

# THE ASSOCIATION OF EXPLORATION GEOCHEMISTS



**President:**

I. Nichol  
Dept. of Geological Sciences  
Queens University  
Kingston, Ontario

November 1973.

NEWSLETTER #11

**Vice Presidents:**

Executive for 1974-75

R. W. Boyle  
Geological Survey of Canada  
601 Booth Street  
Ottawa 4, Ontario

E. M. Cameron  
Geological Survey of Canada  
601 Booth St.  
Ottawa 4, Ontario

The following members will form the Association Executive for 1974-75:

President

I. L. Elliott

Vice-Presidents

R.W. Boyle (1974-75)

C.F. Gleeson (1974-76)

Secretary

R.F. Horsnail

Treasurer

M.B. Mehrtens

**Secretary:**

R. F. Horsnail  
AMAX Exploration Inc.  
4704 Harlan Street  
Denver, Colorado 80212

These officers elect will take office at the Annual General Meeting to be held during the Fifth International Geochemical Exploration Symposium at Vancouver next April.

1974 Symposium

**Treasurer:**

H. Bloom  
Geology Department  
Colorado School of Mines  
Golden, Colorado 80401

The activity surrounding arrangements for the next symposium is increasing. The deadline for receipt of synopses of papers for presentation at this meeting was the end of October. Over one hundred synopses were received for consideration. The local organizing committee faced a difficult task in selecting papers for presentation. Forty-eight papers covering a wide geographic distribution and range subject have been selected.

**Councillors:**

F. C. Canney  
J. A. Coope  
I. L. Elliott  
R. L. Erickson (ex-officio)  
W. K. Fletcher  
C. F. Gleeson  
J. A. Hansuld (ex-officio)  
H. E. Hawkes  
C. J. Lepeltier  
M. B. Mehrtens  
F. N. Ward  
H. V. Warren

Since the last newsletter, the Hyatt Regency Hotel, the site of the symposium, has opened after many delays resulting from labour difficulties. I am sure the Symposium Committee were relieved to see the hotel operational at last as arranging the symposium at a new location at Vancouver at this late date would not have been easy. A second circular on the symposium is currently being prepared and will be mailed to respondents to the first circular by the end of this month.

Anyone wishing information on the symposium should address enquiries to:  
Dr. W.K. Fletcher,  
Geological Sciences Centre,  
University of British Columbia,  
Vancouver 8, B.C., Canada.

### 1976 Symposium

The A.E.G. Council at a meeting on September 14th, accepted an invitation from Dr. N.H. Fisher, Chairman, Organizing Committee of the 25th International Geological Congress, that the 6th International Geochemical Exploration Symposium be held as part of the I.G.C. in Sydney, Australia, in August 1976. The occasion of the I.G.C. in Australia seemed a most appropriate occasion for our biennial symposium to be held in Australia.

Enquiries regarding arrangements for this meeting should be addressed to:  
Dr. C.R.M. Butt,  
C.S.I.R.O.,  
Minerals Research Laboratories,  
Private Bag P.O.,  
Wembley, W.A. 6014, Australia.

### Journal of Geochemical Exploration

In the last newsletter I expressed Council's concern at publication delays and distribution difficulties associated with the Journal and the measures that Council had taken with Elsevier to resolve these problems. I am extremely satisfied with the results. Elsevier have published the first three numbers for 1974 as indicated in the publication schedule outlined in the last newsletter. I assume from the lack of distraught letters complaining of the non-receipt of journals that the journals are now reaching their intended recipients. We very much hope that difficulties with the journal are a thing of the past

Elsevier have advised me recently that the journal has now 800 subscribers, inclusive of the Association, a feature indicating an encouraging response by non A.E.G. subscribers.

The fourth number of 1973 due for publication by the end of the year is a special issue on "Geochemical Exploration in Australia" edited by P.R. Donovan. This number includes the following papers.

THE PRESENT STATUS OF GEOCHEMICAL EXPLORATION IN AUSTRALIA by P.R. Donovan.

IMPLICATIONS OF GEOCHEMICAL INVESTIGATIONS OF SEDIMENTARY ROCKS WITHIN AND AROUND THE McARTHUR ZINC-LEAD-SILVER DEPOSIT, NORTHERN TERRITORY by I.B. Lambert and K.M. Scott.

