



Canadian Geoscience Council

The Geosciences in Canada, 1979

Annual Report

Prepared by
The Canadian Geoscience Council

Edited by: R.G. Roberts

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Edited by
R.G. ROBERTS

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PREFACE

As the Canadian Geoscience Council has grown and matured since its founding in 1972, it has tackled progressively more complex and fundamental issues facing the Canadian earth sciences. In this, the seventh Annual Report of the Council, the major section, published as Geological Survey of Canada Paper 80-6, Part 1, deals with teaching and research in geology and geophysics in Canadian universities. The two year study has been spearheaded by E.R. Ward Neale and Jack E. Armstrong to whom the Council is truly indebted for their endless, volunteered hours of investigation, discussion, analysis, and writing blended with frustration, wit, insight and compromise.

The Council is committed to a series of analytical reviews of different sectors of the earth sciences. Earlier studies have included research in petroleum exploration geology, the soil sciences, and the Geological Survey of Canada; studies in progress involve research in marine geosciences and also geoscience research in the mineral industry.

This volume reports on the many other activities of the Council during the past year. These have been extremely varied and are discussed in the Report of the President. The annual volume of the Canadian Geoscience Council is designed to present the results of major studies conducted on behalf of the Council and to include its annual reports and major briefs or statements by its member societies. Council is anxious that it also serve as a forum for informed views of individuals or groups on topics of concern in Canadian geoscience and contributions are invited for future volumes.

March, 1980

C.R. Barnes
Past-President

CANADIAN GEOSCIENCE COUNCIL 1979 ANNUAL REPORT

REPORT OF THE PRESIDENT

During 1979, the earth sciences were perceived to be central as never before to a host of scientific socio-economic and political issues. The need to discover more Canadian hydrocarbon deposits is probably the nation's foremost single priority; with the current economic deficit, the short-term need to locate, mine, and export more natural resources (uranium, base metals, potash, coal) has become increasingly evident; yet, at the same time, there is an increasing public awareness and concern over environmental protection, especially concerning radioactive and toxic waste disposal, uranium and coal mining, oil spills, and acid rain.

As all of these immediate problems pressure our society at a time of limited financial flexibility, decision makers are urgently seeking advice and solutions and developing, perhaps belatedly, some long-range strategies. For some time, the Council has been trying to communicate information and recommendations at many levels. In its 1976 Annual Report (GSC Paper 77-6), it pointed out that to meet energy and mineral demands by 1990, exploration and development will cost approximately 15 to 40 billion dollars for oil and gas, 3.2 billion dollars for coal, and 4.9 billion dollars for metallic minerals. To meet projected requirements over the next 25 years, expenditures will have to increase by a factor of 3 in real terms. These data cast doubts on whether Canada is producing sufficient trained geoscientists to meet these future challenges. The Council has now completed a major study on geoscience in the universities "80-6, Part 1" which shows that despite recent enrolment increases in earth sciences, the present number of students cannot even meet the current manpower requirements of expanding oil exploration programs. For the past few years, Council has been advising the Ministry of State for Science and Technology and the Natural Sciences and Engineering Research Council of the urgency of providing increased research funding for the (earth science) university community. Thus, we strongly welcome the acceptance in principle by the federal government of the NSERC Five Year Plan and the 32% increase in the NSERC research budget for 1980-81. This bold plan is a first step towards attaining a significant increase in the percentage of the gross national product allotted for R and D (from 0.6 toward 2.5) after a decade of decline.

Advisory Role

A principal mandate of the Council is to provide advice on earth science matters to various levels of government and to the geoscience community. In representing over 13 000 earth scientists through its 12 member societies, the Council is in a unique position to glean information, to identify appropriate specialists, and to offer advice. In 1979, this role has increased for Council through both formal Advisory Committees to certain agencies and through specific representations on particular issues.

