

Memorial of Frederick J. Kuellmer 1924–1992

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Frederick John Kuellmer was born on March 28, 1924, in Chicago, Illinois, the second child of John P. and Ella Schuetze Kuellmer. He passed away on March 13, 1992, after a lengthy illness and is survived by his wife, Jane, three children, Ellen, Louise, and Lawrence, and eight grandchildren. Fred had a career of over 40 years in academia, chiefly at New Mexico Tech, where he served in many capacities, as a teacher, researcher, and administrator. Some colleagues consider Fred as the first geologist of the modern age in New Mexico, and he very likely was the first professor in the state to use thermodynamics in research and teaching and to initiate studies in experimental mineralogy. He was well known for both his research and administrative capabilities. His career began as a field geologist and mineralogist, and he excelled in both areas. Later he became a coal petrologist and was successful in that field also. His ability as an administrator is clearly shown by the number of administrative positions he held at various times at New Mexico Tech. Fred was a Fellow of the Geological Society of America (Chairman of the Coal Division, 1987–1988), Sigma Xi, the American Geophysical Union, and the Geochemical Society, and he was a Fellow of the Mineralogical Society of America.

Despite his commitment to New Mexico Tech, Fred enjoyed spending time with his family. It was a great tragedy to him and Jane when they lost their eldest daughter, Marcia, in an automobile accident in 1977. He enjoyed hunting with his son, and, until he was physically unable to do so, he and Jane were active in a square-dancing group. Among his grandchildren he was known as the “Ice Cream Grandpa,” for he never missed an opportunity to take them out for ice cream. During the sixties, when he was actively engaged in feldspar research, he was known among the graduate students as “Freddie Feldspar.”

Fred’s older sister, Bernice Baumann, remembers him as being rather mischievous during his younger years in Chicago, especially during church choir time. As a teenager his thirst for knowledge was manifested by the large number of books he read. Bernice remembers that he would often check out up to a dozen books, read them all, return them, and check out 10 or 12 more. Fred began to be attracted to geology when he entered the University of Chicago in 1941 and registered for the physical science survey course. His studies were interrupted in 1943 by World War II, when he was drafted into the army, assigned to the Intelligence Division, and stationed in Wales. His excellent knowledge of German made him valuable



in monitoring German telephone conversations. German, incidentally, he learned largely from his German grandmother, who often read to him as a boy.

Fred returned after the war to complete his bachelor’s degree at the University of Chicago, which he received in 1948. He got his master’s in 1949. It was during a summer field camp at Devil’s Lake, Wisconsin, that Fred first met Jane (later to become his wife), who was also majoring in geology. When Fred, Jane, and Don Bloss (a fellow student later to become a close friend of the Kuellmers) took the plane-table mapping course at the same time, Jane, typically, got the highest grade of the three. On June 26, 1948, Fred and Jane were married. Because they needed ready cash, they accepted a job with the Park Service as fire lookouts in Yellowstone National Park, where they spent a pleasant summer honeymoon.

Fred continued with his education at the University of Chicago, where he earned his Ph.D. in 1952. He was a teaching assistant while in graduate school, and one of his favorite stories related to Francis Pettijohn. While

cleaning one of the laboratories, Fred accidentally spilled a jar of liquid bromine on the floor. As fumes began to rise from the reddish brown liquid, he used his knowledge of chemistry and poured sodium carbonate on it, and soon he was ankle deep in a rapidly spreading brownish foam. At about this time, as Fred told it, Pettijohn walked by and said, "It looks like you've got things under control," after which he left Fred to cope with the foamy toxic mess. On another occasion, Fred was assigned to help Don Bloss, who was about to make a mistake in mixing immersion oils. With his customary directness, Fred said, "You can't do that, you dummy," to which Don replied, "I'll have you know you're the assistant to the dummy."

For his thesis, which he did under the direction of Robert Balk, Fred mapped a large part of the southern Black Range in southern New Mexico. Although that was long before ash flow calderas were recognized in New Mexico, as Wolf Elston tells it, Fred's work has stood the test of time and has provided a firm foundation for later studies. Fred was well aware he was mapping a major vent zone with megabreccias and units with inclusions of granitic basement. He applied experimental and theoretical results to interpreting the ash-flow eruptions. In 1956 Fred's map of the Hillsboro Peak area in the Black Range was published as the Geologic Map Number 1 of the New Mexico Bureau of Mines and Mineral Resources. Although it was not until 1975 that the now-famous Emory caldera was identified in this area by Wolf Elston, Bill Seager, and Russ Clemons, it was Fred's detailed and accurate mapping that led to its discovery.