GEOCHEMISTRY OF MINERALISED GRANITIC ROCKS OF NORTHEAST QUEENSLAND by J.W. Sheraton and L.P. Black.

SURFACE AND SUBSURFACE GEOCHEMISTRY OVER THE NATIVE BEE-JASPER-BIOTITE COPPER PROSPECTS, NORTHWEST QUEENSLAND by J.R. Lord.

THE GEOCHEMISTRY OF SIDERITE IN RELATION TO IRONSTONE IN THE PARADISE CREEK FORMATION, NORTHWEST QUEENSLAND by G.F. Taylor.

GEOCHEMICAL EXPLORATION FOR BASE AND PRECIOUS METAL SULPHIDES ASSOCIATED WITH THE JIMBERLANA DYKE, WESTERN AUSTRALIA by R.H. Mazzucchelli and T.W. Robbins.

A METHOD OF DISTINGUISHING NICKEL GOSSANS FROM OTHER IRONSTONES ON THE YILGARN SHIELD, WESTERN AUSTRALIA by J.M. Clema and N.P. Stevens-Hoare.

DISTRIBUTION OF NIOBIUM IN STREAM SEDIMENTS RELATED TO HEAVY-MINERAL SAND DUNES, NEAR PEMBERTON, WESTERN AUSTRALIA by W.A. Fairburn.

On a longer term outlook the first number of Volume 3 due for publication in February 1974 will include a bibliography of geochemical exploration literature for 1973 prepared by the bibliography committee under the chairmanship of Herb Hawkes.

#### Committee Activities

##### Admissions (M.B. Mehrtens)

At a Council meeting on September 14th, Council recommended the following for acceptance:

##### Members

Agnerian, H.	Neelands, J.T.
Baker, W.E.	Nicolet, B.A.
Begley, C.C.	Noqueira, A.C.
Bolter, E.	Noudehon, C.
Capdecombe, H.L.	Obial, R.C.
Clark, L.A.	Oyarzun, J.M.
Cochrane, R.H.A.	Perriam, R.
Davenport, T.	Przenioslo, S.M.
Davies, W.C.	Ryall, W.R.
Ericksson, K.	Saigusa, M.
Evans, D.S.	Sakrison, H.A.
Fauth, H.	Sale, R.V.
Fortune, W.B.	Scott, B.P.
Foster, R.L.	Shalaby, I.M.

Hale, M.  
Haug, G.M.W.  
Kroon T.P.  
Laanela H.  
Leduc, C.  
Lee, R.M.S.  
Leroy, L.W.  
Malicdem, D.G.  
Marchange, J.W.  
McNeil, R.D.  
Moya, E.A.  
Muceniekas, E.L.  
Muthuveerappan, P.L.

Smith, R.E.  
Swyzen, W.  
Takahashi, K.  
Urquida, F.  
Walters, R.A.  
Watterson, J.R.  
Wiltse, M.  
Woolfe, D.L.  
Worthington, J.E.  
Woznessky, B.  
Zeegers, H.M.

Affiliates

Barnett, C.T.  
Bnerger, A.D.  
Carver, R.N.  
Chenoweth, L.M.  
Hardy, D.G.  
Houston, W.N.  
Nelson, K.R.

Students

Castle, B.E.  
Dunkhase, J.A.  
Goodfellow, W.D.  
Koramfeng, A.  
Morley, R.L.  
Quin, B.F.  
Severne, B.C.  
Zulletta, R.

Bibliography (H.E. Hawkes)

The bibliography committee is involved the final stages of the compilation of a bibliography on geochemical exploration for 1973. This will appear in Vol. 3 No. 1 of the Journal due for publication in February 1974.

The bibliography for the period 1965-71 has been reprinted to meet the continuing demand for copies. This bibliography may be obtained at a cost of \$7.50 (prepaid) from Dr. M.B. Mehrtens,  
Rio Algom Mines,  
120 Adelaide St. West,  
Toronto, Ontario.

