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EDITORIAL

The past two decades have seen a fundamental change in the pattern of activities in both polar regions. The old concept of series of small, privately financed expeditions, each separate and distinct, has been replaced almost entirely by government-sponsored, continuing enterprises. Long-term planning now extends over several seasons, and is carried forward by relays of scientists. Detailed investigations of a discipline or of an area are today practical possibilities whereas scientists of an earlier day, with the time, the means and the energy at their disposal, could achieve little more than reconnaissance.

At present, permanent scientific stations operate sophisticated observation and recording techniques throughout the year, unaffected by weather or remoteness. Since the International Geophysical Year, 1957-58, scientific research has, more and more, become a co-operative exercise among interested nations — particularly in the Antarctic.

These developments have had their effect on the conventional reporting of field activities and on the editorial policy of the *Polar Record*. It is no longer possible or useful to attempt to compress into a few pages all the information provided in international, national, university and institutional reports. We shall continue to report in the Field Work section on expeditions which are a distinct self-sufficient enterprise, but we propose to replace the annual summaries of national activities which we have published in the past with periodic reviews of work accomplished in particular disciplines or particular regions, and with notes on specially significant occurrences and events. These features will appear in the Articles and Notes sections of the *Polar Record*.

With curious frequency, the world's very rich mineral deposits occur in environments otherwise hostile to man's endeavours: to join the list of Australian and near-Eastern desert El Dorados now comes an even more hostile, but this time frozen, desert discovery — the oil in the Prudhoe Bay area of northern Alaska.

The figures predicted for the new industry, running to billions of dollars and millions of barrels of oil, are hard to grasp; an early estimate suggested that the Alaskan discovery has doubled already known North American oil reserves. We can, however, even with the little knowledge we have, speculate on the nature and scope of the problems resulting from this discovery.

Basically, the requirements of the oil companies are the ability to extract oil, the recruitment and support of the labour force necessary to work the machinery, and the facility to transport the oil to its markets — and it would tax the wit of man to devise a more difficult setting for any of these operations than the Arctic coast of Alaska.

Before a drop of oil is extracted, thousands of tons of machinery and supplies must be transported to areas far distant from any road, rail or reliable water services. In the event, most transport will be by air, a rapid enough service, though expensive, which must operate through a long winter darkness

and always at the mercy of capricious weather. Water transport, either via Bering Strait or through Great Slave Lake and Mackenzie River, will always be seasonal and so will road transport, which at present operates only during the frozen winter months. Rapid developments in supply-transport methods and facilities may confidently be expected. The review of existing facilities on page 13 of this issue shows how inadequate they are to meet predictable demands.

The drills, after delivery to, and erection on, site in conditions of extreme difficulty created by cold, must bore through rock-hard permafrost, which in summer is overlain by waterlogged tundra and bog. Challenges of this nature can be expected to influence the design and materials of the drilling equipment also.

There will be an immediate demand for labour, skilled and semi-skilled, and for a supporting army of scientific and clerical workers, storemen, shopkeepers, hospital staff, cooks, builders, maintenance men — all this in a land sparsely populated by untrained Eskimos and their southern neighbours, Athapaskan Indians. This demand will be followed by a call for ever more diverse skills as camp life develops into settled communities. Perhaps the vision of completely enclosed towns that create their own micro-climates is not far from realization.

Once extracted, the oil has yet to be transported across the thousands of kilometres that separate the drilling camps from the petrol pumps of civilization. Such transportation must be effected quickly, economically, and with complete reliability in all seasons of the year — breakdown cannot be tolerated between production and marketing. In the immediate future, transport will probably be in pipelines across the wilderness and perhaps also by tanker across the ice-strewn seas. As we go to press, the largest existing oil tanker, specially converted and ice-strengthened, is testing the feasibility of sea transport. Although final results are not yet known, the record of difficulties with sea ice during *Manhattan's* summer reconnaissance strongly suggests that year-round freedom of movement is doubtful. One or more pipelines will therefore probably connect the producing areas to refineries in sub-Arctic centres such as Fairbanks and Anchorage, and thence to internal pipeline systems. The costs of these construction projects, with some 1 200 km of 1.6 m pipe to be laid across little known country, will be very great.

The effects of this bonanza on Alaskan life and economy are, of course, bound to be far-reaching. They may very possibly be disastrous in some respects — for instance to the vulnerable natives of the country, the Indians and Eskimos, and to the birds, animals and vegetation on which their subsistance economy is based. The United States Government is aware of the dangers to the delicate balance of Arctic ecology, and genuinely intends to afford protection, but the problems will demand unceasing vigilance. Almost overnight Alaska has entered a completely new economic world. On 11 September 1969, the sale of land leases brought $900 million into the state's coffers, and a tax of 12½ per cent on well-head value of oil guarantees Alaskans a future free from the financial strains they have felt in the past, but lays them wide open to the dangers of financial exploitation.

Possible developments outside Alaska also invite speculation. Off-shore discoveries may be made with attendant aggravated problems of transport and supply. If the ability to navigate all the year round through the North West Passage is realized, this fact would influence not only the Canadian search for oil in the Queen Elizabeth Islands, but also the development of the known iron ore deposits in Baffin Island, where progress is delayed by transport problems. The pressure of a vast new source of oil might well affect the whole United States protection policy towards the industry, and the dollar earnings of the British Petroleum interests will certainly have a measurable effect on the balance of payments situation between the United States and Great Britain.

The immediate stimulus which these events must give to activities in the Canadian Arctic is forecast in the Speech from the Throne delivered at the resumption of the Canadian Parliament on 23 October 1969. The Speech contained a specific reference to the intention of the government to encourage developments in the Arctic, in particular the exploration and exploitation of resources in the Canadian Archipelago and adjoining continental shelf. At the same time, the government announced their intention to introduce legislation to prevent pollution of Arctic seas.

We plan, in forthcoming issues of the *Polar Record*, to present informed articles on many of these aspects, for it is hardly fanciful to suppose that these oil discoveries will irrevocably alter a large part of the Arctic environment, in its wild life and vegetation, and in its peoples and economy, to a degree comparable only with the effects of a climatic change.