

MEMORIAL RESOLUTION WILLIAM E.(BILL)BRIGHAM

(1929-2004)

William E. Brigham, Professor Emeritus of Petroleum Engineering, died on February 15, 2004 in his campus home at the age of 74. The cause of death was liver cancer. Known by his colleagues, friends, and students simply as "Bill Brigham", he was an important member of the faculty for 33 years and remained active in the Department until shortly before his death. Bill Brigham was born April 1, 1929 in Murphysboro Illinois. In 1950 he received a Bachelor of Science Degree in Chemical Engineering from the University of Iowa and began working for S.C. Johnson & Sons. In 1951, he was drafted into the U.S. Marine Corps and stationed at Treasure Island in San Francisco. It was during his military service that he met his future wife, Carol Cobb, who was a Stanford student at that time. They married in 1954. After completing his Marine Corps service, he pursued graduate studies in Chemical Engineering at the University of Oklahoma from 1955 to 1962. He obtained Master of Science and PhD degrees in 1956 and 1962, respectively, while working simultaneously for Continental Oil Company (Conoco) in Ponca City, Oklahoma. After holding a series of technical and supervisory positions at Conoco from 1958 to 1971, he joined the faculty at Stanford in 1971 and served as Associate Chair of Petroleum Engineering from 1979 to 1990. Known as plain-spoken, down-to-earth, and an outstanding engineer, Bill Brigham had a keen eye for detail. Students and colleagues stood assured of the correctness and validity of their work once it passed his review. Two generations of engineers that he taught remember fondly the "ring of fire" (i.e., cigarette, cup of coffee, overhead projector, and Bill Brigham himself) that characterized his classroom teaching style. In teaching, he displayed extraordinary ability to break down and explain complicated technical subjects in a way that could be easily understood. In the classroom and during the conduct of research, he strove to imbue his students, and others whom he mentored, with the desire to question vigorously and deeply technical issues.

In reflecting on his collaboration with numerous graduate students, he once remarked, "They make a mediocre professor look like a Nobel Prize Winner." In spite of this modesty, Bill Brigham's research into the physical mechanisms of recovery from oil reservoirs was highly regarded and earned him numerous awards. During his career he was honored by the Society of Petroleum Engineers with the John Franklin Carll Award for technical application and professionalism in petroleum development and recovery, the Cedric K. Ferguson Award for significant contributions to the permanent technical literature, Thermal and Improved Oil Recovery Pioneer Awards, as well as honorary membership in the Society. The United States Department of Energy also recognized his work with the Homer H. Lowry Award for Excellence in Fossil Energy Research.

He was a voracious reader both at work and at home. When in 1987 he lost the ability to comprehend written words as a result of a stroke suffered while on a trip to Norway, it was his love of reading and the crafting of manuscripts that drove him to learn, for a second time, how to read. He analyzed with great interest the impact of the stroke on his brain. That he could read mathematical symbols and understand graphical information correctly, but not read, was fascinating to him even as he was frustrated with the difficulty of

relearning to read. In perhaps the most humbling of moments, he was unafraid to ask colleagues and Department staff how to sound out words.

Bill Brigham's contributions to the Petroleum Engineering literature are immense. He was an independent thinker who was unafraid of being wrong in pursuit of new ideas and concepts. In research, he had extraordinary ability to decipher physical mechanisms and to translate that understanding into theory and mathematical equations. His early research was in the area of fluid mechanics of multiphase flow in pipes and miscible flooding of oil reservoirs. Later, he explored the use of tracers and well testing as a means to define the flow characteristics of oil reservoirs. His most enduring contributions may well be in the area of thermal recovery of heavy oil as a result of steam or air injection into reservoirs. Such oil-production techniques are now used commonly in the San Joaquin Valley, CA. Similarly, Bill Brigham's work in geothermal reservoir engineering has been cited as a chief contributor to the successful recovery of energy from the Geysers' geothermal field near Santa Rosa, CA. In total, he authored 176 papers that appeared in the technical literature.

In spite of his busy academic life, Bill Brigham was devoted to his family. His children recall fondly trips where they drove from Stanford to Oklahoma and he entertained them with his singing and stories. He enjoyed playing duplicate bridge with his wife Carol, was a lover of music, and also a lifelong 49ers and Stanford football fan. He is survived by his wife of 49 years Carol; daughters Nancy Blatell, Laurie Jester, and Sarah Fletcher; sons Bill and David Brigham; 10 grandchildren and 3 step-grandchildren. His colleagues and his family miss the energy and enthusiasm with which he approached life as well as his constant reminder that you can simultaneously be a passionate critic and a caring individual.

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