

THE ASSOCIATION OF EXPLORATION GEOCHEMISTS



President:

I. Nichol
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August 1973.

NEWSLETTER #10

Vice Presidents:

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Geological Survey of Canada
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A glance at the calendar reminds me it is time to assemble a quarterly newsletter. Since the last newsletter in May many of us have been involved in a fair amount of fieldwork but I note from correspondence with various committee chairmen that their association responsibilities have not been forgotten.

Secretary:

R. F. Horsnail
AMAX Exploration Inc.
4704 Harlan Street
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Symposium on "Prospecting in areas of glacial terrain".

A two day symposium attended by some 200 delegates on prospecting in areas of glacial terrain was held in Trondheim, Norway August 21st and 22nd, 1973 and organized by the Institution of Mining and Metallurgy in cooperation with the Geological Survey of Norway and the Norwegian Ore Geological Symposium. The proceedings of the symposium comprising a collection of thirteen papers are available from the Secretary, The Institution of Mining and Metallurgy, 44 Portland Place, London W1N 4BR England at a cost of £10 (\$25 U.S.).

Treasurer:

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

1974 Symposium

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

Arrangements for the 5th International Geochemical Exploration Symposium at Vancouver, April 1st - 4th, 1974 are well in hand by the local organizing committee under the Chairmanship of Dr. I.L. Elliott.

The list of prospective authors now exceeds one hundred. Authors are advised that the deadline for the receipt of synopses is October 31st, 1973.

Synopses should be forwarded to:

Dr. W.K. Fletcher,
Geological Sciences Centre,
University of British Columbia,
Vancouver 8, B.C., Canada.

The symposium is being held in the Hyatt Regency Hotel in Vancouver and blocks of rooms are being held for symposium registrants. Hotel rates are singles \$22 - 31 per day and twins or doubles \$28 - 37 per day.

The keynote address by Professor John S. Webb will be entitled "Applied Geochemistry and the Environment".

The organizing committee are preparing a second circular giving further details of the symposium which will be distributed in October or November.

1976 Symposium

A proposal has been received 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. This seems a most appropriate occasion to hold our biennial symposium in Australia and the matter will be considered at the next Council meeting.

Journal of Geochemical Exploration

The association executive are very concerned about delays in the publication of the journal. The publication delay by Elsevier has been the prime matter of attention of John Hansuld as business manager. At John Hansulds instigation Dick Horsnail and myself met Dr. van Eysinga who has responsibility for the Geo-Sciences Section of Elsevier in late July in London to discuss this matter. Following this meeting Elsevier confirmed the following publication programme for 1973:

Vol. 2(1)	10 August
Vol. 2(2)	September
Vol. 2(3)	October/November
Vol. 2(4)	December.

The Association executive very much regrets these publication delays of volume II and having regard to the importance of the Journal to the Association very much hopes these problems have now been overcome.

However, I would like to assure the membership that the publication performance of the Journal will be kept under continual review by the Association Council.

Vol. 2(1) is in fact now published and I very much hope you have all received your copies of the first number by the time this newsletter reaches you. The journal is now being sent airmail within Europe and to North America.

Elsevier advised us that the Journal currently has a circulation of nearly 700 subscribers which is well ahead of Elsevier's predictions at the time the journal was commenced so clearly the journal has a promising future.

Eion Cameron and his editorial board have assembled an attractive variety of papers for forthcoming numbers of the Journal. A complete listing of papers to appear in the first two numbers for 1973 was given in Newsletter #9 of May 1973. The following list covers papers awaiting publication and is sufficient for issues up to and including the first number of Vol. III (1974).

THE GEOCHEMISTRY OF ARSENIC AND ITS USE AS AN INDICATOR ELEMENT IN GEOCHEMICAL PROSPECTING by R.W. Boyle and I.R. Jonasson.

GEOCHEMICAL SAMPLING TECHNIQUES IN THE EASTERN DESERT OF EGYPT by V. Bugrov.

