

Stanley William Zimmerman

July 30, 1907 — May 13, 2002

Stanley William Zimmerman was born in Detroit, Michigan on July 30, 1907. After obtaining the B.S. degree in Electrical Engineering and the M.S. degree in Engineering, both from the University of Michigan in 1930, he joined the General Electric Company Test Program in Pittsfield, Massachusetts as an Electrical Engineer with research and development interests in electric-power-system protective devices, transmission and distribution engineering, high-voltage phenomena, and lightning and surge studies. Stanley came to Cornell in 1945 as an Associate Professor of Electrical Engineering and Director of the High Voltage Research Laboratory, attained full professorial rank in 1948, and retired as Emeritus Professor in 1973.

During his 15 years with General Electric Company, Professor Zimmerman made many contributions to the field of high-voltage engineering and related dielectric materials. His work in lightning-arrester research and development that involved studies of thyrite, a nonlinear material used in early arresters, was basic for modern arrester design. Stanley's investigations of high-voltage systems in terms of potential distribution, ionization, corrosion, and impact of environmental conditions, necessitated development of unique experimental techniques. For several years, he was associated with field and laboratory studies of high-power circuit protection and circuit interruption, with particular attention to the design and testing of 287 kV circuit breakers and transformers for the Boulder Dam (now Hoover Dam) installation on the Colorado River. Much of his work was also concerned with the development of lightning measuring instrumentation and the statistics of natural lightning. During World War II, he was engaged in the development of radio noise filters for aircraft and participated in flight tests and field tests of military radio noise-suppression applications.

When Stanley arrived at Cornell in September 1945, he took charge of the high-voltage research laboratory that had been established in 1943. The facility was housed in a large corrugated-steel structure south of the campus on Mitchell Street Extension. The building contained a bank of three 250 kV 60 Hz transformers, a Marx generator that could develop a three-million-volt lightning surge, associated control facilities, a 10-ton crane, and a railroad siding that allowed import of heavy equipment, altogether forming a site that was capable of industrial-standards testing of large electric-power apparatus. Stanley developed two senior courses, High-Voltage Phenomena, and Power Apparatus and Systems, and encouraged use of the laboratory for projects in both disciplines at graduate and senior levels. He also began part-time operation of the laboratory as a testing facility for industry. Due to his familiarity with the electric-power field and through his industrial contacts, he was able to obtain substantial gifts

of equipment to augment the laboratory apparatus already in place. Two 1000 kVA generators and one 3000 kVA machine were among the early major acquisitions. Under his direction, one of the 1000 kVA units was upgraded, tested, and placed in service in the first Cornell Synchrotron facility. The other two machines were prepared for short-circuit studies in the laboratory.

In order to bring the laboratory to the attention of electric utilities as a potential industrial testing service, Stanley established a series of lectures by distinguished visitors, and inaugurated tours of the facility coupled with dramatic demonstrations of the high-voltage equipment. He called one of his favorite displays a "Jacob's ladder," a high-voltage arc that would climb up between two copper rods in a vertical "V" formation mounted separately on a block of insulator material. At the top of the V, the discharge would form into a three-foot-long arc that would dissipate, only to form again at the bottom of the V and renew its climb. With the aid of the three-million-volt surge generator and two large copper spheres mounted on insulated posts, Stanley would create a 10-foot-long artificial lightning discharge with associated crackling sound effects. One particular stunt brought him some media attention. He would ask for a volunteer to climb into a "Faraday's Cage," a four-foot cube made of copper mesh. After insuring that the occupant was completely enclosed and that the cage was solidly grounded, he would discharge a lightning bolt to the cage from the three-million-volt surge generator.

On February 12, 1948, the high-voltage laboratory was completely destroyed by a spectacular fire that caused an estimated loss of one million dollars. With the aid of insurance and gifts of equipment, Stanley designed and supervised the restoration of the laboratory to its former condition plus improvements that included an upgrade of the 60 Hz high-voltage capability from the original 750 kV to one million volts, and the installation of a 20-ton crane. For several years, Stanley continued to offer his former courses, directed graduate and senior projects, and resumed industrial equipment testing. By the late 1950s, however, large industrial concerns had established their own internal high-voltage testing facilities, student interests moved to other fields, and the laboratory entered a period of limited use. In 1957, the Association of Edison Illuminating Companies (AEIC) authorized a three-year extra-high-voltage underground cable testing program to begin at Cornell in 1960, with the laboratory to be used as a staging area for the test.

In 1959, Stanley recognized that the laboratory would not return to its former use following completion of the cable test. After assisting AEIC engineers in planning the use of the laboratory for the test program, he transferred responsibility for the facility to Professor Joseph L. Rosson, Director of the AEIC testing program, took a sabbatical leave, and upon his return to the campus taught the service courses (electrical engineering for non-electrical

engineers), offered courses in high-voltage phenomena and technical writing, and served as an undergraduate adviser. During the summer months, and for many years after retirement, he consulted as a high-voltage specialist with several industrial concerns, Argonne National Laboratory, and Lawrence Radiation Laboratory.

Throughout his 28-year academic career at Cornell, Stanley, a naturally jovial and energetic man, was an enthusiastic teacher and willingly shared his expertise with his students and colleagues. He was noted for his ability to acquire substantial donations of surplus electric-power equipment, most of which he stored in the Mitchell Street laboratory building. He believed that the material would be useful some day, and indeed on occasion, a faculty member in need of an otherwise expensive device could find it in Stanley's lab. He was a strong proponent of the practical and professional approach to the education of electrical engineers. His courses in high-voltage phenomena always included field trips to generating plants, substations, and large manufacturing plants, and his lectures in all courses were enlivened with examples drawn from his extensive industrial experience. He was a member of the New York State Society of Professional Engineers, and frequently helped students in other branches of engineering prepare for the electrical portion of their professional license examinations. He participated in both national and local activities of the American Institute of Electrical Engineers (AIEE), authored articles and reports in his specialties, and was named a fellow of the AIEE in 1963 "for contributions in the field of high voltage engineering." In 1973, he was named a life fellow of its successor organization, the Institute of Electrical and Electronic Engineers (IEEE). He was also a member of the Conférence Internationale des Grands Réseaux Electriques à Haute Tension, the electrical engineering honor society, Eta Kappa Nu, and the American Society for Engineering Education.

Stanley and Evelyn Raney were married on October 1, 1932 in Detroit, Michigan. Their 40 years of life together, principally in Ithaca, ended when Evelyn died on June 12, 1972. He is survived by his daughter, Dorothy and her husband, Earl Bynack, of Somers, Connecticut; his daughter, Jo Anne and her husband, Stephen Busch, of Fort Collins, Colorado; his son, William S. and his wife, Emelia Maria, of New Hope, Minnesota; and his son, Richard L. and his wife, Phyllis, of Bryan, Texas; seven grandchildren and one great-grandson.

Stanley will be long remembered as an active and innovative investigator in his chosen field, a dedicated teacher and advisor, a respected colleague, and a good friend.

Benjamin Nichols, Norman M. Vrana, Simpson Linke