

## CANADIAN SNOW CONFERENCE

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CANADIAN problems associated with snow and ice and research work already carried out in connection with these materials in the Dominion were reviewed at a Conference which was held in Ottawa on 17 and 18 September 1947. Attended by a representative group of seventy scientists, engineers and explorers, the meeting was sponsored by two Associate Committees of the National Research Council of Canada. Associate Committees provide a means for bringing together all those in the Dominion interested in major scientific subjects for mutual benefit and for the efficient prosecution of research. The two Committees in question are those concerned with Soil and Snow Mechanics and with Geodesy and Geophysics. The latter is interested in snow from the point of view of hydrology, and one purpose of the Conference was to bring together those interested in this and those who are concerned with it from the engineering and defence points of view.

The Conference was honoured by the presence of Sir Charles S. Wright, the glaciologist of the Scott "Terra Nova" expedition, who was fortunately in Ottawa. Two women were present—Mrs. Diana Rowley, at one time a member of the Committee of the British Glaciological Society and Mrs. T. H. Manning, who (with her husband) has spent several years living with the Eskimos in the Canadian Arctic. Others present included representatives of the water power and water conservation services of various provinces including British Columbia, private power companies, railway engineers, highway engineers, scientists from Universities and the National Research Council and members of the staffs of interested Federal government departments, including the Royal Canadian Mounted Police and the Department of National Defence.

Practically everyone present contributed to the comprehensive review which demonstrated the wide variety of problems created by snow and ice in Canada, the great need for an intensive research programme and the basic connection between most of the problems discussed and the fundamental properties of snow and ice as materials. This fundamental aspect was stressed by Sir Charles Wright and was reflected in the review of snow and ice research work in other countries which was presented at the conclusion of the meeting. G. J. Klein described work carried out in the U.S.A., Japan and Scandinavia, mentioning also the many relevant papers published in the U.S.S.R.; Major M. G. Bekker described research work in Austria and Germany of the pre-war and war years; and the writer gave a brief account of the Swiss work which he had seen in 1946. This international review will be published as a Report by the National Research Council in 1948.

The snow surveys which are at present conducted in Canada in connection with estimates of spring run-off, were described by speakers from British Columbia, Ontario, Quebec and the Dominion Water and Power Bureau. In some areas accurate predictions can be made, but in other regions accuracy varies, which suggests the need for further research. The special survey carried out during the winter of 1946-7 by officers of the

Dominion Meteorological Service for the Associate Committee on Soil and Snow Mechanics was described by G. J. Klein who designed the special instrument kit and who is analysing the results obtained.

Snow clearance was frequently mentioned as a practical problem of unusual importance in the maintenance of airports, highways and railways. Annual expenditures in Canada for snow cleaning from highways and city streets now amount to several million dollars. The magnitude of the railways' snow problem was graphically illustrated by the example from Saskatchewan of a complete train which was buried under snow for several days during the severe winter of 1946-7. Another railway problem of comparable magnitude is the preservation of the vast quantities of ice which have to be stored during summer months for the servicing of refrigerator cars and air-conditioning equipment.

In water transportation the removal of accumulated ice from exposed parts of vessels is the major operating problem. This was graphically described in connection with the operation of Canadian naval vessels which must be capable of travel and effective use in tropical and Arctic waters. Arctic travel was repeatedly mentioned at the meeting in connection with research into over-snow travel, the trials of Canadian "Snowmobiles" by the Musk-Ox Expedition and the vital transport needs of the Royal Canadian Mounted Police.

From the many other topics brought before the meeting there may be mentioned the maintenance of railway switches during bad snowstorms (almost 1000 men having to be employed on this work in the Montreal area alone); the problem associated with the coating by ice of the cables of electrical transmission lines—causing the phenomenon of "galloping conductors"; the operating difficulties of water-power plants caused by frazil ice; the electrostatic charges on falling snowflakes, and the icing of aircraft. Research work into the latter problem is being conducted in the special cold chambers of the National Research Council and some details of this work were given. Other work of the National Research Council which was described included a comprehensive study of aircraft ski which has led to some major changes in ski design.

Discussion disclosed some interesting details of the pioneer work in ice research carried out by Dr. Harold T. Barnes of McGill University. It was found that some of his original films are still available. Work carried out by Dutch engineers on the River St. Lawrence was also brought to light. Some details were given of the research work carried out in Canada in connection with the "Bergship" aircraft carrier project; other researches into the properties of ice were described.

As a result of the Conference, it was decided to set up a joint continuing subcommittee on Snow and Ice Research under the auspices of the two Associate Committees mentioned. This committee will attempt to correlate all existing work in connection with snow and ice in Canada, to promote further research work. In particular it will attempt to have established in Canada special snow research stations, the first of which may be located in the Rocky Mountains in connection with the protection of transportation routes. P. D. Baird, now Director of the Montreal Office of the Arctic Institute of North America, was appointed Chairman of this continuing committee and D. B. Nazzari its Secretary. Copies of the written record of the Conference will be available in due course and may be obtained on application to Mr. Nazzari, c/o National Research Council, Ottawa, Canada.