

Concern for the Arctic environment

Ecological problems exist for pipelines and tankers both

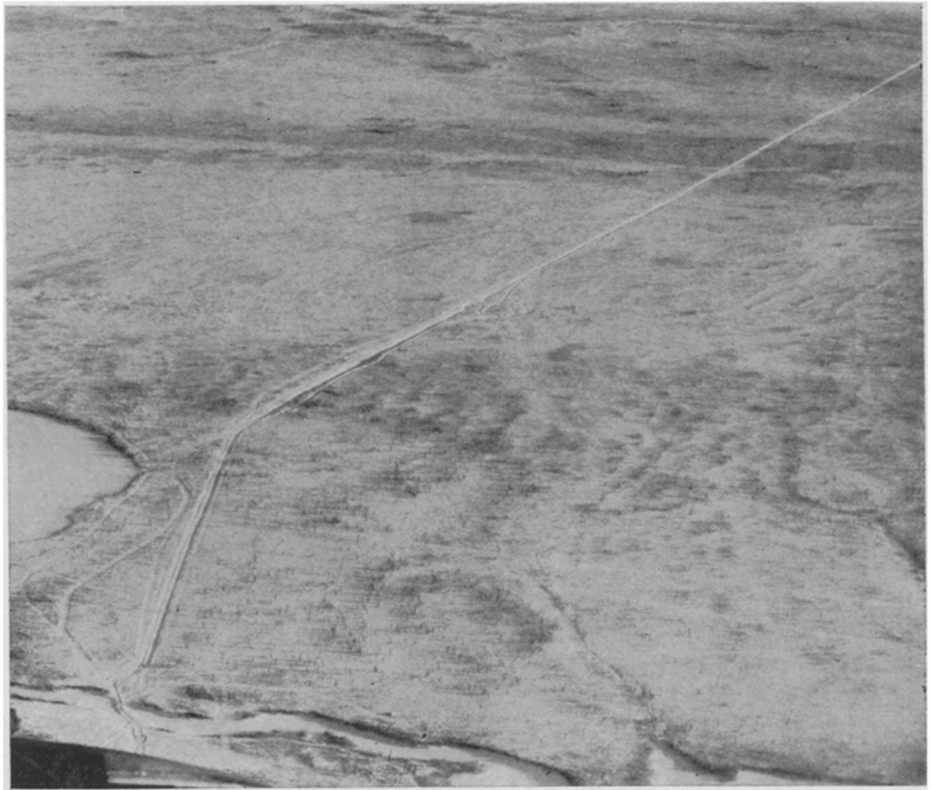
by Warren Kornberg

"The Arctic," says Commodore Owen C. S. Robertson, Arctic explorer and consultant on Arctic ice and navigation to both the United States and Canadian Governments, "is like a mistress. You can do to her only what she wants you to do. To try to do more is courting disaster."

He foresees the day when the oil reserves believed to lie beneath the Canadian Arctic, as well as under and off the Alaskan coast, will justify both a massive pipeline down the Mackenzie Valley to Edmonton and a generation of successors to the Manhattan, which blazed a trail for commercial vessels across the Northwest Passage. Both have raised concerns for the Arctic environment; either, Robertson warns, must be contemplated only in terms of what is possible in the Arctic.

Because they are both cheaper and quicker to build than pipelines, tankers will probably be the first to bring Arctic oil to markets. And the Canadian Government is seeking to establish rigid safety and pollution requirements, partly to protect the Arctic environment from a massive oil spill and partly to establish her sovereignty over the region's waterways (SN: 4/25, p. 420). At the same time, submarine designers are offering the oil companies giant tanker subs, and shipbuilders have been asked for design studies on giant icebreaking tankers.

"Nevertheless," declares L. A. C. O. Hunt, chief of the northern coordination division of Canada's Department of Indian Affairs and Northern Develop-



Gene Brush

Seismic tracks scar the Canadian Arctic in the wake of oil exploration crews.

ment, "the oil companies aren't committing themselves; they are thinking pipe."

