THE ASSOCIATION OF EXPLORATION GEOCHEMISTS

P.O. BOX 523, (METROPOLITAN TORONTO), REXDALE, ONTARIO, M9W 5L4 CANADA

NEWSLETTER

No. 20 SEPTEMBER 1976

SIXTH INTERNATIONAL GEOCHEMICAL EXPLORATION SYMPOSIUM

The Symposium was held as Section 10B of the 25th International Geological Congress in Sydney, Australia on the 19th, 20th, 23rd and 24th of August. As President of your Association, I was extremely gratified to find such a well organized group of A.E.G. members working with such dedication for the success of the Symposium. The identity of the A.E.G. was assured by distinctive A.E.G. badges worn beneath the official I.G.C. name tags. More important for general public relations and publicity for the A.E.G. was the acquisition of an A.E.G. desk at the entrance to the I.G.C. Information Room that served as a focal point for A.E.G. members and all those attending the Symposium, and also served as an advertisement for the A.E.G. Similarly, a display of A.E.G. publications in the I.G.C. Publications Room reinforced the image of the Association as an important scientific body. The bus-boat trip to the northern beaches, Hawkesbury River, and Kaola Reserve on Sunday, 22nd August was blessed by flawless weather -- the late winter blue skies and warm sunshine of New South Wales provided a happy and relaxed break from the constant pressure of papers.

A brief report on the organization of the Symposium and some of the activities is included in this Newsletter, but the next issue will contain a more factual report on the Symposium by Mr. J.F. Gilfillan, the Australian Regional Councillor, and will include a summary of the lead papers of the Workshop session, "Threshold -- Fact or Fiction?". The A.E.G. is indebted to Dr. S.R.M. Butt, Convenor of the Symposium, and his committee in Perth and to Mr. J.F. Gilfillan and his committee in Sydney for their magnificent effort.

EXTRACTS FROM PRESIDENTIAL ADDRESS TO THE SIXTH INTERNATIONAL GEOCHEMICAL EXPLORATION SYMPOSIUM

(Full text will be published in the special Sydney issue of the Journal of Geochemical Exploration, mid-1977)

PRESIDENTIAL ADDRESS OF THE SIXTH INTERNATIONAL EXPLORATION GEOCHEMISTRY SYMPOSIUM BY PROF. G.J.S. GOVETT

In his Presidential Address -- "World Mineral Supplies -- The Role of Exploration Geochemistry" -- to the Sixth International Exploration Geochemistry Symposium held in Sydney as part of the 25th International Geological Congress, Professor G.J.S. Govett (of the Department of Geology, University of New Brunswick, Canada) made a strong plea for greater investment of human and financial resources in mineral exploration to assure adequate mineral supplies to sustain the present living standards in industrialized countries and to permit the less developed majority of the world to attain similar standards. He remarked on the debate among geologists and between them and economists and politicians concerning the adequacy of mineral resources, pointing out that much of the argument and disagreement stems from the failure of many of the protagonists to clearly distinguish between mineral reserves and mineral resources.

He defined this difference as follows: "Mineral reserves are ephemeral figures of the moment -- an estimate of varying reliability of the tons (pounds, ounces, grams) of a particular commodity that is identified and measured in the ground and which can be removed economically from the ground and processed at todays costs and prices and with todays technology. Reserves are dynamic figures that change constantly in response to price, technology, development work, and exploration success. Mineral resources, on the other hand, include not only reserves, but also include identified mineral deposits that are not now economically workable (by virtue of grade, mineralogy, lack of appropriate technology, current prices), plus all unknown mineral deposits yet to be discovered. Mineral resources -- even if we do not know their magnitude -- are conceptually fixed by past geological events. The debate on the adequacy of world mineral resources should now properly be a debate about the adequacy of mineral exploration technology to find mineral deposits, and the adequacy of mining and mineral processing technology to convert mineral deposits into ore bodies from which raw materials can be derived economically. Our concern as exploration geochemists is with the first problem -- finding mineral deposits."

This approach was evident in the recently published book, World Mineral Supplies -- Assessment and Perspective (Amsterdam: Elsevier) edited by Professor Govett and his wife, M.H. Govett. In his Presidential Address, Professor Govett assessed the state of world mineral demand as follows: "The magnitude of world demand for minerals in the year 2000 can be estimated with a reasonable degree of confidence (always provided that no major catastrophe of global proportions occurs in the next 25 years). Assuming that little is done to slow the rate of world

population growth -- and there is no evidence of this happening despite the dire prognosis for the future if the current rate of increase, which will lead to a world population of some six billion by the end of this century, is not slowed -- and given the legitimate striving for development in the countries of Asia, Africa, and Latin America, world mineral demand is conservatively expected to increase at an annual rate between 3.6 and 5.5 per cent. What this means in real terms is that if the very conservative figure of 4 per cent growth per year is used, world mineral supplies will have to double in 18 years and increase four-fold in 36 years. If the less developed countries could increase their per capita mineral consumption in the next 30 years to the same levels that now prevail in the U.S., annual world mineral production in the year 2000 would have to increase 30 times. Whatever assumptions are made...it is clear that pressure will be exerted on some of the world's present conventional mineral reserves -- most particularly copper, tin, zinc, lead, tungsten, molybdenum, titanium, and, of course, petroleum."

In discussing the geographic distribution of world mineral reserves and production, he noted: "At present, a very large share of the world's industrially important minerals are supplied by five developed countries -- the U.S.S.R., the U.S., Canada, Australia, and South Africa. Given the pattern of production (only in the case of bauxite, tin, and cobalt among the important minerals is the share of production in the five countries small), it is not surprising that these five countries also dominate world reserves. Inevitably there are arguments concerning the degree to which this pattern of reserves distribution is a function of where the majority of modern mineral exploration has taken place... it seems to be reasonably certain that the present major producers will maintain their position over the next 25 years: three-quarters of the exploration activity outside of the communist countries has been concentrated in Canada, the U.S., Australia, and South Africa in the past decade; unless this preference for investment in known and politically "safe" countries changes, the pattern will persist."

