**Short RESPONSE**

It was a totally unexpected honor to be awarded the Penrose Medal, and I would like to express my appreciation to Peter Clark, Giff Miller, Dick Peltier, Richard Alley, and Tom Cronin for submitting my name for consideration and for the kind words of the citation.

No person is an island and I was fortunate to be able to take advantage of the tremendous increase in Canadian arctic research, due in no small part to the Cold War. This extensive documentation of Quaternary deposits coincided with the availability of radiocarbon dating, and thus by 1969 two maps on the isochrones of the retreat of the North American ice sheets---one that I was involved with, and the other produced by Vic Prest of the GSC. The increase in mapping and 14C dates was such that I was able to produce maps of isobases on the postglacial rebound of much of eastern and northern North America. These were my early introductions to the reconstruction of the last North American ice sheet, but that took on a new dimension in 1974 when Dick Peltier and I joined forces and attempted to model global postglacial recovery based on a model of the earth’s rheology, observations of changes in relative sea level, and “ICE -1”---a very simple and crude late Quaternary ice sheet history. Dick and others have continued this with increased sophistication and we are now at “ICE-6”. The late 1970’s early 80’s were an exciting time, with efforts to see how quickly you could grow the Laurentide Ice Sheet (Molly Mahaffy) and the debate about “Big Ice” versus “Little Ice” (George Denton & Terry Hughes). This was also a time when Bill Shilts, Giff Miller, Harvey Thorleifson, Phil Wyatt and myself worked on the stratigraphy and chronology of sediments in the Hudson Bay Lowlands, at the center of the Laurentide Ice Sheet. To answer some of the questions that arose I decided to investigate (together with Kathy Tedesco and Anne Jennings) the origins of detrital carbonate-rich sediments off Hudson Strait. This led to the collaboration with Gerard Bond and others, and a long-time pursuit of the significance of Heinrich- and Heinrich-like events in the Labrador Sea, Baffin Bay, and in the western Nordic Seas. An interest that I am still pursuing.

Finally I would like to thank my wife Martha, my early mentors (Cuchlaine King, Jack Ives, John Fyles, Alexis Dreimainis, and Vic Prest), and my colleagues at the University of Colorado, especially Bill Bradley and Pete Birkeland who took me under their wings when I first joint the faculty. I have been fortunate to have a large number of graduate students who have taught me a great deal about Quaternary Science, probably more than I taught them. I also need to thank the National Science Foundation for nearly 50 yrs of research support.

Longer response

When I read my email and learned that I had been awarded the Penrose Medal I was shocked and also a little doubtful about the wisdom of the committee! It is indeed an unexpected honor and I would like to express my appreciation to Peter Clark, Giff Miller, Dick Peltier, Richard Alley, and Tom Cronin for submitting my name for consideration and for the kind words of the citation. I am also proud to be a representative of the Division of Quaternary Geology and Geomorphology as I have been a member of the GSA and this Division since 1965.

I came from a small industrial (mining) town (Millom, pop. 7000) on the Cumberland (UK) coastal fringe, with the Irish Sea at our doorstep and the fells and mountains of the Lake District only 1 km to the east. Having been brought up in the North of England during WWII and the subsequent dire post-War years then my adaption to Arctic climate and field conditions was easy!

I attended the University of Nottingham where, in addition to playing rugby, I learned about glacial geology, glaciology, meteorology, oceanography, and plate tectonics—amongst other things. I went on to attend McGill University and spent a year at the Sub-Arctic Research Station as a weather observer---my first paper was on the strength of lake ice. McGill in the early 1960’s was a center for Arctic Research and this focus was strengthened by the presence of the Arctic Institute of North America being literally across the road from the McGill Campus in Montreal. This was a time, undoubtedly driven by the Cold War, of a tremendous increase in the exploration and mapping of the Canadian Arctic. Coincidentally it was also a time that saw the widespread application of radiocarbon dating to the establishment of the late Quaternary history of the North American Ice Sheets. In 1961 I was offered a position with the Canadian Government to work on Baffin Island. This was an exciting time for Quaternary research and it saw the resurgence of entities such as the “Friends of the Pleistocene” and INQUA.

