



# THE ASSOCIATION OF EXPLORATION GEOCHEMISTS

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*President:*

**P.K. Theobald**  
U.S. Geological Survey  
Branch of Exploration Research  
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## NEWSLETTER NO. 31

*Vice-Presidents:*

**A.W. Rose**  
Dept. of Geosciences  
Pennsylvania State University  
University Park, Pennsylvania 16802  
U.S.A.

MARCH 1980

**G.R. Webber**  
Dept. of Geology  
McGill University  
Montreal, Quebec H3C 3G1  
Canada

### PERSONAL COLUMN

*Secretary:*

**R.G. Garrett**  
Geological Survey of Canada  
601 Booth Street  
Ottawa, Ontario K1A 0E8  
Canada

Information on Association Members is received from around the world. To keep your fellow members informed of your latest moves send a brief summary to the Rexdale Association office.

R. Cox, has resigned as Chief Geologist, Placer Exploration Ltd., Sydney, to accept the position of Chief Mineral Geologist, Robertson Research (Australia) Pty. Ltd., North Sydney, N.S.W. Australia.

*Treasurer:*

**I. Thomson**  
Ontario Geological Survey  
77 Grenville Street  
Toronto, Ontario M5S 1B3  
Canada

B.W. Smee has accepted the position of Senior Geochemist with Pan Ocean Oil Ltd., he is now based in Calgary, Alberta, Canada.

*Councillors:*

1979-80  
**W.K. Fletcher**  
**R.F. Horsnail**  
**L.D. James**  
**K.A. Lovstrom**  
**T.W. Meyer**  
**J.H. McCarthy**

F. Tissot is now technical advisor with the Center for Natural Resources, Energy and Transport at the United Nations at their headquarters in New York, N.Y., USA.

### EDITORIAL

1979-81  
**R.C. Armstrong**  
**P.M.D. Bradshaw**  
**R.H. Carpenter**  
**L.G. Closs**  
**W.B. Coker**  
**E.H.W. Hornbrook**

Spring comes early in some parts of the northern hemisphere, and field seasons are again upon us. Problems with logistics, the meaning of lithologic variations, the reality of structural interpretations, and the search for illusive sources of anomalous metals have become paramount. The administrative duties of the winter are put in a perspective -- many that seemed critical are now trivial annoyances and many that had low priority are now critical.

*Australian Regional Councillor:*  
**J.F. Gilfillan**

*European Regional Councillor:*  
**J.W. Friedrich**

*Southern Africa Regional Councillor:*  
**G.L. Coetzee**

## Editorial (con't)

Communication among us and with colleagues has become a critical element. How is this best accomplished? How can it be expedited? How can we breach the artificial barriers of privileged information? In the field most of these barriers break down. The real problem of understanding the natural processes is sufficiently large and complex that cooperation becomes mandatory. It comes as an annual shock to find, in the first week in the field, that others in my own organization are working on complimentary problems in the same area -- an internal problem-- and, that another organization is actively pursuing a similar program at a different scale. Chance meetings on the air field or in the restaurant are not the most efficient forums for communication. Either the formal proceedings or the informal discussions at symposia should be the forum.

Our next opportunity for effective communication will be in Hannover next month, about the time many of you will receive this Newsletter. My bags are packed, and passports and visas in order. I look forward to an open exchange of concepts, ideas, plans and aspirations. I hope many of you can join me.

Paul Theobald, President

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AWARDS FOR ASSOCIATION MEMBERS

Geochemical Exploration received a double-barreled shot of recognition at the 109th AIME annual meeting held February 23-28 in Las Vegas, New Mexico.

Herbert E. Hawkes received the most prestigious honor given by the Mining and Exploration Division, The Jackling Award. Acting on behalf of the M & E Division, Harold Bloom made the presentation of the beautiful bronze plaque which read "For his pioneering leadership in the science and technology of mineral exploration, especially in the development and world wide application of geochemical methods as major exploration tools, and for his lecture 'Geothermal Hydrogen'." His address, which was preceded by a colorful introduction by Mr. Bloom, was given before a large audience and well received.

Professor John S. Webb received the Society of Economic Geology's most coveted honor when he was invited to deliver the "Distinguished Lecture". His address was to have been "Trends and Prospects in Exploration Geochemistry" but unfortunately, illness intervened and the talk was cancelled.

ADMISSIONS COMMITTEE REPORT

The following persons have been accepted for Membership in the Association by Council. The Association is pleased to welcome the new members.