Professor Govett singled out two inevitable conclusions from the above: "...the average grade of deposits will decrease (which is a problem for mineral extraction technology): and deposits will become increasingly difficult to find -- which is the problem of those engaged in mineral exploration. The greatest long-term problem in mineral exploration is the detection of deeply-buried deposits; the techniques for locating deeply-buried deposits will have to be largely geophysical and geochemical, albeit guided by improved geological understanding and interpretation. This is a challenge that exploration geochemists must accept".

Professor Govett went on to discuss some of the developments in exploration geochemistry and identified some of the problems, stating that considerable more research than is presently being done is required to solve them. He then examined general matters of policy: "Of the three chief components of modern applied science -- government, industry, and the university -- the first two have a direct, although different, interest in ensuring the continued discovery of exploitable mineral deposits. All three have roles to play in developing the appropriate techniques; considerable more progress -- and efficient use of available human and material resources -- would result from

a greater degree of coordination of effort...To achieve the necessary degreee of collaboration will require a change in many individual attitudes. The common attitude of the university academic that the geochemical work of industry is unscientific is matched by industry's view that the academic is divorced from reality -- while the government scientist regards both with an aloof tolerance in many cases. Worse than this is the too prevalent view in universities that exploration geochemistry is not a respectable academic pursuit and in industry that research is not a defensible investment. Given the fundamental dependence of modern industrialized society upon mineral raw materials, it is astonishing how little support research in the earth sciences generally receives relative to other science. (For example, in Canada) not only is the total amount of support to earth sciences as a whole low in absolute terms, the amount awarded to individual research workers in the earth sciences is, on average, the lowest in the general field of science and engineering. The assumption seems to be that somehow the geologist, on his own, will provide the raw materials -- and support goes to research in engineering and chemistry on the processing and fabrication of the raw materials."

He made the point that it is even more astonishing, indeed alarming, that of the very small proportion of total earth science expenditures, the share going to exploration geochemistry research is minimal, especially when it is compared with the relatively large expenditures made by industry and government on geochemical exploration surveys to find mineral resources. He pointed out that "Although scarcely credible, it seems that there is not a single Department of Applied or Exploration Geochemistry in the U.S., Canada, Australia, or South Africa -- four of the "big five" mineral producers: indeed, in the English-speaking world I know of only one applied geochemistry department (at Imperial College, London). Given this background, the achievements of exploration geochemistry are remarkable and a tribute to all engaged in the subject. The situation must be changed, especially in this era when the mining industry is under threat in a number of countries. National science policies must be formulated that encourage the development of research in priority areas -- and I would identify mineral exploration as a priority area -- without diminishing freedom of individual choice and initiative. In terms of our interest -- exploration geochemistry -- universities must encourage the establishment of teaching and research departments in exploration geochemistry; governments must increase research support and provide appropriate tax relief to companies that are interested in conducting or supporting research. In an applied subject the participation of industry is essential; industry should be in the forefront in identifying problems requiring solutions, and universities and governments should be willing to work with industry -- and together -- to assist in providing solutions to the problems."

Professor Govett concluded his address by saying; "I should like to state that I do not believe that the world has any fear of an inherent inadequacy of mineral resources: there are likely to be major problems in converting these resources into reserves unless the available human resources in the earth sciences are more widely used, and a greater proportion of financial resources is devoted to research in mineral exploration. The exploration geochemist has a vital role -- indeed, a moral duty -- in assuring the world its raw materials".

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RECENT PAPERS ON EXPLORATION GEOCHEMISTRY

A new feature of the Newsletter is a list of recent papers on exploration geochemistry appearing in all the major journals except for the Journal of Exploration Geochemistry. The following is the first list of this kind, taking it from the 1972-75 Bibliography to the present. Journals covered are Economic Geology (EG), Geochimica et Cosmochimica Acta (G&C Acta), The USGS Journal of Research (USGS JR), Professional Papers (USGS Prof Paper), Bulletins (USGS Bull), the Geological Survey of Canada Papers (GSC Paper), and the Bulletin of the Canadian Institute of Mining and Metallurgy (CIM Bull).

Ashley R P and Keith W S, 1976, Distribution of gold and other metals in silicified rocks of the Goldfield mining district, Nevada: USGS Prof Paper 843-B 17 p 65¢.

Beck L S and Gingrich J E, 1976, Track-Etch orientation survey in the Cliff Lake area, northern Saskatchewan: CIM Bull 69(769) 104-108.

Bell H, 1976, Geochemical reconnaissance using heavy minerals from small streams in central South Carolina: USGS Bull 1404 23 p $1.10.

Boyle R W, Wandless R K and Stevens R D, 1976, Sulfur isotope investigation of the barite, manganese and lead-zinc-copper-silver deposits of the Walton-Cheverie area, Nova Scotia, Canada: EG 71(4) 749-762.

Camus F, 1975, Geology of the El Teniente orebody with emphasis on alteration: EG 70(8) 1341-1372.

Connor J J, Keith J R and Anderson B M, 1976, Trace-metal variation in soils and sagebrush in the Powder River Basin, Wyo. and Mont.: USGS JR 4(1) 49-59.

Corn R M, 1975, Alteration-mineralization zoning, Red Mountain, Arizona: EG 70(8) 1437-1447.

Culbert R R, 1976, A multivariate approach to mineral exploration: CIM Bull 69(766) 39-52.

Ficklin W H and Ward F N, 1976, Flameless atomic absorption determination of bismuth in soils and rocks: USGS JR 4(2) 217-220.

Friedman I and Denton E H, 1976, A portable helium sniffer: USGS JR 4(1) 35-36.

Fyfe W S, 1974, Geochemistry: Oxford Univ Press, 200 Madison Ave, New York 10016 $13.75.

Gleeson C F and Boyle R W, 1976, The hydrogeochemistry of the Keno Hill area, Yukon Territory: GSC Paper 75-14.

