geogram

No. 5 JULY/JUILLET 1976 AN INFORMAL BRANCH NEWSLETTER
UN BULLETIN INTERNE D'INFORMATION

FROM THE DIRECTOR GENERAL

The notes that I wrote in place of an editorial for the last GEOGRAM were really only a few news items with my own comments on them. From what I hear they proved to be of interest to many of you and so I am going to do the same thing again for this issue. It is rather a pity, however, that most of the news I am able to bring to you at the moment is not very good, and I would be less than truthful if I suggested that there will be any change in this pattern in the foreseeable future. Nevertheless, the Survey continues to survive intact, and, I believe, is still considered a reasonably important part of the Department and of its program.

Rotation of Managers The USGS has long had a successful scheme by which a manager at various levels took on the duties for a fixed term, commonly five years. After the tour he normally returned to the bench as a scientist, or, if he showed aptitude in management he might be promoted or switched to another management job. In every case, however, management rotation was considered a normal and desirable part of the job. We are very anxious to try and institute such a system within the Geological Survey, and are actively discussing how it might be achieved. It would not, of course, be identical with the USGS scheme, because our conditions of employment, pay scales, and staff relations are not the same. Nevertheless, I am optimistic that something might be done, and hope to have further information for you before very long. Not the least advantage of such a scheme would be allowing a potential manager to try a job without feeling that he had completely burnt his bridges behind him. In addition, if the scheme works, it might build up a pool of people who had management competence, and who might return to their scientific duties with a better understanding of the Geological Survey's program and responsibilities as a whole.

Program Forecast In the last GEOGRAM I explained a little of the Program Forecast system and told you that the Geological Survey's suggestions for 1977-78 had survived the first round and that the Minister had agreed to sign the Departmental submission to Treasury Board. We have received a response from Treasury Board

NOTE DU DIRECTEUR-GENERAL

Les propos que j'ai tenu à la place de l'éditorial dans le dernier GEOGRAM ne consistent, à vrai dire, qu'en quelques nouvelles auxquelles j'ai cru bon d'ajouter certains commentaires personnels. D'après ce que j'ai entendu dire, la formule a paru intéressante à nombre d'entre vous et c'est pourquoi je vais recourir à la même formule dans le présent numéro. Quel dommage cependant, que la plupart des nouvelles que je suis en mesure de vous communiquer pour le moment ne soient pas très bonnes! Et je serais de mauvaise foi en vous laissant croire que la situation changera dans un avenir rapproché. Il n'en reste pas moins que la Commission continue de survivre intacte et, à mon avis, on la considère encore comme un élément assez important du Ministère et de son programme.

Roulement des chefs de service Pendant longtemps, la Commission Géologique des Etats-Unis a appliqué avec succès un régime par lequel un chef de service à un palier quelconque assumait ses fonctions pendant une période déterminée, généralement, cinq ans. Après cette période, il réintégrait normalement sa place parmi les scientifiques ou, si ses capacités d'administrateur étaient manifestes, il pouvait être promu ou muté à un autre emploi d'administration. Dans chaque cas, cependant, ce roulement des chefs de service était considéré comme un élément normal et souhaitable de l'emploi. Nous désirons fortement mettre à l'essai et établir un système de ce genre au sein de la Commission géologique et nous étudions activement la façon dont nous pourrions y parvenir. Il va de soi que le régime que nous adopterions ne serait pas identique à celui des Etats-Unis, étant donné que nos conditions d'emploi, nos échelles de traitements et nos relations de travail ne sont pas les mêmes. Néanmoins, je crois fermement que nous pourrions faire quelque chose en ce sens et j'ose espérer que, d'ici peu, j'aurai de plus amples renseignements à vous communiquer à ce sujet. L'un des avantages d'un tel régime, et non le moindre, serait qu'il permettrait à celui qui envisage un poste de chef de service de faire l'expérience d'un tel poste sans toutefois avoir l'impression qu'il a complètement coupé les ponts derrière lui. En outre, si le régime fonctionne, il pourrait permettre de former un corps de scientifiques ayant une certaine compétence dans le domaine de l'administration et susceptible de "revenir à leurs anciennes amours", forts d'une meilleure compréhension du programme de la Commission géologique et de l'ensemble de ses responsabilités.

Energy, Mines and Resources Canada
Énergie, Mines et Ressources Canada

unusually quickly, and the result is not good. In summary, our Capital Budget has been cut by 10%; there might be money for oil sands appraisal, but no additional man-years; no additional resources for environmental impact of coal and oil sands development; no additional resources for Resource Data Base Management; and a cut in funds allocated for transfer of Marine Geoscience Unit from Vancouver to Patricia Bay. It should be realized when considering the apparent severity of this result that the government has fixed its absolute growth for next year at 1½%. This sum must include "non-discretionary increases", such as providing services to which the government is committed by Act or Statute; these services already total more than the 1½% growth allowed. Many departments are, as a consequence, suffering cuts rather than no growth. There are still one or two areas in which we may expect certain increases, particularly money from the Energy Research and Development Program for coal assessment and possibly additional contract funds in support of the Huntec Marine Seismic System. There is little likelihood of additional man-years.

Federal/Provincial Agreements under DREE The Department is becoming increasingly involved in Department of Regional and Economic Expansion programs. Those of particular concern to the Geological Survey commonly involve Resource Subsidiary Agreements which are tied in to some larger agreement to boost the economy of a particular region. The Mineral Development Sector is normally the negotiating agent in discussing with particular Provinces what should be done, but the Geological Survey commonly provides technical advice in regard to resources under consideration – minerals, uranium, or coal. The Survey also provides a member for the Technical Subcommittee advising the Management Committee of each agreement. The problem faced by management is how much benefit the Department should get. DREE is interested in encouraging local development, and does not consider that they have a mandate to require feedback of technical data. If, however, we demand that major data flow should result from an agreement to which we provide technical advice, then we should quickly find we had not the resources adequately to deal with such data and to integrate them into our information base. As regards coal, we are successfully involved in programs with Nova Scotia and will be, shortly, with New Brunswick and possibly British Columbia. Mineral agreements in several Provinces, however, present another problem and we are currently facing yet further agreements with other Provinces. In Newfoundland where a major mapping program will be undertaken with DREE money, valuable information for our resource assessment program and for 1:250 000 maps will flow from 1:50 000 mapping, but we have no one available to exploit such information for the overall benefit of our program. It is ironical that our technical advice is required on setting up programs we believe to be beneficial while we have no capacity to ensure that the Department and other agencies of the Federal government

