

# geogram

No. 7 MAY/MAI 1977

AN INFORMAL BRANCH NEWSLETTER  
UN BULLETIN INTERNE D'INFORMATION



## FROM THE DEPUTY DIRECTOR GENERAL

### Performance Measurement

In keeping with the practice of using the editorial column to make GSC staff aware of new developments that affect our program, I am taking this opportunity to tell you of Treasury Board's latest game - Performance Measurement - one that we are currently learning how to play. Departments are now required to measure the performance of their operations where it is feasible to do so. This must be done in terms of the degree to which their objectives are achieved (effectiveness) and how efficiently they do their work. Accordingly, managers in EMR are now concerned with the following questions:

- Over a given period how does the amount and quality of work produced compare with a corresponding period either in the past or planned for in the future?
- How can inputs and outputs be measured and reported?
- How well are the needs of clients being met with respect to quality and timeliness of outputs?
- What changes are required to improve performance?

GSC has been faced with how to deal with such questions. As may be expected in a Branch concerned with scientific research and development it is very difficult to measure quantitatively our progress in acquiring new knowledge and further understanding of the geology of the Canadian landmass, and the development of related technology. Progress can be expressed in qualitative terms and related most significantly to specific regions of Canada rather than for the country as a whole. Qualitative results can be assessed by such means as peer review, the appraisal process, and by advisory committees, etc.

Significant parts of the GSC program can be measured as to "operational effectiveness". That is: how well we achieve our operational goals and how the performance in a particular year compares to that in other years. For instance, we can record the sq. km. mapped, line miles cruised or flown, samples analyzed, maps and publications produced and projects completed. Furthermore, "operational efficiency" can be determined by assessing the ratio of inputs (financial and manpower resources) to productivity, i.e. units used to measure operational effectiveness. The obvious conclusion from this is that we must maintain statistics, now more than ever before, on all conveniently measurable aspects of our program and relate these to cost information which will be provided by the new computerized Financial Information System currently being installed in the Department.

The effectiveness of the GSC program, as a whole, will be the subject of review by teams from the Planning and Evaluation Unit in the Department, by the GSC Advisory Committee, and, where appropriate, by consultants. For example, following the pioneer work of A.H. Lang, a contract has been let to determine, in economic terms, the impact and contribution of the GSC programs to the development of the mineral industry in Canada.

Within the Survey we will make use of our existing project management reporting system as a means of gathering information for performance measurement. We

## NOTE DU SOUS-DIRECTEUR GÉNÉRAL

### Évaluation du rendement

La tradition veut que la page éditoriale serve à informer le personnel de la GSC des faits nouveaux touchant notre programme; je profite donc de cette occasion pour vous faire part du dernier jeu du Conseil du Trésor, appelé "Évaluation du rendement", dont nous apprenons actuellement les règles. Les ministères sont maintenant priés d'évaluer leur production, lorsque c'est possible. Pour ce faire, il faut déterminer le degré de réalisation des objectifs (efficacité et l'excellence du travail effectué. Les gestionnaires de l'EMR doivent donc se préoccuper des questions suivantes:

- Comment peut-on comparer les aspects qualitatif et quantitatif d'un travail avec ceux d'une période passée ou future correspondante?
- Comment peut-on mesurer et tenir compte des entrées et des sorties?
- Dans quelle mesure les besoins des clients sont-ils satisfaits quant à la qualité et au respect des délais?
- Que faut-il changer pour améliorer le rendement?

Le problème qui confronte la CGC est de savoir comment traiter de ces questions. Comme cette Direction s'intéresse à la recherche et au développement scientifiques, il est très difficile d'évaluer quantitativement les progrès réalisés dans l'acquisition de nouvelles connaissances et dans l'interprétation plus précise de la géologie de la masse continentale du Canada et du développement de la technologie connexe. Le progrès peut être exprimé en termes qualitatifs, et peut être relié de façon plus importante à des régions déterminées du Canada, plutôt qu'à l'ensemble du Canada. L'évaluation des résultats qualitatifs peut se faire, soit par des paires, soit par un processus d'évaluation, soit par un comité consultatif, etc.

Certaines parties importantes du programme de la CGC peuvent être évaluées en termes d'"efficacité opérationnelle": dans quelle mesure atteignons-nous nos objectifs de travail et comment le rendement d'une année donnée se compare-t-il au rendement d'autres années? Ainsi, nous pouvons enregistrer le nombre de kilomètres carrés cartographiés, le nombre de milles linéaires parcourus ou survolés, les échantillons analysés, les cartes et les publications produites, et les projets terminés. De plus, l'"efficacité opérationnelle" peut être déterminée en évaluant le rapport entre les contributions (ressources financières et de main-d'oeuvre) et la productivité, soit les unités utilisées pour mesurer l'efficacité opérationnelle. Il est donc évident que nous devons, plus que jamais, tenir des statistiques sur tous les aspects aisément mesurables du programme et établir un rapport entre ces statistiques et les données sur les coûts, qui seront fournies par le nouveau système informatisé de renseignements financiers que l'on installe présentement au Ministère.

L'efficacité du programme global de la CGC fera l'objet d'une étude menée par des équipes de la Section d'évaluation et de planification du Ministère, par le Comité consultatif de la CGC, et au besoin, par des conseillers. Par exemple, suite au travail de pionnier de A.H. Lang, des contractants ont été chargés de déterminer l'aspect économique des effets et de la contribution des programmes de la CGC sur l'essor de l'industrie minière canadienne.

A la Commission, nous nous servirons de notre système

expect that the present framework for reporting is reasonably adequate to provide information on plans, goals and performance although we may have to accommodate some additional quantitative information as we need it.

Performance measurement also requires performance planning. Already this year we have presented a plan on what we expect to accomplish in 1977-78 for a review currently being held by the Deputy Minister. It has been followed by a similar plan for program forecast for 1978-79. Each of these plans has presented the expected goals and related productivity (outputs) in much more detail than ever before.

It should be obvious, then, that we are entering a new era of more rigorous accountability - witness the statements and directives of the Auditor General. Further, at a time when financial and manpower resources are unlikely to increase, senior managers in the Department and in Treasury Board are turning to performance measurement systems to assist them in deciding where such resources can best be allocated. Finally, a new climate exists in the world that, rightly or wrongly, finds science being questioned and having to justify itself. Therefore, the Survey has to learn how to play the performance measurement game and play it well if we are to ensure that our resource base is not unduly eroded.

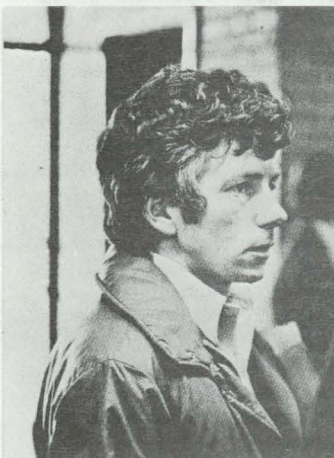
GSC has long had a reputation for undertaking its field projects, for the most part, efficiently and economically. The new emphasis on performance measurement will, however, require us to pay the same attention to the efficiency of office and laboratory phases of our work as we give to field operations. This means that we must improve our ability to complete projects on time and to meet the schedules set out in our performance plan. There is no question that this will put pressure on managers and scientists alike, nevertheless, I feel that we in GSC, as in other trying times in the past, can hold our own and maintain our place in the sun.

\*\*\*\*

#### New Director for AGC

In March, the appointment of Dr. Michael J. Keen as Director, Atlantic Geoscience Centre was announced. Dr. Keen will succeed Dr. B. D. Loncarevic. Dr. Loncarevic has been Director at the Centre since its inception in 1972 at which time he indicated that he would accept the position for a limited term. In 1976, Dr. Loncarevic informed management that he wished to resume his career in marine science research at the Centre.

Dr. Keen graduated from the University of Oxford in 1957 in geology. He went on to the University of Cambridge with a research fellowship in geophysics and received a Ph.D. in 1961. In the same year he became assistant professor in the Institute of Oceanography at Dalhousie University and in 1964, an associate professor. From 1969 to present he has been professor and chairman of the Department of Geology with a period as assistant dean in the Faculty of Arts and Sciences.



