

Slide Rule and Logarithmic Tables

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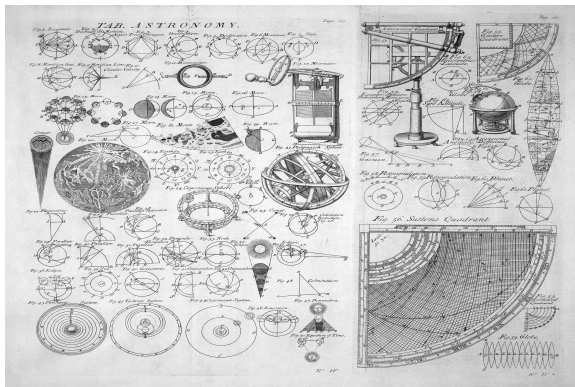
Slide Rule and Logarithm Tables History



Scientific Development

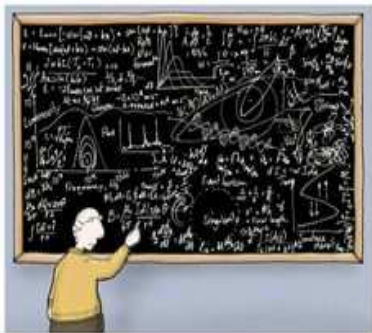
The late sixteenth century saw unprecedented development in many scientific fields; astronomy, long-distance navigation, and efforts to measure and represent the earth.

These investigations required much from mathematics.



Computation Demands of the Late Sixteen Century

Reducing the calculation load that resulted from dealing with such large numbers, and with it, the errors that unsurprisingly came into the results, became a prime objective for mathematicians. As a result, much energy and scholarly effort were directed towards the art of computation



Mathematics made simple



John Napier

The Scottish mathematician John Napier was famous for his devices to assist with computation. He invented ingenious numbering rods known as Napier's bones, that offered mechanical means for facilitating computation. Napier first published his work on logarithms in 1614 under the title *A Description of the Wonderful Table of Logarithms*.



Figure: John Napier, 1515-1670

<http://www.britannica.com/EBchecked/Napier>

Slide Rule Invention

The invention of the slide rule was made possible by John Napier's invention of logarithms, and Edmund Gunter's invention of logarithmic scales, which slide rules are based upon.

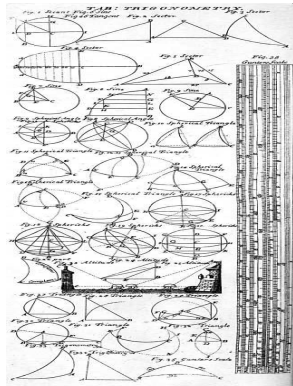


Figure: Gunter's Trigonometry

William Oughtred

- William Oughtred is the inventor of the slide rule in 1622 and made the first one by inscribing logarithms on wood or ivory.
- Before the invention of the hand calculator, the slide rule was a popular tool for calculations.



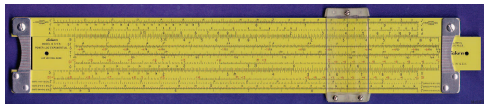
The use of slide rules continued until about 1974, after which electronic calculators became more popular



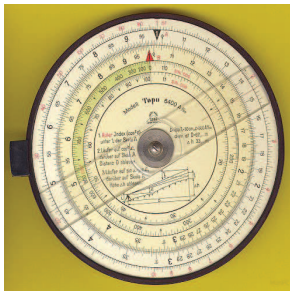
What do you think about those new electronic slide rule calculators?

First Slide Rules

The rectangular (1620)



The circular (1632)

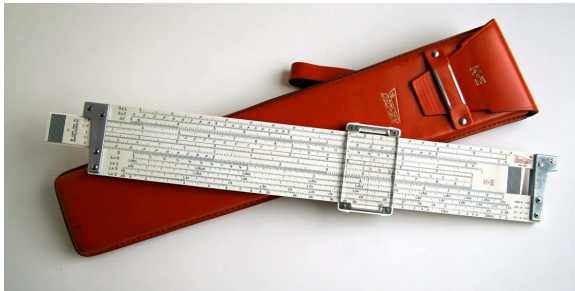


Later Developments of Slide Rules

Several inventors improved upon William Oughtred slide rule.

- 1677 - Henry Coggeshall invented a 2 foot folding slide rule for lumber measure, called the Coggeshall slide rule.
- 1815 - Peter Mark Roget invented the log log slide rule, which included a scale displaying the logarithm of the logarithm.
- 1859 - French artillery lieutenant Amde Mannheim invented an improved slide rule.
- 1891 - Edwin Thacher introduced a cylindrical slide rule in the United States.
- The duplex rule was invented by William Cox in 1891.

- The slide rule works by simplifying multiplications and divisions into logarithmic scale additions or subtractions.
- Slide rules basically print fit scales into a ruler-type setup and by just sliding a cursor against another scale, long operations can be done quickly



Before the invention of calculators, the only alternative to slide rules was to use tables of logarithms.

These were published to varying degrees of accuracy.

Prior to the advent of computers and calculators, using logarithms meant using such tables, which were mostly created manually.

The image shows an open book with two pages of a logarithmic table. The left page is titled "LOGARITHMS OF NUMBERS" and "Log. v. 18072". The right page is titled "LOG". Both pages contain dense columns of numbers and are divided into sections for "Mean Differences".

Four figure Logarithmic Tables

The four figure logarithms table was the most common form of logarithms and until the 1970s was familiar to most school children.

COMMON LOGARITHMS										$\log_{10} x$		
x	0	1	2	3	4	5	6	7	8	9	Δ_m	I 2 3
	+											
50	.6990	6998	7007	7016	7024	7033	7042	7050	7059	7067	9	1 2 3
51	.7076	7084	7093	7101	7110	7118	7126	7135	7143	7152	8	1 2 2
52	.7160	7168	7177	7185	7193	7202	7210	7218	7226	7235	8	1 2 2
53	.7243	7251	<u>7259</u>	7267	7275	7284	7292	7300	7308	7316	8	1 2 2
54	.7324	7332	7340	7348	7356	7364	7372	7380	7388	7396	8	1 2 2
55	.7404	7412	7419	7427	7435	7443	7451	7459	7466	7474	8	1 2 2
56	.7482	7490	7497	<u>7505</u>	7513	7520	7528	7536	7543	7551	8	1 2 2
57	.7559	7566	7574	<u>7582</u>	7589	7597	7604	7612	<u>7619</u>	7627	8	1 2 2
58	.7634	7642	7649	<u>7657</u>	7664	7672	7679	7686	<u>7694</u>	7701	8	1 2 2
59	.7709	7716	7723	7731	7738	7745	7752	7760	7767	7774	7	1 1 2

References:

[http : //inventors.about.com/od/sstartinventions/a/SlidfeRuler.htm](http://inventors.about.com/od/sstartinventions/a/SlidfeRuler.htm)

[http : //en.wikipedia.org/wiki/WilliamOughtred](http://en.wikipedia.org/wiki/WilliamOughtred)

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*[//www.maa.org/publications/periodicals/convergence/logarithms –
the – early – history – of – a – familiar – function – john – napier –
introduces – logarithms](http://www.maa.org/publications/periodicals/convergence/logarithms-the-early-history-of-a-familiar-function-john-napier-introduces-logarithms)*