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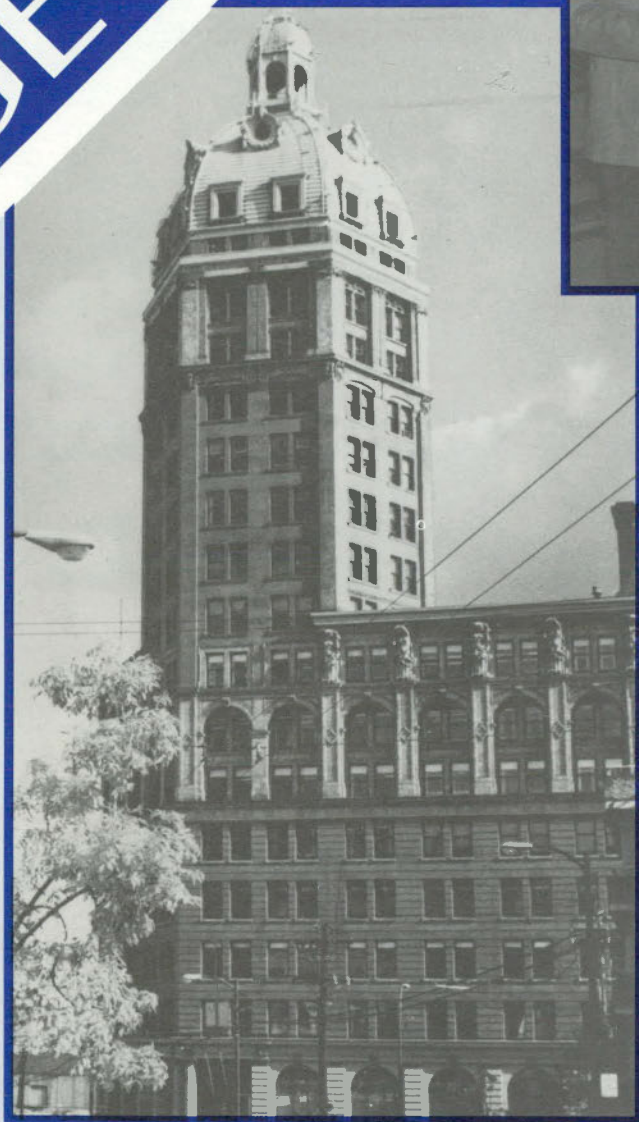
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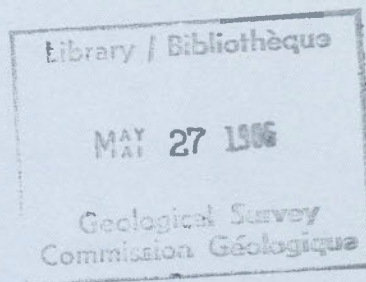
GEOGRAM



Howard Tipper explains the
significance of a fossil
ammonite presented to Minister
Carney during her reception
for EMR employees at Sun
Tower, Vancouver, 12 November
1985. Dick Campbell at left.
(photo credit: Phil Hersee, 155
Water Street, Vancouver, B.C.)



Sun Tower, 1968-present
(1978 photograph)



No. 24 APRIL 1986
an informal branch newsletter



Energy, Mines and
Resources Canada

Énergie, Mines et
Ressources Canada

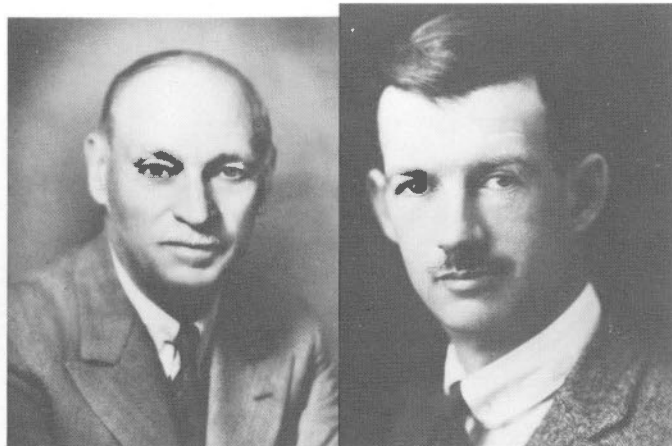
Canada

The history of the Cordilleran Geology Division

VANCOUVER OFFICE OF THE GEOLOGICAL SURVEY OF CANADA

The Geological Survey of Canada has maintained a presence in Vancouver for almost 68 years. It evolved from a small information office in 1918 to the present headquarters of the Cordilleran Division of the Survey to which much of current research in the Canadian Cordillera is entrusted. The Vancouver Office has an interesting past involving a variety of geologists working in a variety of buildings, engaged in a variety of projects. The amalgamation of the Cordilleran Division with the Pacific Geophysics Division of the Earth Physics Branch at Sidney, B.C. on Vancouver Island raises again the question of the future of the office and where it will be housed.

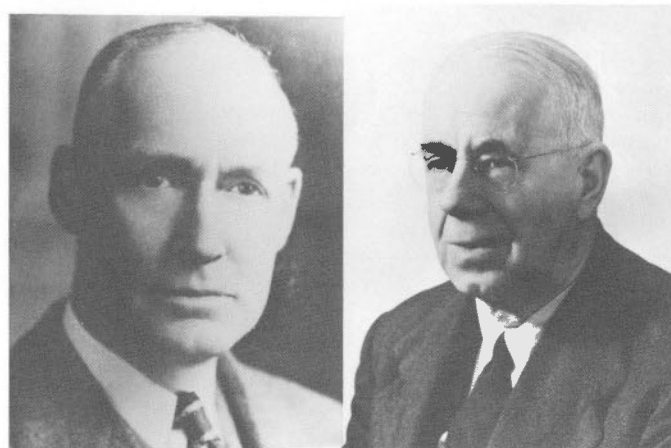
A memorandum, dated 24 April, 1918, by R.G. McConnell, Deputy Minister of the Department of Mines and Resources was responsible for the creation of the office in order to "keep more closely in touch with prospecting and mining development throughout the province and in Yukon Territory, to work more closely in co-operation with the Provincial Department of Mines, and to act as a local distribution office for reports, maps, and other geological information". The memorandum brought quick action. In slightly more than a month (without benefit of control agencies, computers, telex, commercial airlines, or other 'time-saving' gadgets) Charles Camsell, then a pioneering geologist and explorer and later Deputy Minister, opened the office on 27 May 1918. Camsell, of course, immediately applied for a raise in pay to offset the higher living costs of Vancouver and the "more advanced social position" he would have to maintain there. Even then it was expensive to live in Vancouver! The office was an immediate success, as prospectors, exploration geologists and mining engineers availed themselves of its maps and reports, its highly relevant library and its geological expertise. This tradition continues today.



Charles Camsell

J.D. MacKenzie

The early years saw a succession of geologists in charge of the office as it moved from building to building. Camsell remained in charge until 1920 when he returned to Ottawa to become Deputy Minister. J.D. MacKenzie took over until he died in 1922 as a result of severe war injuries. Victor Dolmage managed the office (with the assistance of Clive Cairnes and Forest Kerr) until October 1929, when he left the Survey to begin private consulting, a few days before the stock market crash. It is said that his first year as a private consultant netted him an income of \$82.00, an inauspicious beginning to a long and respected career in the private sector.

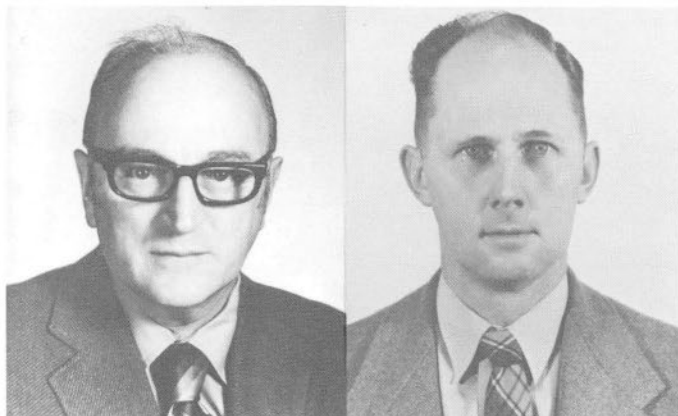


Victor Dolmage

W.E. Cockfield

The longest term as head of the office was served by W.E. Cockfield, from 1929 to his retirement in 1955. He was assisted at various times during the Thirties by A.H. Lang, by H.C. Gunning (still living in the Vancouver area), and by J.F. Walker (who resigned in 1934 to become provincial mineralogist and later Deputy Minister of the B.C. Department of Mines). Cockfield had no assistant geologist from 1939 until 1949 when J.E. Armstrong was transferred from Ottawa. For periods of a year or more during the 1950s other GSC personnel were attached to the office, including W. Brown, R.B. Campbell, J.G. Fyles, E. Hall, E.C. Halstead, S.L. Leaming, and J.A. Roddick. Halstead was with the groundwater section and earned a well-deserved reputation among well-drillers and developers for his expertise on the groundwater of the Fraser Valley both with the Survey and later with the Department of Environment. Leaming was the main link between the Survey and the growing multitude of "rock-hounds" and before he retired he was "Mr. Jade" to the jade industry in B.C. Cockfield was deeply involved during the last years of his tenure in the original planning for blowing up Ripple Rock in Discovery Passage, a hazard to navigation on the east side of Vancouver Island. He was succeeded in 1955 by J.E. Armstrong.

The Vancouver office has had other agencies sharing office space. From about 1939 to 1963 the B.C. Department of Mines was represented by two or three mining inspectors, a gold commissioner, and several support staff. Halstead's work was transferred to the Department of Environment but he remained associated with the office until his retirement in 1985. Federal Explosives Inspectors have shared office space with the Survey since 1945; presently D.I. Campbell heads a staff of three. Members of Legal Surveys (Surveys and Mapping Branch) shared GSC space at least twice, from 1959 to 1964 and from 1969 to about 1973.



John E. Armstrong

Heward W. Little

Armstrong's term as head of the office from 1955 to 1968 was a period of transition from the original information office to a Cordilleran Research facility. In addition to his office duties, Armstrong carried on his studies of the Pleistocene geology of the lower Fraser Valley and with E. Hall wrote the original reports on the Columbia River damsites.



John O. Wheeler

Hubert Gabrielse

During the 1960s all members of the Cordilleran Section were transferred to Vancouver including, A.J. Baer, S.L. Blusson, R.B. Campbell, H. Gabrielse, L.H. Green, W.W. Hutchison, H.W. Little, J.E. Muller, J.A. Roddick, J.G. Souther, H.W. Tipper and J.O. Wheeler. This group was headed by Little and initially this move was temporary, with Calgary as the intended ultimate destination. The group, however, became such an integral part of the Vancouver geological

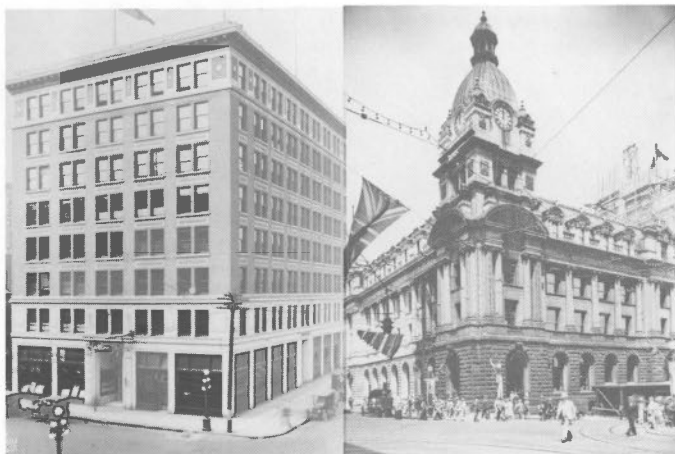
community that any intent to move them to Calgary was soon abandoned, reportedly in part a result of some pressure from the local private sector. The Cordilleran Section under Little remained separate from the information office under Armstrong but facilities and support staff were shared. In 1966 Little returned to Ottawa to become head of the Uranium Section and was succeeded by J.O. Wheeler. In 1968 Armstrong became Secretary-General of the 24th International Geological Congress, requiring his return to Ottawa. The two units, the Vancouver office and the Cordilleran Section, then were united under Wheeler, initiating the present Vancouver-centred Cordilleran Research facility.



