

ROBERT GARRETT & CHRISTY VODDEN

Robert W. Boyle
1920-2003



Robert William Boyle, a pioneer in the application of geochemistry to the discovery and understanding of mineral deposits, was born on June 3, 1920, near Wallaceburg in southwestern Ontario. For most of his professional life he was a member of the Geological Survey of Canada based in Ottawa, though his research took him across Canada from the Maritimes to the Yukon.

He developed an interest in chemistry as a boy and had his own laboratory in the attic of the family farm. Befriended by a retired prospector who lived nearby, his interest in geology was stimulated and he was introduced into the world of prospecting and mineral deposits. In his last years in high school he joined a mining syndicate in Ontario where he started as a line-cutter and driller's helper. From these beginnings he went on to become one of Canada's leading geochemists, recognized internationally for his contributions to the science of ore deposits and the distribution of metals in the earth's crust.

At the outbreak of World War II he enlisted in the Royal Canadian Artillery and spent the next six years in the European theatre where he served with distinction. While he was in Britain the military police arrived at the family farm to collect him for not reporting for conscription; they were sent way by his mother with a tongue lashing and a copy of his regimental address in England. There he took part in the defence of the south coast, and later in the invasion of Normandy and the subsequent advance through France, Belgium and Holland to northwest Germany. Notwithstanding his military duties he made time for geology courses at Imperial College, London, and correspondence courses from Queen's University, Kingston. He turned down a commission and was discharged in October 1945 with the rank of Lance-Sergeant. Eight days later he married his childhood sweetheart Marguerite Brown and in January 1946 began studying at the University of Toronto. He worked as a summer field assistant with the Geological Survey of Canada in 1948, and obtained a degree in mining geology in 1949. He then began graduate work on the gold deposits of Yellowknife, completing his M.A.Sc. in 1950. He became a full-time staff member with the Survey in 1952 and extended his work in Yellowknife for his doctoral thesis. This was subsequently published as GSC Memoir 310. In the course of this work he developed his ideas on ore-forming processes and geochemical indicators for detecting the presence of mineral deposits.

In 1955 he established a laboratory for geochemical prospecting at the Geological Survey of Canada, a facility that he expanded into a broader program in 1957. During that time he began a geochemistry program in Nova Scotia and with a growing staff of permanent employees and students, proceeded to undertake field and laboratory studies on ore deposits there and in other regions. He led the Survey's geochemistry section until 1967, stepping down so he could concentrate on research into precious metal ore deposits. The new insights he developed into the formation of diverse deposits were based on the experience he gained in the Northwest Territories, the Yukon and the Maritimes, as well as at Cobalt, Ontario. His studies led to new discoveries such as the zinc deposits at Walton, Nova Scotia, and expansion of the rich silver fields at Cobalt. His work at Yellowknife and particularly at Keno Hill in the Yukon demonstrated the power of geochemical prospecting, notably by exploiting the way that trace elements are dispersed in permafrost regions. This research guided further prospecting at Keno Hill that kept the camp in production until the 1980s and led to an exchange visit in 1962 to the Soviet Union where similar research was in progress.

Among his more than 160 publications he became particularly well known for those on the geochemistry of silver, gold, thorium and uranium. His growing reputation led to demands for advice on these and other deposit types in many countries. Another facet of his work developed in the 1970s from the growing prominence of environmental issues. He co-authored a series of

reports on trace element abundances in the environment that provided important baselines for evaluating possibly toxic concentrations of elements and the assessment of environmental risks. He drew on his keen interest in the history of mining and its influence in shaping the early civilizations of Europe and Asia in writing, for example, a history of gold deposits for the Society of Economic Geologists.

Robert Boyle was prominent in a number of professional societies and, in 1966, was a founding member and later President of the International Association for the Genesis of Ore Deposits. In the same year he fostered growth in geochemical prospecting by organizing the first meeting of what became the biennial International Geochemical Exploration Symposium and from which grew the Association of Exploration Geochemists in 1970. His commitment to training and teaching was manifest by the many students he guided at the Survey and in his service as Special Lecturer in Geochemistry at Carleton University between 1955 and 1975. He served as ambassador or consultant for UNESCO, the UN Development Programme and the World Bank, toured as visiting lecturer for the Canadian Institute of Mining and Metallurgy, the International Atomic Energy Agency, and visited many universities in India, Brazil and China.

His accomplishments were widely recognized in Canada and abroad. He was inducted into the Royal Society of Canada in 1957 and awarded its Miller Medal in 1971. He was elected a Fellow of the Royal Geographic Society of Canada in 1955, received the Distinguished Service Award of the Prospectors and Developers Association in 1953, the Barlow Medal of the Canadian Institute of Mining and Metallurgy in 1966 and again in 1983, and its Distinguished Service Medal in 2002. He was inducted into the Canadian Mining Hall of Fame in 1997. The Association of Exploration Geochemists gave him its Gold Medal in 1999. He received an Award of Excellence in 1991 from the Society of Technical Communicators and the Past President's Medal in 1992 for long service from the Mineralogical Association of Canada.

A superb raconteur, a generous friend and an unforgettable colleague to the many who worked with him, he was dedicated to his work and to his family. He was followed into science by his daughter Heather, a biochemist, and his son, Dan, who also joined the Geological Survey of Canada as a geochemist and who sadly predeceased him in 2000. Despite failing eyesight and health he persevered with his final work, a history of geochemistry and cosmochemistry and finished the manuscript shortly before his death in Ottawa on August 5, 2003.

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