

# THE GANGUE

*The newsletter of the  
Mineral Deposits Division  
Geological Association of Canada  
No. 25  
May 1987*

## NOMINATIONS FOR MDD EXECUTIVE:

The slate of officers nominated for the 1987-88 year is as follows:

Past Chairman - Chris Jennings  
Chairman - John Morganti  
Vice-Chairman - Tom Schroeter  
Secretary - Barry Cook  
Treasurer - Al Sinclair

At the time of writing, the list of Directors nominated had not been finalized. They will be announced at the annual meeting in Saskatoon, which all and sundry are urged to attend.

There has been a conscious decision taken to start the gradual shift of the centre of gravity of the MDD executive back to the West, after its very successful run in the East. This should not, however, be taken as a sign that others are not welcome - of course they are, and the only way that MDD can really work is to have strong support and representation from all regions of the country.

## DUNCAN DERRY MEDAL WINNER:

It is indeed sad to remember that the famous and much-revered geologist after which this medal is named passed away recently. The awarding of the medal each year will help us all remember Duncan Derry and all that he stood for.

The MDD is pleased to announce that this year's winner of this prestigious award is Dr. A.E. Soregaroli, Vice-President of Exploration for Westmin Resources. A more detailed citation will be published in the next Gangue; at this time suffice it to say that Art has had (and continues to have) a distinguished career, which has seen him active in University, Government, and Industry. He is indeed a most worthy recipient of the Derry Medal.

It is not too early to be thinking of nominations for the 1988 medalist. Candidates should be members of GAC and preferably, but not necessarily members of MDD. Non-member winners are of course possible, but they probably won't stay non-members for long!

Nominations for the medal are to be made by three members of the MDD, either jointly or by independent submissions. Nominations should be supported by an introduction to the candidate, a summary of the candidate's accomplishments in economic geology, a curriculum vitae, and any other information or attachments that will supplement and enhance the presentation. Candidates should be recognized for their skill and stature as professional economic geologists, and also by their public contributions to the science. It is acknowledged that publication is the prime but not the only method of disseminating scientific information in any discipline.

Nominations should be sent to the Chairman of the Selection Committee, who is the current Vice-Chairman of the MDD. Nominations for the 1988 medal candidates should be sent to:

Tom Schroeter  
B.C. Geological Survey  
159-800 Hornby Street  
Vancouver, B.C.  
V6Z 2C5

## THE GANGUE - NEW BUSINESS ADDRESS:

The new address of The Gangue is:

Giles R. Peatfield  
Editor, The Gangue  
c/o MineQuest Exploration Associates Ltd.  
5th Floor, 164 Water Street  
Vancouver, B.C.  
V6B 1B5  
(604) 669-2251

## ACKNOWLEDGMENT:

The Gangue gratefully acknowledges assistance in preparation of Gangue 25 from MineQuest Exploration Associates Ltd., and in mailing by the Geology Graduate Students Association at U.B.C.

## PAST FIELD TRIPS:

### MDD Adventures in Iberia - Part 2:

"Our weekend in Madrid commenced with a rousing start at a reception in the Canadian Embassy on the evening of Friday 18th April. Various representatives of the Spanish mining industry were present and mixed well with the MDD members before setting out to sample the night life in Madrid. Over the weekend, our group were allowed to relax for two days and soak in the sights of Madrid and Toledo before embarking on the planned series of mine visits in southern Spain.

Monday morning found us threading our way along narrow roads leading to the world's leading mercury producer - the Almaden Mine. After an initial period of confusion searching for the Mine Manager's office amidst hectic construction activity we were eventually introduced to two of the mine geologists who gave us a lecture in excellent English on the geology of the three mercury mines operated by Minas de Almaden - a government owned company. Two of the mines are presently producing (Almaden and El Entredicho) and one is being prepared for production with the construction of a 400 m shaft (Las Cuevas).

