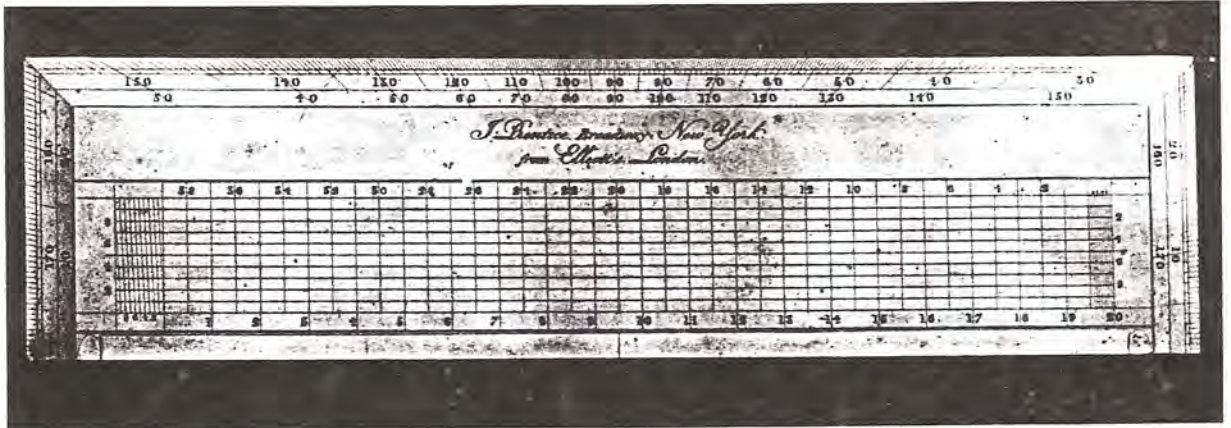


# JAMES PRENTICE'S RECTANGULAR PROTRACTOR

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The small rectangular protractor shown here represents one phase in the continuing interchange between American and European makers of scientific instruments. It is in the style of English protracting scales and was sold by James Prentice (1812-1888). Prentice was born in London, trained there under John Beal, worked for a time as a clerk, and then joined the mathematical instrument department at the London makers Elliott and Sons. Although William Elliott was known as "a very scientific workman" who specialized in drawing instruments,<sup>1</sup> Prentice soon decided to try his fortune in the United States. He opened a shop in New York in 1842.<sup>2</sup>

An early advertisement reflects Prentice's pride in his London training: "Mathematical Instrument Makers. J. Prentice, (From Elliott's, London,) Engineers', Architects', and Surveyors' Instrument Maker, 183 Broadway, New-York. N.B. Drawing Instruments Repaired on moderate terms."<sup>3</sup> The wording of this advertisement parallels the mark on the protractor: "J. Prentice Broadway, New York from Elliott's London." It suggests that Prentice himself made the protractor--it was he, and not it, that came from Elliott's of London. The 1860 Census of Industry indicates that by then Prentice had the resources to produce such mathematical instruments. With \$3000 capital invested in his business, \$400 worth of materials, and 3 male hands paid \$160/month he produced \$2200 worth of mathematical instruments, and \$700 miscellaneous work. A surveyor's plain compass signed "J. PRENTICE, 66 NASSAU ST., NY," now at the NMAH, which dates from this period, may well have been made in Prentice's shop.

James Prentice's early specialty was drawing instruments. In an 1853 advertisement addressed to engineers, architects and draughtsmen he claimed that "he is constantly manufacturing mathematical drawing instruments."<sup>4</sup> He showed drawing instruments at many of the annual fairs organized by the American Institute, each time taking home a diploma or a gold or silver medal. Prentice also won a diploma for instruments of precision--particularly an elaborate protractor<sup>5</sup>--at the Centennial Exhibition held at Philadelphia in 1876.

