

1991 Central Canada Geological Conference

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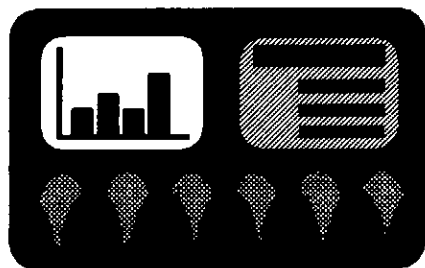
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Conference Reports



1991 Central Canada Geological Conference

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On February 26-28, 1991, more than 45 students and faculty representing seven Ontario universities gathered for the fourth annual Central Canada Geological Conference, hosted by the graduate students at McMaster University. This conference is intended to bring graduate students from central Canadian universities together to share information and present their research. Many speakers use this conference to hone their talks for larger conferences. Although not quite as formal as larger conferences, this meeting drew a broad spectrum of excellent papers on topics as diverse as meteorite impacts and isotope hydrology.

The conference kicked off with an ice-breaker. Although unfortunately few people from universities other than McMaster attended this event, it provided a relaxed atmosphere for some spirited geological discussions.

James Tremblay (McMaster), conference chairman, started the proceedings by thanking the sponsors, which included Falconbridge Ltd., Geological Survey of Canada, Ontario Geological Survey, Geological Association of Canada, Mineralogical Association

of Canada, Canadian Society of Petroleum Geologists, Canadian Institute of Mining and Metallurgy and McMaster University. He also introduced and thanked his organizing committee.

The first session focussed on paleoenvironmental studies. While attempting to describe the link between paleoclimatic variation and astronomical parameters, Michael Gipp (Toronto) likened the problem to code-breaking (disencrypting) messages in a system with two different extreme states in the cycle, in which two different codes dominate. James Tremblay (McMaster) found trilobites in the Ordovician Sunblood Formation in the Northwest Territories to be facies-specific. Laurent de Verteuil (Toronto) determined from pollen in the St. Mary's Formation in Maryland that the area was a diverse, moist coastal plain at 9.5 ± 1.5 Ma, with vegetation similar to today.

In the hydrology session, keynote speaker Shaun Frape (Waterloo) demonstrated that, in southern Ontario, groundwater isotopic ratios and solute chemistries ignore stratigraphic constraints, but follow basement structural trends. A sodium brine from Ohio has migrated north along fractures, while in places meteoric water has penetrated through fractures into the deeper Silurian salt beds. Groundwater modelling suggested to David Bethune (Waterloo) that most recharge bypasses the local industrial area near Managua, Nicaragua, but recharge through surficial sludge dumps contaminates the local water. Jessie Gibson (Waterloo) showed, for the Manner Creek watershed in the Northwest Territories, that isotopic analysis can detail water flow as effectively as using traditional hydrological techniques. Fens in the watershed are contributing water to the river, but not to a local lake.

The sedimentology session began with a keynote address from Guy Plint (Western Ontario). He described third and fourth order cycles in the Cretaceous Cardium through Marchy Bank formations in Alberta that could have been caused by thrust pulses, changing spreading centre morphology, thermal, glacial or geoidal eustasy. Bruce Power (McMaster) feels that stacked shoreface sequences in the Belly River and Lea Park formations resulted from tectonic loading in the Cordillera. Bruce Ainsworth

(McMaster) recognized tidal fluctuations in the estuarine mud drapes in the Cretaceous Horseshoe Canyon Formation in Alberta. Carlos Bruhn (McMaster) found patchily distributed channel-levée complexes in the Cretaceous Almada Basin in Brazil.

In the mineralogy and geochemistry section, Alex Langshur (Ottawa) described structurally related geochemical alteration in the Mooshla intrusion in the Abitibi Belt. Four different deformations occurred, including an intense ductile shearing event. Mike Byerly (Waterloo) related the formation of pillars in the Cambro-Ordovician Potsdam/Nepean sandstone to joints in the underlying Precambrian basement. He felt that catastrophic dewatering along the joints, induced by earthquakes, caused the development of the pillars, which often contain graded concentric cylindrical rings. Christine Brophy (Brock) detailed the mineralogy of ooids from Alberta and Maryland. The presence of significant aragonite suggests that the mid- to late Cambrian seas were aragonitic rather than calcitic.