For three years, a CGC Advisory Committee to the Geological Survey of Canada has been undertaking a thorough analysis of the organization, activities and problems of the Survey. A detailed summary of their findings and recommendations was published by J.D. Weir et al. in the 1978 CGC Annual Report (GSC Paper 79-6). As indicated in the formal reply published in the same volume, the Geological Survey has already implemented many of the recommendations and must be commended for such rapid response. The study demonstrated the extent of the serious erosion suffered by the Survey in recent years in terms of its mapping and research programs. As one of the few divisions of government that can be part of the productive sector of the economy, these budget reductions are particularly regrettable. This year two members, J.D. Weir and J.D. Mollard, retired from the committee and B. d'Anglejan, P.L. Gordy and M.G. Tanguay were selected as new members joining J.A. Coope, D.W. Strangway and A. Sutherland Brown. Through a revised mandate this new Advisory Committee will examine all aspects of the internal and external output of the Geological Survey, partly through adopting user-survey approach.

The Council, along with other scientific and engineering councils, played a significant role in establishing a Technical Advisory Committee to Atomic Energy of Canada, Limited. Of particular concern is the question of the safe subsurface disposal of high level radioactive waste.

In a brief to the Mines Ministers at their annual conference, the Council described the benefits to be gained by provincial ministries surveys through the establishment of their own advisory committees similar to the CGC Advisory Committee to the Geological Survey. We offered to assist in the creation of such committees as was deemed appropriate by individual agencies and several are currently exploring this avenue. In the same brief, Council also stressed the need for greater provincial input and concern over the geoscience aspects of radioactive waste disposal following the recommendations of a recent Council report (GSC Paper 79-10).

Council provided advice on several specific matters over the past year. It proposed two new areas of Strategic Grant funding to NSERC: Mineral Resources, and Environmental Change. It argued strongly for the necessity of a Department of Geology at Laurentian University when university officials threatened to close the department for financial reasons. It continued to meet with the Canadian Environmental Advisory Council and with senior officials of the Department of Energy, Mines and Resources to consider matters of common concern. It is presently preparing a brief to be presented to the Royal Commission of Inquiry into Uranium Mining in British Columbia early in 1980.

The Council, acting as the National Committee for Geology, has selected the official Canadian delegates to the 26th International Geological Congress, Paris, 1980. It continues to administer the Canadian programs of the International Geological Correlation

Project. The CGC Foreign Secretary, R.A. Price, has been active in many other aspects of international geoscience and particularly with the establishment of a new interdisciplinary research program in the solid earth sciences for the next decade that will be a successor to the International Geodynamics Project of IUGG and IUGS. This new project will focus on all aspects of the lithosphere.

Special Studies and Publications

On complex earth science issues, Council can more appropriately provide advice and recommendations after in-depth studies have been undertaken. Four such studies are in various stages of completion and publication.

As referred to above, J.D. Weir et al. provided "A Report Concerning the Geological Survey of Canada" within the 1978 CGC Annual Report (GSC Paper 79-6, p. 4-18). The new committee's analysis of GSC output will probably be published in 1982.

The proceedings of the CGC Forum were published as GSC Paper 79-10, "Disposal of High-Level Radio-active Waste: the Canadian Geoscience Program". Major changes in funding, organization, and disposal options were advocated for this program. The recommendations have been directed to the many agencies involved and discussions on the details are continuing.

Our latest study, organized and edited by E.R.W. Neale and J.E. Armstrong is titled "Geology and Geophysics in Canadian Universities" and is published as Part 1 of Geological Survey Paper 80-6. The study took 18 months to set up and complete with funding being provided by the GSC, NSERC and CGC. Many valuable data and interpretations are included on the activities and problems of nearly 500 geoscience academics in some 40 universities across Canada. External views were solicited from the private, industrial and government sectors on the departments and on the quality of the graduates produced. Various strengths and weaknesses are identified together with the almost universal serious financial straits in which universities find themselves at present.

