



Canadian Geoscience Council

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Annual Report

Prepared by
The Canadian Geoscience Council

Edited by J. P. Greenhouse

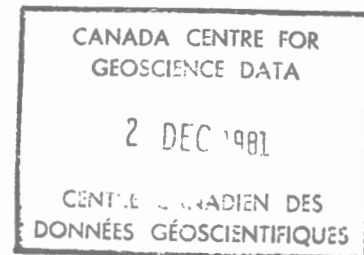


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**GEOLOGICAL SURVEY
PAPER 81-6 PART 2**

**THE GEOSCIENCES IN CANADA, 1980
ANNUAL REPORT**

**Prepared by
THE CANADIAN GEOSCIENCE COUNCIL**

Edited by
J. P. GREENHOUSE

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Preface

This volume, part 2 of The Geosciences in Canada, 1980, forms the annual report of the Canadian Geoscience Council and deals with the activities of Council, its committees, and its Members and Associate Member Societies during the year. Not all of the societies have chosen to make detailed reports, but Table 5 summarizes their purpose, memberships, and continuing activities.

Part 1, which is published separately, contains the detailed study of The Marine Geosciences in Canada, prepared by a committee under the chairmanship of R.D. Johnson.

In the preface to last year's report, C.R. Barnes invited informed groups or individuals to use this Annual Report section of the Geosciences in Canada as a forum for topics of concern to Canadian geoscientists. This year's Council repeats that invitation, but we suggest a specific topic. The 1979 study Geology and Geophysics in Canadian Universities was published in February, 1981. We are urging the member societies to prod their members into reading and commenting on this university study, using their journals and/or newsletters as a forum. The CGC will then collect and synthesize this feedback for publication in the annual report, completing a cycle which we believe will enhance the usefulness of the annual studies.

We urge you to participate in this debate, either through your society or by sending your comments directly to the Executive Director, The Canadian Geoscience Council, Department of Earth Sciences, University of Waterloo, Waterloo, Ontario, N2L 3G1.

D.W. Strangway

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REPORT OF THE PRESIDENT

The Canadian Geoscience Council continued to flourish in 1980 as a voice for the community of geoscientists in Canada. Meetings of the Council were held in Toronto, Halifax, Calgary and Ottawa. Our incoming president, John Wheeler, is located in Vancouver and we assume that meetings will continue to take place across Canada.

The policy of carrying out studies on sectors of geoscience activities in Canada has continued. The 1978 report contained the report of the Visiting Committee to the Geological Survey of Canada and the 1979 report incorporates a massive effort on the university geoscience sector. This report, authored largely by W. Neale and J. Armstrong, is expected to have a major impact within that section of the community since it has many specific recommendations. When it is available the report will be widely distributed, particularly to those to whom the recommendations are directed. A first draft of our 1980 study on the Marine Geosciences in Canada is nearing completion under the guidance of R.D. Johnson.

We have launched a major study of Geoscience Research and Development in the Mining Industry for our 1981 study. This is chaired by R. Barlow and has the strong involvement of our member societies. The Council is now reviewing plans for future reports and is tentatively committed to a report on the Geoscience component of Mineral Exploitation and a report on Geoscience Research and Development in the petroleum industry. The National Research Council has authorized a study of research and development in the geotechnical community and we are pleased to report that this report will be brought to the Geoscience Council for comment and information on this important sector. It seems probable that in the near future we should begin to lay plans for a major study of the geoscience aspects of environmental issues, a review of museum-related geoscience activities and a study of geoscience data compilation and management. Two years ago the CGC organized a successful forum on the disposal of high-level nuclear waste. This report was subsequently published and has been widely quoted. In early 1980, it formed the base for a hearing before the Ontario select committee on nuclear energy. It should also be noted that AECL has formed a technical advisory committee on nuclear waste disposal. R. Farvolden of the University of Waterloo and H. Greenwood of the University of British Columbia served on this committee after nomination by the CGC. The first report of this committee has now been published and should be read by every member of the geoscience community; a summary is included here on page 22. This committee also testified before the Ontario select committee and provided an excellent and balanced view which was subsequently televised. H. Greenwood has since resigned and G. Skippen of Carleton University has been nominated by the CGC as his successor and has agreed to serve. In the spring, we served as co-hosts to a workshop on nuclear disposal that attracted nearly 250 people and we continue to notify members of other relevant workshops.

The Council has started to plan a new forum to be held in late 1981 or early 1982. The topic will be the relationship between the geosciences and the creation of mineral wealth. This topic is extremely complex, but it should provide a useful forum for discussion. We also plan to publish the proceedings of this workshop which should be of much use to our national and provincial policy makers.

The Council continued its active role in reviewing federal and provincial agencies. The committee to review the Geological Survey of Canada was given a new mandate to review the Survey's output and this committee is expected to report early in 1981. Portions of this report will be included in our 1981 report. Members of the committee are A. Coope (chairman), P. Gordy, A. Sutherland Brown, M. Tanguay, B. d'Anglejean and D.W. Strangway. The Ontario Ministry of Natural Resources struck a committee to review the activities of the Ontario Geological Survey. This committee met in 1980 and will report early in 1981. Members of this committee are P.M. Kavanagh (chairman), T. Podolsky, G. Mannard, J. Gartner, D.W. Strangway and I. Haugh. We look forward to publishing portions of this report in the 1981 report. We are pleased to report that the Hon. Leo Barry of Newfoundland has authorized us to create a similar committee to review the geological activities in the provincial government. This should take place in 1981. During 1981, the CGC will approach other ministries from other provinces recommending that similar external reviews be carried out.

The Canadian Geoscience Council brief submitted to the Mines Ministers conference, is published separately in this report. Next year's brief will be more specific and will probably draw on some of the preliminary findings of the report on geoscience Research and Development in the Mining Industry and on the report of the visiting committees to the GSC, to the OGS and to Newfoundland. We also briefed the Hon. Judy Erola, the new Minister of State for Mines in Ottawa, on the role of the CGC and sought financial support for our international activities. We welcomed the opportunity to meet with Dr. A.E. Collin, the new Associate Deputy Minister of EMR. We submitted briefs to the Natural Science and Engineering Research Council on the need for financial support for research in remote areas - a costly venture - and recommended natural resources as an area of strategic concern. We communicated with the Hon. John Roberts, Minister of State for Science and Technology to express our concern that the recently announced National Energy Policy could be expected to have a serious effect on the geoscience manpower base in Canada.

In this annual report you will find a report from the foreign secretary. It has been an active year. We officially became the national adhering body to the International Union of Geological Sciences (IUGS) and will shortly appoint the Canadian National Committee. We met with the Canadian Committee on the Lithosphere whose members are appointed jointly by the Canadian Geophysical Union (CGU) and the CGC. Ray Price, our foreign secretary, was selected to be the head of the International Lithosphere Committee. John Wheeler and Ray Price served as the CGC representatives on the project entitled "Decade of North American Geology". This is a comprehensive undertaking to publish by 1988 a complete set of volumes on North American Geology and Geophysics and will involve members from all across Canada and from all of our societies. In the United States the effort is under the direction of the Geological Society of America (GSA). The Canadian volumes will represent the updated version of the GSC's Economic Geology Report No. 1, "Geology and Economic Minerals of Canada". We represented Canada at a workshop organized by NASA on the Early Crust of the Terrestrial Planets and we continued to serve as the liaison for the International Geological Correlation Program (IGCP). Until a full fledged Quaternary society emerges in Canada, the CGC is acting as the official Canadian representation to INQUA, the International Quaternary group. Finally, we nominated two individuals, R. Price and G. Garland, to represent the geosciences on the Canadian International Science and Technology Association (CISTA).

In other activities we have asked N. Allman of the Geological Association of Canada (GAC) to act as our publicity adviser and B. Greenwood of the Canadian Association of Geographers (CAG) to act as our adviser on environmental affairs and to represent us on the Subcommittee on Problems of the Environment (SCOPE). We reviewed our membership in SCITEC and decided to remain in it for another year.

In education matters we are pleased to acknowledge the long support of C.G. Winder who has stepped down as chairman of the education committee. P.J. Savage has taken on this duty. This means that our EdGeo workshops will continue and that the two new Careers booklets will get wide distribution to high schools, colleges and universities across Canada.

In the coming year we can expect the CGC to take initiatives in examining some of the major future directions that earth science research in Canada might take. This would likely involve a series of topical workshops designed to prepare position papers on what new thrusts might be developed in the next decade. Already there have been discussions about Canadian involvement in the new opportunity for Ocean Margin Drilling and the associated site studies. Very Long Baseline Interferometry (VLBI) is a new thrust recently proposed by the astronomers and which has considerable bearing on modern day geodynamics. Other topics for consideration are expected to include the need for deep crustal sounding, continental drilling, continental margin transects, studies of the early crust, economic geology and major national facilities. It is my hope that the CGC can play a catalytic role in bringing together such workshops and thereby to influence the activities of the coming decade.

It has been an interesting year and I wish John Wheeler, my successor, the same luck and support that I have had. Ted Appleyard, our executive director, was on leave for part of the year and was ably replaced by Gwilym Roberts. It is with much regret however that we are forced to accept Ted's resignation effective December 31, 1980. He has served the council effectively and well since its inception and we will miss him sorely. We are grateful to John Greenhouse for taking over his duties.

In concluding this report I should like to offer the congratulations of the CGC to J.G. Tanner who became the Director General of the Earth Physics Branch during the year and to W.W. Hutchison who becomes the Director-General of the Geological Survey of Canada on January 1, 1981.

D.W. Strangway

REPORT OF THE SECRETARY TREASURER

Four council meetings were held during 1980 at Toronto, March 12; Halifax, May 18; Calgary, September 28; and Ottawa, December 8-9. As in the previous year, a special meeting with senior officials of Energy, Mines and Resources was held immediately following the December meeting. Topics of discussion at this special meeting included the status of annual reports, the international role of the CGC, and the impact of energy policy on geoscience activities.