After receiving his Ph.D., Fred was offered a job by the New Mexico Institute of Mining and Technology in the State Bureau of Mines and Mineral Resources division, where he served as the senior economic geologist until 1964. While there, he received the first NSF grant at New Mexico Tech and probably the first one in geology in the state of New Mexico. During this time, Fred developed X-ray methods for studying the crystallographic structure of feldspars and designed the first X-ray diffraction furnace that was able to monitor the shift in the microcline 201 reflection during heating. From studying the structure of feldspars in copper porphyries, Fred proposed that the timing of hood-rock fracturing was related to the mechanical properties of these rocks and that mixing and unmixing in the alkali feldspars was a good index of those properties. By 1964, Fred had become interested in carbonatites, and he spent some time with O. F. Tuttle at Pennsylvania State University, where he worked on the system $\text{CaCO}_3\text{-CaF}_2\text{-BaSO}_4\text{-H}_2\text{O}$.

It was during 1960, while in Copenhagen to attend the International Geological Congress, that Fred slipped in the fog while he and Jane were riding a ferry across to Sweden. This caused permanent damage to his backbone, which led later to times of considerable grief and pain. In some instances, when his vertebrae slipped out, he had to be hospitalized. Despite the injury, Fred attended the IGC field trip he had registered for, even though he

couldn't lean over to lace his boots in the morning. His roommate, Julian Goldsmith from the University of Chicago, helped him with the lacing.

In 1959-1960, Fred and Jane spent 14 months on sabbatical leave at the University of Zurich in Switzerland, where Fred worked with Fritz Laves on the structure of biotite. It was during this time that he had his first (and last) encounter with rock climbing and glaciers. As he and his Swiss colleague approached Mont Blanc, he had his first flash of concern as the ropes and pitons were unpacked.

In 1964 Fred and Jane left New Mexico Tech when Fred accepted the position of department chairman in the new Geology Department at the University of Illinois at Chicago. While there, he recruited seven new faculty members and initiated a bachelor's degree program. By the end of the second year under his leadership, outside funding for teaching and research in the department grew from zero to \$114,000. One night, while holding a faculty party at his house, Fred received a phone call from the Chicago police indicating that one of his faculty members (not present at the party) was on the ledge of the 21st floor of the science building contemplating jumping. Would Fred come immediately? Because Fred was over an hour's drive from campus, he convinced the police that they must get the man off the ledge, which they finally succeeded in doing, after considerable frustration and anguish on the part of Fred and the other faculty, who could do nothing to help. During his experience at the University of Illinois, Fred learned patience and understanding in working with undergraduates, attributes which he retained in his later career.

Fred did not like the long commute in Chicago, nor did he and Jane really like the intense winters or the environment in which their children were growing up. Topping this off, a tornado demolished much of their neighborhood and nearly hit their house in the spring of 1966. When a phone call came from Stirling Colgate, the new President of New Mexico Tech, offering Fred the position of Vice President for Academic Affairs, Fred was more than willing to accept. During the time he held this position (until 1976), he was responsible for adding many new degree programs at Tech, both at the undergraduate and graduate levels. He also served on state budgetary and educational coordinating boards, initiated the Socorro Community College, and received federal funding to begin a senior citizen's continuing education program. While Academic VP, Fred was appointed to various state committees, including the Environmental Research Committee, the State Academic Council, and the State Board of Educational Finance. Fred served as Acting President of New Mexico Tech in 1975, during which time he was instrumental in adopting a new equal opportunity and affirmative action program and oversaw a study to streamline business operations throughout the organization.

From 1976 to 1983, Fred rejoined the Geoscience Department at New Mexico Tech and returned to teaching and research. It was at this time that he made a dramatic change in his research interests: from feldspars to coal.

Fred spent many hours learning about coal and attended a course taught by Ed Beaumont at the University of New Mexico on coal geology. Unlike other faculty members who attended Ed's course, Fred did not insist on dominating the discussion, but in Ed's words was "attentive and uncharacteristically humble." Fred learned fast, and it wasn't long before he was awarded major research grants to study coal petrography and geochemistry. Later, he became a recognized scientist in coal research. His infrared spectroscopic studies of coals were important in more precisely determining the ratio of organic to inorganic matter in coal and in quality assessment of New Mexico coals. He was among the first to analyze coals for trace elements by neutron activation.

While he was in the Geoscience Department, I had the opportunity to coteach New Mexico Tech's summer field course with him. I soon learned that Fred knew a great deal in various fields of geology, including structural geology and sedimentology. His enthusiasm for explaining difficult concepts to students in the field was never-ending. One day we were examining some Precambrian metasediments south of Gunnison, Colorado, and, while lecturing and not looking where he was stepping, he fell and pulled his arm from its socket. I could tell he was in tremendous pain, but it took over 15 minutes for us to convince him to stop lecturing and go to the emergency room in Gunnison. He was also well known among the students for climbing the steep mountains and canyons to help them, rather than sticking close to the vehicles, as some field course instructors do.

Fred served as chairman in the Geoscience Department during the 1980–1981 academic year. He was appointed as Dean of Graduate Studies in 1984 and served in this capacity until 1987, when he was offered and accepted the position of Vice President of Research and Development at New Mexico Tech. During his tenure in this latter position, in which he served until the end of 1991, he oversaw the large research budget of New Mexico Tech, including the Geophysical Research Center. During this time he was especially popular among new faculty members trying to start research programs, as he was generous with seed money to help them get started.

