exist in chemical union with the silica of the spicular opal. On heating with the Herapath the brown tint disappears, and the ignited silica is snow-white.

The total amount of water found in the different species experimented upon is given in percentages below :—

Choristida :—

Pachymatisma johnstonia, . 7·16

Anthastra communis, . . 6·6 (probably too low, the spicules were not freed from any foreign particles which might have been present).

Lithistida :—

Theonella swinhoei, . .	6·53	*Corallistes masoni*, . . .	6·23
Vetulina stalactites, . .	6·27	*Siphonidium ramosum*, . .	6·1

Monaxonida :—

Suberites suberea, . . 7·34

It will be seen that these results, which are not very different from those of Schulze, vary from 0·363 per cent. above, to 0·877 per cent. below that which is required for the formula $(SiO_2)_4OH_2$, the lowest result indeed better accords with the formula $(SiO_2)_5OH_2$, differing from what would be required for it by being 0·1 per cent. too high. The differences appear to be too great to be explained as errors of experiment, and for the present we may abandon the attempt to represent the composition of the spicular silica by any simple formula. It should be observed that the spicules experimented upon had been for several years in alcohol, and it would be worth while to ascertain whether in more recently obtained specimens, like those experimented upon by Thoulet, a larger proportion of water might not be present. As might naturally be expected, the spicules are extremely susceptible to the action of caustic potash, which attacks them even in the cold; thus the large oxeas of *Tethya lyncurium* left to stand for a night in a strong cold solution of caustic potash split up at their ends in a longitudinal direction (Pl. XLIV. fig. 16); the resulting fibres curl outwards away from each other as though under the influence of tension, which must be greater in the outer than the inner layers of spicules. When boiled for some hours in a strong solution of caustic potash, the Lithistid desmas undergo a curious change, so that they no longer decrepitate when strongly heated, but quietly lose their transparency and become white and opaque; with further boiling all the silica is removed, and a delicate transparent film remains behind which stains with magenta but dissolves with effervescence in hydrochloric acid, leaving only the slightest trace of residual matter.[1] Treated with hydrofluoric acid, the spicules of course readily dissolve; the effects of solution are most evident at the extremities of the spicules,

[1] Sollas, *Proc. Roy. Irish Acad.*, ser. 2, vol. iv. p. 490, 1885.