Ice-Conditions on Lake Balaton

Das Eis des Balatonsees by Eugen von Cholnoky

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on a lower economic level, and consequently one from which the richer country could gain little. On the other hand, the countries of Europe, on a higher economic value, were ones whose proximity could only be advantageous to England; to these, therefore, she devoted her attention rather than to the west, an occurrence detrimental to the prosperity of Ireland. And thus it was that Ireland found no economic advantage in the union of 1800 until England, becoming more exclusively an industrial country, afforded an excellent market for Irish agricultural produce. But the only part which received any industrial impetus from the association of Great Britain with Ireland was the north-east. It is certainly noticeable that the comparative proximity of English and Welsh coal to all the eastern seaboard of Ireland has been little taken advantage of. Again, Dr. Priester deals with the question of Ireland's canals, showing how well adapted is the country for these waterways; yet there are not many, and these but little used. As a means of cheap competition with railways, canals should be of great service to a country. Once they fall into the hands of railway companies, as one-third of the canals of the United Kingdom do, they of course lose this value. However, only one-sixth of Ireland's canal mileage is railway owned, and yet, except for the Grand canal, little use is made of these inland waterways. Dr. Priester advocates state-ownership. Considering the geographical advantages of her site, Ireland does not, thinks the author, reap all the benefit which she ought, and this mainly for two reasons—firstly, the proximity of Great Britain, which ought to be advantageous, is so only in a one-sided way, since it largely results in Ireland's industry and commerce being crippled; secondly, while world commerce with Ireland cannot develop to a great extent, since Ireland lies in the shadow of Great Britain, yet world-traffic, *i.e.* passenger-traffic, might greatly increase. All Dr. Priester's conclusions may not meet with general acceptance, but that will not lessen the value of this study. His volume is one which cannot be overlooked.

R. N. R. B.

ICE-CONDITIONS ON LAKE BALATON.

'Das Eis des Balatonsees.' Dr. Eugen von Chohnoky. With 21 Plates and 122 Figures. (Resultate der Wissenschaftlichen Erforschung des Balatonsees, I. Band, 5 Theil, IV. Section.)

This memoir forms a further instalment of the elaborate reports published under the direction of a Committee of the Hungarian Geographical Society, published at intervals since the committee's appointment in 1891. (For a review of parts previously published, see *Geographical Journal*, vol. 29, p. 554.)

Lake Balaton, though about 45 miles long, has a maximum depth of only 33 feet, and a mean depth of but 10 feet. In consequence it freezes very readily, and in severe winters remains frozen for nearly three months of the year. Notes on the freezing of the lake have previously appeared in section 1 of the same division of the reports. The present memoir describes in great detail the different phenomena which accompany the formation of ice.

Lake Balaton is pre-eminently suitable for a study of ice-formation, as its shallowness makes it respond readily to variations in the temperature of the atmosphere, and its large area adds to the importance of the observations. Moreover, Hungary is in winter "the battle-ground of the Asiatic and Atlantic ocean climates." Very rapid fluctuations in temperature are experienced, and these favour the appearance of a number of interesting phenomena. The sheet of ice which covers the lake at times attains great thickness. During the severe winter 1892-3 a maximum of 46 centimetres (18 inches) was observed.

The effect of wind in mixing the water in stormy weather is to retard freezing,

but to increase the ultimate thickness of the ice-sheet. All the water in the lake is brought near the freezing-point before ice begins to form, and the freezing then proceeds rapidly. A covering of snow hinders the increase in thickness of the ice-sheet, as it diminishes radiation from the lake. Clear and open skies promote radiation, and thus increase the rate of freezing.

The manner in which the ice-sheet forms both in calm and in stormy weather is carefully described and illustrated. The rapidity with which the ice-sheet disappears under the influence of winds is also noted, and is most striking. When the ice is beginning to melt, it breaks up into vertical polygonal needles or "candles" (*Kerzen*), called by the Hungarians "Gyertyásodás." When this stage is reached the ice-sheet is rapidly broken up by the wind, and large banks of rotten ice form on the lee shore.

The rapid fall in air temperature which sometimes occurs at night results in a considerable temperature gradient in the ice-sheet itself, and the temperature of the surface of the ice-sheet may be from 5° to 6° C. lower than that of the bottom. The local contraction of the ice due to this rapid cooling produces fractures, which occur with loud reports. The dynamics of these fractures is discussed, and the places at which they occur in Lake Balaton are carefully charted.

The free water in these cracks again freezes, but owing to the expansion and contraction of the ice-sheet large blocks of ice are forced up and form rugged walls of ice where the fractures have taken place. These ice walls are locally called "turolas." The chapter on the dynamics of the ice-sheet concludes with a discussion of the comparison which has been made by E. R. Buckley and Van Hise* between the formation of these "turolas" in ice-sheets and of mountain ranges in the Earth's crust. Although such a comparison is interesting, the difference between the forces at work and between the physical characteristics of the ice-sheet and the Earth's crust must be kept clearly in mind. The last chapter of the memoir describes and illustrates the phenomena which accompany the covering of the ice-sheet with snow.

Dr. Von Chohnoky makes no reference to the effect of the freezing of the lake on climate, but this must be quite appreciable. During the period of freezing a considerable quantity of latent heat is set free, and when the ice melts in spring a considerable quantity of heat is absorbed. The result of this is that in the neighbourhood of large lakes, which become frozen over, a spell of frost tends to be less severe at its commencement, but to continue longer, than over dry land.

E. M. W.

AFRICA.

ETHNOGRAPHY OF GERMAN EAST AFRICA.

'Mitteilungen aus den deutschen Schutzgebieten, *Ergänzungsheft* Nr. 1: Wissenschaftliche Ergebnisse meiner Ethnographischen in den südosten Deutsch-Ostafrikas.'

By Dr. K. Weule. Berlin: Mittler u. S. 1908.

The author of this well-illustrated quarto volume was a member of the *Kommission für den landeskundigen Erforschung des deutschen Schutzgebieten*, and to him fell the task of collecting ethnographical data on and around the Makonde plateau, which lies in German East Africa between the Lukuledi and Rovuma rivers, the 39th parallel of east longitude and the coast; while his two colleagues were concerned with geographical exploration further north. The main interest of the work is ethnographical; the geographical portion consists merely of an outline

* *Trans. Wis. Acad.*, 1900, vol. 13, part i. p. 141.