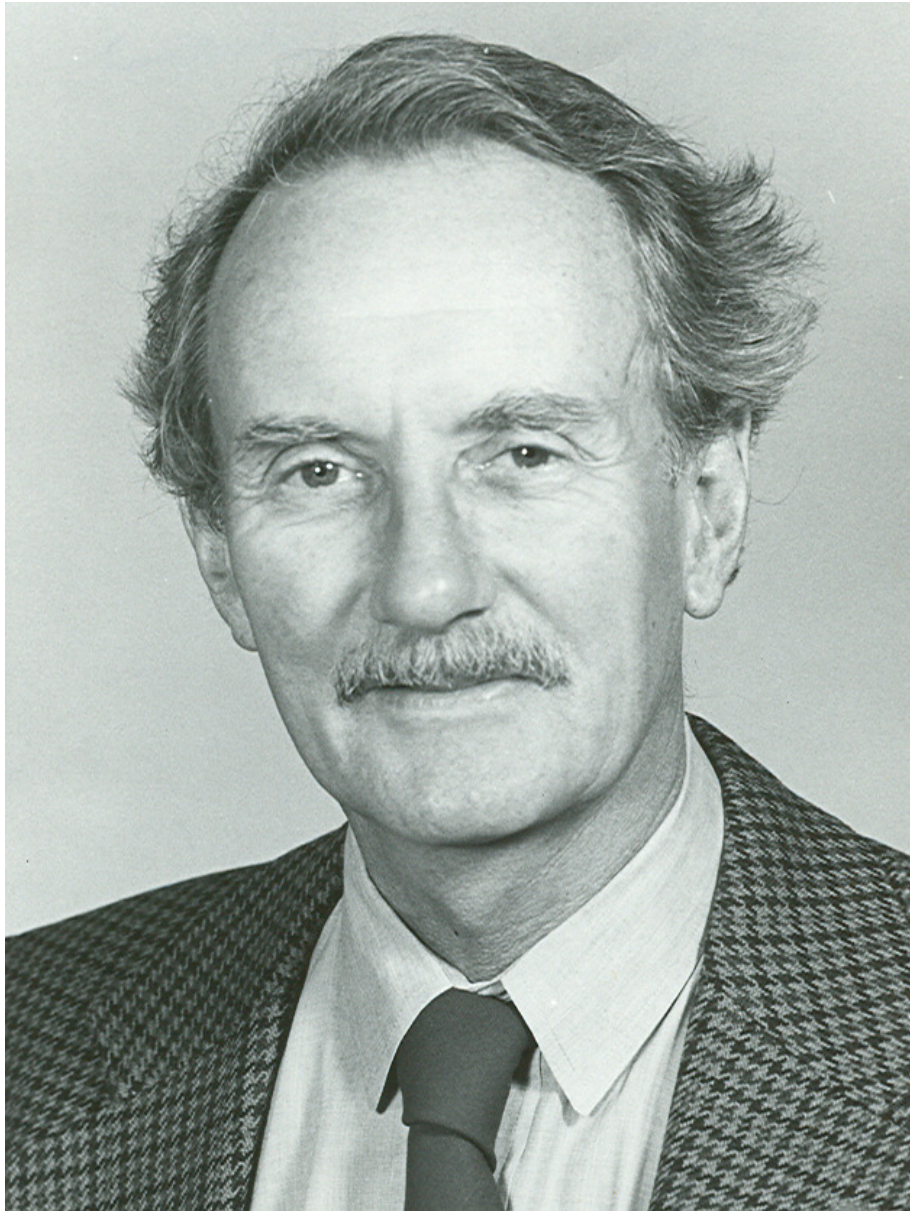


HENRY P. SCHWARCZ, FRSC

Denis Martin Shaw
1923-2003



Denis Shaw was a truly remarkable scientist who left a profound impact on his generation and a lasting record in the world of geochemistry. He was born in St. Annes, Lancashire on 20 August, 1923. He attended Emmanuel College of Cambridge University, receiving a BA (1943) and MA (1948) in geology, at a time when Cambridge was recognized as a world centre for the study of petrology. Moving to the University of Chicago in 1948, Shaw began studies of geochemistry with Louis Ahrens, while learning the use of optical spectroscopy from Oiva Joensuu. His PhD research led to his life-long interest in the use of trace elements in defining crustal processes.