THE DISTRIBUTION OF URANIUM IN THE CRUST OF THE NORTHEASTERN CANADIAN SHIELD AS SHOWN BY LAKE SEDIMENT ANALYSES by E.M. Cameron and R.J. Allan.

DETERMINATION OF MOLYBDENUM IN SOILS AND SEDIMENTS WITH A MODIFIED Zn DITHIOL PROCEDURE by S.J. Hoffman and M.J. Waskett-Myers.

SOME COMMENTS ON INTERFERENCES BY Cu^{2+} IONS AND Ag^+ IONS ON THE WET REDUCTION FLAMELESS ATOMIC ABSORPTION DETERMINATION OF MERCURY by I.R. Jonasson.

A SPECTROPHOTOMETRIC METHOD FOR THE DETERMINATION OF RHENIUM IN GEOLOGIC MATERIAL by E.J. Mahaffy.

BIOGEOCHEMICAL EXPLORATION FOR TUNGSTEN AT DARRYTOWN, NEW ZEALAND by B.F. Quin, R.R. Brooks, C.R. Boswell and J.A.C. Painter.

SOME ASPECTS OF THE PROBLEM OF GEOCHEMICAL METHODS OF PROSPECTING FOR CONCEALED MINERALIZATION by F.K. Shipulin et. al.

THE FORMATION AND DETERMINATION OF METAL DISPERSION HALOES IN ORGANIC LAKE SEDIMENTS by M.H. Timperley and R.J. Allan.

GEOCHEMICAL AND BIOGEOCHEMICAL EXPLORATION RESEARCH NEAR EARLY PRECAMBRIAN PORPHYRY-TYPE MOLYBDENUM - COPPER MINERALIZATION, NORTHEASTERN ONTARIO, CANADA by W.J. Wolfe.

Arrangements have been made with Elsevier for the publication of 1973 supplement to exploration geochemistry bibliography being compiled by H.E. Hawkes and his bibliography committee in the first number of the 1974 volume.

The following papers have been offered for the Australasian issue of the Journal being compiled by P.R. Donovan and due to be published as the fourth number of Volume II. Eight of these papers have already been dispatched to Elsevier. Peter Donovan is to be congratulated on compiling such an interesting collection of papers.

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

BISMUTH ANOMALISM IN LOWER PROTEROZOIC ROCKS, TENNANT CREEK, NORTHERN TERRITORY by P.F. Kelso.

NEAR SURFACE GEOCHEMICAL EXPRESSION OF THE REDROSS NICKEL DEPOSIT, WESTERN AUSTRALIA by R. Dalgarno and A.R. Knowles.

WONGULGUNNA COPPER-ZINC PROSPECT - A CASE HISTORY OF SURFACE EXPLORATION by G.A. McLellan, C.J. Roberts and D.L. Woolf.

GEOCHEMICAL EXPLORATION FOR BASE AND PRECIOUS METALS ASSOCIATED WITH THE JIMBERLANA DYKE, WESTERN AUSTRALIA by R.H. Mazzucchelli and A. Robbins.

MINERALISATION ASSOCIATED WITH ACID IGNEOUS ROCKS IN N.E. QUEENSLAND by J.W. Sheraton.

FLUORINE, A DIRECT INDICATOR OF FLUORITE MINERALISATION IN LOCAL AND REGIONAL SOIL GEOCHEMICAL SURVEYS by B.L. Farrell.

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

NICKEL GOSSANS FROM THE EASTERN GOLDFIELDS, WESTERN AUSTRALIA by W.G. Hancock and J.R. Wilmshurst.

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

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

Committee activities

Admissions (M.B. Mehrtens)

The admissions committee has recommended the acceptance of 42 members, 2 affiliates and 2 students into the Association. These recommendations will be considered at the next Council meeting to be held in Toronto on September 14th, 1973.

Bibliography (H.E. Hawkes)

The bibliography committee is involved in compiling a bibliography of geochemical exploration literature for the current year. This contribution is all the more valuable if published rapidly. Dr. van Eysinga of Elsevier has agreed to publish the bibliography in the first number of the journal each year to allow rapid dissemination of this information.

