

Canadian Geophysical Union Meeting

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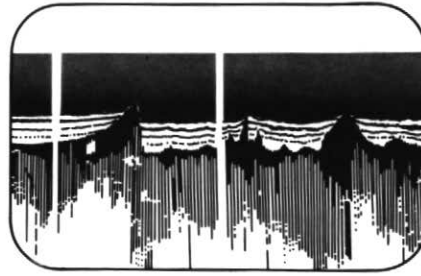
Canada, where, because of the density of population, coastal zone management based on a sound physical understanding of the nature of the coast is becoming a necessity.

In addition to the Canadian papers, the conference heard keynote lectures from three distinguished foreign scientists – Paul D. Komar from the School of Oceanography, Oregon State University, John O. Norrman from the University of Uppsala, Sweden, and Cyril J. Galvin formerly of the U.S. Army Corps of Engineers. The keynote lectures, entitled "Sand transport on beaches," "Coastal problems and research in Sweden," and "Tidal inlets," respectively, were given at the start of each days proceedings, and each of the speakers also contributed to the general discussions.

One of the main reasons for holding the conference was to bring together coastal workers from different disciplines from across the country. There has been an increase in coastal research in Canada in recent years, but there is a lack of awareness in the different research groups of studies outside their own particular field of research or study area. The response in terms of papers and number of participants, and the very keen interest and degree of involvement during the meeting, was a measure of its success in this regard. Almost all papers were attended by the full complement of participants, and as many people listened to the last paper as were present at the introductory session.

Abstracts of the papers presented will appear in the next issue of *Maritime Sediments*, and a full conference proceedings volume will be published by the Geological Survey in the summer of 1979.

MS received June 12, 1978



Canadian Geophysical Union Meeting

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The fifth annual meeting of the Canadian Geophysical Union was held at the University of Western Ontario, London, Canada on May 15-17, 1978. The four previous meetings of the Union were held in conjunction with either the Geological Association of Canada or the Canadian Association of Physicists, since the CGU is a division of each of these parent organizations. At the previous meetings the CGU typically sponsored two or three sessions on geophysics as part of a program with either a dominant geology or physics flavour.

With a membership of less than 300, and many specialized conferences competing for geophysicists' time and conference money, it was with some trepidation that the CGU executive decided to try a meeting on its own. Ten technical sessions were proposed and 133 abstracts of papers were received which necessitated creating an additional half day session in paleomagnetism and rock magnetism; 224 registered participants attended one or more days of the meetings. The sessions which were held and the convenors of those sessions are as follows:

Nature and Composition of Continental Crust and Upper Mantle (CM), M.J. Berry, Mathematical Geophysics (MG), M.G. Rochester. Geothermal Studies in Canada (GT), A.E. Beck.

Crustal Dynamics and Geodesy (DG), A. Lambert. Applied Geophysics (AG), G.West and L. Reed. General Geophysics (GG), E.R. Kanasewich. General Paleomagnetism and Rock Magnetism (PR), D.T.A. Symons. Electromagnetic Sounding Studies (ES), G.D. Garland. Methods and Techniques in Paleomagnetism (MP), P. Lapointe. Paleomagnetism and the Relationship between Paleomagnetism and Age Dating (PA), E. Schwarz. Geophysical Data Processing (DP), R.F. Mereu. The abstracts of each of the papers in these sessions will appear in the December/78 issue of EOS.

The day-long session on the crust and upper mantle covered a range of disciplines and regions although seismic methods formed all or part of eleven of the fifteen papers in the session. Six of the papers were concerned with the structure of the crust and upper mantle of the Superior Province and in the boundary region between the Superior Province and the Churchill Province. Seismologists from the Universities of Toronto and Manitoba presented their interpretation of surveys undertaken in the southwestern Superior Province. The Manitoba group working south of the Trans-Canada Highway in the Snake Bay-Kakagi greenstone belt map a crustal structure with six deep crust and upper mantle reflecting horizons. The Toronto group working in the English River-Wabigoon subprovinces just north of the Trans-Canada find a much simpler two-layered model which requires only a small variation of a few percent in its parameters to explain areal variations in the data.