The fourth study, recently initiated, concerns "Marine Geoscience Research in Canada" and is being spearheaded by R.D. Johnson. At a time of increased offshore exploration, and a new 200 mile territorial limit and major international deep sea drilling projects, there are serious concerns as to the level of research activity in Canadian marine geoscience. The major thrust to exploit offshore resources probably demands a significant change in priority for research in this field. Canada has so far avoided or declined invitations to participate in, and contribute financially to, some major deep sea drilling programs. Marine geoscience will be of increasing concern economically, politically and scientifically in the next few decades and this study promises to be most timely.

Another CGC publication, "Current Research in the Geological Sciences in Canada, May 1978- April 1979" compiled annually by T.E. Bolton, should be published in the near future as GSC Paper 79-5.

Publication has been unfortunately delayed because of the financial restraints imposed on government expenditures.

Education

The Council expanded its education programs during the past year. The successful EdGEO programs for high school teachers in earth sciences could no longer be funded by the Canadian Geological Foundation. Through the efforts of P.J. Savage and others, sufficient funds were solicited from the petroleum industry to guarantee the continued operation of the program at several centres across Canada through at least the next three years.

The breadth of the earth sciences has never been adequately covered in a careers booklet designed for high school students and first year university students. Council attempted this year to produce such a booklet. Prepared by P. Copper with some financial support from the CGF, the booklet is now in press and will be distributed in 1980.

A similar problem of identity as a career option has been faced by the engineering geology discipline. The Council has been working with a committee from the ten universities offering formal engineering geology programs to produce an informative booklet. With financial support from the universities, the private sector, and the CGF, this booklet is also now in press and will be available shortly.

Organization

In its brief seven year history, the Council has been assuming more and more responsibilities and embarking on diverse activities. This has inevitably necessitated improved internal organization and a broader funding base. So far we have been able to resist any major administrative expenses, largely through the generosity of the university hosting the headquarters.

This year, the Canadian Association of Geographers was elected to full (from associate) membership in the Council and the Provincial Geologists have had active representation. A more structured committee system was introduced with more consideration given to key geoscience issues likely to emerge in the future. More attention has been paid to communicating the activities of Council to the member societies and to the public through the creation of a display booth, a bilingual brochure, and the issuance of a variety of news releases.

Attempts have been initiated, and will continue, to broaden the revenue base of the Council. With provincial agencies playing an increasing role in the earth sciences, particularly related to resource development, Council solicited support with some success from such agencies. The industrial sector was approached for funds to support specific projects noted above. Our member societies are also contributing more through increased membership dues.

The Council, like many scientific groups, still depends heavily on the volunteer time, effort and support of many individuals and on the indirect and direct financial support of many agencies and

institutions. As President I have been continually amazed at how much is done, for so many, by so few, for so little.

In particular, I would like to thank sincerely the members of the Executive and of Council for all their support during the last year. After seven years as Executive Director, E.C.Appleyard has taken a well deserved break while on sabbatical leave, leaving the CGC in the able hands of R.G. Roberts. The Council is now truly a dynamic and responsible organization that has matured rapidly in its short history. The challenges ahead are many and varied and it is with a mixture of pleasure, relief, and a tinge of nostalgia that I welcome D.W. Strangway as the new President.

C.R. Barnes
President
December, 1979

REPORT OF THE SECRETARY-TREASURER

The eleven Member Societies in the Council were pleased to welcome the Canadian Association of Geographers into full membership. Contributions to the work of Council by the physical geographers who are part of that association, have and will be of benefit to the geoscience community as a whole.

Invitations to council meetings are extended to the following organizations as Associate Members or Observers:

- Associate Committee on Geotechnical Research
- Committee of Chairman of Canadian University Departments of Earth Sciences
- Committee of Provincial Geologists
- Earth Physics Branch (EMR)
- Earth Science Division of the Royal Society of Canada
- Geological Survey of Canada (EMR)

Funds for Council activities have been obtained from Energy, Mines and Resources as an annual sustaining grant, a contract for the annual report of Council on some parts of Canadian geoscience, and the fees of the Member Societies.

