Memorial to George Melvin Schwartz
1892–1980

P. K. SIMS
U.S. Geological Survey, Denver, Colorado 80225
G. B. MOREY
Minnesota Geological Survey, St. Paul, Minnesota 55108

George Melvin Schwartz, eminent geologist and distinguished gentleman, passed away quietly on December 23, 1980, thus ending a long and productive career as a teacher, scientist, and administrator.

Schwartz—as he was known to his contemporaries at the University of Minnesota—as born on a farm in Oakfield, Wisconsin, September 23, 1892, the son of parents of hardy German stock. His elementary school education was in an ungraded school in Byron township, Fond du Lac County, Wisconsin, and he attended high school in Fond du Lac from 1907 to 1911. His interest in the outdoors and his rigorous upbringing led him to enroll in geology at the University of Wisconsin, Madison, where he received the B.A. degree in 1915 and the M.A. degree the following year.

During his graduate studies at Wisconsin, he worked summers as a field geologist for the Wisconsin Geological and Natural History Survey, mainly chasing down magnetic anomalies under the guidance of Ernie Bean, then State Geologist. After receiving the master’s degree, he was employed as a geologist by Copper Range Company, exploring for copper near Painesdale, Michigan, a position he held until he was called to duty by the U.S. Army on January 1, 1918. This early involvement in exploration for mineral deposits stimulated a lifelong interest in the application of geology to mining and other practical problems.

Schwartz’s career in the U.S. Army as a 2d lieutenant, field artillery, during World War I, like that of many others, was not easy, and he was fortunate to survive several months of front-line duty and the flu epidemic of 1918. While at the front, he was in the major battles of St. Mihiel and the Argonne.

After the end of World War I, Schwartz joined the Department of Geology at the University of Minnesota as an instructor, working at the same time for the Ph.D. degree under the well-known economic geologist W. H. Emmons. He was awarded the Ph.D. degree in geology in 1923. Like C. K. Leith at the University of Wisconsin, Emmons had a profound influence on shaping Schwartz’s career. He was a demanding adviser, and it was probably at this time that Schwartz developed the productive work habits that characterized his professional career.

For most of his career, Schwartz was a faculty member of the Department of Geology at the University of Minnesota. He was appointed as an assistant professor in 1923, an associate professor in 1929, and was a full professor from 1943 until his retirement in 1961. The faculty in the department during his tenure was a most remarkable one, including in its membership such distinguished teachers as J. W. Gruner, F. F. Grout, and G. A. Thiel. It shared with a few other geology departments of that era a
remarkable stability and permanence, which created an almost unmatched esprit de corps among the faculty and graduate students. More than a dozen doctor's degree candidates completed studies under Schwartz, as did many more master's degree candidates. His students were employed in teaching, by the U.S. Geological Survey, and by industry, and several attained outstanding success in both management and geology.

Schwartz attained worldwide renown for his studies in ore microscopy during his early career, a subject in which he maintained an active interest until his retirement. His excellent work on the paragenesis of copper minerals was extended into broader research on mineral deposits, with emphasis on wallrock alteration and porphyry copper deposits. His accurate and comprehensive description of the San Manuel porphyry copper deposit, based on field and laboratory work and published as U.S. Geological Survey Professional Paper 256 in 1953, provided the basis for interpretation of the structure and alteration in an adjacent area, which led to the discovery by private industry in 1965 of a faulted offset of San Manuel, the Kalamazoo ore body.

Schwartz also had a long and illustrious career with the Minnesota Geological Survey, a unit within the University structure. From 1921 until the beginning of World War II, he worked on a variety of field problems, mainly directly concerned with potentially economic materials, and he made substantial contributions to the understanding of the iron ore, anorthosite, and copper-nickel deposits in the State. He also was concerned with sand and gravel deposits and Paleozoic stratigraphy and structure, particularly as they applied to the State's ground-water resources.

A remarkable facet of Schwartz's Survey work was his interest in the application of geology to engineering and environmental problems and a desire to "bring geology to the people." He was a pioneer in these fields and a most successful one. His bulletin on the geology of the Minneapolis–St. Paul metropolitan area, published in 1935, is estimated to have saved several hundreds of thousands of dollars for government, private individuals, and industry; and it provided a firm basis for more detailed, continuing studies of the geology and hydrology of the area. Perhaps he was best known in the State as the author, together with his colleague George A. Thiel, of the book Minnesota's Rocks and Waters. Since publication, about 25,000 copies have been sold. This popular book has been used as a text or reference in many of the schools in the region and was the prototype for many subsequent popular books on geology.

As Director of the Minnesota Geological Survey from 1944 to 1961, Schwartz laid the groundwork for the accelerated geologic mapping program in the State that was later carried out. He was successful in initiating an early aeromagnetic surveying program in cooperation with the U.S. Geological Survey and a progressive topographic mapping program, begun in 1949. He was chairman of the Minnesota State Mapping Board from 1949 until 1961, which determined priorities for topographic mapping in the State. As a tribute to his many contributions to the State and to the science of geology, the Centennial Volume of the Minnesota Geological Survey, Geology of Minnesota, published in 1973, was dedicated to him.

Schwartz was President of the Society of Economic Geologists in 1958 and was a Councillor of the Geological Society of America from 1955 to 1957. He was elected an Honorary Fellow of the Société Géologique de Belgique and of the Association of American State Geologists. Also, he was an active member of the Mineralogical Society of America, American Institute of Mining and Metallurgical Engineers, Minnesota Academy of Science, Mining and Metallurgical Society of America, American Association of University Professors, Sigma Xi, Sigma Rho, and Gamma Alpha.
Schwartz was married to Ruth Harriett Tucker in 1920, a remarkable woman who successfully overcame childhood illnesses and was his lifelong devoted companion. Throughout their marriage they shared deep feelings for one another and for their children. In addition to Ruth, sons George Jr. and John, daughter Ruth, seven grandchildren, and four great-grandchildren survive.

The selected references that follow indicate Schwartz's broad-ranging interest and capabilities. They have been chosen from the full list of 143 technical or semitechnical papers published during his career.

Schwartz will be remembered by his friends and colleagues as a warm, generous, modest person. His former students always speak kindly of him and those of us who were associated with him are much the better for it.

**SELECTED BIBLIOGRAPHY OF G. M. SCHWARTZ**


1924 Contact effects of gabbro and granite on ore deposition: Economic Geology, v. 19, p. 681-684.


1934 Paragenesis of the oxidized ores of copper: Economic Geology, v. 29, p. 55-75.


—the growth of magnetite metacrysts: American Mineralogist, v. 21, p. 635-641.


—the growth of magnetite metacrysts: American Mineralogist, v. 21, p. 635-641.


—the growth of magnetite crystals: Economic Geology, v. 34, p. 399-418.


