Julius Adams Stratton

1901-1994

By Edward E. David, Jr.

Julius Adams Stratton, eminent scientist, educator, leader of institutions, and an important figure in the ultimate establishment of the National Academy of Engineering, died on June 22, 1994. He was ninety-three years old.

Dr. Stratton grew up in Seattle, Washington, where he was born on May 18, 1901, and attended the University of Washington for one year before transferring to the Massachusetts Institute of Technology (MIT), from which he received his bachelor's degree in electrical engineering in 1923. He spent the following year in France at the Universities of Grenoble and Toulouse, returning to the institute for his master's degree, also in electrical engineering, which was awarded in 1926. With an institute traveling fellowship for study abroad, he enrolled at the Swiss Federal Institute of Technology in Zurich and received his doctorate in mathematical physics in 1928. He then returned to MIT as an assistant professor of electrical engineering and proceeded through the ranks to a full professorship in the Department of Physics to which he had transferred in 1930.

In the late twenties he had joined with other young faculty members returning from study abroad in urging substantial curricular reform, particularly in physics, in the light of recent developments in the field. His eventual transfer to that department had been anticipated when he returned to Cambridge in

1928, and it occurred at an important time of change, coinciding with the appointment of Karl T. Compton as president. A strong believer in "science for its own sake" and also as an important source of enrichment for engineering education, Compton would soon take steps leading to major changes in the department—among them, the appointment of John C. Slater as its leader. The physics curriculum was revised, and plans went forward for increased opportunities for graduate work in both theoretical and experimental physics.

Dr. Stratton's research prior to World War II focused on short electromagnetic waves—their launching, propagation, and reception—and was carried out at the institute's Round Hill Field Station in South Dartmouth, Massachusetts. Out of this work came a deep understanding of radio systems at all frequencies, but more important was the development of tools drawn from Maxwell's equations for analysis, design, and the implementation of such systems. This fundamental understanding was later to become important to the development of microwave radar during World War II and for the emergence of microwave radio, widely used today in telephone, television, and data communication. Through this work MIT made major contributions to communications technology that has evolved over the years, and Dr. Stratton was an early contributor. His seminal writings and publications on electromagnetic theory were registered in his 1941 book by that name. *Electromagnetic Theory* is still in use today.

In 1940 he joined the famous Radiation Laboratory, which developed microwave radar and pioneered the LORAN navigation system. At that time he was a member of the Theory Group. By 1942 and for the remainder of World War II he was in Washington as an expert consultant to Secretary of War Henry L. Stimson. There he worked on radio guidance systems for aircraft, ground-based radar, and all-weather flying systems, leading naturally to his assistance in the planning for the use of radar in the Normandy invasion. For his contributions to the war effort, he was awarded the United States Medal for Merit not only for his "tireless efforts and skillful application

of his professional knowledge," but also for his judgment and his "unique tact and vision in enlisting the active cooperation of industry and the development agencies."

In the words of Dr. Stratton, the Radiation Laboratory had produced more than "hardware." It had also produced "enormous advances in the entire field of electronics," a field encompassing the disciplines of both physics and electrical engineering. When the laboratory was disbanded at the end of World War II, the institute was ready with a proposal put forth by John C. Slater to continue this important work through a "new kind of laboratory" to be established jointly by his department of physics and that of electrical engineering. By late 1944 Dr. Stratton had been chosen leader, and he played a key role in its founding and in negotiating its support through a "tri-services" research contract. On July 1, 1946, the Radiation Laboratory's Basic Research Division, which he had headed for several months, became the nucleus of the institute's new Research Laboratory of Electronics (RLE).

During his tenure in this position, RLE became a major resource for educating graduate students and some undergraduates in carrying out both focused and fundamental research. Among the activities he supported and encouraged were construction of a linear particle accelerator, development of technologies based on Norbert Wiener's mathematics, fundamental explorations in plasma physics, efforts in modeling neurons and the nervous systems of animals and human beings, analog computation and simulation, and various other subjects—truly an interdisciplinary mix at the cutting edge of research. This pattern of interdisciplinary research and collegial cooperation established by Dr. Stratton is still evident in RLE. In 1980, and in keeping with this theme, William R. Hewlett, an alumnus and founder of the Hewlett-Packard Company, established at MIT the Julius A. Stratton Professorship in Electrical Engineering and Physics, to be held alternately by a faculty member from these two departments.