Prévision des programmes Dans le dernier GEOGRAM, j'ai expliqué brièvement le système de prévision des programmes et je vous ai dit que les recommandations de la Commission géologique pour 1977-78 – avaient survécu à la première ronde d'examens et que le ministre avait consenti à signer la demande du Ministère au Conseil du Trésor. Nous avons effectivement reçu une réponse du Conseil du Trésor dans un délai exceptionnellement court et les résultats ne sont pas très bons. En résumé, notre budget d'investissement a été tronqué de 10%. Nous avons l'argent pour entreprendre l'évaluation des sables bitumineux, mais aucune année-homme supplémentaire; nous ne disposons d'aucune ressource supplémentaire pour étudier les incidences sur l'environnement de l'exploitation du charbon et des sables bitumieux; rien non plus pour la gestion de la base de données sur les ressources; enfin, les fonds affectés au transfert de la Section de la géoscience marine de Vancouver à Patricia Bay. Devant la sévérité de ce résultat nous constatons que le gouvernement a fixé à 1.5 pour cent son taux d'expansion absolue pour la prochaine année. Ce pourcentage englobe les augmentations non discrétionnaires, comme celles qui sont imputables au service que le gouvernement s'est engagé à assurer en vertu de la loi ou d'un statut; à eux seuls, ces services représentent plus du 1.5 pour cent autorisé. Nombre de ministères, par conséquent, se voient imposer des coupures plutôt qu'une croissance zéro. Nous pouvons nous attendre à certaines augmentations dans un ou deux autres secteurs, notamment des fonds provenant du programme de recherche de développement en matière d'énergie pour l'évaluation des ressources en charbon, et peut-être des fonds additionnels contractuels pour subvenir au réseau sismique marin de Huntec. La probabilité que nous puissions disposer d'autres années-hommes est faible.

Accords entre gouvernement fédéral et provinces sous l'égide du MEER Le Ministère participe de plus en plus aux programmes du ministère de l'Expansion économique et régionale. Ceux d'entre eux qui intéressent particulièrement la Commission géologique mettent habituellement en jeu des accords de subventions relatifs aux ressources, dans le cadre d'un accord plus général qui vise à stimuler l'économie d'une région en particulier. Le Secteur de l'exploitation minérale fait habituellement fonction d'agent négociateur en discutant avec chaque province de ce qui devrait être fait, mais il incombe à la Commission géologique d'assurer des services de consultation technique en ce qui concerne les ressources à l'étude, que ce soit les minéraux, l'uranium ou le charbon. La Commission délègue également un de ses membres au sous-comité technique qui a pour fonction de conseiller le comité de gestion de chaque accord. Les chefs des services intéressés doivent résoudre le problème suivant: quels avantages le ministère devrait-il en retirer? Comme le ministère de l'Expansion économique et régionale s'efforce de favoriser le développement à l'échelle locale, il n'entre pas dans son mandat d'exiger en retour des données techniques. Si toutefois nous insistions pour que tout accord pour lequel nous assurons

benefit as a consequence of improved knowledge. Here as in many other areas, our resources are dangerously thin.

Energy Conservation Treasury Board have introduced a new system to "persuade" Departments to conserve energy. This, in outline, consists of assessing energy usage by Departments in 1975-76, instructing them to reduce energy consumption by 10% in 1976-77 and to continue at this level for 10 years. We are beset by many and complex systems, some of which don't always appear to be entirely helpful in regard to doing our job. I feel, however, that this one is reasonable, and perhaps overdue. In a Department such as ours, we should surely give a lead in eliminating unnecessary energy usage. I hope, therefore, that you will all cooperate in efforts that will be made to cut down energy usage, and I shall be at pains to try and ensure that our real needs, particularly in regard to field work do not suffer.

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A. C. MAJOR
1922-1976

Cliff Major died in hospital in Ottawa on 15 May 1976 after a long illness. Cliff joined the Survey back in 1943 and some of us remember him in the basement of the Museum operating the photostat camera which at the time was our only means of making copies. Cliff had various jobs over the years in printing; photomechanical and other support services to cartography, and latterly was expiditing clerk for the photomechanical unit. (*see* photo, page 6)

Cliff was kindly and good-natured and always seemed to be on easy friendly terms with everyone. He had many friends in the Department but always maintained a strong loyalty towards the Survey. He enjoyed social activities concerned with the Geological Survey and was for many years an enthusiastic member of the GSC bowling team. Cliff had been around for so long that it is hard to believe that he is gone, we shall miss him.

un service de consultation technique produise un flux de données principales, nous découvririons rapidement que nous ne disposons pas des ressources suffisantes pour nous occuper de ces données et les intégrer à notre base d'information. En ce qui concerne le charbon, nous participons avec succès à des programmes avec la Nouvelle-Ecosse et nous le ferons sous peu avec le Nouveau-Brunswick. Dans plusieurs provinces cependant, les accords concernant les minéraux posent un autre problème et, à l'heure actuelle, nous devons nous acquitter des obligations découlant de nouveaux accords passés avec d'autres provinces. A Terre-Neuve, où sera lancé un important programme de cartographie subventionné par le ministère de l'Expansion économique et régionale, nous pourrons tirer de précieux renseignements des cartes à 1/50 000 pour notre programme d'évaluation des ressources et pour nos cartes à 1/250 000, mais personne n'est en mesure de tirer profit de ces renseignements au bénéfice général de notre programme. Ironie du sort, bien que nos conseils techniques soient nécessaires pour mettre sur pied des programmes que nous croyons salutaires, nous ne sommes pas en mesure de garantir que le Ministère et d'autres organismes du gouvernement fédéral bénéficient en fin de compte de l'accroissement des connaissances qui en résulte. Ici, comme dans nombre d'autres secteurs, nos ressources sont dangereusement maigres.

Economies d'énergie Le Conseil du Trésor a établi un nouveau régime pour "inciter" les ministères à économiser l'énergie. En gros, ce régime consiste à évaluer la quantité d'énergie consommée par les ministères en 1975-76 et à conseiller à ces derniers de réduire leur consommation d'énergie de 10% en 1976-77 et de rester à ce niveau réduit de consommation pendant dix ans. Nous sommes entourés d'une multitude de systèmes complexes dont certains ne nous semblent pas toujours entièrement compatibles avec notre emploi. Je crois cependant que celui-ci est raisonnable et aurait dû être établi depuis longtemps. Dans un ministère comme le nôtre, nul doute que nous devrions donner l'exemple en montrant à quel point notre consommation actuelle d'énergie peut être exagérée. Il me reste à espérer que vous contribuerez tous à réduire la consommation d'énergie et je m'appliquerai à vérifier et à m'assurer que nos besoins réels, particulièrement en ce qui concerne les travaux sur le terrain, n'en souffrent pas.

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STAFF NEWS

OFFICE OF THE DIRECTOR GENERAL

As we go to press our Director General is busy with last minute jobs and briefings before leaving for Australia to attend the 25th International Geological Congress. Dr. McLaren is head of the Canadian delegation and also Chairman of the Commission on Stratigraphy of the IUGS. He will have a busy time but is looking forward to seeing some Australian geology on one of the major field excursions.

Our Deputy Director General, John Wheeler, returned from the northern Rocky Mountain where he spent some time with Gordon Taylor, Don Cooke and Bob Thompson in the vicinity of Robb Lake. Bob has identified an early Paleozoic trough with a structural style in marked contrast with that of the adjacent carbonate platform. He also visited Dirk Templeman – Kluit's camp at Ross River and was shown by bush traverses and by helicopter how Dirk is rearranging some of the geology that John did two decades ago.

