sharing, and all the rest make it clear that the land claims settlement was intended primarily as a vehicle for natural resource development in Alaska. As such it reflects the Statehood Act in philosophy and purpose.

The effects of the Settlement Act on the political balance of the State will be enormous. The Natives and their organizations now have control of two resources that guarantee them a permanent, prominent place in Alaska politics, namely, money and land. But beyond this, it is hazardous to predict the political impact of the settlement.

By many provisions of the Act there is potential for both conflict and cooperation between the state government and Natives; ad hoc alliances and antagonisms will no doubt emerge between them. Because of its economic development orientation, the Settlement Act may very well lead to an intensification of the long-standing development versus conservation conflict in Alaska (in anticipation of this, many conservationists inside and outside Alaska, who might otherwise have been expected to support a minority political movement, opposed the Act). However, on many issues, even development issues, there may not be anything that resembles a unified Native position.

For its part, the state government does not regard the Natives as its prime political antagonist. That role is still reserved for its traditional enemy, the federal government. In general, the state government did not regard the claims issue as a conflict with the Natives for land. Rather, it used the issue to press the federal government to surrender more of its land to Alaskans. That is, the State agreed to a generous land claims settlement for the Natives as a means of further eroding the federal government's jurisdiction in Alaska. From the state government's point of view, the main objective was to minimize conflict between Native and state land selection rights. This was accomplished by restricting Native selections for the most part to areas around villages, so 40 million acres for the Natives was 40 million acres out of federal ownership in addition to the 104 million acres granted to the State in the Statehood Act of 1958.

The State could also agree to a generous revenue-sharing program with the Natives (after some friendly persuasion by the federal government) since it expected that the fabulously rich oil fields of the North Slope would soon come into commercial production, and then there would be plenty of money for everyone. In fact, it would take a very long time for the State to pay its share of the $500 million contribution unless the North Slope or comparable oil fields were developed. Since settlement of the Native land claims was a prerequisite for construction of the trans-Alaska pipeline and since it insured that the Natives would be committed to the pipeline's construction, the half billion dollar revenue-sharing provision was considered not too high a price to pay.

Indeed, the acceptance of the land claims settlement by all of the established economic interests in Alaska — the state government the corporate mineral developers, the chambers of commerce, the independent miners, and the labour interests — stems from the fact that it does not substantially redistribute existing wealth among those groups in the State. Rather, it promises to increase the total amount of wealth available to all; the Natives, for the first time, included. This is, of course, an ideal solution to the political demands of an ethnic minority, and conditions in Alaska made it possible.

The Natives carefully made their economic development interests known to the public and to government officials. If occasionally they talked about being Alaska's first and true conservationists, and if occasionally they linked their struggle to that of the Red, Black and Chicano political movements in the other states, this was for what support they might generate among white liberal and ethnic minority groups in the "lower 48". For the land claims movement in Alaska had a very conservative style, marked by repeated references to the welfare of "all Alaskans" and frequent displays of the symbols of American political life.

To be sure, the Alaska Native Claims Settlement Act of 1971, with its overriding commitment to economic development, is very much in the American, and Alaskan, political tradition.

Gordon Scott Harrison
Institute of Social, Economic and Government Research,
Fairbanks, Alaska.

The Vascular Flora of Limestone Hills, Northern Extension of the Ogilvie Mountains, Yukon Territory

Owing to its relative inaccessibility the flora of unglaciated central and northern Yukon, from 65°N. to the Arctic Coast, and between the 136°W. and 141°W., has until recently remained totally unexplored.

The Dempster Highway, still under construction, will provide an easy access to what until now was the largest botanically unknown part of Canada. The new highway branches off the Whitehorse-Dawson highway about 23 miles east of Dawson and, when completed, will reach Inuvik on the East Branch of the Mackenzie Delta, a distance of approximately 400 miles. For about two-thirds of this distance the road follows river valleys and low divides at elevations between 2,000 and 3,500 feet above sea-level, and along its course provides easy access to a number of mountains or mountain massifs reaching 2,000 to 3,000 feet above road-level.

