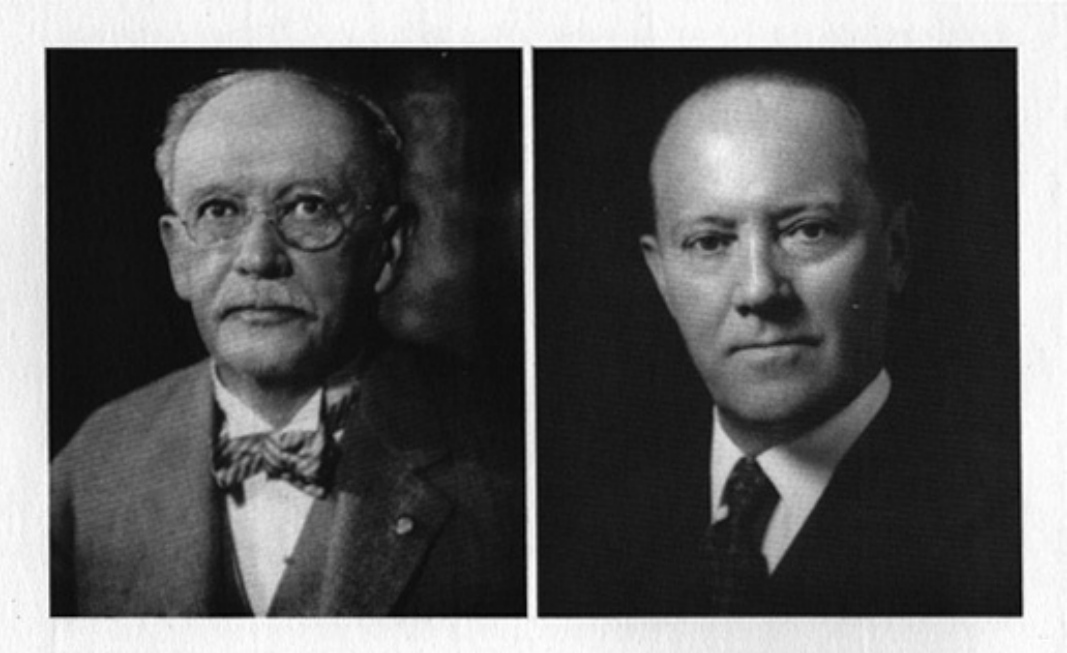
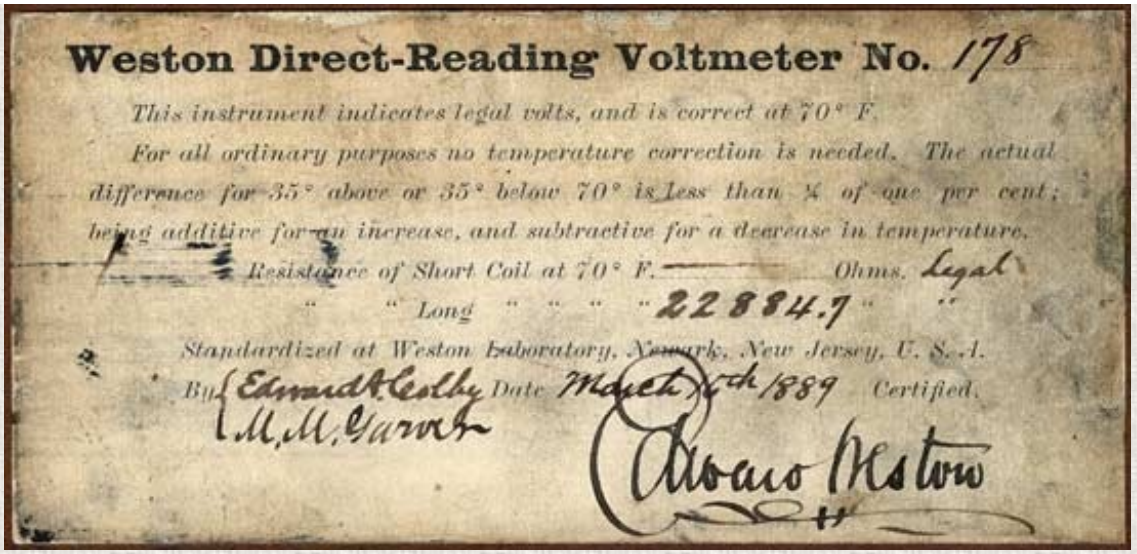
Weston Electrical Instrument Corporation

Founded in New Jersey by Edward Weston in 1888, the company's innovations included the Weston standard cell, the first accurate portable voltmeters and ammeters, the first portable lightmeter, and many other electrical developments.



