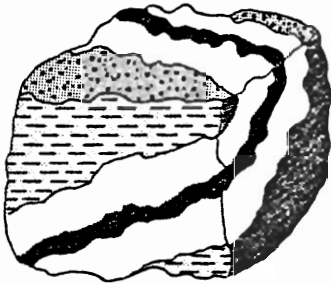


# THE OGNOME



Newsletter of the Mineral Deposits Division

Geological Association of Canada

No. 3

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## CHAIRMAN'S COMMENTS

The 1979 summer field season seems to have gone past at an unprecedented rate. I hope that all enjoyed a successful and profitable summer, and that the various difficulties that nature can place in one's path in the way of weather or geology were not too onerous.

Your committee plans to involve itself in a number of activities this winter. We will be assisting the development of several programs for future G.A.C. national and other meetings. This type of activity requires a substantial lead time and unfortunately results are not always apparent immediately. We believe the symposia, etc., which will be sponsored partly or wholly by MDD at Halifax and Calgary will be attractive and interesting to most economic geologists and we hope to participate in the promotion and planning of other sessions over the next two years as well. Ken has news and data on these activities elsewhere in "The Gangue".

The Division has inaugurated a new GAC Medal to recognize excellence and achievement in the field of economic geology. This will be called the Duncan R. Derry Medal in recognition of Duncan's outstanding contributions to Canadian Geology as a professional and as an active and pioneering member of GAC and other professional groups.

The medal will be awarded for the first time at the Halifax Annual General Meeting. May I urge all of you to pause and reflect on whom you would wish to see honoured as an outstanding Canadian Economic Geologist. When you have selected your hero please organize a nomination and send it to Steve Scott who is Chairman of the Selection Committee. More information on the medal and these procedures is given below.

Hugh Morris.

## DUNCAN R. DERRY MEDAL

The Mineral Deposits Division of the Geological Association of Canada has established a medal to recognize excellence and achievement in Canadian economic geology. Called the Duncan R. Derry Medal, it will be inaugurated as an annual award in 1980 at the G.A.C. Annual Meeting. An outstanding economic geologist who has made major contributions to the science of economic geology in Canada will be honoured.

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The award will recognize the holder's skill and stature as a professional economic geologist and his or her public contributions to the science. It is acknowledged that publication is the prime but not the only method of spreading scientific information in any discipline. Nominees should preferably be members of GAC, and preferably but not necessarily, members of MDD.

Nominations for the medal are to be made by three members of MDD, either jointly or by independent submissions. Nominations must be supported by relevant data, such as a curriculum vitae or a letter outlining the nominee's accomplishments, et cetera. Nominations for the medal may be proposed at any time, but to be considered for particular year, they must be received by the Vice-Chairman of MDD no later than January 31st.

The Award Committee shall consist of the Vice-Chairman of MDD (Chairman), the Chairman of MDD (ex-officio), and five members whom they select from the Directors and Executive. Of those, at least three will be directors. These seven members shall represent, as far as possible, the varied affiliations and geographic locations. The Award Committee would study nominations and make a recommendation to the Directors and Executive for this award.

Unsuccessful nominees will be automatically submitted for review in the subsequent two years, and will then be dropped unless re-nominated.

Duncan Ramsay Derry was born in England in 1907, earned a BA. from Cambridge, then a MA. and Ph.D. in geology from the University of Toronto in 1931. He served five years as a lecturer in geology at Toronto before joining Ventures Ltd. as an exploration geologist, becoming chief geologist in 1947. Dr. Derry then served as vice-president exploration for Rio Tinto from 1954 to 1960. He established and operated his own consulting firm from 1960 to 1969 prior to merging to form his present partnership Derry, Michener and Booth. He is a fellow of the GAC, GSA, SEG, British Geological Society and a Member of the CIM.

CONFERENCE REPORTS

INTERNATIONAL URANIUM SYMPOSIUM ON THE PINE CREEK GEOSYNCLINE, AUSTRALIA

Three hundred eighty two earth scientists gathered in Sydney, Australia between June 4 and June 8, 1979, in order to discuss various geological aspects of the newly recognized Proterozoic unconformity-related uranium deposits. The international symposium was sponsored jointly by the Bureau of Mineral Resources and CSIRO Institute of Earth Resources in co-operation with the International Atomic Energy Agency. The technical sessions were complemented by field excursions to the Pine Creek Geosyncline in Northern Territory.