Richard B. Campbell

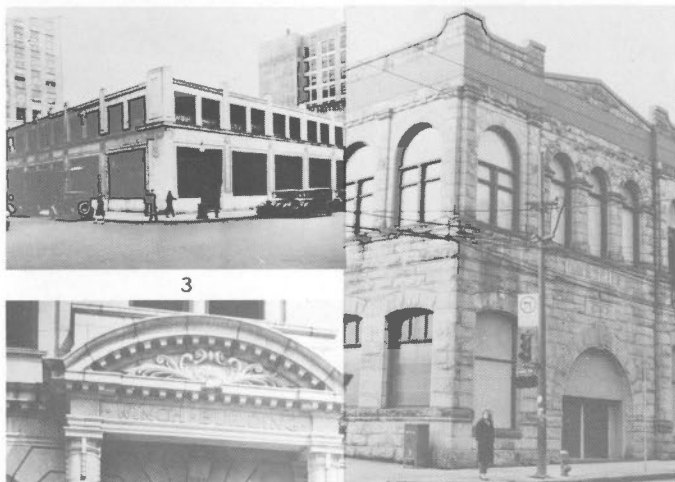
For fifty years, the Vancouver office seemed like an orphan searching for a home, although it has always been located centrally in the downtown Vancouver area near its principal clients. The office was opened in the Pacific Building on the southeast corner of Hastings and Howe in 1918 and remained there for seven years. From 1925 to 1949, the longest time in one place, the office was in the Federal Building, or the old Post Office now being refurbished as the James Sinclair Centre. From 1949 to 1951 the office was at 810 West Hastings in the Macauley Nicolls Maitland Building, from 1951-1954 at 300 West Pender in the Lyric Theatre, from 1954 to 1964 in the Winch Building at 739 West Hastings, and from 1964 to 1968 in the Customs Warehouse at 326 Howe Street. In 1968 the present location in the Sun Tower at 100 West Pender was occupied and gradually the office expanded to require most of the 5th, 6th, 7th, and 8th floors, part of the mezzanine and the basement. The present office is the largest space occupied in the history of the office and probably the most satisfactory. Rumours that arise from time to time of possible relocation or even a new building are greeted with a mixed reaction.

The period from 1966 to the present has been a time of change and growth. J.O. Wheeler headed the Vancouver Office and the Cordilleran Section from 1966 to 1970 when he returned to Ottawa to become a Division Chief and eventually Deputy Director-General. He returned to Vancouver and geology in 1979. H. Gabrielse followed Wheeler as head of the office from 1970 to 1979 when he also returned to full-time geological research. When the Vancouver-based section became the Cordilleran Division in 1979, R.B. Campbell became its first and present Director.



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1. Pacific Building, 1918-1925
(1923 photograph provided by Vancouver Public Library)
2. Federal Building (old Vancouver Post Office), 1925-1949
(1923 photograph provided by Vancouver City Archives)
3. Macauley Nicolls Maitland Building, 1949-1951
(1929 photograph provided by Vancouver Public Library)
4. Lyric Theatre, 1951-1954 (1986 photograph)
5. Winch Building 1954-1964
(1909 photograph provided by Vancouver City Archives)
6. Customs Warehouse 1964-1968
(ca 1913 photograph provided by Vancouver City Archives)

Also during this period, many changes have occurred and many services have been added. In 1971 a small marine geology section under D.L. Tiffin was formed and in 1978 was moved to Patricia Bay to occupy offices and laboratories in the new Institute of Ocean Sciences. Eventually this group numbering about 14 employees was allied with sections of the Earth Physics Branch to form the Pacific Geoscience Centre.

From time to time members of other Divisions have been assigned to the Vancouver office. At present J.J. Clague and L.E. Jackson of Terrain Sciences Division and K.M. Dawson of Economic Geology and Mineralogy Division are attached.

The Cordilleran Division in Vancouver under R.B. Campbell, Director, numbers about 29, augmented, at times, by several term employees. E.K. Wellar heads an effective administrative group, support staff, and sales office staff. The administrative group includes Pat Adams, Wendy Chiu, Mory Dong, Michael Force, and Bev Vanlier. The draftsman is Tonia Oliveric and Peter Krauss is the laboratory technician. Olga Langenhaun and Zedena Hajek are responsible for the sales office. Mary Akehurst, the librarian, with her assistant Wynne Horwath, has developed an extensive research library that is heavily used by the general public, consultants, and students, as well as the staff. The scientific staff (15) includes R.G. Anderson, C.J. Dodds, H. Gabrielse, S.P. Gordey, J.L. Luternauer, J.W.H. Monger, M.J. Orchard, J.A. Roddick, J.G. Souther, L. Struik, D.J. Tempelman-Kluit, R.I. Thompson, H.W. Tipper, J.O. Wheeler and G.J. Woodsworth. One post-doctorate fellow, Carol Evenchick, is presently in the office.



E.K. Wellar,
Administrative Officer

Mary Akehurst,
Librarian

The interests of the scientists in Vancouver are varied and the expertise of the group extends into many facets of earth sciences. With the amalgamation of the Geological Survey and the Earth Physics Branch, a new Cordilleran Division will be greatly enlarged and its field of interest diversified. This raises many new questions and offers new possibilities for the future. We expect that the next few years will be an exciting time that will see many changes.

R.B. Campbell, J.A. Roddick and H.W. Tipper

STAFF NEWS

ATLANTIC GEOSCIENCE CENTRE

Mike Keen, AGC's Director, has exchanged east coast fogs for west coast rains by moving to PGC for a year, July to July. The ploy — to compile and edit the Geology of Canada east coast volume. Contributions to the volume from AGC and other eastern authors are winging westward to reward him for his cryptic, cross-continent messages "Drop everything else — only your contribution counts."

Actually Mike's been gone from AGC since mid-May when he was seconded to the Neilsen task force in Ottawa.

In Mike's absence Dave Ross is acting as AGC's Director.

To reward AGC for their emissary to the west the Cordilleran Division sent a missionary of their own to the mysterious east. Dirk Tempelman-Kluit moved to AGC for a winter of poor skiing. He will learn who and what make AGC tick and is being "beaurocratized" while acting as Assistant Director.

Sebastian Bell, who joined the GSC in 1983 after a dozen years in the oil industry in Calgary, became head of the Eastern Petroleum Geology Subdivision last April. He replaces Graham Williams, who after 6 years as head, returned "to the bench". Graham is also Mike Keen's contact-in-residence for Geology of Canada contributions, a chore that will keep him from full time palynological research, his role of choice, for some time yet.



Cynthia Moors

Carmelita Fisher

Cynthia Moors comes to Environmental Marine Geology as the new subdivision secretary to replace Carmelita Fisher — Carmelita meanwhile has become secretary to Regional Reconnaissance. Cynthia, an Ottawan, worked with CEIC there before moving to Halifax after her recent marriage. Cynthia is helped by Nicky Gray, also new to EMG, but a Nova Scotian. We welcome them both.

Glenn Stockmal, a Manitoban, joined the Regional Reconnaissance Subdivision this year as research scientist in a new position. He comes with a Ph.D. from Brown University. Glenn's interest in deep crustal structure and continental margin evolution complements AGC's involvement in this field, and his experience in onshore Appalachian geology will broaden AGC's expertise. He will assume a lead role in Lithoprobe East interpretations and modelling.



Glenn Stockmal

Brett Mudford

Brett Mudford, a New Zealander with a Ph.D. in fluid dynamics from Oxford, joined the Regional Reconnaissance Subdivision as a postdoctoral fellow. Brett's background gives him skills and expertise in using supercomputers. The many variables to be considered in sophisticated crustal structural modelling require someone with his talents, and we are happy to have him here for the next two years.

Nellie Koziel, a long time Nova Scotia resident and an AGC term employee for about a year, is Eastern Petroleum Geology's new secretary. She replaces Carol Mitchell, who retired last year.



Nellie Koziel

Harold Christian



Dale Buckley

Harold Christian, a Haligonian with a new Masters of Applied Science from the University of Alberta joined AGC this year to help Kate Moran set up our geotechnical laboratory. When complete the lab will provide in situ strength of materials data beyond that obtainable by traditional methods, which is critical to offshore development.

Dale Buckley, one of the Environmental Marine Geology Subdivision's geochemists who is interested in deep sea sediment geochemistry and radioactive waste disposal, was recently recognized for twenty five years of service to GSC by Ray Price.

Reg Gilbert, one of the initial appointees to BIO in late 1961 when the institute was set up, retired at the new year. At the AGC Christmas Party he was presented with a plaque to commemorate his service to AGC. Originally a marine geophysicist with the Earth Physics Branch interested in gravity measurement at sea, Reg became the driving force for AGC's initial instrument buildup. Later he served BIO as director of Institute Facilities, making sure such things as the library, computing facilities and ship use ran effectively. We wish Reg well in his new endeavour, private practice in Dartmouth.

Dirk Tempelman-Kluit

CORDILLERAN GEOLOGY DIVISION

In April 1985 Margaret Meeres joined the permanent staff as an accounts clerk at Pacific Geoscience Centre, Sidney, B.C.

J.E. Reesor, completing a long career in Cordilleran Geology, retired in June 1985. Upon completing a term as a Division Director Dr. Reesor returned to field geology in British Columbia, completed revision mapping of the Nelson (E1/2) map area and is currently writing a final report. He can be found on the first floor, 601 Booth Street, Ottawa.

Patrick McLaren, following a leave-of-absence, elected to resign from GSC in September 1985 and is now establishing a consulting practice in England.



John Fyles and Gary Yeo
Looking for refolded folds (believe it or not)
in Stellarton Basin, Nova Scotia

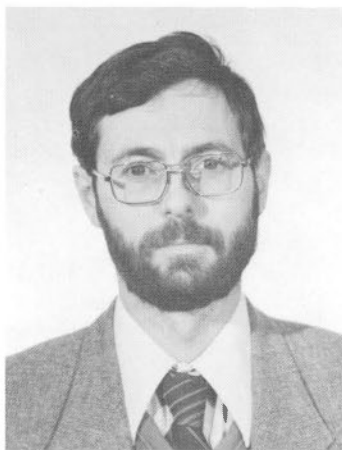
ECONOMIC GEOLOGY AND MINERALOGY DIVISION

Three research scientists have been recruited to co-ordinate the Division's activities in Mineral Development agreements in the Atlantic Provinces, and also to undertake specific project studies under the agreements. They are in the Regional Metallogenic Studies Section.

Tyson C. Birkett joined the division in June 1984, following previous employment with Iron Ore Company of Canada where he was involved in mineralogical studies related to iron mining and processing, and evaluation of base metal and strategic metal deposits. Prior to that he was a project geologist with Shell Canada Resources Ltd., conducting base metal exploration programs in the Superior, Grenville and Appalachian provinces. Tyson was born in Niagara Falls, Ontario, and obtained B.Sc. and M.Sc. degrees from Queen's (1973, 1974). He received his D.Sc.A. from Ecole Polytechnique de Montréal in 1982 on metamorphosed rocks north and west of Thetford Mines, Quebec. Tyson is a member of GAC, MAC, Ordre des Ingénieurs du Québec and is currently a Councillor and Chairman of the Committee on Mineral Resources Research, CIM Geology Division. He co-ordinates EGM activities in the Newfoundland MDA, and is carrying out resource assessment studies in western Labrador.



John Reesor



Tyson Birkett



Al Sangster



Gordon Watson

Alan L. Sangster joined in July 1985 to undertake project studies on the metallogeny of granitic and adjacent metasedimentary and metavolcanic terranes in the Cape Breton, Antigonish and Cobequid highlands of northern Nova Scotia under the Canada-Nova Scotia Mineral Development Agreement, and to co-ordinate the Division's other projects under the MDA. Al's credentials for this work include 4 years as Assistant Chief Geologist and Chief Geologist at the Aguila (Pb-Zn-Ag) Mine in Argentina, and more than 16 years in exploration, particularly in the Grenville and Appalachian provinces. He obtained B.A. (1962) and B.Sc. (1964) degrees from the University of Western Ontario, and an M.Sc. from Carleton in 1967. His Ph.D. (Queen's, 1970) was for his study of base metal, gold and iron deposits in the Grenville Province of southern Ontario.

