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BIOGRAPHICAL MEMOIR

OF

SAMUEL WESLEY STRATTON

1861–1931

BY

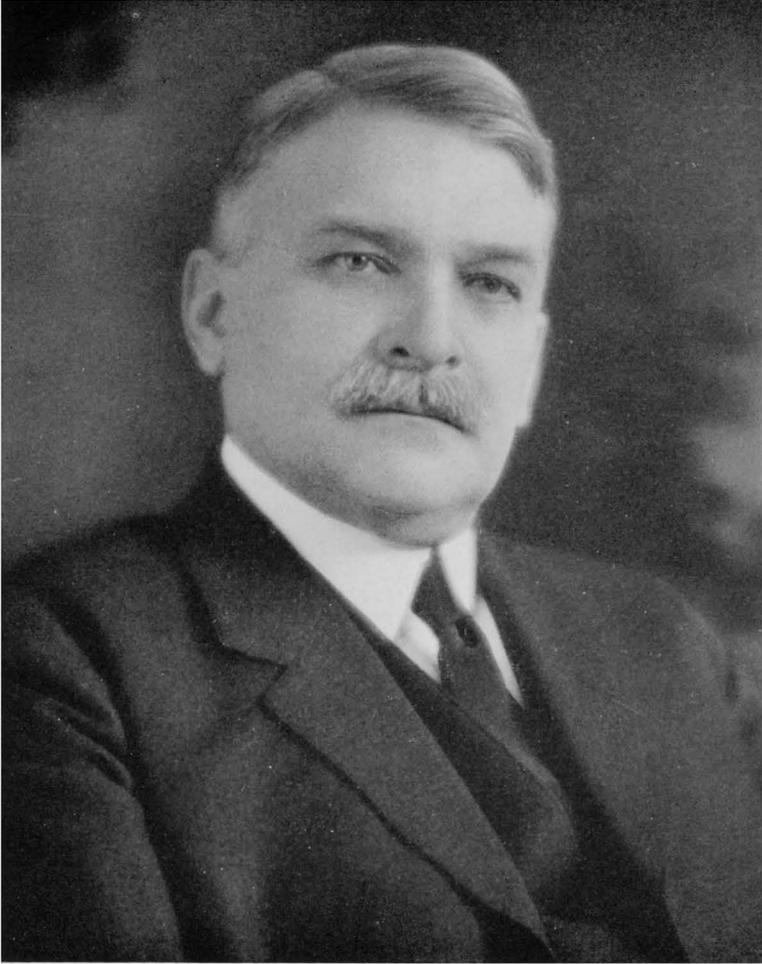
A. E. KENNELLY

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*Samuel W. Stratton*

## SAMUEL WESLEY STRATTON

1861-1931

BY A. E. KENNELLY

Samuel Wesley Stratton was born at Litchfield, Ill., on July 18th, 1861, the son of Samuel and Mary B. (Webster) Stratton. His boyhood was spent in the open country, and he enjoyed a strong physique, with active health, throughout most of his life. He was a tireless worker and always kept long hours.

In his boyhood he showed an unusual aptitude for machines and mechanical processes. In his school days he was entrusted with the care of the machinery on his father's farm.

After finishing school, he entered the University of Illinois, where he worked his way through college, mainly by printing and photography. As a lad, he had learned to do his father's printing, and through all his life he strove to support the art and science of printing. He obtained, in 1884, the degree of B.Sc. in Mechanical Engineering, his favorite subject. In college, his physical strength might well have won for him a recognized place in field sports; but he preferred to take in its place the military course at the University of Illinois, and he graduated from that course with the rank of Captain. This training served him later in good stead.

From 1885 to 1889, he was Instructor of Mathematics and Physics at the University of Illinois, being promoted to Assistant Professor of Physics in 1889. He occupied the chair of Physics and Electrical Engineering from 1889 to 1892. During the latter year, he left the University of Illinois to become Assistant Professor of Physics at the University of Chicago, being there promoted to Associate Professor in 1895, and Professor, in 1898. His special interest lay in the direction of experimental physics, through the development of fine mechanism, and in applied physics, through engineering, towards mechanical processes. At the University of Chicago, he became associated with Michelson, the great experimental physicist. He produced with

Michelson, in 1897, a new form of harmonic analyzer, capable of analyzing a complex harmonic wave into as many as 80 components, or conversely, of synthesizing a complex harmonic wave embodying any combination of given harmonics up to 80. During the years 1892-1899, at the University of Chicago, he was actively engaged in the development of apparatus for the Ryerson Physical Laboratory, and many instruments there are monuments to his ability and skill as a designing engineer.

