

with long bent cladi arise. But it is a rule amongst sponges that bending is a precursor to budding or bifurcating; a bud thus arises at the point of flexure, and a bifurcate cladus is the result (Fig. 1E). Thus the various forms of triænes which characterise this sponge may be explained as special modifications produced by the special mechanical conditions involved in the structure of the cloacal tube. The diænes with a single bifurcate cladus might be regarded as reduced forms derived from dichotriænes like those of *Theneca*. Thus let the figure (Fig. 1F) represent the cladome of a dichotriæne seen in plan; if all the cladi except those shown by heavy lines be suppressed we shall obtain the diæne of *Tethyopsis*. I by no means deny the possibility of such an origin, but regard it at the same time as less probable, for not only do the conjecturally least modified triænes of the cortex present no trace of bifurcation, but in *Tribrachium*, the nearest ally of this sponge, they are similarly absent. (Since writing this I find however that dichotriænes are sometimes present in *Tribrachium* in the cortex near the base of the cloacal tube, and so far the probabilities in favour of a dichotriæne origin of the diænes are increased.) Moreover, they are confined in the sponge under consideration to special regions, and are exactly adapted to the circumstances under which they there occur; the point of bifurcation of the cladus is invariably situated at the point of rapid flexure of the circumference of the excurrent canal, and the relative lengths of the proto- and deuterocladi alter according to the distance of this point from the cladal origin. Finally, a whole series of gradations can be traced between the usual monæne and the diæne with one dichoclodus. The importance of this contention is obvious, for if the conclusions here reached be held correct, we have additional evidence in favour of the origin of similar forms of spicules, and by equal reason of other structures, from different ancestors, but under similar mechanical conditions.

Besides cladoxeas, oxeas are present in cloacal tubes of the stage of four, but not in that of sixteen (fifteen); they lie in the walls of the excurrent tubes longitudinally, and where these tubes form the outer wall of the cloacal tube, they lie both longitudinally and transversely, parallel to the surface, like those of the incurrent conditus.

The lumen or canal of the excurrent tubes is much narrower than the spicular wall, within which it lies more or less concentrically (Pl. XVIII. figs. 18, 19). The face of this canal is lined with epithelium and its sanidasters, and between it and the collenchymatous layer of the spicular wall run connecting strands and fenestrated lamellæ of collenchyma coated with epithelium, beneath which sanidasters occur, but less densely than usual; on the other hand additional spicular elements, the orthodragmas, make their appearance within the collenchyma. The collenchymatous strands and lamella are so disposed, radiating between the inner and outer walls of the canals, curving, branching and anastomosing, as to subdivide the intervening space into widely communicating more or less vesicular lacunæ. The collenchyma of the spicular wall also is fenestrated, so