Memorial To Bruce B. Hanshaw
1930–1998
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The geoscience community lost a very valued friend, colleague, and international scientist with the death of Bruce B. Hanshaw on July 18, 1998, in an off-road vehicle accident near Telluride, Colorado.

Bruce was born in Harrisburg, Pennsylvania, and grew up in Brooklyn, New York. He earned degrees in geology from the Massachusetts Institute of Technology (MIT) (B.S., 1953), the University of Colorado (M.S., 1958), and Harvard University (Ph.D., 1962). At MIT, Bruce was a Teagle Foundation Scholar, and at Colorado and Harvard, he was a teaching fellow. Bruce’s career followed three closely interwoven threads of achievement: research scientist, scientific administrator, and scientific statesman.

After serving as a lieutenant in the U.S. Army, a uranium exploration geologist for the Atomic Energy Commission, and a research geologist in the oil industry, Bruce joined the U.S. Geological Survey (USGS) as a research hydrologist in 1961. Over the next 30 years, two thirds of which were devoted to research in hydrology, geochemistry, and geology, Bruce established a preeminent reputation in a variety of advanced fields including geochemical and isotopic hydrology, paleoclimatology, radioactive waste management, global carbon dioxide modeling, shale membrane theory, anomalous lithic pore pressures, the genesis of carbonate strata, the formation of karst terranes, water-rock interactions, and mass-transfer modeling. Though known for many other outstanding efforts, Bruce’s major scientific contributions were in his chosen fields of hydrology and geochemistry. As a result, several of his more than 80 scholarly papers have been reprinted in “benchmark” collections, won “best paper” awards, or been included in authoritative technical encyclopedias.

Scientifically, Bruce’s most notable contributions were related to the membrane properties of clays, the subject of his doctoral thesis at Harvard, and in the applications of light isotope measurements to the unraveling of water-rock interaction processes. Inspired by the hydrodynamic conditions he worked on in his early days with the Petroleum Resource Corporation, he continued the studies of anomalous pressures and hydrochemistry associated with compacted clay strata to elucidate cation exchange, osmotic, ultrafiltration and other semipermeable membrane phenomena and the implications for thrust fault tectonics (with E-an Zen), regional fluid flow in large-scale sedimentary basins (with John Bredehoeft), and the development of deep basin brines. His work with Bill Back and Meyer Rubin laid the foundations for the use of carbon isotopes to delineate flow systems in regional carbonate aquifers, despite warnings that there would be too many variables to make the techniques useful in the field. Additional consideration of light stable isotopic and mineralogic processes in carbonate rock systems, largely with Back, amassed a significant body of effort over time on all aspects of carbonate geochemistry and associated water resources.
In recognition of his scientific accomplishments, Bruce belonged to and chaired a number of committees that evaluate the progress and determine the future of earth science, gained election to the prestigious Cosmos Club, served as councilor and editor of the Geological Society of America, won the O. E. Meinzer Award for Distinguished Contributions to Hydrology, and—for his scientific achievements alone—received the Meritorious Service Award of the U.S. Department of the Interior in 1982.

In the early 1970s, Bruce joined the Office of the Director of the USGS as Deputy Assistant Director for Research. His assuming this post coincided with the passage of the National Environmental Policy Act. With an explosion in environmental concerns worldwide, much of the leadership on environmental studies in the USGS was focused in his office. He coordinated new programs in the Urban Area Pilot Studies, and Resource and Land Information. He chaired a panel on Natural Hazard Amelioration for the Office of Technology Assessment and co-chaired the task force preparing Volume 5 of the 10,000-page Environmental Impact Statement for the Alaskan oil pipeline. He was the principal architect of an innovative methodology of environmental impact analysis and co-convenor of a Penrose Conference on this topic. Many of the theories and procedures he devised then are now working standards in the United States and the world today.

Between 1982 and 1985, Bruce again served in the USGS Director’s office, as Assistant Director for Research. This demanding position had responsibility for the health and direction of basic research within the USGS. It provided coordination across the program portfolios of the three operating divisions as well as in the international sector. Two of his many achievements in this position are particularly outstanding. First, he negotiated with the National Science Foundation and the Department of Energy for continuing access by the earth science community, including the USGS, to tandem accelerator mass spectrometers for making very precise age determinations of very small rock samples. Second, his continuing advice to the Earth Systems Science Committee for the National Aeronautics and Space Administration led to the inclusion of paleontologic information in the high-priority Global Change Program, information critical to understanding past and future climate cycles.