VOTING MEMBERS

Scott, K.M.                      Geochemist, CSIRO, North Ryde, Australia.

Willard, P.D.                    Laboratory Manager & geologist, Rocky Mountain, Tucson, Arizona,  
U.S.A.

AFFILIATE MEMBERS

- Keuken, M.P.                      Research assistant, State University of Utrecht, Holland.
- Parslow, G.R.                     Associate professor at the University of Regina, Regina, Saskatchewan, Canada.

STUDENT MEMBERS

- Carraway, K.E.                   Graduate student, University of El Paso, El Paso, Texas, U.S.A.
- Merkle, R.                         Graduate student, University of Mainz, Mainz, West Germany.

FUTURE MEETINGS8th INTERNATIONAL GEOCHEMICAL EXPLORATION SYMPOSIUM - April 10-15, 1980, Hannover

Final preparations are being made by the Organizing Committee in Hannover. The program, laid out in the Third Circular, promises a very interesting meeting with papers and poster sessions on a broad range of topics. The variety of field trips, before, during and after the symposium will offer a valuable opportunity to see many mineral deposit types, learn of exploration experience and meet with fellow geochemist.

NEA/IAEA URANIUM EXPLORATION R & D GROUP

Details of the purpose of this meeting were outlined in the January Newsletter (#30). The meeting of the R & D Group has been set for 9 a.m. on Monday, April 14, and will be held at the Bundesanstalt für Geowissenschaften und Rohstoffe (Federal Institute for Geoscience and Natural Resources), Alfred-Bentz-Haus, Stilleweg 2, Hannover.

Unfortunately this clashes with paper sessions on the Monday morning and visits to the BGR in the afternoon. Also the Annual Meetings of the FSL and AEG are to be held later that afternoon.

MINI SYMPOSIUM - April 1981

Council has received several offers for the 1981 meeting, these are being followed up and a decision will be made and announced at the forthcoming Annual General Meeting in Hannover.

9th INTERNATIONAL GEOCHEMICAL EXPLORATION SYMPOSIUM - May 12-14, 1982, Saskatoon

There is no further news at this time, organizing work is continuing. Be sure to try and keep the May 1982 dates free so you will be able to attend.

SHORT COURSESGEOCHEMICAL EXPLORATION FOR URANIUM AND BASE METALS

The Colorado School of Mines, Office of Continuing Education, has announced this short course to be held May 5-9, 1980, which will be lead by Hal Bloom, Al Levinson and Graham Closs. This course, now in its 20th year, is an introduction to the fund-

amentals of modern geochemical exploration techniques. It is ideally suited to geologists, chemists and others interested in trace element geochemistry as related to mineral exploration. The course includes both theory and practice, involving field and laboratory work.

The course fees are US \$375 and those interested should contact:

The Director of Continuing Education  
Colorado School of Mines  
Golden, Colorado, 80401, Telephone 303 + 279-0300 Ext. 2321

#### URANIUM GEOLOGY AND EXPLORATION

Another Colorado School of Mines short course is being given by Dr. Richard de Voto on May 21-23, 1980. This was described in more detail in the January Newsletter. Again anyone interested should contact the Director of Continuing Education at the address given above.

#### ADVANCED TOPICS IN THE ANALYSIS OF REMOTE SENSING DATA

Many geochemists are using remote sensing data in integrated approaches to mineral exploration and this Purdue University course is to be held May 14-16, 1980. The course treats advanced techniques in the numerical analysis of remote sensing data. It builds on the basic pattern recognition-oriented methods such as implemented in such systems as Image 100, LARSYS etc. The course is intended for those who are concerned with numerical analysis of remote sensing data and who have already acquired knowledge of and experience with the fundamentals of quantitative remote sensing.

The registration deadline is April 30, 1980, and course fees US \$595.  
For more information contact:

Prof. Philip H. Swain  
Laboratory for Applications of  
Remote Sensing  
1220 Potter Drive,  
West Lafayette, Indiana, 47906, USA  
(Phone 317 + 749-2052)

or

John Almon  
Division of Conferences  
Room 116, Stewart Center  
Purdue University  
West Lafayette, Indiana, 47907,  
(Phone 317 + 749-2533)

#### NUMERICAL ANALYSIS OF REMOTE SENSING DATA

This introductory 5 day course is given several times a year by Purdue University. The course covers the fundamentals of remote sensing: the underlying physical concepts, spectral reflectance characteristics of earth surface features, and multispectral scanner systems. It covers the concepts of data processing, pattern recognition and numerical analysis of data leading to information extraction. Courses are scheduled for April, May and June 1980.