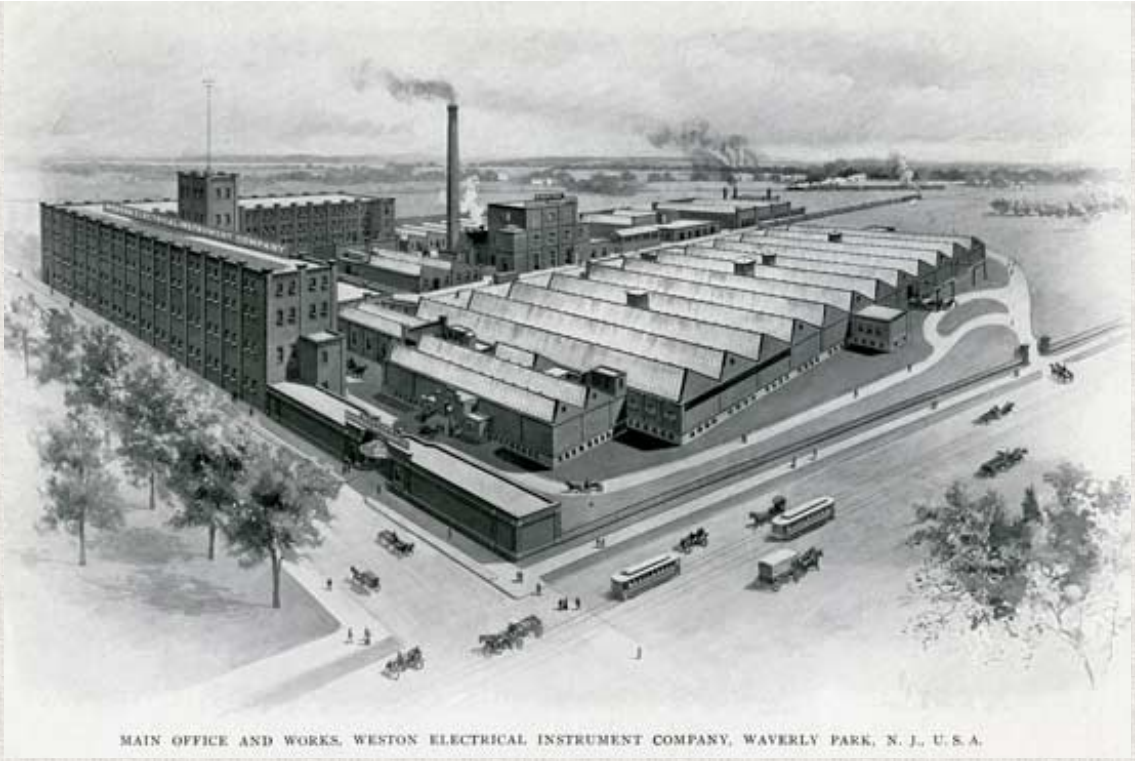
1930 portrait of Dr. Edward Weston (1850-1936)
and his son, Edward Faraday Weston (probably around 1938)



March 16th,1889. Signature of Edward Weston on the calibration certificate of Weston Direct-Reading Voltmeter No. 178, a very early instrument. The meter was standardized by Edward A. Colby and M.M. Garver, and certified by Weston.

Edward A. Colby graduated from Yale University in 1880. He is notable for inventing the induction furnace, for which he received two patents in 1890, and he spent much of his later career in this industry.

Madison M. Garver worked in the electrical industry for many years (references cite him as early as 1876, when he was a recent graduate from Cornell University, through at least 1916). He was issued several patents for measuring instruments, filed in December 1889 and January 1890, none of them assigned to Weston, so perhaps he had left the company at this point. In 1893 Garver became a physics professor at The Pennsylvania State College.