Throughout his career, Bruce served the earth science profession through leadership of governmental and extra-governmental advisory panels, committees, or task forces. In 30 separate and distinct roles, Bruce gave dedicated leadership in the affairs of such professional associations as the Geological Society of America, the American Association of Petroleum Geologists, the American Association for the Advancement of Science, the Geochemical Society, the American Geophysical Union, the American Chemical Society, the Geological Society of Washington, and honorary societies of Sigma Xi and Sigma Gamma Epsilon. These activities in support of professional societies brought many benefits to the Department of the Interior, the earth sciences community, and the USGS. They included opportunities to develop cooperative research on critical national problems with colleagues from academia and industry through interactions at scientific meetings and conferences of these societies; validation and recognition of the USGS research through presentations and discussions at these meetings; worldwide dissemination of that work published in the societies’ scholarly journals; and provision of an excellent recruiting arena for the addition of world-class scientists to the USGS staff. Bruce brought to this arena a discerning scientific palate and unmatched clarity in written and oral expression, coupled with a cheerful demeanor, an affable personality, a manifest interest in people, and as much tact as a British diplomat. In the latter part of his career, these traits of beneficent character and scientific stature thrust him into the role of Secretary General of the 289th International Geological Congress (IGC).

The IGC, the principal convocation for the global earth sciences, meets at four-year intervals, in different locations around the world. In 1985, at the behest of Dallas Peck, then director
of the USGS, Bruce became Secretary General of the 28th IGC, to be held in Washington, D.C., in 1989. This was the first IGC meeting in the United States since 1933. In his typical fashion, Bruce became the chief executive officer of the Congress and selected the leadership and oversaw the work of the scores of committees charged with staging. The congress took more than four years to organize, was attended by more than 6,000 earth scientists, had more than 3,400 technical papers presented, included more than 50 workshops and short courses, and presented more than 75 field trips to see the geology of every part of the United States. In addition, Bruce was instrumental in having the first IGC field trip to Antarctica. The 28th IGC was the largest ever, up to then, and Bruce was responsible for raising the funds for it and generating a financial surplus. With this surplus, Bruce was able to help establish an IGC fund, tended by the Geological Society of America Foundation, to support the attendance of young U.S. scientists at future IGC meetings. For his lifetime contributions to the programs for the Department of the Interior and for his many contributions to the geosciences, including the IGC, Bruce was awarded the department’s highest honor, the Distinguished Service Award, in 1989.

Bruce was an avid outdoorsman and enjoyed skiing, scuba diving, sailing, and chopping wood. Typical of his zest for life and its challenges, Bruce undertook all of them with verve and satisfaction. He and his family built a retreat in Colorado, where Bruce relaxed, when he was not sailing his beloved Sequoyah in the Chesapeake Bay or the Caribbean.

Bruce and his wife, Penelope, for many years were directors, writers, and actors in the USGS Pick and Hammer shows, a satirical creation by USGS employees to celebrate the follies of each other and the organization, and just to have fun. Bruce’s sharp wit, humor, and acting ability brought much pleasure and enjoyment to these shows. Many of his friends will always remember his enthusiastic belting out of the song “call me doctor, call me doctor. . . .”

Bruce was also fond of exploiting the absurdities in many government rules and regulations, especially if they were self-imposed or pompous. Many of us remember well Bruce’s encounter with the signs prohibiting fishing in Lake Nolan, a pond commemorating a former director at the USGS National Center. Bruce showed up the day after the sign went up all decked out in his scuba gear ready to do some diving. In response, another sign went up prohibiting scuba diving as well as fishing. The next day Bruce was decked out to go water skiing.

Bruce leaves behind his beloved wife, Penelope, who is a well-known geoscientist in her own right; two sons, Douglas of Anchorage, Alaska, and Gregory of Telluride, Colorado; and two grandchildren, Stephanie and Derek Bruce of Anchorage. All of us who knew Bruce miss this warm, caring human being who enjoyed life to the fullest.

SELECTED BIBLIOGRAPHY OF B. B. HANSHA W