Council was pleased to receive a sustaining grant from the Province of Alberta and grants from Hudson Bay Oil and Gas, Sunoco and Esso Resources which have and will enable the Education committee to continue support of various geoscience workshops across the country.

With the continued rise of interest rate, additional interest was received for short term funds. The increased income however is offset by the increasing costs incurred for Council meetings. The main expenditures of Council are still in support of Education and Editorial Committee activities. The Council is a member of SCITEC and supports the Youth Science Foundation.

Four Council meetings were held during 1979; Vancouver on February 8, Quebec City on May 22, Calgary on September 19 and Ottawa on December 11. Immediately following the Ottawa meeting a special session was held with senior officials of Energy, Mines and Resources primarily to discuss the current report 1979 and proposed 1980 reports prepared under contract.

The Executive Committee of the Council in 1979 comprised:

President - C.R. Barnes

Vice-President - A. Sutherland Brown

Past-President - G.W. Mannard

Secretary-Treasurer - K.A. Morgan

Executive Member - R.H. Erickson

Foreign Secretary - R.A. Price

Executive Director - E.C. Appleyard, R.G. Roberts

Member societies and representatives at year end 1979.

Association of Exploration Chemists - L.A. Clark

Canadian Exploration Geophysical Society- K.A. Morgan

Canadian Geophysical Union - R.D. Russell

Canadian Geotechnical Society - F. Patton, D.F. VanDine

Canadian Institute of Mining and Metallurgy -
A.E. Soregaroli, R.J.M. Miller, G.D.J. Boldy

Canadian Society of Exploration Geophysicists-
R.J. McCaffrey, E.F. Mahaffy, W.D. Evans,
J.R. Pullen

Canadian Society of Petroleum Geologists - D.W. Organ,
R.H. Erickson, J. Andriuk, N.J. McMillan

Canadian Society of Soil Science - G.C. Topp,
D.F. Acton

Canadian Well Logging Society - M.Heseldin,
J.A. Ellis

Geological Association of Canada - A.Sutherland Brown,
N.J. Allman, W.G.E. Caldwell, A.V. Morgan

Mineralogical Association of Canada - A.C. Brown

Canadian Association of Geographers - B. Greenwood,
O. Slaymaker.

K.A. Morgan
Secretary-Treasurer
December, 1979

The Canadian Geoscience Council established the position of Foreign Secretary in 1976 when responsibility for Canadian representation in the International Union of Geological Sciences and at the International Geological Congress was transferred from the Geological Survey of Canada to the Canadian Geoscience Council. At that time the council also established a Standing Committee on International Scientific Relations, under the chairmanship of the Foreign Secretary, with terms of reference drawn up by the first foreign secretary, W.W. Hutchison. The terms of reference, which appeared as Appendix 8 Geoscience Council meeting of April 1977, are available upon request from the Executive Director of the Council.

The Standing Committee on International Scientific Relations is chaired by the foreign secretary and consists of J.M. Harrison, Chairman of the Canadian National Committee for the International Geological Correlation Program (IGCP), R.A. Price, Chairman of the Canadian National Committee for the International Geodynamics Project (IGP), R.A. Blais, Vice-President of the Association of Geosciences for International Development (AGID), as Canadian representative of that association, J.M. Duke, Secretary of the Mineralogical Association of Canada, representing the International Mineralogical Association, W.J. Eden, of the NRC Associate Committee on Geotechnical Research, representing the International Association of Engineering Geology (IAEG), and T.E. Bolton, representing the Geological Survey of Canada which pays the subscription fees as the adhering body of the International Union of Geological Sciences (IUGS).

The purpose of the Committee on International Scientific Relations is to provide advice and guidance to the Canadian Geoscience Council and provide a forum of discussion of Canadian activities in International Geoscience. It acts as a clearing house for reports of national committees concerned with international programs and international geoscientific relationships, proposes responses to new international initiatives and ensures that council is adequately represented in international nongovernmental programs, projects, and meetings.