Course fees are US. \$695 and for more information contact;

Douglas B. Morrison  
LARS/Purdue University  
1220 Potter Drive  
West Lafayette, Indiana 47906, U.S.A

REGIONAL REPORT - EUROPE

Our Regional Councillor, Gunter Friedrich, sends us news of a future joint research and development programme in Europe. What will be particularly attractive to university members are the cost sharing aspects of the programme.

"Following a decision of the Council of the European Communities in 1978, the Commission initiated a Research and Development Programme in the field of primary raw materials (excluding energy minerals) for a four-year period, dealing with exploration, ore processing and mining technology. Participation in this R & D programme is possible for any scientist or research group within the EC. The investigations are based on cost-sharing contracts, generally on a 50-50 % basis.

Research programmes dealing with geochemical exploration are connected with the following topics:

1. Optimization of traditional techniques
2. Rock geochemistry in carbonate sediments
3. Hydrogeochemistry
4. Soil gas geochemistry
5. Interpretation of geochemical maps
6. Other topics

In May 1979, a "contact group" comprising the leaders of the 20 selected projects, held its first meeting in Brussels for an exchange of information on the research programmes. The members of the group came from Belgium, Denmark, Federal Republic of Germany, France, Ireland, Italy, the Netherlands and the United Kingdom. Industry groups, geological surveys and university groups of the EC member states are incorporated."

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LETTER TO THE EDITOR

The following letter was received from two Australian members and is reproduced below. Let me take this opportunity to encourage members to use the Newsletter as a forum for discussion. The Newsletter is less formal than the Journal, but offers a great opportunity for discussion of problems of interest to geochemists.

Dear Sir,

We read our President's annual review (Bradshaw, 1979) with great interest and would basically agree with his observations. The establishment of a fundamental understanding of the primary and secondary geochemical processes involved in ore body deposition and weathering is unquestionably of prime importance if efficient and effective geochemical exploration is to be carried out. It is also true that exploration geochemists have been a little tardy in attempting to provide the basic framework into which our empirical observations may be placed. The President has identified some of the reasons for this situation. the present "state of the art" in respect of fundamental exploration geochemical research is not quite as bleak a picture (in Australia at least) as has been painted.

Basic research, directed at establishing the underlying geochemical principles is being carried out in Australia at the CSIRO, some universities and by a few exploration companies. Much of the CSIRO and university work is in direct collaboration with, or is supported by, exploration companies. Results of fundamental work carried out in Australia on solution geochemistry which relates directly to ore body weathering has recently been published (Mann and Deutscher, 1980: Thornber, 1979: Thornber and Wildman, 1979) and this work and other research into bedrock and vapour phase geochemistry is continuing. The investigative procedures used in Western Australia during the early 1970's to gain an understanding of the genesis of nickel/copper gossans have been applied and extended in our own research into the processes of formation of gossans on Cu, Pb, and Zn mineralisation. These investigations have been carried out over the last few years and it is hoped that results will appear in the Journal of Geochemical Exploration in the near future. In addition, new techniques for evaluating base metal gossans, such as the potential use of lead isotopes ( Gulson and Mizon, 1979) are being evaluated in Australia.

Whilst there is considerable room for further fundamental research into the basic problems of exploration geochemistry the position is not as bad as has been presented.

G.C. Sylvester  
C.R.A. Exploration Pty. Ltd.,  
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Fyshwick, Canberra, 2609  
A.C.T. AUSTRALIA

G.F. Taylor  
CSIRO Division of Mineralogy,  
P.O.Box 136,  
North Ryde, N.S.W. 2113  
AUSTRALIA

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Mann, A.W. & Deutscher, R.L.	1980	Chem. Geol. (in press)
Thornber, M.R.	1979	Chem. Geol., <u>126</u> , pp. 135-149
Thornber, M.R. & Wildman, J.E.	1979	Chem. Geol., <u>24</u> , pp. 97-110

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REGIONAL COUNCILLORS

Currently the Association has three Regional Councillors, one each for Australia, Europe and Southern Africa. Council is required to decide upon regional representation each year and announce this to Voting Members prior to May 1.

Council will continue to have representation from Australia, Europe and Southern Africa. In addition the Association has a fast growing membership in Brasil, over 25 members now, and it is Council's decision to seek a Regional Councillor for Brasil.

Brasilian members are referred to the By-Laws sections 4.07-4.09 for details on nominating a Regional Councillor.

