

quite literally the foundation on which the north rests. In the Arctic it may be several hundred feet thick. If it were not there, most of the north would be desert. It is the basin which cradles the water in this land of scant precipitation and prevents it from draining deep into the earth.

The Mackenzie Valley is properly called the sub-Arctic. Most of it is south of the tree line, and it is not a frozen desert; rainfall and snowfall are light but adequate (similar to the falls of Saskatoon or Regina). In the southern part the permafrost occurs in patches and is only a few feet thick below the seasonally thawed surface ground.

Permafrost is much affected by the laying of pipelines. Oil or gas piped under pressure is usually warm. A warm pipeline would melt the permafrost and make it an unstable goo. The solution advanced by the pipeline companies is to refrigerate pipeline gas, and that would seem to solve the melting problem. This could work in the Arctic.

In the Mackenzie Valley, however, there is a different problem. There the pipeline would pass under rivers and lakes, which do not have permafrost bottoms, and through the areas of "discontinuous permafrost," where the pipe would freeze the ground causing an ice ring to form around itself, expanding, building pressure, possibly pushing the pipe out of its intended line and causing it to break. The Berger report notes: "The question of frost heave is basic to the engineering design of the [Mackenzie Valley] gas pipeline. Both Arctic Gas and Foothills (Maple Leaf) propose to bury their pipes throughout their length, and to refrigerate the gas to avoid . . . thawing permafrost."

The problem of frost heave, though formidable, could probably be resolved, as Justice Berger suggested ("We can devise terms and conditions that will allow a pipeline to be built"). He was more concerned with a subtler problem: a pipeline's impact on the native people.

The Dene alliance of Indian tribes has claimed a

right of control over a large part of the Northwest Territories. They are convinced that if they do not have that control, their fishing and hunting culture will soon be destroyed by industrialization. It has been suggested that industrialization — caused directly and indirectly by pipeline construction — would be a boon to their economy, but Justice Berger questioned that assumption. He pointed out that theirs is an economy they have practiced for thousands of years and that it exists independently of white civilization. "It is an illusion to believe that the pipeline will solve the economic problems of the North. Its whole purpose is to deliver northern gas to the homes and industries in the South. Indeed, rather than solving the North's economic problems, it may accentuate them."

He added: "The concept of native self-determination must be understood in the context of native claims. When the Dene refer to themselves as a nation . . . they are not renouncing Canada or Confederation. Rather, they are proclaiming that they are a distinct people, who share a common historical experience, a common set of values and a common world view. . . . [They] must be allowed a choice about their own future. If the pipeline is approved before a settlement of their claims takes place, the future of the North — and the place of native people in the North — will, in effect, have been decided for them."

He stated succinctly that "the future of the North ought not to be determined only by our own southern ideas of frontier development," and he recommended that Mackenzie Valley pipeline construction be delayed for ten years, until native claims have been settled and the settlement implemented.

The National Energy Board had additional reasons for rejecting the Foothills (Maple Leaf) proposal. It concluded that such an all-Canadian pipeline from the delta "could not be financed on the basis of the reserves discovered to date."

## The Foothills (Yukon) or Alaska Highway Project

The version of the Alaska Highway pipeline proposal submitted in September 1976 was to connect the Alaskan sections to northern British Columbia and Alberta, where it would tie into the existing Canadian pipeline network, using a forty-two-inch pipeline running through the southern Yukon.

In February of this year the group filed an alternative for a forty-eight-inch "express" pipeline through the Yukon and along existing routes in northern British Columbia and Alberta. It also proposed a west coast line, parallel to the existing Alberta Natural Gas route in southeastern B.C.

The National Energy Board sat for over a year, hearing spokesmen for the applicants, public interest groups, representatives from government and industry, and other interested parties. The conclusions reached were comprehensive.

The board's "most likely" forecast was that some of the approximately five trillion cubic feet of proved natural gas in the Mackenzie Delta on-shore area would be needed in Canada as early as 1981. After considering the various proposals, the board focussed on the Foothills (Yukon) project. It stated that a "crucial question is whether the pro-