

cases the extremity is conical and sharp (Pl. III. figs. 3-5) or simply rounded (Pl. III. figs. 7-9). It is either smooth or provided with small knobs. These prongs or knobs, which project obliquely outwards, give the ends the appearance of club-like thickenings (Pl. III. figs. 9, 12, 17, 20, 25), but this may be also exhibited by smooth extremities (Pl. III. figs. 10, 14).

The tuft of siliceous spicules, rooted in the mud, is formed of two essentially different kinds of spicules, the main difference between which may be shortly noted by the designations "pronged diacts" and "smooth pentacts." Both begin in an upper, pointed, smooth extremity, and run out into an anchor. But, while in the comparatively rare smooth pentacts the intersection of the axial canals lies in the centre of the four anchor teeth, which are always crossed at right angles, and while not only the long smooth anchor stalk, but also each of the four upwardly bent anchor teeth is traversed longitudinally by an axial canal (Pl. III. figs. 22, 23), the intersection of the axial canals in the pronged diacts does not occur in the greatly thickened inferior terminal knobs but somewhat above this in the spinose stalk (Pl. III. fig. 29). Inferiorly the axial canal runs out generally in a penicillate fashion into a variable number of diverging branches. The smooth anchor teeth of the prong-bearing diacts, which (to the number of three to eight or more) stand in a whorl on the side of the terminal knob, and project outwards or upwards, possess no axial canal (Pl. III. fig. 29), and are accordingly to be considered not as true rays, but only as lateral outgrowths like the prongs of the stalk. The tuft spicules may in full-grown specimens attain a length of 10 cm. or more. During growth they project downwards and outwards from the longitudinal bundles of fibres in the tube-walls, and spread out in a brush-like manner. A bending back of the fibres against the lateral walls of the tube does not normally occur. Predominant among the spicules which form the upper sieve-plate, and which are distinguished by their particularly firm union, are strong triacts with distorted angles, and diacts whose two rays either form a plain arch or an obtuse angle. Regular cruciform tetracts, or pentacts and hexacts, seldom occur here.

In addition to the spicules above referred to, which become for the most part firmly united, there are numerous isolated spicules in the parenchyma of the soft parts, as well as in both the limiting membranes. These compose the so-called flake-like tissue ("Flockengewebe" of authors). This designation is due to the resemblance which the heaps of such needles, liberated by maceration and dried, bear to flakes of snow. As the age of the sponge increases some of them become cemented together, while others remain isolated throughout life. Among the former are numerous delicate spicules with a variable number of rays, but for the most part triacts, which in their whole appearance resemble the long and thin comital spicules above referred to, but which possess outwardly bent rays not so long as those of the comitalia (Pl. III. fig 25). The spicules which always remain isolated may be classed in the following five groups:—(1) parenchyma spicules, which are distinguished by thick, short, pointed rays, uniformly conical towards the outside ;