From 3 to 12 July 1970, my brother, R. T. Porsild of Whitehorse, and I made a hurried trip along the southern part of the Dempster Highway to visit places between the North Klondike Pass and Mile 89 where he had made large collections of vascular plants, when under contract with the National Museum of Canada during the summers of 1966 and 1968.

(A lengthy report by the present writer which will include the more significant range extensions and numerous additions to the known flora of the Yukon, contributed mainly from R. T. Porsild's collections in the Ogilvie Mountains along the Dempster Highway between Mile 44 and Mile 89, and from the Mayo District in 1967, is to appear soon[1].)

Beyond Mile 89 a few days were spent examining the flora of light-gray limestone hills that form a northward extension of the Ogilvie Mountains, at approximately 65°20′N., 138°30′W., south of Mile 100 to 110 on the Dempster Highway and thus beyond the point accessible by road to R. T. Porsild, in 1968.

In strong contrast to the more fertile and better vegetated southern Ogilvie Mountains between the North Klondike Pass and Mile 89, the much lower northward extension of the Ogilvie Mountains, at approximately 65°03′N. presents a strange and weird landscape of dendritically eroded plateaus of a general elevation about 3,500 feet above sea-level (Fig. 1). Viewed from a distance this looks as if it were snow-covered, but on closer inspection the "snow" proves to be screes and ridges covered by a pale-grey mantle of huge, angular blocks of frost-shattered grey limestone, often totally or nearly devoid of vegetation (Fig. 2). This mantle is very deep, and the broken rocks so large and angular that a traverse on foot is difficult and even dangerous. Soil is either totally absent, or at best confined to small pockets that may harbour tufts of mosses among which may be seen individual plants such as *Oxyria digyna, Saxifraga oppositifolia* or *Luzula confusa,* that only there could have gained a precarious foothold. Growing from deep down amongst the rocks, we were surprised also to find occasional specimens of the otherwise exceedingly rare *Smelowskia borealis,* here mainly sterile and etiolated, because of the shady habitat.

In this rock mantle, weathering obviously

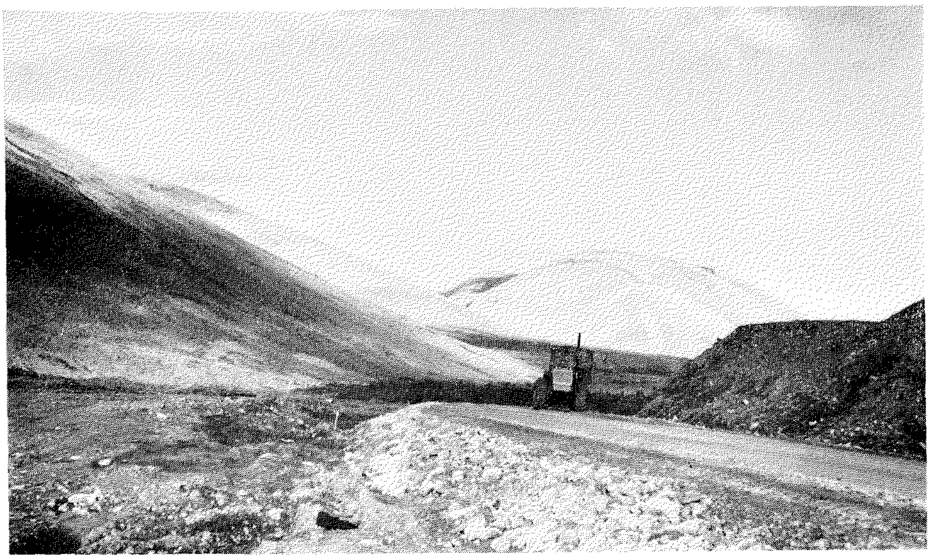

FIG. 1. Looking West on Dempster Highway about Mile 100. Note the pale gray northwest slope of mountain right of centre.

is very slow, because no water from rain or melting snow is retained in its upper layers. During the winter the rock mantle probably catches much snow that later, because of the shade between the rocks, melts slowly. The run-off, during summer, feeds the lower slopes and the valley below. In mid-July ice could still be seen everywhere deep down between the rocks.