Dr. Keen, as a member of a six man ad hoc subcommittee of the Canadian Geoscience Council to advise the Survey on its program, is also familiar with the Survey's administration and activities.

actuel de rapports sur la question des projets, afin de recueillir des renseignements pour l'évaluation du rendement. Nous croyons que le mode actuel d'établissement de rapports suffit largement à fournir des données sur les plans, les objectifs et le rendement, bien que nous devons peut-être utiliser quelques données quantitatives supplémentaires au besoin.

Le rendement doit être, non seulement mesuré, mais aussi planifié. Déjà, cette année, nous avons soumis au sous-ministre un plan de nos projets pour 1977-78, aux fins d'une étude actuellement en cours. Nous avons aussi présenté un plan semblable pour les prévisions du programme de 1978-79. Chacun de ces plans a énoncé les objectifs attendus et la productivité correspondante de façon beaucoup plus détaillée que jamais auparavant.

Par conséquent, il paraît évident que nous commençons une nouvelle époque de comptabilité plus rigoureuse, si l'on en juge par les déclarations et les directives de l'Auditeur général. En outre, alors que les ressources financières et de main-d'oeuvre ont peu de chance d'être augmentées, les gestionnaires supérieurs du Ministère et du Conseil du Trésor cherchent à déterminer, à l'aide des systèmes d'évaluation du rendement, où ces ressources peuvent être le plus profitable. Enfin, on constate, dans le monde, une tendance nouvelle qui, à tort ou à raison, remet la science en question et l'oblige à se justifier elle-même. Ainsi, la Commission doit apprendre comment jouer le jeu de l'évaluation du rendement, et comment le bien jouer, si nous voulons nous assurer que notre base de ressources ne soit indûment détruite.

La CGC a depuis longtemps la réputation d'entreprendre la plupart de ses projets sur le terrain de façon efficace et économique. L'accent nouveau sur le système d'évaluation du rendement nous obligera, cependant, à porter autant d'attention à l'efficacité des phases de travail de bureau et de laboratoire qu'à celle des travaux sur le terrain. Ceci signifie que nous devons améliorer notre capacité de terminer les projets selon les délais prévus, et de respecter les échéanciers établis dans notre plan de rendement. Il ne fait aucun doute que ceci exercera une pression sur les gestionnaires de même que sur les scientifiques; toutefois, je crois que tous, de la Commission, nous pouvons tenir bon et garder notre place au soleil comme nous l'avons fait par le passé, dans des situations difficiles.

\*\*\*\*

Dr. Keen is no stranger to the personnel and operations at the AGC. He has had an active research career in oceanography and geophysics, his research being mainly concerned with the continental margin of eastern Canada, much of it in collaboration with the scientists at the Atlantic Geoscience Centre. He has a long list of publications to his credit.

Dr. Keen has been active in a number of professional organizations and committees, and has served as president of the Geological Association of Canada and president of the Atlantic Geoscience Society. He is a Fellow of the Royal Society of Canada.

In addition to his research background he brings to his new appointment considerable experience in administration. Under his leadership the Department of Geology at Dalhousie became an important centre of geological research in eastern Canada and as assistant dean he was responsible for long-range planning in the faculty and a building program on the university campus.

## RUSSELL EDWARD LEADER

Russ Leader died suddenly on 31 December. He joined the old Department of Mines and Resources in 1945 following his release from active service in the Royal Canadian Navy. He had served on a number of ships and was demobilized as a telegraphist.



His entire career with the federal government was with the Geological Survey.

Russ was a skilled cartographer and a popular and effective supervisor. He had many good ideas for improvements in map making and he received departmental awards for several successful suggestions.

He is survived by his wife, Isobell and two sons, Russell (1958) and Randy (1961).

## JOHN A. NETTERVILLE

All who knew John are deeply saddened by his death in a car accident this February. John received his B.Sc. from the University of Alberta in 1971 when he joined Terrain Sciences in Calgary to work on surficial mapping projects with Nat Rutter and Rudy Klassen. He returned to the University of Calgary and received his M.Sc. in 1974, while working part-time at the Survey. In the fall of 1974 he moved to Ottawa to become part of the continuing staff of Regional Projects Section, Terrain Sciences. John worked on mapping projects in the Boothia Peninsula - Somerset Island area of the Arctic. He also became involved with the evaluation of satellite data for terrain mapping purposes and was active in the work of the Canadian Advisory Committee on Remote Sensing. In September 1976 John went to McMaster University on educational leave where he was working towards his Ph.D. specializing in the application of remote sensing and image interpretation to the management of resources, environmental protection, and land use planning.

We extend our sincere sympathy to John's wife Rocio and to his family. We will all miss him.

## LILA OLGA JELETZKY

The sudden death of Lila Jeletzky at Kingston in January came as a great shock to her many friends and associates. Lila began work for the Geological Survey in 1971 as a field assistant and in 1974 under the direction of Howard Tipper she started a study of the Jurassic of the Bowser Basin in central British Columbia. This was to have been her doctoral thesis at Queen's University. The passing of this gifted, young scientist is a great loss to the Canadian geoscience community. A memorial conducted by Peter Harker was held in Alice Wilson Hall on 25 January and was attended by more than 150 friends.

## R.J.C. "DICK" FABRY

Older members of the GSC will remember R.J.C. "Dick" Fabry, whose death occurred on February 16, 1977. He joined the (then) Division of Mineralogy in 1927 as chemist and for many years worked with Drs. Poitevin and Ellsworth in the old Mines Building at 541 Sussex Drive. Following the move to 601 Booth he was responsible for the identification of specimens received from the public and retired in 1961 to pursue his love of gardening and of cats.

## STAFF NEWS

### OFFICE OF THE DIRECTOR GENERAL

Digby McLaren attended the International Geological Correlation Program meetings in Paris in January and March.

W.W. Hutchison was in Paris in January at the IGCP Scientific Committee meetings and in early February he spent a week in Vienna at the IUGS executive meetings held in "Rasumofsky Palace". The Palace is the home of the Geological Survey of Austria and is where Beethoven wrote much of his music. His room and the beautiful chandeliered ballroom has been preserved. Also in February, he spent three days at IUGS secretariat in Haarlem, Holland to handle matters arising from IUGS executive meetings.

J.M. Harrison, director of the Survey from 1956-1964, has accepted the Chairmanship of the Canadian Committee for the International Geological Correlation Program where he will be associated with E.T. Tozer.

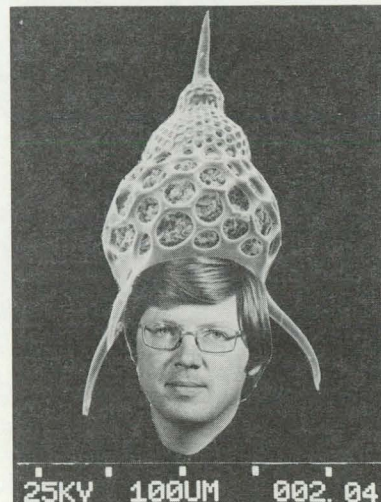
### ATLANTIC GEOSCIENCE CENTRE DARTMOUTH, NOVA SCOTIA

Shigeki Hada, an NRC post-doctoral fellow with the Eastern Petroleum Geology group since 1975, returns soon to Kochi University in southern Japan as an Associate Professor. During his sojourn with AGC, Shigeki did extensive work on the Paleozoic evolution of the Appalachians in Newfoundland.

Robert E. Sibley, scientific illustrator with AGC since 1974, has accepted a position with the Defence Research Establishment Atlantic in Dartmouth.

Willem J. M. van der Linden, research scientist with the Regional Reconnaissance group since 1972, is crossing the Atlantic to take up an appointment at the Meinesz Laboratory of geophysics at the University of Utrecht. While with us, Willem carried out important geological and geophysical investigations of the geology and geophysics of the Labrador Sea and margin.

David A. Walker, with us since 1968, has taken up a new challenge as the man in charge of the new scanning electron microscope (SEM) facilities at the Survey office in Ottawa.



