



## 27th Canadian Geotechnical Conference (New Frontiers in Geotechnical Engineering)

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The 27th Canadian Geotechnical Conference, under the capable chairmanship of Murray Harris, lived up to its theme and provided over 350 participants with two days of lively discussion. The wide variety of topics under consideration attracted a mixed crowd of earth scientists, environmentalists, contractors and engineers from many parts of North America.

Each session was organized with a Chairman, a General Reporter and a Panel, who discussed, with varying relevance, the subject matter in papers submitted to the session. Since each panel consisted of four or five speakers who considered five to seven papers of different authorship, any attempt to summarize the conference would break down into a long list of names. Therefore, only a brief description of each session will follow. The papers accepted for the conference are available in the Volume of Preprints and high quality papers of completed projects will be published in forthcoming issues of the Canadian Geotechnical Journal.

Session 1 considered "Geotechnical Engineering and Environmental Analysis" and discussions covered such topics as geophysics, radioactive

waste disposal, subsidence due to mining, earthquakes induced by reservoir impounding, land management, underground space utilization and reservoirs in quick clay.

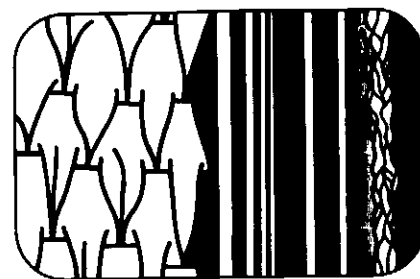
Session 2 considered "Geotechnical Engineering in the Mining Industry" with the subject matter varying from open pit mine stability and mountain slides to the design of tailings and coal waste disposal systems both above and below ground.

Session 3 covered the subject "Permafrost and Northern Pipelines" with lively discussion of arctic engineering topics such as bearing capacity, pipeline design for a thawing soil situation, offshore drilling islands and water flow induced by freezing. Considerable discussion centered on the rates of thawing around pipelines and the mechanics of formation of ice layers in free draining granular deposits.

Session 4 was divided into two sub-sessions, the first considering "Geotechnical Aspects of Northern Roads and Runways" and the second dealing with "Geotechnical Aspects of Ocean Engineering." In the first sub-session, the discussion dealt with northern problems such as design on frozen or organic soils. In the second sub-session, discussion related to wave and ice forces on ocean platforms, electro-osmotic reduction of pull out forces, platform anchors, sediment strength and bottom scouring by icebergs.

Perhaps the highlight of the conference was the awards presentation ceremony at which Dr. Geoff Meyerhof received the R. F. Legget Award for his many contributions to geotechnical engineering in Canada and the world. The best paper award went to Jack Clark and Geoff Meyerhof for their paper entitled "The behaviour of piles driven in clay. II. Investigation of the bearing capacity using total and effective strength parameters." A special award was made to Tony Stermac in recognition of several years of dedicated service as Editor of the Canadian Geotechnical Journal.

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## Eastern Canada Paleontology and Biostratigraphy Seminar

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The eighth annual meeting of this group was held on December 6th and 7th, 1974 at McGill University, Montreal. Each year the nature of the meetings has been determined by the convenor of the seminar. This year three invited speakers were asked to present discussions on major factors in the evolution of life: latitude, random processes, and geography. A wide range of subjects was covered by the ten other speakers who presented research results.

Maxwell Dunbar, of McGill's Marine Science Centre, considered the influence of latitudinal factors on rates of evolution and diversity. He contrasted the diversity and degree of metabolic adaptation of Antarctic communities to Arctic ones and attributed this largely to the earlier onset of glacial conditions in the Antarctic (perhaps 20 million years ago), and the consequent greater maturity of the ecosystem. He recognizes two types of stability in marine communities; the first, an adaptation to steady state conditions such as exist in the tropics and having a low productivity/biomass ratio, and the second type, developed to absorb the oscillations of conditions found in high latitudes and having higher productivity/biomass ratios. He believes the rate of evolution and ecosystem development was, and is, higher in high latitudes and innovations

originating in these areas invading lower latitudes produced bursts of adaptive radiation.

