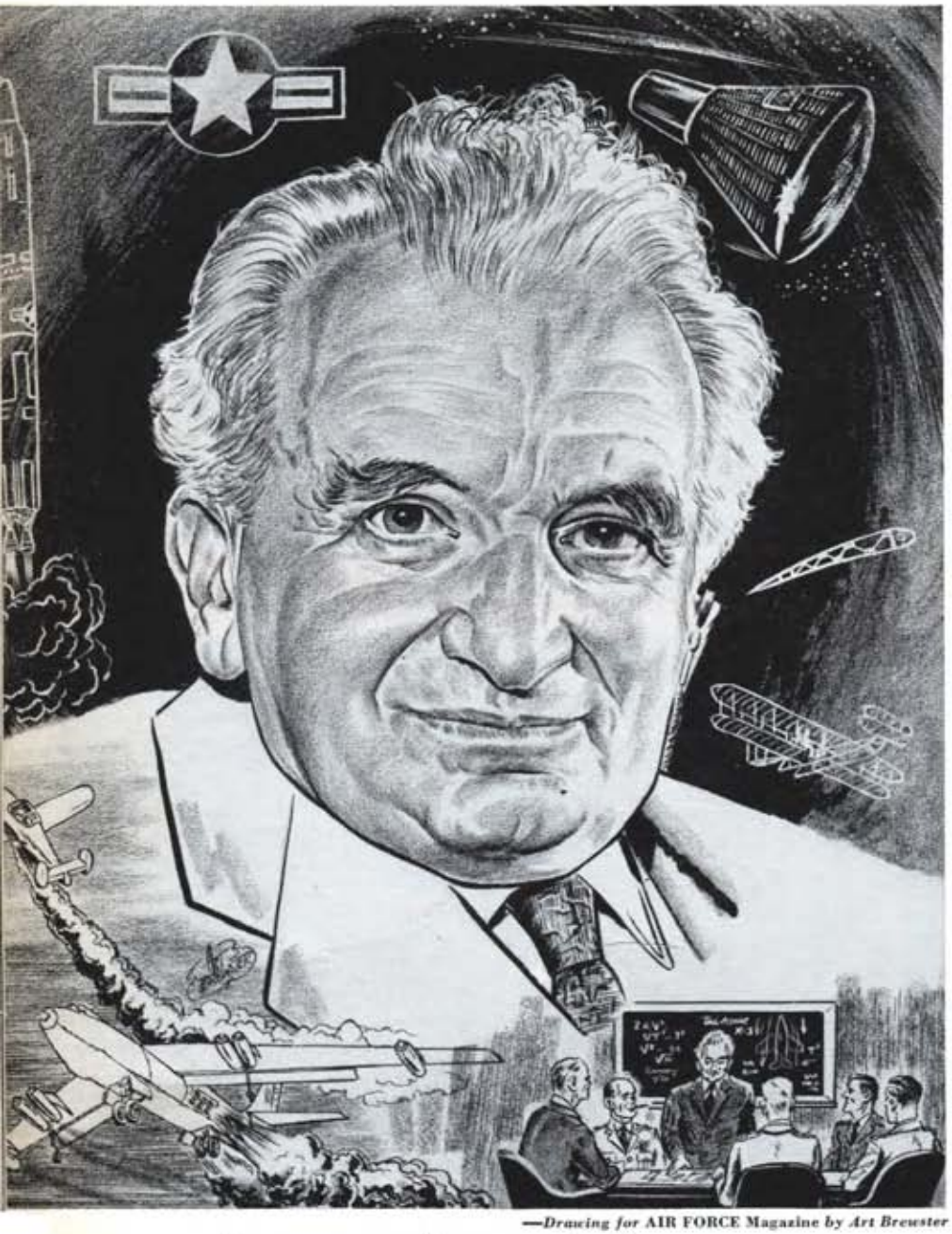

—*Drawing for* AIR FORCE Magazine *by Art Brewster*

THEODORE VON KARMAN: IN MEMORIAM.

The life of the remarkable genius of aerospace, warm-hearted, brilliant Theodore von Karman, came to a quiet close last month. His contributions to the science of flight and to the defense of his adopted country were monumental . . .

'TOWARD NEW HORIZONS'

"WHAT I can do in the rest of my life I do not know, but so far as I am in good health, I will try to be grateful for this country."

With these words, uttered haltingly in the English that he never perfectly mastered, Dr. Theodore von Kármán, premier aerodynamicist, working prophet of the aerospace age, and scientific patron saint of the US Air Force, thanked President Kennedy last February after the Chief Executive, at a White House ceremony, awarded him the first National Medal of Science.

Last month, on May 6, Dr. von Kármán died in Aachen, Germany, of a heart attack at the age of eighty-one. His passing truly marked the end of an era. No individual had contributed more to the science of flight or to the defense through aerospace power of the free world.

Dr. von Kármán's list of scientific achievements and contributions to the strength of his adopted country—he settled permanently in the United States in 1930—is so full as to be overwhelming. The list of anecdotes illustrative of his *Gemütlichkeit* and warm humor will be a challenging task for his biographers. (*See "Dr. Theodore von Kármán—Gemütlicher Genius of Aeronautics,"* AIR FORCE, *October '57.*)

A native of Hungary and a child prodigy who developed early into an outstanding mechanical engineer, Theodore von Kármán turned his attention at the age of twenty-six to aerodynamics after viewing the first powered flight of an airplane in France in 1907. The reason, scientific curiosity. Newtonian physics should have made the flight impossible. Yet the Frenchman flew.

