

CANQUA 1993: Applied Quaternary Research

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Approximately 150 "Quaternarists" gathered in beautiful Victoria, British Columbia for the fifth biennial CANQUA Meeting, 18-21 April 1993. With the help and support of the British Columbia Geological Survey (BCGS), west-coast Geological Survey of Canada (GSC), the Royal British Columbia Museum's Newcombe Theatre, the University of Victoria, several provincial government ministries, and local companies, the 16-member organizing committee under Chairman Peter Bobrowsky managed to put together a meeting with excellent content, good field trips, and a well-rounded program of events.

A bar and snack social on Sunday night brought together many old and new faces, with a remarkable representation from Newfoundland, New Brunswick and Nova Scotia. Representatives from central Canada were mostly GSC staff from Ottawa and the Quebec Geoscience Centre. The bulk of registrants came from the prairies and west coast, while the ten American participants came from as far away as Illinois and Minnesota. We also welcomed Ed de Mulder (Cogeoenvironment) of the geological survey of the Netherlands.

In the official opening addresses by Peter Bobrowsky and Bruce McRae (Assistant Deputy Minister, British Columbia Ministry of Energy, Mines and Petroleum Resources) and during the next three days of presentations (52 oral, 48 poster), it became clear that

Quaternary geology has been *applied* for a long time, but its value needs much more publicity, and that the applications of our research have become more diverse.

The sessions began with Geologic Hazards and Geotechnical Studies, spanning a wide range of topics. Several papers on terrain mapping in relation to slope stability, landslides and forestry practices indicated that there will be a lot of work for Quaternarists in the near future (eg., Bruce Thomson, "Coastal terrain stability classification"; Peter Jordan, "Terrain and hydrologic factors influencing logging-related landslides.") Geological hazards were also shown to influence the zoning of new subdivisions (Bob Gill), urban development (Mike Roberts, "Socio-economic versus geological considerations"), and acid mine drainage (Bruce Broster), while existing data bases can aid planning in many ways (Kim Feltham, "A borehole study of the Edmonton City Centre site").

Monday afternoon suggested that the west coast is a geologically dangerous place to live. Tsunamis (Brian Atwater) and shaking and liquefaction (John Clague) should be reckoned with. Brian Watts presented guidelines for seismic microzonation maps, which initiated a discussion about ethical and moral obligations for professionals, a hot topic these days. The poster sessions dealt with hazards, planning and surficial resources. These surficial resources vary from wetlands (Linda Halsey), aggregate resources (J.D. Lehr, Minnesota, and Bob Fulton's surficial materials map of Canada), to groundwater pollution by agricultural runoff (Mike Wei *et al.*, British Columbia Ministry of Environment). The W.A. Johnston medal for professional excellence in Quaternary Science was presented to J.R. Mackay by CANQUA past-president Bruce Broster.

An evening public lecture was presented by Gordon Fader of the Bedford Institute of Oceanography (GSC, Dartmouth) entitled "Marine geology in the clean-up of Halifax Harbour: a model for Victoria?" Gordon's deep involvement, great science images, and a good dose of humour and historical knowledge brought home the point that even if we want to "put things away", we still need to know where they are destined to go. Proper direction of funds and research can help spell out the public's options;

the decision will eventually be influenced by political and financial forces. Victoria's continuing battle with public opinion, American authorities, and a growing sewage problem may benefit from an excellent study from the Atlantic coast.

The Tuesday morning session on global change chaired by the "David Letterman" of Quaternary (Richard Hebda) took us from coastal processes on the Gilbert Islands (Rick Gillie) to vegetation changes in the Columbian Andes (Karin Helmens) to climate change around Baffin Bay (Wes Blake). David Liverman delivered a paper on geologic indicators of environmental change, and Bob Vance highlighted the GSC Palliser Triangle project. Keynote speaker and "father" of many Quaternarists present, Nat Rutter, spoke on forcing mechanisms of climate change. Correlation of ice core, vegetation, loess and deep-sea records were used to show the global picture of these variations with their regional fluctuations. One of Nat's "sons", Peter Bobrowsky, showed how derivative maps can (re)distribute existing information to new users. Ed de Mulder spoke on applied Quaternary geology in European cities.

