

Memorial to Harry F. Ferguson 1921-1989

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Harry F. Ferguson died on November 4, 1989, after a long illness. Harry was born in Pittsburgh, Pennsylvania, on June 11, 1921. After graduating from high school in June 1939, he worked in a steel mill until February 1943, when he enlisted in the U.S. Army Air Corps. Harry flew 23 combat missions from Italy in B-17 bombers as a navigator, bombardier, and gunner. At the end of World War II, he was honorably discharged as a staff sergeant. Like many of his contemporaries, Harry attended college on the G.I. Bill.

Harry graduated from the University of Pittsburgh in 1949 with a B.S. in geology. After graduation, Harry joined the U.S. Geological Survey Ground Water Branch in Baltimore, Maryland, and conducted groundwater investigations throughout Maryland. Reports on these investigations were published by the Maryland Department of Geology, Mines and Water Resources. In 1955, Harry transferred to the Survey's Military Geology Branch in Washington, D.C. There he was a member of a team that developed terrain intelligence reports on strategic foreign areas.

Harry's career shifted to engineering geology in 1956 when he returned to Pittsburgh for a position with the Pittsburgh District of the U.S. Army Corps of Engineers. For the next decade he assisted Shailer S. Philbrick on geological and geotechnical aspects of all military and civil works projects in the district. The Pittsburgh District includes the upper Ohio River Basin, with its glacial terrain, cyclic sedimentary rocks, and long history of coal mining. With a relatively small staff, Harry and Philbrick handled all the geological and geotechnical aspects of site investigation, design, and construction of numerous flood-control dams, navigation locks and dams, and flood-protection projects. Geological observations made during numerous excavations for dam foundations throughout the Allegheny Plateau led to Harry's pioneering work on valley stress relief, which he first published in 1967.

Harry became District Geologist in 1966, succeeding Philbrick. He was named Chief of the Foundations and Materials Branch (later the Geotechnical Branch) of the Pittsburgh District in 1972. Notably, Harry was one of the first two geologists to serve as Chief of a Foundations and Materials Branch within the Corps of Engineers.

The 1970s brought increased emphasis on environmental aspects of projects, instrumentation and performance monitoring, reevaluation and rehabilitation of existing structures, and the National Dam Safety Program. Harry was actively involved in all of these areas as both a technical specialist and an administrator. In the latter role, he was responsible for the National Dam Safety Program in the state of Ohio.

Harry retired as Chief of the Pittsburgh District Geotechnical Branch in January



1980. He was highly respected by his peers in the Corps. This is evidenced by the Official Commendations for Outstanding Performance awarded to him by the Department of the Army in 1961, 1963, 1968, 1971, 1974, 1976, 1977, and 1978.

During his tenure with the Pittsburgh District, Harry participated in numerous dam projects, some of which had unique aspects. One of these was Kinzua Dam, a 179-ft-high embankment and concrete gravity dam on the Allegheny River. The embankment portion of Kinzua Dam has the first concrete cutoff wall to bedrock (180 ft maximum depth) constructed in the United States by the ICOS method. At Kinzua, Harry provided consultation and liaison services during design and construction of an electric utility's pumped storage project, which included an upper reservoir, a 2,400-ft-long, 26-ft-diameter power tunnel with a 560-ft vertical shaft, and a powerhouse.

Harry also encountered unique rock mechanics problems at navigation projects in the Pittsburgh District. Rehabilitation of Locks and Dam No. 3 on the Monongahela River involved some of the earliest applications of rock anchors in navigation structures in the United States. Construction of Hannibal Locks and Dam on the Ohio River included anchoring and drainage of foundation rock for cofferdam stability as well as H-pile reinforcement and grouting of shattered and faulted rock in the dam foundation.

Following his retirement from the Corps of Engineers in 1980, Harry practiced full-time as a geotechnical consultant on a wide range of projects until the time of his death.

Harry will always be remembered as an outstanding practitioner in the field of engineering geology. He was a professional who consistently emphasized the fundamental—score logging, development of site stratigraphy, correlation of rock defects—all necessary to develop the geologic framework of a site and relate it to the engineering requirements of the project. Through his many contributions with the Corps of Engineers and in private practice, he has had a major influence on the practice of engineering geology in the Upper Ohio Basin.

Harry also influenced many young geologists and colleagues through discussions at technical meetings and field trips. He was an active participant in many professional and community organizations and served as chairman of the Geological Society of America's Engineering Geology Division in 1982. He became a Fellow of the Society in 1968, and he was a member of the ASCE-GSA-AEG Joint Committee on Engineering Geology from 1969 to 1978. Harry organized a symposium on "Environmental Geology Mapping" for the 1972 annual meeting of GSA in Minneapolis. He then edited papers from this symposium for publication as *Geological Mapping for Environmental Purposes* (Engineering Geology Case Histories No. 10, Geological Society of America, 1974).

Harry's most significant contribution to both theory and practice in engineering geology was his concept of valley stress release in flat-lying sedimentary rocks. This concept was developed in the classical manner of observational engineering geology. Harry observed rock characteristics, behavior, and defects exposed in numerous and extensive foundation excavations for navigation locks and dams and flood-control dams in the Upper Ohio River Basin during the late 1950s and early 1960s. He correlated these observations with subsurface data, stratigraphy, and geological cross sections, and then interpreted all of this within the context of valley formation, including erosion, stress release, and rock response as a function of strength and deformability of individual strata or suites of rock.

Harry will be deeply missed by his many friends and colleagues within the geological community. He is survived by his mother, Bertha; his wife, Vivian; his son, Michael; and three daughters, Sandra, Andrea, and Jill.

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