

Rock Deformation Meeting: Canadian Tectonics Group

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geology - ideally, the estimates can provide a focus for future work and a catalyst to conduct such studies as the Nahanni project noted above. S.M. Roscoe's contribution was a qualitative assessment of the potential mineral resources of the Bathurst Inlet area, Canadian Shield. Many precious and base metal showings are known, in a complex variety of geological settings. The area has the advantage of being close to possible future shipping sites. The most promising targets are copper and uranium in Proterozoic rocks.

G.F. Bonham-Carter outlined the approach that he, C.F. Chung and A.G. Fabbri are taking in treating mineral occurrence data by computer-based techniques. An area in northern Manitoba provides various geological, gravity, aeromagnetic and airborne radiometric data. Digitizing these data permits graphic plotting of a large number of combinations of data. For example, it is possible to prepare maps comparing lake sediment uranium values with uranium/thorium patterns in bedrock, leading to reasonable prediction of known occurrences and new prospective areas. Again, this work depends fundamentally on the quality and amount of basic data available, as well as the nature and validity of the assumptions underlying the various computations.

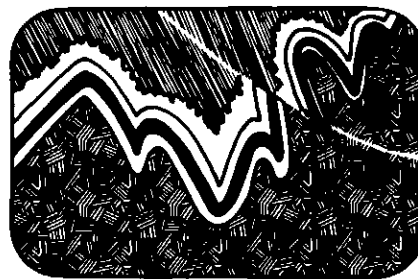
Who attended the forum? A list of first-day registrants names and affiliations made available on day 2 had about 280 names on it - 120 GSC people, 80 mining company and related industry people, 40 university types, 15-20 consultants, 15 provincial government employees and various other federal government personnel. And the format? Talks were 25 minutes, and although there was little discussion from the floor, there was much informal discussion in the halls and in the adjoining poster session room over the two days. Three of the poster sessions were directly related to talks, 5 were partly related, and the remaining 26 dealt with other topics, mostly generally related to aspects of mineral exploration. A list was provided of the poster sessions, which were mostly well-done and informative (and "a helluva lot of work", according to one poster session preparer). Many poster preparers were available at an informal evening session held on day one. About 30 to 40 separates were available from GSC Current Research, Paper 82-1A. A publication booth featured the new Proterozoic Basins in Canada volume just off the press as GSC Paper 81-10, the new Cordilleran Tectonic Assemblage map 1505A, the new magnetic anomaly map of Arctic

Canada (map 1512A), and several new magnetic anomaly maps of the Val d'Or area.

Several minor criticisms seem in order. The meeting was not well enough advertised - I learned of it only because I subscribe to the GSC publications mailing list directly, and this was the main form of advertisement. Others, even local Carleton and Ottawa University people, only learned of it once the meeting had begun. This is unfortunate, because the presentations were of interest to anyone with regional or mineral exploration interest in Canada. Better advertising might have lured more academic types, although January is a busy month in academe. Talks, as at GAC/MAC and other meetings, were outstanding to rarely mediocre, as were slides. Photographs of published maps and tables of data are just not acceptable. Some speakers would do well to follow the general rule of thumb: one slide, one concept; one slide, one minute. The outstanding work by scientists in GSC's other offices, Vancouver, Calgary and Dartmouth, was not presented here. Perhaps in future a single speaker might report for each of these settings, giving a 25 minute field season highlight account - or, a few speakers from these far-flung outposts could be conscripted for the Ottawa meeting. It is not clear to me whether the meeting was aimed primarily at the mineral exploration community as it seemed to be, or at the greater earth science community with a strong interest in regional geology. Inclusion of presentations from across the country at future meetings obviously will depend on just what community is viewed as of most interest. Perhaps some guidance and direction will surface from the questionnaire which all attendees were asked to complete. Many did so.

But these are relatively minor points which can be addressed if this forum becomes an annual or bi-annual event as I, for one, feel it should. There is some outstanding work being done by GSC scientists, and the forum provided both a showcase for it and an opportunity for much first-hand contact with all speakers/poster session preparers/attendees. A well-done first effort.

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Rock Deformation Meeting: Canadian Tectonics Group

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The first meeting of the Canadian Tectonics Group, convened by Dr. Paul F. Williams, was held in the Geology Department, University of New Brunswick, Fredericton, October 16-18, 1981. Twenty-two participants, invited from across Canada registered. Papers and poster sessions were presented within the general theme of rock deformation which was divided into two parts: structure and tectonics, and detailed and general structural mechanisms. A post-session field trip along coastal southern New Brunswick was arranged by the writer to examine and discuss structures in Ordovician to Triassic sedimentary rocks resulting from Ordovician (Taconic), Devonian (Acadian), Carboniferous (Variscan) and Late Triassic (Palisades) deformation.