The Executive Committee of the Council for 1980 were:

President:	D.W. Strangway
Vice President:	J.O. Wheeler
Past President:	C.R. Barnes
Secretary Treasurer:	G.W. Wright
Executive Member:	L.W. Gold
Foreign Secretary:	R.A. Price
Executive Director:	E.C. Appleyard

Member societies at year end 1980 were:

Association of Exploration Geochemists
 Canadian Exploration Geophysical Society
 Canadian Geophysical Union
 Canadian Geotechnical Society
 Canadian Institute of Mining and Metallurgy
 Canadian Society of Exploration Geophysicists
 Canadian Society of Petroleum Geologists
 Canadian Society of Soil Science
 Canadian Well Logging Society
 Geological Association of Canada
 Mineralogical Association of Canada
 Canadian Association of Geographers

A summary of the Council's financial position is given in Table 1. This statement is an estimate only as it was prepared prior to the end of the fiscal year.

December, 1980

G.W. Wright

Table 1

Interim Financial Statement of the Canadian Geoscience Council: Estimate made 1980-12-07

Revenue		Expenditures	
EMR Sustaining Grant	5,000	Career Booklets	12,000
EMR 1979 contract, final	1,500	EdGeo Field Meetings	5,000
EMR 1980 contract, initial	6,000	IGC delegation	3,000
EdGeo donations	8,250	GSC Questionnaire	2,245
Membership Fees	4,522	Executive Travel	2,000
Interest	3,734	Annual Report Committees 1979, 1980	900
Ontario Geological Survey	2,000	Printing and Mailing, Waterloo	2,000
Can. Geotechnical Society	750	CGC Meeting expenses	1,500
Can. Geological Foundation	61,000	Memberships: SCITEC, YSF, AGID	1,450
	92,756	Clerical	500
	92,756	"Concise Atlas of World Geology"	55,000
		Miscellaneous	100
			85,695
Revenues	\$92,756	Balance 1979 12 31	37,357.81
Expenditures	85,695	Net Income	7,127.00
Net Income	7,127	Balance 1980 12 31	44,484.81



The Executive of the Canadian Geoscience Council, 1980.

From left to right: R.G. Roberts, Acting Executive Director; R.A. Price, Foreign Secretary; G.W. Wright, Secretary-Treasurer; J.O. Wheeler, Vice President; D.W. Strangway, President; C.R. Barnes, Past President.

REPORT OF THE FOREIGN SECRETARY

The position of Foreign Secretary was created in 1976 to respond to the new responsibilities assumed by the Canadian Geoscience Council when the role of Canadian National Committee for Geology was transferred to the Council from the Geological Survey of Canada, and the Council became the adhering body to the International Union of Geological Sciences and the International Geological Congress. The Council established a Standing Committee on International Scientific Relations, under the chairmanship of the Foreign Secretary, to provide a forum for discussion of Canadian participation in international geoscience organizations, to advise the Canadian Geoscience Council on its relations with international non-governmental geoscience organizations and with Canadian national committees for international geoscience organizations, and to ensure that the Canadian Geoscience Council is adequately represented in the development and implementation of international programmes dealing with geoscience for which the Council has a responsibility. The Committee receives, on behalf of the Canadian Geoscience Council, reports from Canadian national committees or representatives of international geoscientific activities, and it makes recommendations to the Canadian Geoscience Council, on new international geoscientific initiatives and on arrangements for Canadian participation in international geoscience activities.

The Committee consists of the chairmen of the Canadian National Committees for the International Geological Correlation Program (J.M. Harrison), the International Union of Geological Sciences (R.A. Price); International Union of Geodesy and Geophysics (A. Beck); International Lithosphere Program (C.E. Keen) and the International Union of Quaternary Research (D. St-Onge), a representative of the Director-General of the Geological Survey of Canada (T.E. Bolton), and representatives of Canadian groups affiliated with other international earth science organizations: W.J. Eden (Associate Committee on Geotechnical Research), for the International Association of Engineering Geologists; J.M. Duke (Mineralogical Association of Canada), for the International Mineralogical Association, and R.A. Blais, Vice-President of the Association of Geoscientists for International Development.

Annual Meeting of the Standing Committee

The fourth annual meeting of the Committee was held in Ottawa, February 14, 1980. The full minutes of this meeting are available upon request from the Foreign Secretary or the Executive Director of the Council. In addition to regular members, special observers included W.W. Hutchison (Secretary General of IUGS), A.M. Stalker (representing Canadians affiliated with INQUA), and D. Morrison (member of the U.S. National Committee for IGCP).

IUGS: In a brief summary of recent activities with the union Hutchison mentioned that a new international interdisciplinary research program in the solid earth sciences, funded by IUGG, IUGS and ICSU (the International Council of Scientific Unions), would be launched at the 26th International Geological Congress in Paris; that a symposium on Metallogenesis in Latin America was organized in conjunction with the IUGS Executive Committee in Mexico City as part of a continuing effort to strengthen the role of IUGS in fostering international cooperation in the geological sciences; that a trust fund was being established with IUGS to help support these and other new activities; and that the IUGS publication "Episodes" has continued to grow in stature and circulation.

IGCP: The Canadian National Committee for IGCP held its annual meeting the day before the meeting of the CGC Committee on International Scientific Relations. In a review of the entire program Hutchison reported that seventeen projects had reached the end of their specified terms and would be wound up; and that seven new projects had been started. There is increased emphasis on applications, and growing interest in participation from developing countries. The Canadian National Committee approved expenditures of \$8600 for 1979 for partial travel support for five projects involving Canadian participation, and for the work of the Canadian National Committee. The 1980 budget, involving Canadians, and for the work of the committee, was approved at \$14,200. In accordance with policy regarding rotation of membership four nominations were approved for appointments to replacing committee members whose terms expire in 1980.

IGP: The Final Report of the Canadian Subcommittee for the International Geodynamics Project was published as a special issue of the Canadian Journal of Earth Sciences that was dedicated to J. Tuzo Wilson, and was organized by the outgoing Chairman of the Canadian Subcommittee for IGP (R.A. Price). One component of the Canadian program for the Geodynamics Project, scheduled for completion in 1980, is a joint effort with the U.S. Geodynamics Committee involving publications of seven cross sections through parts of the Canadian Cordillera. A new joint effort of the U.S. and Canadian Geodynamics Committees, the Continental Margins Transects Program, involves integrated geological, geophysical and geochemical investigations of corridors extending from the Precambrian craton, across the continental margins, into the adjacent ocean basins. The Canadian National Committee for the Lithosphere Program will assume responsibility for monitoring Canadian participation in this project.

ICL: Nominations to the Canadian National Committee for the International Lithosphere Program were approved by the Canadian Geoscience Council and the Canadian National Committee for the International Union of Geodesy and Geophysics in 1979. Charlotte Keen is Chairman of CNC-ICL, and the first meeting of the committee was called for February 15, 1980.

INQUA: In response to an enquiry from the NRC office of International Relations, the Canadian Geoscience Council, in May 1979, reported that because most of the Canadians who are involved with the activities of INQUA (The International Union of Quaternary Research) are probably members of one or more of the professional societies comprising the CGC, and because the CGC is the Canadian adhering member of the International Union of Geological Sciences, with which INQUA is affiliated, responsibility for Canadian representation within INQUA should be assigned to the Canadian Geoscience Council. The NRC office of International Relations reported that the NRC Committee on International Scientific and Technological Affiliations (CISTA) proposed that NRC remain the Canadian adhering member to INQUA, while the CGC, on behalf of NRC, manage the Canadian National Committee for INQUA. Similar arrangements exist with respect to other non-governmental international scientific organizations, for example the Chemical Institute of Canada in connection with the International Union of Pure and Applied Chemistry. Under these arrangements the Canadian National Committee for INQUA is nominated by the Canadian Geoscience Council and appointed by the NRC Committee on International Scientific and Technological Affiliations; the Canadian affiliation fees to INQUA are paid by NRC; and NRC provides financial support for the Canadian National Committee for INQUA.

A.M. Stalker, who has been active in INQUA for many years, outlined for the committee, previous arrangements for Canadian representation in INQUA, and recent efforts to form a Canadian Quaternary Association. The former NRC Associate Committee on Quaternary Research, which was disbanded on March 30, 1979, passed resolutions at its final meeting recommending that:

1. a Canadian Quaternary Association be formed;
2. INQUA be invited to meet in Canada in 1986;
3. the Canadian Geoscience Council be contacted regarding Canadian representation in INQUA; and
4. any future Canadian National Committee for INQUA be under the NRC.

In view of the fact that a Canadian National Committee for INQUA should be appointed at the April 1980 meeting of the NRC Committee on International Scientific and Technological Affiliations, it was agreed that Archie Stalker and his colleagues would prepare a proposal for appointments to the Canadian National Committee for INQUA in time for submission to the March 1980 meeting of the CGC, from whence nominations could be submitted to the April 1980 meeting of the NRC Committee on Scientific and Technological Affiliations. This would ensure Canadian representation in INQUA, and would make possible the development of an invitation for INQUA to meet in Canada in 1986. When the Canadian Quaternary Association has become fully established, future arrangements for managing the Canadian National Committee for INQUA would be investigated with the Canadian Geoscience Council and NRC; but, in the interim, formal responsibility for Canadian representation within INQUA will remain with the Canadian Geoscience Council.

DNAG: A report on planning for the Geological Society of America centennial project – "A Decade of North American Geology" – was presented by Ray Price, who, along with John Wheeler, represented the Canadian Geoscience Council on the GSA Steering Committee for the centennial project. In 1978 the CGC and the GSC made a commitment to participate in this project which will involve, among other things, the preparation of a series of memoirs and thematic maps outlining the geological evolution of the North American continent and adjacent parts of the ocean basins. Canadian participation coordinated through the Geological Survey of Canada by John Wheeler will involve a broad spectrum of Canadian earth scientists from the federal and provincial governments, industry and academia and will lead to the production of a series of books and thematic maps dealing with the Canadian part of North America. These will comprise part of the GSA series but they will also comprise the updated sixth edition of "Geology and Economic Minerals of Canada", previous editions of which were published as a single volume prepared by officers of the Geological Survey of Canada.