The King of SEM did not leave an heir apparent to the throne he sat on so competently for years, and this has prompted shivers of concern in the habitual users of AGC's excellent SEM facilities.

Paul Girouard, interim SEM troubleshooter, managed to take the accompanying SEM picture of the King (at 25kV) shortly before Dave fled the Maritimes.

## CENTRAL LABORATORY AND ADMINISTRATIVE SERVICES

Kathrine Wiskemann, supervisor of the Typing Pool, is on French language training and Sharon Parnham is acting supervisor in her absence.

The Accounts Office welcomes Becky Taylor who comes to us from Statistics Canada.

## GEOLOGICAL INFORMATION DIVISION

In early March friends and associates of Thelma Stewart gathered in Alice Wilson Hall to present Thelma with a gift and to wish her a long and happy retirement. Thelma has been to the West Coast of Canada and the United States since she retired in the fall of 1976.

Mary LaHam, former co-ordinator of GEOGRAM and information retrieval specialist in the Library, has moved next door to Surveys and Mapping Branch. Mary was the successful candidate for the position of Head, Gazetteer Section in Toponymy Division. Lorna Firth will take over the duties as co-ordinator of GEOGRAM.

There are quite a few new faces in the Library. — Doug Tedford joined our staff in early January having worked in the library at Agriculture Canada.

Dianne Parsonage has brought her library experience with her from New Brunswick to help the Technical Services position in the Library. Formerly from Ottawa, Dianne worked as Librarian with the Research and Production Council of New Brunswick in Fredericton.

Le'Anne Frieday came to us in December of last year as an SDI assistant, working in computer terminals, and supervising the transfer of books from the third floor library to Room G-70.

Michael Foster is replacing Thelma Stewart at the Circulation Desk and Rosemary Pleasant has been accepted as a permanent employee in the Library. Congratulations Rosemary and Mike.

Richard Fix has accepted the position of editor in the Department of National Defence and Lorna Firth has joined Mike Kiel as Leona Mahoney's Assistant.

A warm welcome is extended to Sharon Workman who recently moved into our Cartography Unit as secretary to Mick Roberts.



GSC Cartography Unit presentations.  
Left to right: Peter Harker,  
Mary Raddatz, Gilles Barbary,  
Bernie Mainville and Bob Daugherty.

The Cartography Unit has been a busy place for awards. Bernie Mainville and Bob Daugherty recently received the "GSC rock" for 25 years' service with the Geological Survey of Canada plus a pin and certificate commemorating 25 years of continuous service with the Public Service. Gilles Barbary also received a piece of the rock, so to speak, and Mary Raddatz received the Public Service pin and certificate. Congratulations to all.

## INSTITUTE OF SEDIMENTARY AND PETROLEUM GEOLOGY, CALGARY, ALBERTA



Don Stott, Director of ISPG, was elected Vice-President of the Canadian Society of Petroleum Geologists for the year 1977.

Rick Evis has joined the Organic Geochemistry Section as a technician. He comes to us via the University of Calgary, Chemistry Department, having received his training at St. Lawrence College of Applied Arts and Technology, Cornwall, Ontario.

From the same Section, Misba R. Khan left in January, after 5 1/2 years as a technician. Also from this Section, D.C. Brown has transferred to Regional and Economic Geology Division in Ottawa. Robert Davidson joined the staff in February.

Art Hoffman joined the ISPG staff as Building Services Foreman. He takes over from Bert Delay, who is working in a similar position at the new Calgary International Airport Terminal Building.

The staff wish good fortune to Graham Davies in his new venture. He left in January to form a consulting firm, based in Calgary. Graham had been in Regional Geology at the ISPG for 5 1/2 years.

Winston Mottley received a permanent position at the ISPG as Geological Clerk for the Regional Geology Section.

Some of the newest happenings in the Coal Geology Subdivision —

Dave Hughes joined the staff as a Coal Geologist. He comes to us from Consolidation Coal Ltd. in Red Deer. Dave received his B.Sc. (Masters) at the University of Alberta.

Terry Birmingham retired this fall after 30 years of service. After serving in the military, Terry joined the Department in 1952, working in Nova Scotia, in Ottawa and, since 1973, in Calgary. Although he says he has no definite plans, he has expressed an interest in teaching in his native Nova Scotia.

Maria Tomica transferred from the Coal Subdivision to Regional and Economic Geology Division in Ottawa.

The staff welcomed back Alex Cameron to the ISPG in January, after 16 months' leave of absence. He has been teaching and setting up a coal lab at Southern Illinois University in Carbondale.

New in Cartography Section are George Whitman, Ann Pelletier and Archie Ellis. George, a native of Ottawa, brings with him 21 years of experience in thematic mapping, 11 with the GSC and 10 with the Soil Research Institute of the Department of Agriculture. Ann Pelletier, also from Ottawa, comes to us from the Department of Environment where she worked for the past three years. Ann was with the Department of Energy, Mines and Resources in Ottawa from

1964 to 1966, and then did some penance in industry. Archie Ellis, who was a student at the University of Calgary, previously worked as a carpenter and surveyor, and for a short time as a tree-planter before joining Cartography.

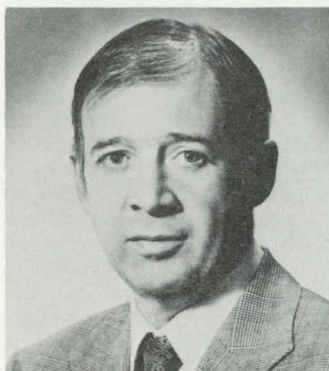
Art Densmore, a native Albertan, comes to us from Panarctic Oils Ltd. Art, who has been in geophysics since 1948, is now our geophysicist for the Arctic Islands.

Debbie Somers has transferred from Central Registry to take over a position as clerk in the Publications and Air Photo Distribution Section. Cathy Grose, formerly the switchboard operator, is the new mail clerk in Central Registry, and Cathy Faire has taken over as switchboard operator.

Ken Roy has left the Institute to become a senior exploration geologist with Panarctic Oils Ltd.

Lloyd Snowdon and Ken Roy received an honourable mention from the Canadian Society of Awards Committee for their paper on Regional Organic Metamorphism in the Mesozoic Strata of the Sverdrup Basin, published in the Bulletin of Canadian Petroleum Geology.

At the annual meeting of the CSPG, Bill Kerr received the Link Award for the best oral presentation of a geological



paper to the CSPG during 1976, for his talk entitled "Lead-zinc Deposition in the Central Canadian Arctic, and its Relation to Petroleum". The award has a stipend of \$1000 for a national lecture tour of Canadian universities.

Andrew Miall is spending a few months at the University of Edmonton teaching sedimentology to the uninitiated.

In January, 1977 the CIM Bulletin began a monthly series of feature articles on

personalities involved in Canada's mineral industries. The first person to be so honoured was Pauline Moyd, a member of our Economic Geology Subdivision.



As chairman of the Industrial Minerals Division to the CIM, Pauline will serve on the Executive of the CIM, the first woman to hold this position in the history of the CIM. (Photo courtesy of the CIM Bulletin).

#### REGIONAL AND ECONOMIC DIVISION

Two new faces are to be found in the paleontology laboratory, Ottawa -

Maria Tomica and Charlie Brown. Neither are Survey strangers however, as both were wooed away from ISPG.

Maria comes from Czechoslovakia where she graduated in geology from the Industrial Geological Institute and later worked in the Coal Exploration Institute. Since coming to Canada, she has held technical positions with Hudson Bay Oil Co. and the Alberta Energy Resources Conservation Board and, since 1975, with ISPG. Charlie is a Nova Scotia native, with the B.Sc. degree from Dalhousie University, Halifax. His geological background includes summer sojourns with Falconbridge Nickel, Granges Exploration and Canadian Engineering Surveys before joining EMR in 1973. Previous employment with the Survey was at AGC and ISPG (since 1975).

Paula Webb, technician in the palynology laboratory for the past 4 years, left the Survey January 1 to enjoy life on the farm near MacDonald's Corners, Lanark County. Her laboratory experience and ability will be difficult to replace.