As the mineralogy and geochemistry session continued on Thursday morning, Amin Mumin (Western Ontario) described the gold mineralization in the Ashanti Gold Belt in Ghana, where the gold is concentrated in mylonite zones and in placers derived from the mylonites. Also intriguing were the insects and biota which live in the mines. Edna Mueller (McMaster) demonstrated that Pb/Pb zircon evaporation dates agreed with standard U/Pb dates, and then reported zircon dates from the Grenville and the Winnipeg River Belt. She found no correlation between the age derived and the current strengths used during evaporation. Debra MacDonald (Windsor) described her work in the Michipicoten Belt, which has shown that feldspar dissolution caused substantial losses of silica, aluminum and several trace elements, indicating significant volume losses during mylonitization. The keynote speaker, Steve Scott (Toronto), discussed the hydrothermal alteration seen in the deep ocean basins. Hydrothermal alteration in the Guayamas Basin in the Gulf of California is also producing thermogenic oil that is less than 5 ka old. Where the continental crust is being split as a spreading ridge migrates toward Papua New Guinea across the Western

Woodlark Basin, barite chimneys contain significant mineral assemblages, but black smokers, the H_2S that supports deep chemo-synthetic life, and hence the life, are absent.

In the metamorphic session, Sam Gichile (Ottawa) described the structural and metamorphic history of the Proterozoic Mozambique orogenic belt in East Africa. Most of the deformation in the belt occurred between 800 Ma and 700 Ma, and involved massive overthrusting and crustal thickening in a Himalayan-type orogeny. Keynote speaker Alan Dickin (McMaster) summarized the tectonic history of "Cottage Country" (a.k.a. the Grenville), Ontario. Based upon Nd model and Pb/Pb ages, he feels that two island arcs were added to the southern edge of the Superior craton at 1900 Ma and 1400 Ma, while plutonism occurred at 1700 Ma and 1450 Ma. A wide passive margin lasted from 1400 Ma to 1250 Ma, and was then rifted. Another island arc was added at 1100 Ma, followed by continent-continent collision at 1000 Ma.

After lunch, keynote speaker Michael Dence (Royal Society of Canada) gave a detailed tour of some impact craters on Earth, Io, Gannymede, Mars, Venus, the Moon and other satellites. He showed that few impact structures are obvious on Io, which has active volcanism, whereas impacts abound on Gannymede and Venus, which have no recent volcanism. Crustal material in the larger craters is forced as much as 20-30 km deep, then brought back to the surface within a few seconds, causing the central cones to form with much more metamorphosed, shattered rocks. James Tremblay ended the oral sessions by thanking the participants and organizing committee.

Several posters were also presented. Holding the poster sessions in the same room as coffee and lunch breaks ensured that most people read the posters, while the coffee, doughnuts, sandwiches and pastries fuelled the discussions. Tamie Weaver *et al.* (Waterloo) discussed the groundwater chemistry of the Devonian oil wells in southern Ontario, while Bob Drimmie *et al.* (Waterloo) described the isotopic signatures of sedimentary paleowater in the Lake Ontario and Lake Erie basins. Jessie Stimson *et al.* (Waterloo) detailed the isotopic evolution of groundwater in the Cochabamba Basin in Bolivia. Dolores Durant and Paul Clifford (McMaster) showed how they used crystal size distributions to determine nucleation rates and densities in syenites from Spanish Peaks, Colorado. Bonnie Blackwell *et al.* (McMaster) described how they dated Sanganonian kettle deposits at Hopwood Farm in Illinois by using electron spin resonance to date tooth enamel and fish scales. Bruce Ainsworth (McMaster), with S. Crowley, described transgressive strand plain sediment from the Upper Carboniferous in the United Kingdom. Bonnie Blackwell *et al.* showed how fossilization occurs in bones deposited in hypersaline lakes in Australia and

Saskatchewan. Alan Dickin (McMaster) detailed his work in progress using various isotopic systems, including Sm/Nd, Pb/Pb, U/Pb and Re/Os.