The north- and northwest-facing slopes are steep, with an angle of 40 to 45 degrees but, owing to the great size and angularity of the rocks, they appeared remarkably stable, with no downhill movement.

On south- and southeast-facing slopes weathering appears to be more active and, no doubt, is accelerated by more frequent freezing and thawing. The evident downhill movement here of rock debris from the rock-mantle above, causes these slopes to be less steep; their lower part, often with a gradient of 20 degrees or less, are strikingly fluted by water-sculptured, shallow ravines between gravelly ridges. The ravines were probably formed in a period when the climate was moister than at present, but at the time of our visit they were quite dry, although enough soil moisture remained to sustain an open plant cover that from a distance imparted a light grey-green colour contrasting markedly with the dull-grey limestone rubble of the intervening ridges.

Ascending these slopes the gradient becomes steeper and the soil particles progessively coarser until, near the summit, we again reach the mantle of huge angular blocks.

In comparison with the surprisingly rich and varied flora of the southern Ogilvie Mountains that of the limestone hills is extraordinarily poor in species but very different in composition.

The valley shown in Fig. 2 is oriented SE-NW and is directly south of Mile 110 on the Dempster Highway. It was chosen partly for its closeness to the highway and partly for the diversity of its plant habitats described below.

The hills on either side of the valley rise to approximately 800 feet above the valley bottom. The northwest-facing slopes to the left, except for a very narrow strip near the bottom, are devoid of vegetation as is the upper half of those on the right side of the valley.

A small stream, barely visible in the photograph, is fed from snowbanks at the head of the valley, and from seepage.

ALPINE SCREE-SLOPE

About 50 species of vascular plants, nearly all pronounced calciphiles, were noted on the lower third of a southwest-facing slope, most of them growing in the ravines. By far the most common were *Kobresia myosuroides* and *Dryas sylvatica.* Common, but never dominant were: *Carex glacialis, C. scirpoidea, Tofieldia coccinea, T. pusilla, Zygadenus elegans, Arenaria arctica, Thalictrum alpinum, Papaver Keelei, Braya glabella, B. Richardsonii, Parrya nudicaulis, Saxifraga caespitosa*

FIG. 2. Southwest-northeast oriented valley south of Mile 110 on Dempster Highway.

ssp. *monticola, S. tricuspidata, Oxytropis Jordalii, Cassiope tetragona, Androsace Chamaejasme* ssp. *Lehmanniana, Phlox alaskensis, Eritrichium aretioides, Pinguicula vulgaris* and *Chrysanthemum integrifolium.*

Much less common were: *Woodsia glabella, Elymus innovatus, Carex petricosa, Salix arctica, Polygonum viviparum, Anemone parviflora, Lesquerella Calderi, Smelowskia borealis, Draba barbata* (new to the flora of North America), *Parnassia Kotzebuei, Saxifraga oppositifolia, Potentilla fruticosa, P. nivea, Dryas alaskensis, Hedysarum Mackenzii, Oxytropis Maydelliana, Rhododendron lapponicum, Castilleja hyperborea, Pedicularis lanata, Valeriana capitata, Campanula aurita, Antennaria densifolia, Arnica alpina* ssp. *attennuata, Crepis nana, Erigeron purpuratus, Senecio resedifolius* and *Taraxacum alaskanum.*

STONY FLOOD PLAIN

Stony flood plain valley bottom is oriented southeast-northwest between low limestone hills. Starting at the head of the valley, the following more or less distinct plant habitats were examined in some detail: 1) Well-drained gravelly or sandy stream banks, the down-stream parts subject to spring flooding; 2) Dry, stony ridges usually with some soil around or between the stones; 3) Moist flood-plain meadows; 4) Moist, peaty bogs well above present flooding; 5) Low willow thickets, mostly on boulder flats between former stream beds but no longer subject to flooding; the space between boulders now well filled by sediments topped by a humus layer; the older and mature willow thickets are now being invaded by white spruce (see Fig. 2).