The third annual meeting of the committee was held in the Board Room of the Geological Survey of Canada on March 1st and 2nd, 1979. The full minutes of this meeting are available upon request from the Foreign Secretary or from the Executive Director of the Council. In addition to the regular members of the committee special observers included W.W. Hutchison (Secretary-General of IUGS), G. Ranalli (Secretary, Canadian Geodynamics Committee), E.T. Tozer (Secretary, Canadian National Committee for IGCP), and L. Jansa and H. Morris (Members of the Canadian National Committee for IGCP).

International Geological Correlation Program (IGCP)

The Canadian National Committee for IGCP held its annual meeting in the forenoon of March 1st, 1979. Full minutes of this meeting are available from the secretary T. Tozer (Geological Survey of Canada, Ottawa). The Committee has a budget of \$12,00 per year, received in the form of a grant from the Geological Survey of Canada, with which to support Canadian participation in the activities of the

international working groups, and the coordination of the Canadian program. Disbursements for 1978, which included grants to eight IGCP project groups in Canada, amounted to \$17 204. A review of procedures for dealing with applications for financial support submitted by Canadian IGCP project teams resulted in the decision that these applications should be submitted on a standard form, and should provide both an itemized budget for the particular activity for which support is requested, and a statement listing other sources from which financial support is being requested. It also resulted in the policy decision that sums of up to \$500 may be applied to individual projects at the discretion of the chairman and secretary without consulting the whole committee, but that the total of such disbursements should not exceed \$4,000 in one year. The allocation of \$10,600 for meetings of various IGCP project groups, and for national committee travel, during 1979, was ratified.

The terms of appointment on the Canadian National Committee for IGCP of R.L. Armstrong, L.F. Jansa and J. Riva expired in 1979. R.L. Chase, J.D. Weir and G. Williams were nominated as replacements.

Following a general discussion of the publication policies and procedures adopted by the IGCP, the following resolution was approved for transmittal to the IGCP Board:

"The Canadian National Committee for the IGCP wishes to express to the Board its concern about the limited extent and inconsistent nature of the way in which scientific results arising from IGCP projects are made available. It is submitted that features such as lack of standardization, limited availability, etc., seriously impare the value of much of this work in that it is not freely available to the world geoscience community".

International Geodynamics Project

The annual meeting of the Canadian Subcommittee for Geodynamics was held on March 2nd, 1979. Minutes are available from the secretary G. Ranalli (Carleton University, Ottawa). The final report of the Canadian Subcommittee for Geodynamics was published as a special issue of the Canadian Journal of Earth Sciences (Volume 16, no.3, part 2, March 1979) dedicated to J. Tuzo Wilson. This special publication consists of a series of eight papers, each of which reviews and assesses new information and concepts developed during the period of the International Geodynamics project (1970-78), in a particular field, by Canadian scientists. Each paper attempts to outline and assess the significance of the main advances in its field, to identify important problems which require further investigation, and to transmit to other interested geoscientists, regardless of their specialities, some of the excitement and intellectual stimulus of the new developments.

The International Geodynamics Project ended officially in 1979. It was created as a joint effort of the International Union of Geodesy and Geophysics (IUGG) and the International Union of Geological Sciences (IUGS). Planning for a new

joint IUGG-IUGS international interdisciplinary research project in the solid earth sciences was initiated in 1978. A joint task force of the two unions presented a proposal for a new project on "The Lithosphere: Frontier for the 1980"; and a special symposium was convened by IUGS in Zurich, in February 1979, to discuss this proposal. In view of the recommendations from the joint task force the establishment of a new proposal, and the enthusiasm with which these recommendations have been received throughout the world, the IUGS and the IUGG have requested that individual nations maintain their national committees for Geodynamics, or else establish new national committees for the successor program, in order that the new program may be implemented promptly. The Canadian Subcommittee for Geodynamics, which only remains in existence until March 1980, recommended to the Canadian National Committee for IUGG and the Canadian Geoscience Council that the terms of appointment and financial support for the Canadian Subcommittee for Geodynamics be maintained beyond March 31, 1980; that the CNC-IUGG and the CGC each nominate before January 1980, one half of the sixteen new members for the committee, making provisions for some continuity in membership, and that a joint meeting of the old and new committees be convened in 1980. It is intended that the chairman and secretary of the US National Committee for Geodynamics be invited to attend this meeting, so as to foster closer cooperation between the two countries in the development of the new program. The members of the new committee, their affiliation, and terms of appointment are given below:

