

Memorial to George Alfred Kiersch (1918–2001)

ALLEN W. HATHEWAY

Past-Chairman, Engineering Geology Division, Rolla, Missouri, USA

JANE HOFFMANN

1545 E. Water Street, Tucson, Arizona, 85719 USA

“The more experienced and familiar with Geo-Principles the more likely the investigator can solve the geological-related problems and environmental issues arising in engineering practice, whether for civil, mining, or military works.”

—George A. Kiersch, in reflection, September 2001

George A. Kiersch, P.G., P.E., engineering geologist, professor, researcher, and international consultant, was America’s premier engineering geologist of his time. He came out of the West (Lodi, California), the only son of second generation German immigrants Adolf Theodore Kiersch and Viola Elizabeth Bahmier Kiersch, and was educated at the Colorado School of Mines (BSGE, 1942; commissioned to the U.S. Army Corps of Engineers, from the R.O.T.C., upon graduation) and the University of Arizona, Tucson (M.S., Ph.D., 1947, 1956). George fought as a combat engineer officer (U.S. Army, Southwest Pacific Theater, WWII), contracted malaria, and was sent stateside in the spring of 1945, where he went on to enroll at Tucson.



After completion of his M.S. studies, George signed on with the Civil Works Program of the Army Corps of Engineers and went to work on dams with the Sacramento District. From the Corps, George moved to the International Boundary & Water Commission for field geologic mapping in the Big Bend region of Texas, again working on dam sites. When a faculty position opened up at the University of Arizona in 1951, George returned to become an assistant professor and doctoral candidate at its School of Mines, and he also managed the mineral resource survey of the Navajo Tribal reservations (published in 1955). While at Arizona, George was closely mentored by Professor Edwin D. McKee, the famous Grand Canyon stratigrapher who had sought the Navajo funding from the Bureau of Indian Affairs. Meanwhile, George organized courses in engineering geology at Tucson, making it only the fourth American university to embrace the specialty as a major. Those first degrees (B.S. and M.S.) were awarded in 1954.

George was granted tenure and advanced to associate professor in 1955, and he began summer consulting that year with the former Utah Construction and Mining Co. of San Francisco. As a result of the San Francisco assignments, the Southern Pacific Railroad (SPCO) approached George about becoming assistant chief of exploration and organizing and directing a massive (56,300 km² at 1:24,000 scale) geologic mapping survey of the railroad’s vast land holdings, granted in the nineteenth century as incentives to construct their segments of the nation’s rail network. In order to promote uniformity and quality, George personally compiled a *Handbook for Geologists, Engineers, and Draftsmen*.

This was all accomplished on a five-year contract.

On completion of the SPCO project, it was the McKee influence in 1959 that brought George to respond to interest in a new, endowed faculty hire to lead Cornell's Geology Department. George visited Ithaca on the way home from an Air Force consulting assignment to locate a Cold War Air Base in Spitzbergen. George, among the competition, was selected for the tenured professorship, and his 19-year association with Cornell University began in 1961. He filled the long-vacant engineering geology position once held by early textbook author Heinrich Reiss, and he was assigned his predecessor's largely uncleared office in McGraw Hall. There were other outstanding academic offers available to George at the time he made his choice. The 18-month hiatus between the Southern Pacific and Cornell had been filled with a variety of challenging consulting assignments, including a spate of litigation consultation, launching George into a series of papers on expert testimony by applied geologists. Just as he arrived at Cornell University, George also was installed as the 1961 chairman of the GSA Engineering Geology Division.

In terms of his writing, the Cornell years were especially productive. He was one of the creators of the GSA Engineering Geology Division *Case Histories in Engineering Geology* series, and he also edited *Reviews in Engineering Geology*, v. II.

At the same time, the Air Force came through with several choice consulting assignments, bringing research funding to the department. Notable among these was some of the first concentrated American work performed on cataloging the state of stress in bedrock masses (for Cold War protective command and missile launch facilities) and in geothermal resources.

These solid research contracts also led to authorized leave for 14 months of studies at the Technische Hochschule at Vienna. From there, he was given a good deal of free entry and passage to the Iron Curtain countries and thereby was able to befriend the beleaguered Czech mass wastage specialist Professor Vojtech Mencl at Brno. It was at Vienna where George's Golden, Colorado, alma mater contacted him with an interest in his taking charge of its Geology Department. With appropriate regrets stated, George remained on the Cornell faculty, electing to request a half-time appointment in 1976 and establishing a winter residence at Tucson, taking full emeritus retirement from Cornell in 1981 for full-time consulting based in Tucson.

Of his research at Vienna, George is most remembered for being the first engineering geologist to arrive on the scene of the awful destruction wrought by the near-instantaneous collapse some 300 million m³ steeply dipping strata of the side of Mount Toc at Vaiont Dam, Italy, and the resulting destruction of several villages in the Longarone Valley immediately downstream. At least 2,065 lives were lost as the 125 m high wave of displaced reservoir waters shot over the undamaged concrete gravity dam.