Gleeson C F and Brummer J J, 1976, Reconnaissance stream-sediment geochemistry applied to exploration for porphyry Cu-Mo deposits in southwestern Yukon Territory: CIM Bull 69(769) 91-103.

Harris M and Radtke A S, 1976, Statistical study of selected trace elements with reference to geology and genesis of the Carlin gold deposit, Nevada: USGS Prof Paper 960 21 p $1.20.

Hem J D, 1976, Geochemical controls on lead concentrations in stream water and sediments; G&C Acta 40(6) 599-609.

Kaback D S, 1976, Transport of molybdenum in mountainous streams, Colorado: G&C Acta 40(6) 581-582.

Lalonde J-P, 1976, Fluorine - an indicator of mineral deposits: CIM Bull 69(769) 110-122.

Malcolm R L, 1976, Method and importance of obtaining humic and fulvic acids of high purity: USGS JR 4(1) 37-40.

Miller L J, 1976, Corporations, ore discovery and the geologist: EG 71(4) 836-847.

Miller T P and Bunker C M, 1976, A reconnaissance study of the uranium and thorium contents of plutonic rocks of the southeastern Seward Peninsula, Alaska: USGS JR 4(3) 367-377.

Neuerberg G J, Botinelly T and Watterson J R, 1976, Ochre as a prospecting medium in the Montezuma district of central Colorado: USGS JR 4(3) 359-365.

Olade M A and Fletcher W K, 1976, Trace-element geochemistry of the Highland Valley and Guichon Creek batholith in relation to porphyry copper mineralization: EG 71(4) 733-748.

Routhier P, 1976, A new approach to metallogenic provinces - the example of Europe: EG 71(4) 803-811.

Schmidt R G, 1976, Exploration for porphyry copper deposits in Pakistan using digital processing of Landsat-1 data: USGS JR 4(1) 27-34.

Turek A, Tetley N W and Jackson T, 1976, A study of metal dispersion around the Fox orebody in Manitoba: CIM Bull 69(770) 104-110.

Wrucke C T and Armbrustmacher T J, 1975, Geochemical and geological relations of gold and other elements at the Gold Acres open-pit mine, Lander County, Nev.: USGS Prof Paper 860 27 p $1.45.

This bibliographic compilations are being prepared for the Newsletter by Dr. H.E. Hawkes.

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FROM THE SECRETARY'S OFFICE .....

This is the second Newsletter produced from the new permanent office of the Association established in Rexdale, Ontario. The records of the Association are now in their new home and the activities are becoming more efficient and streamlined. Correspondence from the office is being handled by Mrs. Filicetti or myself.

Many letters are received from the membership and other interested persons. Orders for Special Volumes available from the AEG, requests for application forms, etc. are filled routinely. Other major correspondence includes receipt of advice on changes of address and enquiries regarding individual members dues status.

MEMBERSHIP SUBSCRIPTIONS

Membership subscriptions are payable in advance on January 1st of each year, and, beginning this year, the Association will send out a dues notice with the Newsletter distributed during the September-October period. Your Dues Notice is attached for your attention and completion and you are asked to prepare your payment and forward it to the permanent office of the Association without delay. Subscriptions for the 1977 year are the same as for 1976. For details see your Dues Notice.

Because of the increased costs of publication and distribution of the Journal of Geochemical Exploration and the Association newsletter, all mailing lists will be updated and revised on January 31st of each year. Members are asked to take note of this because late payment of dues, (i.e. payments received after January 31st), may result in interruption of receipt of the Journal and other literature.

In order to make your record keeping easier, a receipt-form which you complete and retain for your own records, is attached for your convenience. Please keep this receipt-form for your future reference.

The Associations' records indicate that the following members have paid all or part of their 1977 dues. The Association would appreciate receiving the balance due as soon as possible.

Name		Amount Paid
Archer, A.R.	Vancouver, B.C.	$27.00
Atkinson, P.R.	Claremont, W. Australia	5.00
Bell, III, H.	Reston, Virginia, U.S.A	27.00
Bolter, E.	Rolla, Mo. U.S.A.	27.00
Bondar, W.F.	Ottawa, Canada	27.00
Bose, S.K.	Calcutta, India	42.50
Burgoyne, A.A.	Burnaby B.C.	27.00
Carpenter, R.H.	Athens, Georgia, U.S.A	27.00
Davies, R.	Toronto, Ont.	7.50
Flesher, E.M.R.	Phillips Arm, B.C.	27.00
Forgeron, F.D.	N. Vancouver, B.C.	27.00
Foster, R.L.	Reno, Nevada, U.S.A.	27.00
Gammon, J.B.	Oslo, Norway	27.00

Name		Amount Paid
Hansen, D. A.	Spokane, Wash. U.S.A.	$27.00
Jaffe, F.C.	Geneva, Switzerland	27.00
Kidd, R.	Toronto, Ont.	27.00
Morse, R.H.	Willowdale, Ont.	27.00
Muller-Kahle, E.	Wheat Ridge, Colo. U.S.A.	27.00
Ong, H.L.	Bandung, Indonesia	27.00
Overstreet, W.C.	Santa Fe, N.M. U.S.A.	27.00
Rosenblum, S.	Denver, Colo. U.S.A.	27.00
Rowlands, N.J.	Adelaide, Australia	11.50
Shiikawa, M.	Akita-Shi, Japan	27.00
Sinclair, I.G.L.	Toronto, Ont.	27.00
Stevens, D.N.	Golden, Colo. U.S.A.	27.00
Takahashi, K.	Jeddah, Saudi Arabia	1.50
Thompson, I.S.	Toronto, Ont.	27.00
Tilsley, J.E.	Toronto, Ont.	27.00
Wallace, S.R.	Lakewood, Colo. U.S.A.	27.00

Several people receiving this newsletter have yet to pay their 1976 dues. The Association believes that busy schedules and other reasons often cause members to overlook such payments when due. Consequently a letter will be sent to all those in default. Regretfully, the Association will not be able to accomodate late submissions of dues in future years.