ATLANTIC GEOSCIENCE CENTRE DARTMOUTH, NOVA SCOTIA

AGC welcomes its 1976 summer students: Brian Eastwood of St. Mary's University, Halifax, and Hugh D. Monroe of the University of South Carolina will work with Gerry Reinson on the geodynamical studies of Atlantic coastal environments. John D. Greenough of Acadia University and Francis Thomas of Dalhousie University will assist Pat Purcell in the Eastern Petroleum Geology Subdivision. Geoffrey Martin of Memorial University and Bruce Renton of the University of Toronto will work with Dave Ross's Regional Reconnaissance group. David J. Secord of King's College, Halifax, will assist Charlotte Keen and Lynn M. Smith of Dalhousie University will assist Richard (Dick) Haworth, both in the Regional Reconnaissance group. James Young of Dalhousie University will work with Charles Schafer of the Environmental Marine Geology group.

CENTRAL LABORATORIES AND ADMINISTRATIVE SERVICES DIVISION

During Ken Church's absence for language training, Peter Bélanger is acting supervisor of production analysis in the spectrographic laboratory, and Nicole (Lafontaine) Roxburgh has been taken on as a casual employee.

Ed Cooke who has given valuable assistance for several years in our Accounts Office decided to take an early retirement. There was a presentation in June and Ed has now left Ottawa for Prince Edward Island where he is going into the rug cleaning business.

GEOLOGICAL INFORMATION DIVISION

Angie Koops recently "retired" as technical editing assistant to Leona Mahoney. We wish Angie all the best in her new career as homemaker. Mike Kiel has rejoined our staff as Leona's assistant.

Dan Maruska joined our Photography Section having had previous experience as camera man in various photographic services.

The Data Processing Unit in the Library lost Carol Segall to the Computer Science Centre where she has taken on the responsibility of index compiler.

David Roadhouse recently joined the Survey to fill a term position in the Library. David comes to us from Carleton University where he was an audio-visual technician.

With the coming of summer, the GSC employs a few summer students to help out in various activities. We would like to welcome Catherine Melnychuk and Rosemarie Pleasant to our Library summer staff.

It is sad to report that Gayle Wilson, who was our typesetter for a number of years, died in the spring. Gayle had been on medical retirement for the past year.

Jean Paul Corriveau transferred on May 14, 1976 to Lands Directorate, Environment Canada and his vacant position was filled on July 5, 1976 by Gisèle Bouvier a 1975 Algonquin College grad in Cartography.

Sylvia Junginger joined the section on April 1, 1976. She came to us after 2 years in private industry. Sylvia is a 1974 Algonquin College grad in Cartography.

Dana Kurfurst has transferred to Cartography from Terrain Sciences Division.

Two new checker positions have been created in our Cartography Section. Bernie Mainville and Guy Lavigne have won the competitions and their duties entail checking automated cartographic work which is skillfully performed in Pierre Debain's unit.

Blayne Chapman has left Photography for a position with the Department of Indian and Northern Affairs.

INSTITUTE OF SEDIMENTARY AND PETROLEUM GEOLOGY, CALGARY, ALBERTA

Gwen Esau and Vicki Blunden are no more to be seen in the typing pool. Gwen is now married and living near Swift Current. Vicki is a secretary with an engineering firm in Vancouver. Catherine Jeffrey and Mildred Wilton are the new faces in the typing pool.

Ghulam Jamro, previously with the Canada Centre for Inland Waters at Burlington, Ontario, has joined the staff as a technician in the inorganic geochemistry laboratory.

Lloyd Snowdon returned to the Institute in May. He has been attending Rice University, Houston, Texas. Residence requirements for his Ph.D. have been completed and Lloyd is now working on his thesis – Organic Geochemistry in the Mackenzie Delta/Beaufort Sea.

Helen Belyea added another academic trophy to her already impressive collection. She received an honorary degree from the University of Windsor, where she also delivered the convocation address.

Chris Yorath has transferred to the Vancouver office where he will be working in the Marine Geoscience Unit until the new institute at Patricia Bay opens.

Roger Macqueen has left the Institute to take a teaching position at the University of Waterloo.

Ray Rahmani has joined the Regional Geology Subdivision and is working on clastic sedimentology of the western Arctic Islands. Ray comes to us from Shell Oil.

Cathy Douglas is now working as a geological technician for the Petroleum Resources Section.

Merle Beaver has resigned from his position as draftsman in the Cartography Unit.

REGIONAL AND ECONOMIC GEOLOGY DIVISION

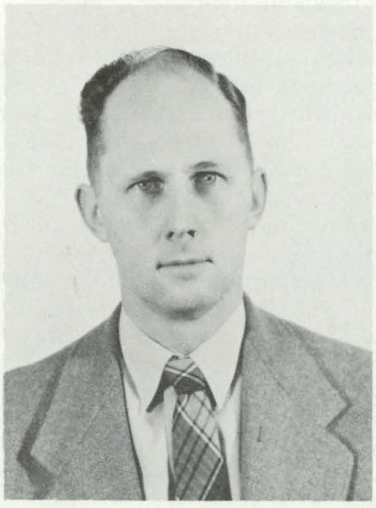
On June 25, J.J. Callahan, chief paleontological preparator, retired from the Geological Survey after more than 28 years of service. Jack, an Ottawa native, served as a sapper with the 2nd Division Field Engineers, was captured at Dieppe in 1942 and spent the rest of the war in a POW farm camp in Prussia. Ardent gardener that he is, to this day Jack won't grow cabbages or turnips as a result.

Over the years, Jack has maintained a great interest in minor league athletics and proved to be one of the star performers with the now defunct GSC bowling league. He and Bert Botte have doubled on several occasions as bartenders for Survey functions, and at the Museum and 601 Booth Street, they formed an unbeatable team guiding all activities of the paleontological laboratory and collections. Jack's cheery presence will be sorely missed around the 6th floor, because of his ability to make excellent paleontological sections and casts and because of his unlimited supply of stories of dubious origin. Even if Jack has retired to spend his waking hours in the garden, refereeing, umpiring and travelling to Montreal to see his beloved Canadiens (win or lose), let's hope he often returns to the office to replenish our supply of jokes! (*see* photo, page 6)

A. (Art) Soregaroli (see GEOGRAM, No. 1, p. 4) resigned from Mineral Deposits Geology Section in May to accept the position of Vice-President, Exploration, Western Mines Limited. He is responsible for the co-ordination and supervision of all hardrock activities of the company. Good luck Art.

D.M. (David) Watson, a native of Ottawa, joined the Mineral Deposits Geology Section, after spending more than 2 years as a mineralogist with the New Brunswick Research and Productivity Council. Dave received his B.Sc. (Honours) from Carleton University in 1973, and has worked several seasons with various mining exploration companies.

H.W. (Hew) Little, Head of Uranium Resources Evaluation Section, has recently retired after 28 years service. Hew received his B.A.Sc. and M.A.Sc. from University of British Columbia and spent several years in the R.C.A.F. and completed his graduate studies at the University of Toronto before joining the Survey in 1947. Until 1967 most of Hew's career was devoted to Cordilleran geology, becoming Head of the Cordilleran Section. In 1967 he accepted the call to undertake a study of uranium and thorium deposits. Started as a one-man show while the uranium industry was still in the doldrums, this project was propelled by the growing energy crisis to become the busy Section that Hew finally headed.