AGID: Roger Blais, Vice-President of the Association of Geoscientists for International Development (AGID), who was unable to attend the February 14th meeting, sent a copy of the 1979 AGID Annual Report that was prepared for submission to IUGS. His request for support from Canada for the AGID application for affiliation with IUGS was endorsed by the committee.

Canadian Commission for UNESCO: Jim Harrison, Vice-President of the Canadian Commission for UNESCO discussed three UNESCO scientific programs of particular interest to the CGC:IGCP, the International Hydrologic Decade; and the Man and the Biosphere Program.

IMA: Murray Duke, Secretary of the Mineralogical Association of Canada, reported on the activities of the International Mineralogical Association and on Canadian participation in these activities.

IAEG: Bill Eden, reporting on the International Association of Engineering Geology, noted that there are no arrangements for government funding of Canadian participation in IAEG, and it was agreed that the Foreign Secretary should investigate, with the GSC and NRC, arrangements for establishing financial arrangements for Canadian representation in non-governmental international scientific activities in the geological sciences on the same basis as Canadian representation in the other sciences.

Canadian Representation and Participation in International Activities in the Geological Sciences

The National Research Council of Canada, through its International Relations Secretariat, and with the advice of its Committee on International Scientific and Technological Affiliations, has been responsible for Canadian representation and participation in non-governmental international activities in most scientific fields. However, Canadian representation and participation in non-governmental activities in the geological sciences has been the responsibility of the Geological Survey of Canada since before the National Research Council was created. These two Federal Government agencies have paid the annual fees for Canadian membership in the international scientific associations and unions, have contributed to the travel expenses of certain Canadian delegates to the meetings of the international scientific associations and unions, and have contributed to the travel and operating expenses of committees that were appointed by them to advise them on the place of Canada in the scientific associations and unions, and on Canadian participation in their activities.

In recent years, in an effort to produce maximum involvement of the Canadian scientific community in the activities of the international associations and unions, the NRC and the GSC have transferred the responsibility for appointing members to the advisory committees, and for appointing Canadian delegates to the international meetings to the appropriate Canadian national scientific associations. Thus a series of Canadian national committees for individual international scientific unions are appointed by national scientific societies but supported financially by NRC. They serve as the communications link between Canadian scientists and the international organizations, and advise NRC and the Canadian scientific community on Canadian participation in the international scientific organization and activities.

One of the committees is the Canadian National Committee for the International Union of Geodesy and Geophysics. Its members are appointed by several Canadian scientific associations, some of which are members of the Canadian Geoscience Council. However, the Canadian Geoscience Council has assumed, from the GSC, responsibility for Canadian representation and participation in most international activities in the geological sciences. This overlap between the Canadian Geoscience Council's national role as the organization which represents all of solid earth science and its international role as a Canadian national committee for the Geological Sciences (which are but one segment of the earth sciences) presents some difficulties. Moreover, unlike the committees which operate through NRC it does not have well established financial arrangements with the GSC wherewith to can carry out the role of a Canadian National Committee for the Geological Sciences. Under the existing arrangements the GSC has paid the annual fee for Canadian membership in the International Union of Geological Sciences and in the Commission for the Geological Map of the World, but, unlike the situation with the NRC Committees, there has been no specific financial allocation for sending official Canadian delegates to international meetings or for geological sciences. The GSC also provides financial support for the activities of the Canadian National Committee for the International Geological Correlation Project, which is linked to the Canadian Geoscience Council and is responsible for Canadian participation in this joint venture of UNESCO and the International Union of Geological Sciences. Furthermore, in the past it has provided some financial assistance for the Canadian Committee for the Geodynamics Project (an international research project organized jointly by the International Union of Geodesy and Geophysics and the International Union of Geological Sciences).

In order to ensure that Canadian representation and participation in international organizations and activities in the geological sciences receives the kind of attention that it deserves, and that is provided for other branches of science by NRC, the Canadian Geoscience Council and the Geological Survey of Canada have agreed to establish a Canadian National Committee for the Geological Sciences with financial support and terms of reference like those of the committees that have been established under NRC.

Statement of Basis for Agreement between the Geological Survey of Canada and the Canadian Geoscience Council regarding the International Union of Geological Sciences and the International Geological Congress ---

The Canadian Geoscience Council and the Geological Survey of Canada agree to share the responsibility of adherence to the International Union of Geological Science (IUGS) and the International Geological Congress (IGC) as follows:

1. The Canadian Geoscience Council is the Canadian adhering member to IUGS. The Geological Survey of Canada will award an annual grant to cover the annual IUGS affiliation fees.

2. The Canadian Geoscience Council is responsible for setting up a Canadian National Committee which maintains liaison with the Union and the Congress.
3. The Canadian Geoscience Council is responsible for the drafting and adoption of the Terms of Reference for CNC/IUGS, for ratifying changes in these terms of reference, and for the appointment of members to the CNC/IUGS. The Geological Survey of Canada expects that the CNC membership will be extended by the CGC to members of other national societies, if appropriate, in order to match all the activities of the Union.
4. The Director-General of the Geological Survey of Canada, or his delegate is an ex-officio member of the CNC/IUGS.
5. The Canadian National Committee will evaluate the place of Canada in the Union and, appropriately, will advise CGC on Canadian participation in the activities of the Union and will keep CGC informed on IUGS activities and Canadian participation.
6. The Canadian National Committee will appoint delegates and alternates to represent Canada at the IUGS Council meetings, according to the Statutes and the Regulations of the Union.
7. The Canadian National Committee will act as a channel of communication between the Union and the Canadian scientific societies and scientists interested in the activities of the Union.
8. The Geological Survey of Canada will contribute to the costs of the activities of the Canadian National Committee i.e., travel expenses of members of CNC/IUGS and of official delegates to meetings of the Council of IUGS and IGC.
9. The Chairman of the CNC/IUGS or his delegate is the official representative on the Canadian Committee for the International Council of Scientific Unions.

Anticipated funding from the GSC – 1981

Annual allotment for travel costs of delegates to quadrennial meetings of IUGS and IGC	3,000.00
Travel costs for meetings of CNC-IUGS	3,000.00
Annual affiliation fee to IUGS	12,000.00
	<hr/>
Total	18,000.00

Canadian National Committee for the International Union of Geological Sciences

Terms of Reference

1. The purpose of the Canadian National Committee for the International Union of Geological Sciences (CNC-IUGS) is:
 - a) to advise the Canadian Geoscience Council on Canadian participation in the activities of International Union of Geological Sciences (IUGS) and the International Geological Congress (IGC), and to keep Council informed of IUGS and IGC activities and Canadian participation;
 - b) to receive reports from Canadian delegates to meetings of the council of IUGS and to the IGC and other international conferences and meetings sponsored by the IUGS; to report on them to Council;
 - c) to act as a channel of communication and to facilitate cooperation between IUGS and IGC and Canadian scientific societies and scientists interested in the activities of IUGS and IGC;
 - d) to inform Council of CNC activities.
2. Members of the Committee to be appointed by Council shall include:
 - a) 4 members selected in consultation with the member societies and associations of the Council that are concerned with the geological sciences;
 - b) 2 other members selected in consultation with the Committee;
 - c) the Foreign Secretary of the Council, as chairman;
 - d) Canadian officers of IUGS and the chairmen of the CNC for the Lithosphere Program and the CNC-IGCP on an ex-officio basis;
 - e) ex-officio – the Director-General of the GSC or his representative.

A secretary shall be appointed from among the members of the Committee on the recommendation of the Committee;

Due regard should be taken to proper geographical and linguistic distribution of membership as well as to adequate representation of all disciplines covered by IUGS and IGC. Whenever possible, disciplinary distribution should follow the pattern: one member for paleontology and stratigraphy, one for sedimentology and petroleum geology, one for structural geology and tectonics, one for mineralogy, petrology and geochemistry, one for economic geology, one for engineering geology and hydrogeology and one for quaternary geology and geomorphology.

Whenever possible, there should be no more than one member per institution represented on the Committee.

3. The terms of office for all members of the Committee shall normally be equal to the period covering two successive general assemblies of the IUGS:
 - a) the terms of office shall be initially staggered to provide continuity;
 - b) termination shall be on the 31st of December of the last year in office.
4. The Committee shall meet:
 - a) annually;
 - b) as required especially prior to and following meetings of the IUGS Council and the IGC.

The Head of the Canadian delegation of the IUGS Council and the IGC should be present at the CNC meetings.

One-half of the membership shall constitute a quorum.

IUGS Council Meeting and International Geological Congress – Paris, July 1980

The Canadian delegation to the IGC and the Council of the IUGS was D.J. McLaren (chief delegate), C.R. Barnes, M.E. Hriskevich, H.C. Morris, R.A. Price, A. Sutherland Brown and L.P. Tremblay.

IUGS President Trumpy and Secretary-General Hutchison reported on the growing importance of the international scientific programs of IUGS, which include IGCP and the Geodynamics Project, and on improved communications, exemplified by the successful new IUGS publication "Episodes". IUGS Treasurer Reinemund reported on the need for increased membership dues to meet the increase in operating costs over the past decade and the new expenditures arising from new activities and scientific programs. He paid special tribute to the significance of the support that had been provided by the Geological Survey of Canada in operating the IUGS Secretariat and the launching of "Episodes". D.J. McLaren noted that membership subscriptions did not always appear to be linked to the gross national production of the country concerned; some were paying more than "average", while others were paying less. He suggested that it would be useful to have membership fees geared more closely to the ability of a country to pay.

Ten additional countries were admitted to IUGS membership, and applications for affiliation (adherence) to IUGS were accepted from eight associations.

