of the ship. *Noctiluca miliaris*, various species of *Ceratium* and Diatoms were always present in great numbers, and in addition Copepods, Cirriped larvæ, Annelid larvæ, Hydromedusæ, *Appendicularia*, and *Diphyes*.

The Calcarea and Keratosa.—On the return of the Expedition to England, Dr. N. Poléjaeff, of the University of Odessa, undertook to prepare a Report on the collections of Calcareous and Horny Sponges, and his two separate Reports appear in the zoological series.[1] Dr. Poléjaeff gives the chief results of his investigations in the following notes:—"The adequate discussion of questions bearing upon geographical distribution as well as upon the relation of the deep-sea fauna to the fauna of the later geological periods is quite impossible as regards the Calcareous and Horny Sponges. Both the Calcarea and the Keratosa belong not to the deep-sea, but to the littoral, fauna, the greatest depth from which they have hitherto been obtained not exceeding 400 to 450 fathoms, and even this only in exceptional cases (*Leucosolenia blanca*, var. *bathybia*, *Leuconia crucifera*, *Cacospongia levis*, *Stelospongos longispinus*, *Verongia tenuissima*). Again, up to this time, there are in palæontological literature no trustworthy statements as to their occurrence in the earlier geological periods. The question as to whether the Pharetrones, or at least a part of them, are really to be referred to the Calcarea remains still open to discussion, and on the other hand the nature of a couple of fossils described by Zittel and Carter as Horny Sponges is no less ambiguous. Finally, and with regard to the geographical distribution of the two groups in question, it must be noticed that most of their representatives in the Challenger collection have been found to present new forms, almost every one of which is represented only by a single specimen, so that in this respect also no further conclusions and generalisations were possible. Accordingly the scientific investigation of the Challenger Calcarea and Keratosa was possible only from a purely zoological point of view.

"Apart from the systematic description of new forms, the chief results with regard to the Calcarea find their expression in the attempt to frame a new and more natural classification than that proposed by Ernst Haeckel in his splendid monograph Die Kalkschwämme. The necessity of this measure has been recognised for some years, but there was a want of conditions appropriate to its realisation, since the reformer ought also to have proved that the phylogenetic ideas on which Haeckel's system is based are false, the execution of this latter task involving, in its own turn, a similar proceeding with respect to many of his statements as to the anatomy of the Calcarea in general. Of course, numerous contributions to a more correct knowledge of their organisation and mutual affinities have long since been made, as for instance the statements of F. E. Schulze as to the impossibility of adopting Haeckel's strobiloid gemmation hypothesis of the origin of the Sycones from the Ascones. Again, what we have learned from

[1] Report on the Calcarea, Zool. Chall. Exp., part xxiv., 1883; Report on the Keratosa, *Ibid.*, part xxi., 1884.