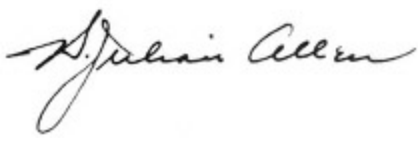

Harry Julian Allen

1910-1977

By Nicholas J. Hoff

Harry Julian Allen, retired Director of the Ames Research Center of the National Aeronautics and Space Administration (NASA), died at the age of sixty-six in Stanford University Hospital on January 29, 1977. He had joined the research staff of Ames Research Laboratory of the National Advisory Committee for Aeronautics (NACA) at the time of its founding in 1940 and continued carrying out most original research there until his retirement, in 1969. It is not an exaggeration to state that no man has had as much influence on the work of this great research center as Harry Julian Allen.

Born on April 1, 1910, in Maywood, Illinois, "Harvey" Allen (as he was known to all his friends) received a Bachelor of Arts degree in engineering in 1932 and the professional degree of Aeronautical Engineer in 1935, both from Stanford University. The following year he was appointed to the staff of NACA'S Langley Memorial Aeronautical Laboratory near Hampton, Virginia (now NASA'S Langley Research Center), as a Junior Aeronautical Engineer. In 1940 he moved back to California as an Aeronautical Engineer at Ames Research Laboratory (now NASA'S Ames Research Center) at Moffett Field. From 1941 he was Chief of the Ames Theoretical Aerodynamics Branch, in 1945 he became Chief of the High-Speed Research Division, in 1959 he was promoted to Assistant Director for Astronautics, and from 1965 to 1969 he was Director of the Ames Research Center.

Harvey Allen was much honored for his professional accomplishments. He was a Fellow of the American Institute of Aeronautics and Astronautics, the Royal Aeronautical Society of Great Britain, the American Astronautical Society, and the Meteoritical Society. In 1966 he was elected a Member of the National Academy of Engineering. Among the honors he received were the Sylvanus Albert Reed Award of the Institute of the Aerospace Sciences (predecessor of the AIAA) in 1955, the Wright Brothers Lectureship of the same Institute in 1957, the Distinguished Service Medal of the NACA in 1957, the Airpower Trophy of the Air Force Association in 1958, the Medal for Exceptional Scientific Achievement of the NASA in 1965, and the Daniel Guggenheim Medal awarded by AIAA, ASME, and SAE in 1969.

Throughout his career, Harvey Allen combined the fundamental curiosity of the natural scientist with the practical thinking of the engineer. He devoted himself to the study of aerodynamics in the broadest sense and made original contributions to the theories of subsonic, transonic, supersonic and hypersonic flow. When after World War II the United States became interested in the construction of ballistic missiles, he began a study of reentry dynamics and thermodynamics, and of the effects of radiation and meteorite impact on space vehicles.

Among Harvey Allen's most original contributions to science and engineering was the development of the concept of the blunt nose for reentry vehicles. As is well known, the first ballistic missiles, both in the Soviet Union and the United States, were built with long nose cones having very small apex angles. They were designed to reenter the atmosphere at very high Mach numbers, and everyone knew that the drag of bodies traveling at hypersonic speeds is very high unless the body is thin and slender. With his typical combination of engineering common sense and superb scientific knowledge, Harvey Allen freed himself of this preconceived notion. He showed that the slender cone receives much more heat from the attached shock wave than the blunt body from its detached shock wave, even though the latter has the higher drag. But in the design of the early ballistic missiles the greatest worry of the designer was not drag, but the protection of the body from excessive

aerodynamic heating, which can melt and burn the surface of the missile. Harvey Allen's blunt-body approach has been accepted as the solution of the problem all over the world; it has made possible such achievements as the flight of the Apollo to the moon.

Harvey Allen also found an ingenious new way of studying hypersonic aerodynamics when he observed the flight of meteorites. These objects are ballistic missiles of a nature that become visible when they begin to radiate light in consequence of aerodynamic heating following entry into the atmosphere of the earth. To obtain a correlation between astronomic observation and terrestrial work at Ames, Harvey Allen designed and built a most original piece of equipment. It consisted of a shock tunnel into which the model of a meteorite or of a reentry body could be shot upstream out of a gun. The superposition of the speeds of the airflow and of the specimen resulted in relative speeds as high as M = 45.

Aeronautics was Harvey Allen's lifework, but by no means his only interest. He was a fancier of old cars and owned at various times a Duesenberg, a Rolls-Royce, a Mercedes-Benz, an Isotta-Fraschine, and a Cadillac. He was also an accomplished archeologist and a great admirer of Far Eastern art. The house in which he lived alone in Palo Alto was a veritable museum containing beautiful furniture, statuary, and paintings from East Asia.

Harry Julian Allen's scientific and engineering achievements are best documented by his numerous publications, but his influence on aeronautical and astronautical development is much more far-reaching than the list would indicate. His successor as Director of Ames Research Center, Hans Mark, said that time and again when he talked to members of research groups in the laboratory he was told "Oh yes, Harvey started us out on this work ten or more years ago and we have been going strong ever since along the lines he had suggested."

This statement shows that the work of Harvey Allen, a very informal man revered by all his collaborators, has not reached its end yet. It will continue to produce useful results for many years after his death.