Colleagues, administrators, and students all generally had favorable comments about Fred Kuellmer. As Larry Lattman, President of New Mexico Tech, indicated, Fred's "experience and unswerving commitment to fairness and excellence in academics made his actions and advice invaluable. In every institution there are a handful of people whose input is always sought. Fred Kuellmer belonged to that small group. He cared nothing about credit or rewards. His reward always seemed to be the satisfaction that he had contributed." Although not everyone appreciated Fred's teaching style, as stated by Jacques Renault, a former graduate student of Fred's, "If there was any single hallmark of it, it was independent work. Fred really believed in independence and gave me my first hands-on experience with geological research." As Ed Beaumont, a colleague in coal research, recalled, "I

can divide my feelings and relationship with Fred into three phases: initially I was put off a bit by his directness and humor; then I began to see the seriousness and purpose of his intent; and finally, I realized the depth of his caring, his sensitivity and the meaningful values he held beneath the facade." Stirling Colgate characterized him as "an intelligent man that understood complicated things." Even near the end, when he was suffering from cancer and in pain, he couldn't hide his passion for discovery. "Education," he said, "is the only thing that will save us from ourselves."

Whether we remember Fred for his dedication to New Mexico Tech and to research; as a person who was always lecturing on some matter or another, be it geology, politics, religion, family, or taxes; or as a person walking across the Tech campus with his hands in his pockets, his reddish hair blowing in the spring wind and a lift to his step, everyone at New Mexico Tech will miss Fred Kuellmer. In closing, perhaps nothing would be more fitting than a statement he often used himself when parting, "Be of good cheer."

I would like to thank Larry Lattman, Jacques Renault, Donald Bloss, Ed Beaumont, and Wolf Elston, all of whom shared with me some of their experiences with Fred at various stages in his career, some of which I have incorporated in this memorial. Also, I appreciate the help of his wife, Jane, in filling in some of the gaps and adding a personal touch to Fred's history.

SELECTED BIBLIOGRAPHY OF F. J. KUELLMER

- Geologic section of the Black Range at Kingston, New Mexico. *New Mexico Bur. Mines and Mineral Res.*, Bull. 33, 100 p. (1954).
- Geology of disseminated copper deposit near Hillsboro, New Mexico. *New Mexico Bur. Mines and Mineral Res.*, Circular 34, 46 p. (1955).
- Geologic map of Hillsboro Peak, Thirty-Minute Quadrangle, New Mexico. *New Mexico Bur. Mines and Mineral Res.*, Geologic Map 1 (1956).
- Alkali feldspars in a Tertiary porphyry near Hillsboro, New Mexico. *Journ. Geol.*, 66, 151–162 (1958).
- X-ray intensity measurements on perthitic materials. I. Theoretical consideration. *Journ. Geol.*, 67, 648–660 (1959).
- X-ray intensity measurements on perthitic materials. II. Data from natural alkali feldspars. *Journ. Geol.*, 68, 307–323 (1960).
- Compositional variation of alkali feldspars in some intrusive rocks near Globe-Miami, Arizona. *Econ. Geology*, 55, 557–562 (1960).
- Alkali feldspars from intrusive porphyries of southwestern United States. *New Mexico Bur. Mines and Mineral Res.*, Circular 62, 15 p. (1961).
- (with M. Willard and R. Weber) Reconnaissance geologic map of Alum Mountain, Thirty-minute Quadrangle, New Mexico. *New Mexico Bur. Mines and Mineral Res.*, Geologic Map 13 (1961).
- (with T.I. Poe) The quartz-cristobalite transformation. *Journ. American Ceramics Soc.*, 47, 311–312 (1964).
- (with A.P. Viscocky and O.F. Tuttle) Preliminary survey of the system barite-calcite-fluorite at 500 bars. In *Carbonatites*. Wiley, N.Y., p. 353–364 (1966).
- (with F. Kimbler and J. Nuter) Diffuse reflectivity of some New Mexico coals. *New Mexico Energy and Minerals Department, Final Rept. Project 78-3318*, 33 p. (1980).
- (with F. Kimbler and J. Nuter) Preliminary report of the diffuse reflectivity of some New Mexico coals. *Intern. Journ. Coal Geol.*, 2, 261–277 (1983).
- (with G. Roybal, F. Campbell, E. Beaumont, A. Cohen, and F. Kottlow-ski) Quality assessment of strippable coals in New Mexico, Phase III:

- Fruitland and Cleary coals in the San Juan Basin of northwestern New Mexico. New Mexico Research and Development Institute, Project Rept. 2-73-4304, 90 p. (1986).
- (with D.T. Kendrick and L. Baker) Trace element distributions in some New Mexico coals. New Mexico Research and Development Institute, Project Rept. 2-74-4321, 252 p. (1987).
- (with D.T. Kendrick and P.R. Kyle) Analysis of NBS coal standard reference materials 1632a and 1635 by instrumental neutron activation analysis. Geostandards Newsletter, 12, 375-377 (1988).
- Coal geology. Geotimes, 33, 14-15 (1988).
- Coal geology. Geotimes, 34, 10 (1989).