SIXTH INTERNATIONAL GEOCHEMICAL EXPLORATION SYMPOSIUM

The Association expresses its thanks to the following persons who formed the Organizing Committee for the 6th International Geochemical Exploration Symposium (which was also Section 10B of the 25th International Geologcal Congress) held in Sydney, Australia in August 1976:-

Technical and Editorial Committee

Dr. C.R.M. Butt (Convenor-Section 10B); Dr. I.G.P. Wilding; Dr. R. Davey; Dr. R. Mazzucchelli and Dr. R.E. Smith.

Program, Workshop, Social, Campus, etc. Committee

Mr. J.F. Gilfillan (Chairman; AEG Regional Councillor); Dr. R. Cox; Dr. J.J. Hobbs; Mr. N.J. Marshall; Dr. A.L. Mather; Dr. W.R. Ryall; Dr. G.F. Taylor and Dr. J.R. Wilmshurst.

Mr. Gilfillan reports that over 60 A.E.G. members identified themselves at the Information Desk and the various papers were attended by up to 250 people. Many interesting discussions took place and over 400 copies of the last A.E.G. Newsletter, (No. 19), and over 110 Membership Application forms were taken by interested persons.

The following companies and organizations graciously made available members of their staff for various periods during the Symposium:-

Amoco Minerals Aust. Co: Australian Oil and Gas Corp. Ltd.;

Australian Selection (Pty) Ltd; C.S.I.R.O. - North Ryde; Getty Oil Development Co. Ltd; Pancontinental Mining Ltd., and Placer Exploration Ltd.

Drafting and printing of signs was undertaken by the N.S.W. Geological Survey. The Association is particularly indebted to the C.S.I.R.O. in North Ryde and Perth for numerous invaluable services.

The Proceedings of the 6th International Geochemical Exploration Symposium will be published by Elsevier. Details will follow in future newsletters.

Extracts from President G.J.S. Govett's address at the Meeting are included in this newsletter.

An A.E.G. Council Meeting was held during the Symposium and AEG members were invited. Council Members present welcomed the opportunity to meet with members from several different countries of the world and discuss matters of mutual interest and ways in which the Association can better serve the membership and facilitate greater and better communication among geochemists. All recommendations are receiving serious consideration and improvements will be implemented at future Council Meetings in the current year. Council is grateful for this input.

The next symposium - the 7th International Geochemical Exploration Symposium - will be held in Golden, Colorado, U.S.A. during the week of April 10th, 1978. Information on this meeting will begin to flow early next year.

SPECIAL VOLUMES

All members should have received through the mails their copies of A.E.G. Special Volume No. 5 "Exploration Geochemistry Bibliography, January 1972 to December 1975" compiled by H.E. Hawkes. This volume is available free of charge to all paid-up members of the AEG and will also be distributed free to new members whose applications are accepted before July 1st 1977. Additional copies of Volume No.5 for members and copies for non-members are available from the Rexdale office at a cost of $10.00 each on a PAYMENT with ORDER basis. Application forms for membership are available from the Rexdale office or from Members of Council.

Please be advised that all copies of the "Field Excursion Guidebook - Selected Mineral Deposits of New Brunswick" compiled and edited by W.D. Goodfellow, J.L. Wahl and G.J.S. Govett have been SOLD OUT.

Copies of AEG Special Volume No.1 "Exploration Geochemistry Bibliography, Jan. 1965 to Dec. 1971", 118 pages,($7.50) and AEG Special Volume No. 4 "Application of Probability Graphs in Mineral Exploration" by A.J. Sinclair, 95 pages ($8.00 non-members; $6.00 A.E.G. members and students) are still available from the Rexdale office on a PAYMENT with ORDER basis.

The papers presented at the Fredericton Meeting in April 1976 will be published as a volume of the Journal of Geochemical Exploration in November. All paid-up members will receive this 200-300 page volume as part of their subscription, but additonal copies for university or company office libraries, non-members of the AEG etc., can be ordered through the AEG Rexdale office for a very reasonable $25.00. Once again, only PAYMENT with ORDER requests will be filled.

JOURNAL OF GEOCHEMICAL EXPLORATION

The membership will be interested to learn that the Journal of Geochemical Exploration is doing very well with a circulation of 1250 and growing. This is an impressive record for a specialized scientific journal and the J.G.E. is an excellent vehicle for publication of important papers. The Editor-in-Chief will be pleased to receive your manuscripts.

MEMBERSHIP CERTIFICATES

Apprroximately 18 months ago the Association received its first enquiries about the availability of AEG Membership Certificates - in a form suitable for framing and display. Enquiries were made and Council's decision to make Membership Certificates available at a cost of $5.00 each was announced in the first Newsletter of 1976. This offer was contingent on a large enough group of the membership wishing to purchase these Certificates. To date, the A.E.G. has received requests from less than one dozen members for Membership Certificates, and, unless there is an upsurge in demand in the next few months, Council's offer to the memberhip will expire. A minimum demand for 40 Certificates is required.

NOMINATIONS FOR ORDINARY COUNCILLORS

Since the publication of Newsletter No. 19, the Secretary's office has received three nominations for Ordinary Councillor to the time of this writing (September 30, 1976). There is no upper limit to the number of nominations that can be accepted, and membership is referred again to By Law 39 (iv) stating ".....any six voting members may nominate any duly qualified Member for election as an Ordinary Councillor by delivering such nomination in writing to the Secretary together with the written undertaking of the Member to accept office and attend Meetings of Council if elected".

Nominations close November 1st, 1976. If this reminder reaches you too late this year - please note this constitutional provision for next year.

INFORMATION FROM THE MEMBERSHIP

The Association has received four recent communications from members advising of meetings, and a workshop of possible interest to others and also of a drafting aid for production of geochemical maps. Details will be found on pages 11, 12, 13, and 14.

The AEG Newsletter has a very significant world-wide distribution among exploration geochemists and other geoscientists and an excellent medium for exchange of interesting information on exploration geochemistry. It is suggested that professors or department heads consider summarizing their departmental activities in exploration geochemistry in not more than 250 words for publication in future issues of the newsletter.