RESOURCE GEOPHYSICS AND GEOCHEMISTRY DIVISION

Staffing seems to have slowed to a crawl in RGG. Two new permanent employees have joined the Geochemistry Section in the period since the last Geogram was assembled. The two new geochemists, both in the field at present, are: Wayne Goodfellow Ph.D. (UNB 1975) currently running a geochemical survey in the Yukon and Barry Smee who is in the field near Penticton. Wayne spend last year doing postdoctoral research at University of New Brunswick on the application of geochemical method to exploration for massive sulfides. Barry completed his B.Sc. at the University of Alberta in 1969, since then he has worked as a geochemist for Cominco, and for Barringer Research. Most recently, while with Barringer, he worked on the air trace system.

TERRAIN SCIENCES DIVISION

Ron DiLabio joined the Sedimentology and Mineral Tracing Section in June. A native of Ottawa, Ron comes

to us from the University of Western Ontario where he has just finished his doctoral dissertation on the anatomy of a glacial indicator train in the Matagami area. Till in the train he studied was so rich in copper that it was actually mined. Ron will participate in the drift prospecting program, specializing in methods and interpretations of detailed sampling around known or suspected mineralization in the Arctic (1976) and Cordillera.

Linda Dredge and Sylvia Edlund were featured in an article in the Ottawa Citizen and described some of their experiences in the Arctic.

John Adshead joined the Sedimentology and Mineral Tracing Section in April. John comes to us from the Department of Agriculture where he has been involved in postdoctoral research on the chemistry and mineralogy of the "active" (<1μ) fraction of soils. John is a clay mineralogist whose Ph. D. thesis on the mineralogy of estuarine sediments of the James Bay region was done at the University of Missouri. John has had several years in the refractory products industry, prior to which he completed a Master's thesis on the Belt Series in his native Alberta. John is at present on five-months leave at the Centre de Sedimentologie et Geochimie de la Surface in Strassbourg, France, where he has been invited to study clay mineralogy of deep-sea sediments. When he returns in November, John will begin research on various aspects of drift mineralogy and its relationship to geochemistry. He will also continue a project designed to define the sedimentological budget of selected arctic lakes – the relationships of lacustrine sedimentation to the nature of the surrounding glacial landscape.

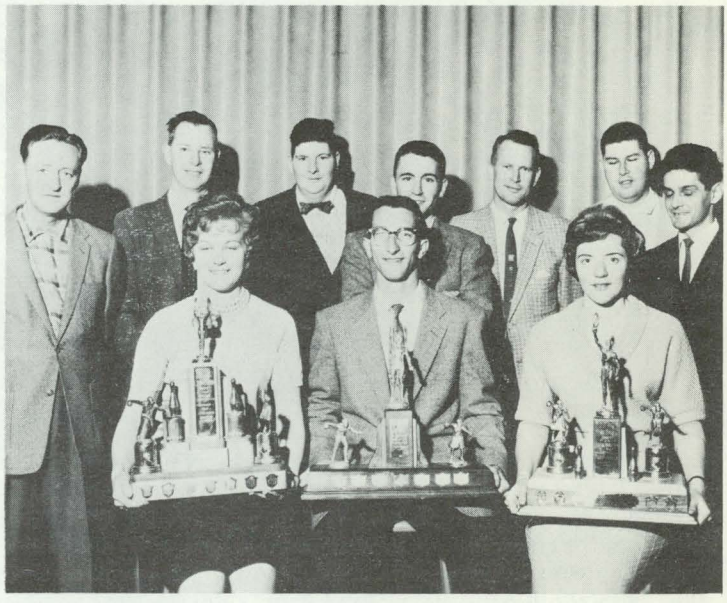
John D. Milliman resigned from the Geological Survey at the end of June to return to his previous position with the Woods Hole Oceanographic Institute. During his brief career with the West Coast Unit of the Marine and Coastal Geology Section, John contributed significantly to the development of the west coast marine geology program through his work on both suspended and bottom sediments in the Strait of Georgia, Fraser River, and offshore areas west of Vancouver Island.

The Departmental nomination of J.S. Scott, Director, Terrain Sciences Division as a candidate for the National Defence College Course has been accepted by the Department of National Defence.

The course, held at Fort Frontenac, Kingston, extends from September 1976 to July 1977 and will be attended by approximately 30 senior military officers and civilians. Studies include various aspects of national and international affairs which determine or significantly affect Canada's external defence and related policies. Comprehensive studies of the various topcis both at the Defence College and at field locations throughout North America, Latin America, Carribean, Europe, Middle East, Asia and Africa are included in the course.

During his absence W. Blake, Jr, R.J. Fulton, C.F.M. Lewis, and W.W. Shilts will, in turn, assume duties as Acting Director, Terrain Sciences Division.

We salute Marie-France Dufour, who has been selected to be one of the judges in the Fencing competitions at the Olympic Games this summer. After having shown their own fencing skills, each judge is chosen to supervise an individual aspect of the art, whether it be watching the style or ensuring that there is no foul play. Congratulations Marie-France, and watch those swords. We hear they tend to be sharp!



This is the only picture we could find of Cliff Major and Jack Callahan – also included are Russ Leader, Lyle Papps, Lloyd Babcock, Serge Courville, Guy Letang, Terry Dregas, Bob Delabio and Barbara Simonds.

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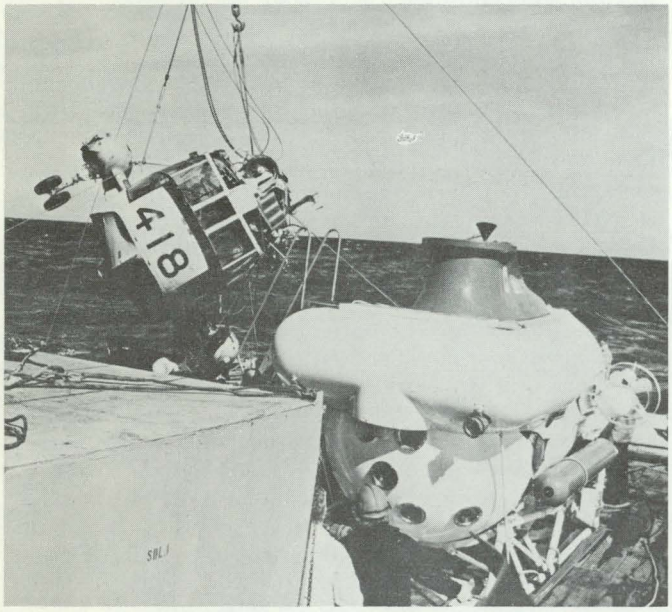
OF GENERAL INTEREST

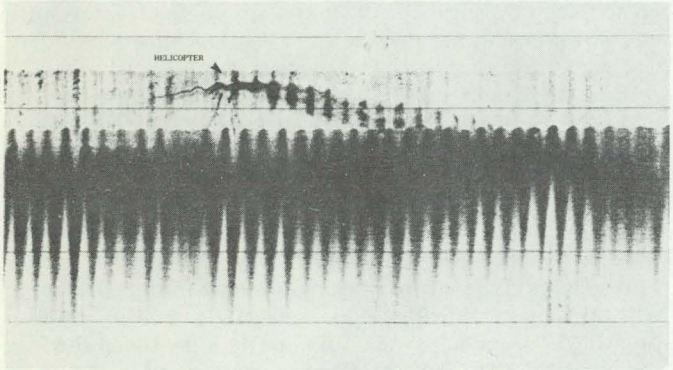
The death at the age of 88 of Norval Kilgour which was reported in the local papers recalled the old Museum days. Norval ran the carpenter's shop and his memorial should surely be an air photo box. He must have made hundreds of these elaborate and beautifully finished boxes to his design. He was very versatile, always in demand for sharpening saws, wrote poems and had some considerable musical talent and could also be persuaded to act as a barber during the lunch hour. He was a gentle and kindly man and it was always a pleasure to visit him in his vast, cavernous shop beneath the auditorium of the Museum.

