

Quebec. I recall one late summer afternoon when Ron, Tony Lecheminant and I emerged from the bush around the Morin Anorthosite to be engulfed in a dust cloud generated by a fast-moving truck with a GSC emblem on the door. At the wheel was Wade Reinhardt, representing the Grenville mapping project led by Hugh Wynne-Edwards. That dusty encounter led to several late evenings of discussion on granulites, charnockites and anorthosites, and also to my respect and friendship for Wade Reinhardt, who patiently taught me about the subtleties of granulite petrology over the following decade.

My interest in granulites was helped by a very fortunate opportunity to work as a doctoral candidate under the supervision of Hans Eugster. Hans showed his students the importance of fluids as a factor in understanding mineral development in metamorphic rocks; his own pioneering work on the oxygen reservoir in the Earth helped David Wones and Bevin French to develop new ideas on the hydrogen and carbon reservoirs.

Dan Marshall and I have used the approach of these earlier workers on mineralogy as an indicator of fluid chemistry. I must tell you, however, of my concern that we have not yet achieved an adequate understanding of

the carbon reservoir in petrological processes. The use of graphite as an indicator of carbon chemistry certainly is helpful, but calculations using carbonate–silicate pairs suggest a different pattern of fluid evolution in metamorphic processes. I plan to turn off my computer for a while and to go back to the field to look for insight into the complexities of the carbon reservoir. I hope to look not only at the role of carbon in the form of carbon dioxide at higher metamorphic grade, but also at the possible importance of methane in fluid evolution and metal transport during greenschist-facies metamorphism. As is often the case, I hope that mineral chemistry will be the key to understanding petrology.

I would also like to thank my colleagues at Carleton University and elsewhere for their help and support in my research. I have benefitted from discussions with many of these colleagues, and particularly David Watkinson and Ian Jonasson, both of whom are economic geologists with an interest in minerals that goes beyond metallic luster and the geochemistry of sulfur.

Finally, may I thank the Mineralogical Association of Canada for making it possible for researchers such as Dan and myself to experience such a happy occasion.

George B. Skippen

Ladies and Gentlemen,

I would like to echo some of George's thanks to the MAC; it certainly is a very great honor to receive this award. Furthermore, I would like to thank the Institute of Mineralogy and Petrology at the University of Lausanne in Switzerland for kindly providing the financial support for me to be here today. I also acknowledge Carleton University for providing me with a place to work, the facilities to do so, many good friends and an education along the way.

I would like to quote a few words from the speech of one of the 1986 Hawley Medal winners, Judith Moody. "The innovation in my life related to the Hawley Medal started at least 12 years ago in my Ph.D. defense at McGill University, when I had to respond to the questions raised by the external examiner.... In his

questions, why did I do the petrological laboratory experiments that I did, he provided me with a challenge, by stating that if I wanted to continue to do experimental petrology, then I should carry out a very careful experimental design before I started the experiments." Today I share the Hawley Medal with that external examiner. I certainly have benefitted from similar questions from George during my undergraduate and Masters degrees, at Carleton, very few of which I had the answers to. Therefore, finally I wish to thank my friend and mentor, George B. Skippen, for the opportunity to be here.

Dan Marshall

THE PAST PRESIDENTS' MEDAL FOR 1992 TO ROBERT W. BOYLE

Bob Boyle's contributions to the geochemistry and geology of mineral deposits during his 40-year career at the Geological Survey of Canada have made him one of the most widely recognized Canadian geoscientists. On joining the GSC in 1953, Bob started his work on the Keno Hill district of the Yukon, and it was there that his interest in surficial geochemistry blossomed. He was the

first to show that geochemistry is a viable tool for exploration in permafrost environments, and this marked the beginning of research in exploration geochemistry at the GSC. The first public-domain regional geochemical surveys in Canada were done in the Maritime Provinces, beginning in 1956, and resulted in a number of important discoveries.

In 1965, Bob's focus shifted to the Cobalt camp in Ontario. In addition to numerous research papers, he produced three major synthesis volumes on the precious metals. In 1969, "Elemental Associations and Indicators of Interest in Geochemical Prospecting" was published. This was followed in 1976 with "Mineralization Processes in Archean Greenstone and Sedimentary Belts". In 1979, his *magnum opus*, "The Geochemistry of Gold and its Deposits" was published. This work remains the standard reference on the geochemistry of gold.

Bob Boyle's travels have taken him around the world, from Australia to Zimbabwe. He has been a constant proponent of exploration geochemistry, and is one of its best known ambassadors in the less-developed countries, either as a visiting scientist or as a consultant to UNESCO and UNDP.

Bob's commitment to education also is shown by the large number of visiting fellows and students who have worked with him at the GSC. Many of these came from overseas to learn the practical aspects of geochemical prospecting. They returned to their own countries better

equipped for activities in the field of mineral reconnaissance so essential to their national prosperity.

Bob Boyle was elected to the Royal Society of Canada in 1957, and was awarded its Willet G. Miller medal in 1971. He was awarded the Barlow Medal of the CIM in 1966, and again in 1983. He has served on the councils of many societies, and has been President of the International Association for the Genesis of Ore Deposits.

Bob has been active in geochemistry for forty years, and his contributions are now landmarks in the field of exploration geochemistry. He has fostered exploration geochemistry both directly at the GSC, and through his efforts as a lecturer, practitioner and consultant in Canada and worldwide.

Ladies and gentlemen, I take pleasure in presenting the Past-President's Medal of the Mineralogical Association of Canada to Robert W. Boyle.