That predawn flight stirred the young Hungarian toward a new career. After further study and research in Germany, von Kármán produced "the von Kármán

theory of voretx streets," the sound mathematical foundation and formulae on which aircraft designers have depended ever since. By 1912, he was running Germany's newly established Aeronautics Institute at Aachen and was taking flying lessons on the side. His flying career was cut short early. He walked away unhurt from a crash but was fined for making an unauthorized landing in a potato patch. The flying enthusiast went back to theory.

World War I came along, and he made major contributions to the infant art of aerial combat as a scientific adviser to the Austro-Hungarian Air Force. One of the ideas he worked on was the concept of an aircraft that would fly straight up. He foresaw the helicopter.

Dr. von Kármán stayed on at the Aeronautics Institute in Aachen until 1929. He early predicted spaceflight as a practical possibility. "I'm not a fantast," he said. "It is just a simple fact that one pound of kerosene has more energy than is necessary to take . . . one pound out of the gravitational field. It is only a question of technology and progress and time."

He was invited to America in 1926 by the Guggenheim Foundation and the late Dr. Robert Millikan, Nobel Prize-winning physicist at the California Institute of Technology. After three years of soul-searching, he decided to stay permanently in America and accepted directorship of the Caltech Guggenheim Aeronautical Laboratory, forerunner of today's Jet Propulsion Laboratory at Pasadena, Calif. It was a happy decision for Dr. von Kármán, for his new country, and for western freedom. He was to see, fortunately only from a distance, the wholesale destruction by the Nazis of European Jewry, from whose stock he had sprung.

In the years that followed, his pioneering work in the development of jet propulsion, rocketry, and supersonic flight paved the way for the aerospace wonders of today.

His eye was always on the future. To Dr. von Kármán and to his close friend, the late Gen. H. H. "Hap" Arnold, goes the prime credit for the research-and-development orientation of today's Air Force.

In 1944, General Arnold, foreseeing the future significance of the airpower that had already helped decide World War II's outcome, asked Dr. von Kármán to serve as first chairman of the Army Air Forces Scientific Advisory Group. This top-level panel was to chart the postwar future of airpower

As General Arnold wrote in his book, *Global Mission:*

"I told these scientists that I wanted them to think ahead twenty years. . . . I wanted them to think about supersonic-speed airplanes, airplanes that would move and operate without crew, improvements in bombs . . . defenses against modern and future aircraft . . . communication systems . . . television . . . weather, medical research, atomic energy, and any other phase of aviation which might affect the development of the airpower to come. . . .

"I assured Dr. von Kármán I wasn't interested in when he submitted his report. He was to go ahead . . . to look into the future twenty years. . . ."

The thirty-odd volumes produced by the task force under Dr. von Kármán were entitled *Toward New Horizons.* The summary volume, *Science, Key to Air Supremacy,* was a remarkable blueprint for future airpower developments. Uncannily, the von Kármán Committee foresaw airpower in the 1960s, particularly the feasibility of the intercontinental ballistic missile —which other scientists had dismissed as an unwieldy, impractical approach to weaponry.

The impact of the von Kármán group on the Air Force was enormous. An incomplete checklist of the "fallout" includes:

- Establishment of the Air Force Scientific Advisory Board, of which Dr. von Kármán was chairman for the first ten years of its existence.
- Establishment of the Air Research and Development Command (now Systems Command), later recommended by the Ridenour-Doolittle Report.
- Establishment of the Air Force Institute of Technology at Wright-Patterson AFB, Ohio, and Arnold Engineering Development Center, Tullahoma, Tenn.
- The Air Force's air defense program in conjunction with Massachusetts Institute of Technology, a move sparked by MIT's Dr. George Valley.
- The ICBM program, which was stimulated by the von Kármán group's analysis of German World War II rocket achievements.

Dr. von Kármán capped his distinguished career by conceiving and forming the Advisory Group for Aeronautical Research and Development (AGARD). AGARD was established in May 1952 to coordinate a cooperative R&D effort in support of NATO, with the US Air Force designated executive agent. Dr. von Kármán served as its chief from AGARD's beginning until his death.

With his colleagues, men like Edward Teller and John von Neumann, encouraged by resolute Air Force Secretariat civilians such as Trevor Gardner, the Hungarian-born genius helped shape a future that never surpassed his own amazingly limitless vision.

He will be uniquely missed. —W.L.

AFA TROPHY RENAMED FOR VON KARMAN

The Air Force Association Science Trophy, one of the five top AFA awards presented annually at the Association's National Conventions, is this year being renamed the Theodore von Kármán Trophy, to honor the memory of the distinguished aeronautical engineer who died on May 6. This move was approved unanimously last month by AFA's Executive Committee. Dr. von Kármán himself won the Science Award at the 1950 Convention in Boston *(see cut)*. At that time he was cited for his many contributions to the aeronautical sciences. The year before, one of Dr. von Kármán's most important recommendations had become reality when Congress approved the Arnold Engineering Development Center.