The sessions were well organized and included more than fifty papers on geology, metallogeny, geophysics, geochemistry and mineralogy of the Proterozoic unconformity-related uranium deposits in the Pine Creek Geosyncline, as well as comparative papers on uranium deposits in Canada, United States, Republic of Gabon, Sweden, Finland and People's Republic of China.

Figures provided by the International Uranium Resource Evaluation Project showed that the unconformity-related uranium deposits of the world (excluding People's Republic of China and eastern U.S.S.R.) contain reserves in the "reasonably assured" and "estimated additional" categories totalling 600,000 to 700,000 tonnes of U metal. However, in the "speculative resources" category, this recently recognized class of deposit is estimated to contain global resources at least three times that amount.

It was apparent from papers on the Australian and Canadian Proterozoic unconformity-related uranium deposits that, despite being similar in many respects, Canadian and Australian deposits of this type differ. Among the common similar features is their spatial relationship to mid-Proterozoic (1800-1600 Ma) unconformities and Archean granitic plutons, and the presence of Upper Proterozoic clastic sediments above the unconformity.

However, an overwhelming majority of the uranium in the Australian deposits (e.g. Ranger I and III, Koongarra, Jabiluka I and II and Nabarlek) occurs in Archean metamorphic rocks below the unconformity, whereas in the Canadian deposits (e.g. Key Lake, Cluff Lake, Midwest Lake) the uranium mineralization occurs mainly within the regolith portion of the unconformity, in the altered portion of the Archean rocks and in the Helikian sedimentary cover rocks.

Field excursions to the Rum Jungle, South Alligator Valley and Alligator River areas of the Pine Creek Geosyncline that included visits to the Jabiru and Ja-Ja camps conveniently complemented this scientific symposium.

Vlad Ruzicka.

PENROSE CONFERENCE ON THE ANTLER OROGENY

A symposium of interest to geologists involved with Cordilleran stratiform shale-hosted base metal-barite deposits, the Penrose Conference on the Antler Orogeny, was held in Elko, Nevada, September 9-15, 1979. The Conference dealt with evidence for late Devonian-early Mississippian orogenic events in the classic area of the Antler Orogeny and possible correlative events the length of the Cordillera and in the Arctic

Devono-Mississippian orogeny in the Arctic Islands (Ellesmerian) seems most easily compared with that in the Caledonides of Greenland. Some of the Alaskan geologists preferred correlation of Brooks Range mid Paleozoic geology with Arctic Islands geology whereas others saw strong similarities with the Yukon part of the Canadian Cordillera. In general, the Antler Orogeny in the Cordillera is contained mainly in the sedimentary record; structural evidence is essentially restricted to Nevada (Roberts Mountain Allochthon) and plutonic and volcanic rocks generally minor, to the northern Cordillera. Nonetheless, the character of Upper Devonian-Lower Mississippian clastic sedimentation is remarkably similar from the Great Basin region to Alaska and suggests an equally widespread tectonic event.

In view of the recent discovery of significant stratiform base metal deposits in fine-grained clastic Upper Devonian rocks in Selwyn Basin and northern British Columbia (Tom, Jason, Driftpile, Cirque) exploration has been increased to the south, particularly in Idaho. The barite deposits which have long been worked in the Elko area are identical in stratigraphic setting to those in the northern Cordillera. So far, however, significant related lead and zinc deposits have not been found. Interestingly, disseminated gold deposits (Carlin, Cortez) occur in intensely fractured shelf carbonate rocks just below the Roberts Mountain thrust.

Hugh Gabrielse.

Following is a brief report to MDD members of a symposium and visits to several European deposits in which the writer participated during September, 1979.

I. CCSS Symposium, Trondheim, Norway

IGCP Project 60 (Correlation of Caledonian Stratabound Sulphides) held a Symposium in Trondheim, Norway, September 10-12, preceded by field trips to eight Norwegian and Swedish deposits. The Symposium was orchestrated by Prof. F. M. Vokes, International Leader of the Project and the writer attended in his capacity as Canadian National Representative. Eighty participants registered for the Symposium and about half of these attended the field excursion. A 120-page guidebook was provided for the latter.

