



Carl Hering

(A'88, M'88, F'12, Life Member)

President 1900-01

vania, teaching there the next year as instructor in mathematics and assistant in mechanical engineering. In 1887 he received the M.E. degree and in 1912 the university conferred upon him the honorary degree of Sc.D. In 1882, becoming interested in electrical engineering, recognized then as a new and important branch of the art, Doctor Hering obtained a transfer to the department of physics. The following year he went to Germany to take courses at Darmstadt, teaching in the Polytechnikum there and working in Frankfort as chief engineer for Henry Moehring and Company, which manufactured and installed motors and dynamos. Upon his return to Philadelphia in 1886, he established a consulting practice which he continued until his death, May 10, 1926, specializing in work on electric furnaces, underground electrolysis and electrochemical and electrophysical processes.

He started the first comparative life tests of incandescent lamps in 1884, at the Electrical Exposition in Philadelphia, of which he was the assistant electrical engineer. By 1890 he had made extensive researches into storage batteries, obtaining numerous patents from the results of his work; he also investigated the regeneration of battery solutions. His work on electric furnaces

began in 1900 with tests for the reduction of arsenic ores. Some 6 years later, while designing and operating electric furnaces, he discovered the "pinch" effect. He also made other discoveries showing that electromagnetic forces act upon the material of the conductor. In 1909 he applied these forces to impart rapid motion to molten masses and, based upon this principle, he invented an electric furnace in wide commercial use.

Doctor Hering was a voluminous writer, aiming to bridge the gap between pure and applied science. In 1883 he computed conversion factors for electrical and mechanical energy, publishing a comprehensive treatise in 1904; later he recalculated all electrochemical equivalents. In 1892 he was technical editor of the *Electrical World* and in 1893 he established and compiled the "Digest of Electrical Literature."

He served the Institute as committeeman, first local secretary for Philadelphia (1888) and national vice-president (1891-93; 1895-98), standing firmly for the maintenance of Institute ideals throughout the whole period of his membership. He was a founder and president of the American Electrochemical Society and a member of the Franklin Institute, Illuminating Engineering Society, and American Association for the Advancement of Science. He was appointed officer of Public Instruction by the French Government in 1889 and decorated a Knight of the Legion of Honor in 1891. He was a delegate to a number of important national and international conventions.

ONE of the outstanding figures in the electrical engineering world was Carl Hering, a pioneer in the field of design and construction of electrical apparatus. He was a productive researcher in electrochemical and electrophysical fields, and the discoverer of several fundamental natural laws.

He was born in Philadelphia, March 29, 1860, and was graduated in 1880 with the B.S. degree from the University of Pennsyl-



Charles P. Steinmetz

(A'90, M'91, F'12)

President 1901-02

FOR more than 30 years Charles Proteus Steinmetz was a leader in the electrical industry, devoting his life to research, largely relating to mathematical foundations upon which many of the developments in electrical engineering are based; there was scarcely a detail of any branch of electrical science or mathematics with which he was not conversant. Of his achievements among the most important were his investigations in the field of magnetism and his researches into the theory of direct and alternating current and the phenomena of lighting.

He was born on April 9, 1865 in Breslau, Germany, and was educated at the universities of Breslau and Berlin, and the Polytechnic in Zurich, Switzerland, specializing in mathematics, electrical engineering, and chemistry, and teaching mathematics at the same time. At 24, he left Germany because his socialistic affiliations barred him from preferment, and came to the United States practically penniless and knowing almost no English. Later he was naturalized, and became interested in politics in Schenectady. During a Socialist régime he was appointed president of the board of education of that city in 1912 and held the position throughout succeeding administra-



tions until his death on October 26, 1923.

The first job he obtained was as draftsman at the Osterheld and Eickemeyer factory in Yonkers, N. Y.; soon he was given charge of all the new and experimental work in the establishment. Besides working on inventions for electric motors and generators and electric street cars, Doctor Steinmetz attracted attention by articles he contributed to scientific papers here and in

Germany, especially on the theory of alternating currents. He was put in charge of the research laboratory and began to specialize on magnetic testing. In 1892, the firm merged with the General Electric Company and he was sent to Lynn, Mass.; the next year he was transferred to Schenectady as chief consulting engineer, remaining in that position until his death. In 1902 he became also professor of electrophysics at Union University.

He possessed a marvelous insight into all scientific phenomena and an unequalled ability to explain the most difficult and abstruse problems by systematic mathematical methods. He expressed his desire to communicate his fundamental knowledge to others in the stimulating instruction he gave to his assistants at the General Electric and in the publication of a large number of scientific papers and electrical books, which have long been accepted as standard textbooks in colleges, laboratories, and workshops.

Doctor Steinmetz served the Institute as vice-president (1896-98), manager (1892-95; 1898-1901) and as committeeman at various times; he also contributed papers frequently to Institute meetings and publications, his first, in 1892, "On the Law of Hysteresis," marking a new epoch in electrical science. He was a member of numerous scientific and educational organizations. He received 2 honorary degrees, the A.M. from Harvard (1902) and Ph.D. from Union (1903).