Géographie physique et Quaternaire

Foreword Victor K. Prest (1913-2003)

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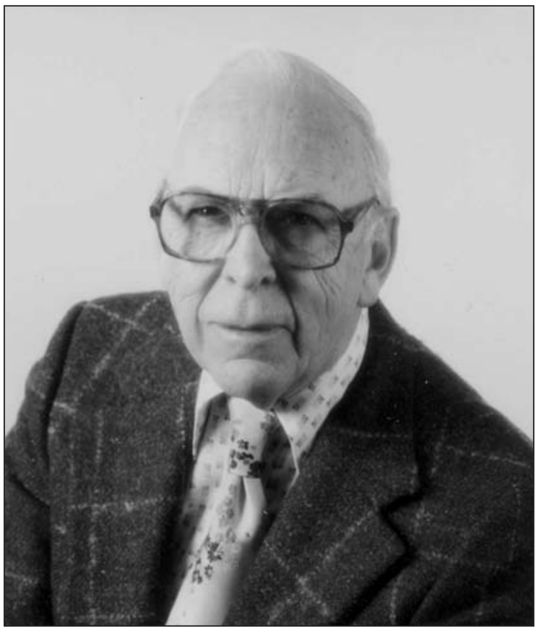
Foreword

VICTOR K. PREST (1913-2003)



Courtesy of Doug Hodgson (Geological Survey of Canada)

This is the second of two issues of *Géographie physique et Quaternaire* in honour of Dr. Victor K. Prest. In the foreword to the first issue (Vol. 58, nos 2-3) we presented a dedication to Vic Prest in recognition of the considerable foundation he laid for our present knowledge of Quaternary geology. In this second foreword, we briefly convey some of the changes in Quaternary geosciences in Canada, and present personal perceptions on what it means to be a Quaternary scientist.

The Glacial Map of Canada (Prest *et al.*, 1968) likely remains the single most significant contribution to the advancement of knowledge of the Laurentide Ice Sheet and its effects on northern North America. In the last few decades, Quaternary sciences have witnessed many advances in the way of technological evolutions, which have greatly impacted the way we pose and answer questions fundamental to our discipline.

Perhaps the most significant technological changes are the advances in geochronological methods applicable to Quaternary studies. Conventional radiocarbon dating, which was introduced in the 1950s and required large samples, has given way to radiocarbon accelerator mass spectrometry (AMS) dating that provides increased precision and the ability to date small samples. This technological advancement has removed some of the problems related to the dating of potentially mixed assemblages of reworked material. Furthermore, calibration of radiocarbon ages to calendar years has revealed plateau areas in crucial late glacial portions of the record, and has permitted better agreement with other chronological methods. Other dating techniques have also followed impressive progression. The development of optically stimulated luminescence dating (OSL), including dating of single grains is widely used for eolian sediments, and is being increasingly applied to other depositional environments. The size of material needed for established methods and the upper limits of application have both decreased for U-Th, K-Ar and Ar-Ar methods, allowing incredible resolution. U-Th-He is proving to be an excellent companion to fission track in dating uplift and landscape evolution. The development and improvements in terrestrial cosmogenic isotopes has opened new doors, not only for dating glacial deposits and landscape stabilization, but also in potentially resolving periods of cold-based ice cover and in determining erosion rates.

Dating is not the only area that has witnessed an impressive evolution. Access to large databases of geological information has changed the way we interpret and reconstruct glacial and post-glacial landscapes. For example, high quality three dimensional data are now available for some highly populated areas of Canada, and the integration of subsurface geophysical architecture with detailed surface mapping, sedimentology, landform and DEM analysis, and improved dating control, are providing the critical framework for advanced reconstructions of glaciated terrain that have not been previously possible. Furthermore, databases are now composed of multi-proxy datasets. These large datasets and the variety of specialities, notably in paleoecology (dendrochronology, diatom analyses, pollen, macrofossils, entomology and more), together with the interaction of the scientists from different disciplines, have enriched our understanding of Quaternary paleoenvironments. Furthermore, the expansion of geographic information systems, the development of new multibeam sonar which is enhancing our view and interpretation of the continental shelf, and the improvement of mineral tracings which are now widely used in diamond exploration are further examples of huge technological steps forward, and from which Quaternary research has greatly benefited.

The audience and users of Quaternary research has also greatly evolved. The scientific results and interpretation are not only useful to contemporaries and the next generation of Quaternary scientists, but are now required to address a range of pressing environmental and land use issues. There are new challenges, demands and excitement for Quaternary scientists as planners, municipal officials, engineers, local politicians and the public recognize the significance of Quaternary sciences. With these responsibilities, comes a change in focus of Quaternary research away from broader scientific questions, towards more directed, shorter-term, policy issues of immediate relevance to a Canadian public. This change may reduce opportunities for undertaking longer-term continental-scale compilations, like that of Vic Prest.

With the Glacial Map of Canada, North American Quaternary scientists have an outline of deposits and ice-flow indicators of the last continental ice sheet as a scientific resource to underpin and stimulate further research. Thus, given the wealth of new Quaternary information at hand, and the technology available for handling large multi-parameter spatial and temporal datasets, the time is right for improving the regional and national-scale knowledge of Quaternary science. In addition, Quaternary researchers in Canada are well equipped to take full advantage of societal issues pertaining to the environment, geological hazards, water availability, mineral development and climate change.

For many Quaternary scientists, to be involved in the understanding of Canada's Quaternary history represents a stimulation to serve the community, to interact with a maximum of colleagues while pursuing some personal scientific objectives. It is a holistic science where the interaction between the flora, fauna and the Earth continues until the present. Clearly, the discipline is evolving, and our contemporary knowledge is superior to those of past decades. However, the range of tools that have become available in recent decades should not blind us to the fact that we are standing on the shoulders of giants, and sometimes it seems we are merely filling in details on a broad canvas painted by the masters. Quaternary scientists can only be filled with wonder at the evolution of techniques, methods, applications and ideas witnessed in the last 50 years, and share a sense of pride to be associated with it.

Alain Plouffe and Stephen A. Wolfe
with contributions from Chris Clark, Lynda Dredge, David Fisher, David Sharpe, Isabelle McMartin, Pierre J.H. Richard, John Shaw, Jean Veillette and Brent Ward

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