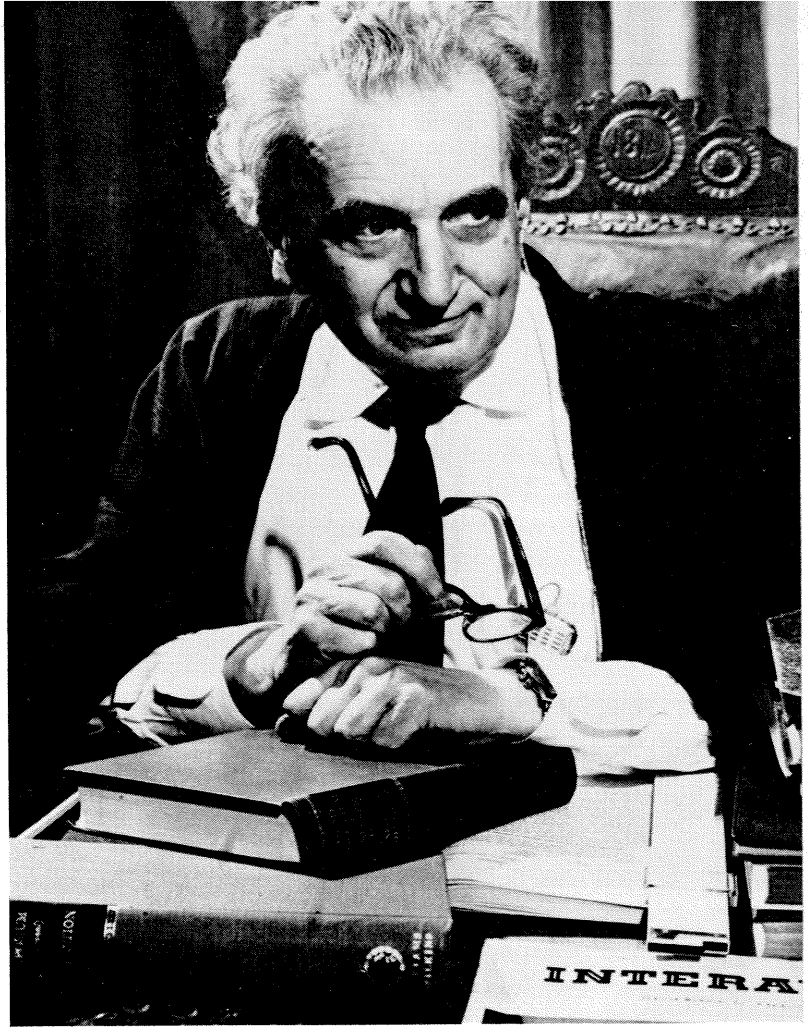

Theodore von Kármán

1881 - 1963

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Theodore von Kármán, Professor of Aeronautics Emeritus, died after a brief illness in Aachen on May 7, 1963, a few days before his 82nd birthday. Although his career was directed toward engineering research, principally in aeronautics, his influence in many fields was so great that no one person can pay him adequate tribute.

Theodore von Kármán was born in Budapest on May 11, 1881, the son of Maurice von Kármán, professor of philosophy and outstanding teacher at the University of Budapest. In the stimulating intellectual atmosphere of his home, Theodore showed a flair for mathematics at an early age, and his interest in science led him to the Royal Technical University in Budapest where he studied mechanical engineering, graduating with high honors in 1902. After a period of employment as an engineer in Budapest, he entered the University of Göttingen in 1906.

Von Kármán quickly established his reputation at Göttingen, a center renowned in mathematics, mechanics, and physics. He became a student of Prandtl, received his PhD in 1908 and stayed on to teach. His publications in this period were concerned principally with elasticity and its applications to structures, but he also began investigations in fluid mechanics. He discovered the condition for stability of the vortex street that since has carried his name. He made important contributions to the theory of specific heats of solids.

Von Kármán was invited to become the first director of the newly formed Aeronautical Institute at the University of Aachen in 1912. Under his leadership, which continued for 18 years except for a period with the Austro-Hungarian Air Corps in the first World War, the Aeronautical Institute became recognized as the foremost school for aeronautics in the world, and students came from many foreign countries to work under its distinguished director. Von Kármán's publications in the Aachen period covered a wide variety of aeronautical subjects. He wrote definitive papers, many forming the basis for all subsequent work, in the theory of airplane stability, airfoils, helicopters, propellers, and airships. Of less specific application, although still with aeronautical flavor, were his important contributions in boundary layer theory, similarity theory in turbulent shear flow, and theory of thin-walled structures.

