



JAMES R. JOHNSON

1923–2019

Elected in 1972

“Contributions to ceramics research and technology relating to nuclear fuel materials and to control of exhaust emissions.”

SUBMITTED BY THE NAE HOME SECRETARY

JAMES ROBERT JOHNSON, a pioneer in the changing field of ceramic engineering and ceramic science after World War II, died October 18, 2019. He was 96 years old.

Born January 2, 1923, in Norwood, Ohio, he was the middle of three sons. Both his parents were educators—his mother, Della, was an elementary schoolteacher and his father, Charles, with a doctorate in education, taught in university classrooms and became superintendent of the Cincinnati school system.

In 1940 Jim entered the Ohio State University to pursue his dream of becoming an engineer. In 1942, at 18, he volunteered for military service and was called to duty in 1943 as a US Army Corps engineer, eventually serving in Europe in the Rainbow Division. His company was among those that helped liberate Dachau and satellite concentration camps throughout southern Germany and Austria. After the war he returned to Ohio State and, in 1950, earned a PhD in ceramic engineering.

Three days before he left for the war he married his longtime sweetheart, Virginia (Jini) Bowen. When he returned 2 years later, they began a family and became the proud parents of six children. Jim laid a foundation for his family of humble excellence in all things—a way of life that was also a hallmark of his career.

He began as an assistant professor at the University of Texas. In 1951 he left to join the beginnings of America's nuclear research at Oak Ridge National Laboratory (ORNL) where, as a ceramics technical advisor, he became part of the exciting research into nuclear power reactor design and development.

His personal goal was to develop high-temperature reactor technology, and his work at ORNL pioneered development of novel materials especially useful for high-temperature reactors. He did some of the first work on uranium and thorium oxides and laid a foundation for the fuel elements now used in reactors worldwide. He was briefly engaged in the development of seminal weapons technology, particularly in the invention and development of the trigger container for the hydrogen bomb.

Following the 1954 Congressional Act to involve industry in nuclear reactor technology Jim was asked to join 3M Company to explore nuclear opportunities. In the course of reactor materials development, he and his lab invented and developed the coated microspheres used in the first nuclear rocket (KIWIB4-E 301), tested by Los Alamos. These same particles were later used in high-temperature gas-cooled reactors.

With the demise of the US nuclear powerplant construction industry in the 1970–80s, 3M decided not to pursue the nuclear materials business and asked Jim to develop and lead a major physical sciences laboratory. His lab was responsible for patents on many life-changing inventions, including sol gel ceramic applications—inventions that were eventually introduced into products by 3M and other companies. He was issued the first patent to describe the ceramic honeycomb catalytic converter now used worldwide. After 23 years with 3M, he retired in 1979 as the company's first executive scientist.

Retirement began another chapter in Jim's life and work. During his early "retirement" years, several companies approached him for consulting services. One in particular, Phillips Plastics, was interested in his leadership skills to develop a laboratory to create ceramic materials for medical applications. In 1989 he joined the company "part time" and

thus began yet another career. The partnership led to several patents in bone repair, stents, ceramic engine rotors, coatings for the stealth fighter system, and other applications.

He was also asked to serve as an adjunct professor and advisor at both the Universities of Minnesota and Wisconsin. Of particular interest to him was the opportunity to team-teach society and technology courses with a political science professor at the University of Minnesota.

He became very involved in the need to improve K–12 education, and in 1993 he was named chair of the American Association for the Advancement of Science Technology Panel for Project 2061 (named for the return date of Halley’s Comet), whose goal was to influence the way science, math, and technology are presented to K–12 students and suggest new ways for students to learn. He also served on the Board of Industrial Advisors for International Technology Education and the Minnesota Governor’s Education Task Force.

In addition, he was involved in leadership and advisory boards for the Minnesota and Wisconsin Academies of Science, serving as president of both, and he served on advisory boards for the Massachusetts Institute of Technology, University of Washington, and Ohio State. In 1993 he was the recipient of the first honorary doctorate from the University of Wisconsin–Stout, an honor conferred in conjunction with the establishment of the James R. Johnson Service Award in recognition of his leadership in “building bridges” between industry and higher education.

Among his other honors and affiliations were fellow of the World Academy of Ceramics; fellow (for 60 years), president (1973–74), and distinguished life member (the society’s highest honor) of the American Ceramic Society; the ASM Engineering Materials Achievement Award (as a corecipient; 1980), “For development and commercialization of monolithic catalyst technology for control of automotive emissions”; the Greaves-Walker Award (1985) of the National Institute of Ceramic Engineers; and the Prakken Professional Cooperation Award (1989) from the International Technology Education Association.

Jim never did really retire. In the last 10 years of his life, he developed and taught short courses for the public in the fields of energy, natural climate change, conservation, and pottery. His interest in ceramics began with throwing porcelain vases and bowls on the potter's wheel in 8th grade, a lifelong avocation that he continued until age 95. He was particularly interested in creating one-of-a-kind copper red ceramics but experimented with many unique glazes. Another lifelong hobby was cartooning. His mouse character appeared in hundreds of cartoons he drew for family and friends, even in the last days of his life.

Jim was an engineer, inventor, teacher and mentor, and artist. He was one of those rare intellects that could converse knowledgeably on almost any subject. A creative thinker, he melded science, technology, and art to discover and design inventions that helped to change the world. He had 54 patents and authored numerous publications in nuclear, medical, and porous ceramics fields. Jim believed that whatever talents or abilities were given to him, it was his job to use them to serve all people.

He is survived by children Cathy Spear (Ted), Randy (Jan) Johnston, John (Laura), Jamie Sue Myers (Randy), and Brian (Shawn); 13 grandchildren; and 9 great-grandchildren. He was predeceased by daughter Barbara Kallusky, and Jini passed away a few months after Jim, after 75 years together. Jim and Jini were both adored and respected by their family and friends and are greatly missed.

