

# Memorial to Frederick Betz, Jr. 1915–1997

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Fred Betz was born to a German-American family, his father Frederick senior and family having arrived in New York City in the 1880s. Frederick senior taught high school languages (German and Spanish) in New York from about 1910 to the 1940s, instilling in young Fred a love of languages, literature, music, and art. At home he was brought up bilingually in English and German, and in school and university he also became proficient in French and Spanish. He first considered an academic career in French; however it was the “Great Depression,” and he turned to geology as a more stable vocation.

Fred junior was born in Rochester, New York, on March 11, 1915, and died in Tucson, Arizona, March 5, 1997. Fred got his A.B. at Columbia University in New York City in 1934, going on to Princeton for his doctoral work. He earned a Ph.D. in 1938 with the dissertation “The Geology and Mineral Deposits of the Canada Bay Area of Northern Newfoundland.” While at Princeton, Fred also spent time with Harry Hess, studying the bathymetric data on the floor of the north Pacific, an early interest that Harry was able to follow up during World War II. Fred’s newly gained knowledge of the nature of faulting led to a joint paper (Betz and Hess, 1942) on the major fracture systems of the oceanic crust there, one of the early defining papers of the yet-to-be-born theory of plate tectonics.

He was then appointed assistant professor of geology at Lehigh University in Bethlehem, Pennsylvania, but with the outbreak of World War II in 1941, he joined the Bureau of Mines. In 1945 he moved on to the U.S. Geological Survey in Washington, serving in the Military Geology Unit, where his language skills were invaluable. Eventually, in the 1950s, he became deputy to Frank Whitmore, chief of the unit.

In 1944–1945 Fred participated in the preparation of the Strategic Engineering Studies, terrain intelligence folios consisting of maps with accompanying tabular texts that were expanded map legends. These studies covered terrain analysis, cross-country movement, airfield sites, road construction, construction materials, water supply, and landing beaches.

After the war Fred taught again briefly at Lehigh University. In 1946 Frank Whitmore became chief of the Military Geology Unit (later Military Geology Branch) and persuaded Fred to return to the Survey as assistant chief of the branch.

Quoting from Whitmore, “The late 1940s was a hectic time for the Military Geology Branch; at the end of the war most of the staff had returned to their peacetime pursuits, and my job as branch chief had been to shut down the operation. Instead, the cold war began, and the Corps of Engineers, our main sponsor, asked for an expanded terrain intelligence program. So I found that instead of shrinking the branch I had to enlarge it, and I gave Fred the responsibility for recruiting. This was a terrible job, for geologists were in short supply and the oil companies



were hiring at salaries far above what we could offer. Fred, as you know, was a very careful and methodical person, and his recruiting standards have shown up well as you trace the subsequent careers of people whom he recruited.”

In the early 1950s Fred was assigned as chief of the newly formed USGS Team Europe, attached to the Office of the Engineer, HQ, U.S. Army Europe, in Heidelberg. He remained there for about seven years. Quoting again from Frank Whitmore, “In 1956 Fred and I went to Berlin, and made a reconnaissance in the North German Plain, an area of primary interest for our cross-country movement mapping. While in Berlin, in addition to consulting with intelligence people, we went to two plays. The one that sticks in my memory was “Life with Father,” with Father Day throwing down his newspaper and exclaiming ‘Gottverdämmt New-Haven Eisenbahn!’

“In the U.S. Army, a common means of communication was the ‘Dear Butch’ letter—unofficial correspondence in which problems were thrashed out before being formalized on the record. Fred and I had such a correspondence.

“Diplomacy was the order of the day; intrigue (or the suspicion thereof) reminded one of a European court. The USGS Team Europe was formed at the request of the Office of the Chief of Engineers in Washington to prepare cross-country movement maps at a scale of 1:100,000 of all of Germany and parts of adjacent countries. Its support devolved, by direction from Washington, upon the Office of the Engineer, U.S. Army Europe. The team was placed at the Engineer Intelligence Center at Schwetzingen, a suburb of Heidelberg, which put it one echelon down and several miles removed from theater headquarters. You can imagine the resentment that this caused in some officers at the Center. In addition, there were continual disagreements between Heidelberg and Washington as to mapping priorities, and at least once Fred had to forge ahead on his own, committing his staff to a certain area before higher authority had reached a decision. Fred’s was a very stressful job, as they say these days, and he walked the tightrope very well, maintaining proper standards of research and explaining to the military authorities why he had to do so. At the same time he oversaw a rigid production schedule which necessitated close dealing with the Engineer Base Topographic Battalion, which printed the maps.”

I first became acquainted with the mysteries and procedures of the U.S. Army Corps of Engineers and military terrain studies while serving in the southwest Pacific in General MacArthur’s HQ staff, being an intelligence officer in the Royal Australian Air Force. Trying to integrate our material information and get it all printed up in time to conform to a rigid operational schedule did indeed call for patience and diplomacy. Nevertheless, it provided a basis for lifelong friendships.