Application of small-scale detailed surveys to geological studies on the shelf

In April 1973, a Canadian Armed Forces Sea King helicopter crashed and sank into the Atlantic Ocean 25 km. south of Chebucto Head on the Scotial Shelf. The crew escaped unhurt, but the helicopter sank in 150 m of water. In the subsequent search and recovery effort (see photos), many side-scan sonar and precision depth sounding records were obtained in the vicinity of the crash. Data were compiled and a preliminary interpretation of the detailed surficial geology was made by Geomarine Associates under contract to A. G. C. On the basis of this work, additional information (particularly high resolution seismic data) was obtained by the Nova Scotia Research Foundation.



Canadian Armed Forces helicopter that crashed and sank into the Atlantic in April 1973 is winched aboard a barge after its recovery by the SDL-1 (foreground) submersible. (Canadian Forces photograph)



The acoustic record that helped locate the helicopter on the sea floor. (BIO photograph)

In February 1976 a workshop was held at the Bedford Institute of Oceanography to review the results of the data analysis to date, to evaluate the usefulness of the results for application in other areas (particularly coastal areas where work is being carried out by Dalhousie University), and to decide on additional studies that could be usefully carried out during the proposed field work for 1976. The workshop provided an opportunity to discuss recent geological processes on the Scotian Shelf and the applicability of new remote sensing techniques to these. The main outcome of the workshop was the decision to follow up with a further workshop in the fall of 1976 to review the work completed to date in St. Margaret's Bay, N.S. Work there is highlighting interesting geological problems similar to those that were uncovered by the survey conducted to locate the downed helicopter off Chebucto Head.

Such surveys provide opportunities for studying variability in surficial deposits, their causes, and their importance in land use studies. Detailed survey of small areas provides opportunities for calibrating and evaluating new remote sensing techniques.

David I. Ross
AGC – Dartmouth

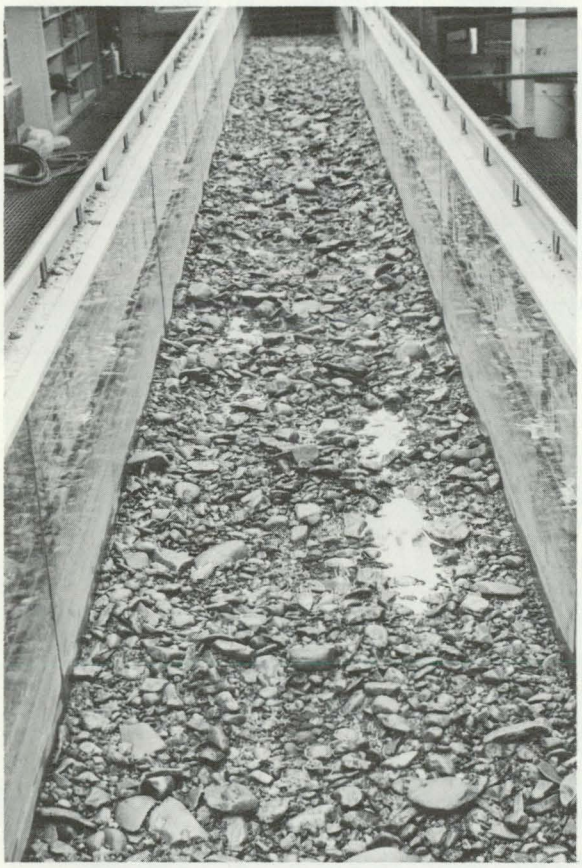
Congratulations to George Falconer and his National Atlas of Canada staff on the award of the Gold Metal of the Royal Canadian Geographical Society to the Atlas. The gold metal has only been presented twice before and was instituted to recognize a significant national or international event. For many years the Atlas staff were our neighbours at 601 Booth Street.

From the Flume Laboratory

The GSC Flume laboratory has provided information on a variety of problems, these notes describe a study concerned with the formation of an armour or surface pavement on channels forming in coarse, nonuniform material. If a sediment mixture is exposed to a shear stress, less than that necessary for general movement, erosion of the finer size fractions is more likely to occur than of the coarser fraction. As this selective degredation continues, the supply of transportable particles decreases forming a layer of coarser material which eventually stabilizes thus preventing further degradation. The formation of armour is considered to be an example of self-stabilizing tendency.

It is of great economic consequence in stable channel design to know whether or not it is possible to use this self-stabilizing tendency of alluvial channels that have coarse, nonuniform bed material. This experimental project was initiated to complement some GSC reconnaissance studies of Arctic rivers. Knowledge of armour formation and hydraulics is critical for channel stabilization, prediction of stage-discharge relationships, and evaluation of the effects of channel disturbances which result in the removal or disruption of the armour layer; all factors of considerable engineering importance.

The GSC flume is an 18 m long recirculating flume (width of 0.76 m). The flume channel is first lined with a known gravel mixture, this material is then subjected to a constant discharge which is maintained (up to 24 hours) until transport is restricted to isolated movements. The hydraulics of this flow (mean velocity, mean depth, velocity profiles) are measured, and five lower discharges are run to permit assessment of the armoured bed. The flume slope is then increased and another test series undertaken. A photograph of a flume bed is shown below. The bed was formed over a slope of 0.0204 by a 90 l/s flow. The bed material ranged in size from 2 to 90 mm. This experiment is the third in a planned series of six, with slopes ranging from 0.005 to 0.05. The roughness of the bed is evaluated from a 5 m traverse (1 cm intervals) along the flume centre. The size distribution of the armour coat is determined by several sampling techniques – wax impregnation, painting of a predetermined surface area, and grid by number - the equivalence of these techniques is also being evaluated. (*see* photo)



The next step in the experiments is to study the formation and characteristics of an armour layer developed under a known sediment transport rate. There is some evidence that, for a constant sediment mixture, the armour layer varies with the prevailing sediment transport. The results of these experiments are more directly applicable to those conditions found in natural rivers.

T.J. Day,
Terrain Sciences Division.

Summer field work – ISPG

Don Cook, Dave Morrow and Willy Norris are spending the summer in the South Nahanni River country. There is apparently no truth to the rumour that this party is primarily researching the role of the Sasquatch in the development of the famous Nahanni myth.