Rectangular protractors, usually made of ivory or box-wood, were sold in 19th-century America both individually and as parts of sets of drawing instruments. This piece is brass, and not associated with any set. In addition to the protracting scale around the rim, it has a diagonal scale for measuring off small fractions of an inch. The reverse side has a set of scales for subdivisions of 20, 25, 30, 35, 40, 45 & 50 parts. Such diagonal and simply-divided scales were commonly found on contemporary rectangular protractors. Prentice also carried on an older English tradition, including scales for trigonometric functions and for spherical projections useful in surveying, navigation and sundial-making. An instrument in the NMAH collection made by Gilkerson of London in the early decades of the century follows a similar plan. The small size of rectangular protractors prevented makers from producing divisions of great accuracy.<sup>6</sup> Protractors sold in Boston by Widdifield & Co., in Philadelphia by McAllister & Co., and late in the century in New York by Prentice & Son, omitted these scales. Such simplified rectangular protractors, some made of plastic, would be sold into the 20th century.

As the years went by, Prentice's work shifted away from mathematical instruments and from English patterns. Pens and dividers made by hand in his shop could not compete with European imports produced on a larger scale. During the Civil War Prentice added a retail optical store to his business and began to identify himself as an optician. In 1867 he obtained a patent (#61,099) for a pince-nez which was said to adjust itself "to any form of nose with less pressure than any other." Prentice's so-called "anatomical eye-glass" proved quite successful. Available in gold, shell, "zylonite" and hard rubber, and produced by such manufacturers as Bausch & Lomb, it remained on the market, paying royalties to Prentice, well into the 1880s.

Prentice wished to have his only surviving son, Charles, succeed him in his business, but did not believe that apprenticeship would provide him with the education he needed. Instead, Charles spent four years studying mechanical engineering at an advanced technical institute. Influenced, perhaps, by his mother's German ancestry, he went to the Karlsruhe Polytechnische Schule in Baden (now West Germany). With this professional background, the younger Prentice regarded optometry as a science, and published

several works on the subject.

In 1883 Charles Prentice joined his father to form the firm of Prentice & Son. A catalog from that time lists a wide range of optical, meteorological, mathematical and engineering instruments as well as electrical apparatus. It shows drawing instruments imported from France, Germany and Switzerland, and products of the American firm of Darling, Brown & Sharpe. It shows no instruments from England. Precise engineering instruments such as transits and levels were said to be made in the Prentices's shop by "the best skilled labor available."<sup>7</sup> Semicircular and rectangular protractors apparently were made there also. James Prentice's initial interest in drawing instruments had abated, but did not vanish altogether.

1. William Ford Stanley, *Mathematical, Drawing, and Measuring Instruments* (New York, 1888), p. vii.
2. For biographical information about James and Charles Prentice, see C. F. Prentice, *Legalized Optometry and the Memoirs of Its Founder* (Seattle, 1926).
3. Prentice advertisement in Sheldon & Co., *Business or Advertising Directory...of New York* (1845), p. 128.
4. Prentice ad in New York city directory for 1853/54, reproduced in Charles Smart *The Makers of Surveying Instruments in America Since 1700* (Troy, 1962), p. 130.
5. *Engineering News* (Aug. 12, 1876).
6. Stanley, *op. cit.*, pp. 242-244, 263.
7. James Prentice & Son, *Illustrated and Descriptive Catalogue and Price List* (New York, 1883), p. 150.

The image shows a page from a historical price list or catalog, likely from the late 19th century. The page is filled with a grid of numbers, possibly representing prices or measurements. The numbers are arranged in rows and columns, with some larger numbers at the top and smaller numbers below. On the left side, there are several text labels: "Ch", "Int", "Sin", "Tan", "Sec", and "EP". The page is somewhat aged and has a dark border around it.

brass surveying compass with serial number 374 made by JAMES PRENTICE AND SONS of New York.

The instrument was made probably between 1883 and 1897, the period during which the firm name was "James Prentice and Son." James Prentice was an English instrument maker born in London in 1812. After serving an apprenticeship with the instrument maker John Beal he emigrated to New York in 1842.

His name first appeared in the New York city directories in 1846, listing him as a maker of mathematical instruments. He imported and sold English-made instruments as well as those of his own manufacture, and his shop featured surveying and drafting instruments and supplies. In 1883 he was joined in business by his son Charles F. Prentice as a partner, and from 1883 to 1897 they advertised as "James Prentice and Son."

In 1888 James Prentice died at Clifton Springs, New York and his son incorporated the firm in 1897 under the name "James Prentice and Son Company." The corporation was dissolved in 1924; Charles Prentice died in 1946.