Oil companies working in Alaska despite setbacks, still want to run 800 miles of 48-inch pipe to carry hot oil from Prudhoe Bay on Alaska's North Slope to the port of Valdez in the south. And Canadian oil companies are confident they can build as easily a similar 1,600-mile line south across the Canadian Arctic from the Mackenzie Delta to Edmonton in Alberta. They even want to run a feeder across the Yukon, so they can carry Alaskan oil to market.

Canada's Hunt believes, with Robertson, that the ecological problems to be created by the construction of 1,600 miles of pipe across the Canadian Arctic are virtually identical to those which would face the builders of the Trans-Alaska Pipeline System (SN: 2/14, p. 177).

Nevertheless, neither Hunt, nor Richard M. Hill, director of the Government's laboratory at Inuvik, in the heart of the Mackenzie Delta, which will be most affected by oil and pipeline development, believes that the problems are either very serious or will interfere with development.

"There is a considerable ecological problem," says Hill, "but I'm not overly concerned. Any disruption of the environment will be minor over all.

"I think it's been overblown," he says.

"The best protection against oil spills," says Hill, "is economic. Oil spills are expensive, and the oil companies

don't want them any more than the Government does." And he, as well as other Government officials, believes the oil companies know enough about the Arctic, and are sufficiently concerned, to take the necessary precautions.

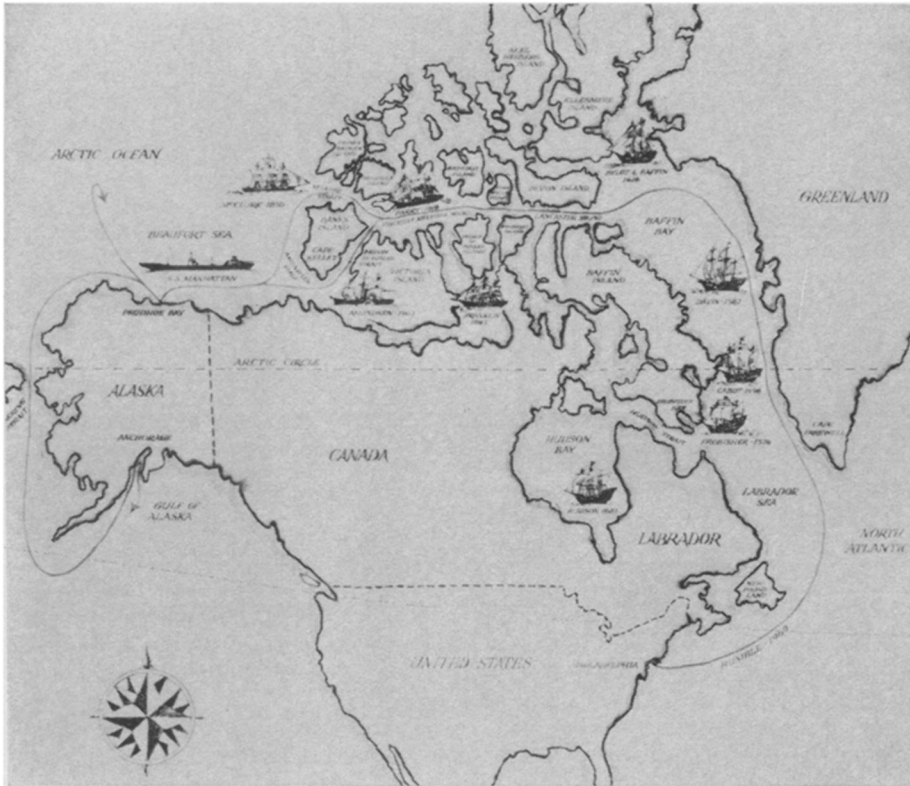
"Permafrost is a problem," confirms Imperial Oil's Exploration Manager R. A. Hemstock, "but I'm not afraid of it. We can solve it; it's just a question of how. It may take a year to get it all ironed out, but there is general agreement in the industry that the pipe is feasible."