Case History (P.M.D. Bradshaw)

The case history committee has been involved with a series of regional meetings designed to collate information on geochemical exploration practice in different areas. To date meetings have been held in Vancouver and Toronto devoted to geochemical exploration in the Cordillera and the Canadian Shield. A series of papers is being prepared summarizing geochemical activity in these areas. In the future similar meetings are scheduled for other regional centres.

Constitution (J.A. Coope)

The Constitution Committee has presented for Councils consideration a report on Professional Practice and qualifications for a Professional Exploration Geochemist. This report will be considered at the next Council meeting.

Research & Education Committee

The compilation of a series of reports dealing with geochemical exploration in various areas of the world and with the development of new techniques is continuing. A report entitled "Use of Geochemistry and Exploration Geochemistry by State Surveys" by Otis M. Clarke is included at the end of this newsletter. In addition an addendum to C. Lepeltiers "Geochemical Exploration in the United Nations Development Programme 1970/73" on United Nations Geochemical Exploration activity in Greece" by A.Y. Smith is also included.

A.I.M.E. meeting

The Geochemistry Division of the A.I.M.E. will present a half-day session on VOLATILE ELEMENTS IN GEOCHEMICAL EXPLORATION at the February annual meeting in Dallas. Papers to be presented will include fundamentals and recent developments in the application to mineral exploration of Hg (P.R. Buseck, Arizona State University), Rn (N.M. Saum and W.T. Caneer, Colorado School of Mines Research Institute), He (G.R. Goldak, University of Saskatchewan), AIRBORNE PARTICLES (G.C. Curtin, U.S.G.S., Denver) and Cl-F-H<sub>2</sub>O (S.E. Kesler, University of Toronto).

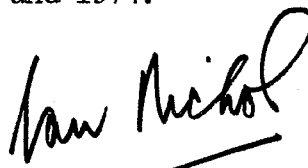
Annual dues

Your billing for 1974 dues is included with this newsletter. The annual dues of U.S. \$27 which are maintained at last years level are composed of \$17 Journal subscription and \$10 forwards the cost of transacting Association business.

Change of address

I would ask you to check that your address appearing on the newsletter envelope is correct and if not please advise Secretary Horsnail accordingly on the accompanying form.

With best wishes for the festive season and 1974.



IAN NICHOL,  
President.

slb/IN

USE OF GEOCHEMISTRY AND EXPLORATION  
GEOCHEMISTRY BY STATE SURVEYS

By Otis M. Clarke, Jr.

Twenty-two out of fifty state geological surveys have active projects in exploration geochemistry, and thirty-one out of fifty have projects involving the use of geochemistry in mineral, geologic, and environmental investigations in 1973. This summary of activities of state surveys was obtained from results of a questionnaire submitted to state surveys, with 80 percent returns. Four of the ten states who did not reply to the questionnaire have geochemical projects (The State Geologists Journal, vol. 25, 1973).

Returns from the questionnaire indicate that in most state surveys geochemical support is an integral part of a complex varied program, but few states have personnel assigned exclusively to exploration geochemical projects. Although 18 out of the 40 states reporting have exploration geochemical projects, they report only 8 professional geologists or geochemists working full time on geochemical projects, but they report over 47 geologists working part time on geochemical projects. Many states employ full chemists; the survey shows 15 part time chemists and 34 full time chemists. They also show an unfavorable ratio of professional scientists to technicians with only 30 part time and 3 full time technicians for 45 professionals. The range of activities is given below.

	Number of states
(A) Analytical support for water or environmental projects	16
(B) Geochemical research not pertaining to mineral deposits	12
(C) Analytical support for mineral investigations	23
(D) Mineral investigations where exploration geochemistry is an important part of the project.	17
(E) Research in exploration geochemistry	11

Chemical Support

Twenty states maintain their own laboratory and five states contract or submit samples to other laboratories. Nineteen states use atomic absorption, and twelve use colorimetric and emission spectrography. Other types of analyses include wet chemistry, fire assaying, electron microprobe, X-ray diffraction, and X-ray fluorescence. The following types of analyses are made:

	Number of states
(A) Soil	18
(B) Rock	23
(C) Water	16
(D) Air	1
(E) Stream sediments	14
(F) Vegetation	6

## Budgets

Information on budgets for geochemical exploration and research is difficult to evaluate because few states have a separate geochemical exploration budget. The data is unobtainable in some states. It is also difficult to draw an exact line on what is exploration geochemistry in a complex program dealing with various geochemical projects. Estimated geochemical budgets range from \$500,000 to \$1,000,000. Data from seventeen states totaled \$983,000.