The Almaden Mine, now nearing the end of its long life, has been worked since before the Roman occupation and has produced approximately 11 million flasks of mercury (1 flask = 76 lbs). During the last six years much of the production has come from the El Entredicho open pit mine. This mine is similar to the Almaden Mine in that most of the ore comes from stratabound zones of almost massive cinnabar located in the 'Criadero Quartzite' near the Ordovician-Silurian boundary. The Las Cuevas deposit on the other hand is located about 550 m higher in the section and the mercury mineralization has a cross-cutting relationship with the mafic lavas, pyroclastics and greywackes. This deposit has a substantial tonnage, is high grade and may become the Western World's most important mercury producer in the 1990's.

Currently, Minas de Almaden produces about 40,000 flasks of mercury per year, about 25% of 1985 World demand.

The origin of the mineralization is controversial. Recent studies at Almaden have advanced strong arguments for syngenetic or pre-diagenetic mineralization during deposition of the Criadero Quartzite. Of great significance is the spatial relationship between the cinnabar mineralization and occurrences of 'Piedra Frailesca' - a breccia which usually has a discordant relationship with the stratigraphy and is composed of fragments of argillite, metabasic rock, peridotite and rare clasts of quartzite mineralized with cinnabar in a carbonatized matrix. The thickness of the mineralization increases towards this breccia but the breccia itself is generally barren.

After the lecture one half of our group went underground at Almaden Mine and the other half visited the El Entredicho open pit mine. The underground group witnessed native mercury dripping from the backs of old stopes to form pools on the ground. Inspection of broken chunks of dark quartzite sometimes showed beads of mercury oozing from fresh surfaces. The open pit

group saw excellent exposures of 'Piedra Frailesca' and obtained fine samples from a 2 m 'bed' of almost massive cinnabar. On departing from Almaden our bus travelled to the ancient city of Cordoba where we spent a pleasant evening inspecting the old Jewish quarter in the vicinity of the 'Mezquita'.

On Tuesday morning we made an early start for Aznalcollar and stopped off for early morning continental breakfast at a roadside cafe. Some of the participants noticed that the Spaniards in the cafe commonly ordered a glass of colourless liquid to wash down their breakfast. This they decided was a very civilized idea and thereby discovered that an early morning medicinal snort was all they needed to help them survive the day.

The Aznalcollar massive sulphide deposit is operated by Andaluza de Piritas S.A. and is located 40 km northwest of Sevilla in the eastern part of the pyrite belt. The deposit presently being mined by open pit methods was discovered in 1971 as a result of application of volcanogenic concepts and grid drilling in an area of Roman workings. The drilling outlined a series of north dipping lenses of massive pyrite containing base metal values and forming a 1400 X 60 m sheet overlying shales, tuffs and rhyolites. The complex pyrite ore had an original reserve of 43 million tonnes containing 0.44% Cu, 1.77% Zn and 67 g/t Ag. Structurally overlying the massive sulphide ore is a 30 million tonne lens of pyroclastic ore containing 0.58% Cu, 0.4% Zn and 10 g/t Ag. This mineralization occurs as chalcopyrite pyrite and sphalerite stringers parallel to the foliation in a pyroclastic. The lens is overlain by a series of shales, tuffs and acid volcanics. At the time of our visit the mine was producing about 2 million tonnes of pyritic ore per year and 1.5 million tonnes of pyroclastic ore. The stripping ratio is 9:1 (waste to ore).

Our group was able to examine a magnificent section through the open pit. Much controversy surrounded the structural complexity of the deposit and whether the pyroclastic ore represented a stringer zone in the overturned stratigraphic footwall. The debate continued on the bus on the way back to Sevilla with our in-house massive sulphide experts (Dane Bridge and Alex Davidson) leading the discussion.

The late afternoon and evening were spent exploring Sevilla. Most people visited the famous Gothic cathedral and a few stalwarts ventured into the flamenco bars in the early hours of the morning. Dave Cooke's flamenco performance was so impressive that he was offered a job as a dancer: he declined - reluctantly.

