

Robert Recorde

Robert Recorde (1510-1588) wrote the first English textbooks on arithmetic and algebra, which became the standard works in Elizabethan England. The earliest use of the printed English word “algebra” is found in his *Pathway of Knowledge* (1551), when he wrote “Also the rule of false position, with dyvers examples not onely vulgar, but some appertaining to the rule of Algebra.” The Egyptian calculation method, called the rule of false position, was still in use in the Middle Ages. In his popular arithmetic *Grounde of Artes* (1540), Recorde explains it thusly:



“Gesse at this woorke as happe doth leade.
By chance to truthe you may procede.
And firste woorke by the question,
Although no truthe therin be don.
Suche falsehode is so good a grounde,
That truth by it will soone be founde.

Recorde was born in Tenby, Pembrokeshire Wales. Little is known of his childhood. He studied at Oxford and obtained a fellowship to All Souls College in 1531, before moving to Cambridge where he received a medical degree in 1545. He gave private lessons in mathematics at both Oxford and Cambridge, but after earning his M.D. he became the physician to the monarchy. He died in King’s Bench prison, Southwark. The exact reason for his imprisonment is not known. Recorde was an ally of the Lord Protector Edward Seymour, who appointed Recorde to the post of controller of the mint at Bristol. Later he was appointed to oversee the king’s mines in Ireland. In this position he was in charge

of silver mines at Wexford. Some believe that his misfortune was due to mismanaging the mines, while others claim that he had backed the wrong man. During the turmoil following the death of the sickly boy king Edward VI in 1553, the Duke of Pembroke became the most powerful man in the kingdom. Recorde unwisely and unsuccessfully brought a lawsuit against the Duke, who counter sued Recorde for defamation. Recorde was found guilty and ordered to pay Pembroke the astronomical sum of 1000 pounds.

In *The Grounde of Artes*, which ran to eighteen editions, Recorde gave instructions in computation both by abacus and algorism with commercial applications. He used the signs “+” to indicate excess and “-” to indicate deficiency. He represented the equality of two ratios by two equal and parallel lines whose opposite ends are joined diagonally that is by a symbol similar to a Z. According to Recorde, it was only necessary to learn the multiplication tables as far as “five times five.” The following illustration for finding the product 9×6 is an example of his algorithm for other multiplications.

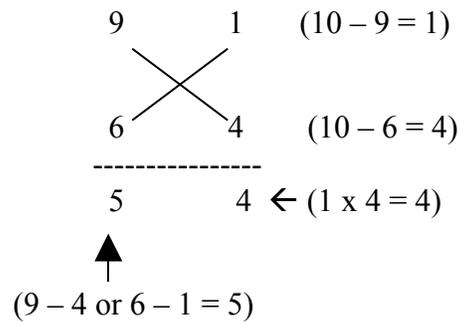
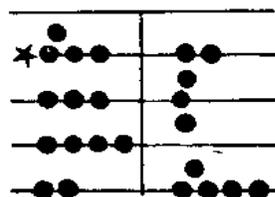


Figure 8.5 shows a page from in which Recorde demonstrates the use of “counters” in finding the sum of 2659 and 8342.

A D D I T I O N.

Master.

The easiest way in this arte, is to adde but two summes at ones together: how be it, you maye adde moze, as I wil tel you anone. therefore whenne you wylle adde two summes, you shall fyrste set downe one of them, it forceth not whiche, and then by it draw a lyne crosse the other lynes. And afterwarde sette downe the other summe, so that that lyne maye be betwene them: as if you woulde adde 2659 to 8342, you must set your sumes as you see here.