Gordon P. Watson is co-ordinator for the New Brunswick MDA and is conducting a regional metallogenic study of Silurian and Devonian rocks of the Chaleur Bay belt, as an MDA project. Gordon came to the Division in July, 1985 from University of New Brunswick, where he was an Assistant Professor. Born in Montreal, Gordon graduated from University of Waterloo (Hons B.Sc., 1977) and received his M.Sc. from UNB (1981). His

Ph.D. (University of Western Ontario, 1984) was on ore types and fluid regimes at Macassa Gold Mine, Kirkland Lake.

H. Scott Swinden joined the Regional Metallogeny Section of the division in April, 1985. Scott, originally from Truro, Nova Scotia, completed his B.Sc. Honours degree in Geology at Dalhousie University in 1970, and his M.Sc. at Memorial University of Newfoundland in 1976. Scott brings to the division his experience in mineral exploration in the Appalachian and Superior geological provinces as well as the Northwest Territories, Yukon Territory and western United States. Scott has spent the last several years working for the Newfoundland Department of Mines and Energy engaged in mapping and mineral deposit and metallogenic studies. He is a student at Memorial University and is nearing the completion of his Ph.D. program concerning the geochemistry, and isotopic geology of Ordovician volcanic rocks in central and southern Newfoundland. Scott is an active member of CIMM, a Fellow of the GAC and a director of the Mineral Deposits Division of the GAC. Scott's immediate duties with the GSC involve metallogenic studies of the central mobile belt of Newfoundland.

D.F. Garson and C.R. McLeod

RETIREMENT OF MRS. J.E. CLEMMER

Jane Clemmer retired from the Division Office of the Economic Geology and Mineralogy Division in December, 1985, after 23 years in the Public Service, 12 of which were spent at the Geological Survey. Mrs. Clemmer came to the Central Laboratories and Administrative Services Division in 1975, from Environment Canada, and in her quiet and no-nonsense fashion managed the Division office through one name change to its final merger with EG&M in 1985.

GEOLOGICAL INFORMATION DIVISION

Gilles Lemieux was the successful candidate for the vacant Chief Photographer position created by John Kempt's retirement in 1985.

Rachel Clairoux recently joined the Photomechanical Unit, coming from Surveys and Mapping Branch.

Mario Methot and Martina Wecke have joined the staff of Cartography Units A and B respectively. Mario comes from the Surveys and Mapping Branch and Martina from Kenting Earth Sciences.

INSTITUTE OF SEDIMENTARY AND PETROLEUM GEOLOGY, CALGARY

In November, Edward Hau began working in the ISPG library. Before assuming his responsibilities at the Institute, Edward had been librarian at Agriculture Canada's Beaverlodge Research station, west of Grand Prairie, and at Microtel, a subsidiary of B.C. Tel. Edward received a B.Sc. in Agriculture before continuing his studies at the University of British Columbia in Library Sciences.

Maureen Smith began work as biostratigraphic technician in the Institute's Conodont Laboratory and assistant to Allan Pedder in October 1985. She obtained her B.Sc. in biology from Guelph University in 1978 and worked for Agriculture Canada in Calgary as a biologist.



Edward Hau



Maureen Smith



Sneh Achal

Sneh Achal recently graduated from the chemical technology program offered at the Southern Alberta Institute of Technology. Since October, Sneh has been employed in the organic geochemistry laboratory of the Institute. She replaces Mike Ferguson, who left the Institute to work in the geochemistry lab of Canterra Energy Limited. Mary Kowalsky became administrative support clerk in the Administration section in August 1985. Joan Moore transferred from the Calgary office of Parks Canada, where she was a revenue accounting clerk, to the Accounts office of the ISPG in December 1985. Receptionist and secretary, Cathy Brennan, left the Institute to work for a Calgary-based geological consulting firm in November. She was replaced by Sandy Young. Storesman Massino Novati transferred from the Calgary airport office of Transport Canada to become Willie Williams' righthand man.

DON NORRIS RETIRES

On 20 December 1985, a tea was held in honour of Don Norris. The tea, attended by over 100 people, was organized by Carol Boonstra and a legion of helpful ISPG staff. Amid the commotion of the celebration, Norris was presented with a cradle mount that had been specially constructed for his 8" telescope. He was also presented with a medallion and a certificate signed by the Prime Minister in recognition of his 35 years service as a public servant. On this occasion, as well as at a dinner held at the Calgary Winter Club in his honour, well wishers were to learn about Norris's lifelong interests in geology and astronomy.

In 1947 Norris graduated from the University of Toronto with an honours degree in geology; by 1949 he had obtained a Masters degree in astronomy from that institution. He then went on to study geology at California's Cal Tech, conveniently located near the Palomar Observatory. After completing his doctoral thesis, a structural study of coal measures of southwestern Alberta and southeastern British Columbia, Norris was hired by the Survey. Over the years this coal geologist was to participate in several significant regional mapping projects and to shape the administration of coal research at the ISPG. In 1953, when he joined the Survey, he was engaged in regional mapping of the Blairmore area. He went on to participate in Operation Mackenzie (1957-61) and to lead Operation Porcupine. After being head of the Coal Subdivision for 9 years (1976-85), Norris stepped down in February 1985 in order to concentrate on wrapping up his research projects.



Mary Kowalsky



Massino Novati

Clastic sedimentologist/stratigrapher Dale Leckie began work as a Research Scientist in the Regional Geology Subdivision in October. Dale received his doctorate in Geology from McMaster in 1983. His thesis was a field outcrop and subsurface investigation of Lower Cretaceous clastic beds of the Moosebar and Gates formations. Dale also received a Masters degree from McMaster in 1979. His Masters thesis concerned late Quaternary history of the Hermitage Bay area of Newfoundland. Prior to joining the Survey, Dale was employed by Petro-Canada for three years. He is currently studying outcrop and subsurface clastic beds of the Lower Cretaceous in Western Canada.



Don Norris

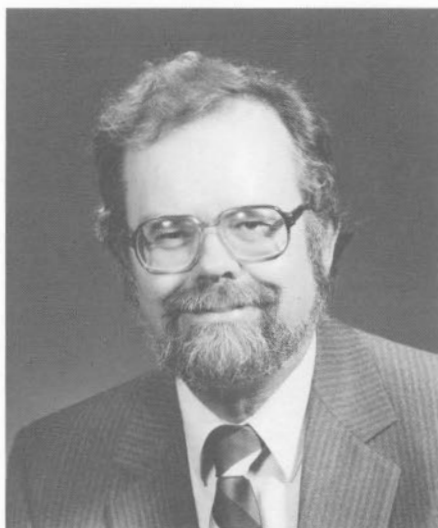
A winner of the Douglas Medal in 1985 and the CSPG's Medal of Merit (in 1974), Norris has received recognition for his regional studies and his contribution to Canada's Coal Inventory. Don was a good-natured and enthusiastic participant/contributor to staff field trips. His helpfulness and kindness will be remembered by students and staff alike.

As the Institute's Director, Walter Nassichuk emphasized at Norris's retirement lunch, Don will be focusing his attention from his "fast" (f 3.4) 8" telescope in Kelowna, on the identification of as yet undiscovered comets.

Lynn Machan-Gorham

ROGER MACQUEEN, SCIENCE MANAGER

The Petroleum Geology Subdivision of the ISPG has acquired a new head. Scientist and former professor Roger Macqueen accepted the position of Science Manager of the Petroleum Geology group in August 1985. Macqueen's association with the GSC spans a period of 28 years. It began in 1958 when he worked as senior assistant under E.W. Mountjoy mapping the surface geology and studying the stratigraphy of the Miette map area near Jasper, Alberta. Before completing his Ph.D. in geology at Princeton, he spent several years working for industry and geological consultants. In 1965, after earning his doctorate, Macqueen became a GSC research scientist and for the next 11 years was involved in sedimentological, stratigraphic, mineralogical and geochemical studies, except during the 1971-72 academic year when he taught at Erindale College, University of Toronto. In 1976 he left the GSC to become Associate Professor of Earth Sciences at the University of Waterloo. He returned to the Survey to spend his sabbatical year (1982-83) at the ISPG. Although actively engaged in teaching and in research, Macqueen also participated as director and committee member of numerous scientific societies and associations, including being president of the GAC during 1977 and 1978. He prepared an oil and gas forum, held in Calgary in February 1986, which gave Survey scientists the opportunity to present their research, in talks and poster sessions, to industry geologists.



Roger Macqueen

OTTAWA PALEONTOLOGY SECTION

The section has been joined by two Visiting Post-Doctoral Fellows. Jim Haggart arrived in November 1984 and is presently on the second year of his fellowship. Jim obtained his Bachelor's degree from the University of Arizona and completed both his M.Sc. and Ph.D. programs at the University of California at Davis. His doctoral thesis was concerned with Upper Cretaceous ammonites from northern California and their stratigraphic implications. His research interest continues to be in Cretaceous fossils and he spent last summer in pursuit of them on the Queen Charlotte Islands.

Alexander McCracken joined the section in October 1985. "Sandy" obtained his B.Sc. from the University of Western Ontario, his M.Sc. from the University of Waterloo and returned to Western for his Ph.D. which he completed in October. His research interests include Lower Paleozoic conodonts and stratigraphy which he has studied on Anticosti Island, the Arctic Islands and northern Yukon. Sandy will be working on conodonts from Melville and Ellesmere islands as well as on a new project dealing with geochemistry of conodonts and strata around the Ordovician-Silurian boundary.

Godfrey Nowlan has replaced Tim Tozer as section head, effective November 1985.

M.J. Copeland

PRECAMBRIAN GEOLOGY DIVISION

Janet King (in private life Mrs. Marc St-Onge) has joined the Bear-Slave section as a Research Scientist. Born in North Bay and raised in southern Ontario, Janet received her B.Sc. from the University of Toronto and her M.Sc. and Ph.D. from Queen's. Three summers of field work in the internal zone of Wopmay orogen formed the basis of her dissertation. Following her defence, she was hired by the Survey in the morning of June 5, 1985 and that same afternoon was on a plane to Yellowknife to begin another field season.



Janet E. King

Cees van Staal

Cees van Staal holds an appointment in the ERDA program. Cees (pronounced "case") was born in Amsterdam and took his undergraduate and "doktoraal" degrees at the Free University of Amsterdam. His thesis dealt with the metamorphism and structure of a mantled gneiss dome in southwest Finland. In 1980, Cees came to Canada to begin structural and metamorphic studies of the Bathurst mining camp for a Ph.D. at the University of New Brunswick. After the award of his degree early in 1985, he joined the Survey, where he is continuing work on the Bathurst area. For relaxation, Cees, along with Gary Yeo (with whom he shares an office) and two others, sailed his 10 m long sloop from Portugal to Bermuda - in February!

Thomas Frisch

RESOURCE GEOPHYSICS AND GEOCHEMISTRY DIVISION

Colin Dunn left the frozen Prairies and arrived in Ottawa amidst the Christmas festivities to assume a research scientist position with the Resource Geochemistry Subdivision. His R & D efforts will be focused on the development and application of biogeochemical methods to the exploration for mineral resources. In 1965, after several years with an engineering company in England attending to legal, economic and business administration matters, Colin's career changed direction to the halcyon world of geology. He obtained his B.Sc. in geology in 1968 and a Ph.D. in geology/geochemistry from London University in 1972. He came to Canada with his wife in spring 1972 to accept a position with the Saskatchewan Geological Survey. Colin worked on sedimentological and stratigraphic problems before returning to geochemical studies during the uranium boom of the mid-seventies. In recent years, he conducted extensive biogeochemical research studies and surveys for uranium and gold while employed as a senior geologist with the Saskatchewan Survey.

Dr. Chang Park joined the Geochemistry Laboratories Section of the Resource Geochemistry Subdivision on a Visiting Fellowship in October. Chang recently received his doctorate from the University of Toronto, Aerospace Institute, where he studied the instrumental design of an inductively-coupled plasma mass spectrometer (ICP-MS). At the GSC, Chang will continue development and application of his thesis subject, electrothermal vapourization coupled to the ICP-MS or the "Elan" as it is now known by its commercial manufacturer, Sciex, Ontario.

