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ABOUT THE COVER: EARLY AMERICAN ARITHMETICS

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The handsome manner in which that work is printed, and the elegant manner in which it is bound, are pleasing proofs of the progress which the arts are making in this country....But I should do violence to my own feelings if I suppress an acknowledgement of the belief that the work itself is calculated to be equally useful and honorable to the United States.

These are the words of George Washington after examining a copy of A New and Complete System of Arithmetic Composed for the Use of the Citizens of the United States by Nicholas Pike, 1788 [3].

The Pike arithmetic was not the first arithmetic printed in the new world. The first was *Hodder's Arithmetick: Or That Necessary Art Made Most Easy* published in Boston in 1719 [2], and it was based on a 1661 English arithmetic by James Hodder. Isaac Greenwood, a Hollis Professor of Mathematics at Harvard, was the first North American author to write and have published an arithmetic in the colonies. His 1729 *Arithmetick Vulgar and Decimal: With the Application Thereof, to a Variety of Cases in Trade, and Commerce* may have been written for his own classroom at Harvard [1]. His arithmetic never had a wide audience, and Greenwood himself was censured for drunkenness and dismissed from Harvard in 1738.

The second arithmetic by a colonist was published in 1730, and it was in Dutch. Pieter Venema's *Arithmetica of Cyfer Konst* [4] also had limited success. It consisted of only 63 leaves and was printed in New York by John Peter Zenger.

The first popular English language arithmetic by a person born in the colonies was this 1788 arithmetic by Nicholas Pike, the arithmetic of which George Washington spoke. It also received the following recommendations:



FIGURE 1. CLEAR COPY THE COVER. Title page of Nicholas Pike's A New and Complete System of Arithmetic, Composed for the Use of the Citizens of the United States, John Mycall, publisher, Newburyport, Massachusetts, 1788.

... we beg leave to acquaint the Public, that in our opinion it is a work well executed, and contains a complete system of Arithmetic. The rules are plain, and the demonstrations perspicuous and satisfactory; and we esteem it the best calculated, of any single piece we have met with to lead youth, by natural and easy gradations, into a methodical and thorough acquaintance with the science of figures.

Joseph Willard, President of the University in Cambridge [Harvard]

Upon examining Mr. Pike's System of Arithmetic and Geometry in Manuscript, I find it to be a Work of such Mathematical Ingenuity, that I esteem myself honored in joining with the Reverend President Willard, and other learned Gentlemen, in recommending it to the Public as a Production of Genius, interspersed with Originality in this Part of Learning, and as a Book suitable to be taught in Schools of Utility to the Merchant, and well adapted even for the University Instruction.

Ezra Stiles, President, Yale College

The book begins with numeration, defining such terms as billions, trillions, and even sextillions. There is an explanation of the notation by Roman letters: e.g., CCC = three hundred, D or $I_{\text{O}} =$ five hundred, M or $CI_{\text{O}} =$ one thousand, $I_{\text{OOO}} =$ fifty thousand. There are tables of various sorts: a money table showing how to convert farthings, pence, shillings, and pounds; US federal currency, which had already been authorized by Congress, is not mentioned in any of the exercises in the book, though later editions do use US currency. Other tables are time, distance, square measure, wine measure, ale or beer measure—we were not aware that 9 gallons are equivalent to 1 firkin of beer in London or that 54 gallons is the same as 1 hoghead.



FIGURE 2. One of Pike's illustrations from the section on Plain Trigonometry

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ART. 25. To measure a Sector.

Definition. A Sector is a part of a Circle, contained between an arch-line and two Radii or Semidiameters of the Circle.

RULE. Find the length of half the Arch by Art. z_3 : then multiply this by the Radius or Semidiameter, and the product will be the area.



FIGURE 3. A page from Mensuration of Superfices [3]

There is the method and example for finding the square root of a number, and there are two methods for the extraction of the cube root with examples for each method; there are also three approximation techniques for finding the cube root. One can find problems on the present worth of annuities, on permutations and combinations, on trigonometry. The second last section is an Introduction to Algebra with Sir Isaac Newton's Rule for raising a binomial or residual quantity to any power whatsoever. Infinite series are mentioned. The final chapter of the book is an Introduction to Conic Sections. Some 512 pages make up this early arithmetic.

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Nicolas Pike was born in Somersworth, New Hampshire, in 1743, son of Reverend James and Sarah Pike. He was a 1766 graduate of Harvard College and earned an A.M. degree three years later. During the time of the Revolution, he was a town clerk in Newburyport, and later he was a selectman and then a justice of peace. His academic career included being the master of the Newburyport grammar school, operating a private evening school, and a school for women.

The arithmetic was printed by John Mycall in Newburyport and went through eight editions. The *Abridgement of the new and complete system of Arithmetic...* was printed by Isaiah Thomas and continued to appear until 1830.

Pike's contribution to American education was substantial and enduring.

References

- [1] Isaac Greenwood, Arithmetick Vulgar and Decimal: With the Application Thereof, to a Variety of Cases in Trade, and Commerce, Cambridge, 1729.
- [2] James Hodder, Hodder's Arithmetick: Or That Necessary Art Made Most Easy, Boston, 1719.
 [3] Nicholas Pike, A New and Complete System of Arithmetic, Composed for the Use of the
- Citizens of the United States, John Mycall, publisher, Newburyport, Massachusetts, 1788.
- [4] Pieter Venema, Arithmetica of Cyfer Konst, John Peter Zenger, publisher, New York, 1730.

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