Murray Copeland has been appointed head of Eastern Paleontology Section. He succeeds Bill Dean who is in France on an international exchange program for the next 6 months at Université de Paris-Sud. Bill plans to speak trilobese in both official languages.

You wouldn't know that Jack Callahan retired from the paleontology laboratory over six months ago. He has been around 601 Booth Street for a few months, on contract, doing one of his specialities -- making excellent plaster casts of fossil ammonites for distribution to scientific institutions around the world. For years Jack has been active at most Survey functions, but, not running true to form, requested that no formal retirement party be held for him. Accordingly, when his many friends from around the Survey, both east and west, contributed to a retirement gift, it was presented to him privately by the Director General.

We all wish Jack a happy and full retirement. When he isn't 'plastered' in the paleo lab he's active around town as a 'sport' (enthusiast, that is) and can be seen goading his hockey team to victory each week at the Nepean Sportsplex. Jack's 'salty' nature, honed to a fine edge over the years at the expense of his many Survey friends, is paying off at the rink - his team's winning.

#### Cordilleran Subdivision

During the past six months the Subdivision was faced with an unusually large number of personnel changes. Alet Marble retired from the Information Services Unit after 35 years with the Geological Survey. She took with her an encyclopedic knowledge of publications relating to the earth sciences in the western Cordillera. Alet's role has been filled by Judith Velker and Judith's former position was taken by Penny Houlden.

Bob Jones resigned from the GSC at the end of October to assume administrative duties with the Department of Indian and Northern Affairs in Vancouver. During his four years with the Subdivision Bob did a superb job in the numerous and varied chores loaded on an administrative officer in a regional office.

Jack Armstrong retired in December and was honoured at gatherings by his colleagues in Ottawa and in Vancouver.

In January Ray Dumas, our draftsman for the past five years, resigned. We are greatly indebted to Ray for the enormous number of diagrams, maps, etc. that he produced in support of the Subdivision's program.

Newcomers to the Vancouver Office are Chris Yorath who transferred from the ISPG in Calgary to carry out stratigraphic studies on the Pacific Continental Shelf and Ken Dawson of the Economic Geology Subdivision who has been assigned the role of regional metallogenist for the northern Cordillera.

Thirty-five winter works people have filled up most of the nooks and crannies in the Survey's Sun Tower space. As usual, Howard Tipper has performed a remarkable feat in selecting personnel for the program. Although the program is a great asset to the Subdivision it is a sobering fact that more than 100 unemployed graduate geologists are registered with Manpower in Vancouver.

## RESOURCE GEOPHYSICS AND GEOCHEMISTRY

Rachel Morra left the Electrical Methods Section to embark on a new career - motherhood. Since November 1973 she has provided the Electrical Methods Section as well as many members of RGG with skillful drafting. Her departure in January, 1977 left many people wondering how they were going to get their diagrams completed before that deadline.

On February 21st Susan Elsmore joined the Electrical Methods Section to take over the position left vacant by Rachel's departure. Susan came to the GSC via DPW, CDC (Navigation Division) and Geoterrex Ltd. Her ample and varied background in geophysical and other types of drafting will enable her to take over the job with a minimum of fuss.

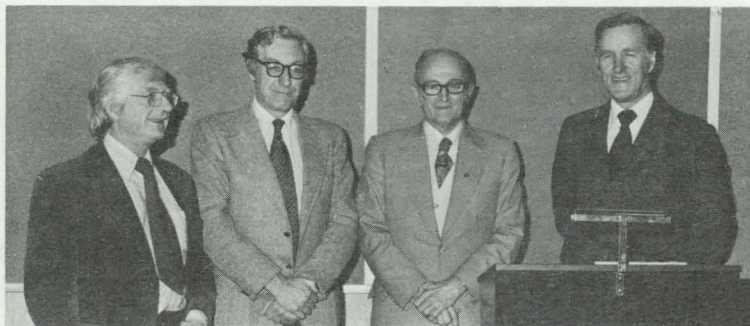
Dan Boyle joined the Geochemistry Section on January 3rd, 1977. He is working with the Uranium Reconnaissance Program doing assessment of geochemical surveys. He expects to work Canada wide in this capacity. Dan received his Ph.D. in 1976 from Imperial College. His B.Sc. was completed at Queen's University in 1971. While completing his Ph.D. he was a lecturer at Imperial College.

Gerry Neave has been loaned to the Seismic Section of RGG by Polar Continental Shelf Project to help analyze and compile sub-area permafrost data obtained from industry records. The project area comprises the Mackenzie Bay-Mackenzie Delta. Gerry who has been working on these data with Hugh MacAuley formerly taught geology at Algoma College of Laurentian University, Sault Ste. Marie, Ontario. He obtained his Ph.D. (1971) at the University of Toronto and did postdoctoral work at the University of British Columbia.

## TERRAIN SCIENCES DIVISION

In December, 1976 John Edward (Jack) Armstrong retired after a distinguished and varied career.

Jack's career with the GSC started in 1934 as a student assistant, and he became a permanent employee in 1942. His early work concerned bedrock geology but after the War he became interested in glaciation and surficial geology and as a result was involved in many engineering problems in the West. In 1949 he moved to Vancouver as a senior geologist in charge of the office there. He remained in Vancouver until May 1969 when he was designated Secretary-General of the 24th International Geological Congress to be held in Montreal. For his services he received the Public Service Commission Merit Award. He returned to Vancouver in 1973. As Fellow of the Royal Society of Canada, he was also a member of a number of important committees and was generous with personal time in the service of his profession.



The delegation for Jack Armstrong's retirement were (left to right) Bruce Craig, Digby McLaren, Jack and Charlie Smith.

Jack was also a good talker and had a great fund of anecdotes. He could also be described as an information specialist. There was little he did not know about the internal workings of the Geological Survey and the personal history of many of his colleagues. He always seemed to know what had happened to his old field assistants and followed their careers with interest. He could always be relied on in the old days to give you an up-to-date version of the seniority and pecking order of the geological staff and perhaps it was with some regret that he saw the demise of the old seniority system in place of the somewhat more equitable merit plan.

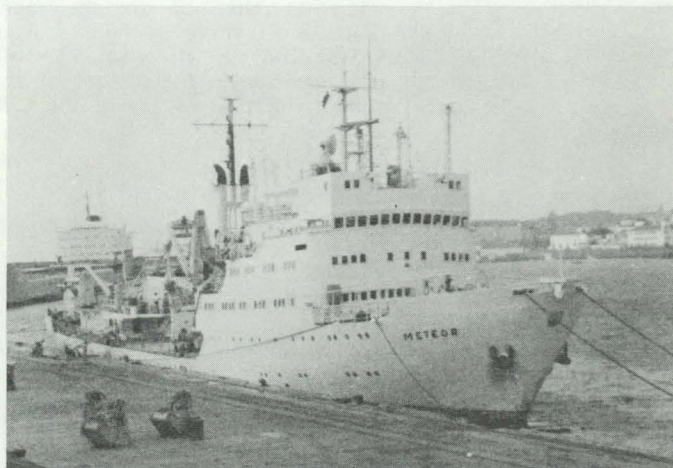
Suzanne Chartrand - resigned from the Geological Survey of Canada in order to devote her time to her family.

John E. Gale - resigned from the Geological Survey of Canada and will be working out of Berkeley as a consultant until July. He will then take a teaching position with the Department of Earth Sciences at Waterloo; all the best John.

John E. Harrison - transferred to the Ministry of State for Science and Technology to act as a policy advisor. His main efforts will be directed towards developing long-term research and development policy related to the energy fields. We wish John the best of luck in his new endeavours.

## OF GENERAL INTEREST

AGC decided to obtain two low cost shallow water seismographs which were being built at Cambridge, England. These instruments are called PUSSs for Pull Up Shallow Water Seismographs. As the engineer at AGC, I went to Cambridge on October 17, 1976 to work on these instruments and learn of their design and construction. During my two month stay, I also worked with a microcomputer system to develop a small, low power clock and control unit for these instruments. It turned out that exactly the same computer designed for AGC's deep water seismometers could be used, but the program had to be changed. While in England, I also visited the Institute of Oceanographic Sciences in Wormley and the Ocean Bottom Seismometer Group at Blacknest. In addition to working with the PUSSs, I made useful contacts at Cambridge and obtained some fresh insights into geological research.

