Memorial to Ogden L. Tweto  
1912–1983  

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Ogden Tweto, a distinguished Fellow of the Geological Society of America and a true gentleman, passed away quietly on November 23, 1983, at his home in Lakewood, Colorado. He is survived by his wife, Marguerite (Nikki); a son, John; a daughter, Barbara; and four grandchildren. For more than 45 years he was identified with the U.S. Geological Survey, and for much of this time he was deeply involved in the geology of Colorado. So deeply was he steeped in all aspects of the history of his beloved state that he had become "Mr. Colorado" to colleagues and friends.

Tweto was born of Norwegian parentage in Abercrombie, North Dakota, a rural town in the Red River Valley. A move to Missoula, Montana, in his early youth exposed him at an impressionable age to the fascination of mountains and geology in the "Big Sky" country. He graduated from Missoula County High School in 1930, and earned B.A. and M.A. degrees at the University of Montana in 1934 and 1937, respectively. Tweto entered graduate school at the University of Michigan in 1937, and by 1939 had satisfied the course requirement for the Ph.D. degree. Thesis preparation, however, was delayed by higher-priority work connected with critical minerals investigations during World War II, so it was not until 1947 that all formal requirements were satisfied and the degree was granted. At Michigan, Tweto was influenced strongly by T. S. Lovering and F. S. Turneaure, who more than any others fixed the destiny of his career. Lovering introduced Tweto to the wonder of Colorado mountain geology; Turneaure implanted the spark of interest in complex ore deposits that grew to an intense but carefully focused flame.

Tweto began his association with the U.S. Geological Survey as a summer field assistant to W. C. Alden in 1937, studying glacial geology and geomorphology in western Montana and northern Idaho. He began his Colorado work as field assistant to T. S. Lovering in the Boulder tungsten district in 1938. In 1940 he became a permanent employee of the Survey, assisting Lovering in mapping the Minturn 15-minute quadrangle, Colorado, and studying the contained replacement ore deposits at Gilman. These studies were interrupted during World War II by the urgent need to increase the Nation's supply of strategic minerals. Tweto moved to independent assignments, mainly short-term investigations of known or potential mineral deposits in Colorado and adjacent areas. During the Strategic Minerals Program, his work in the Boulder tungsten district contributed significantly to a 40-fold increase in annual production from that district.

Immediately after the war, Tweto expanded his studies in central Colorado to a regional investigation of the heavily mineralized area including Gilman, Leadville, and Climax, near the center of the Colorado mineral belt. In 1954 he began detailed geologic mapping in the western part of the Holy Cross quadrangle, a key area for understanding the complex geology of this part of the mineral belt. Northeast-trending mylonite shear
zones mapped here led to the recognition (with P. K. Sims) that the whole belt was localized along a zone of en echelon shears of Precambrian ancestry.

In 1961 Tweto was made Branch Chief, Southern Rocky Mountains and Colorado Plateau, in which capacity he supervised geologic research projects from Texas to Utah. He moved to Washington, D.C., in 1965 to become Assistant Chief Geologist for Economic Geology, responsible for managing the Survey’s efforts on minerals and mineral fuels. In this position, he helped develop and then managed an accelerated program of research on precious metals for the Department of the Interior, and he was largely instrumental in setting up the Wilderness Program, as required by the Wilderness Act of 1964 (Public Law 88-577).

In 1968 Tweto left Washington and came home to the Rockies, first completing some long-pending reports prepared jointly with Lovering, and then beginning work on a new geologic map of Colorado, which was published in black and white in 1976 and in color in 1979. Preparation of the geologic map was a true labor of love, and it was approached as a primary research project, not just a compilation of existing data. He meticulously compiled geologic maps of the 1° x 2° quadrangles of the state, including reconnaissance mapping of poorly known areas, and then combined and condensed these into a coherent, understandable geologic map for publication at 1:500,000. Interpretations reflected in this new state map give insight into Tweto’s remarkable knowledge and imaginative grasp of the complex geology of this important area. A common judgment by knowledgeable geologists is that the Geologic Map of Colorado is the finest such product ever assembled.

As an outgrowth of the Colorado map, Tweto embarked on a new round of studies of the larger features of the geology of the Southern Rocky Mountains; the results include a regional synthesis of the tectonism of west-central Colorado, a tectonic map and report on the Rio Grande rift system in Colorado, a geologic map and accompanying report on the Precambrian basement, and a basement configuration map of Colorado. These syntheses chronicle Tweto’s remarkable ability to patiently assemble and synthesize regional geologic data into coherent and unifying concepts.

Tweto earned many honors and awards during his distinguished career. The Department of the Interior presented him with its highest honor, the Distinguished Service Award, in 1970. In 1978 he was named Scientist of the Year by the Rocky Mountain Association of Geologists, and in 1983 he was the recipient of the first Distinguished Geological Pioneer Award of the Denver section of the Society of Economic Paleontologists and Mineralogists. The Rocky Mountain Association of Geologists volume on Colorado Geology was dedicated to him, and he was granted honorary membership in both the Rocky Mountain Association of Geologists and the Colorado Scientific Society.

He was a dedicated and responsible member of several national and local scientific societies; he was councilor of the Society of Economic Geologists from 1969 to 1972 and later declined nomination as society president. He was an active member and leader in the Colorado Scientific Society and served as secretary from 1948 to 1951 and as president in 1952.

Tweto’s bibliography consists of 79 papers, not including abstracts and reports now being processed for publication. The papers are mainly a mix of regional geologic investigations and studies of ore deposits, and they include a remarkable spread of subject matter. Each report is of exceptional quality and is highly readable, and many are important contributions. Tweto’s papers reflect his conservative and disciplined approach to scientific thinking; he believed that a body of good data should stand on its own and was reluctant to extrapolate interpretations beyond the limits of the data.
Tweto was a modest man of great integrity, and he had a truly uncommon amount of common sense. He was an unselfish public servant who many times put organizational loyalty above personal goals. His wisdom was always available to those who sought his counsel, including, for example, author James Michener, who acknowledges the help received on geologic and historical matters for the epic novel *Centennial*. To those of us who knew him well, he was a generous friend who enriched our lives.

As a fitting and lasting memorial, colleagues in the Colorado Scientific Society have established the Ogden Tweto Memorial Fund to provide support for graduate-student research in Colorado geology.

**SELECTED BIBLIOGRAPHY OF O. L. TWETO**


