

1. *Microoxea*.—A minute oxea which may be smooth (Fig. XII., η) or spined (Fig. XII., γ), centrotylote (Fig. XII., ζ) or not.

2. *Microstrongyle*.—A minute strongyle, smooth, or spined, centrotylote or not (Fig. XII., μ). This spicule is the "bacillus" of Carter. The centrotyle in both forms of microrabd represents the centrum of the aster from which it has been derived. These spicules are of polyphyletic origin, an aster in one genus of sponge being represented by a microrabd derived from it in another closely related genus.

PHYLOGENY OF THE SCLERES OF THE DEMOSPONGIÆ.

The megascleres in their ontogenetic development commence as very minute spicules, which if their growth were arrested would be indistinguishable from microscleres; the leading forms of the megascleres are repeated by the microscleres; and in the simplest Tetractinellid sponges the skeleton consists wholly of microscleres, without any admixture of megascleres. On these and *à priori* grounds we may fairly infer that the megascleres have a microscleral origin. The interest attaching to the microscleres is in inverse ratio to their size; they not only represent the primitive material from which the megascleres have been derived by increased growth and mechanical selection, but they present among themselves most perfect transitional series which help us to understand the history and causation of spicular forms; while last but not least they reveal in an unexpected manner the filiation between the different families of sponges constituting the order Demospongiæ.

The simplest form of microsclere is probably the globule, which occurs associated with the sigmaspires of the genus *Tetilla*, and next to this the sigmaspires themselves. Within the family Tetillidæ the sigmaspire presents but slight modifications, but those which do occur are of great interest.

1. The transition from the sigmaspire to the toxaspire can be traced in *Chrotella macellata* (*vide* p. 20).

2. From the sigmaspire to a curved microstrongyle in *Tetilla stipitata*, Carter (*vide* p. 49).

3. In *Tetilla geniculata*, Marenzeller (p. 46), the sigmaspire is centrally tylote. This seems to point to the globule as the original form of the sigmaspire, the central tylus representing the persistent globule.

4. In *Tetilla japonica*, Lampe (p. 46), and in *Craniella atropurpurea*, Carter (p. 50), the sigmaspire becomes spined, and in the latter of the two sponges it acquires an unusually large size, though the spines remain small in proportion to the spire. The largest spines, however, occur at the termination of the spire and thus suggest a tendency towards the Desmacidine chela.

In Demospongiæ which are not Tetractinellida we meet with sigmas, which may be