The proposal, from the joint IUGS-IUGG Steering Committee, for a new international interdisciplinary research program on the lithosphere was accepted; and the following IUGS nominees to the Bureau of the Lithosphere Program were approved: R.A. Price, Canada (President); U. Cordani, Brazil; H. Illies, Federal Republic of Germany; LS. Uyenda, Japan (joint IUGG-IUGS nominee).

The revision of the IUGS constitution was discussed at length. A revised constitution, as prepared by an editorial committee appointed by the Council, was adopted at the closing meeting of the Council.

The formula for IUGS membership, which relates the category of membership (number of voting delegates) to the number of units of contribution was revised as follows:

Category	I	II	III	IV	V	VI	VII	VIII
Units	1	2	4	7	12	20	35	70

The value of the unit of contribution was raised from \$200 to \$300 (US\$). Canada is in category VII. On a motion from the chief delegate from Canada Council requested that the Executive Committee examine the existing categories of countries' membership and to ensure that each country is properly and fairly represented in the Union.

The Netherlands National Committee requested that the IUGS seek assurance from the USSR that geologists from all IUGS countries would be able to obtain visas to enter the USSR for the 27th IGC in Moscow in 1984. The President noted for the record that such assurance had been received from Academician A.V. Sidorenko, the Vice-President of the USSR Academy of Sciences. The U.K. National Committee requested that IUGS urge restriction of future IGC publications to abstracts only in order that registration fees be kept as low as possible.

The following new IUGS officers were elected:

President:	E. Siebold , Federal Republic of Germany
Secretary-General:	C. Weber , France
Treasurer:	J. Reinemund , USA (second term)
Vice-Presidents:	P.F. Howard , Australia (second term)
	U.V. Menner , USSR (second term)
	T. Tatsumi , Japan (second term)
	F.F. de Almeida , Brazil
	G. Kautsky , Sweden
	Z. Kielan-Jaworowska , Poland
	C.A. Kogbe , Nigeria
	S. Sherif , Iraq.

CNC-INQUA

The NRC Committee on International Scientific and Technological Affiliations, at its May 1980 meeting, approved the following appointments to the Canadian National Committee for INQUA, as recommended by the Canadian Geoscience Council on the advice of organizers of the Canadian Quaternary Association.

D.A. St-Onge (geography) Chairman
T.W. Anderson (paleoecology, geochronology)
K.R. Fladmark (archeology)
R.H. Fillon (marine geology)
C. Hillaire-Marcel (paleo-environmental studies)
D.R. Grant (geology) Secretary
P. Richard (palynology, paleontology)
R.W. May (geology)

The committee held its inaugural meeting in September 1980.

Raymond A. Price

REPORT OF THE EDUCATION COMMITTEE

Educational programs for pre-university teachers were held at three locations in 1980: Edmonton, Winnipeg and Vancouver.

The Council acknowledges with gratitude donations to the educational program from the following petroleum companies: Dome (\$1000.00), Aquitaine (\$150.00), Chevron (\$2000.00), Texaco (\$100.00), Gulf (\$3000.00), Esso (\$2000.00), Suncor (\$1000.00).

P.J. Savage
C.G. Winder

**CANADIAN GEOSCIENCE COUNCIL BRIEF TO THE PROVINCIAL MINES
MINISTER'S CONFERENCE, HALIFAX, OCT., 1980**

Who Are We?

The Canadian Geoscience Council is an organization that represents most of the major geoscience groups in Canada. There is a total membership of over 10,000 members representing all aspects of industry, government and university-based geoscientists. Our member associations are:

1. Association of Exploration Geochemists
2. Canadian Association of Geographers
3. Canadian Exploration Geophysical Society
4. Canadian Geophysical Union
5. Canadian Geotechnical Society
6. Canadian Institute of Mining and Metallurgy – Geology Division
7. Canadian Society of Exploration Geophysicists
8. Canadian Society of Petroleum Geologists
9. Canadian Society of Soil Science
10. Canadian Well Logging Society
11. Geological Association of Canada
12. Mineralogical Association of Canada

We also have representatives from the following groups:

1. Committee of Chairmen of Canadian University Earth Science Departments
2. Committee of Provincial Geologists
3. Associate Committee on Geotechnical Research
4. Earth Science Division, Royal Society of Canada
5. Director General, Geological Survey of Canada
6. Director General, Earth Physics Branch

What Do We Do?

A. Annual Report. We prepare annual reports that describe the major activities in the earth sciences by soliciting views from all our members and publishing an annual report which contains highlights and problems. We publish an annual list of major mineral and hydrocarbon discoveries. These have been published since 1974.

B. Topical Reviews. We prepare reports on the strengths and weaknesses of various sectors of the earth sciences and use these reports to make representations in various quarters.

Topics of our recent reports are:

- i) 1975 – Canadian Petroleum Exploration Geology Research
- ii) 1977 – Soil Science in Canada
- iii) 1979 – Geosciences in Canadian Universities (in press)
- iv) 1980 – Marine Geoscience (in prep.)

We have just approved a start to a comprehensive study of Research and Development in the Geoscience Sector of the Mineral Industry. This study is scheduled in two parts, one for 1981 and one for 1982. Already steering committee members have been selected and we are preparing the final terms of reference.

We specifically seek the input of the Mines Ministers in establishing the terms of reference. What information would assist you in formulating geoscience policies? It is probable that we will approach you for a small contribution in support of this endeavour.

C. Reviews of Government Geoscience Activities. In our 1978 annual report we published a comprehensive review of the level and quality of the efforts in the Geological Survey of Canada. This resulted from a two-year study by an external visiting committee and identified a number of problems. It also stressed the need to maintain a strong geoscience capacity in support of the effort to discover and exploit our natural resources. This study is continuing with an assessment of the output (both formal and informal) of the Survey.

We have signed an agreement to conduct a similar review of the activities of the Ontario Geological Survey, starting in November. We expect to start a similar study soon on behalf of the Government of Newfoundland.

In the next two years we will be approaching other ministries on the assumption that external reviews are beneficial in the long run.

D. Education. We raise some funds and support workshops for teachers across the country. These workshops are titled Ed. Geo. and usually involve local geoscientists spending two days with a group of high school teachers and giving them information useful for classes and field trips.

We have also produced career booklets for "Careers in Geoscience" and "Careers in Geological Engineering". These are available for distribution at a nominal cost. Your departments might be interested in these.

We produce the most accurate statistics available on students in universities in graduate and undergraduate programs and on their places of employment.

E. Workshops. We have organized a number of workshops on topics of national geoscience interest.

1. In 1977 we sponsored a series of talks on the Federal Government and Earth Science Activities.
2. In 1978 we sponsored a workshop on the Disposal of High Level Radioactive Wastes. The proceedings of this workshop have been published and received wide attention.
3. In 1978 we prepared a report for the Science Council on Mineral and Hydrocarbon Resource Evaluation. This was extensively used in preparing an energy report.
4. We are now planning a workshop for 1981 on the topic of Geoscience, Minerals and the addition to Canadian Wealth. As this is very much in a formative stage we would welcome suggestions on suitable speakers and advice on some of the problems of this complex topic.
5. We were cosponsors of the 1977 conference entitled "Exploration, 1977".
6. We have been asked to be the coordinating body in the preparation of a multi-volume set on the Geology and Economic Minerals of Canada.

F. Representations to Government. We have made representations to a number of different government agencies addressing a variety of problems. We have met with Ministers and Deputy Ministers of Energy, Mines and Resources; Environment; Ministry of State for Science and Technology and others.

We have testified to both Ontario and Federal committees on the geological science aspects of nuclear waste disposal and were instrumental in having AECL form a committee to review their nuclear disposal program.

We played a role in the new and highly successful program launched in Ontario to sponsor high quality and relevant research in the Ontario universities. We commend this model to your attention and we would be pleased to discuss with you how to set up an analogous program in your own province.

G. International Relations. The CGC is now the official adhering body to the International Union of Geological Sciences which is responsible for a number of international programs. We have a major role in the Canadian Lithosphere Committee; the International Geological Correlation Project; International Quaternary group, and SCOPE (Environment). In other words we are establishing an important role in helping Canada to be fully represented in the International community. We expect this role to become more important in the years ahead.

Recommendations. We ask you to consider carefully:

- i) Assisting us to conduct our review of Research and Development in the Geoscience Sector of the Mineral Industry.
- ii) Advising us on a workshop on "Geoscience, Minerals and the Addition to Canadian Wealth".
- iii) Setting up external review committees for your geoscience activities.
- iv) We are concerned that your ministries have not adequately stimulated research and development in universities and in the small high technology sector of geoscience and wonder what response you would have to further representations on these issues.

ANNUAL REPORTS OF THE SOCIETIES

1. The Association of Exploration Geochemists

The Association of Exploration Geochemistry has had a year of international growth, however, our Canadian membership has stabilized. The major highlight of the year was the 8th International Geochemical Exploration Symposium in Hannover, West Germany. This meeting, attended by some 400 geochemists from over 45 countries around the world, was the broadest based international meeting the Association has ever held. In Canada it has been a year of planning and preparation for meetings in 1981 and 1982. What is of particular note, and importance, is that these meetings are being jointly sponsored and organized with sections of the Geological Association of Canada. Two other items of special Canadian interest occurred at the Annual General Meeting in Hannover. Firstly, the election to Honorary Membership of Professor H.V. Warren was announced in recognition of his pioneering work in exploration geochemistry, and particularly biogeochemistry. Secondly, on the occasion of the Association's tenth anniversary a special award was made to J. Alan Coope in recognition of his dedicated service to the Association in its initial organization, as its first President and in many other less visible but most valuable ways. **R.G. Garrett, Secretary**

2. The Canadian Geotechnical Society Report to the Canadian Geoscience Council, 1980

During 1980, the Canadian Geotechnical Society grew in membership to 1029. Most of the members are also associated with one of the ten regional sections established in the major centres across the country. Within the Society there is one technical division, the Engineering Geology Division, and four technical sub-committees which cover the fields of Foundation Engineering, Slope Stability, Tunnelling, and Dams and Embankments.

