Bowerbank thought that he had discovered the great desideratum in the arrangement of the skeleton, and his subfamilies and genera were consequently made to depend solely upon this character. But a glance at his system shows the utter failure of such an attempt. Let us take an example from his work:[1]—"*Order II.* Silicea. *Suborder I.* Spiculo-radiate skeletons. Not reticulate. Composed of spicula radiating in fasciculi or separately from the base or axis of the sponge." In this suborder Bowerbank places the following genera:—

1. *Geodia* (Tetractinellid).
2. *Pachymatisma* (Tetractinellid).
3. *Ecionemia* (Tetractinellid).
4. *Alcyoncellum* (Hexactinellid).
5. *Polymastia* (Monaxonid).
6. *Halyphysema* (Foraminifer).
7. *Ciocalypta* (Monaxonid).
8. *Tethea* (partly Tetractinellid).
9. *Halicnemia* (Monaxonid?).
10. *Dictyocylindrus* (Monaxonid).
11. *Phakellia* (Monaxonid).
12. *Microciona* (Monaxonid).
13. *Hymeraphia* (Monaxonid).
14. *Hymedesmia* (Monaxonid).

Such is the result of applying the arrangement of the skeleton as a sole guide to the distinction of genera; we need say no more.

But although the arrangement of the skeleton cannot be applied by itself to the distinction of genera, yet it is by no means valueless as a guide to classification when taken in conjunction with other characters, especially when applied to larger subdivisions than genera. Thus, in the more careful and discriminating hands of Mr. Carter it has led to much better results; the Axinellidæ, Ectyoninæ, and Suberitidæ, being all characterised by special types of skeleton arrangement fairly constant within the group; still it is at the best an uncertain guide.

Hitherto a great deal of reliance has been placed upon the greater or less amount of spongin, or horny cementing material, present in the skeleton, but of late years this character also has been losing favour amongst spongologists. Indeed, as has already been pointed out, it is the great merit of Dr. Gray's system that in it the horny sponges are included amongst the Silicea. Dr. Gray was, however, a good deal in advance of his times in this respect. We hope to show in this place that even within the group of Monaxonida the amount of spongin present varies in such an irregular fashion as to be of comparatively little use for purposes of classification.

In all the Halichondrina spongin is usually present, and we find that the amount stands, roughly speaking, in inverse proportion to the number of spicules. Thus, taking first the Homorrhaphidæ, the division between the Renierinæ and Chalininæ is a purely arbitrary one; both groups contain more or less spongin, very few (if any) species even of Renierinæ containing none, while in the Chalininæ the amount is relatively very large.

[1] Mon. Brit. Spong., vol. i. pp. 159, 167, &c.