Frank C. Hawthorne
Past President

Ladies and Gentlemen,

Thank you, Professor Hawthorne, for your generous citation and remarks. I am greatly honored by the award of the Past Presidents' Medal for 1992, and I wish to thank collectively all those who nominated me. I also want to thank collectively all those, numbered in the hundreds, who assisted in my research in many parts of the world through the last forty years. I am particularly appreciative of the financial and scientific support of the Geological Survey of Canada through the same period.

In preparing my acceptance of the Past Presidents' Medal, I thought that you might be interested in some recent historical research that I have been doing, especially that relating to this area, Wolfville-Walton, where we are presently meeting, and where I have worked in the past. As you perhaps know, this is one of the earliest areas settled by Europeans in Canada. Actually, it is the cradle of geology and mineralogy in Canada, dating from the early decades of the 17th century.

The commissions granted by the King of France to the early explorers always contained a clause ordering the search for mineral deposits and documentation of their location. Hence, when Samuel de Champlain came to this region of Acadia, founding Port Royal in 1605, he brought with him a miner, Master Simon. The term "Master" is of importance, since at the time it implied that Simon was an expert geologist, mineralogist and miner. Simon was, therefore, the first geologist to examine Canadian rocks and mineral deposits. Together



Robert W. Boyle

with Champlain, he prospected the coasts of the Bay of Fundy and Minas Basin, finding argentiferous galena at Mink Cove on Digby Neck, native copper on the shores of the North Mountain basalts, amethyst at Cape Blomidon, and gypsum (alabaster) along the Cheverie shore. These are the first occurrences of these minerals examined by Europeans in Canada. The name "Minas Basin" is an anglicized form of "Le Bassin des Mines" originally given to the estuary by Champlain.

Passing over the next two centuries, I want to talk briefly about the Wolfville – Windsor – Walton area, important in the history of geology and mineralogy in Canada. During the late decades of the 18th century and early decades of the 19th, Windsor was the cultural center of northern Nova Scotia. Here was founded in 1788–1789 King's College, the first university in Nova Scotia and one of the first two in what is now Canada. Henry How was professor of chemistry at King's College for many years and took a very active interest in the mineralogy of Nova Scotia. His *Mineralogy of Nova Scotia*, published in 1869, was the first comprehensive treatise on mineralogy in what is now Canada.

The Windsor–Walton area is remarkable for its display of sedimentation and early plant and animal life as portrayed by the early Carboniferous (Mississippian) Horton and Windsor Groups and the Triassic Fundy Group, the latter separated from the former by a spectacular angular unconformity. The Horton Group displays fossil forests, paleosoils in abundance, and many other features of the rise of the first land plants,

and the lower Windsor formations record a typical sabkha environment, in which limestone and evaporites were precipitated. Finally, the Triassic rocks in places contain remnants of fossil dinosaurs.

In the past, several famous geologists visited the Windsor–Walton area to examine and study its geological features. Among these were Sir William Logan, first director of the Geological Survey of Canada, Sir William Dawson, author of *Acadian Geology*, the first Canadian geological monograph, published in 1855, and Sir Charles Lyell, author of *Principles of Geology*, first published in 1830, a treatise that was to change the whole science of geology in the years following.

Finally, of interest to mineralogists is the discovery by Dr. Jambor and myself of two new minerals in the Windsor–Walton area, aplowite and moorhouseite, both cobalt sulfates, the former named for A.P. Low of the Geological Survey of Canada, and the latter, for W.W. Moorhouse, late Professor of Geology at the University of Toronto. Two selenides, penroseite and clauthalite, also occur in minor amounts in the area; so far as I am aware, these are the only occurrences of selenides in Nova Scotia.

These then are a few geological and mineralogical vignettes of the historic Wolfville – Windsor – Walton area where we are meeting today.

Thank you again for awarding me the Past Presidents' Medal for 1992.

R.W. Boyle

THE BERRY MEDAL FOR 1992 TO JOHN L. JAMBOR 1992

Ladies and Gentlemen,

It is a pleasure to present the 1992 Leonard G. Berry Medal to John L. Jambor in recognition of his many contributions to the Mineralogical Association of Canada, particularly his distinguished term as editor of *The Canadian Mineralogist*. John is an outstanding mineralogist of international reputation, and the Berry Medal will join five other medals that John has received in recognition of the excellence of his research. He won the Hawley Medal in 1970 for the best paper published in *The Canadian Mineralogist* during 1967 to 1969. He has twice won the Barlow Gold medal, in 1967 and 1975, for the best scientific paper in geology in the *Bulletin of the Canadian Institute of Mining, Metallurgy and Petroleum*. His first Barlow medal paper was coauthored with R.W. Boyle, the winner of this year's Past Presidents' Award. In 1977, John was awarded the Queen's Silver Jubilee Medal in recognition of his contributions to mineralogy, and in 1987, he won the Consolidated Gold Fields Silver Medal for the best

technical paper in the *Transactions of the Institute of Mining and Metallurgy*. The titles of John's medal-winning papers give an outline of the extent of his interests and the development of his career, and show his ability to work with other scientists: "Mineralogy, geochemistry, and origin of the Magnet Cove barite–sulfide deposits, Walton, N.S." with R.W. Boyle, 1967 Barlow Gold Medal; "New lead sulfosalts from Madoc, Ontario – Part 1, Part 2, Part 3 – synthesis, paragenesis and origin", 1970 Hawley Medal; "Mineralogy, zonal relationships and economic significance of hydrothermal alteration of porphyry copper deposits, Babine Lake area, B.C.", with D.J. Carson, 1975 Barlow Gold Medal; "The behaviour of silver during jarosite precipitation", with J.E. Dutrizac, 1987 Consolidated Gold Fields Silver Medal.

John is internationally recognized for his expertise in descriptive mineralogy and mineral nomenclature, and has described over 30 new mineral species during his