

derived allies the Monaxonia and horny sponges the regular four-rayed form (spanische Reiter), and in the Triaxonia (Hexactinellida) the regular six-rayed spicule, it seems to me of essential importance to note the difference of the architecture of the soft parts in these three principal groups.

The Ascones, which may be regarded as the starting group in the calcareous sponge series, exhibit, as is well known, in the simplest instance, a fixed thin-walled tube open at the free end, and with its side wall penetrated by uniformly distributed circular pores.

In the much-varied group of Tetraxonia and their descendants we may consider the typical form as that of a thick-walled cup, in the compact wall of which roundish or quite spherical ciliated chambers lie crowded together like the acini in an acinose gland. Such at least are most of the Tetractinellida and Lithistida, numerous Monactinellida and horny sponges, though deviations also occur, as in the flat crusts of many Plakinidæ, which can hardly be regarded, however, as typical or primitive forms.

The typical structure of the Hexactinellida is very different.

The exceedingly loose wall of the typically sack-shaped body exhibits, between two abundantly penetrated, thin, parallel bounding lamellæ, a single layer of large, sack-shaped, ciliated chambers, connected both with the outer dermal and inner gastral membrane by a trabecular system of thin thread-like strands. In simple and young forms these thin connective-tissue trabeculæ run predominantly in a radial direction between the chamber-layer and the two limiting lamellæ, or directly between the latter, and are usually so closely united with one another by tangential uniting strands that one usually observes six threads at right angles to one another at each node of intersection. This simplest structure is not of course persistent throughout. And in many cases, doubtless, the insufficient preservation of the soft parts does not permit of the recognition of the original disposition of the trabeculæ.

Let us now consider how the spicules, regarded as typical and primitively characteristic, are disposed in the very variously constituted tissue of these three divisions of sponges.

The regular three-rayed spicules of the Ascones are well known to occur tangentially embedded in the wall of the tube, and in such a way that one ray lies parallel to the axis directed backwards towards the base, while the two others run obliquely forwards and to the side, each usually embracing a parietal pore posteriorly.

In the Tetraxonia the typical regular tetracts lie in their simplest and most normal form between the spherical ciliated chambers, while, as a rule, the regions without chambers, viz., the margin, basis, and neighbourhood of the large canals, contain more or less markedly differentiated spicules.

In the Triaxonia (Hexactinellida), finally, the typical regular hexacts are found almost exclusively in the strands of the trabecular framework, while in the chamber-wall