Stewart presented a novel use of differential PP-P travel time residuals from ISC catalogues. Careful association of the residuals with reflection points in the vicinity of Newfoundland shows a strong anomaly coincident with the Fogo seamounts, which could be interpreted as a 200 km diameter lithospheric plug extending down to the low-velocity layer. Similarly Mooney and colleagues find that in the Rhenish Massif of Europe there is a clear correlation of crustal structure with surface volcanism, where profiles crossing major Tertiary volcanic features show a heavily disrupted M-discontinuity and an intermediate

intra-crustal boundary at about 20 km depth.

Authors presenting papers in the full-day session on Mathematical Geophysics representing seven Canadian universities and one English university, Earth Physics Branch (EMR) and the U.K. office of Geophysical Surveys. A wide range of problems was discussed: theoretical seismology, tidal triggering of earthquakes, free oscillations of the rotating liquid core, geomagnetic dynamo theory, long-baseline interferometry, mathematical geodesy, rheology of lithosphere dynamics, deep mantle convection and the Earth's thermal history. The good attendance (50) and high quality of the contributions are strong arguments for the robust health of theoretical geophysics in Canada. A short business meeting at the beginning of the session saw C. Beaumont (Dalhousie U.) take over from E. Nyland (U. of Alberta) as chairman of the Mathematical Geophysics subdivision of CGU.

The crustal dynamics and geodesy session began by focussing on the development of precision geodetic and geophysical field techniques for the measurement of crustal deformation and crustal stress. Several papers were presented on the development of precise techniques for the measurement of differential vertical movements or tilt. A technique for measuring in-situ crustal stress by overcoring strainmeters in shallow boreholes was described. In spite of the high variability of measured stresses and orientations in a single outcrop, it seems possible to determine meaningful regional stresses, if many measurements are averaged. The session continued with a look at the analysis and interpretation of field and laboratory data in terms of contemporary and geologically recent vertical movements and upper mantle rheology. It was reported that all available first and second order re-levelling data and mean sea level data in Canada are being assembled in a form suitable for the production of the first vertical movement map of Canada. The initial synthesis and interpretation is hampered, however, by the lack of data in the hinterland areas, and the fitting of velocity surfaces is highly dependent on data distribution. A paper compar-

ing past sea levels in Atlantic Canada with land elevation changes predicted on the basis of a self-gravitating, Maxwell-earth model gave some hope for eventually predicting vertical movement associated with glacial rebound. Further work will attempt to model the fluctuations of the sea surface in Atlantic Canada. Although there is yet no strong necessity to invoke non-linear rheology to explain post-glacial rebound, the final speaker in the crustal dynamics session used extrapolations of laboratory measurements in olivine to upper mantle temperatures and creep rates to show that non-linear creep is a distinct possibility under Canada. He also showed that the predominant creep mechanism may not only be a function of position but also of time. Discussion of this paper emphasized that the presence of water in association with olivine would lead to unacceptably low viscosity values in the upper mantle.

A full day session of 20 papers on applied geophysics was arranged by KEGS, the Toronto-based Canadian Exploration Geophysical Society. Eleven of the papers were on a wide variety of topics including the mechanism of induced polarization, the mechanism of electrical conduction in sea ice, practical interpretation techniques, resistivity modelling and three case histories. Six papers were devoted to radiometric exploration methods including a most interesting review by R. Grasty on the most exotic exploration play of them all – the Cosmos 954 satellite debris recovery project. Four papers on airborne and ground time-domain electromagnetic systems concluded the session. Explorationists interested in the electromagnetic technique had a further opportunity to participate in and listen to papers in a morning session on the third day of the meetings. In this session deep crustal anomalies were probed by the techniques of geomagnetic sounding and magnetotellurics using both natural and artificial sources and with period ranges from 10⁻⁴ seconds to 24 hours. Explorationists interested in array seismology, data processing including display and filtering of two and three dimensional geophysical and geological data sets, had an opportunity to participate in a session on the

afternoon of the third day of the meeting.