Our second mine visit in the pyrite belt was to the historic Rio Tinto Mine. My first impression on arrival at the mine was of an incredible conglomeration of white-walled, red-roofed Spanish villages surrounded by immense open pits, dumps and old mining equipment. In the past, the area has been mined by the pre-Roman people of Tartessos, the Romans and after a long period of dormancy, the British (starting in 1850). It has been estimated that the original aggregate tonnage of all the ore bodies including the gossan must have been around 500 million tonnes. At the time of our visit the mine complex was producing three different types of ore; gold and silver ore

from the oxidized cap, copper ore from the Cerro Colorado stockwork and sulphur ore from the massive pyrite.

During Roman times, approximately 10 million tonnes of gossan were mined for gold and silver. The gossan consists of masses of siliceous hematite cemented by limonite containing at its base layers of precious metal bearing jarosite. It is believed that this gossan represented a sheet of oxidized massive sulphide which at one time completely covered the Cerro Colorado stockwork zone. Much of this gossan has now been removed but at the time of our visit, Rio Tinto Minera were mining 2.25 million tonnes/year of gossan grading 2.2 g/t Au and 55g/t Ag. Reserves are 40 million tonnes and an expansion of 5 million tonnes/year was being planned.

At Rio Tinto much of our time was spent inspecting a section in the Atalaya open pit which showed excellent exposures of quartz, chalcopyrite and pyrite stockwork in chloritized mafic or acid volcanics underlying a massive pyrite stockwork (reserves 45 mt). This ore body, until recently, produced 1 million tonnes per year of crude pyrite which was shipped to the smelter at Huelva and used as a source of sulphur. At the adjacent Cerro Colorado open pit, the 'porphyry' type stockwork ore was being mined at a rate of 7 million tonnes/year at a grade of 0.5% Cu (0.2% Cu cut-off; 150 million tonnes reserves).

In the afternoon, after a delicious lunch hosted by Rio Tinto, we drove across the Portuguese border to the town of Beja in Portugal which was to be our base for two nights. We were sorry to leave Spain as the hospitality at the mines and at all the small villages where we had stayed had been unsurpassed for warmth. This was in distinct contrast to the rather arrogant or uncaring treatment we sometimes met with at the big hotels in the cities. Another point which struck us in Spain was the widespread respect for the Monarchy and the government (or so it seemed among the people we talked to). Perhaps a country has to suffer many years under a dictatorship to attain this state of mind.

On Thursday, we visited the Aljustrel Mine which possesses the largest reserve of massive sulphide in the pyrite belt, totalling some 200 million tonnes. The sulphide deposits occur in a Mississippian rock sequence composed of a basal felsic volcanic pile with overlying slates, a massive sulphide sheet, hematitic to manganiferous cherts, jaspers and phyllites. The massive sulphides are thought to have formed in two basins flanking a felsic volcanic pile that formed a topographic high. This sequence was then isoclinally folded during the Hercynian Orogeny to form a central anticlinal belt of acid pyroclastics flanked by two linear belts of massive sulphide deposits. The sulphide deposits can be up to 100 m thick and have average grades of 47% S, 0.5-1.7% Cu, 3.25-3.75% Zn and 1.1-1.25% Pb.

After a buffet luncheon at the mine manager's residence we inspected outcrops of megacrystic tuff exposed in the core of the Aljustrel Anticline. This tuff contains 5 mm crystals of K-feldspar and quartz in a green phyllitic matrix. Recent workers have pointed out that the feldspar crystals grow across clast boundaries and, employing isotopic evidence, have invoked a model for their formation involving

convective circulation of sea water through permeable pyroclastics and metasomatic growth of the megacrysts in a low temperature (100 C) environment. This phenomenon only occurs in the footwall rocks of the massive sulphides.

In the evening we met with Fernando Barriga, a professor at the Polytechnic University in Lisbon. Fernando carried out his doctoral studies on the Aljustrel Mine at the University of Western Ontario and with his colleague Jose Brandao Silva had kindly volunteered to lead an excursion to the Pomarao area where we could examine pyrite belt lithostratigraphy and structural style. This trip proved to be a worthwhile and relaxing change from our tight schedule of mine visits. The setting for the trip was idyllic and most of us have memories of examining outcrops amidst flower strewn meadows and quaint Portuguese villages.