Case history (P.M.D. Bradshaw)

The case history committee is involved with arranging a series of group discussions in different locations to review geochemical exploration technology in different areas. These discussions will culminate in the presentation of a series of papers dealing with geochemical exploration in the North American Cordillera, the Canadian Shield, the Maritimes, the Southeast and Southwest United States.

Constitution (J.A. Coope)

The amendments to the Constitution that were approved at the Vancouver meeting have been incorporated in a new Constitution. This Constitution is now in the course of being printed.

The Constitution committee is currently devoting its attention to a consideration of the definition of the Professional Geochemist and Professional Practice.

Geochemical Analysis (H.W. Lakin)

The processing of the analytical data on the standard samples is proceeding and I am advised by Dr. Lakin that he plans on having a report on 8 to 10 elements from all reporting laboratories available at the Vancouver symposium.

Regional Geochemical Data Compilation (W.K. Fletcher)

A questionnaire was distributed with the previous newsletter to provide information on (a) a census of the regional geochemical data arising from the activities of exploration companies, government agencies and universities, (b) the sampling and analytical techniques in common usage in regional geochemical surveys, and (c) the future role of government agencies and universities in regional geochemical surveys and related research. The replies to this questionnaire are currently being processed by the committee.

Research and Education (R.H. Carpenter)

The research and education committee has underway the production of a series of review articles by committee members dealing with geochemical exploration in various areas of the world and with the development of new techniques. Two reports are included at the end of this newsletter, i.e. "GEOCHEMICAL EXPLORATION IN THE UNITED NATIONS DEVELOPMENT PROGRAMME 1970/73" by C. Lepeltier and "RECENT TRENDS IN EXPLORATION GEOCHEMISTRY IN BRAZIL" by R.W. Lewis, Jr.

The following reviews are underway and should be completed before the end of 1973:

THE ROLE OF EXPLORATION GEOCHEMISTRY IN U.S. AND CANADIAN UNIVERSITIES
by R.H. Carpenter.

APPLICATION OF EXPLORATION GEOCHEMISTRY BY U.S. STATE GEOLOGICAL SURVEYS
by Otis Clarke.

TRENDS IN EXPLORATION GEOCHEMISTRY IN AFRICA by G.L. Coetzee.

EVALUATION OF RECENT LITERATURE FOR TRENDS IN EXPLORATION GEOCHEMISTRY by
Peter Siems.

GASEOUS GEOCHEMISTRY, RECENT GEOCHEMICAL DISCOVERIES by P.B. Trost.

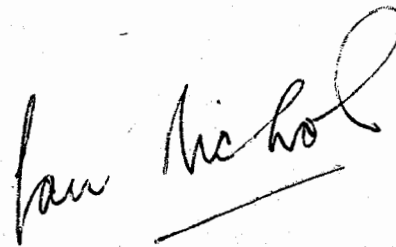
Employment Service

As a service to our membership the Secretary is maintaining a roster of persons available for employment in the exploration industry. Anyone wishing employment should advise the Secretary of their qualifications, background experience and nature of the position sought. Interested employers should contact the Secretary for information on available personnel.

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.

Before closing I should like to express my appreciation to the many individuals who are assisting with Association matters. It is only by active participation of the membership in Association affairs that the Association will grow and constitute an active group of people involved in geochemical exploration.

A handwritten signature in cursive script that reads "Ian Nichol". The signature is written in dark ink and is positioned above a horizontal line.

IAN NICHOL.

IN:slb

RESEARCH AND EDUCATION COMMITTEE

CHAIRMAN: R.H. Carpenter

Geochemical Exploration In The United Nations Development Programme 1970/73

by C. Lepeltier

Introduction

Three years ago, at the 3rd International Geochemical Exploration Symposium held in Toronto in April 1970, I reviewed the United Nations activity in exploration geochemistry for the period 1960-1969, the general outline of which is still valid to date, (Lepeltier 1971).

