen as a strongly folded layer, connected with the ectosome only where the outer crests of the folds become continuous with it. The outside sinuses of the folds are the incurrent canals not yet differentiated from the subdermal cavities, which are now merely the broad outer ends of the outer sinuses bounded by the ectosome and by the pillars through which this and the choanosome pass into each other. The inside sinuses of the folds are the excurrent canals, and the common cavity with which they are continuous is the remains of the paragaster, which communicates with the exterior by a single oscule.

¹ A woodcut in which the structure represented in this figure is worked out in greater detail is given in the introduction.