

others, such as *Pacillastra*, *Characella*, and *Sphinctrella*. So too in the Stellettidæ a radial arrangement is characteristic, but an exception is presented by the genus *Stryphnus*; in the Geodiidæ also the genera *Erylus*, *Caminus*, and *Pachymatisma* are non-radiate. In the Sigmatophora the arrangement of the spicules is best known in the family Tetillidæ; throughout this group it is radial, but in the lower forms, such as some of the species of *Tetilla*, the radial spicules are often crossed by numerous others concentrically arranged. From these examples, particularly that of the Theneidæ, it would appear that the disposition of the spicules is a character which cannot be relied on for family distinctions.

Finally, as regards the sigmaspire, this is the most constant next to the protriæne with regard to form, but it is one of the least constant as to occurrence; it, or some obvious modification of it, is always present when microscleres are present at all; it may pass into a microstrongyle by straightening out and increasing in size, but in the only species in which this modification occurs the normal sigmaspire is present as well; it may also develop an additional half-turn and pass into a toxaspire, the normal sigmaspire in this case also persisting along with its modification; or finally it may become sparsely spined and thus approach the spiraster, but it is never replaced by a true aster. Thus, when present, the sigmaspire is characteristic; on the other hand it may fail altogether, so that allied species otherwise precisely similar may differ solely by the presence or absence of the sigmaspire,¹ e.g., *Craniella cranium*, in which it is present, and *Craniella zetlandica*, in which it is absent. So similar in all other respects are these two species that but for the absence of sigmaspires in the one they could not be distinguished; and I should have been inclined to regard the absence of the sigmaspire as accidental, were it not that the young sponges, while still within the body of the parent, present the same difference as the adults, a fact first stated by Carter, and for which I can vouch, having seen Mr. Carter's specimens.

Now, while the occasional absence of the sigmaspire diminishes its value, in so far that it proves to be a guide which may at a pinch desert us, it does not by any means impeach its trustworthiness when present, and if we attempt to follow it in other groups of Sponges which are not Tetractinellids (see Appendix II. p. 413) we shall have to bear in mind that in the Tetillidæ it is not so much its absence but its truthfulness when present that is of importance.

The first application of this result was made in the case of the genus *Samus*, Gray; before I had seen a specimen of this Sponge its systematic position was to me most perplexing, but directly its spicules were before me I recognised at once the characteristic sigmaspire, and my thoughts naturally reverted to the Tetillidæ; clearly, however, *Samus* cannot be placed in this family, it differs in the absence of oxeas, of

¹ Does this suggest that the sigmaspire is the final and waning term of a degenerating series of microscleres, commencing with an aster and proceeding downwards through the spiraster? It would be surprising were this so, considering the other characters of the Tetillidæ.