Acting as executing Agency for the United Nations Development Programme (UNDP) the United Nations Department of Economic and Social Affairs has, since 1960, executed some 65 full-scale mineral survey projects in co-operation with and jointly financed by recipient governments in developing countries (Brand, 1972). Of these 65 operations, 59 included geochemistry, the importance of which varied from ancillary techniques to full-scale reconnaissance and follow-up programs. As of June 1973, 39 projects with a geochemical component have been completed and 20 are in progress.

Type of activity

The United Nations sponsored projects have a direct economic orientation. Though all of them have a training component for counterpart personnel, their main purpose is to delineate exploration targets promising enough to attract private investment for further development. An average operation may last from 2 to 5 years, the zone to be covered ranging from 5,000 to 200,000 km² the total budget going from US \$500,000 to 4,000,000 and the international personnel involved varying from 2 to 12. The projects are executed in close co-operation with national organizations (Geological Survey, Service de la géologie et des mines, Direccion de Minería, Instituto de Geología, etc. . .) and technical counterpart personnel participate in all aspects of project operations.

Reconnaissance stream sediment surveys account for the bulk of geochemical activity although soil surveys are employed when warranted by local conditions; in the follow-up phases, detailed soil and rock surveys usually complement geological mapping and ground geophysics. Biogeochemical and hydrogeochemical surveys have been very limited in extent.

Geochemical operations are carried out entirely by project personnel with the exception of control or specialized analyses which are often sub-contracted to commercial laboratories, as well as of consultants services which are used when the need arises at critical stages of the operations. In the average project, the staff usually includes a geochemist in charge of the planning, supervision of field operations and interpretation of data with an analytical chemist responsible for the laboratory services required. Technical backstopping is provided to the projects by a group of technical advisers at U.N. Headquarters in New York, whose expertise covers the different fields of mineral exploration. In some countries existing laboratory facilities may be used, generally up-dated with modern equipment; in many cases new laboratories have been established as part of project operations. Most of the laboratories have been equipped with atomic absorption spectrophotometers: to date, 48 such instruments have been installed in different countries. According to the importance of the program they may be complemented by emission spectrographs, X-ray fluorescence units and selective-ion electrodes; however, colorimetry still plays its part in many countries.

Personnel

Since the start in 1960 of the United Nations mineral exploration program, recruitment in the field of geochemistry has included:

- 32 geochemists (18 of whom are now on duty)
- 25 chemists (10 of whom are now on duty)

Furthermore, 17 short-term consultants have assisted in our programs for periods of 1 to 4 weeks.

As mentioned in the author's Toronto Symposium paper, most of the geochemists come from eastern european countries (44%) but in the last year, this proportion has decreased to 33%. Of the 25 chemists, 16 come from Europe (only 2 from the USSR). As for the consultants, 8 came from the United States and Canada, 4 from France, 2 from the United Kingdom, one from Sweden, one from New Zealand, one from the USSR.

Any inconvenience caused by heterogeneity in the professional backgrounds and experience of international staff recruited is generally compensated for by exchange of experience and the comparison between different approaches to exploration problems. The main drawback is the difficulty in recruiting highly qualified personnel for relatively short fixed-term appointments and retaining their services without hiatus between assignments. In this respect much depends on the overall level of UNDP-financed mineral survey activities which, after a sharp and steady rise during the first decade, has reached a plateau and possibly some decline in the last few years.

Global distribution of the projects

The geographical distribution of the United Nations mineral surveys is widespread. One can roughly say that it is worldwide south of the 40th north parallel, entailing operations in the most diverse climatic and topographic conditions, from the Bolivian Altiplano to the swamps of Panama, from the deserts of Mauritania to the equatorial jungle of Gabon. Possible the only environments not touched so far are the glacial overburden and the permafrost. Since 1960, geochemical exploration has been carried out by U.N. teams in the following countries:

AFRICA: Morocco* - Tunisia - Egypt* - Mauritania* - Mali - Niger - Sudan - Ethiopia* - Somalia* - Senegal* - Liberia - Ivory Coast - Upper Volta* - Togo* - Dahomey* - Nigeria - Gabon - Congo - Zaire - Rwanda* - Burundi* - Uganda - Kenya - Tanzania - Zambia - Lesotho* - Swaziland - Madagascar.

