

continuous rod for 0·026 mm. along one cladus, and for about the same distance as a row of granules along the other. Just before it terminates, for a distance of 0·019 to 0·026 mm., it loses its regular even-sided, rod-like appearance, and presents an irregular, wrinkled, or alternately swollen and constricted outline. The concentric layers of opal of which the desma is built up (both in this sponge and in the Lithistida generally) appear in optical section as a number of longitudinal lines parallel to the axial rod, but just beyond its termination they unite across in front of the end of the axis in curved lines, from which it is evident that in the course of development of the desma the axial rod not only ceased to lengthen with the growth of the epactines, but that immediately it did so it became closed in by the completion of the mineral part of the desma in front of it. The subsequent growth of the desma, its formation of cladi, twigs, and syzygial tubercles, takes place therefore entirely independently of the axial fibre. An axial portion, however, is still to be traced through the twigs and branches. It consists of silica of different refractive index and different solubility to the outer coatings, and runs as a wide core, about 0·005 mm. in diameter, bounded by undulating, longitudinal lines, and crossed by transverse curved lines up to the commencement of the apophyses. It reminds one of the axial core of the spongin fibres of horny sponges.

2. *Dicho-* or *tricho-triæne* (Pl. XXXI. figs. 10, 10*a*, 10*b*). A short, straight, conical rhabdome, with a rounded point, cladi bifurcate, or trifurcate, or irregularly subdivided, with rounded points, proto- and deutero-cladi extending in one plane at right angles to the rhabdome. Rhabdome 0·15 mm. long, protocladi 0·026 mm., deuterocladi 0·25 mm. long.

3. *Oxea* (Pl. XXXI. fig. 8), fusiform, with rounded points, 2·28 by 0·026 mm.

II. Microsclere. 4. *Spiraster* (Pl. XXXI. figs. 9, 9*a*), a short, thick spire, with long spines spirally arranged round it; total length 0·045 mm., length of spire 0·013 mm., of spines 0·032 mm.

*Colour*.—Unknown; the specimen consists only of the skeleton, which is snow-white.

*Habitat*.—Station 173, off Matuka, Fiji Islands, July 24, 1874; lat. 19° 9' 35" S., long. 179° 41' 50" E.; depth, 315 fathoms; bottom, coral mud. Dredged.

*Remarks*.—The single specimen dredged of this sponge consists merely of the skeleton, from which all the soft parts, except a few shreds of yellowish material, which appear to be parts of the skin, have disappeared. It is from this "skin" that the dermal triænes and spirasters described above were obtained.

The sponge is of extreme interest, since it represents in existing seas the *Siphonia* and *Jerea* of the mesozoic era. With *Siphonia*, the first fossil Lithistid ever completely described and interpreted,<sup>1</sup> it agrees in all essential respects except, so far as one can judge from the broken character of the upper surface, in the absence of a deep central cloaca; in this respect it appears to resemble the genus *Jerea*, hence Schmidt's name

<sup>1</sup> Sollas, On the Structure and Affinities of the genus *Siphonia*, *Quart. Journ. Geol. Soc.*, p. 790, 1877.