In 1952 he came to the newly established Department of Geology at McMaster University where he set up a trace element geochemistry lab centered around the use of the optical spectrograph. A series of papers followed charting the geochemistry of the rarer elements such as thallium, indium and barium, and elaborating on the rules of element distribution as originally conceived by V. M. Goldschmidt. This early work established him as a leading figure on the burgeoning field of trace-element geochemistry. His two subsequent papers on the chemical history of the Littleton Formation of New Hampshire (1954) were models for the integration of petrology and geochemistry.

At the same time Shaw served as a field geologist for the Ontario Geological Survey, mapping Precambrian igneous and metamorphic rocks around Bancroft. He maintained a life-long love of this terrain, sending many students to study its petrological and geochemical features. Through the 50s and 60s he continued to focus on various aspects of mineralogy and analytical geochemistry, also contributing significantly to the use of statistics in this field. In the late 1960s he embarked on a new challenge: to determine the geochemical character of the entire Canadian Shield. This project, called "SCRAPE", exploited samples collected in geophysical surveys, and allowed him and his colleagues to pool these samples and to determine the elementary abundance of this representative portion of the earth's crust. It resulted in a series of papers concerned with major and trace elements as well as isotopic properties of the shield.

In recognition of his contributions to geochemistry, Shaw was elected to the Royal Society of Canada in 1961. At about the same time he also began to hold a series of administrative posts at McMaster, serving twice as chairman of his department, and later as Dean of graduate studies. His gifts as a scientist, writer and editor led to his appointment in 1970 as executive editor of *Geochimica et Cosmochimica Acta*, widely recognized as the leading journal in its field. In 1981 he received the W. G. Miller medal of the Royal Society in recognition of his work in geochemistry and also his leadership of *Geochimica*.

In the 1970s, as optical spectrography faded in importance as an analytical tool in geochemistry, Shaw's restless mind turned to mathematical modeling of crustal processes. Following on a lead of the late Paul Gast, he produced a series of elegant papers on the fate of trace elements during partial melting of the crust (anatexis). Many other geochemists leapt on Shaw's new models to account for the curiously wide ranges in elemental abundances in magmatic rocks. This work also stimulated an upsurge in experimental studies of anatexis. His theoretical work was widely cited and further elaborated by other scientists.

He also became deeply involved in the Lithoprobe Project's study of the Kapuskasing structural zone, recognizing this as an opportunity to extend his studies of the bulk composition of the crust to a setting where nature could provide samples from greater depths. One of the frustrations of

his career was, however, the failure to convince others of the importance of drilling a hole on the KSZ which could have provided an even deeper sample of the Canadian Shield.

In the late 1970's Shaw took up a new analytical method, using prompt gamma emission to analyze for lighter elements (boron and lithium), exploiting the McMaster reactor. This work continued until his retirement in 1989. Having had a life-long interest in meteorites as samples of the chemistry of the solar system, he used this new method to probe the light-element chemistry of stony meteorites. He was a regular attendee at the meetings of the Meteoritical Society as well as the Lunar and Planetary Conference in Houston, in his role as editor of the volumes of that conference.

Throughout his rich and energetic career as a geochemist, Denis Shaw managed to intersperse other academic interests. His fascination with statistics and its application to geochemical analyses resulted in a rich lode of papers, a shining example of which is a chapter in the Handbook of Geochemistry, of which he was an editor. He wrote about the philosophy of science, especially reflecting on the nature of the earth sciences in relation to the broader world of science. In the course of a career which saw the publication of over 100 scientific papers and many book chapters, he also left a profound mark through his editorial leadership of *Geochimica* to its position of eminence in the earth sciences. At the end of his life he was still actively writing, working on a treatise on the theory trace element distributions in igneous processes which, hopefully, will soon emerge as a final monument to his life-long creativity.

Quite apart from his passion for science, Denis had a keen life-long interest in all the arts. His home was a show place of exciting works of contemporary artists. He was a gifted pianist, and a constant supporter of writers and artists.

All through his career Shaw was a gifted and admired teacher. He supervised many graduate students who respected and emulated his work. Many of them went on to distinguished careers themselves. His style while lecturing was meticulous; as he developed an argument in geochemistry or statistics on the blackboard in his elegant hand, one could clearly capture the flow of his thoughts. His relation with his colleagues and students was always gentle and encouraging, especially to younger scholars whose work he supported with vehemence.

After a brief illness, Denis Shaw passed away on October 6, 2003 in Hamilton. He was surely one of Canada's most distinguished earth scientists but, as well, a fine gentleman, beloved and mourned by all his colleagues and students, as well as many friends in the community of the arts.

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(Author's title given as of the time of writing)