(*) Operations in progress.

LATIN AMERICA: Mexico - Guatemala - Honduras* - El Salvador - Nicaragua -

WEST INDIES & SOUTH AMERICA: Panama - Colombia* - Guyana - Ecuador - Bolivia - Chile - Argentina* - Haiti* -

MIDDLE EAST: Turkey* - Cyprus - Jordan - Iran - Yemen*

FAR EAST: Philippines - British Solomons - India* - Malaysia - Burma*

Volume of work

As of June 1973 there are 21 mineral exploration surveys in progress, where geochemistry plays a major role. For the first decade (1960/Dec. 1969) the revised figures for samples collected and analytical determinations amount to 460,000 and 2,160,000 respectively. As of June 1973 they amount to:

1960/June 1973 - Samples collected: ca. 1 million
Analytical determinations: ca. 5 million

To give a better idea of the volume of work carried out over the last years, figures have been computed for the period January 1970/June 1973, viz.:

January 1970/June 1973 - Samples collected: 600,000
Analytical determinations: 3,200,000

which results from an average of 20 projects over a 3.1/2 year period or:

170,000 samples) per year, and 8,500 samples) per year/per average
900,000 analyses) per year, and 45,000 analyses) per year/per average
project

Samples collected can be broken down as follows:

Stream sediment ca. 70%
Soil ca. 25%
Miscellaneous (rock, drill-core, water, vegetation) 5%

reflecting the importance of reconnaissance surveys in the United Nations programs. It should be noted that figures given for analytical determinations include an estimated 10% control analyses.

Geochemistry plays a very important role in our mineral surveys, especially at the reconnaissance stage when very rugged topography and/or extreme climatic conditions make other exploration tools too difficult, too unreliable or simply too expensive. Also good geological reconnaissance is reached always, simultaneously with geochemical sampling.

Productivity and costs of geochemical surveys will not be discussed here, but will be the subject of a further paper.

Exploration results

(a) MALAYSIA (Sabah)

The discovery of the Mamut porphyry copper in northern Sabah dates back to 1965 when a geochemical stream sediment survey outlined important copper anomalies in the headwaters of the Mamut River. Subsequent work, including shallow drilling by the Borneo Geological Survey has shown the existence of extensive copper mineralization of porphyry type estimated at 80-90 million tons averaging 0.7% copper.

A Japanese-Malaysian joint venture, the Mamut Mines Development Company, was granted permission to develop the deposit at an estimated cost of \$70 million.

(b) ECUADOR

In the Chaucha valley, 100 km. southeast of Guayaquil, an intensive geochemical program (1968) located a porphyry copper-molybdenum deposit. A Japanese group, the Overseas Mineral Resources Development Corporation, was granted the concession and spent 4-5 million dollars for detailed exploration. Work is going on on the deposit now estimated at 80 million tons grading 0.7% copper equivalent.

(c) PANAMA

Phase I: In 1968 a geochemical stream sediment survey combined with geological observations resulted in the discovery of mineralization of porphyry copper-molybdenum type at Cerro Petaquilla, near the Caribbean coast of Central Panama. The results of preliminary drilling indicate that several low-grade, large volume orebodies may exist within an area of some 15 square kilometers. The deposits will be developed by a group of seven Japanese companies.

Phase II: The main results of Phase II investigations was the discovery and delineation of the San Blas mineral belt in northeastern Panama, in which geochemistry played a major role (regional reconnaissance in stream sediments, then soil and rocks detailed surveys). The dominant element of potential economic importance is copper with subordinate gold and zinc, and lesser amounts of molybdenum and silver. The most promising zone is the Rio Pito general area, near the Colombian border. Government has now invited proposals for exploration concessions.