FROM THE SECRETARY'S OFFICE

We are approaching the end of the Association year and it is a busy time for Council making sure that dues are in and annual reports are writtten. To early March some 520 members had paid their 1980 dues, it may seem inconsistent in that our dues year coincides with the calendar year but the Association year runs from AGM to AGM, however this is the most convenient financial form of operation. The membership lists for Journal circulation were returned to Elsevier in January showing members who had paid their 1980 dues. So, late-payers come on, there are some 80 of you out there. When dues come in late addenda have to be sent to Elsevier, and this can cause delay in your receiving Journal issues. It has also meant delays in preparing the 1980 membership list for publication. You know who you are, I know who you are, please help your Association by getting dues in on time.

There have been several responses to the 'Journal back issue offer'. As I explained in the last Newsletter this is a one-time offer and will not be repeated. As I suspected response has not been overwhelming, as a result collating the orders will not be a tedious task and I will accept orders up to the close of the 8th I.G.E.S. in Hannover.

I look forward to seeing as many of you as possible in Hannover and hope that we have an excellent meeting both scientifically and socially.

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BENZENE — A HAZARDOUS CHEMICAL

Alan Coope, our first President, supplied the Newsletter with this information. The Canadian Departments of the Environment, and National Health and Welfare annual issue a List of Priority Chemicals. The following is an extract from the 1979 list.

## BENZENE:

Recent epidemiological surveys have indicated that industrial exposure to benzene substantially increases the risk of leukemia and chromosomal aberrations. While the occupational group unquestionably has the greater risk, leukemogenic potential in the general public following benzene exposure cannot be dismissed. Benzene is a widely used industrial chemical: as a feed stock for plastics (styrene), detergents, pesticides and other chemicals, as a solvnet, as a laboratory reagent and as a component in gasoline. The amounts used are so substantial that the inadvertent release of benzene into the atmosphere or waterways cannot be ignored. Recent analytical surveys by the US-EPA indicate that benzene can be detected in urban air (1-7 ppb), soil (2-191 ppb) and water (1-13 ppb) in some areas of the United States.

In these days of atomic absorption, and other forms of, spectrophotometry, colorimetric methods using benzene are far less used in geochemistry. However, it is unwise to leave the warning unheeded, unfortunately familiarity with laboratory reagents gained over years of use often leads to their being taken for granted and their hazardous nature goes unrecognized.

JOURNAL NEWS

The Editor of our Journal, Eion Cameron, has provided the Newsletter with a list of forthcoming papers in the Journal. These are listed in order of their transmittal from the Editor to Elsevier, they will probably appear in this same order, as listed below.

Wilmshurst, J.R. and Ryall, W.R. Sirosorb: A collector for the use in the determination of mercury in Geochemical Samples.

Dyck, W. Uranium, radon, helium and other trace elements and gases in well waters of parts of the St. Lawrence Lowlands, (Ottawa Region) Canada.

Beeson, R. The recognition of hydrothermal processes in the trace element geochemistry of uranium and thorium enriched tuffaceous rocks, North-West Iran.

Horler, D.N.H., Barber, J. and Barringer, A.R. A multielemental study of plant surface particles in relation to geochemistry and biogeochemistry.

Meier, A.L. Flameless atomic absorption determination of gold in geological materials.

Torgersen, T. Controls on pore fluid concentration and variations in  $^4\text{He}$ ,  $^{222}\text{Rn}$  and  $^4\text{He}/^{222}\text{Rn}$  ratios.

RECENT PAPERS ON EXPLORATION GEOCHEMISTRY

This list comprises titles that have appeared in major publications since the compilation present in Newsletter No. 30. Journals routinely covered and abbreviations used are as follows: Economic Geology (EG); Geochimica et Cosmochimica Acta (GCA); The USGS Journal of Research (USGS JR); Circular (USGS CIR); and Open File Report (USGS OFR); Geological Survey of Canada Papers (GSC Paper) and Open File Report (GSC OFR); Bulletin of the Canadian Institute of Mining and Metallurgy (CIM Bull); Transactions of Institute of Mining and Metallurgy, Section B: Applied Earth Sciences, (Trans IMM). Publications less frequently cited are identified in full. Compiled by L. Graham Closs, Colorado School of Mines, Member AEG Bibliography Committee.

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STREAM SEDIMENT SURVEY IN THE CONGO RIVER

S.S. Sarkar, Professor of Applied Geochemistry in the National University of Zaire, has informed us of a stream sediment survey of the Zaire (Congo) River for Cu, Mn, Au, etc. Requests for reprints from members should be forwarded to this address.

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