

The *height* of the water undergoes very considerable variations in the course of the year, especially where the lake is fed from melting snow; the renewal of the water proceeds unequally at the various seasons—most rapidly in spring, when immense quantities of water during thaw pour into the lakes. Owing to the great evaporation in summer and the decrease in all affluents the level of the water sinks greatly; the degree of concentration combined with great but regular variations in transparency, colour of water, etc., therefore undergoes considerable oscillations. On the great changes in level in the high alpine lakes see Zschokke (1900, p. 17).

Information regarding the *temperature* in many lakes of this zone is to be found in numerous records of many authors. It is not my intention to give here a summary of our knowledge of lake temperatures in general, but merely to emphasise those features which are characteristic of the lakes in each zone. After having studied this literature, it has, however, been impossible for me, apart from the little advanced here, to discover any features which might be said to characterise the alpine lakes in contrast to the Baltic lakes.

Temperature varies greatly, of course, but presents, on the other hand, a certain amount of uniformity hitherto hardly sufficiently noticed. There are lakes which must be designated as completely arctic, frozen even in the middle of summer or with masses of ice floating on their surface and the summer temperature hardly exceeding 2–3° C. Such lakes are mentioned by Monti: Lac de Séracs (at a height of 2370 m.; the surface was in September covered with ice, and the temperature at surface was only 2° C.; 1906, p. 131), Lac de Grand-Doménon in the massif of Belledonne (Delebecque, 1898a, p. 170), Lac d'Arrius (Delebecque, 1898a, p. 171). The lake of St Bernard hospice, at a height of 2445 m., is closed up in certain years for 330 days: it closed on the 22nd October and was not open till the 15th September (Zschokke, 1900, p. 35). The majority are no doubt temperate lakes, but approach the arctic type more or less: there are lakes which one year may be designated as arctic, in others as temperate. Concerning all these lakes there is much extremely interesting information in Zschokke's excellent chapter on temperature in high alpine lakes (1900, p. 20). In the same zone in which we find these lakes, situated under more or less arctic conditions, the temperature of which at any rate in certain years does not exceed 4° C., we find distinctly tropical lakes which never freeze—Lac Léman (Forel, vol. ii. p. 395) and the North Italian lakes—or only exceptionally—Bodensee, seven times since the year 1227 (Geistbeck, 1884–5, p. 364)—or only exceptionally and in part—Vierwaldstättersee (B. Amberg, 1904, p. 142). However much all the lakes of this zone differ in regard to winter temperatures and ice conditions, their summer temperatures are some-