



William J. Givens

WILLIAM McGUIRE

1920–2013

Elected in 1994

“For contributions to the understanding of the behavior of steel structures and the development of computer graphics capabilities for design of those structures.”

BY STEVEN J. FENVES*

WILLIAM McGUIRE, a prominent contributor to knowledge of the behavior and design of steel structures, died on January 31, 2013, at the age of 92.

Bill, as he was universally known, was born on December 17, 1920, on Staten Island, New York, the only child of Edward J. McGuire, a transit police officer, and Phoebe McGuire, née Sellman. After high school he enrolled at Bucknell University and received a bachelor of science degree in civil engineering in 1942.

While a senior at Bucknell, Bill was commissioned as an ensign in the US Navy, and served from 1942 until his separation from active service on January 7, 1946. After training as an aircraft maintenance officer for dive bombers, he served from January 1944 to May 1945 in the Pacific Theater aboard the aircraft carrier *USS Franklin*, which participated in the Third Fleet operations in the Marianas, Western Carolines, and Leyte Gulf. The *Franklin* was attacked twice. The first, a kamikaze attack off Leyte Island on October 30, 1944, damaged the flight deck and aft elevator. After repairs, the *Franklin* joined the Fifth Fleet operations off the coast of Japan, where a bomber strike

*With assistance from John F. Abel, Gregory G. Deierlein, and Ronald D. Ziemian.

on March 19, 1945, caused 800 fatalities and 500 wounded on the carrier. The Navy citation of Lieutenant McGuire states, in part: "In the face of continuing explosions and raging fires, he led a valiant group fighting the fires until forced by flames and smoke to go overboard." In his characteristically modest way, Bill refers to the citation in his *Memories of Service* as "perhaps exaggerated slightly in that [it] did not mention that we weren't successful."

Bill's experiences in the wartime Navy remained a formative influence throughout his life and an inexhaustible source of anecdotes. Because he could detect engine faults from their sound, during launching operations he stood on the flight deck directly behind the launch officer; when he heard a faulty engine, he tapped the officer's shoulder and the flight was aborted.

After his discharge from the Navy Bill enrolled at Cornell University and earned a master of civil engineering (MCE) degree in structural engineering in 1947. He was also an instructor, responsible for undergraduate courses. In 1947 he joined Jackson & Moreland Engineers, a structural engineering office in Boston, as a designer and worked on the design of then-novel nuclear power plants and atomic energy facilities.

In 1949 he joined the faculty of Cornell's School of Civil Engineering as an assistant professor. He went on to become an associate professor (1952), professor (1960), director of the school (1966–1968), and, in 1989, professor emeritus after 40 years of service. During that time he also spent periods away from Cornell as a visiting professor at the Asian Institute of Technology (Bangkok, Thailand), the University of Canterbury (Christchurch, New Zealand), the University of Western Australia (Perth), the University of Tokyo (Japan), the University of Liège (Belgium), and Strathclyde University (Glasgow, United Kingdom).

Bill's work dealt primarily with the behavior of steel structures and their design and analysis. He was the author or coauthor of numerous papers and reports and of two widely used textbooks: *Steel Structures* (1968) and *Matrix Structural Analysis* (first edition, 1979, with R.H. Gallagher; second edition, 2000, with Gallagher and R.D. Ziemian).

Starting in the early 1970s, Bill was an innovator in the adaptation of interactive computer graphics techniques to the computer-aided nonlinear analysis and design of three-dimensional framed structures. He advocated that better designs would always come from a better understanding of structural behavior. To this end, it was his ambition, and that of his coworkers and PhD students, to model the behavior of such structures under load as realistically and comprehensively as possible with computational models. He led a 20-year effort that eventually resulted in a revised appendix to the Specification of the American Institute of Steel Construction (AISC) that provides an opportunity for engineers to use this approach.

On the education front, Bill led efforts to make advanced nonlinear analysis accessible to students and professional engineers through interactive computer programs, including the MASTAN2 software widely used in structural engineering courses on analysis and design.

His teaching, mentoring, research, writing, and consulting earned him wide respect from students, colleagues, and the structural engineering profession as a whole. In 1994, the year he was elected to the National Academy of Engineering, he was also named a Distinguished Member of the American Society of Civil Engineers (ASCE). He was twice a winner of the ASCE Norman Medal, with G.P. Fisher (1962) and with R.D. Ziemian and G.G. Deierlein (1994). Other honors included the ASCE Shortridge Hardesty Award (1992); the AISC T.R. Higgins Lectureship (1992) and Geerhard Haaijer Award (2000); and the Structural Stability Research Council Lynn S. Beedle Award (2005).

Bill consulted widely on a number of special structural problems and structural failure investigations, including the Hyatt Regency Hotel walkway collapse (1980) and the L'Ambiance Plaza collapse (1988). For more than 40 years he was almost continuously engaged with aspects of the planning, design, and periodic upgrading of the structure of the Arecibo Observatory, the world's largest single-dish radio telescope (a 305 m-diameter fixed dish with a movable feed suspended on three cables) in Puerto Rico, conceived and operated by

Cornell University faculty and administration members as the National Astronomy and Ionosphere Center (NAIC). He also designed, in partnership with Solomon Cady Hollister, retired dean of the College of Engineering, the Fall Creek Suspension Bridge on the Cornell campus (1959).

Bill's colleagues and friends remember him as a true gentleman, an avid reader, especially of nonfiction, and a wonderful conversationalist who invoked history, travel, politics, and current affairs in addition to what he termed his "sea stories," many of which had nothing to do with the Navy.

Bill and Barbara Weld, daughter of Dr. Stanley B. and S. Frances Weld, were engaged in November 1943 and married in Hartford on February 5, 1944, while Bill was on leave from the Navy. For the next four years, theirs was the typical Navy life of short periods of togetherness in many different places. Until her death in 2009, Barbara and Bill offered their hospitality to colleagues, friends, visitors, and students in their home in Ithaca. They traveled extensively throughout the world.

Bill is survived by two sons, Robert of Ithaca, New York, and Thomas of Tucson, Arizona; two granddaughters, Christina McGuire Adelman of West Baldwin, Maine, and Marketa Elsner of Lakewood, Colorado; and two great-grandsons, Cash Thomas Adelman and Elias Weld Elsner.