Deposits visited were the Bleikvassli and Hofjellet highly deformed and metamorphosed Pb-Zn deposits in mica schist (meta-shales?) the Rana magnetite-hematite iron mine; the Laisvall sandstone-hosted Pb-Zn deposit; the Stekenjokk, Joma, Lokken, and Hídal volcanic-hosted massive sulphide deposits.

The Bleikvassli (4.8% Zn, 2.5% Pb, 0.15% Cu) and Hofjellet (3.6% Zn, 0.8% Pb, 0.3% Cu) are low-sulphide (i.e. not massive sulphide) deposits enclosed in mica schists and gneisses with minor amphibolites. Both deposits consisted of many lenses and layers of this low-grade material and the general impression this writer came away with was that they likely represent a variety of shale-hosted deposits. Although originally considered to be of Caledonian (Lower Paleozoic) age, recent dating (as yet unpublished) indicates a Precambrian (possibly Grenville) age.

The Rana iron mines (4 deposits are currently under development, the largest of which is 180 million tonnes of open-pit ore) are associated with a dolomitic marble enclosed in garnet and mica schists. Again, there is controversy over the age of these rocks, originally considered Lower Paleozoic but now possibly Precambrian.

The famous Laisvall mine in Sweden was the highlight of the trip for this writer. The deposit, hosted in clean quartzitic sandstones of Eocambrian age, contained original reserves of 80 million tonnes and is currently being mined at 1.4 million tonnes of 4% combined Pb-Zn per year. The ore consists almost entirely of galena as an intergranular matrix to the sandstone. The ore is strongly zoned laterally with the Pb-rich ore containing almost no sphalerite and vice versa in a small sphalerite ore-body. The contact between the two is very sharp and can be easily accommodated within a single photograph. Sedimentary features such as cross-bedding and convolute bedding are readily recognizable even in the highest grade ore. In summary, a deposit that must be seen to be appreciated.

The remaining deposits are, in the writer's opinion, fairly standard small volcanogenic massive sulphide deposits which would hold few surprises for most geologists familiar with Canadian equivalents. In spite of age correlations, the Norwegian-Swedish ores are not similar to, for example, the Bathurst deposits. Host rocks in the Scandinavian deposits contain a much higher proportion of mafic volcanics and are considerably poorer in lead than the Bathurst deposits. The former are, moreover, low-grade. The largest Norwegian deposit of this type (Lokken) averages 2% Cu and 1.8% Zn while Stekenjokk, in the Swedish Caledonides, runs about 1.4% Cu and 3% Zn.

Symposium papers, which dealt mainly with descriptions of Scandinavian Caledonian sulphide deposits, will be published as a unit, probably in the Geological Survey of Norway's Norges Geologiske Undersøkelse (NGU).

## II. Finland

Following the CCSS Symposium, this writer visited three Outokumpu Oy deposits in Finland, namely Vihanti, Pyhasalmi, and Outokumpu-Vuonos. The first two of these are described in the recent Fennoscandian issue of *Economic Geology* (Vol. 75, No. 5) and appear to be fairly normal Cu-Zn-Pb massive sulphide deposits associated with minor felsic volcanic rocks within a thick sequence of monotonous mica schists. One interesting feature of the Vihanti mine, not recognized in previous studies, is the occurrence of a distinctive uranium-apatite horizon just above the ore. As for the Outokumpu-Vuonos deposits, Cu-Zn (Co-Mi) deposits associated with serpentized ultramafics, meta-chert, and black schist, all enclosed in the usual mica schist, the writer would agree with recent authors (e.g. Peltola, *Econ. Geol.* Vol. 73, No. 4) that the deposits are an unusual type of exhalative Cu-Zn massive sulphide associated with an ultramafic body (possibly, but not proven, extrusive). The relatively high Mi-Co content of the ore may be due to its association with these ultramafics. One interesting feature, not mentioned in Peltola's paper, but touched on in an earlier publication (*Geol. Surv. Finland, Bull.* 271, 1975) is the occurrence of a cordierite-anthophyllite rock in the mines. Upon questioning by myself and J. Stewart (BP Minerals, Toronto), mine geologists admitted that this distinctive rock occurred only in the Outokumpu-Vuonos mine area and only between the serpentinite and the adjacent orebody. If the cordierite-anthophyllite represents a metamorphosed alteration zone, then, for the first time, perhaps stratigraphic tops may be determined in this area. By this criteria, both orebodies are upside down and the proper stratigraphic mine sequence would be (from bottom to top) serpentinite-carbonate-chert (plus ore)-black schist.