Main Office and Works of Weston Electrical Instrument Company, Waverley Park (Newark), New Jersey
From the back cover of *Bulletin No. 6* (August 1906)

1909 Letterhead

Links

The Robert W. Van Houten Library at the New Jersey Institute of Technology in Newark, New Jersey, maintains the **Weston Museum** and the **Weston Rare Book Room**, which contains over 100 rare books and the Edward Weston Papers. Access is by appointment only, Monday thru Friday from 8:00am to 4:00pm

Edward Weston was an early contributor to the founding of the Newark Technical School, which eventually became NJIT. Weston Hall at NJIT is named for him and for his son, Edward Faraday Weston, who was a trustee of the School, at that time known as the Newark College of Engineering.

The entry for Edward Weston in the **New Jersey Inventors Hall of Fame**.

A **note on Weston lightmeters**, with an interesting letter from Charles Mulhern, a former Weston employee (see note on the Mulhern collection below). This is part of the Weston Master site, dedicated to continuing the Weston exposure meter line.

Another site on **Weston lightmeters**, with a comprehensive model listing

The **Weston Aerospace website** has a short history of Edward Weston. A British company,

Weston Aerospace traces its roots back to 1921, when it was founded under the name *British Sangamo Ltd.* In 1936 the company acquired the *Weston Electrical Instrument Co. Ltd.* of Surbiton, Surrey, the United Kingdom subsidiary of Edward Weston's US corporation.

Scientific instrument historians will find many items of interest at Humboldt State University's **Robert A. Paselk Scientific Instrument Museum**. The on-line catalog includes a **short biographical note on Weston** and shows a number of instruments, each with a photograph and detailed description.

Weston exhibit at the Franklin Institute, Philadelphia, 1884

The Edward Weston Exhibit at the International Electrical Exposition, Philadelphia, 1884

The Edward Weston Laboratory - 1887 article in The Manufacturer and Builder Exhibit

The Weston Model 30 Sensitive Relay

The Dibner Institute for the History of Science and Technology, Burndy Library, at MIT had a Weston collection which included instruments, company records, photographs, and ephemera. It was gathered by Charles Mulhern, who worked as an engineer for the Weston Company, and acquired many of the instruments from the Company's own museum when that was dismantled in

the 1970s. See also the letter from Mulhern referenced above.

The Dibner collection has now been transferred to the Huntington Library, andwhile the Huntinton's catalog has entries for written Weston material, I cannot locate the instrument collection there. The archived remnants of the MIT site may be seen here.

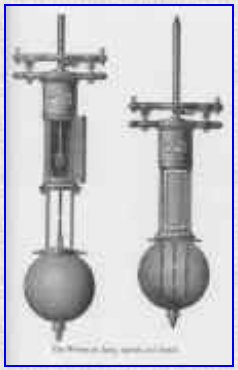
The Yokogawa Electric Corporation has a **description of the Weston archive** at NJIT, and a **note by its author**, Eiju Matsumoto.

[Note: as of 30 November 2003 these pages were no longer found on the Yokogawa site, and the copies shown here are from archive.org, which does not store the images for the pages]

A brief history of Weston's lighting developments

Weston's success with his pioneering measuring instruments has perhaps obscured his early research into lighting equipment. After emigrating to the US in 1870, Weston found a job in the electroplating industry, and made many improvements in the processes used. He realized that a constant source of current was required for quality plating, and the batteries used at the time were not sufficient for the job. After the first company he worked for went out of business, Weston had a short career as a photographer, but returned to the plating industry in 1872, opening a business in partnership with George G. Harris. In 1873 he developed his first dynamo for electroplating, and by 1875 he had moved to New Jersey, in business for himself making dynamos. One of Weston's dynamos, running electric arc lamps, was shown at the Centennial Exposition in Philadelphia in 1876, but it received little attention. Shortly after this, Weston was contacted by Frederick Stevens, who offered Weston the opportunity to set up a dynamo division of his Steven, Roberts & Havell company. In 1877 the division was organized as a separate company, the Weston Dynamo Machine Company, in Newark, New Jersey.