A. Baer	University of Ottawa	1980-85
F.H.A. Campbell	Geological Survey, Ottawa	1980-84
H. Gabrielse	Geological Survey, Vancouver	1980-83
C. Hubert	University of Montreal	1980-84
R. Macqueen	University of Waterloo	1980-85
H.R. Balkwill	Panarctic Oils Limited, Calgary	1980-84
C.J. Yorath	Pacific Geoscience Centre, B.C.	1980-85
A.E. Soregaroli ¹	Western Mines Limited, Vancouver	1980-83
I. Gough	University of Alberta, Edmonton	1980-84
P.Y. Robin	University of Toronto	1980-83
D. Oldenburg	University of British Columbia, Vancouver	1980-85
M.J. Berry	Earth Physics Branch, Ottawa	1980-84
C. Keen	Atlantic Geoscience Center, Dartmouth	1980-83
J. Sweeney	Earth Physics Branch, Ottawa	1980-85
H.E. Palmer	University of Waterloo, London, Ontario	1980-84
W. Cameron	York University, Toronto	1980-83

A series of seven cross-sections through parts of the Canadian Cordillera are being prepared under the auspices of the Canadian Subcommittee for Geodynamics to complement a series of twenty-three cross-sections being drawn through various parts of the Cordillera in the United States under the auspices of the US Geodynamics Committee. These structural cross-sections, which will be accompanied by strip maps, are intended to outline the current state of knowledge and the main requirement for future research on the tectonics of parts of the Canadian Cordillera, and will be published as part of the Geological Society of America's Maps and Charts Series.

Planning for a new continental margins transects project, involving participation by Canadian and United States geologists and geophysicists on the Pacific and Atlantic margins of North America, is well underway, and seems destined to become an important component of United States-Canada collaboration in the new inter-union project.

Association of Geoscientists for International Development (AGID)

In a communication to the Foreign Secretary, Professor R. Blais, Vice-President of the Association of Geoscientists for International Development reported that the AGID headquarters are now successfully established in Caracas, Venezuela. The new Director-General is Alirio Vellizzia, who is also Director of the Venezuelan Geological Service. Membership now stands at over 1100 and the annual fee has been raised to \$10.00 (U.S.). A series of successful training workshop programs have been conducted in developing countries, and AGID is attempting to set up an International Geoscience Institute which will tackle problems of special interest to the developing countries. A series of handbooks are being prepared on various subdisciplines of use to geoscientists in developing countries. A review committee is being established to examine the progress of AGID and to advise on its future goals. AGID is now seeking formal affiliation with IUGS.

International Union of Geological Sciences (IUGS)

W.W. Hutchison, Secretary-General of IUGS reported to the committee that considerable success has been achieved in encouraging publication of results of IUGS activities, increasing IUGS income, and promoting IUGS visibility. The new IUGS display booths have been successful in establishing contact with many geoscientists at a variety of national and international meetings.

A scientific review committee has presented its report on the activities and future scope of IUGS and this is now under review by the IUGS Executive Committee. The following nominations for positions in the IUGS Executive were submitted by the Foreign Secretary on behalf of the Committee on International Scientific Relations:

for president: A. Bally or Eugene Seibold
for vice-president: Digby McLaren, Deborah Adjakalye, Jan Petranek, E. Herrero, A. Belliezzia

W.W. Hutchison announced that he will resign as Secretary-General in 1981.