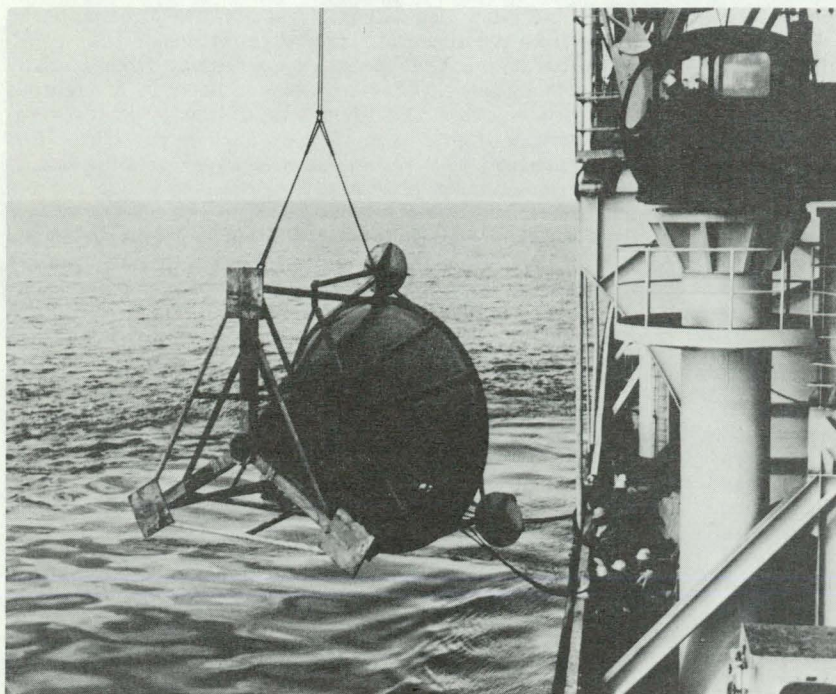


Mike Hughes (of AGC) was extended an open invitation by Dr. U. Fleischer of German Hydrographic Institute to participate on one of their cruises. Mike, never loath to accept such an offer, joined the F.S. Meteor at Ponta Delgada in the Azores on October 22, 1976. The vessel worked in the FAMOUS area for 12 days conducting a detailed gravity, magnetic, and seismic reflection survey using an underwater positioning system operated by Dr. V. Renard of CNEXO, Brest, France. Mike bid aloha to ship and crew from one of the islands in the Azores and headed back home, no doubt regretfully.

## Mapping the Atlantic Ocean Subsurface

Ever since the Deep Sea Drilling Project (DSDP) ventured into the North Atlantic, there have been attempts to come to an understanding of the stratigraphic and facies framework of this deep basin. Through the combined efforts of DSDP Legs 2, 10, 11, 41, 43, and 44, there is at present a detailed knowledge of over 20 drill sites covering Upper Jurassic through Cenozoic pelagic and terrigenous deep sea sediments. Some of the striking features are the "ocean-wide" presence of Upper Jurassic variegated limestones, the Upper Jurassic-Lower Cretaceous light coloured limestones overlain by dark gray shales, and the Lower Tertiary sediments with chert. Upper Cretaceous and mid-Tertiary sediments often appear to be missing. After DSDP Legs 41, 43, and 44, it appeared that further study and communication dealing with the sediments, especially in the western Atlantic Ocean, would be much advanced if formal stratigraphic units following the procedures of the International Code and the American Commission of Stratigraphic Nomenclature could be designated. This then was the major purpose of the Workshop on (Western) Atlantic Basin Formations hosted by the Woods Hole Oceanographic Institution in September 1976 which was attended by over 25 North American marine geologists. Charles Hollister organized the accommodations and arranged for an efficient and pleasant meeting. There were several documents available as a basis for discussion, including Brian Tucholke's (USA) work on acoustic stratigraphy, a proposal on western Atlantic Basin Stratigraphy by Paul Enos (USA), Felix Gradstein (GSC, Canada), and Robert Sheridan (USA), and a manuscript on North Atlantic Mesozoic stratigraphy by Lubomir F. Jansa (GSC, Canada). Discussions, which were presided over by Robert Sheridan, were extremely fruitful and centred on the problems of formation concepts in the ocean, the feasibility of such units themselves and their correlation to the continental margin. Some of the sedimentary units present in the North Atlantic are very similar to pelagic formations exposed in Spain, Italy, Tunisia, and the Canary and Cape Verde Islands. It was agreed to prepare a more advanced joint document on western North Atlantic Formations, to be submitted by the above scientists to the scientific community involved, and to the American Commission of Stratigraphic Nomenclature. The results are to be published.

Felix Gradstein  
AGC



## Scientific Exchange between GSC and the Federal Republic of Germany

Since 1972 the GSC has participated in an active scientific exchange with the Federal Republic of Germany, as part of an exchange agreement negotiated between the Canadian and FRG governments. Each country funds its own direct participation costs (travel, accommodation, air charters, etc.) and, in the GSC, these are borne by the participating Division.

Our chief area of scientific exchange is with the Federal Institute for Geosciences and Natural Resources (Bundesanstalt für Geowissenschaften und Rohstoffe) in Hanover. This is our FRG counterpart, except that nearly all of its work is done outside the FRG. Internal geoscientific studies are the responsibility of state organizations such as the Geological Survey of Lower Saxony, which shares the same building in Hanover with the Federal Institute. There is also some exchange with scientists at the universities of Munich, Kiel, Aachen, Braunschweig and Tübingen, in which scientists from CANMET, Earth Physics and Canada Centre for Remote Sensing participate also; our Atlantic Geoscience Centre is involved in joint projects with the German Hydrographic Institute in Hamburg.

There are twelve projects with on-going status at present, of which eight involve GSC staff. The topics range from a study of uranium concentration in offshore basins (Dr. Loncarevic/University of Hamburg) through the technical application of automation in geocartography (Dr. Hutchinson/BGR) to paleontological investigations in sedimentary basins of Northern Canada (Dr. Jeletzky/BGR). The writer is Liaison Officer for the GSC and Dr. Martin Kursten, Director of the Geochemistry and Mineralogy Division, serves a similar purpose in the BGR. Mr. W.M. Jarvis, Planning and Evaluation Sector, co-ordinates all scientific exchange for EMR.

J.A. Maxwell  
CLAS

Bob Delabio - CLAS Division (Mineralogy Section)

Bob has achieved some success in ten-pin bowling in the past few years. Last year he appeared on national television five times - a program which is shown every Sunday afternoon from 3:30 p.m. to 4:30 p.m. on channel 9, CBOFT in Ottawa, called L'Heure des Quilles, which originates from Montreal.

During the television series, he bowled the second highest game on television (238) and was the second highest money winner of all the bowlers that appeared on this program. He also qualified for the championship of L'Heure des Quilles which was televised on Labour Day weekend, last year.

In order to qualify for this program, tournaments are run every second Saturday during the winter months in Montreal and the top nine bowlers out of 400 entries qualify for television.

A view of a re-entry cone being lowered in preparation for a deep penetration of Atlantic Ocean sediments and crust. From the GLOMAR CHALLENGER (drill ship for DSDP, now IPOD). This picture was taken at Site 391, Leg 44, Blake-Bahama Basin. The depth at this site is 5 km. (Photo by Felix Gradstein)

Fourth International Palynological Conference  
Lucknow, India

The annual meetings of the American Association for the Advancement of Science used to be held at Christmas, and I often wondered how anyone could "gear-up" at that time of year for a scientific conference. Christmas night found us in a state of depression as we waited at Mirabel to board an overnight flight for London. However, our spirits were buoyed somewhat by the fact that our ultimate destination was India where at Lucknow the Fourth International Palynological Conference was to be held.