Weston had first used a carbon arc lamp in his own shop in 1874, run by his plating dynamo, and he continued to research lighting equipment. By 1877 he had made many developments in arc lighting and in 1878 he put an arc light on the Newark Fire Department's watchtower in the center of town. Publicity from this led to an order from the city for lighting Military Park, and this was followed in 1879 by an installation in Boston's Forest Garden. In 1880 the firm's name was changed to the Weston Electric Light Company, which became a leader in the supply of arc lighting systems, providing the lighting for the new Brooklyn Bridge when it opened in 1883.



Weston's arc lamp

Weston incandescent light bulb with Tamidine filament

Weston was also working on incandescent lamps; his background in chemistry served him well in developing filament materials. On 26 September 1882 he was granted a patent on the Tamidine filament, a carbon material which gave a bulb life of up to 2000 hours, when other materials burned out after only a few hundred hours. Weston also took out patents on incandescent lamp seals and many other inventions in the lighting field, and by 1886 had been granted 186 patents (see below for some highlights). At that time he was 36 years old; he quit the electric lighting business and started his research on measuring instruments. In April 1888 the Weston Electrical Instrument Company was chartered in Newark, his fourth and last company.

The image to the left shows three Weston incandescent lamps made in the 1880s. The two smaller ones have Tamidine filaments. These lamps, part of the Dr. Hugh Hicks collection, were photographed by Tim Tromp in 1999.

For much more information on early incandescent bulb lighting technology, see Tim's excellent **Antique Light Bulb website**.

MEASURING INVISIBLES

In 1938 the Weston Electrical Instrument Corporation
published a history of the company's first 50 years, titled:

Measuring Invisibles

The Fifty-Year Record of the World's Largest Manufacturer of Electrical Measuring Instruments

The information below is reproduced from page 15 of the book.

(Note: When this was written in 1938, David O. Woodbury's biography of Weston had not yet been published)

No biographer has yet chosen to tell the story of Edward Weston's life and his contributions to electrical science. Like that of many other great inventors his work remains buried in the papers and reports and patents of the 19th century, unknown to a public which for years has read of the careers and findings of such men as Fulton, Marconi, Edison, Westinghouse and the Wright brothers. And no attempt has been made in these pages to do more than sketch in the outline of Weston's life, suggesting his accomplishments rather than fully describing them for the sake of future historians of this country's inventions and inventors. But for those who are interested in scientific pioneers, the following list of 25 Weston achievements will serve to show the originality of the man whose name now appears on 309 patents in the United States Patent Office.

Edward Weston was the man who . . .