Conferences sponsored or co-sponsored by the Canadian Geotechnical Society during 1980 included a Specialty Conference on Slope Stability Problems in Urban Areas (Toronto, 21-22 April), Underground Rock Engineering Symposium (Toronto, 28-29 May) and the 33rd Annual Canadian Geotechnical Conference (Calgary, 22-26 September). Associated with the annual conference were a seminar and workshop to discuss the recently published Canadian Foundation Engineering Manual and the 1st Canadian Symposium on Geotextiles. The general theme of the annual conference was "Problems and Progress in Geotechnical Aspects of Resources Development". Professor J.K.T.L. Nash, Secretary-General, International Society for Soil Mechanics and Foundation Engineering discussed geotechnical aspects of "The History and Development of London Bridge over nearly 1000 years". The 4th Canadian Geotechnical Colloquium was presented at the annual meeting by Dr. Guy Lefebvre, Université de Sherbrooke. The topic of his presentation was "Strength and Long Term Stability of Canadian Soft Clay Deposits".

Traditionally the two Society awards are presented at the annual meeting. The 1980 recipient of the R.F. Leggett Award for outstanding contributions to the field of geotechnique in Canada was Dr. Roger J.E. Brown, National Research Council, for his contributions to the field of Permafrost Engineering over the past 30 years. The Canadian Geotechnical Journal was awarded to J.L. Jasper and N. Peters, P.F.R.A., for their paper entitled "Foundation Performance of Gardiner Dam".

D.J. Bazett of Vancouver has stepped down as editor of the Canadian Geotechnical Journal, and R.J. Quigley, University of Western Ontario has assumed that role. W.J. Eden and J.W. Gadsby have given a new fresh look to the Society's quarterly newsletter, now renamed "CGS News".

This year the Society sponsored three cross Canada lecture tours. Dr. Maurice Dusseault, from the Mineral Engineering Department, University of Alberta travelled throughout eastern Canada to discuss the "Geomechanics of Tar Sands". Jean Jacques Pare, Société d'énergie de la Baie James, travelled throughout western Canada and discussed the Foundation Treatment of Dykes and Dams within the James Bay Project. Dr. A.S. Vesic, Duke University, travelled across Canada and talked about various aspects of pile foundations. Plans are developing for sending eminent Canadian geotechnical engineers to developing countries to present topics of interest to those countries. This project is being funded in part by CIDA.

The Engineering Geology Division of the Society is also the National Group of the International Association of Engineering Geologists, and represents the Canadian Geotechnical Society on the Canadian Geoscience Council. The Division has recently become more active and has established committees to study the Canadian Foundation Engineering Manual and to develop a Land Information Bank for Canada. It hopes to send a delegation of Engineering Geologists and Geotechnical Engineers to China in 1981, and in 1982 the Division will participate in the joint Canadian Geotechnical Conference/Association of Engineering Geologists Annual Meeting to be held in Montreal.

D. VanDine

3. The Canadian Society of Exploration Geophysicists

The geophysical industry was very strong in 1980 and the CSEG membership grew accordingly. Over 1200 delegates registered at the National Convention held in May of 1980, marking the 30th Anniversary year of the society.

The society was more active in University liaison in 1980. Teaching aids were distributed, a student society was set up at Memorial University and technical speakers were sent to some of the Universities. Twenty-three scholarships were awarded to Canadian University students.

A committee of oil industry executives successfully completed the fund raising for a chair in geophysics at the University of Calgary. This committee was supported by the CSEG and the CSEG itself donated to the fund.

Letters were sent to the provincial and federal governments in November, expressing concern at the lack of agreement in oil prices and policy, and pointing out the serious affect of this to our industry. **J.D. Boyd, Secretary**

4. Canadian Society of Soil Science

The Annual Meeting of the Canadian Society of Soil Science was held in Edmonton, Alberta, August 4-8th in conjunction with the Agriculture Institute of Canada and their affiliated scientific societies. The Canadian Society of Soil Science program consisted of a symposium, technical papers and a business meeting-banquet. A symposium on northern Agriculture with special reference to northwestern Canada was held jointly with the Canadian Societies of Agronomy and Horticultural Science. Joint technical sessions with the Canadian Society of Agricultural Engineering (Soil Physics and Soil Water) and the Agronomy Society (Minimum Tillage) as well as approximately 40 research papers rounded out the program. At the awards banquet, Dr. Steve Pawluk, University of Alberta was recognized as a Fellow of the Canadian Soil Science Society.

Some of the activities of the Canadian Soil Science Society during the past year are summarized as follows:

A history of Soil Science in Canada has been prepared by several of the charter members of the Society and plans are underway to publish this and make it available to our current and new membership. Plans were made to employ Society funds to support a national lecture tour on Soil Science topics as well as to establish annual awards of \$500 to Soil Science undergraduate students at each of the eight Canadian Agricultural Colleges. Surplus copies of Volume 4, 11th Congress, International Soil Science Society entitled "Photographs and Descriptions of some Canadian Soils" are to be made available free of charge to soils oriented Departments (Geology, Forestry, Agriculture, etc.) for distribution to senior students. **G.J. Wall**

5. The Canadian Society of Petroleum Geologists

Society activities continue their growth across Canada. Membership increased by 229 during 1980, for a grand total of 3115 members. Almost seventy active committees plus a number of University Liaison and Area Representatives report to the Society. The noon-hour Technical Speakers program saw average attendance increase from 753 in 1979 to 857 in 1980, with sell-outs of 1000 tickets on several occasions.

The highlights and new developments of 1980 are listed below.

A new award, the R.J.W. Douglas Memorial Medal, was introduced. This award recognizes major contributions to regional tectonic and structural geology and the general understanding of sedimentary rocks in Canada. The first recipient of this award is Dr. Harold Williams of Memorial University.

The Distinguished Lecture Tour and Link Award Tour exposed a number of Canadian universities to two excellent lectures. Ray Price presented "The Cordilleran Overthrust Belt in Southern Canada: Its Regional Tectonic Implications, and its Role in Hydrocarbon Generation and Entrapment". Ian McIlreath presented "Canadian 'Deep Water' Carbonate Deposits: Distinction from 'analogous' Siliclastic Deposits and Their Hydrocarbon Potential".

Honorary memberships were awarded to D.J. Glass, R.J. Kirker and Dr. D.J. McLaren. Meritorious service to the Society and to the community in general were recognized through a series of annual awards which are summarized in Table 4.

Volumes 1 (Arctic Archipelago) and 2 (District of Mackenzie and Yukon) of the Lexicon series were completed and are available for purchase. Volume 3 (Western Cordilleran and Southwestern Yukon) and 4 (Western Canada) are well under way while Volume 5 (Central Canada) and 6 (Maritime Provinces and Eastcoast Offshore) have been started.

A "National Energy Program" committee was struck with the intent of documenting to our membership, governments and the general public the effect of this federal program on the employment of Canadian petroleum geologists. Results of the committee's questionnaire to petroleum companies on this matter will be made available and periodic updates to monitor ongoing effects will be conducted.

The "Energy Audit of the Eighties" conference, held Sept. 28 to Oct. 1, provided a timely assessment of Canada's energy sources for the future. The clear message from this conference was that Canada has the resources to be self-sufficient in energy, but that cooperation of all levels of government with industry will be required if this goal is to be realized.

The C.S.P.G. and G.A.C. executives met in Calgary to discuss publication of the Canadian Paleontological Monograph Series. The Societies agreed to co-sponsor the series and a joint committee made up of three members from each society plus the society editors will be set up to oversee this project.

Thirty-two students from across Canada gathered in Calgary from May 6 to 16 for the Student-Industry Field Trip. The success of this endeavour confirmed our conviction that this is the most important single public service function performed by the CSPG. **R.D. Orr, President**

6. The Canadian Well Logging Society

The Canadian Well Logging Society has had a very active year. Our Luncheon Speakers' program has been excellent, and both our active and corporate membership has increased substantially.

The Executive Committee has concluded several changes in the Bylaws which will make us more effective in the future:

1. Honorary Membership changes, initiated in 1978 and 1979, have been passed, whereby the election to Honorary Membership position shall be by the unanimous consent of the Directors.
2. The positions of Publications Chairman and Membership Chairman have been elevated to an elected, rather than appointed position. This reflects the increased responsibility and contributions required in these positions.
3. The fee structure was changed to reflect the effects of inflation and some ambiguities in initiation and annual dues structure.
4. The liaison agreement with the Society of Petroleum Well Log Analysts (SPWLA) was officially signed by the Presidents of SPWLA and the CWLS, to provide a better interchange of membership privileges.

An agreement was made with the CIM's Journal of Canadian Petroleum Technology to allow the publication at no charge to the CWLS of news, short papers and technical papers. All CWLS members will now receive this journal as part of their membership. The CWLS Journal was not published this year due to a lack of volunteers to take on this onerous task. The new duties of the Publication Chairman will include an investigation into the revitalization of the CWLS Journal.

Several CWLS members attended the SPWLA Symposium in Lafayette in July, 1980. We found an interest amongst the SPWLA members in holding a future convention in conjunction with the CWLS. As a result, we offered informally to co-host the 1983, SPWLA convention in Calgary. This was followed up by an official offer presented at a Houston meeting of the SPWLA Executive in September. We were advised in November that we were successful in our bid and now look forward to a 1500 delegate Symposium in 1983. Since this is a "first" and a very important conference in our CWLS history, we have decided that the 1983 Symposium Committee also host the 1981 CWLS Symposium. **R.V. Everett, President**

7. The Geological Association of Canada

Membership in the Geological Association of Canada continues to grow with the bulk of the membership still concentrated in Ontario and Quebec in the east and in the provinces of Alberta and British Columbia in the west. The 1980 Annual Meeting, held in conjunction with the MAC, saw an attendance figure approximately 20% above the attendance figure for the 1979 joint Annual Meeting.

