



Henry J. Ramey, Jr.

HENRY J. RAMEY, JR.

1925–1993

WRITTEN BY WILLIAM E. BRIGHAM SUBMITTED BY THE NAE HOME SECRETARY

HENRY JACKSON RAMEY, JR., Keleen and Carlton Beal Professor of Petroleum Engineering, died November 19, 1993, of leukemia. He is survived by his wife, Alyce, and three children, Jonna, Terri, and Taigh. It would be hard to overstate Hank's contributions to the petroleum engineering profession; to the departments of petroleum engineering at Stanford and Texas A&M Universities; and to the lives of the many students, faculty, staff, and practicing engineers with whom he worked during his long career.

He was a pioneer. He personally led the development of three distinct areas of petroleum engineering technology: *in situ* combustion for recovery of heavy oil; the engineering of recovery of steam from geothermal reservoirs; and the design and interpretation of pressure transient tests of oil, gas, groundwater, and geothermal wells to determine properties of reservoir rocks. Hank made fundamental contributions to each of those areas at their inception, and he wove the three strands into a research effort that continued until his death.

Hank was born in Pittsburgh in 1925. His education was interrupted by World War II. He served as a B-29 navigator in the South Pacific, and after the war, completed his B.S. (1949) and Ph.D. (1952) degrees in chemical engineering at Purdue University. Hank married Alyce in September 1948. He began his research career in 1952 with Magnolia Petroleum Company, a

predecessor of Mobil Oil. Over the next eleven years, he held positions in research, production engineering, and reservoir engineering with Magnolia, General Petroleum Corporation (another Mobil predecessor), Mobil, and the Chinese Petroleum Corporation in Taiwan (on loan from Mobil). He began his teaching career as a part-time graduate school lecturer at the University of Southern California in 1960. He moved fully into the academic arena in 1963 as professor of petroleum engineering at Texas A&M University. In 1966 he came to Stanford, where he chaired the Petroleum Engineering Department for ten years (1976–1986), leading its growth and building its stature. He was named to the Beal chair in 1981.

Hank is known worldwide for his contributions to pressure-transient well testing, a technique by which the transient change of pressure in a well, due to injection, can be interpreted to yield information about the properties and size of the reservoir. Hank and his students were responsible for much of the mathematical and practical development of modern well testing. They pioneered the use of log-log type curves as a way of diagnosing well and reservoir characteristics. The theories they developed include the effects of complex fluid flows in and near the wellbore, and as a result, useful information can be extracted from experimental observations that would otherwise be uninterpretable. The Society of Petroleum Engineers (SPE) monograph *Advances in Well Test Analysis* cites his work more than any other person's.

Hank was a key innovator in the development of thermal oil recovery methods, which are applied to displace the heavy viscous crude oils that are abundant in California and elsewhere (Canada, Venezuela, and Indonesia, for example). In the late 1950s he led the South Belridge Thermal Recovery Experiment, a field test of the new *in situ* combustion technique supported by eleven oil companies. Later while with Mobil, he installed several additional combustion operations, all of which proved to be economic successes. Throughout his career he worked with many students to analyze and develop engineering science descriptions of *in situ* combustion and steam injection methods for heavy oil recovery. The SPE mono

graph *Thermal Recovery* frequently cites his work, for his research was always practically oriented as well as academically sound.

He pioneered the field of geothermal reservoir engineering. In the 1960s he began to apply the principles of petroleum reservoir engineering to the recovery of steam energy from geothermal reservoirs. In 1972 the Stanford Geothermal Program was established, and it remains the premier geothermal reservoir engineering research curriculum in the world today. Many of his former students dominate the geothermal industry. For his work in this area, he received in 1993 the Department of Energy Award for Exceptional Public Service, the highest recognition that can be presented to someone outside the department.

Many other awards were bestowed on Hank. He won every major award given by the Society of Petroleum Engineers, and he served twice as a distinguished lecturer. He was elected to the National Academy of Engineering (NAE) in 1981. He participated on the NAE Chemical/Petroleum Engineering Peer Committee (1983–1986), the National Research Council (NRC) Board on Mineral and Energy Resources (1984–1987), the NAE Committee on Membership (1987–1990), and the NRC Board of Radioactive Waste Management's panel that evaluated the proposed repository on Yucca Mountain (1990–1992). Hank's professional colleagues worldwide know and appreciate his many technical contributions.

While Hank's research is known to all, he will be remembered most for his personal warmth, his sense of humor, and for his steadfast concern for students. His example created an environment in which good students could develop their intellectual skills in an atmosphere of respect. On the news of his death, messages of regret flooded in from former students from all corners of the globe.

Hank was multidimensional. He read voraciously, researched the history of petroleum engineering, especially at Stanford, and had an ardent interest in aircraft. He and his son Taigh helped fly a relic B-29 from the United States to Britain. The aircraft was restored for museum exhibition after that flight. At the time, it was barely airworthy. Hank's skills in celestial navigation made the flight a success.

Navigation was both a personal and a professional specialty for Hank. His leadership of the Petroleum Engineering Department at Stanford used those skills as well. He always knew where he was, where he had been, and where he was going, and he was a leader in charting a course for the department at Stanford. He will be terribly missed by those whose love and respect he will always hold.

