

influence of the winds in producing currents, and the greater or less abundance of salts in solution, also affect the temperature conditions, as well as the quantity of atmospheric gases absorbed from the air at the surface and distributed by currents and convection throughout the mass of water in the lake.

Deposits.

The deposits in lakes consist of gravels, sands, marls, clays, and muds, the variations in these depending largely on the geology of the country in which the lakes are situated. Usually the muds in the deeper parts of lakes contain a large amount of organic matter, which is chiefly of vegetable origin, and in this respect they differ from marine deposits. It occasionally happens that diatomaceous deposits are formed in lakes, especially where the detrital matter from the

seen in lava-flows, which build great dams across valleys: the marshes around the edge of the Snake River lava-sheets seem to be lakes of this sort, verging on extinction: crater lakes are associated with other forms of eruption. Accidents of the cold kind are the glacial invasions: we are perhaps disposed to overrate the general importance of these in the long history of the world, because the last one was so recent, and has left its numerous traces so near the centres of our civilization; but the temporary importance of the last glacial accident in explaining our home geography and our human history can hardly be exaggerated. During the presence of the ice, especially during its retreat, short-lived lakes were common about its margin. . . . We owe many prairies to such lakes. The rivers running from the ice-front, overloaded with sand and silt, filled up their valleys and ponded back their non-glacial side-streams; their shore-lines have been briefly described in Ohio and Wisconsin, but the lakes themselves were drained when their flood-plain barriers were terraced; they form an extinct species, closely allied to the existing Danube and Red River type. As the ice-sheet melts away, it discloses a surface on which the drift has been so irregularly accumulated that the new drainage is everywhere embarrassed, and lakes are for a time very numerous. Moreover, the erosion accomplished by the ice, especially near the centres of glaciation, must be held responsible for many, though by no means for most, of these lakes. Canada is the American type, and Finland the European, of land-surface in this condition. The drainage is seen to be very immature, but the immaturity is not at all of the kind that characterized the first settlement of rivers on these old lands: it is a case, not of rejuvenation, but of regeneration; the icy baptism of the lands has converted their streams to a new spirit of lacustrine hesitation unknown before. We cannot, however, expect the conversion to last very long: there is already apparent a backsliding to the earlier faith of steady flow, to which undisturbed rivers adhere closely throughout their life.

“Water-surface is, for the needs of man, so unlike land-surface, that it is natural enough to include all water-basins under the single geographic term ‘lakes.’ Wherever they occur,—in narrow mountain-valleys or on broad, level plains; on divides or on deltas; in solid rock or in alluvium,—they are all given one name. But if we in imagination lengthen our life so that we witness the growth of a river-system as we now watch the growth of plants, we must then as readily perceive and as little confuse the several physiographic kinds of lakes as we now distinguish the cotyledons, the leaves, the galls, and the flowers, of a quickly growing annual that produces all these forms in appropriate order and position in the brief course of a single summer.”