A N N O U N C E M E N T S

1. GEOCHEMICAL EXPLORATION IN THE CANADIAN SHIELD

The Department of Geological Sciences, McGill Univeristy, in association with the Mineral Exploration Reearch Institute, will offer a one week professional short course on the theme "Geochemical Exploration in the Canadian Shield" from January 24 to January 28, 1977.

Lectures, case histories and workshops will be conducted by personnel from government, mining companies, universities, and independent consultants.

Registration will be limited. The registration fee will be $300.00.

Inquiries and requests for registration should be directed to:

G.R. Webber,
Department of Geological Sciences,
McGill University,
P.O.Box 6070, Station 'A'
Montreal, Quebec. H3C 3G1

2. SECOND CIRCUM-PACIFIC ENERGY AND MINERAL RESOURCES CONFERENCE

The Circum-Pacific Council for Energy and Mineral Resources announces its second conference to be held July 30-August 4, 1978 at the Hilton Hawaiian Village, Honoloulu, Hawaii. This international conference is sponsored by The American Association of Petroleum Geologists, The Committee for Coordination of Joint Prospecting for Mineral Resources in Asian Offshore Areas, The Pacific Science Association, The American Mining Congress, and the University of Hawaii.

This Conference will follow the general pattern of the very successful 1974 Conference by presenting approximately 120 papers by outstanding international scientists and statesmen on the energy and Mineral potential of this vast region. These forward-looking papers will focus on future needs and potential for petroleum, oil shale, tar sands, coal, geothermal energy, nuclear energy, minerals, ores, and ground water. A special seminar on environmental geology will be offered during the Conference. The 1974 Conference papers are being published this

summer in a special A.A.P.G. Memoir, and it is our intention that the 1978 Conference papers will be similarly published.

Pre-and post-Conference geological field trips similar to those in 1974 will be conducted on the islands of Kauai, Oahu, Maui, and Hawaii.

Consideration is being given to holding a subsurface methods workshop during the week prior to the Conference.

For further information please write to:

1978 Circum-Pacific Conference,
c/o AAPG, P.O.BOx 979,
Tulsa, Oklahoma U.S.A. 74101

3. EXPLORATION 77

An international symposium on the application of geophysics and geochemistry to the search for metallic ores will take place in the Chateau Laurier Hotel, Ottawa, from 16 to 20 October, 1977. The meeting is sponsored by the Canadian Geoscience Council, the central coordinating body of Canadian geoscientific societies. It is patterned after the very successful Conference on Mining and Groundwater Geophysics held at Niagara Falls in 1967, which was attended by scientists from more than 50 countries.

EXPLORATION 77 will be a state-of-the-art review of geophysical and geochemical techniques, directed towards all concerned with the theory and practice of mineral exploration. It is aimed to inform and stimulate exploration geologists and managers as well as exploration geochemists and geophysicists. Approximately 24 review papers will be delivered over three days by internationally known authorities, with evening discussion sessions. On the fourth day a series of international exploration case-histories will be presented, and on the fifth day there will be a choice of local excursions. An exhibition of Canadian exploration equipment and services will be held in conjunction with the Symposium. The Proceedings will be published by the Geological Survey of Canada. The meeting will consist of single sessions and this will place an upper limit on registrations.

Early in 1977 the detailed program will be announced, and those hoping to attend will be invited to respond. Pre-registration and accomodation forms will be sent in May/June of 1977.

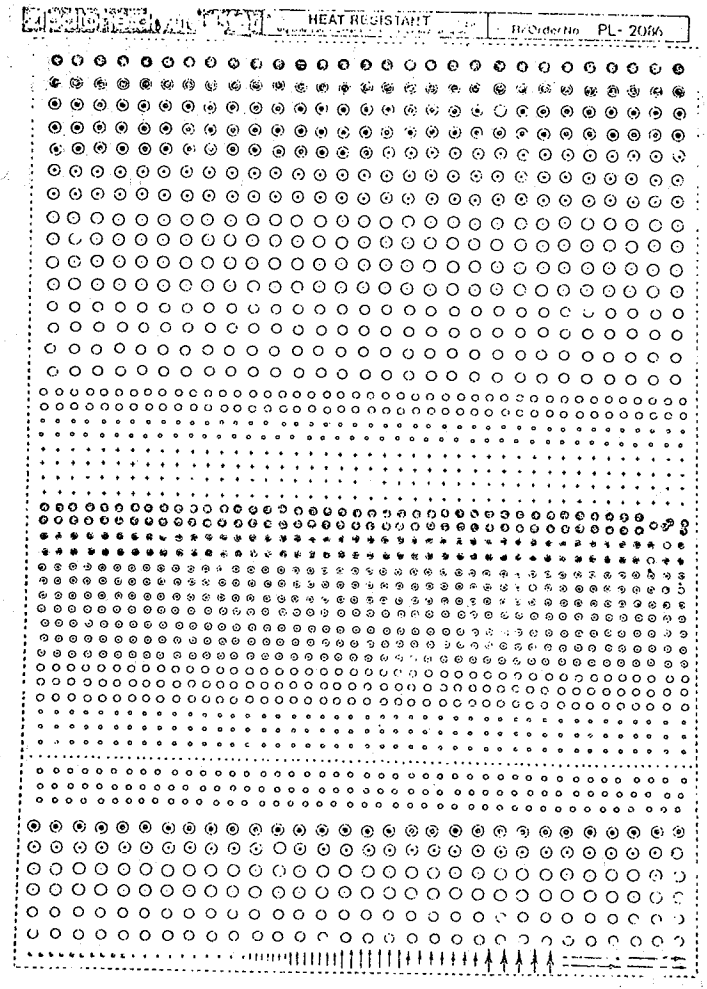
P.J. Hood,
Chairman, Program Committee,
601 Booth Street,
Ottawa, Canada K1A 0E8

A.G. Darnley,
Chairman, Organizing Committee,
601 Booth Street,
Ottawa, Canada K1A 0E8

