

beams are crossed on the one hand by long spiral fibres, which run parallel to the edge of the ridges, and on the other hand by small short beams, which run through the ridges transversely. The ridges are doubtless to be regarded as folds of that part of the tube-wall which extends over those meshes of the inner quadrate lattice-work not occupied by parietal gaps, and which is supported by spiral fibres crossing one another obliquely. The long ridge-fibres running parallel to the margin are to be looked upon as a direct continuation of one of the two systems of spiral fibres, which cross one another obliquely, and further, the rafter-like beams which intersect the former at right angles are to be ascribed to the other system of those spiral bands. The latter appear in the ridges as if laid in a fold sharply involuted on the outer extremity (Pl. II. fig. 8).

The strong circular and longitudinal fibrous bands, which are so manifest on the inner side of the macerated tube, have for their groundwork the much drawn-out, strong rays of the regular, simple and cruciform tetracts. These are interwoven in a peculiar manner, and become subsequently firmly united by cementing matter and synapticula. While all the circularly arranged rays of these tetracts run along the inner side of the tube, the longitudinal rays on the other hand lie transversely across the outside, and all the rays extend over several adjacent tetracts, thus producing the interlacing which is suggested in Pl. II. fig. 2. The long siliceous fibres which form the basal tuft join the longitudinal beams of the quadrate network externally, from the commencement of the inferior third portion of the tube.

The narrow, much prolonged comital spicules, which are closely applied by the two long rays of their principal axis, partly to the circular rays and partly to the longitudinal rays of the large tetracts, and which at a later period become fused together, are for the most part triacts (Pl. II. fig. 4; Pl. III. fig. 12), whose unpaired ray is continued into the oblique spiral bands of the tube-wall, or contributes to the formation of the ridges. More rarely the comital spicules are diacts or irregular tetracts, in which the longer rays lie in one and the same axis, while the two other shorter rays are placed at right angles to one another (Pl. III. fig. 20).

The oblique spiral bands of fibres which extend over the covered meshes of the quadrate network, and the firm margins of the parietal gaps, are chiefly composed of the long principal axes of triacts. Here and there irregular tetracts also occur, and diacts whose atrophied transverse axes are usually more or less prominent owing to the presence of prongs.

Pentacts and hexacts are less frequently found among the thread-like elongated spicules (Pl. III. fig. 17).

The extremities of all those needles, which are subsequently firmly united, exhibit remarkable modifications, a few of which are figured on Pl. III. figs. 2-10. The rays seldom run out to a point, with a gradual decrease of diameter (Pl. III. fig. 2); in most