Robert Phillips, a term employee, joined the analytical staff in the Geochemistry Laboratories Section of the Resource Geochemistry Subdivision on December 3, 1985. Bob comes to us from the University of Ottawa where he graduated last spring with a B.Sc. (Hons.) in Geology.

Peter Morden, a CO-OP from Fanshawe College in London, Ont., joined the Resource Geochemistry Subdivision in September for his first four-month work experience. He has assisted in the collection and drying, preparation and bottling of two international reference till samples.

Stephen Cook, an Honours graduate in geology has been hired for four months to re-organize the Subdivision archived samples. During four previous summers, Stephen acquired experience in base metal exploration and uranium exploration with a number of companies in Canada.

Karyne Besso joined the Resource Geochemistry Subdivision on a 6 month term to assist in the study of massive sulphide cores from the Juan de Fuca ridge as well as with ongoing geochemical studies in the Yukon. Karyne obtained her B.Sc. in geology from Concordia University in 1977 and is completing her M.Sc. in geology from the University of Saskatchewan. Her past employment included: mineral exploration in northern Quebec, Saskatchewan and the N.W.T.; two years as a research scientist at the Saskatchewan Research Council and a year and a half at the Petro-Canada Research Laboratory.

Catherine McCann, an Ottawa Valley native, joined the Resource Geochemistry Subdivision over the winter to provide computer services to scientists. She is a familiar face at 601 Booth, having worked for a number of terms at the GSC since 1973. Most recently, she worked as a programmer/analyst, managing a data base for the Nuclear Waste Management Program at AECL. Catherine has a B.Sc. in mathematics (minor, geology) from Carleton University.

Johannes Hill joined the Resource Geochemistry Subdivision for the winter to assist staff geochemists on their projects through literature searches, data compilation and plotting information. Johannes graduated from Queen's in 1975 with a B.Sc. in geology, and in 1985 with an M.Sc. in mineral exploration. He has several years of exploration experience in North America while employed with Canadian Occidental Petroleum and self employed as a consultant.

Jean-François Bourillet, an exchange scientist from France, joined the Radiation Geophysics Section of RGG for 14 months in November 1984. He worked on problems associated with compilation of multiple airborne gamma-ray spectrometry surveys into composite maps and his background in mathematics, statistics and geophysics enabled him to develop several important programs. In January 1986, he returned home to continue his work in marine geophysics at L'Institut Français pour la Recherche et Exploitation en Mer, Brest, France. Among his first duties on his return to France will be a trip to Tahiti to join a Trans-Pacific cruise ending at Mazatlan.

Derek C. Gresham of RGG resigned his position as a geophysicist on November 30, 1985, to join Paterson, Grant & Watson Ltd. of Toronto, as a software specialist. Derek was responsible for processing all electro-magnetic field data collected by the surface E.M. group of the Borehole Geophysics Section. He was also involved in writing software for two microcomputer systems.

TERRAIN SCIENCES DIVISION

Michel Lamothe (B.Sc., Université de Montréal, 1974; M.Sc., Université du Québec à Montréal, 1977; Ph.D. University of Western Ontario, 1985) joined the division in June 1985 to lead the till geochemistry project under the Canada-New Brunswick Mineral Development Agreement. In the past, he devoted most of his time to research and teaching at Université du Québec à Montréal, Concordia University and Université du Québec à Rimouski, and spent two years in West Africa working for the Canadian International Development Agency. Besides glacial geology and drift prospecting, his main scientific interests are Pleistocene stratigraphy and thermoluminescence geochronology.



Michel Lamothe

Helen Dumych

of GENERAL INTEREST

News from AGC

Charley Schafer, of Environmental Marine Geology subdivision is going to China in January for a month as part of a research team to study sedimentation patterns at two proposed port development sites on Hainan Island. The work will be done jointly with colleagues from Nanjing and is sponsored by the Canadian International Development and Research Centre.

Fred Nurk, one of our technicians, recently cycled across the Rockies towing his dog Patsie behind him in a small trailer. The trip from Toronto to Vancouver took seventeen weeks.

Felix Gradstein of AGC and Frits Agterberg's collaborative book titled "Quantitative Stratigraphy", solicited by UNESCO as part of IGCP's final report, was recently published by the Reidel Publishing company. In his review Digby McLaren hailed it as "A major advance in the science of stratigraphy." The book is selling well and a soft cover edition is available from UNESCO.

In 1986 a party consisting of among others Felix Gradstein (AGC) and F.P. Agterberg (EGM) will continue investigating the Jurassic formations of western Portugal. The focus is on microfossil distribution in subsurface sediments and their uses for correlation, on blooms of planktonic Foraminifera in Kimmeridgian dark shale and sand and on Jurassic nanofossil taxonomy.

Frank Thomas, micropaleontology technician at AGC, recently defended his Master's thesis at Dalhousie.

Dirk Tempelman-Kluit

UNDERWATER MINING WORKSHOP

An annual gathering of scientists interested in offshore mining was held at Halifax this fall, the first time the meeting has been held outside the USA in its 20 years existence. AGC personnel made up the local organizing committee. The three days of meetings and field trips highlighted the potential for Canadian offshore mining.

CORE

In October several AGC scientists participated in CORE (Canadian Offshore Resources Exposition), held annually in Halifax. Bob Howie, who has coordinated AGC's displays for several years considers that the show advertises our expertise to oil and gas industry personnel and that the effort pays off in contacts gained. Gordon Fader's new open file map of the surficial geology of the Hibernia field figured prominently in the display.

14TH ARCTIC WORKSHOP

AGC hosted the 14th and largest ever, Arctic workshop in early November. The theme was "Arctic land-sea interaction". Most past workshops have been held at the Institute of Arctic and Alpine Research in Boulder, Colorado, and this change in venue emphasizes the importance of marine science to Arctic research. Gus Vilks, Jim Syvitski, Iris Hardy and Bob Taylor, of AGC's Environmental Marine Geology Subdivision organized the meeting and field trips.

BIO HUNTSMAN AWARD

At an all-BIO ceremony in mid-November Wally Broecker, Newberry Professor of Geology at Lamont-Doherty Geological Observatory of Columbia University, was awarded the 1985 Huntsman Award. Wally's geochemical studies and insights have had a profound impact on our understanding of past, present and future oceans.

The Huntsman Award, first given in 1980, was established by BIO to recognize excellence in marine research. It is named after A.G. Huntsman, a Canadian, who was himself a marine sciences pioneer, chiefly noted for his work on Atlantic salmon.

SNAKE PIT HYDROTHERMAL AREA

During Leg 106 of the Ocean Drilling Project scientists aboard the SEDCO/BP 471 discovered an active vent field with up to 10 m high sulphide chimneys in the Kane Fracture Zone of the mid-Atlantic Ridge. This area was recently surveyed by CSS Hudson. Bare rock drilling recovered 6 m of sulphides overlying fresh basalt.

GSC GOLD WORKING GROUP

The GSC Gold Working Group presented a two day session, 19-20 September, on descriptions of Canadian gold deposits and techniques used in studying them to a delegation from the People's Republic of China. The mission, which comprised five geologists, also attended the "Gold in the Western Shield" CIM Symposium in Saskatoon, and visited gold deposits in the Northwest Territories, Hemlo, and the Timmins-Val D'Or area. The interpreter for the delegation, Mr. Wan Liangguo, spent two years with Economic Geology Division as a Visiting Scientist.

NEW QUARTERS

Thane Anderson and Sigrid Federovich of the Paleocology and Geochronology Section, Terrain Sciences Division, have finally moved into newly constructed laboratories on the fifth floor of 601 Booth Street, where they join John Matthews. The Radiocarbon Dating Laboratory has also been renovated, so that Roger McNeely, Ian Robertson, and Alice Telka have a much brighter and more efficient lab in which to carry out chemical pretreatment and conversion of samples to CO₂.

TERRAIN SCIENCES DIVISION — INVITED LECTURERS

Steve Evans spent 2 weeks (Nov.-Dec. 85) in Edmonton as an invited lecturer at the Department of Civil Engineering, University of Alberta. Steve lectured on landslides in the Canadian Cordillera.

David Harry lectured on the role of ground ice in Arctic geomorphology and on landscape evolution in northern Canada at the Department of Geography, University of Western Ontario in November.

CANADIAN NATIONAL COMMITTEE FOR THE INTERNATIONAL PERMAFROST ASSOCIATION

In GEOGRAM #20, December 1983 I reported the founding of the International Permafrost Association (IPA) and in particular the role played by Canada in the formation of the IPA. During 1985, the adhering body for Canada was formed — the Canadian National Committee for the IPA (CNC-IPA). This is the 45th such committee formed by the National Research Council of Canada.

This newest CNC had its first meeting in Edmonton on 19 November 1985. The chairman is H.M. French, University of Ottawa, and I was elected secretary. The other members comprise J.I. Clarke, C-CORE; G.H. Johnston, DBR/NRC; N. Kalmanovitch, Dome Petroleum; B. Ladanyi,

1984 GEOLOGICAL WIVES' ASSOCIATION AWARD

Jennifer Gordon, daughter of Terence Gordon was awarded the annual Award of the Geological Wives' Association.

The award is based on academic standing, extracurricular and community activities, interests, general aim and accomplishments.

Jennifer, graduated from Hillcrest High School, is a recipient of an Ontario Scholarship and the George and Elizabeth Rutherford Admission Scholarship. She has started her studies at Victoria University, Toronto, in the Faculty of Arts and Science. Jennifer hopes to achieve entrance into Medical School.

TERRAIN SCIENCES DIVISION LECTURE SERIES ON SEDIMENTOLOGY

The second and third Terrain Sciences Division lectures on sedimentology were given this fall. The short courses provide a 'state-of-the-art' review of various aspects of sedimentology and present staff with the opportunity of upgrading their skills. The lecturers are recognized leaders in their fields.

In the second lecture R. Gilbert (Queen's University) described the processes and deposits associated with sedimentation in glaciomarine and glaciolacustrine environments, progressing from basic physical processes through sediment transport and deposition to facies models. During workshop sessions material was presented by Terrain Sciences Division staff and others on Champlain Sea sediments, Precambrian glaciomarine deposits, and glaciolacustrine sequences from Lake Erie Basin and Lake Agassiz.

In the third lecture M. Church (U.B.C.) dealt with fluvial sedimentation. This course covered four major topics (1) sediment transport, sedimentation and river channel patterns, (2) alluvial facies and facies models, (3) paleohydraulics and paleohydrology, and (4) the sediment cascade in the drainage basin.

P.A. Egginton and F.M. Nixon

Ecole Polytechnique, Montreal; K.L. MacInnes, DIAND, Yellowknife; J.R. Mackay (ex officio, as Secretary-General, IPA); J.C. McDougall, Esso; and F. Tordon, Terratech, Montreal.

Prof. French and I attended an open meeting of the Executive Committee of the IPA in Oslo, Norway, in September 1985. A major topic of discussion at that meeting was the preliminary plans for the Fifth International Conference on Permafrost to be held in Trondheim, Norway, in August 1988.

Further details on CNC-IPA and the next International Permafrost Conference can be obtained from me.

J.A. Heginbottom

AEROMAGNETIC SURVEY OF THE CONTINENTAL SHELF EAST OF NEWFOUNDLAND

The most complex and largest offshore aeromagnetic survey to date, totaling 128 000 line kilometres, was carried out last summer over the East Newfoundland Shelf and Orphan Knoll for a group of Calgary-based oil companies headed by Chevron Canada Resources Ltd. and GSC. The survey contract had been awarded to the consortium of Geotrex Ltd. and Kenting Earth Sciences Ltd., both of Ottawa. Two four-engined DC-4 aircraft were supplied by Millardair of Toronto. The navigation package was subcontracted to Nortech Surveys Inc. of Calgary. The latest technology enabled this company to integrate by digital process the LORAN-C navigation with the Global Positioning System (GPS) and achieve an absolute positioning accuracy well within 50 m over the survey area. As not all satellites have been placed in orbit yet, the GPS was only fully operational during the night. Both aircraft would therefore take off during late afternoon and fly survey over the Atlantic Ocean at an altitude of 305 m, returning to base some 14 hours later. Prevalent weather conditions in the survey area caused the aircraft to fly through cloud almost continually.