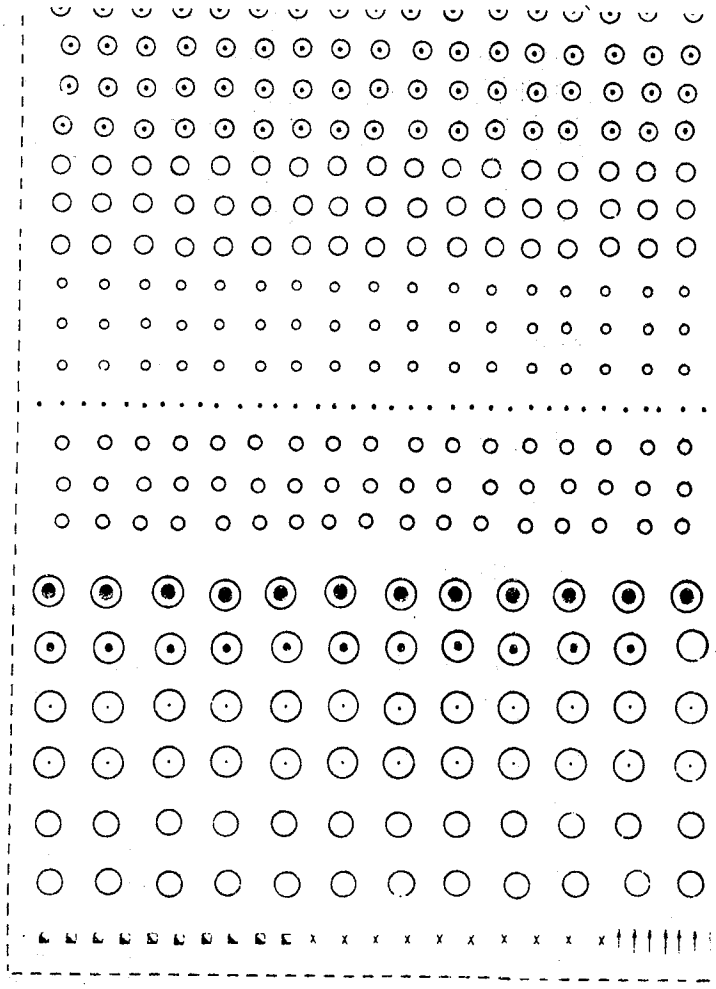
4. SYMBOLS FOR GEOCHEMICAL MAPS

Professor John E. Callahan of Appalachian State University has advised the Association of a custom Zipatone symbol sheet for use in the preparation of geochemical maps. Prof. Callahan writes "One of the problems with the production of geochemical maps, that are not contoured, has been the choice of symbols or the availability of symbols for these maps. As a result many exploration geochemists have had to rely on the commercially available symbols or go to the time and expense of preparing their own custom sheets. Because of this problem, I have prepared my own custom sheet patterned after a sheet of symbols I obtained from Prof. Ian Nichol at Queen's University. There are two basic sizes of symbols on the same sheet, with one of a base of 4 mm to 1 mm and the other starting at 3 mm to 1 mm. These custom made sheets (32.5 cm x 23.5 cm) can be ordered from Zipatone Inc. of 150 Fencl Lane, Hillside, Ill. 60162 USA. The plate reorder number is PL-2086 and the minimum order is for 50 sheets at $3.50 per sheet."

For the information of the membership, reproductions of PL-2086 are illustrated below.



(Reduced Zipatone Sheet. Actual Size 32.5 cm x 23.5 cm)



(Actual Size)

Zipatone PL-2086

Prof. Callahan notes that if special arrangements are made to buy in quantity, very significant discounts may be available.

Some members may wish to recommend other custon symbol sheet for geochemical use, which, together with PL-2086 could form the basis for a standard symbol use if such a system is desirable.

Prof. Callahan has kindly agreed to receive comments and opinions from the membership on the matter of symbols. If you are interested in PL-2086 or in the design of other geochemical symbol sheets, please contact him at the following address:

Prof. J.E. Callahan,
Department of Geology,
Appalachian State University,
Boone, North Carolina, 28608

We will advise membership of the response in due course.

NEW MEMBERS

Applications for membership in the Association from the following individuals have been recommended for acceptance by the Admissions Committee and approved by Council. The Bylaws provide that if, after a minimum of 60 days have elapsed following the submission of a candidate's name to the voting membership in the newsletter, no signed letters have been received objecting to the admission of the candidate, he will be declared elected.

	Member
Adams, S.C.	Indiana, U.S.A. - Geochemistry research trainee, Mineral exploration consultant.
Allcott, G.H.	Denver, Colo., U.S.A. - Geologist.
Chacon, N.I.	Lima, Peru - Geochemist.
Joyce, A.S.	North, Quay, Qld., Australia - Department Head of Applied Geology, Queensland Institute of Technology.
Kelly, G.R.	Townsville, Qld., Australia - Exploration geochemist/geologist.
McBride, D.E.	Bathurst, N.B., Canada - Resident Geologist, The Price Co. Ltd.
Ojo, O.M.	Jos, Nigeria - Principal Geologist, Nigerian Mining Corp.
Perrault, G.	Ste. Foy, Quebec, Canada - Vice-President for research, SOQUEM.

Riese, W. C.	Albuquerque, N.M. U.S.A. - Geologist, Gulf Mineral Resources Co.
Saheurs, J-P., G.	West Germany - Senior Research Fellow, University of Heidelberg.

Affiliate

Carvalho, N.B.	Sao Paule, Brazil - Exploration Geologist.
Castle, B.E.	Anchorage, Alaska - Exploration Geologist, Union Carbide Corp. (transfer from student).
Cox, R.S.	Braamfontein, South Africa - Exploration Geochemist, Phelphs Dodge of Africa Ltd.
Emami, M.S.	Tehran, Iran - Chief, Geochemistry Div. of URIRAN.
Raforth, R.L.	Boulder, Colo., U.S.A. - Exploration Geologist.
Wieler, A.	Brazil - Geologist, Mineracao Morro Velho S.A.

