

The illustration (Pl. XXX. fig. 17) represents the spongin uniting two crossed spicules as granular—it is not really so; and the margins of a spongin mass are usually more sharply marked than in the illustration.

*Development of the Desma.*—The desmas commence within a large mother-cell as minute calthrope with cylindrical actines (Pl. XXX. figs. 20, 21), the surface of the spicule presents the eroded appearance characteristic of most very young forms of spicules; its actines measure about 0·016 mm. in length, and an axial fibre extends from their origin to their termination, so that the whole spicule is moulded on a tetrad axis. In this stage it resembles the young calthrope of *Dercitus* and its allies. The mother-cell, about 0·028 mm. in diameter, consists of granular protoplasm, which stains deeply with reagents, and presents an oval nucleus, about 0·008 mm. in diameter, with a small, spherical nucleolus. It now occupies (after treatment) a cavity in the granular collenchyma. In the next stage, when the actines are about 0·06 mm. long, the characteristic form of the central part of the adult spicule has already originated. The young actines have now the form of triangular daggers with hollow faces (Pl. XXIX. figs. 8, 8a-b), and may be readily represented by folding a triangle of paper into a three-sided pyramid, and pinching in the sides; if four such pyramids be joined together at their bases, so that their edges are confluent, a model of the young spicule will be produced. The model will be exact except in one particular, it will not represent the webbing of the angles of the young spicule produced by an extension outwards of the confluent ridges. This feature may readily be added to the model by gumming triangles of paper with a concave base across the angles, so that the concave curve continues the direction of the ridges. The young spicule still presents a deeply eroded surface, the pits frequently perforating it, so that it looks almost like a network of silica rather than a solid structure. With further growth the erosion disappears, the surface becomes smooth and even, the sharp edges of the actines thicken into rounded ridges, the triradiate depressions about the centre become circumscribed, and finally, towards the distal extremities, the actines or epactines, as we may now call them, assume a cylindrical form, and, sometimes bifurcating, sometimes not, break out into the tubercles characteristic of the adult. The tubercles are at first slender, somewhat twig-like processes, and their intergrowth takes place in the following manner:—The contiguous epactines or their cladi are covered with tubercles on their apposed faces, and owing to their numbers, proximity, and direction of growth, they cannot enlarge unhindered—they are constantly encountering one another. A very general case is where one tubercle in its forward growth is hindered by another growing at right angles to it, so that the side of the latter is opposed to the growing end of the former; this in consequence subdivides, or becomes bifid, and continuing its onward direction it encloses its opponent on each side. The increase in thickness of both the enclosing tubercle and its opponent, which it has taken prisoner, leads to a mutual adaptation of the closest kind, though, however close it may become, a thin film of tissue