The year 1949 brought a major change in his career. He became the chief academic officer of MIT as its first provost, with the added title of vice-president two years later. He was

named chancellor in 1956 and acting president late in 1957. On January 1, 1959, he took office as the eleventh president of the institute. When he reached mandatory retirement age in 1966, his influence had been felt throughout the institution for nearly two decades. During this time of change and expansion, he had maintained a firm commitment to students, the quality of their education and the environment in which they lived and studied. A major building program had included a much-needed dormitory for women, making possible an increase in their enrollment. He had overseen the integration of the humanities, social sciences, and management within the context of the institute's central mission in science and technology, and he had encouraged the growth of research and interdisciplinary centers following the general pattern of RLE. As he left the presidency, he was elected a life member of the MIT Corporation.

In 1966 he moved to New York as chairman of the board for the Ford Foundation, of which he had been a trustee since 1955. There he streamlined the board's function to allow more time for in-depth review of program trends, instituted a system of board visiting committees for the various divisions, and served as an influential spokesman in the cause of private philanthropy. When he reached yet another mandatory retirement age, he returned to Cambridge, where he continued to be concerned with MIT affairs.

Dr. Stratton was elected to the National Academy of Sciences in 1950 and served as vice-president from 1961 to 1965. During that period he chaired an Academy committee to explore with the Engineers' Joint Council the possibility of founding a similar organization for engineering, proposals for which had been set forth from time to time over the years. The road was not easy, but in 1964 a National Academy of Engineering (NAE), of which he became a founding member, was established under the charter of the Academy of Sciences, of which Frederick Seitz was then president. He and Dr. Stratton have been credited with finding acceptable bases for the NAE.

His service to the engineering and scientific community was continuous and distinguished. He was a member of the National Science Board and its Executive Committee from 1956 to 1962 and was reappointed in 1964. He resigned in 1967, however, when he was appointed by President Lyndon B. Johnson as chairman of the Commission on Marine Science, Engineering, and Resources recently established by Congress. Two years later their thorough review of the entire field and its relation to national needs appeared in a landmark report, *Our Nation and the Sea*, which led to the establishment of the National Oceanic and Atmospheric Administration (NOAA), a Coastal Zone Management Program, and the National Advisory Committee on Oceans and Atmosphere (NACOA) on which Dr. Stratton served from 1971 to 1973. He was a life trustee of the Boston Museum of Science and served on the board of the Charles Stark Draper Laboratory.

In the field of education he was a trustee of Vassar College and Pine Manor College and the Carnegie Foundation for the Advancement of Teaching and also served for several years on the board of the ESSO (now Exxon) Education Foundation.

His awards and decorations were legion and included the Medal of Honor of the Institute of Radio Engineers (now the Institute of Electrical and Electronics Engineers [IEEE]), and the Faraday Medal of the British Institution of Electrical Engineers. He was an officer of the French Legion of Honor, a knight commander of the Order of Merit of the Federal Republic of Germany, and a commander of the Colombian Order of Boyacá. He held seventeen honorary degrees from institutions both here and abroad. He was in addition a life fellow of the IEEE, a fellow of the American Academy of Arts and Sciences, the American Association for the Advancement of Science, and the American Physical Society, and a member of the American Philosophical Society.

This recitation could go for many pages. However, the two dominating features of Dr. Stratton's character were evident in all of his activities. The first of these was his insistence on excellence and integrity. He was a protagonist of the first-rate, recognizing that the futures for institutions and nations lay in

cultivating excellence through people and their education. The second of his traits concerned people, students, and humanity. Though he nourished quality, he recognized that people grow in their abilities, some later, some sooner. His philosophy made room for all those climbing toward achievement. He aided such people personally and through institutional policies. His balance between excellence and compassion for individuals led to the respect and regard in which he was held by all who knew him.