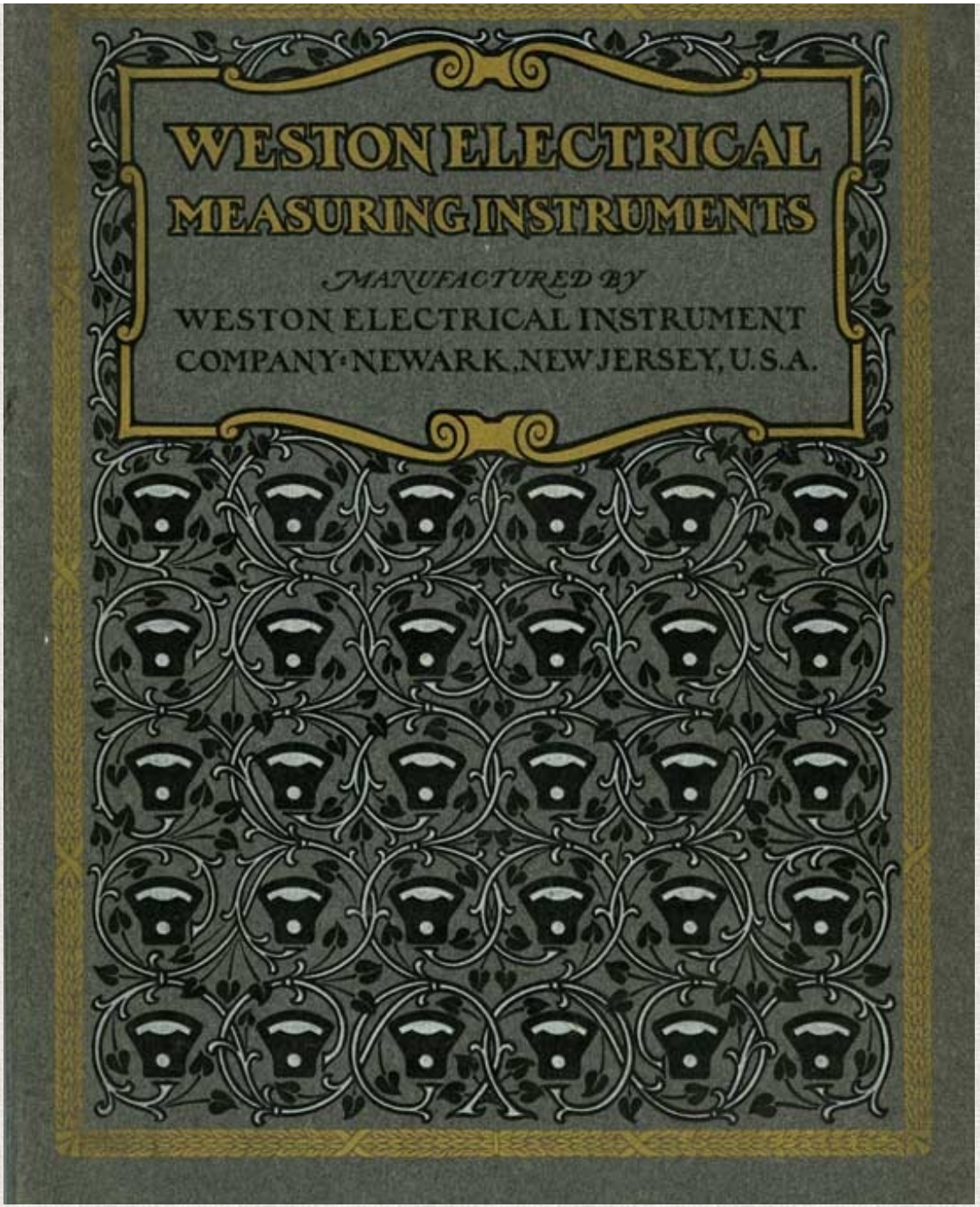
1	Applied the dynamo to electroplating (1872).	14	Made nitrocellulose into pure fiberless cellulose (1885).
2	Patented an anode for making malleable plated nickel (1875).	15	Made a truly permanent magnet (1887).
3	Patented the rational construction of dynamos (1876).	16	Compounded a German Silver alloy containing 30 per cent nickel (1887).

4	Patented laminated pole pieces and cores for dynamos, raising their efficiency from about 45 per cent to 85 per cent (1875).	17	Made a metal having a negative temperature co-efficient (1887).
5	Gave a public exhibition of arc lighting in the United States (1877).	18	Made a metal having an extremely low temperature co-efficient (1887).
6	Used the arc light for general lighting purposes (1877).	19	Made an aluminum alloy which could be drawn to very thin tubes (1887).
7	Opened a commercial arc light factory in the United States (1880).	20	Used a metal frame for damping the motion of moving coils (1887)
8	Used a soft metal core for arc light carbons (1878).	21	Made a commercial, direct-reading electrical measuring instrument (1888).
9	Copperplated the ends of arc light carbons (1878).	22	Used the shunt circuit (1893 - US Patent No. 497,482).
10	Used an electric arc furnace industrially in the United States (1875).	23	Made a stable cell for use as a secondary standard of the volt (1893).
11	Used the dynamo as an electric motor for industrial purposes (1878).	24	Developed the magnetic drag-type speedometer (1885).
12	Made a successful homogeneous carbon lamp filament (1885).	25	Made an ammeter for use with automobile starting batteries (1911).
13	Cured weak spots in carbon lamp filaments with hydrocarbon flashing process (1885).		

WESTON ELECTRICAL MEASURING INSTRUMENTS

MANUFACTURED BY

WESTON ELECTRICAL INSTRUMENT COMPANY · NEWARK, NEW JERSEY, U.S.A.



The cover (above) and endpapers (below) of Catalogue No. 15 (c.1904)

Last revised: 1 June, 2010

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