Two special Papers of the Association were produced in 1980. Special Paper No. 19 – The History of Concepts in Precambrian Geology, edited by W.O. Kupsch and W.A.S. Sarjeant summarizes a series of papers originally presented in 1972 at the International Geological Congress. These were brought up to date and appear in a 20-chapter, 292-page publication.

Special Paper No. 20 – The Continental Crust and its Mineral Deposits (a volume dedicated to J. Tuzo Wilson), appeared in the latter part of the year. This publication summarizes up to date ideas on the early Earth, the evolution of the Precambrian Crust, plate tectonics and the location of mineral deposits. The book is 804 pages in length and is divided into six sections. Over 40 individual papers are incorporated in the body of the text.

Two further Special Papers on The Cretaceous Rock and Their Foraminifera in the Manitoba Escarpment, edited by D.H. McNeil and W.G.E. Caldwell, and The Buchans Ore Bodies: Fifty Years of Geology in Mining, edited by E.A. Swanson, D.F. Strong and J.G. Thurlow, are in final stages of preparation.

The Logan Medal, the Geological Association's highest award, was awarded to Dr. G.V. Middleton of the Department of Geology at McMaster University in Hamilton, Ontario in 1980 and the Past Presidents' Medal was awarded to Dr. D.F. Strong of the Department of Geology at Memorial University in St. John's, Newfoundland. Dr. Charlotte E. Keen, the 1979 recipient of the Past Presidents' Medal gave a lecture entitled: 'Evolution of Sedimentary Basins on Rifted Continental Margins: Implications for Petroleum Generation' to groups of members of the Association in St. John's, Fredericton, Montreal, Ottawa, Toronto, Winnipeg, Saskatoon, Edmonton, Vancouver and Victoria.

The Duncan Derry Medal was awarded to A.J. Naldrett for his outstanding achievements in economic geology. It is encouraging to observe that membership in all Divisions of the Geological Association went up in 1980.

The Robinson Committee working in cooperation with the Mineral Deposits Division of the Geological Association of Canada has recommended that a series of publications be produced on selected mineral deposits. The series will be edited by Alex Brown of Ecole Polytechnique, Montreal, P.Q. An 'Ore-Deposits Models Series', edited by R.G. Roberts of the Department of Earth Sciences, University of Waterloo, Waterloo, Ontario will be produced for Geoscience Canada. Both of these series will be produced over the next few years and further reports will be made in subsequent issues of this report.

8. The Mineralogical Association of Canada

The Mineralogical Association of Canada celebrated the twenty-fifth anniversary of its founding during 1980 and the event was marked at the Silver Jubilee Dinner held in conjunction with the GAC/MAC Joint Annual Meeting in Halifax. The fifth in a series of very successful short courses was held prior to the meeting. The course was organized by G.K. Muecke and dealt with Neutron Activation Analysis in the Geosciences. The Association also sponsored two special technical sessions during the meeting. A Symposium on Peraluminous Granites was organized by D.B. Clarke, and the papers presented will comprise a forthcoming special number of *The Canadian Mineralogist*. A special session on Trace Element Geochemistry was organized on the Association's behalf by D.M. Shaw. The Hawley Award for 1980 was presented to Louis J. Caruso and Joseph V. Chernosky, Jr. in recognition of their paper entitled "The Stability of Lizardite" which was published in *The Canadian Mineralogist*, v. 17, p. 757-769. Membership in the Association has increased to a total of 1908 of which 1268 are individuals. New initiatives include the decision by the executive to establish The Past Presidents' Medal to recognize distinguished contributions to mineralogy and the allied sciences in Canada. The twelfth General Meeting of the International Mineralogical Association was held from July 4 to 7, 1980 in Orleans, France. The Mineralogical Association of Canada, as national adhering body for IMA, appointed Canadian representatives to the various IMA Commissions and business meetings. **J.M. Duke, Secretary**

REPORTS OF THE ASSOCIATE MEMBER SOCIETIES

1. Committee of Chairmen of Canadian Earth Science Departments

Report on Enrolment Statistics

This committee last reported to the Geoscience Council with data up to 1976-77. This report provides data up to the period 1979-80. Statistics on student, faculty and staff numbers in Earth Science departments, by region, are given in Table 2. The areas of employment for graduating students are summarized in Table 3. The data are not complete; there is some reluctance to complete requests for statistical data. We live in an age of data collection and there is little doubt that the task of preparing such materials is hardly stimulating. But I think it is of value to present what we have received. Geology departments in Ontario, via their frequent meetings, have provided the most significant data. From their data, there is no doubt that certain trends appear:

1. The number of students being exposed to Earth Science via a first year course is increasing but not in any spectacular fashion. Levels have been more or less steady since 1977.
2. There are small increases in the number of second and third year students with the most significant changes occurring in the Western Provinces.
3. There are indications that the number of Masters' candidates is declining in Ontario and the West but increasing in the Quebec and Atlantic regions.
4. The number of doctoral candidates is still at about the 1973-74 level.
5. Faculty levels are almost constant except in the West and there is no sign of much change in technical support levels.
6. From the available figures there does appear to be a trend for decreasing interest in graduate studies from B.Sc. and M.Sc. students.

In view of the inadequacies in our data I have not added totals or graphs of trends for this report for I consider that except for Ontario they could be grossly misleading. We only hope that in the future we can do a little better job of reporting. Perhaps the most interesting conclusion from the figures we have is that there is little indication of any recent dramatic change seen through the normal noise of the data. **W.S. Fyfe, Chairman**

Table 2
Students, faculty and staff in Canadian Earth Science departments, 1973-1980

	Year	Atlantic ¹	Quebec ²	Ontario ³	Western ⁴	Total
1st Year Students (all students taking a course)	73/74	-	-	3280	-	
	74/75	741	-	3569	-	
	75/76	869	-	4270	-	
	76/77	734	-	4666	-	
	77/78	1017	96	4637	3785	9485
	78/79	955	103	4167	3772	8997
	79/80	554	-	4622	1656	
2nd Year Majors - Arts & Science & Engineers	73/74	-	190	374	249	813
	74/75	163	205	372	231	971
	75/76	113	202	387	253	955
	76/77	197	202	351	312	1062
	77/78	195	199	333	234	961
	78/79	234	171	396	306	1107
	79/80	100	150	428	403	
3rd Year Majors - Arts & Science & Engineers	73/74	-	177	320	245	742
	74/75	155	164	341	226	886
	75/76	73	176	338	199	786
	76/77	147	172	310	279	908
	77/78	106	166	291	220	783
	78/79	134	172	311	238	855
	79/80	87	101	320	373	

Table 2 (cont.)

	Year	Atlantic ¹	Quebec ²	Ontario ³	Western ⁴	Total
4th Year Majors – Arts & Science & Engineers	73/74	-	131	283	268	682
	74/75	85	153	276	233	747
	75/76	102	124	254	212	692
	76/77	120	144	244	236	744
	77/78	100	156	257	183	696
	78/79	106	166	277	221	770
	79/80	102	87	243	246	
M.Sc. Candidates enrolled	73/74	-	68	195	136	399
	74/75	48	106	217	160	531
	75/76	54	112	261	203	630
	76/77	78	111	279	226	694
	77/78	66	75	248	211	600
	78/79	69	96	271	191	627
	79/80	100	99	252	177	
Ph.D. Candidates enrolled	73/74	-	32	141	86	259
	74/75	46	30	156	85	317
	75/76	34	30	182	90	336
	76/77	65	35	152	94	346
	77/78	52	35	146	85	318
	78/79	41	39	141	86	307
	79/80	67	39	146	77	
P.D.F. and Research Fellows	73/74	-	13	14	28.5	55.5
	74/75	9	15	22	33	79
	75/76	6	14	23	34	77
	76/77	2	9.5	24.5	22	58
	77/78	13	11	17	21	62
	78/79	7	20	17	28	72
	79/80	6	10	26.5	10	
Faculty, Full-Time	73/74	-	77	156.5	119.5	353
	74/75	66	80	159.5	120	425.5
	75/76	83	79	160	121	443
	76/77	93	81	152	139.5	465.5
	77/78	71	86	162	128	447
	78/79	75	86	167	130	458
	79/80	71	62	169	139.5	
Faculty, Part-Time	73/74	-	8.75	-	12	20.75
	74/75	-	8.5	-	14	22.5
	75/76	-	5.75	17	12.5	35.25
	76/77	-	3	17	21	41
	77/78	9	13.5	24.5	11	58
	78/79	9	15	22	13	59
	79/80	7	16	24.5	19	
Secretaries and Admin. Ass'ts	73/74	-	19	36.5	30.75	86.25
	74/75	38	19	37	31.75	125.75
	75/76	48	19	38.25	30	125.25
	76/77	19	20	39	39.75	117.75
	77/78	19.5	23	39	31	112.5
	78/79	19.5	23	39.75	30	112.25
	79/80	16	16.5	36.25	36.5	
Technicians	73/74	-	35	87.75	64	186.75
	74/75	18	36	97.5	63.5	215
	75/76	20	36	96	68	220
	76/77	27	47	100	80.5	254.5
	77/78	28	42	106	66	242
	78/79	28.5	41.5	103.75	71	244.75
	79/80	34	37	100.75	70.5	

¹For 1979/80 no report from Dalhousie, St. Mary's, Acadia.

²No report from Université du Québec at Montreal or Concordia, 1979/80.

³No report from Toronto geophysics.

⁴No report 1979/80 from Alberta geophysics.