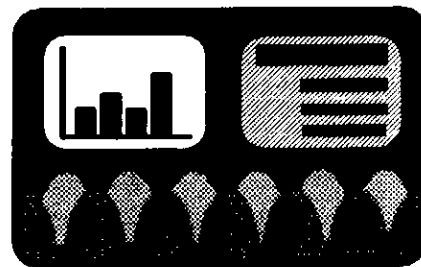
This year's presentations were extremely well done. The quality of slides and overheads far exceeded that seen at many national and international meetings. Unfortunately, microphones were not available: they would have been a real bonus for several soft-spoken speakers. Scientifically, all the data presented was of the highest calibre. This made it difficult for the judges to select the winning papers. Uwe Brand (Brock) judged for the GAC; Derek Armstrong (OGS), for the CSPG and Charles Gamba (McMaster), for the CIMM. Michael Gipp won the GAC trophy for the best talk, with David Bethune as runner-up. The GAC trophy for best poster went to Bruce Ainsworth, with Jessie Stimson as runner-up. The winner of the CSPG trophy for best paper was Carlos Bruhn, with Bruce Ainsworth and Christine Brophy as runners-up. The CIMM award went to Alex Langshur, with Debra MacDonald as runner-up.

The only complaint I have with the student speakers is that there were so few. This is an excellent opportunity to "test-market" a paper before presenting it at a national meeting, but very few students took advantage of it. Granted, the fact that not all Ontario universities have the same reading week makes it difficult to select an optimal time to suit everyone. This hampered attendance by both speakers and others. One way that attendance could be increased would be to insist that all graduate students from the host university present talks or posters.

Although the program frequently ran behind time, this did not prove problematic, because only one session was running. It did mean that some speakers could present more detail than would normally be possible, as well as leaving more time for questions. It would, however, have been nice if the first sessions had begun on time each day. Unlike some small conferences, technical services were good, except for the lack of microphones. Certainly, the organizers provided ample food and refreshments. Congratulations must go to the McMaster students who organized the conference. I think it proved valuable for all who attended. Considering that each year's group must start from scratch to organize the event, it is a daunting task. The CCGC needs to build a handbook giving hints on how to plan and run such an event.

Waterloo will host next year's Central Canada Geological Conference, during their reading week. Anyone wishing to attend, or to present talks or posters, should contact the Department of Earth Sciences, University of Waterloo, Waterloo, Ontario N2L 3G1 for more information.

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European Petroleum Exploration — Impressions

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The European Association of Exploration Geophysicists and the European Association of Petroleum Geoscientists joined forces for, respectively, their 53rd and 3rd meetings at the Fortezza de Basso in Florence, Italy, from May 26 to May 30, 1991. Fifteenth-century battlements enclose what has been converted into a spacious modern conference centre, about one kilometre northwest of the old city.

The conference centre has excellent facilities for exhibitors. They took up the lion's share of the space, pushing lecture theatres to curtained-off corners or into adjacent buildings. It was clearly their show, and most of the 157 listed exhibitors were geophysical contractors. What they had to offer was impressive, especially in the field of reflection seismic data processing. Banks of monitors relayed vivid images of 3-D seismic surveys. They projected horizon maps, slice maps, hydrocarbon anomalies, reservoir character maps and incredibly detailed structural profiles, plus all kinds of graphic displays of vertical seismic profiling. Work stations proliferated, with hands on involvement by delegates encouraged. Companies like Halliburton and Schlumberger gave walk-in courses on their new software. Interactive cross-section modelling, data management systems, geochemical synthesis, computerized drafting; if it could be programmed, it was on show. Beside all this megabyte technocracy, the drilling company stands with their pipe and bits and the publishers with their book-laden shelves and tables looked very staid. Clearly, this was one trade show that geophysical contractors active in Europe took very seriously. US companies were particularly prominent, both in terms of the level of their participation and the sophistication of their exhibits. From the examples of previous work that they showed, they are clearly