

the physical and chemical conditions of the lakes of the tropics is extremely slight. What I have tried to do in the following, with regard to the Arctic, North European, Central European lakes of the level country (Baltic lakes) and the alpine lakes, has been to bring together the available information concerning the topography and general geography of the lakes: morphometry, bathymetry, littoral region with littoral vegetation, character of the soil in the drainage area, precipitation, temperature, chemistry, colour, and transparency of the lake-water. In Part II. I have tried to give a sketch of the plankton communities, their geography and life-history; and in Part III., according to Sir John Murray's special wishes, to expose my views with regard to the main problems of future limnological investigation.

PART I.—CONTRIBUTION TO THE GENERAL GEOGRAPHY OF THE LAKES

THE ARCTIC LAKES

If we try to form a picture of the arctic lakes, we have unfortunately but few certain facts to rely upon. It is only by means of general descriptions of the nature of the arctic regions that a vague and uncertain sketch, which must be corrected and added to in future, can be given. During the last ten years I have read many accounts of travels in the arctic regions, hoping to find accounts of arctic lakes. From this literature I shall attempt to give an outline of the nature of arctic lakes and the conditions of life which they offer their organisms.

The rainfall is stored as large snow and ice-masses, of which but a small part, and that only for a short period of the year, breaks forth from the ice into the lake-basins in the form of torrential rivers. The *country surrounding* the lakes is perpetual snow, naked rock or sparingly coated (moss-covered) rocky slopes, sometimes wide tundras frozen throughout the whole or at any rate the greater part of the year.

No account of the *sizes* and *depths* of arctic lakes on which to found a general description is available. The descriptions of travellers convey the general impression that the arctic lakes are comparatively small. In the real lakes the littoral zone is always narrow, the pelagic region reaching up to the shore. The primary lake bottom is rock or rough sand and gravel. The height of the water will undergo considerable variations: high water in spring, low water in autumn. In lakes near the margin of the ice, where the affluents are rivers of cold water from the inland ice, the water is surcharged with particles of clay. The filling up of the real lake-basins probably proceeds