The Precambrian session, the first of three on structure and tectonics, opened with a well-illustrated paper by Bill Fyson on enigmatic time relationships between conformable and cross-cutting structures in supracrustal sediments and volcanics bordered by granitoid rocks in the Slave Province, near Yellowknife. Nick Culshaw interpreted the SE plunging L-S fabrics in Grenville Province gneisses near Bancroft, Ontario, as a result of NW directed, ductile thrusting that subsequently switched to locally concentrated shear deformation, opposite to but diagnostic of, the regional shear sense. Claude Hubert gave a paper on mega-shear tectonics in the Abitibi Volcanic Belt, Rouyn - Val D'Or, Quebec. In a further contribution to his well-documented research on strain patterns in diapiric gneiss domes of the Superior and Grenville Provinces, Fried Schwerdtner argued that a significant component of the total strain predated the doming in the granitoid cores

of several Archean and Proterozoic structures. The evolution of the Wathaman batholith in the Churchill Province of Saskatchewan and Manitoba, at 50 by 900 km one of the world's largest batholiths, was related by Mel Stauffer to the opening through orogenic closing stages of an Aphebian ocean. Jack Henderson presented a kinematic interpretation of sheath-fold nappes developed in the Foxe Fold Belt, Melville Peninsula, during the Hudsonian orogeny. Chris Mawer recorded progressive textural changes in anorthositic gabbro gneiss and granodiorite gneiss during mylonitization in the Grenville Province, central Ontario.

The Appalachian session dealt largely with the timing and spatial relationship of deformation in Lower Paleozoic rocks. Tom Calon discussed the emplacement history of the White Hills Peridotite, Newfoundland. Stephen Kumarapeli analysed gravity and magnetic anomalies in the Sutton Mountains region, Quebec and Vermont to show that the deformed Tibbit Hill Volcanics originated at a late Precambrian - early Cambrian triple junction. In papers on the deformation of Ordovician and Silurian rocks in northeast Newfoundland, Karl Karlstrom, described regional asymmetrical F_2 folding in the Port Albert Peninsula area, and Ben van der Pluijm presented a structural analysis of New World Island; in collaboration with Paul Williams, they argued that the evidence both for Ordovician (Taconic) deformation and for previously proposed tectono-stratigraphic zones is questionable. Cees van Staal provided details of four generations of deformation in Ordovician rocks of the Brunswick Mines area, northeast New Brunswick. P. Stringer and George Pajari discussed the polyphase deformation in southwest New Brunswick and presented evidence for penetrative Taconic (Ordovician) deformation as well as Acadian (Devonian) deformation in Lower Ordovician meta-sediments of the Oak Bay area.

In the Cordilleran session, Henry Charlesworth and L.G. Gagnon introduced some of us to "duplexes" produced by thrust faulting of Mesozoic strata in the Rocky Mountain Foothills of Alberta; the duplexes form by structural stacking from one metre to one kilometre thick, and coal seams locally show a remarkable ten-fold thickening. Philip Simony gave an interesting exposition on the development of three deformation episodes in lower Paleozoic, Proterozoic and basement rocks in the northern Purcell, Selkirk, Monashee and western Rocky Mountains by upward and outward progression of F_1 , F_2 , and F_3 folds in the inner tectonic zones of the Columbian Orogen.

The detailed and general structural mechanisms part of the meeting opened with two particularly exciting papers, by Graham Borradaile on the relationships of particulate flow, folding, cleavage and magnetic fabrics in rocks, and by Simon Hanmer on the microstructure and geochemistry of plagioclase and microcline in naturally deformed granite. Hanmer also exhibited maps indicating the importance of investigating thrust faults in New Brunswick within the tectonic framework of the northern Appalachians. Giorgio Ranalli gave a lively discourse on the advantages of stress-grain size "deformation maps" (with fixed temperature) over stress-temperature maps (with fixed grain size) in the study of high pressure/temperature rock deformation, and he proposed that the upper mantle should flow by power-law creep unless the grain size is small whereas lithospheric shear zones are likely to flow by Coble creep. The influence of deforming stresses on metamorphic reactions and partial melting was presented by Pierre Robin. John Starkey discussed the calculation of pole figures, inverse pole figures and the crystal orientation matrix directly from orientation data, and using computer generated fabrics he showed that the orientation diagrams obtained with these techniques more closely represent the actual data than diagrams derived via the orientation distribution function (ODF). C.M. Gold and Henry Charlesworth presented a computer-based system for collecting, storing, editing, retrieving and processing certain types of outcrop and drillhole data. Joe White and S. White presented a transmission electron microscope study of deformation microstructures found in cataclases and mylonites associated with the Alpine Fault, New Zealand, which give an indication of the variations in deformation mechanism with depth in the fault zone. Paul Williams described experiments with "salt/mica schist" that produced folds, some with axial plane foliation and others without, explained in terms of the relative timing of large and parasitic fold development. These data were compared to two common groups of natural folds in layer silicate rich rocks: upright, close to tight, symmetrical folds with well developed axial plane foliation, and recumbent, tight to isoclinal, markedly asymmetrical folds that commonly lack an axial plane foliation.

Abstracts of the papers and poster sessions will be published in the Journal of Structural Geology in 1982.

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