As Technical Inspector I participated in many survey flights and was much aware of the high degree of professionalism displayed by the crews. Also evident was the strain from flying long monotonous hours in darkness with no margin for error.

The high-sensitivity aeromagnetic data for the western part of the survey area will initially be compiled into total field maps at 1:100 000 scale and will be completed during the present fiscal year. The oil companies will exercise their contractual right to treat the maps as privileged information for five years, after which the GSC will publish the maps at scales of 1:125 000 and/or 1:250 000. The eastern half or 'Outer Area' is covered by profiles spaced 30 km apart. These profiles will be presented in stacked form at scales of 1:1 000 000 and 1:2 000 000 and will be available for viewing in spring 1986.

The present timetable for 24 hour satellite windows worldwide lists 1989 as the target date. This coverage combined with the next generation of satellite receivers should reduce navigational errors to mere metres and be economically viable for any type of airborne survey.

Wim Knappers (RGG)



Millardair DC-4

GEOCHEMISTRY OF MARINE HUMIC COMPOUNDS

The publication of a book by a staff member is always cause for celebration at the Bedford Institute of Oceanography. Recently, an informal get-together was held to toast Mohammed Rashid — a longtime employee with the Atlantic Geoscience Centre at BIO — as he presented a complimentary copy of his new book to our head of Library Services, Elizabeth Sutherland. This book is special for several reasons: it is one of the first reviews of the complex geochemistry of marine humic compounds and its completion was achieved under trying circumstances. Dr. Rashid suffered from a cardio-vascular condition through much of the work of writing the manuscript and in fact submitted to open-heart surgery only days after final completion of the text. The book is titled "Geochemistry of Marine Humic Compounds" and is available from Springer-Verlag, New York.



Elizabeth Sutherland and Mohammed Rashid

Michael Latremouille

CONGRATULATIONS TO ISPG GEOLOGISTS AND CARTOGRAPHERS

Lachie Maclachlan, Tom Uyeno, Brian Norford, Dick Procter, Gordon Taylor, Bill Vermette and John Thomson have completed 25 years of public service.

While completing graduate work in stratigraphy and paleontology at Yale University in 1956, one of Brian Norford's first jobs with the Survey was as a summer assistant to Fred Roots, a geologist who, at that time, was in charge of a field party preparing maps of Watson Lake, part of Operation Stikine. In 1960, Brian was hired on a permanent basis as a research scientist. In 1967, he moved to Calgary and became Section Head of Paleontology at the ISPG. In addition to his duties as research scientist at the Institute, Brian is Chairman of the International Working Group on the Cambrian-Ordovician Boundary, Foreign Secretary and Board Member of the Canadian Geoscience Council, and Chancellor of the University of Calgary.

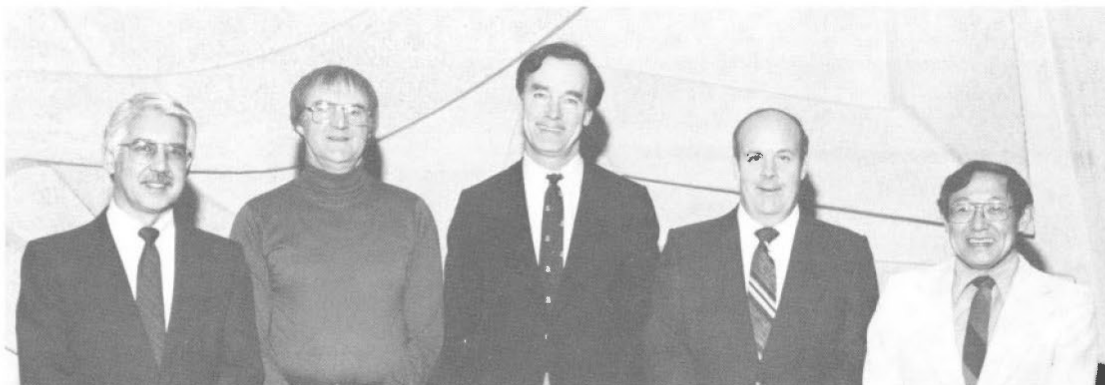
Tom Uyeno first worked for the Survey as a technical assistant under Digby McLaren in the Ottawa office, where he sorted and catalogued

brachiopods in 1959. A Bachelor of Science graduate of the University of Western Ontario, Tom was hired by the Survey on a permanent basis in 1960. By 1966, he had earned his Ph.D. in geology from the University of Iowa. A conodont specialist, he came to work as a research scientist in the Calgary office in October 1970.

Cartographer Lachie Maclachlan was educated in Edinburgh, Scotland. He joined the Survey in Ottawa in August 1959 and has been Chief of the GSC Cartographic Unit in Calgary since March 1962.

Cartographic Supervisor, Bill Vermette, joined the Survey in Ottawa in September 1958, after having completed a drafting program at the Manitoba Institute of Technology. He was transferred to the Calgary office in 1969.

Cartographic Supervisor, John Thomson, joined Lachie and Bill in March 1967. John's first drafting position began in November 1958 in Ottawa, following completion of a technical program in Winnipeg.



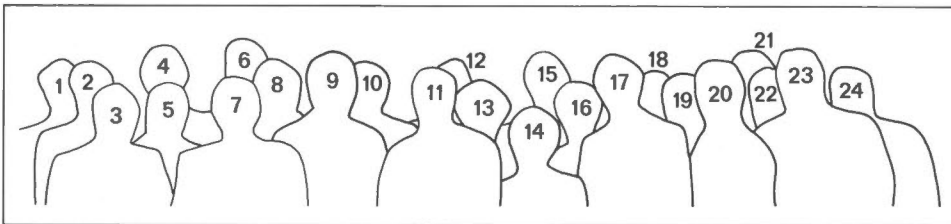
Bill Vermette, Lachie Maclachlan, Brian Norford, John Thomson, and Tom Uyeno.



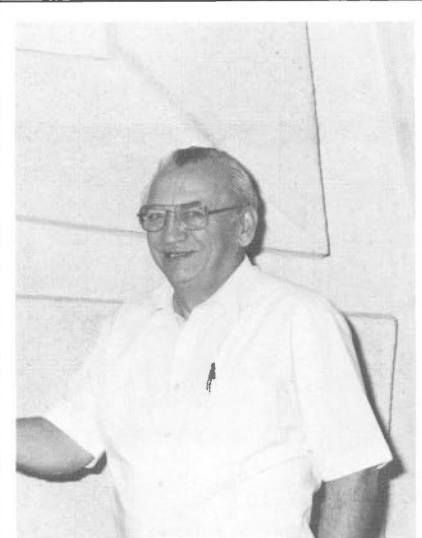
Gordon Taylor

Gordon Taylor participated as an assistant in several GSC mapping projects in Nova Scotia from 1952 to 1954. In December 1959, Gordon joined the Survey in Ottawa after earning his Ph.D. in geology from Princeton University. His thesis, based on four years mapping in Venezuela, discussed metamorphic petrology and ultramafic intrusions. This research scientist was transferred to the Western Canada office in 1964. He is presently Senior Petroleum Geologist in the Petroleum Resource Appraisal Secretariat, having previously served as Head, Regional Geology Subdivision from 1973 to 1980.

As early as the summer of 1949, Dick Procter was participating in GSC field parties. That year he assisted Dr. Kalliokoski in the detailed mapping of a section of Precambrian rocks in northern Manitoba, where most of the traverses were carried out by canoe. Throughout his student years, he worked summers for the GSC. He also gained industry experience and earned a Ph.D. in clay mineralogy from the University of Kansas before joining the western office as a research scientist in January 1960. At present, he is Executive Director of the Petroleum Resource Appraisal Secretariat.



The Director General and Directors with Ottawa recipients of the 25 year public service award: 1-Ken Currie; 2-Roger Gariépy; 3-Kolman Bencik; 4-Yvon Claude; 5-Garry Freda; 6-Hugh Bostock; 7-John McGlynn; 8-Ron Emslie; 9-Ray Price; 10-Dave Benson; 11-Ray Rozon; 12-Chris Durham; 13-Willy Dyck; 14-Jocelyn Watson; 15-Arthur Darnley; 16-André Dicaire; 17-Ron Delabio; 18-Bob Blackadar; 19-Ron Kelly; 20-Richard Potvin; 21-John Fyles; 22-George Plant; 23-"J.P." Corriveau; 24-John Maxwell.



Alex Stadnyk

SUGGESTION AWARD WINNER

On the 23rd of October, electronics technologist, Alex Stadnyk, was presented a certificate and a cheque by the Director General, Ray Price, for suggesting that an interrupt circuit be installed in the ISPG's Carbon Hydrogen Nitrogen analyzer. The interrupt circuit causes the system to shut down until it can be manually reset by an operator, thus reducing the possibility of damage to the equipment due to overloading of power.



Director General Ray Price presents a commemorative plaque to Dick Procter.

ISPG VISITS THE RED DEER RIVER BADLANDS AND THE TYRRELL MUSEUM

Introduction

The scientific achievements of Joseph Burr Tyrrell in western Canada and the barrens have fired the imaginations of Canadian biographers, geologists and historians. It is not surprising that the name of this renowned scientist-explorer should be associated with a new museum of paleontology located in the Red Deer River Badlands.

The Tyrrell Museum

The badlands of Alberta has a rich fossil heritage that was recognized in 1979 when Dinosaur Provincial Park became a World Heritage Site. To commemorate this designation the recently built Tyrrell Museum is dedicated to the study and display of that heritage in a world-class facility. At this \$38 million complex attempts are being made by paleobotanists and paleontologists to unravel the environmental conditions and determine the life forms that existed in the badlands before, during and after the Age of Dinosaurs.

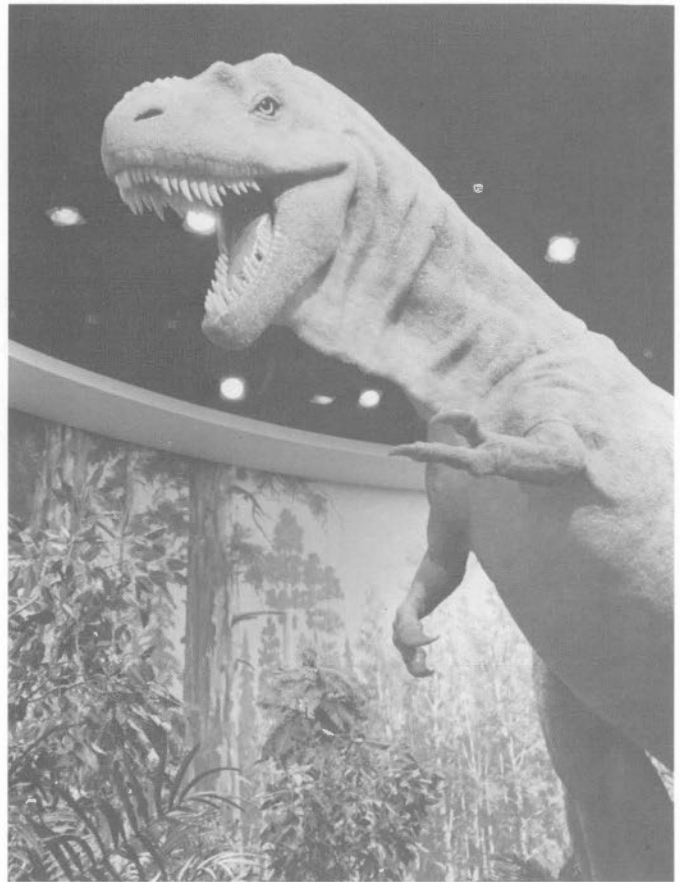
Collecting in the badlands - past and present

Already significant finds have been made in the badlands. Recently, Dr. Philip Currie, a museum paleontologist, discovered a new specimen of **Albertosaurus**, the same genus of dinosaur found by Tyrrell in 1884 during his second expedition into the badlands. In 1984, Clive Coy, another staff member, discovered a new species of a racoon-sized opossum-like mammal, **Didelphodon coyi**. Although relatively small, **Didelphodon coyi** was the largest known mammal to inhabit the Earth 68 million years ago.

