verse bundles, which run irregularly and usually form anastomoses; the dermal ostia are usually irregularly distributed between them. At the upper end is a strongly injured sieve-like plate which is not so distinct from the tissue of the wall as in *Euplectella*. This trabecular network seemed to Marshall to consist of unsoldered spicules. The loose mass of spicules lies on the inner side of the lattice, and consists of uniaxial spicules 1 to 10 mm. long, slender daggers, weak five or six-rayed forms with irregularly developed rays, very small spicules with several rays (three to six), spicules with compressed rays and similarly formed diacts which are like a compass needle. Hexacts with axes, from 0·2 to 0·3 mm. long, which bear at the end of each ray an umbel with seven rays, are especially characteristic. Finally, there were found five-rayed spicules and floricomes which could not be distinguished from those of *Euplectella*.

Genus 3. *Dictyocalyx*, n. gen.

This genus contains only the one species, *Dictyocalyx gracilis*.

Dictyocalyx gracilis, n. sp. (Pl. XII. figs. 1–7).

The framework of siliceous beams, which is shown in its natural size, from a photograph, in Pl. XII. fig. 1, was trawled in the South Pacific (lat. 22° 21′ S., long. 150° 17′ W.) from a depth of 2385 fathoms, and a red clay bottom (Station 281). From a compact conical basis, which has been attached to some solid body by a basal surface of 5 mm. in breadth, and which is narrowed upwards to a diameter of 3 mm., there arises an irregular retiform framework of beams, resulting in a cup-like form, 25 mm. in length, and about 18 mm. in width above. One of the sides appears to have opened inferiorly, and to have been again closed above.

The beams of this framework, where they spring from the massive base, measure from 2 to 3 mm. in thickness, but become thinner upwards by gradual ramification. They consist of greatly prolonged spicules, which vary in the number of their rays, but which are for the most parts diacts, cemented externally in a quite irregular fashion. In the meshy conical basal portion numerous hexacts occur, soldered between the larger beams.

After a more careful examination of the entire specimen I detected in various places, but especially at the points of union of several intersecting beams, small patches of an adherent soft substance which partly covered the beams. Although such insignificant remnants of the soft body were no longer available for sections, it was still possible to detach them in small fragments from the lattice-like framework, and to detect in them a number of isolated spicules, which throw at least some light on the true character and systematic position of the sponge.