

rather slender, fusiform cells. These cells are highly granular, and often multipolar, differing really but very slightly from the ordinary mesodermal cells which occur in the ground tissue of this sponge, save for their great elongation in one particular direction (*cf.* Pl. XLIX. fig. 2). They commonly measure about 0·048 by 0·007 mm., and in some cases there appears to be a nucleus in the centre of the cell. The spongin uniting the spicules together is distinct but not very abundant.

In *Suberites perfectus* there is, as is usually the case in the Clavulina, no trace of spongin. But the skeleton fibres are accompanied and apparently held together by dense bands of very strongly fibrous connective tissue (Pl. L. figs. 2, *f.t.*, 2*a*, 2*b*). Scattered fairly abundantly through this tissue are a number of fusiform, elongated, more or less granular bodies, more numerous in some parts than in others (Pl. L. figs. 2*a*, 2*b*, *g*). The bands of fibrous connective tissue are directly continuous with the fibrous cortex.

The data before us are perhaps too scanty to justify any wide generalisation, but it is a significant fact that in *Suberites perfectus*, where there is no spongin to hold the spicules together, the fibrous element of the surrounding connective tissue is very strongly developed, and the granular element comparatively feebly developed, while in *Raspailia tenuis*, in which there is a very great deal of spongin, and hence no need for fibrous tissue to unite the spicules, exactly the reverse is the case. The other species mentioned, *viz.*, *Esperiopsis challengerii*, *Axinella* (?) *paradoxa* and *Acanthella pulcherrima*, occupy intermediate positions between these two extremes, both with regard to the amount of spongin present and with regard to the degree of development of the granular and fibrous elements of the connective tissue respectively.

In explanation of these facts we would venture to suggest that in *Raspailia tenuis* and other species where spongin is present, surrounded by highly granular, specially modified, mesodermal elements, the latter secrete the former, and were themselves originally ordinary mesodermal cells, which have become slightly modified for the fulfilment of this special function. In other sponges (*e.g.*, *Dendrilla*), where there is a still greater development of spongin, these cells have become still more highly specialised and constitute the "spongoblasts" of the so-called Keratosa. These suggestions are in perfect harmony with the views now generally held as to the late appearance of spongin in the Porifera.

To sum up briefly, we may state that spongin is a secretion of mesodermal cells, which, originally indistinguishable from other mesodermal cells, have become under suitable conditions specially modified in form in order to fulfil their special function; and it is probable that, in at any rate some cases, these cells were derived from bands of fibrous connective tissue which accompanied the bands of spicules for the purpose of holding them together.

Coincidentally with the development of the spongin the fibrous tissue in some cases