Commencing with his military studies at the University of Illinois, Dr. Stratton was of great service to military science throughout his life. From 1895 to 1901, he served first as Ensign, next as Lieutenant, and then as Lieutenant-Commander, in the Illinois Naval Militia. During the Spanish-American war of 1898, he served as Lieutenant in the U. S. Navy, and from 1904 to 1912 commanded the D. C. Naval Militia, with the rank of Commander. He took much interest in naval gunnery, and later at the Bureau of Standards directed various researches in internal ballistics.

On returning to Chicago at the end of 1898, Dr. Stratton was asked to go to Washington, to invite Admiral Dewey and Secretary Gage of the Treasury, to give addresses in Chicago. In his interview with Secretary Gage, the Secretary asked him many questions concerning the standard weights and measures of the country, then in the custody of the U. S. Coast and Geodetic Survey, at Washington, D. C. Stratton described how, in certain European countries, such standards were entrusted to National Physical Laboratories, and formed there the nucleus of much scientific work. This led to Stratton being invited to take the post of Superintendent of U. S. Weights and Measures, at Washington, in the Coast Survey Building, with the understanding that he would work towards the establishment of a suitable national laboratory for conserving and developing them. Stratton accepted the offer.

Thus established at Washington, Stratton drew up, with the aid of various government officers, plans for the creation and maintenance, by the Congress, of a national laboratory of standards to be situated near Washington, D. C.

Temporary offices were secured in Washington for the scien-

tific work of the new department, and a bill was drawn up for the establishment by the Congress of the National Bureau of Standards. The bill went through many vicissitudes; but was finally passed in the closing hours of the Congressional session in March 1901. It was saved from failure more than once by Stratton's ability to interest the men on Congressional committees. A site for the buildings of the new bureau was selected in the Washington suburbs near Chevy Chase, on three hectares of unbroken land, free from mechanical and electrical disturbances. In building and manning the laboratory, Stratton showed marked organizing ability. He was appointed its Director, a position he held, with great distinction, for more than twenty years.

While superintending many investigations at the Bureau, on the uses and improvements of national standards for mechanics, light, heat and electricity, Stratton found means to interest many manufacturers in the applied science of standards for industry and economical production. He showed how improved tests and standards for machinery of all kinds would reduce costs and improve production. The National Bureau of Standards became known all over the world as the home of scientific measurement, the support of high-class engineering, and the inspiration of improved manufacture. By the year 1922, the original two large laboratory buildings had grown to fourteen, with a total staff of nine hundred employees extending over some twenty hectares of land. This great organization was largely self-supporting from its services to industry. Dr. Stratton was the director and inspirer of all this work.

When the question arose of establishing a U. S. Government radio research center, Stratton succeeded in getting the Army and Navy Departments to pool their operations with those of the Bureau, for joint effectiveness and economy. He secured an appropriation for a separate building on the Bureau grounds, to serve the three departments.

In the international field of standards and their measurement, Stratton was also very successful in organizing coöperative effort. He was the American member of the International Committee of Weights and Measures, at the International Bureau of Weights and Measures, in Sèvres, near Paris, where the inter-

national meter and kilogram are deposited, and copied for world distribution. He was instrumental in extending the province of the Sèvres International Bureau from mechanical to electrical standards, and in securing funds from the Rockefeller Foundation for work on maintaining and comparing electrical standards. After the electrical conference in London, of 1908, between representatives of the various national physical laboratories, he was able to bring to the Bureau at Washington a group of electrical physical experts from England, France and Germany, to collaborate with American experts at the Bureau, for redetermining international standards of electric current, resistance and voltage. The outcome of this joint effort was of great international usefulness. He also aided in the establishment, in 1927, of the Consulting Committee on Electricity, to advise the International Committee and the Conference of Weights and Measures, towards establishing world standards for electricity and magnetism at the Sèvres Bureau. This Consultative Committee has already accomplished important world work for preparing such standards.