Student

Bamwoya, J.J.	Post-graduate student at University of New Brunswick, Canada.
Chork, C.Y.	Post-graduate student at Univeristy of New Brunswick, Canada.

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LOST MEMBERS

Copies of Newsletter No. 19 addressed to the following members in the cities indicated were returned to the Association office:

J.A. Criswell, Golden, Colorado, U.S.A.

M.R. Khalie, Beirut, Lebanon.

Q.C. Lusty, Carlin, Nevada, U.S.A.

Change of address information on these members would be appreciated.

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LAST MINUTE NEWS

MORE CONCERNING THE JOURNAL OF GEOCHEMICAL EXPLORATION

Dr. Eion Cameron, Editor-in-Chief, writes as follows:

"At the time of writing (early October) 3 issues of the Journal are in press. The first of these, a 240 page issue to be distributed in October, is a special issue on Exploration Geochemistry in the Scandinavian Countries, edited by L.K. Kauranne. This issue brings together a large number of short summary papers discribing previously unpublished work and should be of particular interest to readers working in glaciated terrain. The second special issue will appear in November. This is Exploration Geochemistry in the Appalachian and comprises 280 pages of proceedings from the AEG meeting held in Fredericton earlier this year. The editor is our current president, G.J.S. Govett. The final issue of the 1976 Volume year will be a regular issue of 7 papers accepted to the end of August.

Next year we again plan to publish a mixture of regular and special issues. The special issues will be on exploration for oil and gas, post-poned from 1976, and the proceedings of the Sydney Symposium."

THE ASSOCIATION OF EXPLORATION GEOCHEMISTS

1977 MEMBERSHIP DUES

1977 Annual subscription to the AEG are due January 1st, 1977 and payable in advance.

Members are asked to forward their subscriptions proptly to the AEG, Rexdale office upon receipt of this newsletter. The Association regrets that it may be necessary to remove a member's name from the Association's mailing lists (including the Journal of Geochemical Exploration) if subscriptions are not received before February 1st, 1977.

Your cancelled cheque is your receipt.

Keep this portion for your reference of payment

Date Feb 17 /77

Amount $42.50

THE ASSOCIATION OF EXPLORATION GEOCHEMISTS

CHANGE OF ADDRESS

TO: The Secretary, Association of Exploration Geochemists,
P.O.Box 523,
Rexdale, Ontario M9W 5L4
Canada

Please be advised of my change of address effective immediately. For your complete records I provide the following information.

(i) My old address:

Print Capital Letters Please

Name _____

Address _____

_____

_____

(ii) My new address (to which all AEG correspondence and the Journal of Geochemical Exploration will be forwarded).

Print Capital Letters Please

Name _____

Address _____

_____

_____

I would be grateful if you would adjust your records accordingly.

Yours Sincerely,

_____
Signature

FOR CANADIAN MEMBERS ONLY

CANADIAN GEOSCIENCE COUNCIL

The Canadian Geoscience Council (C.G.C.) has evolved into the national coordinating and representative body for geoscience in Canada and has assumed an international role in representing Canada's interests in various international activities. The Association of Exploration Geochemists was one of the earliest members of the C.G.C. where the interests of Canadian members of the A.E.G. are represented. One of the more significant aspects of A.E.G. membership of C.G.C. is that exploration geochemists have a voice in the formulation of national geoscience policy. It is particularly gratifying, for example, that an exploration geochemist (Dr. J.A. Coope, Secretary of A.E.G.) is a member of the External Advisory Committee to the Geological Survey of Canada (see below).

For your information the following paragraphs give some background information on the C.G.C. and some news of the recent activities. To achieve maximum effectiveness in C.G.C. it is essential that members of A.E.G. make their views known; your A.E.G. delegate to C.G.C. 1975-1977 is G.J.S. Govett.

Background Information on C.G.C.

Intoduction

The Canadian Geoscience Council is a unique organization existing to foster close relationships among the earth science learned societies and professional associations in Canada and to encourage the development of the geosciences in the best interests of both individual geoscientists and the Canadian nation as a whole. Some of its other objectives are to provide advice to governments on science policy and its implementation especially on matters involving the earth sciences, to promote science education in Canada, and to provide an informed opinion on matters of public concern relating to the earth sciences.

The Council was formed in 1972 with an initial membership of three societies; this grew to ten by the end of the first year. The membership now includes the following twelve major associations all of which are concerned with geoscience and operate on a national scale;

Association of Exploration Geochemists, Canadian Section
Canadian Exploration Geophysical Society
Canadian Geophysical Union
Canadian Geotechnical Society
Canadian Institute of Mining and Metallurgy
Canadian Rock Mechanics Group
Canadian Society of Exploration Geophysicists
Canadian Society of Petroleum Geologists
Canadian Society of Soil Science
Canadian Well Logging Society
Geological Association of Canada
Mineralogical Association of Canada

The Council is financed by dues from its member societies and by a sustaining grant from the Department of Energy, Mines and Resources. Individual Council projects are supported by government contracts and by grants from the Canadian Geological Foundation.

Canada is possibly the only country with a large population of geoscientists which has achieved a single, non-governmental co-ordinating council. This Council grew out of recommendations of an exhaustive study commissioned by the Science Council of Canada entitled "Earth Science Serving the Nation." The report suggested that co-ordination and representation previously effected by the National Committee on Research in the Geological Sciences, which operated under aegis of the Department of Energy, Mines and Resources, should be replaced by a council formed of representatives of Canadian geoscience societies. Preliminary meetings held under the chairmanship of Duncan R. Derry led to the formation of the Canadian Geoscience Council in February 1972.

The Council has many significant achievements to its credit since its founding. It has prepared and submitted briefs on national science policy. It sponsored an International Workshop on Geoscience Aid to Developing Countries which led to the formation of the Association of Geoscientists for International Devleopment. It is presently sponsoring Exploration '77, an international mineral exploration technology symposium. The Council is an adherent to SCITEC (Association of the Scientific, Engineering and Technological Community of Canada) in order to exchange views with other non-governmental scientific groups and to ensure geoscience input in this national forum of scientists.