Table 3
Place of Employment of Graduating Students

Bachelor's Graduates	Atlantic			Quebec			Ontario			West*			Total	
	76/77	77/78	78/79	76/77	77/78	78/79	76/77	77/78	78/79	76/77	77/78	78/79	76/77	77/78
Provincial Government	8	10	5	7	11	-	11	14	8	9	4	-	35	39
Federal Government	2	1	2	1	-	-	8	5	3	2	-	-	13	6
Foreign Government	-	-	3	-	1	-	1	1	-	-	-	2	1	2
Canadian Industry														
-mining	19	19	14	28	34	-	28	42	50	5	13	28	80	108
-petroleum	18	17	21	9	7	-	18	47	49	48	75	50	93	146
-other	3	4	8	4	11	-	8	20	6	5	6	3	20	41
Foreign Industry														
-mining	4	-	7	1	12	-	2	-	6	-	-	-	7	12
-petroleum	-	-	11	2	5	-	-	2	2	-	-	8	2	7
-other	-	-	-	-	-	-	-	4	-	5	-	1	5	4
Graduate School														
-Canadian	12	5	9	22	18	-	64	42	20	19	16	9	117	81
-Foreign	-	-	-	1	1	-	3	3	2	2	2	2	6	6
Teaching	-	1	-	1	2	-	12	2	2	1	-	-	14	5
Non-Earth Sciences	-	-	-	7	4	-	12	4	12	5	5	-	24	13
Unknown	11	12	7	6	45	-	48	33	44	38	19	13	103	109
Total	77	69	87	89	151	-	215	219	204	139	140	116	520	579
Master's Graduates	Atlantic			Quebec			Ontario			West*			Total	
	76/77	77/78	78/79	76/77	77/78	78/79	76/77	77/78	78/79	76/77	77/78	78/79	76/77	77/78
Provincial Government	3	5	2	3	1	-	8	6	1	5	4	3	19	16
Federal Government	2	1	3	-	-	-	2	4	3	1	1	1	5	6
Foreign Government	-	1	4	-	-	-	2	4	2	2	1	1	4	6
Canadian Industry														
-mining	1	4	-	3	11	-	7	9	12	7	12	3	18	36
-petroleum	5	5	2	-	-	-	7	12	10	11	16	11	23	33
-other	1	-	7	3	2	-	3	8	2	-	-	1	7	10
Foreign Industry														
-mining	-	1	-	-	2	-	3	1	2	2	2	4	5	6
-petroleum	-	1	-	-	-	-	1	-	-	-	-	-	1	1
-other	-	-	5	-	2	-	-	5	1	-	3	-	-	10
Graduate School														
-Canadian	4	2	4	4	4	-	14	14	5	9	3	5	30	23
-Foreign	-	1	-	-	-	-	4	7	2	1	2	3	5	10
Teaching	-	-	-	-	1	-	1	1	1	1	2	-	2	4
Non-Earth Sciences	-	2	-	1	-	-	-	4	-	-	-	-	1	6
Unknown	-	-	-	2	-	-	2	5	2	8	1	1	12	6
Total	15	23	27	16	23	-	54	80	44	47	47	35	132	173

*No report from University of Calgary.

2. Report from The Royal Society of Canada

The Royal Society has not, for several years, held sessions for the presentation of professional papers in the earth sciences. Instead, it arranges inter-disciplinary symposia on topics of national or international importance; the proceedings of these symposia are normally published by the Society and copies may be obtained by addressing:

The Secretary
Royal Society of Canada
344 Wellington Street
Ottawa, Ontario, K1A 0N4.

Recent symposia of interest to Council members include:

Shifts in the Balance of Canada's Resource Endowments; R.E. Follinsbee, ed., Royal Society of Canada, 1977 (\$4.00).

Nuclear Issues in the Canadian Energy Context; E.P. Hincks, ed., Special Publication no. 14, Royal Society of Canada, 1979 (\$8.00).

Symposium on Glacial Beds: The Ice-Rock Interface; Journal of Geology, v. 23, no. 89, 1979.

A Century of Canada's Arctic Islands, 1880-1980; M. Zaslow, ed., in press (1980).

The New Planetology; M.R. Dence, ed., in press (1981).

3. Associate Committee on Geotechnical Research

The Associate Committee on Geotechnical Research is one of about 25 technical committees which assist the National Research Council in the coordination of scientific and industrial research in Canada. Members of the Committee are appointed by Council. The Associate Committee on Geotechnical Research was established in 1945 to coordinate and stimulate research on the engineering and physical aspects of the terrain of Canada. The original six-member Committee was concerned with the operation of tracked military vehicles over terrain. With the end of hostilities, the Committee turned its attention to civilian needs. Subcommittees were established to deal with specific problems under the following general terms of reference:

"To define problem areas in their assigned field, advise the Associate Committee on research needs, follow through actively in promoting research and assisting in the publication and application of results."

There are presently five Subcommittees that are concerned with Peatlands, Permafrost, Snow and Ice, Soil and Rock Engineering, and Urban Engineering Terrain Problems. There is, in addition, a task group on Marine Geotechnical Engineering.

The Subcommittees are active in the organization of research conferences, seminars and workshops on specific topics. For example, there have been a series of Muskeg Research Conferences and Permafrost Conferences (the most recent held in Calgary, March 1981), and also special conferences, such as the First Canadian Conference on Marine Geotechnical Engineering in Calgary, April 1979. Whenever possible, such activities are carried out in conjunction with professional activities, in particular the Canadian Geotechnical Society.

The Committee publishes its work in a series of Technical Memoranda, which are distributed by the Publications Office of the National Research Council. Enquiries about the Committee and its publications may be directed to

The Secretary,
Associate Committee on Geotechnical Research,
c/o Division of Building Research,
National Research Council of Canada,
Ottawa, Ontario, K1A 0R6

The present officers of the Committee are:

Dr. L.W. Gold, Chairman
Mr. W.J. Eden, Technical Advisor
Mrs. J. Curran, Secretary

Recent publications include

Technical Memorandum No. 126 – Results of a Survey of Research in Geotechnics at Canadian Universities. November 1979.

Technical Memorandum No. 127 – Proceedings of the Eighteenth Muskeg Research Conference, 15 August 1979. June 1980.

Technical Memorandum No. 128 – Proceedings of Symposium on Permafrost Geophysics (No. 5) 13-14 November 1978. July 1980.

Technical Memorandum No.129 - Workshop on Winter Roads, 18-19 October 1979. September 1980.

Technical Memorandum No.130 - Proceedings of Workshop on Permafrost Engineering, 27-28 September 1979. December 1980.

W.J. Eden,
Technical Advisor, ACGR

4. Geological Survey of Canada

The overall objective of the Geological Survey of Canada is to ensure the availability of comprehensive knowledge, technology, and expertise concerning the onshore and offshore geology of Canada including geological aspects of mineral resources and non-renewable energy resources and geological conditions affecting land and seabed use. In working towards the attainment of this objective the Survey determines the resource base of Canada, facilitates formulation of mineral and energy policy, assists in resource exploration and exploitation and promotes effective management of land and resources.

The 1980-81 budget of the Survey was \$35,286,000 and the authorized strength was 757 person years. The Survey is divided into 9 divisions, 6 in Ottawa (Precambrian Geology, Terrain Sciences, Economic Geology, Resource Geophysics and Geochemistry, Central Laboratories, and Geological Information) and 3 outside of Ottawa (Atlantic Geoscience Centre - Dartmouth, N.S., Institute of Sedimentary and Petroleum Geology - Calgary, and Cordilleran Geology - Vancouver).

At the end of 1980 W.W. Hutchison was appointed Director General succeeding D.J. McLaren who became Assistant Deputy Minister, Science and Technology, in EMR. During the year J.C. McGlynn was appointed Director, Precambrian Geology Division and W.W. Nassichuk, Director of the Institute of Sedimentary and Petroleum Geology.

The year saw an acceleration in the Branch involvement with the Geological Society of America's Centennial Project - the Decade of North American Geology. Nine of the planned 23 volumes will be prepared and published by the GSC and will be in effect the sixth edition of the Survey's Geology and Economic Minerals of Canada. At present 11 GSC staff members are serving as project leaders for the regional synthesis volumes with J.O. Wheeler acting as Canadian co-ordinator. The Canadian volumes will average 350 pages each and the first are planned for publication in 1984-85. Because of size limitations separate English and French editions will be printed. During 1980 GSC staff members participated in workshops at which plans for preparing individual volumes were prepared. Although the GSC has the responsibility for co-ordinating and publishing the Canadian volumes, project leaders will draw on specialized expertise especially that available from provincial surveys.

The Survey's program in the sedimentary basins of Arctic and Western Canada continued to suffer from the attraction of higher salaries in industry. Only sporadic progress was made in staffing and several positions remain unfilled after being vacant for almost two years. Indeed, during 1980 there were 35 appointments and 35 resignations. The problem affects other parts of EMR and is the subject of a special study team, whose report is expected in mid-1981.

The GSC is a major publisher of earth science information and in 1980 published 3 memoirs (235 p.), 18 bulletins (1169 p.), 36 papers (2000 p.), 3 volumes of "Current Research" (945 p.), and 15 coloured maps, 11 preliminary maps, and 72 Open File items. Included in the last category was the latest estimate of Canada's Conventional Oil and Gas resources and resources prepared by the ISPG's Petroleum Resource Appraisal Secretariat. This group provides liaison with resource administration groups of Indian and Northern Affairs and the Resource Management Branch of EMR and as well as making resource estimates, develops estimate methodology, and gives direction to petroleum resource activities in other GSC divisions.

This year witnessed dramatic developments in the exploration for oil and gas in offshore eastern Canada with the initial promise of the first well on the Hibernia structure being confirmed by two additional wells. In order for the GSC input into the appraisal process to adequately recognize the developments in the offshore areas subsurface geological studies of the area of interest (44°N to 76°N) were accelerated at the Atlantic Geoscience Centre.

During the year the GSC was again called on to participate in mineral resource appraisals. In 1979 almost all federal territories above the treeline were assessed; in 1980 appraisals were underway for three proposed national parks in the North and for the entire Yukon.

During the latter part of 1980/81, twenty booklets of the National Geochemical Reconnaissance 1:2 million Coloured Compilation Map Series were released providing coverage for about 10 per cent of the area of Canada for 14 geochemical parameters. In 1980/81, 56,103 line kilometres of standard-sensitivity aeromagnetic surveys were flown and 489 aeromagnetic maps were issued bringing the total to 8799 for all parts of Canada.