The session on environmental assessment dealt with soil loss in southwestern Saskatchewan (Dave Sauchyn, "Farmers can get you funding"), climate change and natural processes in the Nevada test site region (Wayne Gibson), climate history and tree rings of a landfill site extension (Richard Hebda), and human impact on Wood Lake, British Columbia (Ian Walker). The poster session dealt with global change (Ian Spooner *et al.*, "Repeatability of large-scale ice sheet dynamics"), public education and sustainability on a watershed basis (Bob Turner *et al.*), groundwater sensitivity mapping (Kathy Woodfield), and evidence for the proposed existence of the "ice-free corridor" (Bob Young *et al.*).

On Wednesday morning, marine and coastal studies were highlighted. Don Howes presented an oil spill response information system, Dave Sanger gave a review of geoarchaeology in the Gulf of Maine, and Bruce Hart outlined the developmental pressures on the submarine part of the Fraser Delta. Drift exploration presentations focussed on kimberlites (Ron DiLabio and Beth McClenaghan). In the surficial resources

session, Ted Fuller and Vic Levson talked about placer deposits in the Yukon and British Columbia, respectively. Tim Fisher tied in his research on the Athabasca spillway with aggregate resources, and Ian Spooner showed how to use a facies model in aggregate exploration. At the end of the oral sessions, a prize for best student paper was presented to Harry Jol (U. of Calgary) for his oral presentation on "Ground-penetrating radar of lacustrine spits in northwestern Saskatchewan". The poster session focussed mostly on drift exploration (especially kimberlites: Brent Ward, Northwest Territories; Janet Campbell and Mike Millard, Saskatchewan). Other exploration studies focussed on a combination of lithological, chemical and depositional factors (Allain Plouffe, British Columbia; Andrée Bolduc, Labrador). Marine studies on archeology (Norm Easton) and the continental shelf as a source of sand and gravel (Kim Conway *et al.*) were also presented.

Some of the social events, such as Tuesday evening's banquet at the University of Victoria's Faculty Club, were outstanding. Three young men from Thunderbird Park (on the Royal Museum grounds) welcomed us with song and dance from their aboriginal heritage. The explanation of their stories gave us an inside perspective on their cultural roots. Thanks are due to Richard Hebda of the Royal Museum for making this presentation happen. After the great food, Heiner Josenhans introduced Tom Vandall on guitar and vocals, and Gordon Fader (man of many talents) on piano, who entertained us with 60s and 70s songs.

On Wednesday night Heiner Josenhans showed that it does not take a local to know all the "locales". A great number of people came out for this tour of the town, even though many still had to go on fieldtrips the next day.

A total of three sea kayak trips, and two land and one marine fieldtrips were held, with maximum participation. Many classic sections were visited (e.g., Beacon Hill Cliffs, Muir Point) and glacial and marine events discussed. The kayak trip (Doug VanDine and Hugh Nasmith) combined geology with some physical exercise, while the 12-hour long marine trip (Pat Monahan, Bruce Hart, Tim England and Andrée Blais) focussed on methods and equipment, with practical examples. The land trip

(Heather Blyth, Peter Bobrowsky, Rob Buchanan, John Harper, Richard Hebda, Don Howes and Vic Levson) took us through southern Vancouver Island. At a stop at Heal Lake, where the regional landfill is being extended into a drained lake basin, a meeting was arranged with a group of about a dozen bald eagles, who seemed to be after seagulls. They did not appear to be interested in the exposed vegetation record and Mazama ash.

This CANQUA meeting was well organized, well attended, and well received, and will live on in memory as the *applied* meeting. The organizing committee (Vaughn Barrie, Peter Bobrowsky, Rob Buchanan, Kim Conway, Kim Feltham, Tim Giles, Bruce Hart, Richard Hebda, Don Howes, Heiner Josenhans, Dan Kerr, Vic Levson, Pat Monahan, Dan Smith, Doug VanDine and Paul Wilson) can look back on a job well done!

A special issue of Quaternary International will be devoted to papers presented at this meeting.

In closing, CANQUA's out-going president Michel Bouchard spoke of the role of Quaternarists in many applied fields, our obligations to the public, and our need to be organized. He invited everyone to the 1995 meeting to be held in Newfoundland (specific location yet to be determined). This meeting showed that Quaternary applied research touches everyone's life and that we need to be bolder in publicizing this. I will end this report with a quote from St. Bernard of Clairvaux (*via* Richard Hebda): "Trees and stones will teach you that which you can never learn from a master".

For more information about CANQUA, contact Toon Pronk at the Geological Survey Branch, Department of Natural Resources and Energy, P.O. Box 6000, Fredericton, New Brunswick E3B 5H1; telephone (506) 453-7949, FAX (506) 444-4176.

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