The trip was structured so that we could examine an autochthonous section through the Devonian-Mississippian in the morning and in the afternoon examine a similar stratigraphy in an allochthonous setting complicated by the presence of major thrusts. The Pomarao section through the early Mississippian volcanic-sedimentary complex covered about 600 m of stratigraphy and included three rather subtle volcanic cycles characterized by tuffites, phyllites, radiolarites, quartzites and tuffs. Most of the section consisted of fine grained laminated rocks and the obviously volcanic component formed only a minor part of the section. In the afternoon, we had lunch astride a major structural discontinuity which most of us would probably have walked over without noticing. Recent recognition of these discontinuities has emphasized the importance of mapping the structures before attempting to piece together volcanic facies relationships. This may represent one of the frontiers in the understanding of the pyrite belt. At the end of the day we said our farewells to Fernando and Jose and drove to the ancient walled city of Evora where we spent the night.

The grand finale of our field trip took place on Saturday morning with our visit to the Neves Corvo massive sulphide deposit 21 km southeast of Castro Verde in southern Portugal. This deposit is owned by EDMA (51%) and Rio Tinto Zinc Corporation (49%). On arrival at the mine site we were given a lecture on the Neves Corvo project and then half of our group were taken on an underground tour while the other half inspected core samples and the mine model.

The discovery of the Neves Corvo deposits in 1977 by BRGM presents a fascinating case history with a serendipitous message. In 1972 BRGM undertook a major exploration programme covering 4000 sq km in the Portuguese part of the pyrite belt. This took considerable faith in the potential of the volcanogenic geological environment given that most of the deposits in the pyrite belt have low base metal content and at that time were mined primarily for pyrite. In 1974, BRGM obtained a 0.5 mg gravity anomaly over an area containing Culm greywackes overlying Mississippian volcanic-sedimentary rocks. To test the gravity anomaly, they drilled a diamond drill hole which cored 200 m of volcanic and sedimentary rocks before entering a monotonous greywacke sequence. At this point, drilling was discontinued, and it was not until 3 years later that drilling resumed because of the geophysicists' insistence that the gravity

anomaly remained unexplained. The second hole passed through a similar sequence to the 1974 hole and intersected 50 m of massive sulphide between 250 and 300 m depth - only 10 - 20 m beyond the end of the 1974 hole. This intersection was in the thickest part of the Corvo orebody.

The massive sulphides at Neves Corvo are overlain by Culm greywackes and underlain by a felsic pyroclastic pile. They occur in a series of four connected lenses extending over an area of at least 2 X 1.5 km. The main part of each lens is about 600 m in diameter. Maximum lens thickness is 93 m. The four lenses are Corvo (contains the bulk of the high Cu ore), Neves (mainly complex ore), Graca and Zambujal.

Tonnages are as follows:

	MT	Cu%	Zn%	Pb%	Agg/t	Aug/t
Copper ore	27.0	8.66	0.1	0.06		0.2
Complex ore	7.2	4.84	2.48			
Zinc ore	35.0	0.48	5.5	1.2	40	

The cupriferous massive sulphide and the massive pyrite generally consist of 98% sulphide and 2% quartz. The complex zinc ores on the other hand may contain up to 75% quartz. The Corvo orebody is zoned laterally and vertically with a copper-rich core (up to 12%) grading into pyritic massive sulphide and zinc-bearing ore in the upper or distal sections. Minor tetrahedrite occurs with the chalcopyrite. In the footwall of the Graca lens there is a cupriferous stockwork zone which is considered equivalent to the copper-rich core of the Corvo deposit. Also present in one of the deposits is an 'epiclastic breccia' with massive sulphide clasts, which passes laterally into massive sulphide and is overlain by jasper and underlain by a chloritic black shale.

After the geological part of the trip was over, we were entertained at a luncheon hosted by Somincor, the operating company. This proved to be a convivial gathering and our crew was well primed for a party by the time they stepped on the bus to return to Lisbon. The final event of our itinerary was a reception on Sunday evening at the house of James Feir, the Commercial Secretary at the Canadian Embassy. A pleasant evening was spent socializing with members of the Lisbon mining community.