Stephen J. Gould of Harvard University spoke of his work on the influence of random processes on the course of evolution under the title; *Stochastic Models of Phylogeny and the Shape of Evolution*. He described his work on the modelling of clades by computer programs showing that certain generalizations concerning diversity changes in time may be artifacts of taxonomic practice. Randomly generated pinch and swell diagrams of higher taxa showed close resemblance to those plotted from real taxons with the following possible exceptions: (a) actual clades of living animals are larger than extinct ones, (b) extinct clades have shapes with a centre of gravity lower than the middle of their ranges, (c) actual clades show more pronounced pulsations in diversity.

Niles Eldredge of the American Museum of Natural History and Columbia University spoke on the influence of geography in speciation. He suggested that progress in understanding the evolutionary processes in paleontology will be made by studies at the species level and not be compiling data on higher categories. He reviewed the differences of opinion on the effect of transgressions and regressions in epeiric seas on changes in diversity and rate of speciation. He expressed his conviction that only geographic space available for speciation and the presence of isolating mechanisms are important controls on rate of speciation.

James Noble spoke of the work of Alan Logan, G. R. Webb, and himself at the University of New Brunswick on brachiopod communities in the Bay of Fundy. The diversity of these communities established on boulders is much greater than that of adjacent communities on soft sediment substrates and the death assemblages associated with them are much different from the living biota.

Michael Risk of McMaster University presented a paper on modern intertidal communities in the Minas Basin, Nova Scotia and one on trace fossils in the Silurian Grimsby Formation. In the Minas Basin tidal flats organisms

produce characteristic burrows, castings, etc. in the sediment. For the Grimsby Formation he suggested that trace fossil diversity could be used to find ancient shorelines.

Two papers on the effects of boring organisms on modern corals were presented. Frances Hein of McMaster illustrated the high rate of bio-erosion in the heads of various species from the Florida reef tract. Kirk MacGeachy of McGill reported on comparative rates of boring by sponges, bivalves, sipunculids, sabellids, barnacles, polychaetes, etc. in *Montastrea annularis* from fringing and bank reefs on the west coast of Barbados.

A paper by Geoffrey Norris of Toronto and David Jarzen of the National Museum documented the sequence of eight microfossil zones in the middle to late Cretaceous of Alberta. Keith Howells described the sequence of Silurian communities in a succession of the Celerville and La Vieille formations on the south shore of Baie des Chaleurs. Hugo Greiner of the University of New Brunswick reviewed his recent work in the Albert Formation and his reconstruction of the basin of deposition as an algal-rich tropical lake. Although most fossil evidence points to an early Carboniferous age for the bulk of the formation, recently discovered crossopterygian fish remains suggest that the lower part may be Devonian in age. Colin Stearn of McGill University proposed that Paleozoic stromatoporoids were encrusting sponges that secreted aragonite in trabecular or spherulitic microstructures. Reconstructions of the soft tissue of the group were discussed. Gerd Westermann of McMaster University discussed the functional morphology of ammonoid septal patterns tracing how strengthening of the septa against pressure changes resulted in successively more complex folding of the surface.

The meeting considered the formation of a paleontology section of the Geological Association of Canada and appointed a committee to draft a proposal and constitution for the consideration of Canadian paleontologists assembled at Waterloo next spring. If they approve, application will be made to the Association for the formation of this section. The section would not replace the Canadian

Paleontological Association which exists at present only to assure the affiliation of Canadian paleontologists with the International Paleontological Union.

The meeting also accepted an invitation from Desmond Collins, Peter von Bitter, and Geoffrey Norris to hold the next year's seminar under the auspices of the Royal Ontario Museum and the University of Toronto.

MS received December 19, 1974.