

## Obituary for George Paul Sutton 1920-2020

**GEORGE PAUL SUTTON**, former Chief Scientist of the Defense Advanced Research Projects Agency (DARPA) and Executive Director of Rocketdyne, whose seminal book on rocket propulsion guided rocket scientists across nine editions and multiple generations, passed away peacefully due to natural causes on October 15, 2020, in Los Angeles.

Sutton's book, *Elements of Rocket Propulsion* – first published in 1949 and updated continuously with a second printing of the 9<sup>th</sup> edition due out in December 2020 – has informed, maddened and inspired rocket scientists and aerospace engineers. SpaceX engineers tell stories of their CEO admonishing them, "Don't tell me it cannot be done. George Sutton says it can be done!"

Sutton's achievements crossed industry, government, and academia. In industry, he started as a development engineer of rocket propulsion at Aerojet, and advanced to become the Executive Director of Engineering at Rocketdyne, a department with 2,000 engineers, technicians, and support personnel. Although most of his engineering work focused on liquid propellant rocket engines, he also worked on solid propellants and their rocket motors at the Rocketdyne facility in McGregor, Texas.

In government, Sutton worked in the Pentagon as the Chief Scientist and Deputy Director of DARPA. There he started the development of several large liquid propellant rocket engines for eventual applications in long range ballistic missiles. He served for 11 years for the Scientific Advisory Board of the U.S. Air Force. He was awarded the Air Force's Silver Civilian Medal for his contributions.

His family shared a recollection of Sutton's personal briefing to President Dwight D. Eisenhower at the request of the Secretary of Defense. Sutton presented DARPA studies of potential future military space-based weapon systems in the cabinet room of the White House. He recalled afterward, "The president asked some good questions." He also worked for about 10 years at the Lawrence Livermore National Laboratory as an associate program leader on the Machine Tool Task Force (5 Volumes of Advanced Precision Technology of Machine Tools) and as an assistant division leader in manufacturing technology, as well as having responsibility for various rocket propulsion projects.

In academia, Sutton accepted an appointment as the Hunsaker Professor of Aeronautical Engineering at the Massachusetts Institute of Technology (MIT) in 1958-1959. He was also a member of the mechanical engineering faculty of the California Institute of Technology for four years and taught several analytical courses and student laboratory lessons and served as a guest lecturer at several universities, and corporate and government laboratories.

Sutton received a Bachelor of Science degree in Mechanical Engineering at the California Institute of Technology, followed by a Master of Science degree and post-graduate work.

He first worked at the Aerojet Corporation where he oversaw making a US copy of the German A-4 rocket engine used in the German V2 missile. He also designed, built, and tested a new 75,000 lb. thrust

chamber, the largest US rocket engine at the time. It was used to put the Mercury capsule into space orbit (including John Glenn, the first US astronaut).

At Aerojet Corporation, he initially worked directly with the renowned aeronautics professor Theodore von Kármán in analyzing the effects of hot air boundary layers or the heating of liquid rocket propellants in the tanks of flying large diameter vehicles.

As a development engineer at Aerojet Corporation, he developed high pressure, high frequency rocket propulsion pressure pick-up for measuring combustion vibration and propellant oscillations beginning in 1943. The Aerojet Corporation became Rocketdyne, a division of North American Aviation. His work at Rocketdyne continued until 1972 in various position with responsibilities to develop and test different rocket engines. He became the Executive Director of Engineering and Assistant to the President.

Sutton was born in Vienna, Austria, on September 5, 1920. He was widowed twice. He married Kathleen Margarite McMullan in July 1944, she passed away in 1952. In 1955, he married Yvonne Barnes, who passed away in 1992. He is survived by his long-time friend and companion, Barbara Inamoto, two daughters, Christine Upton and Marilyn Milam, three grandsons, Fred Upton, Ron Milam and David Milam, and three great grandsons, August Milam, Sebastian Milam and Quinn Milam Pasquerella.