And then if you lyst, you maye adde the one to the other in the same place, or els you may adde them bothe tohither in a new place: which way, by cause it is most plyest

Figure 8.5

Recorde's *The Whetstone of Witte* (1557) was England's first taste of algebra. According to the author the book "containing the extraction of Rootes: The *Cossike* practice, with the rule of *Equation*: and the woorkes of *Surde Nombres*." The old name for algebra was the "Cossic Art." The Latin phrase *Cos Ingenii* translated into English is "The Whetstone of Wit." It was in this work that Recorde became the first in print to use parallel lines to represent the equality of two quantities. However it would be more than a century before this symbol won out over rival notations. Some preferred the symbol \parallel and others *ae*, from the word *aequalis*, which means equal, which was widely used until the 1700's. In the Recorde used the word "zenzizenzizick," which means the "eighth power of a number." It contains more z's than any other word in the English language. Figure 8.6 is the title page of "The Whetstone of Wit."

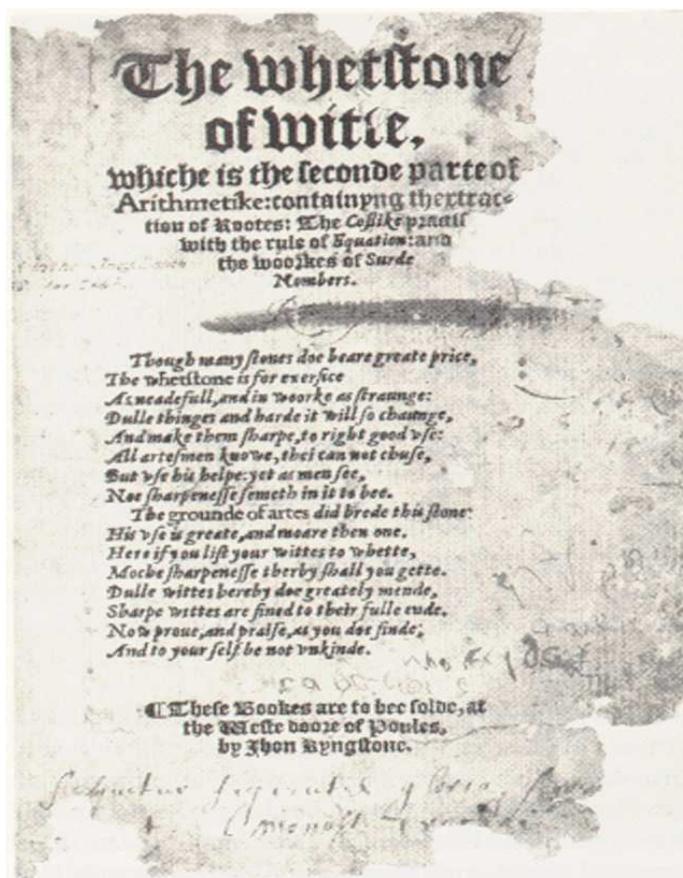


Figure 8.6

With these two books, written in the vernacular, Recorde in essence established the English school of mathematics. Among the other works of Recorde is a comprehensive textbook on astronomy *The Castle of Knowledge* (1551). It is not only a treatise on Ptolemaic cosmology, but it is the first book to inform English readers about the Copernican system, which had only been circulating for 20 years. *Pathewaie to Knowledge* (1551) is a translation and rearrangement of Euclid's *Elements*. The latter was the only one of Recorde's books not written in the form of a dialogue between a master and his young scholar. He also published a treatise that details uroscopic methods, *The Urinal of Physick* (1547). The early modern physician claimed, "both Urine and Pulse are so necessary, that without them all knowledge of Physick, besides, is doubtful, obscure, and uncertaine." Like other physicians of the time,

he asserts that urine is a waste substance of blood. He also described a urinal, called a *Jordan* after the river Jordan, a bladder-shaped glass container, which he claimed “should be of pure glasse, not thick, nor green in colour, without blots or spots in it, not fat at the bottome, nor too wide in the neck, but wider in the middle, and narrow still towards both ends, like the fashion commonly of an egg...”

Quotation of the Day: “To avoide the tedious repetition of these woordes: is equalle to: I will sette as I doe often in worke use, a paire of paralleles, or Gemowe [twin] lines of one lengthe, thus: ==, because noe 2 thynges, can be morare equalle.” – Robert Recorde