In 1968 I had taken a faculty position at the University of Colorado Boulder in the Department of Geological Sciences with an association with the Institute of Arctic and Alpine Research but continued my research interests that had its roots in my Canadian experiences. The combination of extensive field mapping, aided by air photo mapping, and radiocarbon dating of sediments that could be associated with ice margins led to two isochrone maps of the deglaciation of North America (Bryson et al, 1969, and Prest, 1969); for the first time these maps showed the pronounced asymmetry of the pattern of deglaciation. In 1970 I was able to use my own work and that of colleagues to reconstruct the postglacial glacial isostatic recovery of eastern North America. These two data gathering exercises gained additional importance when I was introduced to a visiting Canadian physics post-doc, Dick Peltier, and we embarked on an ambitious effort to model the 3-part “forward problem.” This involved the reconstruction of changes in the area and volume of the ice sheets (ICE-1), the development of a data base of relative sea level changes from within and outside the glacial limits, and an Earth rheological model. ICE-I has of course evolved as new data and new insights have been obtained and it now stands at ICE-6. My interests at this time were focused on how, where, and how fast do large ice sheets grow and collaboration with graduates Molly Mahaffy and Larry Williams were important steps in trying to see if we could model the rate of sea level fall during Marine Isotope 5 stadials---although we invoked massive lowering of snowlines and large positive mass balances we could not simulate the rate of ice sheet growth. This was also the time when Giff Miller and I were trying to define the seaward extent of the Laurentide Ice Sheet across Baffin Island and engaged in the “Big Ice” versus “Little Ice” debate with George Denton and Terry Hughes. In1982 my thoughts on the reconstruction large ice sheets were summarized in the first paper of the new journal “Quaternary Science Reviews”

The focus on ice sheet growth shifted in the 1980’s as I worked with Bill Shilts, Giff Miller, Harvey Thorleifson and Phil Wyatt on the chronology of events recoded in the Quaternary sequence of the Hudson Bay Lowlands---at the center of the former Laurentide Ice Sheet. In order to test whether Hudson Bay had become ice-free during MIS3 I decided that an answer might lie offshore in cores from the Labrador Sea. Hudson Bay and Strait are floored with Paleozoic limestone and we could reconstruct the ice sheet history by documenting and dating changes in the detrital carbonate (DC) content in marine cores. Two Canadian-based researchers (Chough and Aksu) had already described several DC units in cores, but their importance in terms of the abrupt changes in the dynamics of the Laurentide Ice Sheet took on new meaning with the investigation into “Heinrich” events which Kathy Tedesco and I described in a paper spearheaded by Gerard Bond in 1992.

In the 1990’s I was able to participate in cruises to the East Greenland fjords and shelf, including an episode with an iceberg and CSS *Hudson*, and started a long-term project of collaboration with researchers in Iceland with successful cruises on the *Bjarni Saemundsson*, and investigations into the late glacial history of the Greenland Ice Sheet with collaboration of colleagues from Canada, UK, Denmark, and Germany.

Basically it has been fun and I have been fortunate to be in the right place at the right time and have met and worked with good people and I hope that they will forgive the absence of specific name recognition. However, I would like to specifically mention the scientists and staff of the Geological Survey of Canada—Atlantic Division for their support over 3 decades, and to Dennis Eberl of the USGS for giving me a set of “tools” to keep me busy during the so-called “retirement”. However, I could not have undertaken the various projects without the support of many people. I would like to thank Martha, my wife and family; my early mentors (Cuchlaine King, Jack Ives, John Fyles, Alexis Dreimainis, and Vic Prest); and my colleagues at the University of Colorado (Bill Bradley, Pete Birkeland, Pat Webber, Nel Caine, Roger Barry, Giff Miller, James Syvitski and Anne Jennings). I have been fortunate to have a large number of graduate students who have taught me a great deal about Quaternary Science ---they know who they are. I will end by thanking Baffin Island and the indigenous people, Arctic Canada, for providing a rich treasure trove of Quaternary puzzles that have provided myself, colleagues, and graduate students many years of enjoyment, but also for the magnificence of its landscapes and the tranquility it brought.