And so ended a fine trip. Thanks are due to all members of the Spanish and Portuguese mining communities who made the trip possible. Special words of mention must be made to Bruce Winfield who carried out most of the organizational work in Spain, the Canadian Embassy staffs in Madrid and Lisbon, and Art Freeze who acted as trip treasurer."

Ian Paterson

Brazil '86:

Although I have not received a written report on this field trip, which took place in Nov. 1986, I am assured by Luca Riccio that a small but enthusiastic group of North American geologists enjoyed a superb trip to many of the better known mining centres of Brazil. All went well, and the trip, true to MDD tradition, made a small profit. This is a solid achievement, and Luca deserves a vote of thanks from all MDD members. Who wants to do Argentina?

UPCOMING FIELD TRIPS:

New Zealand - Fiji '87: CANCELLED

Professor David Mossman of Mount Allison University, Sackville, New Brunswick regrets to announce that the field trip to New Zealand and Fiji, planned for May 1987, has had to be cancelled because not enough participants signed up to make it a break-even proposition. This is too bad, and I know that Prof. Mossman is very disappointed. He deserves a vote of thanks from MDD for all the work he put into trying to get this trip off the ground. Perhaps at some time in the future the concept should be dusted off and tried again - volunteers?

Others:

I have no word on any other field trips in the planning stage. This could be either because MDD is "tripped out" or because my information network is not as good as it should be. How about it - is anyone planning a trip to some exotic (or even mundane) place, and would they like support from MDD? Please contact the Executive if you are. I would remind people that the MDD has an enviable record for well conceived and executed field trips, and has never lost money on such a venture. Let's try to keep up the tradition.

Vancouver '90:

Ken Dawson of the GSC in Vancouver has asked me to announce that preliminary plans for a wide-ranging series of field trips of interest to MDD members to accompany the GAC-MAC Annual Meeting in Vancouver in 1990 are being formulated. Anyone who has ideas or is willing to help with organizing tours is urged to contact Ken - it's never too early to start field trip planning. Some of the destinations mentioned are China, Japan, Australia, New Zealand, Mexico, Hawaii and Chile, as well as perennial favourites in B.C., Nevada and California.

UPCOMING MEETINGS:

Saskatoon '87:

The annual meeting of GAC-MAC is upon us again, and the organizing committee appear to have done a fine job of putting together a comprehensive program. Of special interest to MDD members are planned sessions on 'Gold exploration in central Canada', 'Uranium exploration in Saskatchewan', 'Metallic mineral potential, western interior platform and underlying preCambrian', and of course all the general topics of interest to all. Short courses, field trips, and social events will undoubtedly make this a fine meeting. All MDD members should have ample documentation through GAC. While you are there, do make an effort to attend both the MDD Luncheon and the GAC Luncheon to applaud the Duncan Derry Medal winner.

Pacific Rim Congress 87:

The Australasian Institute of Mining and Metallurgy (AUS.IMM) will host an international congress on the geology, structure, mineralisation and economics of the Pacific Rim, at Gold Coast, Queensland, Australia from August 26-29, 1987.

Note that registration closes June 30, 1987. "This major international congress will bring together from around the Pacific Rim a broad spectrum of geoscientists with knowledge of the geology, structure and ore body development in that area, to provide a total up-to-date understanding from basic mechanics to descriptions of orebodies, exploration methods and exploration problems. It will provide a forum for geologists from all nations of the region to present their knowledge of the area and its economic potential together with the economic and political realities of their region." More information is available from:

C/O AUS.IMM CONGRESS SECRETARIAT  
PO Box 731 Toowong  
4066 Qld.  
AUSTRALIA  
Telephone (International) (617) 371 7900

Exploration '87:

"Building on the success of conferences held in Niagara Falls and Ottawa in 1967 and 1977 which were attended by delegates from many countries, the Canadian exploration community is pleased to invite their colleagues to participate in the Third Decennial International Conference on Geophysical and Geochemical Exploration for Minerals and Groundwater, entitled EXPLORATION '87, to be held in Toronto from September 27 to October 1, 1987."

