

## ARRANGEMENT AND DISTRIBUTION OF THE SPICULES.

## I. MICROSCLERES.

In *Placina monolopha*, simplest of the Tetractinellida, microscleres of two orders of size present; the smaller are monolopous microcalthrops, and these are distributed immediately beneath the epithelial surface of the sponge, chiefly occurring beneath the epithelium of the outer skin; the larger are microcalthrops, microtriodes, and microxeas, these are densely and uniformly distributed throughout the mesoderm, lying in contact with the flagellated chambers, to which their actines are tangential. A similar distribution occurs in *Epallax callocyathus* (q. v., Appendix, p. 423, Pl. X. fig. 11).

In *Placina dilopha* the lophose actines are obliquely directed outwards towards the external surface of the sponge; in *Placina trilopha* the three lophose actines are directed towards the outer surface, so that this spicule is orientated like a trichotriæne, which it closely resembles; in *Thrombus challengerii* the trichotriænes are similarly directed when they lie near the exterior of the sponge, but in the choanosome they are dispersed without any approach to regularity.

In most of the Theneidæ microscleres of three orders of size are present, the smallest, spirasters or amphiasters, usually occur immediately beneath the epithelial surfaces, thus occupying a similar position to the smallest microscleres in *Placina* (occasionally they present forms suggestive of derivation from a lophose calthrops), those of intermediate size, the metasters, have much the same position; the largest (plesiasters, euasters, or microxeas) are however no longer related to the flagellated chambers, but rather to the walls of the canals, to which their actines most frequently are tangential (Pl. VII. fig. 2). In the remaining groups a relation between the orientation of the microsclere and the flagellated chambers is seldom to be traced.

With the differentiation of the sponge into ectosome and choanosome a differentiation of the microscleres is usually associated; thus in the Tetillid, *Chrotella macellata*, ectosomal are to be distinguished from choanosomal microscleres; in the Stellettidæ and Geodiidæ, however, the chief distinction is into somal and choanosomal; the microscleres which lie immediately beneath the epithelium of the cortex also occur throughout the choanosome, hence they are somal; though they have so much the appearance of distinguishing the ectosome that by a slip (*lapsus calami*) they may sometimes be referred to as ectosomal. On the other hand, in the large majority of the Euastrosa a special variety of microsclere is confined to the choanosome, and this will be termed choanosomal. Sometimes in addition a special form of microsclere occurs both in the cortex and choanosome, but is restricted to the region surrounding the subcortical crypts; these will be termed subcortical.

In the Sterraastrosa the characteristic sterraster is present in addition to somal, choanosomal, and subcortical asters; it occurs in all stages of development, scattered irregularly in the choanosome, but when adult it passes into the cortex, where it unites with its