means all, Monaxonid sponges unites the individual spicules into a coherent skeleton, and ultimately (in the so-called Keratosa) constitutes by itself the entire skeletal system. In chemical composition spongin has been found to resemble silk. Krukenberg has recently investigated it, and assigns to it the chemical formula $C_{30}H_{46}N_9O_{13}$.[1] Its physical characters and mode of occurrence in the sponge, however, concern us more in this place than its chemical composition. It is usually pale yellow or amber-coloured, and is arranged in concentric layers around the spicules which it unites together. Concerning its mode of formation in any sponges but true so-called Keratosa we have no actual observations. There can, however, be no doubt, from the analogy of the true Keratosa, and from its arrangement in concentric layers, that it is a secretion of glandular cells (spongoblasts). Our own histological investigations on the Challenger material throw some light upon this point. We have found, in a number of different Monaxonid sponges, sheaths of more or less fibrous connective tissue cells accompanying the fibres of the skeleton. This condition has been carefully observed by us in the following species:—*Esperiopsis challengeri*, *Axinella* (*?*) *paradoxa*, *Raspailia tenuis*, *Acanthella pulcherrima* and *Suberites perfectus*.

In *Esperiopsis challengeri*, where there is a fair amount of very pale coloured spongin, these cells are fairly abundant; they accompany the larger bands of spiculo-fibre in dense tracts, in which the individual cells lie close together side by side. They are fusiform, but apparently not usually very much elongated, measuring about 0·024 by 0·0096 mm.; occasionally, however, they seem to be drawn out into a fine, transparent thread at each end; they are highly granular and stain well with borax-carmine.

In *Raspailia tenuis* the cells in question are uncommonly well developed; and here there is also a very large amount of spongin. They occur in a thick but not densely packed sheath around the central axis, with which their longer axes are of course parallel (*vide* Pl. XLIX. figs. 1, 1*a*); they closely resemble those of *Esperiopsis challengeri* just described, and their form will be best understood from the figures. They average in size about 0·033 by 0·0096 mm. We have not succeeded in distinguishing a nucleus; the cells appear to be highly and uniformly granular throughout.

In *Acanthella pulcherrima* we have found similar granular cells scattered about fairly plentifully amongst the spicules, but not forming a definite zone around a central axis. The amount of spongin present is very small, but our thin, stained sections have demonstrated its presence beyond a doubt. Hence we cannot entirely agree with Schmidt, when he says[2] in his generic diagnosis "Parenchyma spisse impletum spiculis simplicibus longioribus, substantia firmiori non inclusis."

In *Axinella* (*?*) *paradoxa*, the fibrous tissue accompanying the bands of spicules is very highly developed (Pl. XLIX. fig. 2*a*). It is composed of very much elongated,

[1] *Cf.* Vosmaer, Bronn's Klass. u. Ordnung. d. Thierreichs, Porifera, p. 434. [2] Spong. Adriat. Meeres, p. 64.