Subsequent to the meeting of the Committee on International Scientific Relations, and as a result of consultation with the executive and other members of the Canadian Geoscience Council, the Foreign Secretary submitted to the President of IUGS a recommendation that A. Berger of Memorial University be considered as a nominee for Secretary-General of IUGS.

Canadian Government Support for International Scientific Relations

The Office of International Relations of the National Research Council advised the Canadian Geoscience Council that it was considering a proposal to transfer responsibility for Canadian non-governmental representation in international science to the Royal Society of Canada and the Engineering Institute of Canada; and that it was seeking advice from the various scientific associations concerning this proposal. On instructions from the Committee on International Scientific Relations and the Canadian Geoscience Council the Foreign Secretary conveyed to the National Research Council our concern about future arrangements for maintaining adequate representation in international geoscientific activities. Two kinds of problems were anticipated with the new proposal. (1) The earth science community in Canada is involved with two international unions: The International Union of Geological Sciences (IUGS), for which the new Canadian adhering member is the Canadian Geoscience Council, and for which Energy, Mines and Resources Canada has been the sustaining Canadian body; and the International Union of Geodesy and Geophysics (IUGG), for which the NRC, through the Canadian National Committee for IUGG has been the sustaining Canadian body. Close cooperation at a national and international level between these two groups is essential (as for example in the Inter-Union Geodynamics Project); and any new arrangements should ensure that this cooperation will be fostered. If the Canadian representation in IUGS and IUGG become the responsibility of two different bodies; this may not be easy to accomplish. Earth science engineering groups face similar and probably even more complex problems involving division of international responsibilities among several discrete organizations. (2) Financial support for Canada's national representation in IUGS has come from Energy, Mines and Resources Canada, and in IUGG from the National Research Council. There is a serious risk that if adequate provision for continued financial support from the Canadian government is not available, Canada's national contribution to and benefits from international geoscience activities will be jeopardized.

Raymond A. Price
Foreign Secretary
February 1980

REPORT OF THE EDUCATION COMMITTEE

Educational programs for pre-university teachers were held at four locations.

1. In April, Dr. George Lammers, Manitoba Museum of Man, Winnipeg, organized a weekend session at the Star Lake Field Station with 20 participants.
2. EdGEO, Edmonton '79 was held in April, and was organized by Dr. R.A. Olson. Twenty-nine earth science teachers attended. A most impressive field guide and manual was assembled.
3. Dr. Alan Gordon, St. John, presented a session at a professional development day at Riverview, New Brunswick, on the historical geology of Southern New Brunswick. Seven teachers were taken on a local field trip.
4. The Canadian Geoscience Council supported the production of "Geology News for Ontario Teachers" prepared by Mr. Ed Haydon (Chatham) and Mr. Tom Chatterson (Wallaceburg).

C.G. Winder
Chairman, CGC Education
December 1979

SIGNIFICANT METALLIC MINERAL DISCOVERIES: 1977-79

As a service to those keeping abreast of Canada's resource discovery/consumption balance, lists of significant discoveries made during the previous three year period are published. Metallic mineral discoveries for the period 1977-79 as listed in Table 3.1.

Table 3.1
Significant Metallic Mineral Discoveries 1977-1979

Among its accomplishments in the 1977-1979 period, Canada's mining exploration community lists the following significant mineral discoveries.

This list is an update of a similar list published
in 1979 covering the 1976-1978 period.

