

lipogastrism and lipostomism already indicated. There is always a single oscule in *Anthastra pulchra*, but, while always small, it varies considerably in size, and sometimes becomes so minute that it requires properly orientated thin slices to find it. In correspondence with the reduction of the oscule we find a reduction in the size of the main excurrent canals.

Passing to *Anthastra communis*, we find that the oscule has disappeared, being represented either by small ostia or most commonly by pore-sieves; the large excurrent canals are also reduced and have usually disappeared. The explanation which suggests itself is as follows:—With the reduction in size of the oscule the pressure within the excurrent canals (the size of the sponge, area of the pores, and extent of the flagellated surface remaining unchanged) must be increased; but the passage of water through the sponge depends on the pressure over the excurrent face of a flagellated chamber being less than that on its incurrent face, and hence this increase of pressure must be reduced. Now the branches of the excurrent canals run radially in all radiate sponges towards the ectosome, interdigitating with the incurrent canals. Continued growth will cause them to enter the ectosome and reach the exterior. There they find already built up the ectosomal spicular framework, and consequently when they open to the exterior they do so through areas, fenestrated or simply perforated, like those already established in connection with the incurrent tubes. The branches of the excurrent tubes having now established communication with the exterior, water can as easily, probably more readily, escape through them than through the main canals, which thus become of secondary importance. With the growth of the choanosome these then become pressed together and are finally obliterated, the branches alone sufficing for an excurrent system.

The development of the protriænes and anatriænes, after their earliest appearance, can be readily followed in sections of this sponge. The cladomes lie one behind the other in the radial sheaves, forming a series in which progressively younger forms are encountered as we pass from its distal to its proximal end. The youngest observed forms occur at a distance of about 2·4 to 3·2 mm. from the outer surface. The youngest protriæne (Pl. XIII. fig. 16) commences with a swelling or tylus at the distal end of a uniaxial spicule (oxea), produced at the broad distal margin into three short conical spines, traversed by axial fibres; these spines are the rudiments of the adult cladi. The axial fibres are quite straight, and project outwards and forwards, at an angle of about 120° with the axis of the rhabdome. Thus at an early stage all the triænes of the sponge are provided with simple cladi. With growth the spines of the protriænes increase in size and maintain their original direction, or, in the specimens with cyathiform cladomes, curve slightly inwards as they extend forwards. They presently bifurcate, the deuterocladi first appearing as exceedingly short processes with rounded ends (Pl. XIII. fig. 18); both primary and secondary cladi continue to increase in size as they are traced distally, the latter both in length and thickness, the former apparently only in thickness.