During the year work continued on the compilation of Quaternary data for 1:1 million map sheets that straddle the Canada-U.S. border. Compilation for five of the eleven maps has been completed. The U.S. Geological Survey will publish these along with a series of Quaternary geology maps being prepared for the conterminous United States.

**A SUMMARY OF THE FIRST ANNUAL REPORT
OF THE TECHNICAL ADVISORY COMMITTEE ON THE
NUCLEAR FUEL WASTE MANAGEMENT PROGRAM; MAY 1980**

The Technical Advisory Committee of distinguished scientists and engineers was established by Atomic Energy of Canada Limited in June 1979. Its members were selected entirely from nominees submitted by the major scientific and engineering societies of Canada: the Canadian Association of Physicists, the Canadian Federation of Biological Societies, the Canadian Geoscience Council, the Canadian Institute of Mining and Metallurgy, the Chemical Institute of Canada and the Engineering Institute of Canada. In order to broaden its range of expertise, the Committee requested AECL to approach the Biological Council of Canada and the Information Processing Society of Canada for their nominees; a member from the latter group has recently been appointed.

The role of the Technical Advisory Committee is to advise AECL on the extent and quality of the technical program on nuclear fuel waste management, acting as an independent peer review committee. It is required to report annually through a publicly available document. In its first year, the Committee concentrated on a preliminary scientific review and evaluation of program activities to date, with full realization of the extensive "learning process" required.

In the Committee's overall view, the program is well conceived, there are many impressive accomplishments of high quality, the research objectives are becoming more clearly defined and the most critical areas in which more research is needed are being identified. The Committee was assured by the increasing participation in the program by university and industry scientists and engineers and the excellent understanding of relevant international research activities on the part of the principal investigators.

The term "concept verification" has been used to describe the initial research phase of the program. The Technical Advisory Committee felt that the first priority of the program must be to show that a workable solution to the disposal question exists rather than to embark on a long-term search for some ideal or "best possible" method of waste disposal. In this light, the Committee felt that a better description of this research phase is conveyed by "concept assessment".

The research phase of the disposal program was reviewed in four areas representing the major components of the program. These are environmental and safety analysis, geoscience research, applied chemistry and immobilization. However, in assessing performance to date the Committee has concentrated on the geoscience research.

In the area of environmental and safety assessment, the Committee agreed that it is essential that AECL maintain a strong program of basic and applied research on methods for the assessment of ecological and health effects which might arise from any leakage of radioactive material from the proposed disposal vault. While endorsing the use of computer simulation models for the assessment program, the Committee recognized that, since such models are critical components of the entire program, they must be evaluated with great care. This is an area the Committee will, as a matter of priority, evaluate further.

The Technical Advisory Committee considered it reasonable to concentrate research efforts in the geoscience area on granitic plutons in the Canadian Shield. They suggested that the program should emphasize the search for relatively unfractured rocks and give comparatively less effort to highly fractured rocks and those of rarer chemical composition, e.g. syenites and anorthosites. Nonetheless, the Committee believed that some resources should continue to be allocated to research on alternatives such as salt and shale.

A review and planning document which details the overall hydrogeologic research program is needed to ensure that among other things the best possible hydrogeologic use is made in every borehole that is drilled as part of the field research program. Such a document could also serve as a basis for independent review by Canada's hydrogeologic community and as a method of attracting their participation in the program. The Committee also recommended that increased efforts be made in the field of hydrogeologic modelling and to study the nature of groundwater flow patterns in plutons of the Canadian Shield on both local and regional scales.

Because of the lack of experience in translating laboratory measurements of rock properties to behaviour underground, the Technical Advisory Committee strongly supported the construction of an Underground Research Laboratory as a matter of program urgency. The Committee also endorsed active Canadian participation in the international hydrogeological, geotechnical and geochemical program at the Stripa mine in Sweden.

The applied chemistry research covering interactions between the waste form, groundwater and the rock body as well as buffering and backfill materials is satisfactorily underway. Investigations of groundwater chemistry should include both equilibrium and kinetic studies of the reactions between minerals and synthetic or natural groundwater. Studies should also be made of any effect construction of the vault may have on groundwater. The Committee believed that more consideration should be given in sorption studies to how closely laboratory conditions will compare to the real situation, and to the sorption characteristics of minerals which are deposited in fractures at depth.

Studies of methods for immobilizing both used fuel and reprocessing wastes should be continued, at least through the concept assessment phase. The Committee found the research program well-defined and integrated with the international scene. At this time, greater emphasis should be given to the work on used fuel immobilization particularly in the area of corrosion performance. Although it was accepted that borosilicate glasses are now the primary waste form, the Committee supported research on other alternatives for immobilizing reprocessing wastes.

In more general terms, the Technical Advisory Committee supported the continuing effort to publish the results of research in the general scientific literature. It also supported the increased use of workshops and symposia as a means of further informing the scientific community. Increased participation by universities and industry in the research program was strongly advocated.

The Technical Advisory Committee stressed that a proper scientific and technical evaluation of the program can only be made if the necessary research information is available. In particular, it noted that extensive geoscientific work in the field is necessary and it is essential that approvals for field research be obtained. Further, the Committee affirmed its general approval and support for major increases in funding for the expansion of the geoscientific and geotechnical program, especially in regard to field research activities and the development of an Underground Research Laboratory.

The full report is available, on request, from the Chairman of the Technical Advisory Committee:

Dr. L.W. Shemilt
c/o Room 136, Engineering Building
McMaster University
Hamilton, Ontario
L8S 4L7

Table 4
Confirmed Significant Hydrocarbon Discoveries 1978-1980*

Region/Area	Well Name	Discovery Year	Formation/Type	Operator/Participants
Labrador Shelf	Hopedale E-33 55°-52'-24.08"N 58-30-51.08W	1978	Cret./Ord./Gas	Chevron et al.
Scotian Shelf	Thebaud I-94 43-53-42"N 60-13-13"W	1978	Cret./Gas	Mobil et al.
N.W.T.	Kotaneelee Yt E-37 60-06-27N 124-07-16W	1978	Miss./Dev./Gas	Columbia et al.
Arctic Islands	Roche Pt. 0-43 76°-45'-32N 109-46-19.25W	1978	Triassic/Gas	Panarctic et al.
Arctic Islands	Drake F-76 76°-25'-24"N 108-24-44W	1978	Jurassic/Gas	Panarctic
N.W.T.	Norman Wells 36XB-48 65°-17-09N 126-53-02W	1978	Dev./Oil	Esso
Alberta	Moose Mt. 7-27-22-6W5	1978	Miss./Gas	Shell/Home
Alberta	Coalspur 6-26-48-21W5	1978	Tri./Miss./Gas	Gulf et al.
Alberta	Iosegun 10-25-65-20W5	1978	Dev./Cret./Oil	Sabine et al.
N.E. Br. Col.	Ojay c-12-L-93-I-9	1978	Tri./Gas	Pacific et al.
N.E. Br. Col.	Commotion a-23-D-93-P-12	1978	Tri./Gas	Skelley/Getty
N.E. Br. Col.	South Sierra a-31-L-94-I-11	1978	Dev./Gas	Mobil
Scotian Shelf	Venture D-23 44-02-14N 59-34-21W	1979	Cret./Gas	Mobil/PEX
Grand Banks	Hibernia P-15 46-44-58N 48-46-52W	1979	Cret./Jur./Oil	Chevron et al.
Beaufort Sea	Ukalerk 2C-50 70-09-05.3N 132-43-48.9W	1979	Tertiary/Gas	Dome/Gulf
Beaufort Sea	Kopanoar M-13 70-22-55N 135-05-34W	1979	Tertiary/Gas/Oil	Dome/Gulf
Beaufort Sea	Nerlerk M-98 70-27-47.62N 133-29-43.37W	1979	Tertiary/Oil	Dome
Beaufort Sea	Tarsuit A-25 69-54-9.25N 136-20-20.27W	1979	Tertiary/Gas/Oil	Dome/Gulf
Arctic Islands	Whitefish H-63 77-12-18N 106-52-53W	1979	Jurassic/Oil	Panarctic AIEG
Alberta	Blood 10-30-8-23W4	1979	Wabamun/Oil	Kaiser/Gulf
Alberta	Blackstone 11-33-42-16W5	1979	Miss./Gas	Shell/Siebens
Alberta	Brown Creek 11-22-44-16W5	1979	Dev./Gas	Amoco et al.
Alberta	Wembley 7-15-71-7W5	1979	Tri. Halfway/Oil	GAO et al.
N.E. Br. Col.	Sukunka c-45-J-93-P-4	1979	Tri. Halfway/Gas	B.P./AEG
N.E. Br. Col.	Monias 7-30-82-20W6	1979	Perm./Gas	Wainoco
N.E. Br. Col.	July b-27-J-94-P-10	1979	Dev./Gas	Fina et al.

Table 4 (cont.)

Region/Area	Well Name	Discovery Year	Formation/Type	Operator/Participants
Grand Banks	Ben Nevis I-45 46-34-40N 48-21-10W	1980	Cret./Oil	Mobil et al.
Cumberland	Hekja O-71 62-10-15N 62-58-46W	1980	Cret./Gas/Oil	Aquitaine et al.
Mackenzie Delta	Issungnak O-61 70.01-0.45N 134-18-47.93W	1980	Tertiary/Oil	Esso
Arctic	Char G-07 77-36-30N 99-31-08.W	1980	Jur./Tri./Gas	Panarctic Dome
Alberta	Eaglesham 9-9-77-25W5	1980	Wabamun/Oil	Cdn. Occidental
Alberta	Del Bonita 16-35-1-22W4	1980	Miss./Dev./Oil	Amoco et al.
Alberta	Golden 12-2-87-13W5	1980	Dev./Oil	Norcen et al.
N.E. Br. Col.	Steep Rock c-12-L-93-P-1	1980	Cret./Gas	Cdn. Hunter/Esso
* The information in this table was collected by D.W. Organ of Chevron Standard Ltd., Calgary. It is understood that "significant" is a subjective judgement.				