

cavities stands in no insignificant ratio to the mass of its skeleton. In the figures (Pl. XXV.; Pl. XXVI. fig. 1) some of the cavities still filled with spicules are indicated, but many of those represented as empty were filled when the sponge was cut open, and afterwards cleared out to better understand the nature of the cavity. In a paper dealing with the formation of flints, I suggested (while ignorant of the deciduous nature of sponge spicules) the following analogy:¹—

“Excepting that sponges do not periodically shed their spicules like leaves and spores, the explanation we have just suggested bears a striking resemblance to the ‘growth in place’ theory of our coal beds. In the coal, as in the flints, the structure of the constituents has generally been almost entirely obliterated, yet some few of the leaves or spicules, as the case may be, are occasionally found in an admirable state of preservation; and just as a *Sigillaria* every now and again remains a solitary survivor of a whole forest, so now and then a whole sponge is to be found preserved out of a host of associates now vanished or turned into flint.”

It would now seem (leaving out the word “periodically”) that the exception with which I guarded this analogy disappears, and the source of the silica of flints becomes less perplexing. At the quiet bottom of a chalk sea the spicules as they were shed would remain strewn around the parent sponge, and undergoing solution from the moment they were liberated, would commence the transformation of chalk into flint *pari passu* with the life of the sponge.

The cortex of the sponge is about 0·8 mm. thick (Pl. XXVI. figs. 11–13). It consists almost entirely of the sterrastral layer, covered externally by a layer of subepithelial chiasters. Small oxeas project from its outer surface in the neighbourhood of the pores, and the cladomes of the orthotriænes extend within the inner fibrous layer. The oscules are from 0·08 to 2·0 mm. in diameter. Although the sponge is a dried specimen, sections were cut from it in the usual way; the cribriform roof of the poral chones and the sphincters of the oscules were thus demonstrated (Pl. XXVI. figs. 11–13); it is a remarkable fact that the fibrous structure of the tissue binding together the sterrasters of the cortex and the fibrous structure of the inner layer of the cortex are still preserved; and not only so, but the fibres of the muscular sphincters, characteristically different from those of the inner cortex, and sometimes possessing a well-preserved nucleus, are distinguishable. Even indications of flagellated chambers are occasionally to be made out in the choanosome, and a vesicular character in the collenchyma, which occurs in the neighbourhood of the cortical layer of the sinuses of the wall. This latter layer is very thin, the sterrasters are accumulated to form a stratum 0·16 mm. thick, and beneath this follows a somewhat close accumulation of oxeate spicules, lying chiefly parallel with the surface, many with much enlarged canals. It appears as though these were dead spicules, on the way to be thrust out to the exterior.

¹ Sollas, On the Flint Nodules of the Trimmingham Chalk, *Ann. and Mag. Nat. Hist.*, ser. 5, vol. vi. p. 443, 1880.