

violent manner, being brought up from depths between 2000 and 2900 fathoms to the surface within a few hours. Even many deep-sea animals of much stronger texture are so injured by this sudden change that their soft tissues are more or less destroyed. The same must be the case in a much greater degree with such delicate tissues as the epithelia of Sponges and Hydroids.<sup>1</sup> A natural consequence of this circumstance is the fact that in all the Deep-sea Keratosa the epithelia (exodermal as well as entodermal) were more or less destroyed. No trace could be found anywhere of the outer covering pavement-epithelium of the exoderm. The peculiar flagellated epithelium of the entoderm was not distinctly recognisable in most of the specimens, and not fitted for finer examination; in several species, however, its presence could be made out with certainty. The state of preservation was generally better in the structures of the mesoderm and in the skeleton.

#### FAMILIES OF THE KERATOSA.

The numerous and very different forms of sponges, which are united by modern authors under the name Keratosa or Ceratina (Horny Sponges, Hornschwämme in German), are divided into a great number of genera, and these again collected into a small number of families. The characters and affinities of these families must be discussed here to a certain extent, seeing that only two of the four families in which I have disposed the Deep-sea Keratosa agree with those of shallow water, the other two being perfectly new.

Poléjaeff is the only modern author who holds that "the whole group of Keratosa is nothing more than a single family." He expresses this singular opinion in a very decisive manner, both in his Report on the Keratosa<sup>2</sup> and in his general notes on the Horny Sponges, incorporated in the Narrative of the Cruise.<sup>3</sup> These conceptions of Poléjaeff, as also many of his other systematic views, are quite incompatible with the phylogenetical principles of modern classification; they are, in my opinion, quite unnatural and dogmatical. This will be demonstrated in the remarks on classification, in the Appendix to this Report. Since no other spongiologist will follow the view of the Russian spongiologist, it need not be here refuted.

Two well-known spongiologists, Lendenfeld and Vosmaer, published independently in the year 1887 the Prodrômus of a new sponge-system, and since their opinions agree in the most important points, we may here consider together their classification of the Keratosa, passing over all the former attempts, which are critically discussed in the

<sup>1</sup> Compare the remarks on *Monocaulus* by Sir Wyville Thomson, in the Report on the Hydroida by Allman (Zool. Chall. Exp., pt. lxx. p. 6).

<sup>2</sup> Zool. Chall. Exp., pt. xxxi. p. 81.

<sup>3</sup> Narr. Chall. Exp., vol. i. p. 643.