The positive results obtained by the U.N. exploration program encouraged numerous mining companies to undertake systematic mineral exploration in other parts of Panama. Two of these companies have encountered promising copper mineralization in the western part of the Cordillera and one has reached the stage of planning mine development at Cerro Colorado, Chiriqui Province; published figures of over 2,000 million tons grading 0.8% Cu have recently appeared.

(d) ARGENTINA

From 1963 to 1968 two successive exploration programs in which geochemistry was intensively utilized, led to the discovery in the Provinces of San Juan, Mendoza and Neuquen, of a number of interesting porphyry copper-type mineralizations. Legal difficulties have here slowed the follow-up work. However,

concessions were awarded in two areas: Pachon, 200 km. west of the city of San Juan where Compania Minera Aguilar proved more than 100 million tons grading 0.65 to 1% Cu; and Campana Mahuida, in Neuquen, where Falconbridge will follow-up a potential porphyry copper.

(e) MEXICO

Though the discovery of the large porphyry copper deposit "La Caridad" near Nacozari in Sonora was not essentially due to geochemistry, geochemical prospecting played an important role in outlining the mineralized area (stream sediment then soil surveys). Reportedly reserves at the "La Caridad" mine total 750 million tons of ore containing 0.8% copper. Total investment in the mine is figured at over 250 million dollars.

CHILE

In Chile geochemical exploration was successfully applied in detailed investigation of the "Los Pelambres" hydrothermal alteration area. Talus and rock sampling resulted in outlining an anomalous area which later proved to coincide very well with the potentially economic mineralization. So far a limited drilling program has indicated a deposit of 380 million tons of ore averaging 0.7% Cu and 0.025% molybdenum.

PHILIPPINES

The purpose of the U.N. project in the Philippines (1962-1968) was establishing an Institute of Applied Geology. During the training of the personnel in geochemical exploration, the stream sediment survey carried out on the Santo Nino property (porphyry copper type) disclosed important additional mineralized areas. This result has encouraged negotiations for financing further exploration and development.

Problem areas

Some of the general problems encountered can be attributed to: (a) the great diversity in training and experience of project personnel, which, although at times beneficial, can result in different approach to prospecting problems, (b) the wide variety of geographical conditions, (c) difficulty in standardization of operations and of analytical procedures. A consequence of this situation is an uneven quality in data acquisition and a difficulty in correlating results on a global or even a regional basis.

In the field major technical difficulties are encountered in laterite-covered regions and in desert countries without drainage basins or covered by wind-blown sands. Results obtained from experimental studies under such conditions are being compiled and will be published at a later date.

Another serious problem is related to financial considerations as mentioned by Brand (1972): "At the Executing Agency level, and more particular as concerns the Resources and Transport Division, which carries technical responsibility for the projects involved, present provisions are barely adequate to sustain operational aspects and at the same time keep fully abreast with research

and development . . .". There is no easy solution. With greater sophistication in interpretation methodology there would be arguments in favor of re-interpreting, correlating or standardizing all geochemical data collected during United Nations projects to date. This would be a valuable but very large task, which at the moment the U.N. is not capable of effecting itself. Among the possible solutions, are better dissemination of information through meetings of specialized project personnel, participation in professional symposia, experimental studies during the course of project operations and close contact with university research centers or government specialized agencies.

A question often asked is why are there so few U.N. technical publications outlining the results of these exploration programs. A major reason is that all project data are the property of recipient governments, many of which prefer to have the technical reports restricted for varying periods of time. Most derestricted reports can be consulted at U.N. Headquarters in New York and in some cases copies made available by the concerned governments themselves. A list of the publications available at the moment is given together with references.

Conclusion

The relative importance of geochemical prospecting in the United Nations mineral surveys has increased steadily and is now established as a key technique in nearly all exploration undertaken. It has achieved its best results in reconnaissance programs in the tropical or equatorial environments but is also the standard method in integrated follow-up operations. In very rugged topographical conditions, helicopter-borne sampling programs have proven very effective for large scale reconnaissance surveys, the high transport cost being largely off-set by the speed of coverage (in Ecuador for instance and more recently in the Western Cordillera of Colombia). Productivity costs and comparison with other exploration techniques will be discussed in a later paper.

