

no one has tried to bring together what is known regarding the changes these communities undergo systematically and biologically in the direction from north to south, nor can we attempt to do so here in this brief sketch. We shall restrict ourselves to remarking merely that these communities follow the same laws which control the life of land and sea. They reach their highest development in the tropics; for every latitude from north to south we meet with new types both in the vegetal and in the animal kingdom. Still, it must be maintained that the littoral fauna and flora of fresh water, especially amongst the lower organisms, contain many cosmopolitan species, and that even amongst the higher a great many enjoy an extremely wide distribution.

With regard to the plankton communities our knowledge until about 1890 was very insignificant. In the last twenty years the investigation of the European fresh-water plankton has been carried out with great energy; some knowledge of the arctic and the tropical fresh-water plankton (especially that of the great African lakes) has been gained.

During the last ten years I have been much occupied with plankton studies, and in my work on *Plankton Investigations in the Danish Lakes, 1904-8* (Copenhagen), I have endeavoured to bring together all that could throw light on the life-histories of the plankton forms. In the following, in accordance with Sir John Murray's wishes, I shall try to give the main points of these investigations, taking as my starting-point one of the greatest peculiarities of the fresh-water plankton, viz. its cosmopolitanism. From this as basis and as a means to understanding the nature of this cosmopolitanism the opportunity is afforded of mentioning the lines of investigation which have in recent years specially occupied the investigators in this great field of work.

PART II.—THE PLANKTON COMMUNITIES, THEIR GEOGRAPHY AND LIFE-HISTORY

The fresh-water plankton is characterised by its well-marked cosmopolitanism. I consider this cosmopolitanism as an established fact for a great many plankton organisms, and I believe that it can be seen with distinctness from most of the plankton papers of recent times. This subject has been more closely discussed in chap. xii. of my *Plankton Investigations*. In their interesting work, *The British Fresh-water Phytoplankton, 1909*, chap. xii., Messrs West have maintained that it does not hold good for the Desmidiaceæ. It may be remarked, however, that a very large number of these can only with difficulty be regarded as true plankton organisms, especially the true, typical lake plankton which was exclusively in my mind. Further, it must be