



*James R. Frazier*

## JAMES R. FAIR

1920–2010

Elected in 1974

*“For contributions to mass transfer technology and computer simulation of chemical processes.”*

BY DONALD R. PAUL

**J**AMES R. FAIR, a giant in chemical engineering who straddled the industrial-academic interface with great ease, died on October 11, 2010, just three days short of age 90.

Jim was born on October 14, 1920, in Charleston, Missouri, south of St. Louis and near where the Ohio River intersects the Mississippi River. He spent his early years in Tonganoxie, Kansas, and Little Rock, Arkansas. As a young boy Jim was very fond of watching baseball games and was fascinated by all aspects of trains and railroads; these were pastimes that stayed with him throughout his life. He was very active in scouting and became an Eagle Scout before his 16th birthday.

At age 18, Jim entered the Citadel, in South Carolina, in the tradition of his father. In 1940 he transferred to the Georgia Institute of Technology, where he received a B.S. in chemical engineering in 1942. After graduation he joined the Monsanto Chemical Company as a junior engineer in St. Louis. Later he had assignments in Karnack and Texas City, Texas. During World War II he was vitally involved with the government's high-explosives and synthetic rubber programs.

As it turned out, Jim was transferred to Texas City just prior to what has been called the worst industrial accident in U.S.

history, and he narrowly missed being one of its fatalities. On April 16, 1947, a French-registered ship, the *Grandcamp*, which was docked at the port of Texas City, adjacent to the Monsanto facility and loaded with approximately 2,300 tons of ammonium nitrate, caught fire. Seeing the smoke, Jim and some of his colleagues went to the docks to investigate. Very fortunately, though, Jim decided to return to his office to complete some calculations while the others remained on the dock to watch the fire. On his way to the office, the ammonium nitrate detonated and the explosion destroyed the Monsanto plant. Many of Jim's coworkers were among the nearly 600 who died. Jim was knocked unconscious and injured by the blast; he was quite fortunate to have survived the disaster.

Because of his outstanding work and promise as a young engineer, Jim was granted an academic leave of absence for one year by Monsanto and used it to obtain a master's degree in chemical engineering from the University of Michigan, which he completed in June 1949. He returned to Monsanto in Texas City and soon met a lovely young Texas girl by the name of Merle Innis. Merle and Jim were married January 14, 1950. Their first child, James Rutherford Fair, was born in Texas City on February 8, 1951.

Following the Michigan experience, Jim gave a lot of thought to obtaining a Ph.D. and considered reaction kinetics an important area to pursue. In 1952 he took an unpaid leave of absence from Monsanto to enter the graduate program in chemical engineering at the University of Texas at Austin, where he did research with Professor Howard F. Rase. After receiving his Ph.D. in 1954, Jim joined Shell Development Company in Emeryville, California, where he worked for about two years. A second child, Elizabeth Fair, was born in Oakland, California, on April 30, 1955.

In 1956, Jim returned to the Monsanto Chemical Company in its Corporate Research Laboratories in Dayton, Ohio, as a research section leader. In 1961 he was transferred to Monsanto's headquarters in St. Louis, where he took on ever-increasing responsibilities. For a decade he was director of corporate technology. While at Monsanto he maintained

several academic connections, including serving as an affiliate professor of chemical engineering at Washington University from 1964 to 1979. Jim and Merle's third child, Richard Innis Fair, was born in St. Louis on April 26, 1963.