The first specimens of vertebrate fossils collected by Tyrrell and others from the badlands were originally deposited in museums in New York, Philadelphia, London (England), Toronto and Ottawa. In the late 1970s the Province of Alberta became interested in displaying its fossil heritage. A number of factors led to the construction of the Tyrrell Museum - space in the Provincial Museum in Edmonton was limited, Drumheller was a depressed area due to coal mine closures, and the impetus provided by UNESCO in qualifying Dinosaur Provincial Park as a World Heritage Site. These factors and the enthusiasm of people such as Dr. Currie and Dr. D.M. Baird convinced the Government of Alberta to set aside \$40 million for the construction of the museum that now stands in the heart of dinosaur country.

ISPG staff are shown the museum

The highlight of this year's ISPG staff field trip was the visit to the museum. However, en route from Calgary on Saturday, October 5, the group drove through Horseshoe Canyon to Drumheller. Our first stop was to examine tuffaceous strata of the Battle Formation. Our guides, coal geologist Mike Dawson and palynologist Art Sweet, pointed out the distinctive volcanic layer that forms a marker horizon throughout southeastern Alberta and southwestern Saskatchewan. Below the dark shale of the lacustrine Battle Formation and the



Model of **Albertosaurus** sp.

kaolinitic sands of the Whitemud Formation we could see the Drumheller marine tongue of the Horseshoe Canyon Formation. In the riverbed at this locality we found numerous fossil oyster shells. Specimens of the Maastrichtian **Ostrea glabra coalvillensis** and other molluscs were readily collectable. Fragments of dinosaur bones were found in the upper beds, preparing us for our visit to the collection at the new Museum of Paleontology.

Inside the museum

The 11 200 m² (120 560 ft²) building stands on a 20 acre site 6 km northwest of Drumheller. It comprises 4400 m² (47 363 ft²) of display space, a 200 seat auditorium, cafeteria, library, laboratories and research areas. This is the first museum in Canada to have a computer-controlled lighting system programmed to adjust automatically when changes in intensity are required. The environment of the museum's paleoconservatory, a repository of one of the largest collections in Canada of living prehistoric plants, is environmentally controlled so that a constant relative humidity of 60% is maintained and temperatures range from 17 to 25°C. Computer technology has also been used in the production of graphics for the displays. Other technologies used at the museum include laser discs, videocassettes, interactive computer programs and a series of programs called TMIS (Tyrrell Museum Information Service) which portray such topics as continental drift, evolution, sedimentary environments, ecology and geological time. In addition, an Encyclopedia of Fossils is available on line.



The Tyrrell Museum near Drumheller, Alberta

Tails of dinosaurs are mounted to show that they were used to balance the animal and as a possible weapon — they did not drag on the ground. Once knocked to the ground it would have been difficult for **Dynamosaurus imperiosus**, with its short forearms, to get up again and a slow-moving plant-eater would have had the opportunity to escape.

The first half of the building is devoted to scientific principles and their application to the evolution of life forms and environments. Pulleys are used to describe the efficiency of wings; the conversion of energy is shown in a muscle-drawn bicycle that drives a series of lights. The recovery and preservation of fossils are explained, depositional environments are illustrated, evolution is described and the unfolding of the universe, from the settling out of gasses to the development of the physical and biological Earth, is depicted.

As we entered the exhibition area, a colourful, natural history slide presentation, "The Celebration of Life", greeted us. In the main lobby a 6 foot relief globe showed the blue planet in a fibre-optically lit heaven. Farther on, geological, paleoenvironmental and biological principles were demonstrated by huge photographs, videotapes, interactive computer programs and models.

In Dinosaur Hall we marvelled at the life that flourished 75 to 68 million years ago in the badlands: **Edmontonia**, an armoured dinosaur, **Stegoceras**, a goat-sized dinosaur, and the fearsome **Albertosaurus**, a cousin of **Tyrannosaurus rex**. Lifesized models of **Albertosaurus** and **Stegoceras** were counterbalanced by display skeletons.

Various saurichian ("lizard-hipped") and ornithischian ("bird-hipped") dinosaurs are shown stalking, devouring, grazing and running — frozen moments in history. The movements of the animals have been studied scientifically; since 1976, 1700 footprints have been examined in the Peace River area and 90 specimens have been collected. By examining length of stride, calculations can be made of the speed at which certain dinosaurs travelled. For **Albertosaurus** actual trackways were used to position the artists' rendition and to determine that the 8 m high dinosaur travelled relatively quickly. Meat-eaters in general were smaller, longer legged and travelled faster than their plant-eating counterparts. For example, the vicious **Dromaeosaurus** (1.8 m high, 45 kg) may have run as fast as a modern horse.

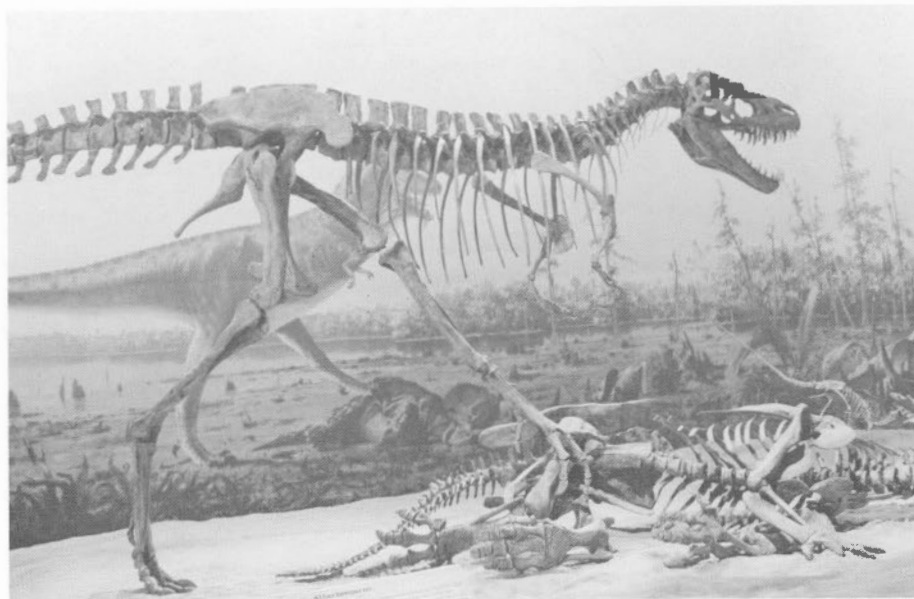
Our guides, Assistant Director Phil Currie and paleontologist Dennis Braman, demonstrated the extreme creativity, scientific expertise and technical skill required to mount such an exhibit. Field specimens are encased in burlap and plaster of paris, then in the laboratory fibreglass molds are made of display specimens. Latex rubber molds are made, cured and removed section by section to be reformed with edges matching. Using liquid plastic, lightweight casts of large specimens can be produced that are easily mounted on steel frameworks constructed to add support from inside the skeletons.

Displays of **Dynamosaurus imperiosus** (Huxley, Alberta), **Triceratops horridus** a horned plant-eater (Montana), **Prosaurolophus** a duckbill (Jenner, Alberta) and **Lambeosaurus** from the badlands together with plesiosaurs, mososaurs and crocodiles are presented in a series of terrestrial and marine environments. The temperature and humidity controlled paleoconservatory allows the visitor to view modern representatives of some of the flora prevalent millions of years ago when Alberta basked in a warm, temperate climate. Many of the plant fossils from the Upper Cretaceous Judith River Formation are similar to those found in present-day southeastern United States and southeastern Asia.

Coal horizons

On Sunday, east of Drumheller, we examined the transition from Bearpaw to Horseshoe Canyon sediments sculpted into fantastic hoodoos. Mike Dawson described the depositional environment, trough cross-stratification and deposition of the prograding deltaic sequence during the early Maastrichtian.

Five formations are exposed at Knudsen Farm: Horseshoe Canyon, Whitemud, Battle, Scollard and Paskapoo. Here the economically important Ardley B coal zone subcrops along the west side of the valley. At the surface the zone has been partially burned and we collected samples of the highly coloured, thermally altered rock that is used by landscape artists as decorative fill.



Albertosaurus and Centrosaurus prey

Earth or could widespread volcanic activity originating deep within the Earth's mantle have accounted for the iridium anomaly at the Cretaceous-Tertiary boundary? These are some of the theories.

The summer field season

Each year the Tyrrell Museum operates a Summer Volunteer Fieldwork Program for persons interested in geology and able to commit up to 12 weeks extracting fossils from a **Centrosaurus** bone bed in Dinosaur Provincial Park. A field camp has been

established at the site and fully trained instructors are on hand to provide on-site training. Anyone interested in participating in this program is asked to write the Volunteer Co-ordinator, Tyrrell Museum, P.O. Box 7500, Drumheller, Alberta T0J 0Y0 for further information.

Epilogue

The opportunity of visiting the badlands and, especially the Tyrrell Museum, was greatly appreciated by all. Our very special thanks are extended to Art Sweet and Mike Dawson of ISPG and the museum paleontologists Philip Currie and Dennis Braman.

Lynn Machan-Gorham

At Dry Island Buffalo Jump, Art Sweet pointed out the precise position of the Cretaceous-Tertiary boundary to those brave enough to scramble down a steep slope. This horizon, at the base of the Nevis coal zone at this locality, is where several species of Cretaceous flora and fauna terminate and Tertiary forms make their first appearance. We could only ponder about the controversial problem of mass extinction.

How did mass extinction come to pass some 64 million years ago (the Cretaceous-Tertiary boundary)? Wildfires triggered by meteoritic impact may have contributed to a "nuclear winter", cosmic showers of asteroids may have created a dust veil blocking the sun and leading to the demise of many life forms. Could an invisible companion star of the sun have driven comets and meteors toward

TYRRELL — THE MUSEUM'S NAMESAKE

Joseph Burr Tyrrell (1858-1957) was born in Weston, Ontario. As a youth he was fascinated by natural history, so much so that in 1880, when he graduated with a B.A. from the University of Toronto, he focussed his attention on geology. He sought employment as an assistant with the GSC in Montreal and spent most of 1881 working under the guidance of J.F. Whiteaves. A.R.C. Selwyn, Director of the Survey, recognized Tyrrell's enthusiasm for geology and the next year he was assigned to a field party led by G.M. Dawson.

In 1884, Tyrrell was appointed leader of a field party to map the 45 000 square mile region of Alberta stretching north from the Bow River to the Saskatchewan River and west from what would become the Saskatchewan border to the Rocky Mountains. At that time Calgary was only a cluster of buildings, a hotel, and a few tents alongside the newly constructed railroad.

For three years Tyrrell worked in his assigned area. The Riel Rebellion came and went but the work of the Survey persisted. Three parties led by

Tyrrell, Dawson and McConnell mapped the region and explored its riches during long and arduous summer field seasons.

Because the Red Deer River flowed through his field area, Tyrrell undertook geological mapping of the badlands by canoe. While searching for evidence of coal he encountered a number of dinosaur bones on 9 June, 1884, including the head of **Albertosaurus sarcophagus**.

During his 18 year career with the Survey, Tyrrell led parties to Manitoba, the sub-Arctic, the Barren Lands, District of Keewatin and Yukon. At the time of the Yukon gold rush, however, he left the Survey to become a prospector and mining consultant in the Klondike. For four years he worked the Bonanza and Hunter creeks for gold and introduced large-scale hydraulic mining to the Yukon. By 1906 he had established himself as a mining engineer in Toronto and became involved in gold mining in Northern Ontario. He became president and managing director of Kirkland Lake Gold Mining Company and, in 1955 at the age of 96 relinquished the presidency of that company to enjoy a well-earned retirement.



J.B. Tyrrell (right) receiving the medal of the Society of Professional Engineers of Ontario from G. Langford in 1954.

Tyrrell's scientific honours are many: honorary doctorates from the University of Toronto and Queen's University; the Wollaston Palladium and Murchison medals from the Geological Society of London; the Flavelle Gold Medal of the Royal Society of Canada, among others. For his part, Tyrrell sponsored a scholarship through the Royal Society of Canada.

