

Obituary

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS

CHARLES FRANCIS BRUSH, ^{34 WEST THIRTY-NINTH STREET, NEW YORK} inventor of the arc light, an outstanding scientist, humanitarian, philanthropist and one of the Institute's first Managers 1884-1887, died at his home in Cleveland, Ohio, June 15, 1929 at the age of eighty. Complications from bronchitis which developed into pneumonia caused his death.

Died June 15/29

CHARLES FRANCIS BRUSH

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~~Charles Francis Brush, Charter Member of the Institute, scientist and Edison medalist for 1913,~~ was born at Euclid, Ohio, March 17, 1849, both of his parents coming from old American families. His grammar and high school education was obtained in the public schools of Cleveland from which he was graduated at an early age. While still at school, he became intently interested in electrical apparatus and, in true boy fashion, experimented with his own construction of static machines, induction coils and small motors. His graduating essay, in fact, was on the dynamo and arc light, based upon the Wilde experiments in London. In 1869 he was graduated in mining engineering, from the University of Michigan, returning for a postgraduate course which won for him his M.S. degree, followed by a Ph.D. from the Western Reserve University. This latter university also conferred upon him an honorary degree of LL.D., as did also the Kenyon College in 1903.

It was in 1860 that the Italian, Paccinotti, made a great discovery in electricity, but it was destined to remain buried in the archives of Italian libraries until a young Belgian by the name of Gramme reinvented the dynamo electric machine. Doctor Brush, then a young man just out of college, was one of the first to realize the value of this "neucleus" and to undertake further the history of its evolution and application with variation and improvement. By 1876 he had designed a dynamo - constructed under his own supervision - a pioneer machine to be exhibited at the Paris Exposition in the United States Historical Exhibit. In 1877 he introduced the compound field winding for constant potentials now so generally applied to electric lighting; its first use was in connection with plating machines. At the Charitable Mechanics' Fair in Boston, (1878), an exhibit of greatest historic and scientific interest, was displayed the earliest form of what afterward became the world-famous Brush arc light machine. His, too, was the great invention of the differential arc lamp, the construction and operation of which included the principle making it possible to operate lamps in series instead of in parallel. ~~He also developed~~ another apparatus of great significance, - the automatic cut-out, permitting each lamp to cut itself out of circuit should trouble arise or the carbon burn out. This was looked upon as one of the greatest inventions of the era - ~~conceded~~ by even Doctor Brush's contemporaries in the same field of development.

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From that time on it was a rapidly growing industry. Copper plating of carbon electrodes was also introduced by Doctor Brush and yielded large royalties. In 1881 the Brush Electric Company was incorporated and capitalized at \$3,000,000. Approximately ten years later when the General Electric Company was formed, it absorbed this company and the works were removed from Cleveland to Schenectady, but in the meantime, through the forma-

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tion of other corporations, the Brush apparatus and system were being introduced. The storage battery problem was also receiving considerable attention from Doctor Brush, and as a result of his effort, great improvement was accomplished in the manufacture of lead plates. ~~By Doctor Brush, also,~~ was devised the ingenious system of charging storage batteries from an arc light system and the subsequent subdivision of light, demonstrating that it was possible to run incandescent lights on an arc light circuit.

In 1881 at the International Electrical Exposition in Paris there was exhibited by the English Brush Company as one of the most interesting features, a certain Brush apparatus. ~~In~~ *It was in* this year, ~~also,~~ Doctor Brush was decorated by the French Government as Chevalier of the Legion of Honor; in 1889, the American Academy of Arts and Sciences awarded to him the Rumford medal, bestowed by both the Royal Society and the American Academy of Arts and Science, "for the most important discovery or useful improvement on heat and light." Doctor Brush is a corporator of the Case School of Applied Science, trustee of the Western Reserve University, Fellow of the American Academy of Arts and Sciences; member of the Physical Society, the American Philosophical Society; Fellow of the American Association for the Advancement of Science; Life Member of the British Association, Ohio State Board of Commerce, Cleveland Chamber of Commerce (of which he was also president 1909-10); The American Society of Mechanical Engineers; members of the Archeological Institute of America, the American History Association, the National Electric Light Association, the Franklin Institute, the American Chemical Society, the Royal Society of Arts; Fellow of the American Geographic Society and the N. British Academy of Arts.

*He was a
Charter member of the ~~Institution~~ and
in 1912 received the Edison Medal
award.*

5/29/29

John