## Geochemical Exploration Projects

(Partial list)

- Alabama: (1) Geochemical exploration of Alabama Copper Belt. (2) Data of geochemistry, Alabama rocks and minerals.
- Alaska: Geological and geochemical mapping of central Alaska range, Prince of Wales Island.
- Delaware: Trace metals in Delaware watershed.
- Idaho: Investigation for stratabound copper in northern Idaho.
- Illinois: Chemistry of lake and river sediments.
- Kansas: (1) Application of organic geochemistry in petroleum exploration.  
(2) Geochemical exploration of stratiform copper, lead, and zinc deposits.
- Minnesota: Soil in greenstone and Duluth Complex.
- Missouri: Trace element concentration in coal.
- Montana: (1) South Butte geochemical sampling. (2) Flathead Reservation soil sampling program. (3) Lewis and Clark County soil sampling.
- New York: (1) Variation of heavy metal content with particle size in stream sediments. (2) Oxide coatings on stream gravel as a geochemical prospecting tool.
- Ohio: (1) Trace elements in coal. (2) Geochemical study of overburden rocks of the Pittsburgh coal. (3) Geochemical prospecting for sulfide minerals in western Ohio.
- Oklahoma: Redbed copper deposits, western Oklahoma (includes investigation of Ouachita lead and zinc mineralization as a source area).
- Oregon: (1) Geochemistry of stream sediments, central Blue Mountains.  
(2) Geochemistry of fluorite in nonmarine sediments.
- Pennsylvania: Re-examination of sulfides.
- Utah: Geochemical survey of Great Salt Lake.
- Virginia: Geochemical reconnaissance for zinc, lead, and copper in Staunton quadrangle.
- West Virginia: Geochemistry of brines.

## UNITED NATIONS GEOCHEMICAL EXPLORATION ACTIVITY IN GREECE

By A.Y. Smith

We read with great interest Mr. C. Lepeltier's exposition of Geochemical Exploration in the United Nations Development Programme 1970/1973.

The International Atomic Energy Agency has been executing a UNDP-sponsored uranium exploration programme in Macedonia and Thrace in which reconnaissance geochemical techniques have figured rather prominently. The programme is a reconnaissance of some 28,400 km<sup>2</sup> using scintillation methods and stream sediment geochemistry. While uranium is the principal commodity sought, at the insistence of Mr. Lepeltier's branch of the UN (and we fully agree), the geochemical programme was expanded into a multi-element survey. At the present time we are determining U, Cu, Pb, Zn, Ag, Co, Ni, Mo, Hg, Mn on 100 samples per day. Since the sampling began in November 1971 we have collected 12,000 stream sediment samples.

One interesting and, we feel, rather special aspect of our work has been the establishment of a simple, efficient computer-based data processing system which is entirely run by the Greek staff. This system includes the recording of field data, a storage and retrieval system, analytical result computing, statistical analysis of the geochemical data and automatic map plotting. We have, at the moment, about 20 operating programmes, some of which have been written here. Others have been kindly supplied to us by Garrett and Cameron of the Geological Survey of Canada, and by Howarth of Imperial College. The system operates on a CDC 3300 computer with 128K storage, and a 30 cm. CALCOMP plotter. It is the first such system in Greece, and to the best of our knowledge is the first integrated data processing system in a UNDP project. We are in the process of preparing a manual of techniques used in this project, including analytical and data processing methods, which could perhaps be considered a first step towards standardization, which, as Mr. Lepeltier so rightly points out, is a problem with UN geochemical programmes. We would be delighted to discuss the system with those interested.

A.Y. Smith, Project Manager,  
A. Armour-Brown, Geochemist,  
UNDP/IAEA Uranium Exploration Project,  
GRE/70/529,  
N.R.C. "Democritos",  
Aghia Pareskevi, Attikis,  
Greece.