

Third Annual Geoscience Research Seminar

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tents in various types of material including organic silt, till, sand and gravel. He showed that the amount of ice will vary with latitude but that the relative amount of ice from one material to the next remains fairly constant in any given area.

Larry Dyke (Terrain Sciences Division of the Geological Survey of Canada) illustrated the impact of vehicle movement on various types of surficial materials in permafrost areas. Till is least affected by heavy vehicle traffic, while peat tends to lose its cohesive strength and liquify. Dyke continued with a second talk of bedrock frost heave, showing field examples, explaining experiments designed to measure frost heave and discussing possible mechanisms.

In the evening Mel Brown, IAND's mining inspector, reviewed his considerable experience with mining and permafrost in the Northwest Territories. This ranges from inspecting curling rinks and cold storage areas mined out of pingos to development of the innovative dry mining techniques in use at the Nanisivik and Polaris mines.

A second northern veteran, John Denison, showed a movie about winter road construction and operation and gave a list of do's and don'ts of winter road construction. A narrative of one of John's winter road operations, "Denison's Ice Road, by Edith Iglauer, is scheduled to be reprinted in a paperback edition in the near future.

A volume of proceedings of the meeting is planned and will be available by late summer, 1981. Contact: The Yellowknife Workshop committee c/o Geology Office, IAND, Box 1500, Yellowknife, N.W.T. X0E 1H0.

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Third Annual Geoscience Research Seminar

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Over 500 Geoscientists from industry, government and universities attended the Ontario Geological Survey (OGS) Geoscience Research Seminar, December 10-11, 1980 in Toronto. Among the individual research presentations were 20 Ontario university progress reports of ongoing research projects funded by the Ontario Ministry of Natural Resources. The Geoscience Research Grant Program, initiated in 1978, provides a total of \$500,000 per annum to Ontario university faculty members for mission-oriented geoscience research projects, complementary to the activities of OGS and ultimately intended to reduce uncertainty by industry in mineral exploration programs.

As a number of these university projects are currently in the final year of funding, some interesting results were presented. E.G. Pye, OGS Director of the grant program, cited some of the research accomplishments to date:

- 1) development of new guidelines to exploration in terms of metallogenic concepts and also in the field of litho-geochemistry; 2) development of modelling techniques as an aid to interpreting electro-magnetic survey data; 3) demonstration that high resolution aeromagnetic and paleomagnetic surveys can be used as effective tools to aid stratigraphic mapping in drift-covered areas; 4) development of the 'collector' system to delineate Ra anomalies in U prospecting; 5) demonstration of the use of horizontal deep drains in reducing ground-water pressures and thereby increasing the stability of clay slopes; 6) development of an ion laser in argon geochronology and microanalysis at mineral grains; and finally 7) experimental work showing that U-Th-Ra levels in mine wastes can be effectively controlled by treating tailings with phosphates.

This latter project, is directed by W.S. Fyfe (University of Western Ontario), and received special mention by the Ontario Minister of Natural Resources, James A.C. Auld, in his seminar address. The University of Western Ontario research team's concept is based on the well-known observation that radium and uranium are concentrated in organisms and particularly those which secrete phosphate bearing skeletons. Thus many large phosphate deposits are also uranium deposits.

In these experiments, the very stable and insoluble phosphate mineral, apatite, is precipitated in the mine wastes by adding calcium carbonate and phosphate solutions. Glacial clays are added to reduce permeability of the matrix. After such treatment, the waters from the mine wastes (samples provided by Rio Algom Ltd., Elliot Lake, Ontario) have radium levels similar to those found in normal ocean water and clean river waters, (and much lower than in some well waters) . . . "The results show clearly that the radium levels can be reduced to near global background levels (given our sample sizes, we only have the detection limit <1.0; data now being collected will allow lower levels to be determined)." (OGS Geoscience Research Seminar 1980, Abstract).

Fyfe also outlined a scenario for a plan to treat the waste and concluded his talk by underlying the principles on which any waste treatment should be based—with one's sights set on the next thousand years, rather than on the next ten years.

Among the OGS staff presentations were 10 special papers, as well as a Symposium on the Kirkland Lake Initiatives Program (KLIP), a \$2.5 million, 5-year program ending in 1983-84. This comprehensive geoscientific survey program sponsored by the Federal Department of Regional Economic Expansion and the Ontario Ministry of Northern Affairs, was designed by the Ontario Geological Survey. The overall objective is to stimulate mineral exploration by private industry in the area. Ian Thomson, the symposium co-ordinator, gave a historical overview of the Kirkland Lake Area which was at its peak of mine production in the late 1930s and saw its population rise to 25,000 (more than double the present figure). By the 1960s, the town's basic industry was moribund, and at present only two mines are operating in the area. However, Thomson stressed that the Kirkland Lake Area is still a good place to look for gold, has good base metal potential and real possibilities for talc, asbestos and diamonds.

An airborne electro-magnetic survey, flown in the winter of 1978-79 and published in September, 1979, resulted in the immediate purchase of these maps by more than 100 companies and individuals, with several thousand claims staked. By October 1980, an estimated \$2.5 million had been spent in the Kirkland Lake area in response to the survey.

The symposium focused primarily on gold and highlighted progress reports of the work currently underway. L. Jensen, with 12 years of mapping experience in the area, is carrying out regional, synoptic, stratigraphic mapping aimed at providing a geological synthesis for the entire area. I. Thomson, is systematically sampling and analysing the glacial till which can direct exploration towards bedrock sources of interesting minerals. N. Trowell is examining the stratigraphic and structural features leading to a better understanding of the Timiskaming group rocks, the so-called 'breaks', and other controls to gold mineralization. The relationship of gold deposits to particular rock types and structures is being determined by F. Ploeger. C. Baker is completing systematic mapping of the Quaternary deposits, including a detailed evaluation of the source, transport and deposition relationships of sediments in esker systems. Finally, Gary Grabowski, and Howard Lovell, have published 60 data series maps as an additional aid to

prospectors. All of these studies are providing an impressive bank of information for planning and implementing exploration in the area.

Concluding the two-day seminar was a panel discussion - "Gold - the Ontario Potential" - moderated by R.W. Hutchinson, University of Western Ontario, and included a panel of five: C.J. Sullivan, Consulting Geologist in Toronto; R.G. Roberts, University of Waterloo; W.O. Karvinen, Consulting Geologist in Sudbury; P.M. Kavanagh, President, Rio-canex Ltd., and D. Pretorius, University of Witwatersrand, Johannesburg, South Africa.

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Position Available

McMaster University requires a senior demonstrator, initially for a period of one year beginning Summer 1981. The incumbent will be responsible for the Year I Geology laboratory programme but will also be required to curate departmental collections and equipment.

Applicants should send a curriculum vitae together with the names of two referees to: Dr. G.V. Middleton, Chairman, Department of Geology, McMaster University, Hamilton, Ontario, L8S 4M1.

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