Von Kármán visited the California Institute of Technology to give advice on the construction of the Guggenheim Aeronautical Laboratory, and spent half of his time in Pasadena, the other half in Aachen from 1928 to 1930. In 1930 he became

full-time director of the Guggenheim Laboratory at the Institute, and Pasadena soon replaced Aachen as the leading school for aeronautics. The 10-foot wind tunnel in the Guggenheim Laboratory had been constructed to specifications set down by von Kármán, and the value of his advice became evident in the early 30's as the aircraft industry throughout the country came to Pasadena for aerodynamic tests.

Father of the supersonic age

Many able students came to Pasadena to work with von Kármán, and in the decade preceding World War II his scientific output was astonishing in quantity, diversity, and importance. He introduced new concepts and theories for nonlinear buckling of thin-walled structures and for isotropic turbulence. He worked and encouraged others to work on problems of supersonic flow. His paper on resistance in compressible fluids presented at the Volta Congress in Rome in 1935 was of extreme importance in pointing the way to supersonic flight. He began extensive investigations of rockets, anticipating by 20 years the developments in this field. His contributions to the development of the X-1, the first airplane to achieve supersonic speed, earned for him the popular title of "father of the supersonic age."

As it became clear that war would occur, von Kármán began to turn more of his attention to the immediate and long range problems of the armed services. He and his associates demonstrated the feasibility of rocket assisted take-off for airplanes, and as the need for large numbers of JATO devices became apparent, he founded the Aerojet Engineering Corporation, now Aerojet-General. He was the chief technical adviser of the corporation until his death. In the same period, he founded the Jet Propulsion Laboratory as a center for rocket research and development and became its first director. He took leave of absence from the Institute in 1944 to devote more of his time to Air Force planning, and formed the Scientific Advisory Group to advise the Air Force on preparation for expected technical developments in the next 20 years.

Still active after his retirement from the Institute in 1949, von Kármán turned his attention to ways of bringing about more international cooperation in engineering research. Toward this end, he was responsible for forming the Advisory Group for Aeronautical Research and Development (AGARD) as a NATO agency in 1951. He was elected chairman of AGARD and devoted a major part of his time to it until his death.

Von Kármán received honorary degrees and awards from universities, scientific societies, and governments throughout the world in recognition of his inspiration and leadership. Most fittingly, he was chosen to be the first recipient of the National Medal of Science, presented by President Kennedy last February.

The "Collected Works of Theodore von Kármán," published in 1956, contain in four volumes all of his papers from 1902 to 1951. These volumes are not solely of historical interest; surprisingly few of the papers are dated, even in subject matter. Von Kármán had an extraordinary ability to isolate the essential controlling factor in a complex physical problem, to represent it in a concise mathematical equation, and to find an elegant solution by a novel application of relatively simple mathematics. This insight is evident in all his publications as it was in his lectures and in the advice he gave to those who consulted him.

The warmth of von Kármán

The papers that he wrote and the organizations that he founded are lasting and impressive monuments to von Kármán's versatility, but they represent only a small part of his contributions to the world. Much of his influence stemmed directly from the exceptional character of his wit, charm, and warmth. No one who once came under his spell could ever forget him. He liked people and was easily approached by anyone. Because he considered teaching his most important function, his students were specially favored with attention and he spared no effort in awakening their enthusiasm. His teaching was very personal, by no means confined to the classroom or restricted to scientific subjects.

Von Kármán remained a bachelor and, until their passing, lived with his mother and his sister, Josephine, both women of unusual talent. The family ties were very close, and much of von Kármán's activity centered about his home, which was always open to students, colleagues, and friends. There were many visitors, and students coming to his home to work with him were absorbed into a fascinating gathering of von Kármán's friends, who included people of every nationality, profession, and station in life.

Von Kármán was gifted with a rare combination of high intelligence, warm understanding, and respect for man's dignity. Throughout his life he shared these gifts generously with others and has left a rich legacy for those who follow.