Although it is a large city (800 000), Lucknow is not on the usual tourist itinerary. But because the Birbal Sahni Paleobotanical Institute is located there, it is the logical place for an international pollen conference. The meetings were held between December 29 and January 5 at the Institute and nearby Lucknow University. Six subject divisions (e.g., morphology, data handling, stratigraphy, medical palynology) were established, and within each division there were a number of symposia. I attended the six symposia of the Quaternary Palynology division and participated in Matsuo Tsukada's session on the Quaternary Palynology of Asia. Other Quaternary symposia dealt with the history of tropical vegetation, Quaternary vegetational history of savannahs and deserts, and the palynology of early habitation and agriculture. Two that looked good on the program but flopped because of a lack of speakers were "Paleofloristic Evolution during Glacials and Interglacials" and "New Approaches to Pollen Analytical Methodology".

In my opinion the highlights of the Quaternary session were Lou Maher's (University of Wisconsin) paper on the use of confidence limits, the paper by R. Bonnefille (CNRS, France), which recently was published in *Nature*, on Pliocene savannah vegetation in East Africa, all talks dealing with tropical vegetation, Matsuo Tsukada's (University of Washington) paper on the vegetation of Japan, Rosa Giterman's (Academy of Sciences, Moscow) review of her recent research in eastern Siberia. Giterman, in her paper and subsequent conversations, provided me with much information on the evolution of Quaternary environments in western Beringia, and it was clear to both of us that some type of joint publication (in Russian and English) is required if Soviet and North American workers are to understand the full implications of each others Beringian research. I also was excited to learn that Siberian Tertiary exposures are now yielding well preserved fragments of beetles and plants like some Tertiary sites in Alaska and the Beaufort Formation of the Arctic Archipelago. It may be possible in the near future to compare Siberian and northwestern North American Tertiary units using insects and seeds as well as pollen. The Siberian Tertiary findings also have a direct bearing on our understanding of the origin of the arctic tundra ecosystem.

The Lucknow meetings were accompanied by several all-conference speeches and receptions. One of the latter was the official opening of the Birbal Sahni radiocarbon laboratory. It is the second such facility in the country (the other being at the Physical Research Laboratory, Ahmedabad), and they expect to be able to date 40 to 50 samples per year. A methane gas counter with an average background of 2.35 counts per minute allows a dating limit of approximately 45 000 years.

Following the meetings, my wife and I joined the post-conference field trip to the Dehradun area north of Delhi. Dehradun, although only a small city, is the site of several important government establishments. We visited the Oil and Gas Institute, the Forest Research Institute, and the northern circle of the Botanical Survey of India. The Botanical Survey is an old department which went into a period of decline in the 1940's. It was revived in the 1950's largely because foreign pharmaceutical houses became interested in some of India's medicinal plants. Thus one of the tasks of the Botanical Survey of India is to make an inventory of medicinal plants in the same way the Oil and Gas Institute is charged with documenting petroleum resources.

Dehradun is located in the Doon Valley with the Siwalik hills, famous for their vertebrate fossils, to the southwest and the lesser Himalayan belt directly to the northeast. We were taken on a brief tour through the Siwaliks and then back through Dehradun to Mussoorie, a town perched on the side of the sub-Himalayan range overlooking the Doon Valley. From Mussoorie the spectacular main Himalayan range is visible. Throughout the field trip we were treated to as much cultural as scientific information, and the last day was entirely given over to culture as we visited the bathing ghats on Ganges River at Rishikesh and Hardiwar. From Hardiwar we travelled by overnight train to Delhi, arriving on the morning of January 12th.

One trip to India does not an expert make, but during our three weeks we did learn some things which might benefit another first time traveller.

1. **Hotels:** Central Travel Services (CTS) seems to hold a very short list of New Delhi hotels. When I requested reservations in Delhi, I was told by CTS that all hotels were booked. When contacted, the Department of External Affairs seemed to have no trouble booking reservations at the Ashoka, one of New Delhi's better hotels. Other good hotels in New Delhi include the Janpath, Imperial, Lodi, and Rajdoot. The only western type hotel in Dehradun is the Manduban. For Palynologists visiting the Birbal Sahni Institute in Lucknow, the Carleton and Clarks Avadh are good hotels and both are within walking distance of the Institute.

2. **Food:** Follow the Public Health doctor's suggestions concerning what food to avoid, and take a good supply of something stronger than Kaopectate. Some of the conference delegates couldn't resist the large salads which were served with meals, and as a consequence many of them were not at the table several days later.

3. **Travel:** Don't be dismayed by the initial experience at a large Indian airport. The onslaught of porters offering to carry everything and anything, following one around the airport for that last rupee, is nerve wracking, especially because one arrives tired and "zoned out" by the 10-12 hour time difference. Things do not seem as bad when one has had some sleep and learns to say "no" - forcibly.

Cab drivers in Delhi are allowed to charge 25% above the meter reading when taking passengers from the city to the airport. Unfortunately there is no sign in the cab or on the meter to indicate this. Had we known of the rule we would have avoided a long, heated argument at the terminal door. Most drivers also will try to add on the 25% surcharge for a trip from the airport to town - resist this.

Allow ample time between connecting flights; many flights from larger airports are delayed because of rigorous security procedures. One should be at the airport several hours before a flight, even if it is an internal one. And finally, reconfirm your reservations at every possible opportunity; it is amazing how easily names are dropped from passenger lists.

We flew from London to India via Afghanistan on the Afghan airline. They are a small airline, but the aircraft are comfortable and I am told that the pilots are very good - they have to be to land at Kabul. Air Canada has an excursion fare agreement with the Afghan airline, but most of the ticket agents know nothing about it. Also, the agreement only applies if you fly to and from London with Air Canada. In this case the North Atlantic pool does not apply, but again most of the Air Canada agents do not know that.

4. **Money:** United States currency is advised. Many of the larger hotels will accept Chargex (Bank America) cards. You must pay with either traveller's cheques, the local currency, or credit card. Avoid the street money vendors, and deal with banks or the hotels.

J.V. Matthews, Jr.  
Terrain Sciences Division



Workshop on Paleolimnological Studies  
of Relict Lakes of the World,  
Burlington, Ontario

The workshop was the second of two North American meetings of the SIL (Societas Internationalis Limnologiae) working group involved with international projects on deep coring operations and paleolimnological work on relict lakes of the world. This and a similar meeting held at the W.K. Kellogg Biological Station, Hickory Corners, Michigan, U.S.A. January 3-4, 1977 were arranged by Prof. S. Horie of Kyoto University, Japan. Joining Prof. Horie was Prof. A. Yamamoto of Osaka University. The purpose of their visit was to familiarize North American geolimnologists with the many studies being carried out on a 200 m core from Lake Biwa, Japan, and to solicit financial support in order to continue their studies on Lake Biwa and other ancient lakes of the world.

The Burlington meeting (January 6-7, 1977) was attended by some 30 Quaternary scientists from throughout Canada. Brief talks were presented on various Quaternary studies being carried out in Canada, including stratigraphy, tephrochronology, palynology, and sedimentation rates, isotope geochemistry, dendrochronology, paleomagnetism and paleoenvironmental research using invertebrate shells.

Prof. Horie outlined how the SIL working group was organized in 1974 during the SIL Conference in Winnipeg. After being appointed Chairman, he formed an international working group which consists of one scientist from each European continental country, two from Great Britain (Prof. W. Tutin and F. Shotton), three from Canada (Drs. L.D. Delorme, A.M. Stalker, J.C. Ritchie), and eleven from the United States (Drs. A. Bloom, Cornell Univ.; U. Cowgill, Univ. Pittsburg; E. Deevey, Univ. Florida; D. Frey, Indiana Univ.; T. Karlstrom, U.S.G.S.; V. Kukla, Columbia Univ.; E. Leopold, Univ. Washington; D. Livingstone, Duke Univ.; R. Miller, Univ. Michigan; S. Porter, Univ. Washington; G. Smith, U.S.G.S.). Prof. Horie would like this team to meet at least once a year and, if possible, arrange to have symposia at the major conferences, for example, the SIL Conference, Copenhagen, Denmark, August 8-15, 1977, and/or the INQUA Conference, Birmingham, England, August 16-24, 1977 and possibly the IGC Conference in Russia in 1978.

