

an ice crystal and the thickness of the ice sheet,  $h$ , is usually 3:70 in natural freshwater bodies, whereas in the laboratory tank ice crystals may grow to 10 to 12 cm. in cross-section, though the thickness of the experimental ice sheet in the tank is only 7 mm. thus giving a ratio of 10:0.7 or 12:0.7. Consequently, the mechanical properties of the natural ice sheet may be quite different from those of the ice sheet grown in the laboratory, since it is lacking the similitude ratio 3:70. To make the model similar to the natural ice sheet, the model ice sheet would have to be grown by a method that would result in the model sheet consisting of ice crystals 0.5 to 0.6 mm. in cross-section. This illustrates the problem of similitude as treated by Lavrov. Conditions for the similitude of the ice of models and methods for achieving it in laboratory-grown ice sheets are discussed in detail.

A few minor flaws appear in this masterly monograph. As the making of laboratory models of ice, so the reinforcement of ice in situ is a quite important physical-glaciological problem that might well have been dealt with in a fifth chapter (see Ref. 3). One misses in the generous list of references (152 titles) the work of K. F. Voytkovskiy<sup>4</sup> on the mechanical properties of ice. Another, and more important flaw is the quality of the paper. This reviewer feels that Lavrov's work deserved to have been printed on better paper.

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<sup>1</sup>Fedorov, E. S. 1915. Protsess kristallizatsii (The process of crystallization). Priroda, December.

<sup>2</sup>Barnes, Howard F. 1899. Notes on frazil and anchor ice. McGill University, Pap. Dept. Phys. No. 10.

<sup>3</sup>Cobble, R. L., and W. D. Kingery. 1962. Ice reinforcement. In Kingery, W. D., Editor, Ice and snow properties, processes and applications. Cambridge: Mass. Inst. Technol., chapter 12.

<sup>4</sup>Voytkovskiy, K. F. 1960. Mekhanicheskiye svoystva l'da (Mechanical properties of ice). Moscow: Acad. Sci. USSR.

THE NORTH WEST PASSAGE 1534-1859. A catalogue of an exhibition of books and manuscripts in the Toronto Public Library. Compiled by Edith G. Firth, with an introduction by H. C. Campbell. Toronto: Baxter Publishing Co. in co-operation with the Toronto Public Library. 1963. 8½ x 11 inches, 27 pages, illustrations, portraits, maps. \$1.35.

Early in 1963 the Toronto Public Library prepared an exhibition of personal narratives and records of the search for the northwest passage. Some 90 books and manuscripts were chosen from the library's collection to be displayed to stimulate interest in the history of the Canadian North. The collection starts with the earliest printed record of Jacques Cartier's first voyage in search of a passage to the wealth of Cathay and ends with M'Clintock's (wrongly spelled McClintock) voyage in the Fox. The latter did, in effect, discover the easiest navigable route through the Canadian Arctic Archipelago, a route that was later used successfully by Amundsen. The voyages selected from those undertaken between the two are arranged in chronological order and all the main expeditions are represented.

The catalogue for this exhibition has been issued in booklet form. For each of the exhibits full bibliographical information is given together with an abstract. It is profusely illustrated with pictures from the expeditions and portraits of the chief explorers. Two maps grace the inside covers. An index of explorers' names is provided. The whole effect is that of a carefully planned and handsomely produced concise guide to the search for the northwest passage and the early exploration of the Canadian Arctic.

The booklet can be obtained from either the Toronto Public Library, College and St. George Street, Toronto 2-B, Ontario; or from the Baxter Publishing Company, 228 Bloor Street West, Toronto 5, Ontario.

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