## III. Germany

As part of a Germany-Canada scientist exchange agreement, the writer spent ten days in the company of BGR (West German Geological Survey) geologists examining the Meggen, Rammelsberg, and Maubach deposits. The first two are well-known Middle Devonian shale-hosted deposits, the third a Laisvall-type sandstone-lead deposit in the Triassic. The first two deposits, regardless of the fact that they are in similar host rocks of almost identical age and only 165 km apart, are quite different in many aspects. Meggen is a single layer of massive pyritic ore (10% Zn, 1.3% Pb) with little or no banding, surrounded by a sulphide-free barite zone. The ore contains little or no intercalations of host shale. Rammelsberg, in contrast, is strongly banded, contains shale interbeds, is a low-pyrite ore (9% Fe), and higher grade (19% Zn, 9% Pb, 1% Cu). Barite occurs mixed with lead-zinc in the top portion of the orebody as well as in a completely separate barite body well into the hangingwall of the sulphide body. An apparent stringer zone of chalcopyrite-quartz occurs beneath the deposit.

The Maubach deposit, which ceased being mined in the 1950's, contains galena occurring as a matrix to clean quartzitic sandstones and pebble conglomerate in a manner very similar to Laisvall (Sweden) and Yava (Canada). Average grade for about 12 million tonnes mined was 2.5% Pb, 0.8% Zn, 0.2% Cu.

Don Sangster.

## COMING EVENTS

Halifax 1980: GAC/MAC Joint Annual Meeting, May 19-21, 1980.

Two symposia of particular interest to students of Appalachian mineral deposits will be held at Halifax '80. A GAC (MOO) symposium Carboniferous Mineral Deposits, organized by Al Sangster, will be followed by a jointly sponsored GAC, MAC, IGCP (CCSS) symposium Geochemical Attributes of Caledonian-Appalachian Volcanogenic Stratabound Sulphide Deposits, organized by the other Sangster, Donald F.

The former symposium will include an overview paper on the Carboniferous System by Peter Giles, updates on Gays River and Yava mines, as well as papers on the Jubilee area of Cape Breton, copper in carboniferous clastic rocks, and uranium deposits. A related field trip "Stratigraphy, sedimentology and mineralization of the Carboniferous Windsor Group" will be led by Helmut Geldsetzer, Peter Giles and Reg Moore.

The Correlation of Caledonian Stratabound Sulphides (CCSS) symposium will include an opening statement by Frank Vokes - an overview of CCSS activities, and a series of invited papers. The half-day symposium will be followed the next day by a workshop, and then a post-conference trip to the Bathurst camp (Brunswick Nos. 6 and 12, Heath Steele, Caribou) under the leadership of A. L. McAllister and J. L. Davies.

GAC Cordilleran Section Symposium: Volcanogenic deposits of the Canadian Cordillera and their regional setting; Hyatt Regency Hotel, Vancouver, January 25-26, 1980.

Program Chairman, Colin Godwin (U.B.C.), has announced the following provisional program:

## OCEANIC PLATE

1. Late Cenozoic plate history and present day offshore geology and geophysics west of Vancouver Island.

- 2. The continental margin off Vancouver and Queen Charlotte Islands, B.C.
- 3. Hydrothermal processes on Juan de Fuca and Explorer Ridges.
- 4. Geothermal resource potential of the Garibaldi volcanic belt, southwestern B.C.

INSULAR BELT

- 5. Sicker volcanic rocks, Vancouver Island, B.C.
- 6. Exhalative manganese deposits, Sicker Group, southwestern B.C.
- 7. Terranes of the St. Elias Mountains, southwestern Y.T.

COAST PLUTONIC COMPLEX

- 8. Stratigraphy and correlation of volcanic sedimentary rocks in the Coast Plutonic Complex, western B.C.
- 9. Geology of Britannia Mine with comments on the Indian River belt, southwestern B.C.
- 10. Geology of Mifty deposit, Bella Coola area, central-western B.C.
- 11. Geology of the Chilliwack Group: B.C.-Washington border area.

INTERMONTANE BELT

- 12. Lower Mesozoic rocks of the Hinterland belt - a volcano sedimentary arc, northern B.C.
- 13. Geology of the Kutcho Creek deposit, northwestern B.C.
- 14. Tahtsa Lake caldera subsidence area, central B.C.