Rick Young, Art Sweet and Walter Nassichuk were in the northern Yukon Territory during part of June, continuing their study of Mesozoic rocks. They were working-guests in the Terry Poulton camp.

Reflecting the current emphasis on coal, a number of Institute geologists have been working on coal-bearing sediments in the foothills. Dave Gibson is continuing his study of the Kootenay Formation in southern Alberta. Ross McLean is studying the Blairmore and related formations in Alberta and northeastern British Columbia. Neil Ollerenshaw is mapping in the Dominion Coal Block. Peter Graham is working in the Upper Elk Valley in British Columbia.

The following will be on mapping projects: Ray Thorsteinsson – Cornwallis and Devon Islands; Bill Kerr and Andrew Miall – Somerset Island; Hugh Balkwill, Ray Rahmani, Dave Wilson, John Wall and Steve Hopkins – western Queen Elizabeth Islands; Bob Thompson – Lady Laurier Lake, north of Peace River; Jim Aitken – Palmer Lake in the Mackenzie Mountains. Brian Norford will be visiting Thompson's camp, and Gord Taylor will be paying a visit to both Thompson and Morrow with J.O. Wheeler.

Ruminations on the Field Season

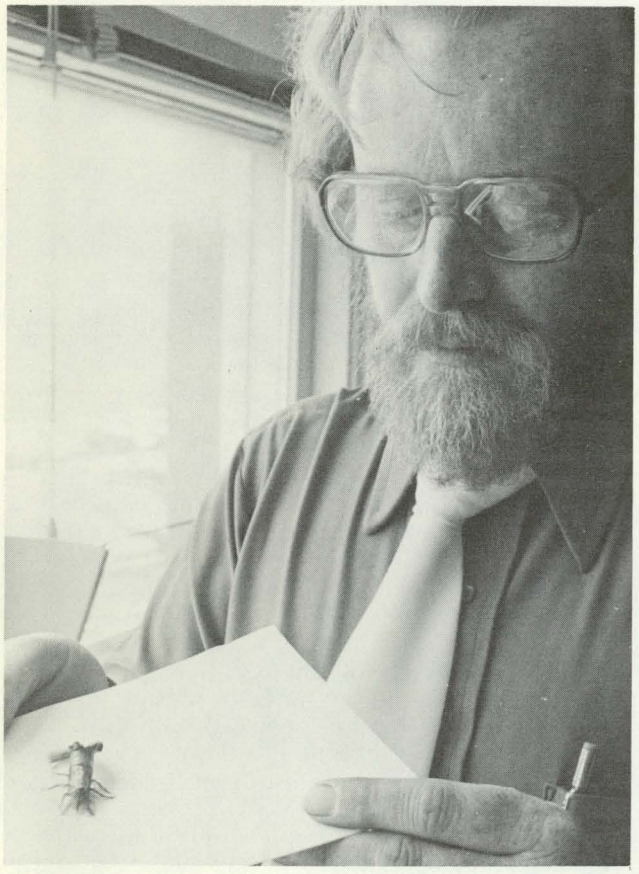
It's that time of year again. You know – when GSC geologists have packed their rock hammers, their K-rations, and their mosquito dope and have headed off to tramp through rocky fields, up vertical outcrops, and down cascading rivers. It's also the time when GSC marine geologists have packed their grabs and corers, their salt-pork rations, and their sea-sickness dope and have headed off to trample over the waves, up one crest and down the other. Alas, it is the time when GSC offices take on a barren look (at least, a geologist – ically barren look). A time when a sort of calm pervades the corridors, the cafeterias, and the conversation centers of the Survey. Come September, GSC geologists, with haircuts and clean undergarments, will be back at their desks painstakingly writing (well, printing) tomes on the magnificent data gathered during the summer. The floors will creak from the weight of rock samples being dragged across them and the

barren look and calm aspect of summer will become the cluttered look and noisy aspect of fall and winter. It can't happen soon enough!

Michael Latremouille
AGC "Rapporteur"

Supershrimp revealed

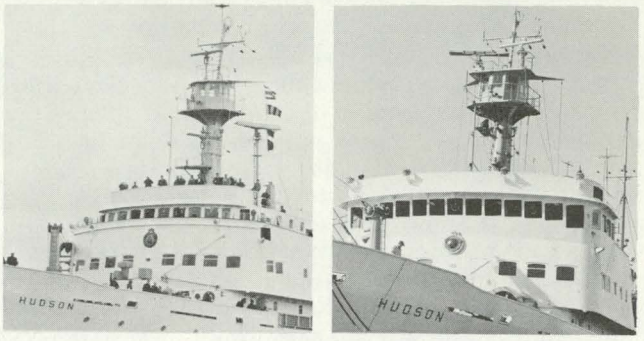
The CBC interviewed Dale Buckley in early June concerning the 1973 *discovery* in Canso Strait *of a mud-shrimp in great numbers*, a shrimp previously thought to be rare worldwide. *Axius serratus*, alias "supershrimp", can burrow to deeper than 5 metres in sediments at an astonishing rate. So fast can it burrow, in fact, that a hydraulic vacuum dredge cannot catch up with it. As a result, few of the shrimp have ever been recovered and scientists had assumed the animals to be extremely rare. In Canso Strait it was discovered that the burrows made by *Axius serratus* number 9 to more than 20 per square metre in polluted sediments. The supershrimp dine on bacteria and so they thrive where the bacterial count in the sediments is high.



Dale Buckley holding one of the "supershrimp" (*Axius Serratus*) collected from Canso Strait, N. S.
(BIO photograph)

Facelift for a queen

CSS *Hudson*, Queen of the BIO fleet, has just had her *bridge rebuilt* as shown by the exterior before and after photos below. The repairs, which cost $202 000, have met with favourable aye ayes from officers and crew. The modification will, among other things, give the captain a better view of the fore deck where much of the over-the-side scientific sampling is conducted.



On the left, the bridge of the CSS *Hudson* as it was before. On the right is the new bridge just completed which offers the captain a wider view.
(BIO photograph)

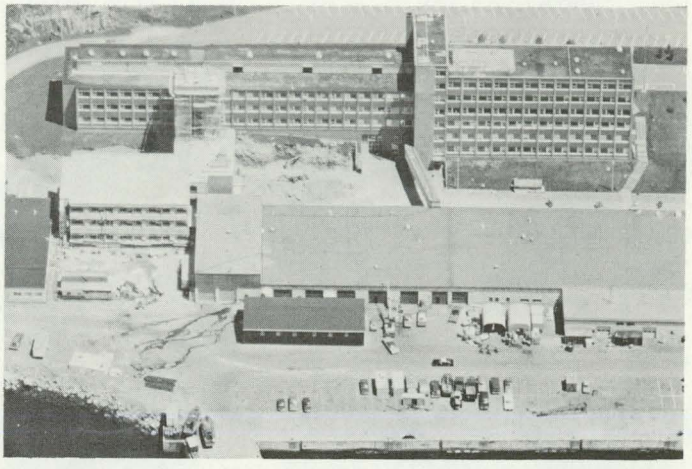
How bilingual can you get?