Name and year of Discovery	Responsible Companies	Location	Type of Deposit	* Grade and Reserves
Lake Gayot (1976?)	James Bay Dev.Corp. Urangesellschaft	La Grande River, Quebec	Uranium in Proterozoic sediments	Not available
Belmoral (1976?) reported 1978	Belmoral	Val d'Or Quebec	Vein Gold	1,324,000 tonnes @ 6.86 g Au/tonne
DY Prospect (1977)	Cyprus Anvil	Anvil District, Y.T.	Massive Sulphides Pb, Zn, AG	Not available
West Bear (1977)	Gulf; Noranda; Sask. Govt.	Rabbit Lake area, Sask.	Uranium in or near Athabasca Sandstone	Not available
Maurice Bay (1977)	Uranerz; Inexco Oil & Gas; Sask. Govt	Lake Athabasca	Uranium	1.5 million lbs. U ₃ O ₈ less than 0.5 % U ₃ O ₈ /tonne
Blizzard (1977)	Lacana Norcen et alia option	Kelowna area, B.C.	Uranium in Tertiary channel deposits	2.1 million tonnes @ 0.227% U ₃ O ₈
Cape Ray (1977)	Riocanex	NE of Port aux Basques, Nfld.	Gold veins in Proterozoic volcanic rocks	540,000 tons @ 0.33 oz Au/ton in three zones. 0.87 oz Ag/ton
Nadaleen River (1977)	McIntyre	80 mi E of Keno Hill, Y.T.	Pb-Zn-Ag in Proterozoic carbonate rocks	1 million tonnes @ 22% combined Pb-Zn and 3 oz Ag/tonnes
Dismal Lakes (1977)	Esso Resources	S of Dismal Lakes N.W.T.	Uranium in Proterozoic Sandstones	Not available
Sissons Lake (Lone Gull) (1977)	Urangesellschaft	Bake Lake area	Uranium	Single drill intersection of 100 ft. @ 1% U ₃ O ₈ reported.
Collins "B" (1977)	Gulf	Rabbit Lake, Sask.	Uranium near Athabasca Sandstone	Collins A & B 40 million lbs. U ₃ O ₈
Midwest Lake (1978)	Esso Resources; Numac Bow Valley	Rabbit Lake area, Sask.	Uranium in and below Athabasca Sandstone	2,000,000 tonnes @ 1.25% U ₃ O ₈ (56 million lbs U ₃ O ₈)
Trout Lake, B.C. (1978)	Newmont; Esso Resources	Revelstoke area, B.C.	Molybdenum porphyry	Not available
Chu Chua Prospect (1978)	Craigmont Mines	Barrier Lake, area B.C.	Copper in metasedimentary rocks	2 million tonnes of 2.0% Cu.
Trout Lake, Manitoba (discovered earlier; reported in 1978)	Granges	Flin Flon area, Manitoba	Massive sulphides in Precambrian volcanics	4.0 million tonnes @ 2.6% Cu and 4.5% Zn w Ag/Au
Cinola (1978)	Cons. Cinola	Queen Charlotte Islands, B.C.	Au "Carlin-Type"	10 million tons 0.12 oz Au/ton Discovery hole 78-6 24 m @ 29.5g/tonne (78.7') 0.86 oz./ton
Cirque (1978)	Cyprus Anvil & Hudson Bay Oil & Gas	N of Williston Lake B.C.	Shale hosted Pb-Zn-Ag Lower Carb? Age	18 million tonnes 2.3% Pb, 7.9% Zn 49 grams Ag/tonne
Logtung (1978?)	Stollery Syndicate ? (Optioned to Amax)	BC- Yukon Border	"Porphyry" Moly-Tungsten	162 million tonnes @ 0.12 WO ₃ , 0.05 MoS ₂
(1978)	Conwest/Essex Minerals J.V.	Loc.? NW of Anvil Yukon	Pb-Zn ore Rocks? Age?	Not available
Dawn Lake (1978?)	Asamera	Athabasca Basin	Uranium	Not available
McLean Lake 1978? - 1979	Occidental Pet. & Inco	Athabasca Basin Sask.	Uranium	Not available
1978? - 1979?	Tintina Silver Mines (Amoco Option)	"Near" Whitehorse Yukon	Molybdenum porphyry?	Not available
Gambier Island (1979?)	20th Century Energy Corp.	Near Vancouver B.C.	Porphyry Cu B.C.	60 million tonnes @ 0.32% Cu 0.01% Mo
* Best available published reserves. Mostly "drill indicated", but may include other categories. Best taken as order-of-magnitude estimates.				