Discussions revolved around the funding of deep coring operations of relict lakes of the world, in particular Lake Baikal and the Caspian and Black seas in Russia, Lakes Tanganyika and Chad in Africa, Lake Ohrid between Yugoslavia and Albania, and Lake Titicaca in Bolivia-Peru. Prof. Horie was also seeking additional funds to continue his Lake Biwa coring operations down to bedrock (200 m) which he maintains will amount to about 1000 m of core. He anticipates that a 10-year program being planned on Lake Biwa probably will cost almost \$6 000 000. In order to proceed with the program, he has applied through UNESCO for financial assistance and intends to explore other sources such as NATO, some oil companies, and Geological Surveys of various countries since, as Horie claims, "Geological Surveys have lots of money".

The meeting was useful in that it acquainted the Japanese visitors with the many different studies being carried out on the Quaternary in Canada, especially those of a geolimnological nature. It was surprising to learn that they neither had carried out nor seemed to have been familiar with seismic refraction and reflection profiling to study lake bottom sediments. The meeting provided a means to learn much more about the Lake Biwa study and how it might serve as a paleolimnological model for future investigations of this kind on lakes having short Quaternary records and on relict lakes whose sedimentation histories might span the entire Quaternary. Volume 3 of "Paleolimnology of Lake Biwa and the Japanese Pleistocene" by Prof. Horie (ed.), 1975, was made available to everyone attending the meeting; I have a copy if anyone is interested.

T.W. Anderson  
Terrain Sciences Division

If you have seen "Roots" don't miss "Rocks"

"Rocks-Les roches" is the latest addition to the popular GSC series of educational wall charts. These charts are prepared under the guidance of the GSC Educational Committee chaired by Murray Copeland. Others in this "best seller" series include the titles: Meteorites, Fossils, Gem Stones, and Minerals. Meteorites, the first to be published, has had a distribution in excess of 25 000 copies and is still in demand. The text of "Rocks" was prepared by Hal Steacy and is illustrated with photos by Bob Christie, Keith Bell, and Ray Price.

#### Geological Wives Association Dinner Dance

On Saturday, February 26, 1977, the Geological Wives Association (GWA) held its 17th annual dinner dance in the Canada Room of the RA Centre in Ottawa. Under the convenorship of Rachel Owen, assisted by Joan Darnley and Helen Thorpe, over 100 guests assembled to partake of a delightful buffet followed by dancing to the melodic strains of Len Week's orchestra.

Highlight of the evening was the presentation of GESEE (GSC) awards by Hal Steacy to three members of the GSC staff for their outstanding contributions to "science". The awards, in the form of small figurines dressed to resemble prospectors, were presented to Tom Bolton for the extreme care he has taken throughout the years of the fossils in his custody; to Peter Harker for his contributions to the physical fitness of the GSC staff by his weighty publications, and to Peter Hood for his invention of a small, portable divining rod which, equipped with lights and horn, enables the operator to locate magnetic materials in the dark.

Using weight-lifting techniques, Chris Durham gave an exhibition indicating the largest number of volumes of Reports of Activities that one person could be expected to carry, and Peter Harker, assisted by Bert Lee and John Scott, instructed the audience on the best method of tearing the more recent Report of Activities in half.

One of the objectives of the GWA is to raise funds for an award which is presented annually to a student who is entering or attending university and whose parent is a member of the GSC. Once again it can be reported that this goal was reached.

E.B. Owen  
Terrain Sciences

#### Papers by Proxy

Lack of funds did not deter Hal Steacy of CLAS's Mineralogy Section from presenting an invited paper on mineralogy of uranium at the Geoscience Forum in Whitehorse, December 7th. He simply put the talk on tape (with his son's tape recorder) and sent it along with about 50 transparencies, and from all reports it was successful and well-received. Hal realizes that if the idea catches on he may well arouse the ire of his colleagues, especially those who may have traditionally regarded the presentation of a paper as a 'ticket' to a meeting, but on the other hand he believes that in the current period of restraint the idea has sufficient merit to be explored further, as it represents a means of presenting the results of current research when funds preclude attendance. A taped talk should, of course, be run through beforehand with an attendee, who can then guide the projectionist in keying the slides to the text. The main disadvantage is that no opportunity exists for a question and answer period, although some questions could likely be handled by other speakers familiar with the topic and briefed beforehand. A spin-off is the opportunity of building up a library of taped talks for seminars and workshops and for loans to universities and other interested groups. Hal is the first to stress that the concept of taped and video-taped talks is not new; he believes it simply has not received as much practical attention by the Geological Survey and other Branches as it should.

Notes on Federal-Provincial Polar Bear  
Technical Conference  
Maple, Ontario  
February 2, 1977

The conference considered measures currently used to avoid or deal with bear problems. Research proposals to determine the behavioral responses of bears to a variety of attractants, deterrents, and aversion conditioning were examined, as were management options for dealing with bear troubles.

At present, oil companies in the arctic are using "early warning" electric signal fences, "bear monitors" or native hunter patrols, dogs, floodlights, scaring devices, culvert bear traps, and radar. The perimeter fences and bear monitors with dogs seem to work reasonably well. Radar has been ineffective so far, but new types are being studied. Scaring devices produce variable responses, depending on both the device and the type of bear. One bear was wounded by a teleshot cartridge and had to be destroyed. The traps are used to capture, tranquilize and relocate bears whenever possible. It would appear that bears often wander into camps when searching for food although they would be equally content to hunt along a lead of open water.

Research on the effects of sound on bears indicates that ultrasonic frequencies have little effect. Biologically significant sounds, such as the roar of an adult male polar bear and similar but synthetic sounds seem to have some value. Field tests were promising except for the response of a female with cubs who charges the sound source. Sound equipment has been installed on some oil rigs but has had little use so far.

Most problem bears are sub-adult (under 5 years of age) males who are very hungry. Females with cubs will usually avoid a male bear they see from a distance but will not hesitate to attack a male if they feel that they or their cubs are threatened. Polar bears seem to have vision similar to that of humans except that their low light vision is more sensitive.

Their sense of smell is so acute that a bear is probably aware of activities for 2-3 miles upwind. Smells may be only a clue to the bear that there is an activity worth investigating. There is a possibility that latrine odours act as an attractant for bears.

Research, planned or under way, mainly involves physiological studies of bear species under laboratory conditions. Such studies can, and probably will be extended to cover attractants and deterrents by measuring the physiological response to an agent and correlating that response with observed behavior. Some tests are planned which will involve the reactions of bears to people alone, in groups, working, groups of children et cetera. Before conclusions reached in the laboratory can be accepted, they will have to be confirmed by field observations of free-ranging bears.

Bears have been "conditioned" with devices, such as baits dosed with emetics and electric fences, to avoid attractive targets such as bee hives. Such learning situations depend on a relatively fixed local bear population. Bears learn quickly to respond to stimulation, whether pleasant or not, but it is much harder to recondition a bear which has learned "bad" habits than it is to teach a "wild" bear which has none. It is probable that young animals are more easily handled with aversive conditioning because they have less experience.

Scaring devices are frequently but not universally effective. Some determined bears will ignore them. Little is known about chemical bear repellents. A few materials are known to be useless but nothing is known about the effectiveness of thousands of materials. Trail bells and whistles seem to have little effect on bears used to feeding in garbage dumps but it is felt that they may be very effective on "wild" bears who choose to disappear without ever being seen by the hiker. High intensity lights and magnesium flares do not appear to bother bears but there is a chance that photoflash or strobe units might work.

Northwest Territories wildlife authorities expect to issue maps soon which will show areas with high bear concentrations, denning areas, migration routes, etc. Bears have their behavior rules as do people. It is important to know their rules and to realize that bear behavior may change substantially in face of a major problem such as a food failure. Many people tend to wait too long to kill a problem bear. Northwest Territories law provides that anyone may kill a bear which is endangering life or property.

J.B. Robertson

Seen a meteorite recently?

