GLACIERS, STRUCTURE AND MOVEMENT THEORIES. Antoni Boleslaw Dobrowolski. Supplement No. 1 to the Bulletin of the Polish Geophysical Society (Polskie Towarzystwo Geofizyczne), Part 16, Warsaw 1939–1948. 191 pages.

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In 1916 he completed the greater part of his *Historia naturalna lodu*, the Natural History of Ice, which was not published until 1923. The reviewer well remembers how, in his earlier studies of glaciology, he wistfully regarded this work which appeared to contain, hidden in Polish, so much that would have been of value to him. Now for the first time two of the fifteen chapters of the book—those dealing with glaciers—have been made available in English to the outside world.

The first of the two chapters deals with the general structure of glaciers, the grain structure and growth, the stratification of the firn and the form of the glacier tongue. The second chapter describes and seeks to explain glacier movement and theories of the elasticity and plasticity of ice.

A few terms in the original have been omitted and notes have been added on the snow line and on recrystallization at low temperatures. There is also a foreword. In this Professor Dobrowolski refers to the British researches at the Jungfraujoch in 1937 and 1938. The British programme had in certain respects, but quite independently, run on lines parallel with those on which Professor Dobrowolski had been thinking, and the results obtained confirmed several of his own ideas. Professor Dobrowolski also recalls how in 1937 he sent a summary of these two glacier chapters to the reviewer who circulated copies to several glaciologists, including the present Bishop of Portsmouth. Subsequently the latter wrote an article on "The Structure and Flow of Glacier Ice" (*Geographical Journal*, Vol. 92, No. 5, 1938, p. 449–53) and Professor Dobrowolski, in support of his assertion that the work even to-day possesses value, says that "most space" in this article was devoted to contents of this summary. This small inaccuracy (only a small part of the article referred to Professor Dobrowolski's views) can be forgiven.

The first point to be considered is whether a book written over thirty years ago has value to-day. Professor Dobrowolski thinks so. In the foreword, dated August 1947, he writes ". . . I am convinced that by no means the whole of my *Natural History of Ice* in general, or the two chapters here presented in particular, are out-of-date." But since 1937, and *a fortiori* since 1916, progress in glaciological research has progressed considerably, much more indeed than Professor Dobrowolski gives credit for, so that the present publication cannot be considered a complete guide to glacier study. Nevertheless these two chapters have a very definite and considerable value, especially if the student never forgets the date of 1916. They have the merit of collecting under one cover practically all the work of the pioneers that was worth collecting. Even to-day there is no work in English which gives so full an account of the basis of glacier mechanics and physics. The reviewer is continually being asked by young students of glaciology what they can read to give them a suitable start for further studies. Hitherto the only works that could be recommended as covering all glacier studies have been the text-books of von Drygalski and von Klebelsberg; but a work in a foreign language is not a convenient way of learning a subject. One can only deplore the fact that Professor Dobrowolski has not been able to bring into this book the recent progress in glacier research made in Europe and America to which he appears perforce to have had no access, yet another accursed sign of the times.

As a grounding to the subject, then, and for its historical interest and for its suggestions for future research, the writer's advice to the student of glaciers is to read this book. Unfortunately it cannot be purchased, but the author in a letter says that it can be exchanged for other scientific works on application to him at Krasinskiego 18/104, Warsaw.

The work has been published by the Polish Geophysical Society at the expense of the Government.

The translation, made by Mr. B. W. A. Massey, formerly of Cambridge University and now apparently resident in Poland, is of a very high order. G. Seligman