JOHN L. GIDLEY
1924–2009
Elected in 1994
“For development of stimulation materials and techniques to increase oil and gas production.”

BY ROBERT S. SCHECHTER, LARRY W. LAKE, AND HENRY H. RACHFORD, JR.

JOHN L. GIDLEY—a creative engineer, a scientist, a man of great integrity, and a beloved family man—died on March 30, 2009, in Houston, Texas. He will be missed by all who frequently sought his wise counsel.

John was born December 30, 1924, in Lytle, Texas, a small town 25 miles southwest of San Antonio. He graduated from Lytle High School as valedictorian in 1942. After one year at Texas A&M University, he served two and one-half years in the U.S. Army Air Corps, flying B-17s, B-24s, and B-29s as pilot or co-pilot. After the war he completed his education at the University of Texas in Austin, receiving B.S., M.S., and Ph.D. degrees in chemical engineering. He was truly grateful for the education he received as a result of the G.I. Bill.

After his formal education John joined the research staff of the Humble (now Exxon-Mobil) Production Research Company in December 1954. He began his research on acidizing processes, which are oil and gas well stimulation techniques. These are designed to create flow paths through the rock surrounding a well bore drilled into a subterranean formation containing hydrocarbons. It was Herman Frasch, inventor of the method of producing sulfur by introducing hot water into sulfur-bearing formations, who first used acid to stimulate the production of oil and gas around 1900. Gidley
hypothesized that acid would release fine particles as well as create preferred flow paths, so he began a study of Pickering emulsions. These emulsions of oil and water hinder flow; they are stabilized by fine particles of mixed wetability that are present at oil/water interfaces. To remove these particles from these interfaces, Gidley developed a mutual solvent that partitioned between oil and water and caused the particles to be drawn into the bulk phases, thereby destabilizing the Pickering emulsions and improving flow.

When Gidley discovered that weak acids (such as formic and acetic) reached a thermodynamic equilibrium when contacted with an excess of carbonate rock, he conceived a new process applying these acids. The Humble engineers decided to try the process on wells on Humble leases on the King Ranch, some 800,000 acres in deep South Texas. After obtaining permission from the owners of the King Ranch to test Gidley’s process there, a well was drilled and Gidley was admitted to the ranch, which was surrounded by a fence and guards. He was driven to the well site, where trucks loaded with the prescribed chemicals awaited his instructions. At the well site vaqueros were busy preparing a sumptuous meal of steaks, fresh corn, and iced tea. It was, Gidley said, “a meal for kings.” He noted about 50 yards from the well site about a 5-acre pasture that had obviously been watered to maintain its green texture. In this pasture resided a race horse; the vaqueros told Gidley that the horse was Assault, the great triple-crown winner who was unable to stud. He was, they said, quite friendly (or lonely). When someone approached the pasture, he would greet them to have his nose rubbed and receive any cubes of sugar they might have with them.

John said this was a most interesting field test. He later contrasted the one on the King Ranch with the test of the same process 150 miles into the Libyan Sahara that required everything—chemicals, water, food, and tools—to be transported into the desert. One must go where the oil is to conduct such tests.

The use of mutual solvents following acid treatments proved to be beneficial in improving the flow of oil into the
well bore, thereby increasing the rates of oil production. Thus, it became widely applied within Exxon, and during the first three years had increased the company’s daily oil production by more than 25,000 barrels. John’s invention, “The Acid-Mutual Solvent Method,” was patented and is still in use. He was extremely pleased that royalties collected from his patents by Exxon’s research affiliate more than paid his salary and benefits during the last 17 years of his 28-year employment with Exxon.

In 1975 John convinced Exxon to conduct a field test of a new experimental material, sintered bauxite, as a high-strength proppant to keep the fractures open following hydraulic fracturing. Designed in collaboration with co-worker Claude Cooke, Jr., the test resulted in a major improvement in hydraulic fracturing. This new proppant, first in a whole series of ceramic proppants, extended the depth of reservoir stimulation by hydraulic fracturing from less than 10,000 feet to more than 20,000 feet.