In 1922, Dr. Stratton was elected to the presidency of the Massachusetts Institute of Technology, Cambridge, Mass., and devoted himself, with characteristic whole-heartedness, to the administration of its affairs, which prospered notably under his direction. He emphasized the importance of research in all departments, and especially of industrial research. He also maintained close contact with the student body, and attended sympathetically to their needs. Two student dormitories were built near to the group of laboratory buildings by his special efforts. In 1930, in view of his increasing responsibilities, he recommended that the noted physicist Dr. Karl T. Compton be invited to the Presidency, Dr. Stratton becoming Chairman of the M. I. T. Corporation, a post which he held until his death.

Prof. Stratton was awarded no less than six honorary doctor's degrees during his career. His alma mater, the University of Illinois, gave him an honorary D.Eng. in 1903, and three universities gave him the honorary D.Sc.; namely, Pittsburgh, in 1903, Cambridge, England, in 1908, and Yale in 1918. Harvard University awarded him a LL.D. in 1923, and Rensselaer a

Ph.D. degree in 1924. He received the Elliott Cresson Medal of the Franklin Institute, and the Welfare Medal of the National Academy of Sciences. He was an Officer of the Legion of Honor, and an Honorary Member of two Honor Societies; viz., the Sigma Xi, in Physics, and the Tau Beta Pi, in Engineering. He was a United States Delegate to two International Electrical Congresses; that of St. Louis in 1904, and that of London in 1908.

He was a member of the following organizations:

- Council of National Defense.
- National Advisory Committee for Aeronautics.
- Interdepartmental Board on Ice Observation and Patrol.
- Standardization Committee, American Section, International Chamber of Commerce.
- Federal Specifications Board.
- National Screw Thread Commission.

He was also a member of a number of scientific and technical societies, of which the following may be mentioned:

- National Academy of Sciences.
- National Research Council.
- American Philosophical Society.
- American Association for the Advancement of Science.
- Washington Academy of Sciences.
- American Institute of Electrical Engineers.
- American Society of Mechanical Engineers.
- American Society for Testing Materials.
- National Aeronautic Association of U. S. A.
- American Physical Society.
- American Engineering Standards Committee.
- Optical Society of America. (Hon. Member).

In personality, he was friendly, direct and engaging, without a trace of affectation. Of medium height, he was of sturdy frame and gave the impression of considerable physical strength. His countenance was stern in repose; but animated, frank, and kindly in discussion. He was quick to perceive the abilities of those who came within his range of communication, and to organize them into coöperative effort for the purposes of applied science, without any consideration of his own personal advantage. His mind was dominated by the ideals of improving all

engineering enterprise through scientific study and research. He loved fine tools, and fine workmanship in the construction of delicate apparatus. At the Bureau of Standards North Building, he equipped a small workshop, at his own expense, with some special tools and materials for instrument work. Here he would often seek recreation, after working hours, in fashioning new instruments for special investigations.

He had a kindly disposition towards the world, in general, and to his staff, in particular. He showed no favoritism; but he would invite groups of his well tried assistants to meet with him, when off duty, on friendly terms. All his men felt that they had his sympathy and moral support. He enjoyed the friendship of a large number of applied scientists in many parts of the world, and without being interested in politics or political parties, he had a large circle of acquaintances in the administrative circles of Washington. He was liked and respected by everyone for his frankness and fair dealing.

The great American inventor and applied scientist, Thomas A. Edison, died on the morning of Sunday, October 18, 1931, at his home in Orange, New Jersey. Edison and Stratton had been close friends for many years. That same evening, Dr. Stratton prepared, at his apartment in Boston, a long telegram of condolence to the Edison family. This finished, he granted an interview to a newspaper reporter, and sitting in his parlor overlooking the Charles River, nearly opposite the Institute of Technology on the Cambridge side, he commenced dictating, seemingly in good health, a warm encomium on the life and accomplishments of Edison. After having spoken about two hundred words, without any sign of pain or fatigue, he commenced a new sentence about Edison's life. He got as far as the words: "His interests . . . ." when his head fell forward suddenly, and he evidently lost consciousness. A physician, hastily summoned, at once pronounced Dr. Stratton dead from heart failure. Thus with dramatic painlessness, Stratton departed this life, with a eulogy of Edison on his lips.

The death notices of Edison and Stratton appeared side by side in the morning papers of Monday the 19th of October, 1931.

Dr. Stratton never married; but his "boys at the Bureau" and the students at Technology had a filial affection for him.

Testimonials to his character and accomplishments came in from all over the world. The National Bureau of Standards at Washington is virtually his monument.

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