

be in many points quite artificial; but we must console ourselves with the impossibility of altering the matter, and although with respect to this group we have to deal with anatomical characters almost exclusively, we must ground upon them our systematic arrangements, proceeding, however, with all possible prudence, and bearing in mind the necessity of a critical attitude towards our own conclusions.

These general remarks will now be followed by more special observations as to the systematic value of various characters of the sponges in question. I begin with the properties of the skeleton. Its high systematic significance has always been recognised; what is more, it has been exaggerated. The systems of Duchassaing de Fonbressin and Michelotti,<sup>1</sup> of Gray,<sup>2</sup> Hyatt,<sup>3</sup> Carter,<sup>4</sup> are founded simply on its properties. In the diagnoses of the last-named naturalist, indeed, the "sarcode" is also very often spoken of; but these particulars might in almost all cases be omitted; and it is precisely owing to the circumstance that the former spongiologists were inclined to pay to the properties of the skeleton an exclusive attention, that its modifications for a long time past have been submitted to a careful study, and considerable differences in its structure discovered. It has been stated that while in some of the Keratose Sponges the horny fibres show no differentiation in their central and peripheral parts, the fibres of the skeleton of many others admit of a distinction into a central pith-substance ("Marksubstanz" of German authors) and of a horny laminar envelope; and while the *homogeneous* fibres are almost always more or less cored with foreign bodies, so that the horny substance shows in many instances a tendency to disappear entirely, the *heterogeneous* skeletal fibres, on the contrary, are in most cases quite free from any foreign enclosures. Finally, it has been stated that in certain sponges (*Ianthella*) the horny envelope of their skeletal fibres is charged with true cells (Flemming,<sup>5</sup> Carter<sup>6</sup>). To the first of these characters the greatest systematic significance has been repeatedly ascribed, and the two spongiologists to whom we owe the most elaborate systems of Keratosa (Carter and Hyatt) have made use of it in order to subdivide the group into two main divisions (Ceratina and Psammonemata, Carter; Aplysinæ and Sponginæ, Hyatt), which proceeding deserves a more detailed critical study, since we have recently learned from the spongiological writings of F. E. Schulze that the above-mentioned differences in the properties of the skeleton present a certain antagonism with regard to the internal structure of the soft parts, that both in Ceratina or Aplysinæ and Psammonemata or Sponginæ two types, or at least modifications, of the canal system, are to be seen. Schulze ascertained, in fact, that while an *Aplysina*, and on the other hand a *Euspongia* or *Cacospongia*, are characterised, in the organisation of their canal system, by comparatively small, round, or pear-shaped

<sup>1</sup> Spongiaires de la mer Caraïbe, Harlem 1864.

<sup>2</sup> *Proc. Zool. Soc. Lond.*, 1867, pp. 503, 508.

<sup>3</sup> Revision of the North American Poriferæ, *Boston Soc. Nat. Hist.*, 1875 and 1877.

<sup>4</sup> *Ann. and Mag. Nat. Hist.*, ser. 4, vol. xvi. pp. 132, 134-140, 1875.

<sup>5</sup> *Würzburger Verhandl.*, N. F., Bd. ii.

<sup>6</sup> *Ann. and Mag. Nat. Hist.*, ser. 5, vol. viii. p. 112, 1881.