The industry, backed by Hill and the engineers, who are testing hot-oil pipe at Inuvik (SN: 5/2, p. 442), believes it will be possible to bury some of the pipe, support some on a surface mound or perm of gravel and carry the rest on piles.

"We would like to bury as much as we can," says Bob Hall, on-site manager for the oil industry's experimental pipe loop. "Then you can put it in and forget about it. Otherwise there's a greater maintenance problem."

It is the burial of pipes full of hot oil in permafrost that raises so many conservationist hackles.

Alaskan studies indicate that such a buried pipe, almost regardless of insulation, would radiate heat into the permafrost. This could create a massive cylinder of mud and slush the length of the buried pipe. This in turn could open a river of mud all along the line, if it didn't wash the support out from under the pipe, causing a fracture and a river



Humble Oil

A navigable Northwest Passage, despite problems, may be the answer.

of oil instead, with deadly results.

This is not necessarily true, says Hill. He believes that pipe can readily be buried in some kinds of permafrost. "All permafrost is not alike," he notes.

In some areas, for instance, the permafrost consists of mixtures of silt and ice for hundreds of feet below the surface. This is the case in the Mackenzie Delta, as it is along Alaska's North Slope region. And a hot-oil pipe there would either have to be suspended above the surface or mounted on an insulating perm of gravel.

In other regions, the frozen material beneath the permafrost's active layer is frozen rock or gravel. Hill sees no reason why pipe cannot be buried in such a region.

Nor does the manager of the Inuvik laboratory believe the pipeline will have any deleterious effect on wildlife.

"There will be disruption of the environment," he concedes, "but it can be argued that it will be minimal or even positive disruption."

Caribou, he argues, can climb the virtually vertical side of a river bank. Why, then, should there be any concern over the ability of migrating caribou to climb the sloping side of a perm on which a pipeline is built?

He also suggests that roads and the seismic tracks that scar the Canadian Arctic in the wake of oil exploration crews, and by extension of the pipeline and its roads, are ecologically beneficial.

The melt of the permafrost, he says,



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Hall: Experimenting on permafrost.

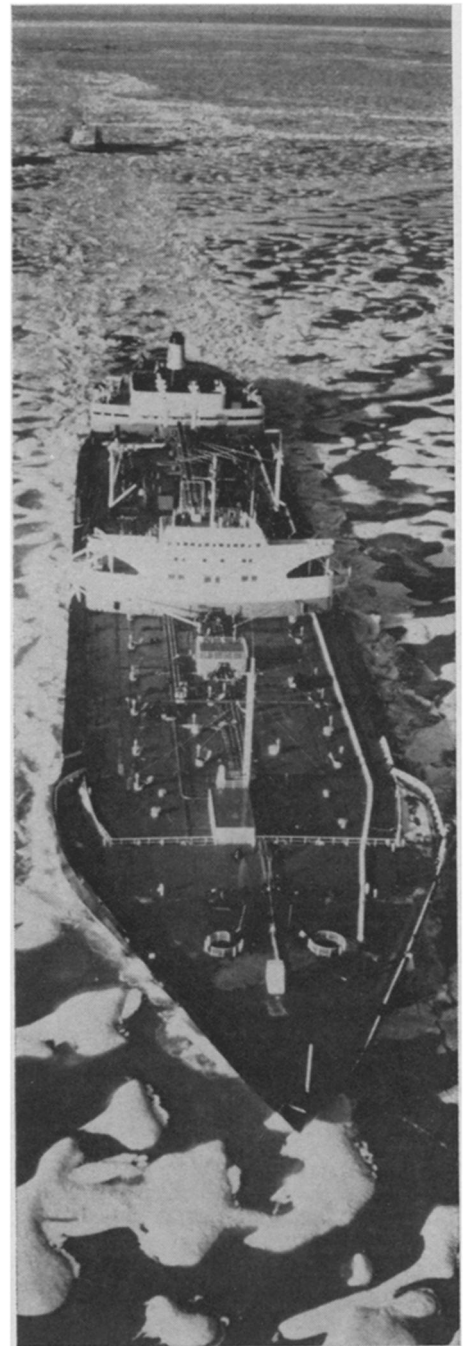
creates lush vegetation that can't help but be beneficial.

