more crowded together towards the outer epithelium, are found immediately outside it embedded in foreign matter which encrusts the surface; in *Calthropella simplex* a small spheraster occurs, and this is found scattered amongst the spicules of a small sponge, *Astropeplus pulcher* (p. 453), which incrusts it.

In *Cinachyra barbata* again the radical anatriænes are extruded in such profusion that they remain entangled together, forming a dense basal mass which serves as a support; a similar case is met with in *Thenea wyvillii;* the most conclusive proof, however, is furnished by *Synops neptuni* (p. 227), a sponge richly traversed by epochets, most of which are completely filled—"stuffed" would best express it—with deciduous spicules evidently derived from the sponge itself; this will appear from the fact, first, that they are all of the same shape and dimensions as those constituting the skeleton of the sponge, no admixture occurring either of foreign spicules or of the sedimentary detritus of the sea floor; and next, because there is no conceivable way by which these spicules could have been introduced into the epochets, except by extrusion from the sponge itself. The sponge is as much as 40 cm. high, and no one would think of invoking currents to introduce a pure gathering of spicules from the sea floor into labyrinthine cavities 30 to 40 cm. above it.

General evidence might very well have led us to conclude that an extrication of spicules from the living sponge really occurs, but nothing less than direct observation of the actual process could have furnished such conclusive proof as that afforded by the preceding instance, and even direct observation, unless long continued, would not have given us so clear an idea of the surprisingly large quantity of spicules which are thus cast out.

That this process must have an important bearing on the question of the origin of flints is obvious, and some remarks under this head will be found on p. 280.

Source of the Silica in Flints.—Since sponges have furnished some, and indeed no inconsiderable portion of the silica of flints, it becomes of interest to determine in a few instances the quantity of silica present in a sponge as compared with its total bulk, and hence if possible to frame an estimate of the time that would be required for the formation of a bed of flints.

The first step is to determine the total bulk of the sponge, including all contained cavities; various methods were devised to accomplish this, all giving more or less concordant results, but the following was found to be the simplest and least inaccurate:—A spirit specimen was transferred from alcohol to distilled water which was repeatedly changed till all traces of alcohol were removed. It was then totally immersed by means of a wire cage in well-boiled water contained in a weighing bottle, and the bottle and its contents were weighed; the sponge was then removed in its wire cage, the cage returned to the bottle, and a second weighing gave by difference the weight of the sponge together with that of the water which filled its interstices and coated its surface; in the case of densely hirsute sponges, the results would from capillarity have been too high, such sponges were therefore somewhat differently treated; after removal from a beaker of