References and available publications

Brand, H.

1972: United Nations Mineral Survey Programmes 24th IGC., Montreal.

Carman, J.

1971: United Nations Mineral Exploration Activities, the first decade. AIME proceedings of Council of Economics.

Lepeltier, C.

1971: Geochemical Exploration in the United Nations Development Programme. CIMM - Special Vol. 11

U.N. Publication

Sales Number 64.II.F.7 Proceedings of the seminar on geochemical prospecting methods and techniques, Bangkok 1963.

U.N. Publication

Sales Number E.72.II.F.2 Proceedings of the second seminar on geochemical prospecting methods and techniques, Ceylon 1970.

Recent Trends In Exploration Geochemistry In Brazil

by R.W. Lewis, Jr.

I. Educational Programs

The Federal University of Bahia, in Salvador, Bahia, has the only educational program specifically oriented to exploration geochemistry. This program is both for undergraduate and graduate levels.

Individual courses in geochemical prospecting and allied disciplines have been offered by the Federal University of Rio Grande do Sul and the U. S. Geological Survey. U.S.G.S. training programs have included in-house training for Brazil technicians in USGS labs in Denver and Puerto Rico, as well as individual training in Brazil by USGS specialists, and intensive courses in geochemical exploration, geomathematics, and field courses in mineral exploration.

II. Research

Three universities are currently engaged in research in geochemistry; the Federal Universities of Rio de Janeiro, Rio Grande do Sul, and Bahia. At Rio de Janeiro an extensive program is in progress investigating the geochemistry of tropical weathering and soil formation; at Rio Grande do Sul investigations of prospecting techniques is underway. The University of Bahia has several projects in progress. These include investigations of analytical techniques, their accuracy and precision; determination of background values in selected areas; and regional sampling and data interpretation.

III. Role of geochemistry in geologic and mineral exploration

The geochemistry of stream sediments is being extensively used in Brazil for the evaluations of large areas, especially where access is difficult and ground cover extensive such as in the Amazon Basin. Data obtained from stream-samples are being used to detect signs of potential mineralization, to evaluate the geologic setting, and to define major rocks units.

Geochemical surveys are also being conducted as a Ground-truth follow-up of the extensive Radar Imagery project that covers all of the Amazon Basin.

In the field of mineral prospecting, geochemistry has found wide acceptance for the search and evaluation of copper, chromium, and nickel in the belts of ultramafic rocks in central and eastern Brazil.

IV. Highlights

The numerous variables inherent in geochemical sampling on a regional basis has severely hampered the interpretation of data from previously unexplored areas. It has been possible in some cases, however, to enhance subtle, yet perhaps, important increases in geochemical values by use of "mineral vectors", in which the weighted values of commonly associated elements (e.g. Cu, Ni, Co, Cr) are summed or plotted with appropriate symbols on a geologic map. We found that the most suitable method for weighting values was to divide each one by the median value for that population, thereby avoiding risky assumptions regarding distribution characteristics. Plotting these values as colored circles on a geologic map has proven a singularly rapid and easy means of establishing which areas merit further investigation.

THE ASSOCIATION OF EXPLORATION GEOCHEMISTS



July 5th, 1973.

President:

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Research Geologist,
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E. M. Cameron
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Dear Bob:

I am planning on preparing Newsletter #10 during August and am anxious to include as much current news as possible on A.E.G. affairs.

Secretary:

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

As you are aware we continue to have problems with Elsevier regarding the publication of the journal. Every effort is being made by John Hansuld to straighten these problems out. In the interim I believe it is important to hold the memberships interest in the Association through the medium of the Newsletter.

Treasurer:

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


I appreciate this is a busy time of year for us all but would be grateful for a summary of the progress made by your committee for inclusion in the newsletter. If possible I would like this to be in my hands by the end of July.

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. Mehrrens
F. N. Ward
H. V. Warren

With best wishes,

Yours sincerely,


IAN NICHOL,
President.

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