Not everybody is so sure.

A year ago there were 9,000 miles of seismic tracks across the Canadian northwest; this year there are 18,000.

A seismic track is a short length of road bulldozed by an exploration crew. Working in the summer, when temperatures reach almost temperate ranges, oil geologists bulldoze off the insulating surface layer of moss. Then, as the road gets muddy, they bulldoze off the mud.

What is left at the summer's end, with the volume of exploration now going on in the area, is thousands of miles of mud-filled, miles-long ditches



Humble Oil


The tanker Manhattan breaks the ice.

and exposed and melting permafrost beneath them. The scars take years to heal.

To prevent further damage to the tundra that Canadians call muskeg, the Canadian Government recently established a ban on summer seismic exploration. This forced the oil companies to work in the winters, at temperatures of 40 degrees below zero, but it protects the environment.

Bob Nowosad, an Arctic naturalist and manager of the Canadian Reindeer Project, is certain neither that the lush vegetation created by local disturbances are innocuous nor that the reindeer and caribou are unaffected by sumps and mounds in the path of

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Inuvik Research Lab.

There is no telling how the caribou will be affected by a miles-long barrier.

their migration. "Certainly caribou can walk up the side of a perm, or swim a ditch," he says. "But there is no guarantee that they will." Caribou, he notes, are arbitrary creatures; they go where they will, and there is no telling how they would be affected by a miles-long barrier in their path.

Nor, he declares, is there any guarantee that the sudden appearance of lush vegetation in an Arctic region is an ecological asset.

In Alaska, he says, vegetation has followed the seismic lines that ran from the coast up into the mountains. As the vegetation moved up the line, so did small animals like mice and lemmings. Following them went their predators.

"There has been no immediate dramatic effect," he concedes, "but it has created a whole new ecology around exotic life forms, and there could be serious long-term effects." The destruction of forage of native species is one possibility he foresees.

He regards the opening of the Canadian Arctic by oil development as inevitable. "We can't stop it; we shouldn't if we could," he says. But he is wistful about the lost opportunities a few years of research would afford.

"The key is that so much is unknown," agrees Hill. But he lacks Nowosad's sense of urgency. "Canada could put all of its scientific resources into the delta. But we feel that it is not necessary. There is no great urgency here," he contends.

What Nowosad would like to see is a greater level of Government regulation built on available knowledge.

He has been able to get willing cooperation from the oil companies, he

says, but too often he gets to them after damage has been done, and the best he can get is an "If we only had known. . . ."

"The ecological data are available," says Nowosad, "if they'd take the trouble to look." He notes bitterly that though there are geologists and engineers on all of the oil teams, not one includes a biologist.

He cites one instance of a warning coming too late:

Last summer, he says, the whole whaling village of Tuktoyaktuk, southwest of the Atkinson Point oil strike, came in with only a single whale. The natives blame the small catch on the fact that in the heart of the previous breeding season the whales were driven off by seismic test explosions in the area.

"I went to the company about it," he recalls. "They said they could have timed the exploration there around the whales' schedule. They just didn't know about it."

He also would like to see the Government ban wheeled vehicles and set load limits for tracked vehicles to protect the tundra from scars that never heal. And he would like to see pavement guards on bulldozer blades, to prevent their scraping the vulnerable tundra raw.

"We're experimenting with low-pressure tires that put down no more than 10 pounds a square inch," says Bechtel's Hall in response to Nowosad's request.

"Pavement guards on the dozer blades will cut their efficiency and raise the costs," he says, "but if that's what has to be done, we may have to look into it." □