One young Canadian consulting group that offers services in the earth sciences must want Canadian government business very badly. This becomes apparent when one observes how they meet the challenge of bilingualism: in a document that recently crossed my desk, one of the group's associates is advertised as "bilingual in 5 languages".

W. J. M. van der Linden,
AGC

New Look for BIO

The projected 18 million dollar expansion of the Bedford Institute of Oceanography's facilities is moving along nicely. The accompanying photograph shows the new parking lot (top left) and the new lab wing near completion.



Close-up of new lab building nearing completion at the Bedford Institute of Oceanography. (BIO photograph).

MEETINGS AND VISITS

AGC Sea Gravimeter Calibration Project in Europe

In the previous issue of GEOGRAM the planned calibration of the AGC Askania GSS-2 sea gravimeters over a large latitude range was discussed briefly. The field portion of the project has now been completed successfully. This marks the first systematic calibration of a sea gravimeter over a large gravity range to our knowledge.

During March 1976 two of our GSS-2 sea gravimeters were shipped to the German Hydrographic Institute in Hamburg, Germany. These were then installed in a specially modified VW van in the Hydrograhic Institute Workshop along with two of their GSS-3 gravimeters. A stable table to hold the gravimeters in transport and on station was constructed: it had three legs and could be lowered to the ground and raised, levelled, and isolated from the van motion when on station. It was necessary to keep gravimeters at a constant temperature and this was accomplished by internal electric heaters: these were powered continuously by large batteries that we recharged every night by plugging into our hotel room outlets or other power source. The interior temperature of the van was also well controlled to within 5°C by the van's heater while underway, by a thermostatically controlled propane heater when on station and by a thermostatically controlled electric heater at night. A small gasoline 115V generator was run on station to provide power for the digital voltmeter used to record the gravity values on the GSS-3 gravimeters. A Lacoste and Romberg portable land geodetic gravimeter was taken and used to tie-in the van location gravity readings to the International Gravity Commission Gravity Stations when the calibration van could not be located directly on the stations.

On the morning of April 22nd the calibration trip began in Hamburg with Alan Folinsee, Mike Hughes and Bosko Loncarevic of AGC and U. Carstens of D.H.I. heading south towards Eibsee in the mountains of southern Germany. Seven gravity stations where occupied between Hamburg and Eibsee each way, with a return to Hamburg on the evening of April 26th. Two persons travelled in the van and the other two travelled in a rented VW stationwagen that carried all the personal baggage and the geodetic land gravimeter. Travelling was good and fast on the autobahn and no major problems were encountered.

Keith Manchester replaced Bosko Loncarevic in Hamburg and after some small modifications to the equipment we left Hamburg on the morning of April 29th heading for Hammerfest, Norway. Calibrations were carried out at nine sea gravity meter stations between Hamburg and Hammerfest, usually one in the morning and one in the evening. It took three days to reach Oslo and a further six days to reach Hammerfest. It is interesting to note that it is a shorter drive to Rome from Oslo than from Oslo to Hammerfest. We arrived in Hammerfest on the evening of May 7 after driving on all kinds of roads. The quality of the roads did not depend on the latitude as some of the worst roads were encountered in central Norway. Frost heaves were numerous and with the spectacular scenery and roadside geology the vehicles did not always slow down quickly enough which resulted in some unexpected flights, one which caused a flat tire on the van. In the 1000-metre elevation mountain pass at the Arctic circle very deep snow was encountered, in places up to 9 meters deep on each side of the road. Nevertheless the roads were very nearly always bare. This past winter has seen the greatest snowfall on record in northern Norway. Darkness was nearly non-existent and even at midnight one could take a good photograph without flash.

In a small hotel in Sorkjosen, Norway, one of the few other guests was Marlin Perkins of television's "Wild Kingdom" fame. He and his crew were filming the Laplanders and their reindeer in the area and were waiting to get some pictures of the reindeer swimming to the coastal islands for the summer. When we returned to the hotel he was still waiting. We on the other hand had to stop and let hundreds of reindeer cross a highway ahead of us: they had just swum on to the island near Hammerfest.

We arrived in Hammerfest on the evening of May 7th and left again heading south towards Hamburg on the morning of May 8th. The return trip was unspectacular and went very well; we were all amazed by the great reduction in snow along the sides of the roads and the resulting tremendous number of waterfalls and streams of all sizes pouring over the sides of the road.

We arrived in Hamburg on the afternoon of May 17th and then went south to Gottingen, Germany and returned to Hamburg the next day to tie the northern and southern portions of the calibration trip together. It took one day to remove and pack for shipment all our equipment.

During the trip the calibration van travelled 9850 km and the accompanying car 10 239 km. This is in gravity range, latitude, and also in distance about the same as driving to and returning from Halifax to north Clyde on eastern Baffin Island. We carried out 101 land gravimeter calibrations and 65 sea gravimeter calibration stations. On the southern part of the trip we averaged 365 km perday driving (with three or more gravity calibration stations per day) while the northern portion averaged 415 km per day (and generally only two gravimeter calibration stations per day). Each calibration station took about one hour and fifteen minutes.

This project has been a good example of the value of the bilateral co-operation in science and technology agreement between Germany and Canada where scientists of both countries benefitted significantly from the co-operation on a joint project.

Keith Manchester
Program Support Subdivision
AGC

Cartography Symposium

A large number of cartographers from GSC attended the Ontario Institute of Chartered Cartographers annual symposium, held May 5 and 6 at Carleton University. These meetings were financially sponsored by Environment Canada, organized by the GSC Cartography personnel and hosted by the Geography Department of Carleton. The theme "Resource Mapping - a multi-dimensional view" was of interest to a wide variety of cartographers from all parts of Canada. An extremely interesting paper by Pete Lewis and Brian Bornhold of the GSC on "Geological Mapping on the Continental Shelf" drew an audience of between 150 to 200. This was one of four papers on non-renewable resources; other papers covered renewable resources and human resources. ISPG was represented by Lackie MacLachlan and AGC by Gary Cook. It was generally agreed that this conference was the outstanding cartographic event of 1975-76 and drew the largest audience ever for a national cartographic meeting.

Henry Mindak and George Falconer - Atlas of Canada
Mick Roberts GSC
Jim Maxwell Lands Directorate D. O. E.

I. S. P. G. Papers and talks

Papers were presented at the G. A. C. Symposium on Petroleum Geology in Edmonton by Trevor Powell, Joe Van Elsberg, Ken Roy, Leon Price and Ron Walker. The theme of the papers by Trevor and Joe was diagenesis, while Ken spoke on statistics, Ron on the contribution of sedimentology to Archean geology, and Leon on coal projects of the Mattagami Formation in the Moose River Basin.

The AAPG-SEPM Annual Meeting in New Orleans was attended by Graham Davies, Andrew Miall, and Daryll Myhr. Graham delivered a paper on carbonate diagenesis, Andrew spoke on a Tertiary delta on Banks Island, and Daryll hosted a poster session on some aspects of Cretaceous sedimentation in the Mackenzie Delta.