Lynn Machan-Gorham

JOINT CANADIAN-AMERICAN INVESTIGATION OF THE CENOZOIC GEOLOGY OF NORTHWESTERN NORTH AMERICA

In July and August 1985 a field party of Canadian and American geoscientists examined the geology of the coastal lowlands in northern Alaska, the Yukon and Northwest Territories. This field project was carried out as a result of a Canadian-American workshop held in Calgary in April 1984 and hosted by the Geological Survey of Canada (Geoscience Canada, 1985, v. 12, p. 68-69). At that workshop it was decided that certain problems of interest to both Canada and the United States could best be resolved with joint field studies. The most pressing problem was deemed to be the chronology and interrelations of glacial and nonglacial deposits in the coastal lowlands of northwestern Canada and Alaska. Future investigations will focus on problems of central Alaska and the Yukon and the Canadian and Alaskan Cordillera.



From left to right, L. David Carter (USGS), David M. Hopkins (University of Alaska in Fairbanks), John V. Matthews (GSC) and Jean-Serge Vincent (GSC). In the background, along Carter Creek in Alaska, beds of the marine Nuwok Formation are exposed.

The group, composed of Jean-Serge Vincent and John V. Matthews (GSC), David M. Hopkins (U. of Alaska) and L. David Carter (USGS) began the investigation on Banks Island, continued west to Barrow, Alaska, and southward along the eastern coast of the Chukchi Sea. Tertiary fluvial and marine deposits, Quaternary glacial deposits, marine deposits of eustatic and glacio-isostatic origin, eolian deposits, and thermokarst deposits were examined and tentative conclusions were drawn regarding their significance for paleoclimate, tectonics, and history of the Arctic ice cover. An interval when larch, rather than spruce, formed the tree line in northwestern North America was found to be recorded in late Pliocene or early Pleistocene interglacial deposits in several places scattered along the northern coasts of Canada and Alaska. The Banks Glaciation — the oldest continental glacial event recognized in northwestern Canada — is probably recorded by glaciomarine deposits of latest Pliocene or earliest Pleistocene age in Alaska. The glaciomarine Flaxman Member of the Gubik Formation of northern Alaska, which records a rapid rise of eustatic sea level about 70 or 80 ka, was traced eastward to Kay Point on the Yukon Coastal Plain, which lies inside the limits of maximum Laurentide glaciation. The participants plan to elaborate on these and other findings in a short article to be published in an international journal.

J.-S. Vincent

THE WORLD'S OLDEST ROCKS: A FIELD TRIP TO GREENLAND (KALÂTDLIT NUNÂT)

In late June and early July, 1985, John Percival and Ken Card of the Precambrian Geology Division had the good fortune to be among 30 or so participants at a field workshop in Greenland. Sponsored by the National Aeronautics and Space Administration, Lunar and Planetary Institute, National Science Foundation, and the Greenland Geological Survey, and ably led by Vic McGregor, Allen Nutman, Clark Friend, Paul Taylor, and Felko Kalsbeek, this was one of a series of such workshops (a similar trip in 1983 examined the Archean crust in the Kapuskasing zone of northern Ontario). The purpose of this trip was to examine some of the world's oldest rocks (ca. 3.8 Ga) in the Godthaab region of West Greenland.

Transportation from New Jersey to Søndre Strømfjord, Greenland was provided by a four-jet C-141 of the United States Air Force. Transportation from Søndre Strøm to Godthaab and in the region about Godthaab was an interesting mix of STOL aircraft, large helicopters, and small boats. Several days were spent talking to one another in Godthaab while one of Greenland's famous weather fronts moved through blowing rain, sleet, and beer cans horizontally down the streets. While in Godthaab, or Nûk as their capital is referred to by Greenlanders, we helped celebrate Greenland's new flag and their first national day with feasting (whale blubber, dried seal, lumpfish roe, etc.) and listening to speeches in Danish and Greenlandic.

Then it was off to look at rocks, first to the ancient gneisses and supracrustals of the famous Isua area, then along the coast and up the fiords to Faeringehavn, Qôrqt, Ameralik, and Fiskenaeset. The main objective was to examine



Vic McGregor (centre) holds forth on the ages of the gneisses at Kangimut sangmissoq.

the relationships among rock units of various ages and origins that have enjoyed repeated deformation and metamorphism, and to see how these relationships, coupled with modern geochronological and geochemical investigations, can be used to decipher the complex history of this ancient craton. McGregor's elegant field methods for reading Greenland's rocks can certainly be profitably applied to parts of the Canadian Shield.

The weather was generally good, although at times the winds were sufficient to make small boat travel interesting. The rocks were, of course, superb, the guides excellent, and the group diverse, representing some 6 different countries and at least twice that many disciplines. The two GSC representatives naturally had their pack rods along and found time for some excellent char fishing. A most rewarding trip in all respects.

Ken Card and John Percival

KARAKORUM HIMALAYA EXCURSION

At the invitation of Mike Searle and Brian Windley of the University of Leicester, Paul Hoffman, Marc St-Onge and I joined a small team of geologists and climbers bound for a three month excursion to the Karakorum Himalaya, northern Pakistan. The objective of the trip was two-fold. Most importantly, a modern geological survey of the Baltoro basin and Masherbrum range was planned.

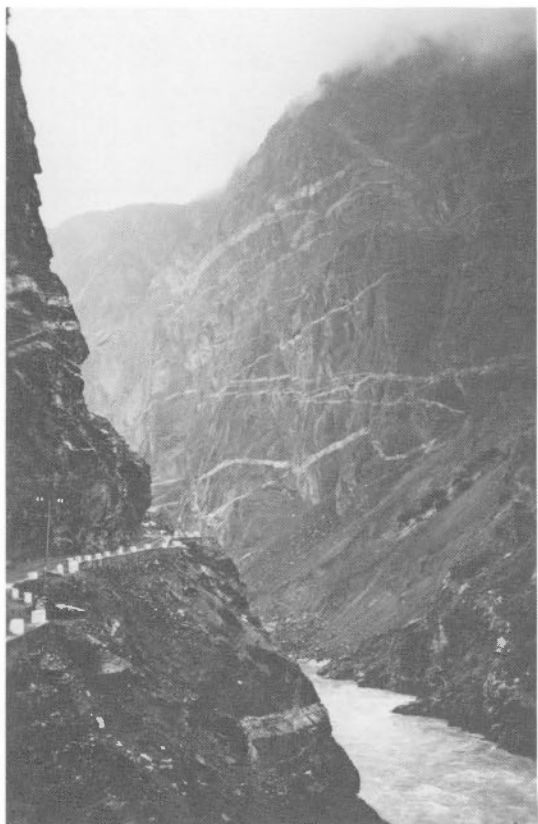
For bureaucratic reasons, the simplest way to gain access to the area was to arrange a climbing expedition, so an assault of one of the more difficult peaks (Masherbrum; 7821 m) via a new (northern) route was also proposed.

The Karakorum Range is far more famous for its mountaineering history than its geology, but this needn't be. It is situated on the north side of the Northern or Shyok branch of the Indus Suture, so it contains a record of events on the Eurasian plate both prior to and after early Tertiary collision with India. Even the most fundamental aspects of this history are unclear. Current debate centres on the polarity of subduction that led to the formation of the Northern Suture, and its relative age with respect to the Indus Suture. An

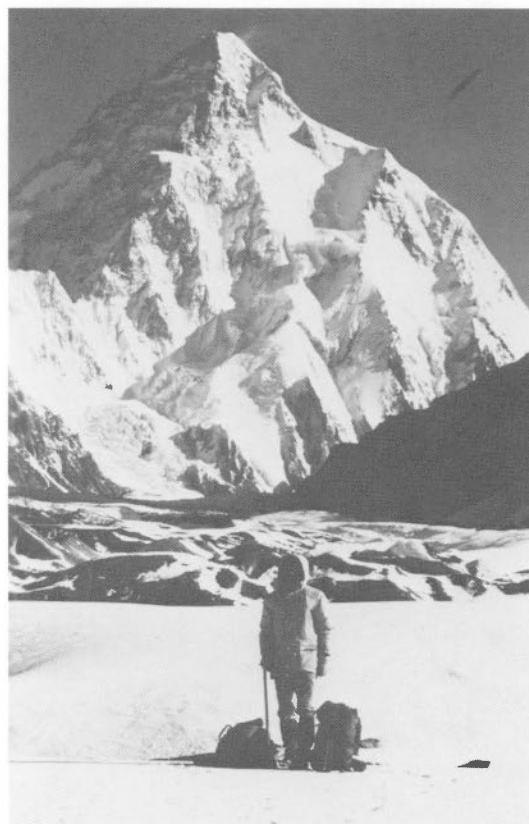
accurate characterization of the Karakorum batholith (north of the better-known Ladakh-Deosai batholith), its age and structural setting, is essential before any model can be accepted.

The excursion began in early May with a much-appreciated field trip north from Peshawar across the Main Mantle Thrust into the Kohistan sequence. The latter is interpreted to be an arc-batholith, deformed into crustal-scale folds during late Cretaceous collision with Eurasia, prior to the docking of India. A transect across the Nanga Parbat massif along the spectacular Indus River gorge followed. The massif is a rising transverse uplift that separates the Kohistan and Ladakh batholiths, which may have initially been continuous. This brought us to Skardu (a Pakistani version of Banff) where final supplies were purchased and most of the necessary 70 porters were hired (about half to carry porter-food).

After a 10 day trek up the Braidu valley, and along the Baltoro Glacier at the foot of the 3 km high granite walls of Paiju and Trango, we arrived at our first base camp, Concordia (4900 m). From here one has a clear view of K2, slightly lower than Everest, but more difficult to climb.



Winding up the Indus River gorge is the Karakorum Highway, which links Pakistan with China. In the vicinity of Nanga Parbat, shown here, present uplift rate is several millimetres per year. The walls of the gorge are metasedimentary gneiss, originally of the Indian plate, cut by tourmaline pegmatites (white streaks).



The author standing in front of K2, 15 km in the distance. The peak rises 3600 m above the glacier surface.

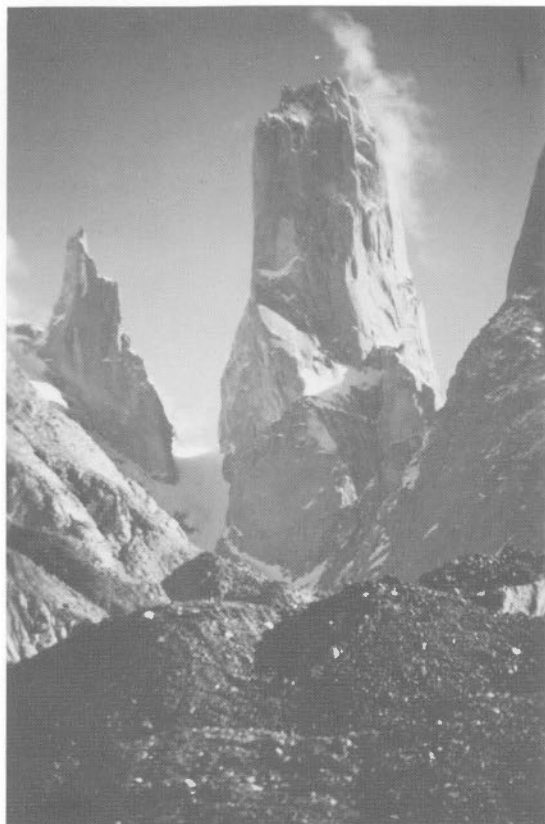


Balti porters can carry enormous, awkward loads, using only cleverly tied rope.

By this time our suspicions that the upper Baltoro valley in May is no place to do geology were fully confirmed. Aside from concealing rock, a thick blanket of snow hides crevasses, making walking anywhere treacherous, and avalanche danger is high. Paul and Marc accordingly left for greener pastures in Ottawa and northern Quebec, respectively. The next day Brian Windley was evacuated by army helicopter because of altitude sickness, and not too long after that Owen Boyd,



From left to right: Rein, Marc and Paul.



"Nameless Tower", a granite spire, about a kilometre high, of the Trango Group, Karakorum batholith.

the doctor, left for the U.K. for an unscheduled gallstone operation. In late June, the attempt on Masherbrum by Mike, Tony Rex (geologist, University of Leicester), our Pakistani liaison officer, and three other climbers who joined them ended at about 2000 m below their objective.

