

Travellers On Frozen Ground

Roger Brown and Hank Johnston

The early days of permafrost research in Canada

by Séan McCutcheon

While still a geography student at the University of Toronto, Roger Brown had his first real taste of the north — a cruise on board the United States icebreaker *Eastwind* carrying supplies to Arctic weather stations. Later, when he went job hunting with his first degree in 1953, he was hired by the National Research Council's Division of Building Research, joining its new Northern Research Group. Hank Johnston, who had studied civil engineering at the University of Manitoba and worked on northern construction projects for several years, had been hired a month or two before Roger. Though in some respects opposites — Roger, for instance, being vigorous and vivid in speech while Hank was quiet and dry — they shared a fascination with the north and soon became fast friends.

Little construction was going on in the north in the early 1950's, but if in the future there was to be any, and

R.F. Legget, the first director of the Division of Building Research, anticipated there would be a good deal, then people would need to know about the ground on which they were building. Early on Legget, who had been a professor of civil engineering at the University of Toronto, recognized the enormous economic potential of the North and saw Canada's future in the development of that vast, inhospitable land. To live and work there, however, dwellings, roads, and other structures would have to be built, and that meant dealing with one of the peculiarities of much of the northern terrain — perennially frozen ground, or permafrost as it has come to be known. So, in forming the Northern Research Group, Legget chose permafrost as its primary research subject. (R.F. Legget's career is quite another story, to be covered in a future issue of *Science Dimension*.) Roger Brown was hired to find out where permafrost occurred,

how it formed, and the effects on it of such factors as climate, snow, vegetation, geology, and terrain relief; Hank Johnston would work on methods of northern site investigation and study design and construction techniques for building houses, roads, airfields, and later pipelines on permafrost. The first records of permafrost in Canada are in narratives of the early explorers. If, as the English explorer Martin Frobisher found in the 1570's, you dig anywhere above the Arctic Circle, and in a good many places to the south of it, you will strike frozen ground. Even though the topmost layer of this ground may thaw in summer, it freezes again in winter, and what lies below is always frozen solid.

Permafrost lies beneath more than half of Canada's land — and beneath one-fifth of all the land on our planet. Northern Canada is awash with bogs, ponds, streams, and lakes because, in part, water cannot