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A HISTORY OF THE SLIDE RULE

By ROBERT GRAF DERRENBERGER

THE slide rule, contrary to popular belief, is not a modern invention but in its earliest form is several hundred years old. As a matter of fact the slide rule is not an invention, but an outgrowth of certain ideas in mathematics.

Leading up to the invention of the slide rule was the invention of logarithms, in 1614, by John Napier.

Probably the first device having any relation to the slide rule was a logarithmic scale made by Edmund Gunter, Professor of Astronomy at Gresham College, in London, in 1620. This scale was used for multiplication and division by measuring the sum or difference of certain scale lengths. Rev. William Oughtred simplified this process of division and multiplication by using two similar scales and instead of adding or subtracting the lengths on one scale he merely had to lay one scale beside the other and by sliding the scales back and forth he read the answer directly off the rule.

Oughtred is credited with the invention of the slide rule in both the straight and circular forms. The circular form was made on cardboard, one scale being on the perimeter of a circular disc which was pivoted at the center of a similar and larger disc and turned upon it, so that the smaller circular scale lay just inside of and in alignment with the larger disc.

The first complete duplex slide rule was made in 1657 by Seth Partridge. This rule consisted of two strips of wood held together by bridging cleats with a third strip sliding freely between them. This rule carried the numbers and trigonometric scales on both faces.

The improvement and development of the slide rule in England, France and the United States will be taken up separately in the order just named.

ENGLAND

The name sliding rule (now called slide rule) was first used by Thomas Everard, who, in 1683, made rules adapted for the computations involved in determining cubic contents of measuring vessels and containers of market commodities. In 1722 John Warner made a slide rule having, in addition to the usual scales, scales by means of which squares, cubes, square roots, and cube roots could be read directly from the rule.

In 1697 William Hunt made a rule having a scale giving the areas of circles of known diameters, one for finding the perimeter of ellipses of known axes and a scale for finding the width or length of a rectangle. This last scale is now known as the scale of reciprocals or the inverted scale. This inverted scale was first used on the rule as a simple regular scale running in the reverse direction, by William Wollaston who also in 1815 made a rule with scales specially adapted for the calculations involved in chemistry.

A very important improvement was made by Sir Isaac Newton when he devised a method of solving cubic equations by laying three movable slide rule scales side by side 'and bringing them together or in line by laying a separate straight edge across them. This is now known as a runner. It was first definitely attached to the slide rule by John Robertson in 1775.

About 1780 William Nicholson, publisher and editor of "Nicholson's Journal", a kind of technical journal, began to devote most of his time to the study and improvement of the slide rule and used his "Journal" to advertise various rules and promote their use. He especially improved the circular and spiral forms of rules. In 1817 Sylvanus Bevan introduced what is now known as the folded scale. This scale was of the same length and graduations as the usual logarithmic scale but was divided into two parts so that it began at the left-hand end of the rule at a point a little past 3 and proceeded to 10 near the center, and beginning again at that point with 1 proceeded to the same number at the right-hand as was placed at the left.

About 1815 the slide rule was neglected and fell into disuse in England. France then became the leading country in its development and production.

FRANCE

Little was done toward the development of the slide rule in France until the time of the French Revolution. During this period some of the world's greatest mathematicians and physicists such as Fourier, Poisson, Ampere and Bernoulli lived. About 1850 the government made knowledge of the slide rule a requirement for admission into all technical public services.

In 1815 the log-log scale was added to the slide rule by Peter Roget, a French physician. By means of this scale it is possible to raise any number to any power and to take the corresponding roots. Improvements were made on this scale by Burdon and Blanc.

The present form of the slide rule was invented in 1850 by Amedee Mannheim. He was only nineteen years old at the time. His rule did not come into general use until 1859 when an Italian named Q. Sella published a book recommending the use of the Mannheim rule.

UNITED STATES

One of the earliest slide rules produced in the United States was Palmer's "Computing Scale" which appeared in Boston in 1844. It was a circular rule eight inches in diameter, thus providing a scale about 25 inches long. It was used only in Massachusetts and New York.

The slide rule came into general use in 1880 when the Mannheim rule was first introduced. Knowledge of the use of the slide rule was made a part of the required courses in mathematics and engineering at Washington University in St. Louis about 1880. In 1881 the well known Thacher Cylindrical Slide Rule was patented by Edwing Thacher, a graduate of Polytechnic (Rensselaer) Institute.

In 1890 William Cox began a long campaign of propaganda and education in the columns of the "Engineering News", published in New York. He used the Mannheim rule as a standard. In 1891 Cox patented his duplex slide rule. The inverted, equal parts, cube and folded scales were, about 1897, added to the Cox duplex rule and the resulting rule called the "Poly-face Duplex" rule.

The standard rules in the United States are made by the Keuffel & Esser and the Eugene Dietzgen companies. The use of the circular rule is beginning to spread in the United States.

Since 1886 the scales have been mounted on white celluloid instead of on boxwood or as in some cases metal. At the present time a Japanese wood is becoming very popular.