Despite these setbacks, much useful geological work was accomplished. In June and July, Mike and

Tony also made reconnaissance observations in most of the upper Baltoro basin, and brought back 10 porter loads of samples for petrography, geochemistry, isotope geology and geochronology. During this period, I mapped, in comparative detail, the structure of the metamorphic rocks exposed along the glaciated side valleys of the Braldu, periodically returning down to the highest villages to buy food and cache samples.

As a result of this combined work, the basic structural geometry and metamorphic grade along a complete transect from the top of the Karakorum batholith, across the Karakorum thrust to the base of the Shyok suture zone is now known. With adequate geochronology, it may soon be reasonably well understood.

I returned with many treasured memories, among them:

- our discovery at the base of K2 of a discarded pile of tinned food, including Polish pork, Spanish sardines, French pâté and cheese, some of which had been in the deep-freeze for at least four years. (It was like Christmas!)
- crossing an 80 m long suspension bridge made of 3 ropes of woven branches of white birch.
- treading on the spongy alpine moss of Doksam after two weeks of camping on ice.
- the spectacular view from a spur of Mango Gusar of the Shigar valley 3000 m below.
- discovering hot springs and nephrite jade in the Ching Kang gorge, and 6 cm long sapphires in pegmatites somewhere else.
- my meeting with the delightful Jean Troillet, who, on July 6th, without fanfare, oxygen, or recognition, became the first Canadian to successfully climb K2.

Rein Tirrul
Precambrian Geology Division

WHERE THEY WERE IN 1886

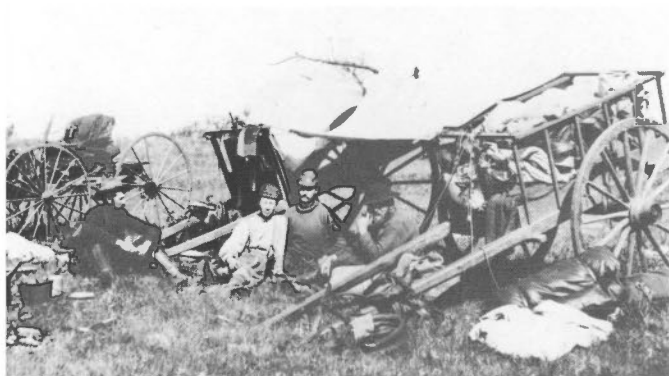
In early February A.R.C. Selwyn, the Director, and three other staff members left for England to participate in the Colonial and Indian Exhibition in London. As this was open until mid-November Selwyn was absent from the Survey for most of the year and G.M. Dawson served as Acting Director. Considerable interest was shown by visitors to the exhibition in the suites of Canadian minerals. The GSC display also included specimens of birds, animals and a variety of other natural history items.

The exposure afforded by this exhibition was very useful to the Survey and to the Canadian mining industry because such affairs generated much newspaper and periodical publicity and were attended by influential political and financial interests.

British Columbia and North-west Territory

Amos Bowman, with support from the BC Government (an early MDA? (ed.)) continued his work in the Cariboo district which was designed to supply data to facilitate placer gold mining. His field season extended from 23 January to 4 November.

R.G. McConnell was directed "to obtain a more detailed section across the Rocky Mountain Range than the hasty exploratory work heretofore done has afforded". The completion of the CPR in 1885 facilitated access and McConnell, between late May and October, traversed along the line of the railway from Banff to Golden on the Columbia River. More recent students of the area may question McConnell's comment that "while much still remains to be done in the way of filling in local details, yet the general features of the section, as presented, are believed to be fairly accurate, and will not be much modified by future investigations".



A well-equipped GSC field party in 1887. (GSC photo held in Glenbow Museum)

J.B. Tyrrell and D.B. Dowling completed reconnaissance surveys between the Bow and North Saskatchewan rivers east of 115°W. Travel was mainly on horseback but Tyrrell used a boat to traverse the North Saskatchewan from Edmonton to Fort Pitt where he rendezvoused with Dowling. Later in the season Tyrrell proceeded on horseback to Rocky Mountain House where he built a boat and descended the river to Edmonton. Their field season ended on 18 November at Calgary. Much of the area covered was but little known and more than 40 pages of Tyrrell's 150 page report were devoted to topographic descriptions.



City of Calgary, looking southwest, 1889. (Photo, Glenbow Museum, Calgary)

Ontario

A.C. Lawson left Ottawa for the country east of Lake of the Woods on 15 June and returned on 12 October. As was the case with all GSC parties topographical work also had to be done as no maps existed. W.H. Smith assisted in completing this work and Lawson continued to unravel the "Huronian (Keewatin) Series" from various gneissic rocks.

E.D. Ingall was in the Thunder Bay area from 9 June to 12 November. Recent silver discoveries had made Port Arthur a centre for mineral explorationists and Ingall's report presented in-depth information on various locations. He also emphasized the need for government support of the explorationist at least to the extent of making claims and land grants accessible to small operators.



"Tent town", Calgary, 1883. (Manitoba Archives photo held in Glenbow Museum)

Robert Bell began his season by mapping on Manitoulin Island before proceeding to Port Arthur his starting point for a trip that took him down the Attawapiskat River to James Bay. He followed the coast to the Albany River then ascended that river to the Kenogami and eventually reached the CPR. One result of Bell's reconnaissance was to virtually eliminate the possibility that Carboniferous rocks occurred in the area and thus any likelihood of finding coal. It will be recalled that one of Logan's first contributions was to prove the same for the original Province of Canada (Ontario and Quebec).

A.P. Low travelled by canoe from Berens River on Lake Winnipeg northeast by way of Big Trout Lake (Ontario) and Fawn and Severn rivers to Fort Severn on Hudson Bay. The party then travelled along the coast to York Factory and then ascended the Hayes River and thence back to Lake Winnipeg. Low was back in Ottawa on 19 October. His comments about the suitability for agriculture of parts of the area traversed (for example around Severn Lake) might seem a bit optimistic to today's residents of Bearskin Lake!!

Quebec

R.W. Eells examined the area east of Lake Memphremagog as part of a study designed to provide data of use to the asbestos industry. The association of the known deposits with serpentine belts was noted. Eells' report contains many detailed descriptions and interesting statistics. Up to \$100 a ton at the railhead was being paid for first quality material which occurred in veins 0.75 to 2.5 inches in width. The material was broken up and graded by boys and old men who were paid 50 cents per day!! Indeed as Eells' noted "the comparison of the cost of extraction with the value of the raw material shows a very good margin for profit".

Rev. Professor J.A.K. Laflamme continued mapping the Paleozoic/Precambrian Boundary on the north shore of the St. Lawrence. L'Abbe Laflamme (1849-1910) long-associated with the Séminaire du Québec, the Grand Séminaire and l'Université Laval where he was professor of mineralogy and geology, was during the 1880s and 1890s an associate member of the GSC staff. In 1897 he represented Canada at the IGC held in St. Petersburg.



Survey group at Eozoon locality, Côte St. Pierre, Québec, about 1894.

	A.R.C. Selwyn	H. Fletcher	
R.W. Ellis	J.B. Tyrrell	E.D. Ingall	R.W. Brock
	W. McInnes	R.G. McConnell	F.D. Adams

New Brunswick

Prof. L.W. Bailey mapped Silurian strata of northern New Brunswick and W. McInnes mapped in the upper St. John area and later around Edmundston and Tobique. R. Chalmers worked the Miramichi country making interesting observations concerning surficial geology and ice movement.

During the year 8185 copies of GSC reports were distributed; 1261 were used for scientific exchange and in return 716 items were received so that by the end of the year the library comprised 6500 volumes.

R.G. Blackadar

STAMP

The Sudbury Timmins Algoma Mineral Program, affectionately known as STAMP, was a federal government job creation initiative designed with two objectives. Firstly, it was to provide meaningful short term employment to a significant number of geologists, chemists and other professionals from the mining sector which had been particularly hard hit during the recent recession. Secondly, it was hoped that the program would produce a body of technical data which would be useful in the mineral exploration efforts of the private sector and, depending upon the results, perhaps even stimulate exploration activity.

The program was carried out between October, 1983 and May, 1984, generating about 1700 person-weeks of employment. Altogether, 82 different people were employed at one time or another during the project. The program was designed and implemented by EMR, and managed by Laurentian University. Results were released as five GSC Open Files, the prompt appearance of which was due to the dedicated efforts of the scientific and production editors of the Geological Information Division.



Dave Garson receiving a Merit Award from Bill Hutchison.

Nova Scotia

Hugh Fletcher and assistants including Faribault continued work in Nova Scotia with Faribault giving attention to gold-bearing rocks on the Atlantic coast while Fletcher studied the Carboniferous in Antigonish and Pictou counties.

The eclectic nature of the Survey's Museum is reflected in the following excerpts from the acquisition list.

From Robert Bell - one harp seal from Blanc Sablon
 From R.G. McConnell - one red squirrel from Wood Mountain
 From J.B. Tyrrell - 125 butterflies
 From A.C. Lawson - one black variety of woodchuck
 From R. Chalmers - four arrowheads from N.B.
 From Rev. W.A. Burman - one striped gopher and two roots of "Cree Turnip"

The components of the program involved mineral data base compilation (CANMINDEX and National Mineral Inventory), overburden (esker) geochemistry in the Swayze Belt, litho-geochemistry of the Huronian Supergroup, study of the mineralization of the Onaping Formation, and metamorphic and chemical alteration studies of the Temagami greenstone belt.

Implementation and management of the program involved dedication and co-operation of many individuals including F.W. Chandler, D.F. Garson, C.R. McLeod, K.H. Poulsen, W.W. Shilts, J. Stapledon and R.I. Thorpe of the GSC; C. Bowstead of Earth Sciences Sector; R. Keyes of the Mineral Policy Sector; D. Janes and M. Bozzo of Employment and Immigration Canada; A.E. Beswick and D. Goldsack of Laurentian University; and the Resident Geologists of the Ontario Ministry of Natural Resources in Sudbury, Timmins and Sault Ste. Marie. The conscientious and enthusiastic efforts of the individuals employed under the program ensured its success.

In recognition of their contribution to the success of STAMP, members of the EMR "team" were presented with Merit Awards. Dr. W.W. Hutchison made the presentations to the Earth Sciences Sector group during a Branch Management Meeting in December 1985.

AGC CHRISTMAS PARTY AND BIO VARIETY SHOW

Our first ever all-AGC Christmas party in early December attracted 100 employees and spouses to a light hearted dinner and dance. Highlights of the evening were humorous awards to AGC managers — one was a plaque to Dave Ross exhorting all to remember the Golden Rule — "Whoever has the gold makes the rules". Dance spot prizes — "grow your own lover seeds" and similar other exotic items, were awarded — some winners were never near the dance floor.

AGC's Finance Subdivision again organized our tree trimming party. Judging by the jollity when all left for home this repeat success threatens to make Santa Claus redundant at Dartmouth.

A Christmas Variety Show, with skits, songs and displays of talent was organized by the BIO staff association and given before a sellout audience of 450 people and families from all BIO labs. Proceeds went to the Christmas Daddies, a Halifax children's fund. The show poked fun at BIO procedures and events and was a hilarious success.

MERGER OF THE EARTH PHYSICS BRANCH WITH THE GEOLOGICAL SURVEY OF CANADA

On 15 January 1986 it was announced that the Earth Physics and Geological Survey of Canada branches of the Earth Sciences Sector will be consolidated into one organization.

The Ministerial Task Force on Program Review chaired by the Honourable Erik Nielson recommended the amalgamation to reduce the potential for duplication of geophysical activities, to reinforce scientific programs, and to achieve economies of scale. The merger was approved by Cabinet on 31 December 1985 and took effect on 1 April 1986.

CONGRATULATIONS SCULPTURE CLUB

"The Big Splash" snow sculpture which won first prize, in the Public category, was made by five members of the Ottawa Cartography Section, Unit "B". The group spent a total of 100 hours, in the evenings and weekends, preparing their masterpiece. In the 4 years since the group began they have been awarded consolation prizes for "The Great White North" and "La danse de la pitoune", 3rd prize for "the Key Save", and first prize in 1986.



Dave Ross at the AGC Xmas party, 1985

Many thanks to those who contributed to this issue of **Geogram**.

Material for the next issue of **Geogram** should be sent via your Division Office to Geological Information Division

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