Would you like a framed scroll for your home or office, with your name in bold letters, and signed by the President of the National Research Council. Discover a new element? No, simply find a new meteorite. The NRC's Associate Committee on Meteorites recently approved the presentation of a scroll to discoverers of the Canadian meteorites. The first presentations are now being arranged and hopefully will be well-publicized. The purpose of the scroll is to recognize the contribution that a new find makes to the science of meteoritics, and to stimulate a public interest in the hope that other finds may turn up. As a matter of interest, 42 meteorites have been found in Canada. The first was the Madoc, Ontario iron meteorite which at 370 pounds still remains the heaviest Canadian meteorite ever found. It is part of the National Meteorite Collection under the watchful eyes of R.J. Traill, A.G. Plant and H.R. Steacy of the Mineralogy Section, CLAS Division.

While on the subject of meteorites the Geological Survey has several portable meteorite displays available for loan, in English and French. They are of the size of a large suitcase and open out to reveal actual specimens of meteorites and 'meteorwrongs' with accompanying photographs and text, against a brightly lithographed background. The displays will be loaned to educational institutions, mineral shows and all other gatherings where they will be under constant supervision of a responsible adult, or in a protective case. Enquiries should be directed to H.R. Steacy, CLAS Division, Ottawa (613-994-9249).

#### Metamorphic Symposium

The Precambrian Subdivision plans to hold a symposium "Metamorphism in the Canadian Shield" in Camsell Hall May 5 and 6 to mark the completion of compilation of an initial metamorphic map of the Shield.

The map, which will be published at a scale of 1:3 million, will show the areal and temporal distribution of the five principal metamorphic facies and the occurrence of selected metamorphic minerals. It will be prepared from more than thirty regional compilations submitted by geologists in the Precambrian Subdivision, provincial and state Surveys, and universities.

The symposium will give to contributors the opportunity to describe metamorphic relationships within the regions they have compiled. Invitations to attend the symposium have been extended to the geological staffs of Canadian universities and government departments.

Recent graduates who have joined the GSC to work on the metamorphic map project are: Marcia Mazurski (B.Sc., McMaster), Dianne McClintock (B.Sc., U.N.B.), and Peter Chernis (B.Sc., Carleton). Co-ordinators of the project are J.A. Fraser and W.W. Heywood.

FRANK SMITHSON YEAGER  
1941-1977

Just as we were going to press we were shocked to hear that Frank had died. He suffered a heart attack in mid-April and was rushed to the hospital under intensive care. He appeared to be getting on well but had another attack from which he recovered and was hoping to be released, but he had another relapse and passed away on May 6.

Frank was born at Leamington, Ontario but had most of his schooling in Detroit. He joined the Department of Mines and Technical Surveys as a student draftsman in Surveys and Mapping Branch in 1959. He transferred from Map Compilation and Reproduction Division of Surveys and Mapping Branch to the Geological Survey of Canada in 1966. He spent most of his time in our drafting unit at City Centre.

He was married in 1963 to Marie Macrillo who was at the time secretary to the old Geological Manuscript Section. We extend our sincere sympathy to Marie and the two boys, Duane and Ryan.

#### Seismic Section's New Marine Survey Launch



The Seismic Section of RGG has taken delivery of the survey launch "J. Ross Mackay" at Lachine, Quebec. The 12 m (40 foot) vessel will be used for shallow water marine seismic profiling in the Mackenzie Delta area of the Beaufort Sea. The boat will be shipped from Montreal, Quebec to Hay River, N.W.T. by truck. After breakup this year, "Captain" Ron Good will run it down the Mackenzie River to the Delta.

#### Variation on a Theme by INTERCOM

##### The Lebreton Look Dismal Pall

Have you stuck your head into 401 Lebreton lately? Yechhhhhhh. The Department's favorite dungeon has been kept in its former dilapidated condition to offer contrast to the gussied up surroundings of the favorite meeting places. The unburnished hallways come equipped with dripping facilities and mobile furniture (on skids) in order to cope with overhead deluges; outlets (sewer) are to be installed in the floor at numerous locations.

The 'slink' connecting 401 to 601 (and other department facilities) was completed a number of years ago by City of Ottawa Works Department (it is now known as Lebreton Street) and has been open to all who dare to brave the traffic of other 'staffers' repositioning their cars (in their spare time). The dress of the Green Hornets now adds a touch of class to an otherwise drab corridor. While the 'slink's' primary purpose was to carry vehicular traffic among the departmental buildings, now it is frequented by scientists scurrying back and forth to library, division directorates, administrative services, etc. with no time to lounge and gossip in the fashion of breaks in meetings in Camsell Hall.

Père A. Fraises

#### SEM antics

On February 2, a medium-size crate was delivered to the Mineralogy Laboratory on the 7th floor. It contained a liquid nitrogen-filled dewar and silicon detector -the essential component of an energy dispersive spectrometer for the new scanning electron microscope (SEM). During the following days, more instrumentation was delivered and the schedule culminated on February 14 with the arrival of seven crates containing the SEM. For George Plant and Bob Traill it was the end of a process which began last summer when approval was given for the purchase of an SEM during fiscal 1976-77. Following their evaluation of scanning electron microscopes at five manufacturers, an order was placed with Aptic Engineering Ltd. of Ottawa for an SEM manufactured by Etec Corporation of Hayward, California. The delivery of the instrument on February 14 also marked the first day in the Mineralogy Section for David Walker, who has been appointed to the position of scanning electron microscope analyst and will be working with George Plant to establish the new laboratory. David has transferred from the Atlantic Geoscience Centre where he was a member of the Environmental Marine Geology Subdivision and had responsibility for their SEM. During the next few weeks, David and George will be monitoring the installation of the SEM.

#### Improved Laboratory Facilities in Ottawa

New laboratory facilities are in the process of being constructed in the basement of 601 Booth Street. This lab is for high temperature and pressure experiments in the study of rock- and mineral- forming processes and will be under the direction of Ken Currie. The lab will be ready and working by April and will be located near the former petroleum well-cuttings examination room.

The 7th floor isotope labs, directed by Bob Wanless, are also undergoing a major refurbishing. The lab area is being expanded and a new air-conditioning system is being installed. This system was put in place in a single day using a huge crane to hoist the heavy equipment to the roof, thereby saving many kilobucks.

#### The New Look Camsell Hall

Have you stuck your head into Camsell Hall lately? Beautiful. The department's favorite meeting place has been gussied up to the point of being almost unrecognizable when compared to its former dilapidated condition. The refurbished hall comes equipped with taping facilities, movie, slide and overhead projectors, along with outlets for floor microphones at nine locations.

The link, joining the tower with 588 Booth, was completed some time ago but was not opened because of the reconstruction work in the hall. But it's open now and it adds a touch of class to the complex. While the link's primary purpose is to carry traffic between the two buildings and will become the main access to the cafeteria from the tower, it will also serve as a lounge and gossip area during breaks in meetings in Camsell Hall. (Courtesy of *Intercom*, No. 1, January 1977)

EXPOSITION D'ART ET D'ARTISANAT  
EMR  
ARTS AND CRAFTS SHOW



"DIGBY, MY BOY, IT'S BEAUTIFUL...  
AND DAMN NEAR AS HIGH  
AS MY MOUNTAIN"

Steve  
77

Il y aura une exposition d'art et d'artisanat à la salle Camsell du 12 au 18 septembre prochain. Les artistes qui désirent participer sont priés de communiquer avec:

André Villeneuve (S&M) 994-9410  
Brian Fletcher (Topo-Survey) 994-5567  
Gisèle Bouvier (GSC) 994-5752

le plus tôt possible. Les employés retraités d'EMR sont également invités à participer.

Artists who wish to exhibit in this year's arts and crafts show please contact, as soon as possible, one of the above persons. The show is scheduled for September 12-18 at Camsell Hall and is open to present and retired EMR employees.

G.C. Bouvier  
GID

Material for the next issue of Geogram should be sent to your Division Office or to Lorna Firth.

Les articles pour la prochaine parution de Geogram devront être dirigés au secretariat de votre Division ou à Lorna Firth.

Editor/  
Rédacteur

P. Harker

Editorial Advisors/  
Conseillers à la rédaction

M.J. Copeland  
P.J. Griffin  
L.A. Firth