Meanwhile, in the mid-1970s the first endowed chair in the College of Engineering at the University of Texas at Austin was established by the family of one of its successful alumni. Soon after I became chair of the chemical engineering department in 1977, the dean of the college, Earnest F. Gloyna (NAE member), and I had several conversations about Jim Fair and his strong interest in engineering education. We decided to see if this chair could be used to attract Jim to return to Austin as part of our faculty. In 1979, Jim began a full-time academic career at the University of Texas at Austin by accepting the offer of the Ernest & Virginia Cockrell Chair in Engineering. In 1985 he was appointed to the new John J. McKetta Centennial Energy Chair in Engineering, established to honor his friend and colleague. Jim established the Separations Research Program, a very successful industrial-academic consortium, in 1983 at the university and remained its head until 1996. At its zenith this program had as many as 40 corporate sponsors. During his academic career, Jim directed the research for 21 master's theses and 22 doctoral dissertations. Over his entire professional career, Jim published more than 200 technical papers and book chapters. He served as technical consultant to many companies. For 25 years he taught a continuing education course under the sponsorship of the American Institute of Chemical Engineers, the course being the organization's most popular; it was offered over 125 times. Jim officially retired from his academic position at age 72 but continued to work every day while holding emeritus status.

The majority of the technical work Jim did during his 33 years in industry was of a proprietary nature, but he was also able to establish a remarkable publication record in the archival literature. His technical expertise and interest were always in the design of the components that make up chemical manufacturing plants—reactors, heat exchangers, separations devices, and so forth. His true love was the design and

operation efficiency of distillation columns. He wrote many review articles and contributions to handbooks in these areas. After joining the University of Texas at Austin, Jim started an active research program on separations, mainly in the areas of distillation and extraction. These topics had been largely abandoned by most universities owing in part to the lack of government funding for topics of such practical concern to companies. However, Jim solved the funding problem by using his strong industry background and connections to obtain very generous support of both fundamental and applied separation research from a wide array of corporations. He added professional staff and included a number of his faculty colleagues and supported their contributions via the industrially funded Separations Research Program.

Jim Fair was involved in many professional activities, with service on many boards and committees. He was widely recognized for his contributions to engineering practice and education. He served as vice president of Fractionation Research, Inc., and was a registered professional engineer in Texas and Missouri. He received the Professional Achievement Award from *Chemical Engineering* magazine in 1968 “for contributions to chemical engineering design education and to the field of separations technology” and was elected to the National Academy of Engineering in 1974.

Jim was especially active in the American Institute of Chemical Engineers (AIChE), where he served a term as an elected director and held the grade of fellow since 1971. He received the following awards from the AIChE: the William H. Walker Award (1973), the Chemical Engineering Practice Award (1975), the Founders Award (1976), and the Gerhold Award in Separations Technology (1994). In November 1979 he delivered the annual institute lecture before AIChE and in November 1983 was recognized as one of 30 living eminent chemical engineers at the AIChE Diamond Jubilee Meeting. In November 2000 he was honored in a special symposium of AIChE for his many contributions to the institute’s distance-learning program. He received the Malcolm Pruitt Award from the Council for Chemical Research (1991), the Gold Medallion

Award from the American Society for Engineering Education (1993), and the Separations Science and Technology Award of the American Chemical Society (1993). In October 1993 he was honored by a festschrift of the international journal *Industrial and Engineering Chemistry Research*, published by the American Chemical Society. He was inducted into the Engineering Hall of Fame at Georgia Tech in 1994.

Jim received honorary doctorates from Washington University (1977) and Clemson University (1987). He was named a distinguished engineering graduate by the University of Texas at Austin (1976) and also received the university's Joe J. King Professional Engineering Achievement Award (1987) "for exemplary leadership in the engineering profession."

Following his childhood interest in trains, Jim conducted research on railroad history and, to this end, published a number of articles as well as two full-length books on the subject. His very large collection on railroad history and operations has been given to the Railroad and Heritage Museum in Temple, Texas. He was an avid book collector, and his extensive collection of technical books was given to the University of Guanajuato in Mexico. Jim wrote his memoirs for his family and a few friends, which he subtitled "Recollections of a Good Life."

Jim led an active church life and served University Presbyterian Church in Austin, including session membership. He is survived by his wife of 61 years, Merle; their two sons (their daughter died earlier in 2010); and six grandchildren.