Three half-day sessions were held on the topics of rock magnetism, paleomagnetic and the relationship of magnetic and isotopic closure in slowly cooled orogens. I found the session on methods and techniques in paleomagnetism the most rewarding of these three sessions. R.C. Bailey appears to have solved the problem of estimating the mean direction and its error when a combination of end-point data and converging remagnetization circle data are used in establishing a mean direction. H.C. Halls reported on a technique whereby three components within a sample may be resolved by using a combination of vector directions and difference vectors. Both Henry and Roy discussed the optimum techniques in leaching the red pigment, in preference to the larger detrital (?) ferrimagnetic grains, in redbeds. The use of specimen serration (multicoring or slotting), temperature and normality of the acid, field-free conditions during the leaching, washing and drying are variables which may well have different optimum values with samples of differing grain size, initial porosity, and differing cement or matrix.

The session on Paleomagnetism and Age Dating, although in the afternoon of the last day of the meetings, was well attended to the bitter end! The session opened with two theoretical papers by Derek York comparing magnetic and isotopic blocking temperatures. The contrast between the two systems, at least for single domain particles, is that the magnetic system becomes essentially fully blocked with a temperature drop of only a few degrees. Four of the papers in this session involved geochronology and paleomagnetism of Grenville Province rocks. A consensus (prejudice ?) seems to be developing that the 'anomalous' Grenville paleopoles are young. This suggestion can potentially be tested by concentrating paleomagnetic effort on 850 Ma-1000 Ma age rocks from elsewhere in North America.

At the annual banquet the John Tuzo Wilson Medal was instituted as the major award of merit of the Canadian Geophysical Union. The first

award was made to the man for whom the medal is named which augurs well for the prestige the medal will bear for future recipients. Subsequent to the award presentation, the banqueters were entertained by a talk from Tuzo Wilson on the history of geophysics in Canada. Needless to say, much of this history was an eye witness account.

The interest shown at the 1978 meeting should be maintained for the 1979 CGU meeting to be held June 4 to 6 at the University of New Brunswick. This will be a prelude for the ambitious 1980 undertaking to co-host in Toronto a joint meeting with the American Geophysical Union. It will be the first time the AGU has held its annual meeting outside the U.S.

MS received August 31, 1978

Workshop on the Continental Crust and its Mineral Deposits

University of Toronto announces a workshop on The Continental Crust and its Mineral Deposits to be held May 14-16, 1979. The conference is dedicated to Professor J. Tuzo Wilson, our distinguished colleague, and will recognize his major contributions to our understanding of the earth.

The symposium is divided into six sessions on: The Early Earth, Evolution of the Precambrian Crust, Vertical Geometry of the Crust, Crustal Motions, The Global View and Ore Deposits.

Papers will be presented by the following: G. Wasserburg, W. Kaula, G. Wetherill, J. Jacobs, R.D. Russell, D. M. Shaw, W. S. Fyfe, S. Moorbath, G. F. West, W. M. Schwerdtner, J. Oliver, I. Gough, D. W. Strangway, M. Berry, L. Sykes, F. Vine, A. Cox, F. Aumento, W. Dickinson, G. Norris, A. Hallam, A. Boucot, H. Williams, E. Irving, J. W. Kerr, D. Dunlop, D. York, G. D. Garland, R. N. Edwards, R. C. Bailey, K. Burke, W. Kidd, P. Hoffman, J. Dewey, D. McKenzie, A. Miyashiro, P. Rona, D. F. Strong, E. T. C. Spooner, D. R. Derry, L. Silver, R. M. Farquhar, A. J. Naldrett, R. Hutchinson, S. D. Scott, D. Sangster, F. W. Beales and G. W. Pearce and the proceedings will be published as a special paper of the Geological Association of Canada.

For further information contact D. W. Strangway, Department of Geology, University of Toronto, Toronto, Ontario, Canada M5S 1A1.

Attendance will be restricted to 200, so we would appreciate hearing soon if you wish to attend. The registration fee is \$35 and we will reserve accommodation on the university campus on request.
