

THE PAST PRESIDENTS' MEDAL FOR 1998 TO FRED J. LONGSTAFFE

Mr. President, Ladies and Gentlemen,

The Past Presidents' medal of the Mineralogical Association of Canada is awarded annually for excellence in research to a scientist who has made outstanding contributions to the mineralogical sciences in Canada. This year's recipient is Fred J. Longstaffe of the University of Western Ontario.

The unifying theme in Fred Longstaffe's work is the use of stable isotopes as tracers for geological processes. The characteristic feature of each major thrust is its pioneering aspect. He has continually broken new and important ground in his isotopic work, and this accounts for his scientific prominence at a relatively young age.

His earliest work focussed on high-temperature environments (igneous and metamorphic, ore deposits), essentially growing out of his thesis work. In particular, his were the first very detailed studies of oxygen isotope evolution in Archean rocks. The isotopic measurements were key in identifying juvenile *versus* supracrustal contributions to granitic magmas and provided a major constraint on models of Archean crustal evolution.

In the early 1980's, he became interested in the diagenesis of clastic sedimentary rocks, and the potential of stable isotopes to identify and interactions involving H₂O, rock and organic matter during the evolution of sedimentary basins. As a result, he pioneered the combined application of clay mineralogy and stable isotope geochemistry to diagenesis, and also established a new area of study in clay mineralogy: stable isotopes. During the last 12 years, this novel multidisciplinary approach has been used to deduce the diagenetic history of clastic rocks in terms of the fluids and temperatures involved in mineral precipitation, transformation and dissolution. Diagenesis has been studied on a basin-wide scale, in terms of timing, mass transport, paleohydrogeology and evolution. The importance to diagenesis of basin recharge by meteoric water has been established. This latter point has been a major factor in resolving the problem of fluid flow in interior sedimentary basins. As a result of this work, the use of stable isotope measurements to reconstruct prewater evolution of sedimentary basins has become widely accepted, and applied by research divisions of most major oil companies. Again, one is forced to acknowledge not only the originality of his work, but also the exceptionally high quality of its execution.

Other expansions of interest are currently underway. Fred is now investigating the Alberta oil sands and ex-

ploring such concepts as the microbial templating of clay minerals, and the possible influence of hydrocarbon microbial interactions in mineral diagenesis. In applied studies, mineralogical reactions (especially involving clays) during *in situ* steam-assisted recovery of oil sand and heavy oil deposits are being identified and characterized. He is also investigating, by stable and radiogenic isotopic methods, the nature and global implications of the potassic diagenesis and alteration which seem to characterize the Cambrian–Precambrian boundary at numerous localities throughout the world. Stable isotope studies of carbon dioxide are being used in an attempt to elucidate the fine-scale response to a variety of urban and rural atmospheric fluxes and to develop stable carbon-isotope methods for tracing contaminants in soil and ground systems. Finally, he is investigating carbon and hydrogen isotope variations in methane produced in temperate-zone wetlands. These studies clearly demonstrate the breadth of Fred's research program.

In summary, Fred Longstaffe is currently one of Canada's premier Earth Scientists with a strong record of original pioneering work. Fred is an ideal candidate for this award, and it consequently gives me great pleasure to present to him the Mineralogical Association of Canada Past Presidents' Medal for 1998.

Roger H. Mitchell
Past President, MAC

Let me first express my appreciation to the Mineralogical Association of Canada for the privilege of this award. I acknowledge especially those anonymous colleagues who set time aside to prepare the nomination on my behalf. These quiet citizens of our scientific community are commonly overlooked at occasions such as this one, and yet it is their efforts that make such awards possible. More broadly, I surprise no one here by stressing the extremely important role played by the Mineralogical Association of Canada in keeping the geosciences vibrant in Canada. We owe all of its volunteers a debt of gratitude for that contribution.

In seeking to understand the distribution of the light stable isotopes in nature, my own path has been travelled in the company of many scientific collaborators, each of whom has been very generous in sharing ideas and efforts with me. Foremost among these individuals are my laboratory managers, graduate students, post-doctoral fellows and assistants – that is, the membership of the Basal Reflections Society for the last two decades. From them, I have received not only scientific

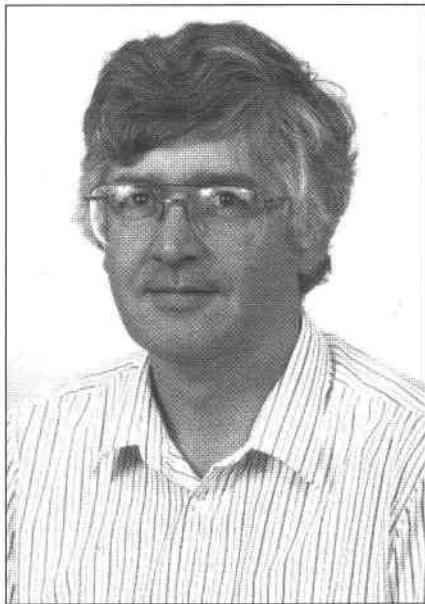
insights and the wherewithal to make measurements, but also camaraderie and friendship and, on more than one occasion, the need for some rather sudden yet sophisticated hypotheses to explain celebrations that verged toward the exuberantly excessive.

I have also been fortunate to divide my academic career between two great departments, spending the first ten years at the University of Alberta, and the latter eleven at the University of Western Ontario. My colleagues at both institutions are to be thanked for an association and atmosphere that continues to place learning and scholarship, by both students and faculty, as the highest priority. Too easily can the time for research be swallowed whole by the myriad of oftentimes conflicting demands placed on members of academic departments, particularly in the 1990s. One critical ingredient for scholarship is time, and its granting to me is a trust for which I am most grateful to my Universities.

The Natural Sciences and Engineering Research Council of Canada has consistently supported my research, particularly in fundamental areas. We are all aware that perceived societal need plays an important part in the political direction of public funds to the granting councils. We should also be aware that there are those who genuinely believe that more research ought to be directed toward "mission-oriented" projects, and that peer review alone is perhaps not the best way to "steer" the distribution of these research funds. I offer special thanks to NSERC, which strives to maintain a balance among the competing demands for the use of its funds, and to keep excellence, determined through peer review, as the foundation for the support of University-based research.

Finally, I salute Linda, Jeffrey, James, Meghan and Matthew, who have accepted the irregular lifestyle and compulsions that (I suspect) are the baggage of most scientists. To them, and to you, thank you for this time and for your patience.

Fred J. Longstaffe



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