

Computational Hardware and Software

Any study of the history of calculation must take account of the variety of hardware that people have invented to and the software algorithms that are developed from time to time. In ancient China the software (decimal place-value system) was so good that the hardware (counting rods, counting boards, and abacus) worked with it very smoothly. The Greek and Roman system of writing numbers, however, was not a good representation of the decimal system, and probably the abacus was an essential tool of computation. When the graphical methods associated with Hindu-Arabic numerals were introduced into Europe, they were thought to be superior to the abacus. This belief is reflected in the famous woodcut called the *Margarita Philosophica* (*Pearl of Philosophy*), which is wrong on nearly every point of its implied history. Boethius never used Hindu-Arabic numerals, since he had been dead for hundreds of years before they came, nor is it likely that Pythagoras used an abacus.



A woodcut from the encyclopedia *Margarita Philosophica* (1503) by Gregor Reisch (ca. 1467–1525). Boethius using Hindu-Arabic numerals wins a calculating contest with Pythagoras, who is using an abacus.