Gidley spent the first 13 years in the laboratory and was then transferred to the headquarters group, where he was put in charge of the schools Exxon conducted for new engineers. During this time he never stopped working on well stimulation technology. From 1969 to 1986 he chaired the American Petroleum Institute (API) Subcommittee on Well Completion and initiated the committee effort that resulted in six API documents on recommended practices for testing and evaluation of well stimulation. He also chaired the Task Group on High Temperature Cements (1971–1979) and API Standardization Committee, Subcommittee 10, on Oil Well Cements (1969–1979). John was also active in the Society of Petroleum Engineers (SPE). He served as editor in chief of the 452-page monograph Recent Advances in Hydraulic Fracturing, published by the SPE in 1990. Written by 23 authors, the book sold 4,955 copies by August 1997. Altogether, throughout his career, he also authored or co-authored 25 published technical papers.

When Gidley retired from Exxon in 1986, he continued to be active professionally. He formed a consulting company
and decided to follow up on some of his ideas. One of these was his conjecture that results would be improved if, before treating wells completed in sandstone formations with hydrofluoric acid, the wells were first flushed with carbon dioxide. The goal was to remove both the oil and the water from the formation surrounding the well bore before it was acidized. Gidley invited several oil companies to participate in tests. The idea was that each company would identify a well, pay the cost of the test, and at the end of the program receive a report that would summarize the results of all the tests performed. Because Gidley was well respected for his previous accomplishments—he was elected to the National Academy of Engineering in 1994 and received the SPE’s John Franklin Carl Award in 1992 as well as honorary membership, its highest award—he almost immediately found more than a dozen companies willing to sponsor the test. As he promised, the tests were completed in rapid-fire order and the report was issued. In Gidley’s estimation the results were positive and formed the basis for a patent application—his ninth.

Gidley was then invited to teach well stimulation at Texas A&M, which he did between 1993 and 1999. He loved the classroom and working with graduate students; he found this activity immensely rewarding. In 1999 the University of Texas at Austin named him a Distinguished Engineering Graduate. He was also a member of the Chancellor’s Council of the University of Texas System. He was honored in October 1990 by being named Distinguished Member of the SPE. In addition, he was designated as Distinguished Lecturer by the SPE (September 1979 to September 1980). He was also a member of several national honor societies: Tau Beta Pi (engineering), Phi Lambda Upsilon (chemistry), Omega Chi Epsilon (chemical engineering), and Sigma X (research).

Gidley more fully retired in 2000, although he still provided his consulting services when requested. He developed a model to calculate the flow of gas within a hydrochloric-acid-induced fracture. Since the flow of gas in fractures is turbulent, Gidley’s correction is necessary to calculate gas production through hydraulic fractures correctly. John Gidley was intrigued by
complex processes that defied mathematical prediction. His laboratory was often found in nature, as he frequently resorted to experiments there.

In addition to his stellar professional life, John was a devoted father and grandfather, sponsoring an annual family reunion known as Gidleyfest at locations throughout the United States. He was active as a cub master for Cub Scouts Pack 280 at Holy Ghost Catholic Parish and School. A convert to the Roman Catholic faith, he served as a lector at Holy Rosary Catholic Church in Houston.

John supported many charitable causes and helped endow new student scholarship funds at Spring Hill College, the debate program at the University of Kansas, and the University of Texas School of Engineering. In addition to his enjoyment of teaching and stressing the importance of education, he had a lively sense of humor and was well known for his warmth, for his humility, and for making people feel at ease.

It truly can be said that John Gidley’s life was a treasure for all of us who had the good fortune to know him.

Dr. Gidley was preceded in death by his wife Betty Jane Boggus and infant son, his brother Jack Gidley, and his sisters Jane Kenagy and Betsy Shaw. He is survived by his wife Virginia Anne Platz, his children Michael Andrew Gidley, John Mark Gidley (Bridget), Carol Gidley Wright (Charlie), Dr. Paul William Gidley (Milvia), Brian David Gidley, Allyson Anne Morrison (Richard), and Neil P. Gidley (Maggie), and his sister Margaret Clover and brother William J. Gidley, and his grandchildren Danielle Gidley, George Franklin Gidley, Travis Gidley, Jessica Gidley, Jack Gidley, Edward Gidley, Elizabeth Gidley, Charlotte Gidley, Eliza and Dalton Wright, Gabriel Gidley, Haley Morrison, Austin Morrison, John Lytle Morrison, Julia Morrison, Lauren Morrison, and Colin Patrick Gidley.