Annual Reports

The Canadian Geoscience Council has assumed responsibility for preparing a biennial analysis of the status of the various sub-disciplines of geoscience in Canada. In the intervening years a shorter report will be prepared on selected topics. The first report 'Geosciences in Canada, 1974' was based on the submissions of 80 contributors selected by the Member Societies. It was published as the Geological Survey of Canada Paper 75-6. The second report entitled 'Aspects of the Geosciences in Canada, 1975' was published as G.S.C. Paper 76-6. In addition, Council has undertaken responsibility for the publication of the series 'Current Research in the Geological Sciences' which will appear annually as G.S.C. Paper XX-6, Part 2. Persons who are members in good standing of any of Council's Member Societies are entitled to receive a free copy of these reports through the Geological Survey of Canada (601 Booth St., Ottawa, Ontario, K1A 0E8) upon application to the Director. The general public may purchase copies through any outlet of the Queen's Printer.

Representations on Behalf of Geoscience

A special committee of Council met with appropriate Cabinet Ministers and senior civil servants in 1975 to discuss implications of the first status report and to press for implementation of certain of its recommendations. The committee was well received and such representations will continue annually.

Advisory Committee

A committee to examine and comment upon the current activities and programme planning of the Geological Survey of Canada was initiated in 1976. Selected from a list of geoscientists provided by Council, it reports both to senior officials of Energy, Mines and Resources and also to the scientific community through Council and its Member Societies.

International Geoscience

Council had recently assumed the role of the National Committee for Geology and now acts as the adhering body to the International Union of Geological Sciences, the International Geological Congress, and the Canadian Committee for International Council of Scientific Unions. Council is also responsible for Canadian participation in the International Geological Correlation Programme and the International Geodynamics Project.

Geoscience Education

Starting in 1975 Council, through its Education Committee and with financial support of the Canadian Geological Foundation, initiated a continuing series of regional workshops for teachers of geoscience at the secondary school level. The Committee has also prepared a resource document for which Council has provided subsidized distribution.

The Canadian Geoscience Council has good reason to believe that the geosciences now rank among the best integrated groups in Canadian science.

Head Office

Department of Earth Sciences,
University of Waterloo,
Waterloo, Ontario,
N2L 3G1.

Executive Committee

C.G.C. News

The Canadian Geoscience Council, meeting in Edmonton May 25, announced two major accomplishments in its list of the year's activities. One ot these was an invitation from the Geological Survey of Canada to name an external committee which could scrutinize the activities of the Survey, the Canadian Government's oldest scientific institution. The other was assumption of the role of Canada's national committee dealing with matters related to international geology.

The external committee to the Geological Survey is beleived to be one of the first of its kind in Canada. Other government departments have themselves appointed their consultants and advisers. This policy was criticized some years ago by Professor J. Tuzo Wilson of Toronto, Canada's leading geoscientist. The Survey has avoided such criticism by asking the earth science community, through its Council, to name the advisers. The initial members of the Committee are: Professor M.J. Keen of Dalhousie University (Chairman), Dr. D. Weir of Chevron Standard Limited of Calgary, Dr. A. Sutherland-Brown of the British Columbia Department of Mines, Dr. Alan Coope of Newmont Mining Corporation in Toronto, Dr. John Mollard of Regina, a consulting photogeologist, and Professor David Strangway of University of Toronto.

The Committee met with Dr. C.H. Smith, senior assistant deputy minister of Mines, Energy, and Resources, and Dr. D. McLaren, director-general of the Geological Survey, to discuss current programs, future planning and its own terms of reference. Interviews took place in Ottawa with the heads of the various divisions of the Geological Survey to determine the constraints upon their functions and to discuss their long and short term goals. They also sat in on one phase of a decision-making meeting on the Research Grant Proposals by which the Survey funds aspects of non-governmental geoscience research. During the remainder of the year the Committee will visit Survey research centers in Vancouver, Calgary, and Halifax, following which reports will be prepared for senior officials of the Department of Energy, Mines and Resources and for the Canadian Geoscience Council. The Council report will be published for the benefit of the Canadian geoscience community. Commenting on the work of the Committee, chairman M.J. Keen of Halifax stated: "Our broad aim is to aid the continuing development of excellence in the Geological Survey. By further contributing to the cross-fertilization between government, industry and the universities we hope to air the common frustrations that hamper our attempts to address ourselves to major problems in the national interest. The Committee hopes eventually to ensure that the whole community of earth scientists will aid the Survey in meeting the demands placed upon it by its many clients." E.R.W. Neale, president of the Geoscience Council, stated that the Geological Survey of Canada had set a rare precedent in openness by inviting external scrutiny of its operations. It was a major step in promoting mutual trust and cooperation in the scientific community at a time when the struggle for scarce funds together with acrimonious resource debates was causing divisiveness.

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Meeting in Edmonton, May 25, the Canadian Geoscience Council announced creation of the post of Foreign Secretary. The first incumbent, Dr. W.W. Hutchison of Ottawa, is a past-president of the Geological Association of Canada. The Council will assume many of the roles formerly carried out by government. It will serve as the National Committee on Geology, appoint delegates to the Interantional Geological Congress and the International Union of Geological Sciences and act as a liaison with federal and provincial agencies on matters of international science. Chairmen of all Canadian committees dealing with international geoscience (e.g. International Geodynamics, International Geological Correlation) will be invited to report to the Geoscience Council through its Foreign Secretary. Dr. Hutchison will also act as chairman of a standing committee on International geoscience.

The Canadian Geoscience Council is the coordinating body of 12 earth science societies comprising 10,000 members. Its interest in international affairs dates back to 1974 when it sponsored a workshop in St. John's Newfoundland, on earth science aid to developing countries which spawned the flourishing Association of Geoscientists for International Development. This Association now meets in many countries of the world to discuss questions such as state versus private enterprise in development of mineral resources and groundwater problems of arid countries. Its international headquarters remains in Newfoundland.

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