John Wall presented a paper on Jurassic microfauna of Saskatchewan to the Jurassic Workshop of the Paleontology Section.

Bill Kerr briefed the Innuits at Resolute and Spence Bay on the GSC activities on Somerset Island and Boothia Peninsula. This type of communication has proven effective in keeping the natives informed of our activities.

Meetings, Visits and News from the field - AGC

Dale Buckley and Gus Vilks of the Environmental Marine Geology group leave for Australia August 8 to attend the 25th International Geological Congress to be held in Sydney. Dale and Gus plan to attend many of the sessions and two of the field trips and after the conference they will visit several Australian universities before leaving for Christchurch, N. Z. on September 5. From there they will begin the homeward journey to Halifax with, of course, a "rest-over" in Fiji.

The second part of the joint Miramichi Project was completed in the first week of June. The movements of the main water masses, both fresh and marine, were monitored successfully over a period of two weeks, despite occasional equipment breakdown. Many water samples were taken at the same time to measure oxygen, salinity, suspended particulate matter, bacteria, mercury, trace elements and organic carbon. Grab samples for sedimentary analysis, wood fibre studies, and faunal studies were taken after the monitoring. The third phase, a series of cores and samples taken by divers, was completed on schedule as well. Good weather most of the time enabled the participants on the three phases to complete almost 100% of their objectives. Sediment movement studies will continue all summer on the barrier islands at the mouth of the Miramichi River.

Charles Schafer, Bernard Long and Carl Amos participated in a cruise on the CSS Dawson to the Bay of Fundy and Minas Basin area during the last two weeks in May. Calm weather permitted 175 grab samples to be collected from the Minas Basin in a week. The new Vibracorer was used with considerable success to core the hard bottom sediments in the area. The only drawbacks of the Vibracorer seem to be its size and weight; its 20 foot width and height , and over 5 ton weight make it awkward to use at times, particularly on smaller oceanographic ships like the *Dawson*.

Comings and Goings in Analytical Chemistry - CLAS

Wesley M. Johnson, head of the analytical laboratories at the British Columbia Department of Mines and Petroleum Resources, spent a two month "mini-sabbatical" in Ottawa. More than half of his time was spent in our section, but he also visited Geochemistry, Mineralogy and other areas at GSC, as well as some laboratories at CANMET, NRC, Atomic Energy of Canada and the U. S. Geological Survey (Reston, Va.).

Richard Lechasseur, of the Université du Québec, paid a one-week visit to our laboratories, and also included several hours in Geochemistry and at CANMET.

Hal Champ and Sydney Abbey participated in a two-day Workshop on Trace Analysis by Atomic Spectroscopy at Carleton University. Hal found himself pressed into service as an impromptu speaker at one point when discussion seemed to falter. Syd was a member of a panel on standard samples and standardization.

Embarassing moments: Serge Courville signed up for a course in gas chromatography offered by an equipment manufacturer in Montreal on the two days following the May holiday weekend. So he spent the weekend with friends in the big town, only to find on Tuesday morning that the course had been cancelled because the instructor had fallen ill. A case for Cancellation Leave?

Gerry Lachance, on "long loan" from Mineralogy, was the "star" of an article about our automated X-ray fluorescence analytical system in a recent issue of Canadian Research.

Branch Administrative Officers' Committee Hits the Road!

After many years of arranging out-of-town meetings for division personnel, the Administrative Officers decided to look into the bit about distant pastures being greener and descended en masse on the Atlantic Geoscience Centre in Dartmouth, N.S. for a two-day meeting, May 10 and 11, 1976. Only Al Brusso could not get away, and A. "Red" Jamieson came in his place; Bob Jones travelled from one side of the country to the other to make it. Ron Eden acted as host, and Dr. Loncarevic opened the first meeting with a few well-chosen exhortations and admonitions.

The group met from 1: 30-5: 00 p.m. on May 10, and again from 8: 30 a.m. -11: 00 a.m. on May 11, and covered a wide range of administrative and financial topics. This was followed by the viewing of a film of the 1970 voyage of the CSS *Hudson*, and by a tour of the survey ship itself. This afternoon was given over to individual appointments and tours of the AGC facilities, followed by the return to Ottawa.

This was the first BAOC meeting to be held outside of headquarters and was generally considered to be a useful innovation. Many thanks are due Ron Eden, and to Dr. Loncarevic, for making the facilities of the AGC available to the group.

* *

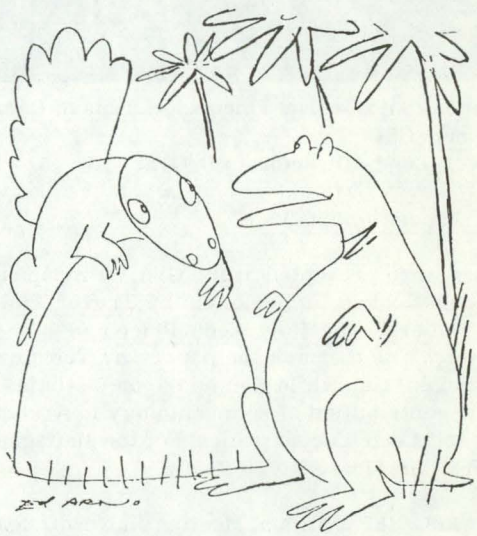
From the Editor

We have received a very thoughful and interesting letter from the AGC Rapporteurs with some retrospective comments on the first year of GEOGRAM and suggestions for the future. They suggest a less formal approach on the first page – in keeping with the sub-title of "An Informal Branch Newsletter" – a list of contents, various other changes of format and also the suggestion that issues be produced in other divisions in regional offices.

We welcome any suggestions, but I have to point out that the production of GEOGRAM requires editorial, typing and layout services – services that are in great demand for our scientific publishing, so we have to keep GEOGRAM in a simple and easily handled format. Some of the suggestions regarding content may well be taken up by other rapporteurs and potential contributors – "items such as an article on the growth of GSC through the years, a list of upcoming lectures, conferences, and workshops, fill-in items of general interest including tidbits on GSC history, activities, etc., a cartoon contest with invited contributions from staff, a rock-photograph contest with samples of the best geological pictures taken by staff during the field season, short reviews or mini-reviews of new general-interest geology texts and, perhaps, of how the Survey is currently being treated by the press, etc.

The section on staff news could perhaps be livened up by including photographs of at least some of the people concerned. Also any new buildings and equipment should be pictorially represented if only by a crude sketch. A more minor point on illustrations is that captions would be easier to distinguish from the main text if they appeared in a different type font. Also, it would be useful if full names of authors and the divisions they work for could be included."

Cartoon credit – Mines and Geology Bull., Dept. of Natural Resources, Alaska. May 1976, by permission.



"It could never work for us - you're at the end of the Pleistocene and I'm at the beginning of the Mesozoic."

Editor/ Rédacteur P. Harker

Editorial Advisors/ Conseillers à la rédaction

M.J. Copeland
P.J. Griffin
Mary LaHam

Material for the next issue of Geogram should be sent to your Division Office or to Mary LaHam.
Les articles pour la prochaine parution de Geogram devront être dirigés au secretariat de votre Division ou à Mary LaHam.