While Fred was head of the Military Geology team in Heidelberg (1955–1960) his principal geological colleagues there were Maxim K. Elias, Harold Hawkins, Daniel Krinsley, and Rick Terman. Fred became an expert on the history of military applications of the earth sciences.

In 1942 Fred married Elisabeth A. Walter and they had two sons, Frederick III and Paul Richard, and one daughter, Elisabeth Walter. His wife Elisabeth died in 1974, and in 1976 he married Bernadine L. Douglas, who survived him. His children all studied languages, literature, and art. Frederick III is professor of German at Southern Illinois University (Carbondale); Elisabeth Betz Parker recently retired as assistant chief of the Prints & Photographs Division of the Library of Congress (Washington, D.C.); Paul is managing editor of the American National Biography project at Oxford University Press (Cary, North Carolina).

Fred gained a deep love of culture from his father and was delighted to expand his experiences in Europe, with visits to art galleries, concerts, and the opera. After his retirement in the early 1980s, he was able to go back there with Bernadine, living in England and Spain. Their son Frederick III writes: “He was also a gourmet, photographer, stamp collector, and voracious reader, especially of books concerning language, humor, art, music, and history. While in Ger-

many, he also established (what turned into lifelong) contacts with German colleagues, including Professor Ernst Becksmann (University of Freiburg), now deceased, and Professor Eberhard Seybold (University of Kiel).” In the United States he was also a great friend of Claude C. Albritton, doyen of the philosophies of geology, who was dean of the Graduate School of Southern Methodist University in Dallas and had also worked on military geology during World War II. Fred Betz contributed a chapter in Albritton’s *Fabric of Geology* (1964) on the subject of “Geological Communication” (p. 193–217), which contains a nice little example of Betzian punditry. If the science of geology is a collection of knowledge, he says, then, like all knowledge, “it has no tangibility until it has been expressed in terms which are understandable to at least one individual beyond the discoverer. In short, its perpetuation as a science depends solely on its propagation, and, incidentally, its survival depends upon a Darwinian sifting of that knowledge that is ‘fittest.’” But with more and more propagation we have developed an information explosion, a potentially disastrous Malthusian population expansion, which Betz says we must deal with by becoming “more expert with the tools of communication.” He points to the geological map as a vehicle, unique to the earth sciences, for the synthesis and quantification of a vast number of scientific observations. Different types of maps, profiles, and tables can profitably expand the basic message. And when it comes to dynamism and process, mathematical symbolization through algebra, “the most perfect scientific language, becomes the ultimate elegance with its brevity, unequivocal nature and universality.”

In verbal communication, Betz grumbled about the wordiness of geologists, especially in Germany. He attributed this failing in part to the universal decline in language training, especially the classical languages, which compel close attention to exact precision. The usefulness of comprehensive glossaries is underlined, as a defense against proliferation of needless and often barbarous new terminology, which makes communication with the general public all the more difficult. And, to close, Betz quoted Sir Archibald Geikie in a work of 1897, “That no man should publish what is not of real consequence....” A century later, we can only sigh and murmur our pious approval.

Following his return to the United States in 1960, Fred became executive secretary of the Geological Society of America, a post he held until 1964. The GSA then had its offices in a row of elegant brownstones belonging to Columbia University on West 117th Street in New York City. Jim Skehan (Boston College) writes that to this post Fred brought not only “a distinguished career in scientific research and administration ... [but also] a concern for the well-being of individuals that endeared him to geologists throughout the Geological Society and the profession.”

Following his stint with the GSA, Fred became Chief Scientist in the Earth Sciences Division of Texas Instruments in Dallas, Texas (1965–1970). This activity was succeeded by his work as executive director of the Coastal Plains Commission in Wilmington, Delaware (1970–1974).

In 1974 Fred and I began a friendly association in connection with a series of reprint volumes being published at that time by the firm of Dowden, Hutchinson & Ross, entitled *Benchmarks in Geology*. As general editor I selected a broad range of topics, which would be presented in facsimile reproduction and arranged in a historical ordering with commentaries to show students and researchers how that particular subject had emerged from its earliest beginnings. The Betz volume (no. 25 in the series, which eventually numbered more than 90) was entitled *Environmental Geology*; it dealt with keynote papers ranging through evaluation, ground water, industrial wastes, pollution, karst problems, medical geology, quick clays, and so on. It showed great depth of understanding and Betz’s extraordinarily profound reading of the literature. It also included translations of some almost unknown material—for example, a discussion of an engineering geologic foundation map of the City of Danzig (modern Gdansk).

Some of the ideas and lessons learned from the Benchmark experiences were presented in 1979 (jointly with A. M. Dowden) as a chapter in a multi-author book, edited by A. P. Harvey and J. A. Dinent, that emerged from the First International Conference on Geological Information, that had been held in London in April 1978.

Thus were the testimonies preserved of a long and interesting life by Fred Betz, Jr.: terrain evaluation and geologic information, with its organization and dispersal—unique contributions to our profession from a generous, warm-hearted, and cultured person.

### **Acknowledgment**

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