1) Gravelly or sandy stream banks: *Equisetum arvense, E. palustre, E. variegatum, Poa alpina, Carex capillaris, C. scirpoidea, Juncus albescens, J. castaneus, Tofieldia pusilla, Arenaria Rossii, A. obtusiloba, Anemone parviflora, Papaver Keelei, Braya glabella, B. Richardsonii, Cardamine purpurea, Draba longipes, Saxifraga aizoides, Parnassia Kotzebuei, Crepis nana* and *Senecio resedifolius.*

2) Dry, stony ridges: *Carex petricosa, Salix reticulata, Arenaria arctica, Silene acaulis, Papaver Walpolei, Lesquerella Calderi, Saxifraga oppositifolia, Dryas alaskensis, D. sylvatica, Hedysarum Mackenzii, Arctostaphylos Uva-Ursi, Campanula uniflora, Arnica alpina* ssp. *attennuata, Artemisia arctica, Chrysanthemum integrifolium* and *Solidago multiradiata.*

3) Moist flood-plain meadows: *Elymus innovatus, Deschampsia brevifolia, Carex atrofusca, Polygonum viviparum, Melandrium apetalum, Thalictrum alpinum, Parrya nudicaulis, Oxytropis Jordalii, Hedysarum alpinum, Castilleja hyperborea, Lagotis glauca, Pedicularis capitata, P. sudetica, P. verticillata, Pinguicula vulgaris, Arnica Lessingii and Aster sibiricus.*

4) Moist peaty bogs: *Equisetum scirpoides, Lycopodium Selago, Festuca altaica, Hierochloe alpina, Eriophorum callitrix, E. vaginatum, Kobresia simpliciuscula, Carex atrofusca, C. consimilis, C. misandra, C. lugens, C. membranacea, C. vaginata, Luzula groenlandica, Salix arctica, Polygonum Bistorta, Rumex arcticus, Saxifraga Hirculus, S. hieracifolia, Potentilla fruticosa, Vaccinium Vitis-Idaea, Arctostaphylos rubra, Ledum decumbens, Rhododendron lapponicum, Pedicularis arctica, P. labradorica, P. sudetica, Pinguicula villosa* and *Saussurea angustifolia.*

5) Low Willow thickets: *Picea glauca, Calamagrostis canadensis* var. *Langsdorffii, Salix alaxensis, S. Barrattiana, S. Bebbiana, S. glauca, Betula glandulosa, Delphinium glaucum, Valeriana capitata* and *Petasites frigida.*

A. E. Porsild
Curator Emeritus
National Museums of Canada

REFERENCE

[1]Porsild, A. E. in press. Materials for a flora of continental Yukon Territory. *National Museum of Natural Sciences, National Museums of Canada. Publications in Botany.*

The Role of Spring Thaw In String Bog Genesis

Much has been written in several languages on the problems of distribution and genesis of string bogs. With the exception of certain botanical studies of string bog flora[1,2], there have been little more than cursory attempts to develop an understanding of the physical and biological forces involved in the formation of string bogs. In three recent textbooks on cold region geomorphology[3,4,5], little attention is paid to these problems. It is possible to make a case for string bogs constituting dynamic landscape elements critical in their adjustment to prevailing environmental factors, and thereby demonstrate that changes in the physical form and ecological character of string bogs over time are vital in the development of theories about the direction, intensity and frequency of environmental change in the subarctic. Before this stage is reached, it is necessary to establish a more