"The activities of EXPLORATION '87 will be of interest to a wide variety of earth scientists, including geophysicists, geochemists and geologists as well as managers, academics and civil servants involved with mineral, groundwater and geothermal exploration."

The conference will include field schools, poster sessions, a comprehensive technical program, and exhibitions of technology. The proceedings will be published.

More information is available from:

EXPLORATION '87  
c/o 222 Snidercroft Road  
Concord, Ontario  
Canada L4K 1B5  
(416) 669-2280  
Telex: 06-964570  
Fax: (416) 669-5132

Prospecting in Arid Terrain - 2nd International Conference - Perth, Australia:

"This second international conference will provide a forum mainly for geoscientists for the presentation and discussion of case histories and the latest research on prospecting in arid terrain. The first conference was organised by the Institution of Mining and Metallurgy, the Ministry of Energy and Mines of Morocco and the Arab

Organisation for Mineral Resources in Rabat, Morocco, in April 1985. The scope for this second conference has been widened from 'desert' terrains to 'arid' and 'semi-arid' terrains with the aim of attracting a wider range of exploration experience from the drier third of Earth's land masses"

The conference, to be held at the campus of the University of Western Australia, at Perth, from 26-29 April 1988, will include technical sessions, poster displays, and field trips. More information from:

Arid Terrain Conference Secretariat  
AUS.IMM  
PO Box 122  
PARKVILLE, VICTORIA, AUSTRALIA 3052  
Telephone (613) 347 3166  
Facsimile (613) 347 8525  
Telex: AUSIM AA33552

GOLD '88:

GOLD '88 will be held in Melbourne, Australia, in May 1988. For information, write to:

Soussan Marmont  
Ontario Geological Survey  
77 Grenville Street  
Toronto, Ontario  
M5S 1B3

St John's '88:

The Annual Meeting of GAC-MAC for 1988 will be held in St John's, Nfld., 22-25 May 1988. MDD will, as usual, be strongly represented.

SKARN RESEARCH:

Dr. Lawrence Meinert of Washington State University at Pullman is interesting in compiling a comprehensive list of researchers or others interested in skarns. Anyone who fits those categories is urged to contact Dr. Meinert and supply:

Name:  
Address:  
Telephone:  
Main Research Area (i.e. exploration, field studies, geochemistry, mineralogy, petrology, or other):  
Geographic Area or Skarn Topic of Interest:

Dr. Meinert's address is:  
Dept. of Geology  
Washington State University  
Pullman, WA 99164-2812  
USA

NOTES FROM THE PAST:

From The Gangeue 5, April 1980:

Roy Beavon, on the A.A.P.G. Uranium Symposium; El Paso, Texas, Feb 25-27, 1980.

"The southwest section of A.A.P.G.'s annual meeting, held at El Paso, Texas February 25-27, featured a symposium on uranium and related volcanic rocks. Economic interest was centred on some new uranium environments and districts namely McDermitt (Nevada-Oregon) and Pena Blanca (Chihuahua, Mexico). Older uranium districts in the western U.S. were retouched against a background of new ideas in volcanotectonics, petrochemistry of volcanic rocks, and the geochemistry of associated trace and gangue mineralization. The mobility of uranium in ignimbritic volcanic glasses, rhyolitic lavas, and in thick sequences of tuffaceous sediments was considered in proximal and distal environments."

Colin Godwin, on the Cordilleran Section Volcanogenic Symposium, Vancouver.

"The Cordilleran Section of the Geological Association of Canada held a successful, well attended symposium at the Hyatt Regency Hotel, Vancouver, B.C., on January 25-26, 1980. Under the title 'Volcanogenic Deposits and their Regional Setting in the Canadian Cordillera' twenty-five talks were presented on regional overviews, geology of local areas, and geology of specific deposits."

Gwilym Roberts, on the Symposium on Archean Volcanic-Hosted Gold Deposits, Waterloo.