Once in the seat at Cornell as chairman of the Geology Department, George moved to develop and implement a reorganization of the program itself, and the program became that of Geological Sciences.

George was an early Corps of Engineers consultant on its Cold War "hardened" command facilities and to several large electric utilities for their nuclear power stations, the latter field of work being in Puerto Rico and even as far away as Taiwan and Brazil. Right up to the end of his life, George was a sought-after consultant and expert witness, and much of his writing was a gift to his profession of his own lessons learned.

Most of all, we remember George as the embodiment and living essence of our profession. George was all noblesse oblige and never took advantage of his height (6 feet, 4 inches) to make his presence felt; that all came naturally. George was soft spoken, but a person of great and convincing convictions, and these he kept well ordered and rationally on the tip of his tongue.

It was good to be around George, and we felt good about that. There was a calmness in his image, and his image meant that there was no geoscience problem that we could not

bring to a satisfactory solution by employing good geologic technique, rational thought, and multiple working hypotheses. George was the “compleat” engineering geologist. Said in the street vernacular of today, he always “had it together.” This competence was recognized by the Association of Engineering Geologists (AEG) by its 1985 elevation of George to Honorary Membership. George was one of AEG’s first members during its first year of existence (1957) as the California Association of Engineering Geologists. The Geological Society of America (GSA) bestowed a similar honor in its 1986 naming of George to the Distinguished Practice Award. The Society again honored George in the year following his death, with a 2002 Annual Meeting (Seattle) symposium of papers that later became the content of the latest *Reviews in Engineering Geology*, edited by the same conveners (Ehlen et. al., 2005).

In addition to his 1955 Colorado School of Mines Quarterly paper defining the bounds of Engineering Geology, George conceived of and spent several years editing a 25-paper Decade of North American Geology volume (1991) *The Heritage of Engineering Geology*—the single book that best defines our discipline. The value of this effort was recognized by the GSA Engineering Geology Division’s E.B. Burwell Memorial Award, granted in 1992, as well as the Claire P. Holdredge Award of AEG, granted George in 1993.

George, by virtue of his undergraduate training, was registered both as a professional geologist and as a professional engineer, but he never strayed philosophically from the primary thinking processes of a well-trained and seasoned geologist. George spoke frequently and eloquently of his concern that we adhere to the concerns of the geological back-to-the-basics movement.

Those who would embark on a career in the applied geosciences would do well to collect the writings of George A. Kiersch, who authored enough papers and books to define our profession; a few of these citations are appended. With a footlocker full of George’s work, any of us could conquer all of the challenges to engineering geologists and bring the truth of nature to the constructed environment, to resource development, and to environmental protection. We would not, of course, have the benefit of his calming presence and guidance.

George is survived by his four children. His close companion and arts-talented and horsewoman wife of 59 years, Jane Keith Kiersch, was a good physical and psychological match to George, and her death on 11 March 2001 seemed to leave even George without an anchor. Our brother passed quietly in his sleep, just six months later, of a well-worn heart, at home in Tucson, Arizona, with two of his four children at his bedside. He was reported to have been immensely satisfied with his life’s efforts and of his teaching and his professional practice, his vast and true friendships and of his beloved profession. It is pleasing that he had a sense of these truths.

REFERENCES CITED

Ehlen, J., Haneberg, W. C., and Larson, R.A., eds., 2005, Humans as Geologic Agents; in memory of George A. Kiersch: Geological Society of America Reviews in Engineering Geology 16, 158 p.

SELECTED BIBLIOGRAPHY OF G.A. KIERSCH

1955 Engineering Geology—Scope, Development and Utilization: Quarterly, Colorado School of Mines, v. 50, no. 3, 122 p.
1955–1956 (compiler and editor) Mineral Resources of the Navajo-Hopi Indian Reservations, Arizona-Utah: University of Arizona Press, 3 vol., 261 p.

- 1957 Teaching Aids and Allied Materials in Engineering Geology: Engineering Geology Division, Committee on Teaching Aids, G.A. Kiersch, J.T. McGill, and J.F. Mann, 36 p.
- 1969 (with Varnes, D.J., editors) Reviews in Engineering Geology: Geological Society of America, v. II (General Papers) 350 p.
- 1986 (with Dunn, J.R., Paschall, R.H., and Bailey, H.H.) The Professional Geologist as Expert Witness: American Institute of Professional Geologists Monograph no. 4, 20 p.
- 1991 (editor and contributing author) The Heritage of Engineering Geology; The First Hundred Years: Boulder, Colorado, Geological Society of America, Decade of North American Geology, Centennial Special Volume 3, 605 p.