OMINECA BELT

- 15. Geology of Adams Plateau and Barriere Lakes area, south-central B.C.
- 16. Geology of Chu Chua deposit, south-central B.C.
- 17. Geology of the Goldstream deposit, Revelstoke area, south-eastern B.C.
- 18. Mississippian volcanism and related mineralization, Pelly Mountains, Y.T.
- 19. Stratiform zinc mineralization, Pelly Mountains, Y.T.
- 20. Anvil stratigraphy and deposits, Anvil Range, Y.T.

Seventh Geoscience Forum: Whitehorse, Dec. 2-4 and Yellowknife, Dec. 4-7, 1979.

The three-day program at the Whitehorse Travelodge includes papers on Yukon, Alaska and northern British Columbia, with some emphasis on massive sulphide deposits of the Anvil district and elsewhere.

The two-day Yellowknife Geoscience Forum program (Dec. 6-7) will be preceded by a symposium on gold, Dec. 4 and 5.

Program and accomodation information may be obtained from:

J. Morin, DIAND, Geology Section, 200 Range Rd., Whitehorse, Y.T. Y1A 3Y1;  
Tel.: (403) 668-5151.

W. A. Padgham, DIAND, 5110 A 50th Avenue, Yellowknife, N.W.T. X0E 1H0;  
Tel. (403) 873-5856.

Fifth Annual Ore Deposits Workshop: University of Toronto, Dec. 10-14, 1979.

Topics and instructors are:

- "Gold", D. A. Pretorius, (Witwatersrand Univ.);
- "Pb-Zn deposits in carbonate rocks", F. W. Beales;
- "Industrial Minerals", E.T.C. Spooner;
- "Uranium", D. A. Pretorius and others;
- "Massive Cu-Zn-Pb sulphide deposits", S. D. Scott.

Registration fee \$ Can. 400; maximum enrollment is 40. For details contact Dr. E.T.C. Spooner, Ore Deposits Workshop, Department of Geology, University of Toronto, Toronto, Canada M5S 1A1.

Symposium: Archean volcanic-hosted gold deposits; Univ. of Waterloo, March 7, 1980.

For information on the one-day symposium that features nine invited speakers, contact Dr. R. G. Roberts, Dept. of Earth Sciences, Tel. (519) 885-1211, ext. 3379.

ANNOUNCEMENTS

University Lectures

University of Ottawa; 11:45 AM in Rm. D-103, Colonel By Hall.

Nov. 5th, 1979 L.S. Jensen, Ontario Geological Survey  
Volcanic Stratigraphy of the Kirkland Lake Belt.

Nov. 12th, 1979 J. Lajoie, Dépt. de Géologie, Université de Montréal  
Origin of rhyolites in the Rouyn-Noranda region.

Nov. 19th, 1979 M. Schau, Geological Survey of Canada  
Geological history of Anorthosites and Granulites at the edge of the Armit Block, Northern Churchill Structural Province.

Nov. 26th, 1979 P. Copper, Dept. of Geology, Laurentian University  
Paleoecological successions and their applications.

Dec. 3rd, 1979 H.M. French, Departments of Geography and Geology, University of Ottawa  
Permafrost terrain and oil and gas exploration, Arctic Canada.

McMaster University; 4:00 PM in S.S.C.-102.

Nov. 6th, 1979 Dr. Monty Hampton, U.S. Geological Survey  
(Tuesday) (Currently visiting the Civil Engineering Department at Cornell University, Ithaca, N.Y.)  
Geological considerations for engineering activities on the U.S. Pacific-Arctic continental shelf.

Nov. 13th, 1979 Dr. William S. Fyfe, Department of Geology, University of Western Ontario  
(Tuesday) Energy and nuclear waste problems.

Nov. 20th, 1979 Dr. Derek York, Department of Physics, University of Toronto  
(Tuesday) The cooling histories of orogens and pre-Cambrian continental drift.

MEG, Vancouver: November Program, Georgia Hotel, 12:00 noon.

Nov. 7th, 1979 Norman Champigny, M.Sc. candidate, U.B.C., on  
"Specogna gold deposit, Queen Charlotte Islands, B.C.

Nov. 28th, 1979 Charlie Forster, Union Carbide Exploration Corp.  
Vancouver, on  
"Lened tungsten prospect, N.W.T."