"A one-day symposium on Archean, volcanic-hosted gold deposits, sponsored by the Ontario Geological Survey and the Mineral Deposits Division of GAC, was held at the University of Waterloo, on March 7th, 1980. The symposium attracted 380 geologists, most of them from the mineral exploration industry."

"The meeting was successful in that it presented new observational and analytical data, and summarized current ideas in the genesis of these deposits. Many of the authors focussed on the aspects of the genetic models that are relevant to exploration geologists."

"A good discussion was provoked by Kerrich's overview of the genesis of gold deposits. He briefly touched on a topic which I suspect will shortly engage many geologists: the relationship between these deposits and massive sulphide deposits."

J.M. Newell, on the International Symposium on Metallogenesis in Latin America, Mexico City, Feb. 3-6, 1980.

". . . papers were presented on aspects of metallogenesis throughout South America and the Caribbean, though I was personally disappointed that, with the exception of Mexico, the host country, Central America was not represented. The majority of papers placed

heavy emphasis on relating mineralizing processes to plate margins and the development of megastructures. My conviction that plate tectonic theory was overstressed was reinforced by having read Don Sangster's paper in the December issue of "Geoscience Canada", on my flight south."

"I believe that most, if not all the exploration geologists present were disturbed by comments that in the context of Latin America, the descriptive geological work is largely complete. Though this may well be true in well established mining districts, the woeful lack of reconnaissance scale regional mapping was glaringly apparent from many of the presentations and it seems unfortunate that there is a strong thrust towards more esoteric geological research at the expense of providing a fundamental regional framework on which to base interpretations."

As a comment on Newell's report, I feel that we have some of these problems in our own country. I would welcome comments from MDD members on the topic of regional mapping vs 'esoteric' research. Over to Don Sangster, Lloyd Clark, and others!

ROBINSON GUEST LECTURER:

It is time to be choosing the next MDD sponsored Robinson Guest Lecturer. As you all know, Dr. Jeff Thurlow's lecture tour was a very definite success, and we must make every attempt to come up with a similar lecturer next time round. Anyone who has any thoughts on candidates should contact any of the MDD executive and make their views known. There is a considerable amount of urgency in this matter, so don't delay if you have a suitable candidate in mind.

One of the best things about the Robinson Guest Lecture tour is that it allows geological groups in smaller centres, especially in the northern parts of the country, to hear a talk from a prominent member of the economic geology community, and thereby to feel that they are in fact a part of that community. I feel that this is very important, and that the tour should be encouraged and supported as much as possible.

GOLD: EXPLORATION GEOCHEMISTRY:

Although this notice was received some time ago, there is a chance that not all positions have been filled.

Starting in the summer of 1987 the Department of Geological Sciences, UBC, will have openings for MSc research into the geochemistry of gold. Applicants with good second class or higher BSc degrees are invited to apply to W.K. Fletcher (604) 228-2392.

FINANCIAL REPORT - MDD:

The following report from the Treasurer, Prof. A.J. Sinclair, shows that the Division's finances continue to be healthy. This report is for the year ended December 31, 1986.

Bank Balance, Jan. 1, 1986			\$15,075.32
<u>Income</u>			
Guidebook Sales			
Hemlo	5,877.11		
Highland Valley	<u>277.57</u>	6,154.68	
Annual Dues - 1985 (late)	544.00		
- 1986	<u>3,056.00</u>	3,600.00	
CAME 86, Refund of Seed Money		1,000.00	
Field Trips - Spain	3,963.08		
- Brazil	<u>795.45</u>	4,758.53	<u>15,513.21</u>
			<u>\$30,588.53</u>
<u>Expenses</u>			
GOLD 86 Seed Money - E. Craigie		3,750.00	
Sed. Cu Symp. - J.A. Coope		8,000.00	
Robinson Lecturer		58.40	
Gangue - Production and distribution		1,926.78	
Field Trip - Insurance	600.00		
- Spain (mailing)	<u>135.00</u>	735.00	
Bank Charges		39.15	
Advertising Guidebooks		<u>39.31</u>	14,544.64
Bank Balance, Dec. 31, 1986			<u>16,043.89</u>
			<u>\$30,588.53</u>

A total of \$29,539.15 in term deposits was held on Dec. 31, 1986. The increase of \$1,629.23 over the previous year end is accumulated interest.

A.J. Sinclair, Treasurer  
January 23, 1987.

GEOLOGICAL ASSOCIATION OF CANADA  
MINERALOGICAL ASSOCIATION OF CANADA

**JOINT ANNUAL MEETING**

**May 25-27, 1987**

**"SASKATOON '87" THE PROGRAM FOR EXPLORATIONISTS**

The annual meeting of GAC-MAC to be held at the University of Saskatchewan in May 25 to 27 1987, has an outstanding series of programs that provide an unparalleled opportunity for exploration geologists to up-date their knowledge on advances in the practice and science of geological exploration. The meeting features the following special sessions, short courses, and symposia that will be important for the explorationist.

To bring you up to date on what is happening in the western shield there are the special sessions on:

**GOLD EXPLORATION IN CENTRAL CANADA** presenting the geological settings, styles of gold mineralization, exploration methods, and recent results of exploration for gold in Saskatchewan and Manitoba.

**URANIUM EXPLORATION IN SASKATCHEWAN** is an updated review of uranium exploration during the eighties in Saskatchewan. Ideal for explorationists who want to be ready to move when King Oil recovers and energy becomes expensive.

**METALLIC MINERAL POTENTIAL, WESTERN INTERIOR PLATFORM AND UNDERLYING PRECAMBRIAN** is a special session that deals with many questions that are of interest to the forward-looking prospector. Where are the new Pine Points? What is the potential for similar deposits of copper and uranium? What metallic mineral deposits occur in the Precambrian at shallow depths below the Palaeozoic, and how does one look for them? This is one of the great unexplored areas of Canada.

To keep abreast of the industry, it is essential to understand the recent advances in exploration techniques, and geological knowledge. The use of microcomputers is exploding. To bring you into the mainstream there will be a vigorous program starting with a short course:

**MICROCOMPUTER MODELLING FOR GEOSCIENTISTS.** Geologists with little or no computer experience will be introduced to graphic computer applications that can be implemented on inexpensive microcomputers. The course features hands-on experience in the geological engineering microcomputer laboratory. In addition there will be special sessions on:

**MICROCOMPUTER APPLICATIONS IN GEOLOGICAL SCIENCES AND PROCESSING and INTERPRETATION OF GEOCHEMICAL DATA.** Today some companies are requesting their geophysical and geochemical results on floppy disks so that their geologists can implement univariate and multivariate techniques, modelling, and interpretation strategies on microcomputers in the field. **SASKATOON 87** is where you can find out what is being done and how to do it.

**GEOLOGICAL APPLICATIONS OF REMOTE SENSING** will bring an appreciation of what can be done now with new techniques and machines on remote data acquired on the ground, from aircraft, and by satellites.

It is not enough to keep up with the latest techniques but it is also vital to be informed on the latest geological concepts. For the exploration geologist, one of the most important parts of this meeting will be the 2-day symposium on:

**THE EARLY PROTEROZOIC TRANS-HUDSONIAN OROGEN: LITHOTECTONIC CORRELATIONS AND EVOLUTION.** During the last ten years our understanding of the Canadian Shield extending from La Ronge to Baffin Island has been revolutionized. This symposium promises to bring together the experts from Canada and abroad, so that the exploration geologist can appreciate the framework in which ore deposits may be found in this great area.

**FIELD TRIPS** are an essential part of any program and a wide assortment is available. Trips to the Athabasca Basin, Flin Flon and Snow Lake, across the Trans-Hudsonian Orogen, and others are available.

**SASKATOON 87** also has a wide spectrum of meetings, special sessions, symposia, and short courses, that encompass most fields of geology. Many suppliers will be on hand to exhibit their wares. A full social program is available for your evenings.

All members of the GAC should have received their copies of the second circular with registration forms. If not write to:

Saskatoon '87  
Department of Geological Sciences  
University of Saskatchewan  
Saskatoon, SK  
S7N 0W0