Eckert, John Adam Presper, Jr. (1919–1995)

See Institute of Radio Engineers; Checking circuits and diagnostic routines. In Convention Record of the I. R. E. Part 7 - Electronic computers.


Eckert, Wallace John (1902–1971)
See Mathematical Tables and Other Aids to Computation (MTAC); IBM pluggable sequence relay calculator. Vol. III, No. 23, July 1948.

E 1
Eckert, Wallace John (1902–1971)
Punched card methods in scientific computation

- Year: 1940
- Place: New York
- Publisher: Thomas J. Watson Astronomical Computing Bureau
- Edition: 1st
- Language: English
- Binding: original cloth boards
- Pagination: pp. x, 136
- Size: 241x168 mm
- Reference: Ran ODC, p. 416

See the entry for Baehne, Practical applications of the punch card, 1935, which gives information on the use of punched card office machinery for scientific computation at Columbia University.

This volume describes the IBM accounting machines used and the methods employed for various tasks such as interpolation, integration, multiplication of various tabular functions, etc.

Illustrations available:
Title page

Eckert, Wallace John (1902–1971) and Ralph F. Haupt
See Mathematical Tables and Other Aids to Computation (MTAC); The printing of mathematical tables, Vol. II, No. 17, January 1947.

E 2
Eckert, Wallace John (1902–1971) and Rebecca Jones
Faster, faster

- Year: 1955
- Place: New York
- Publisher: McGraw-Hill Book Company
- Edition: 1st
- Language: English
- Binding: original cloth boards; gilt-embossed cover and spine; with dust jacket
- Pagination: pp. viii, 160
- Size: 228x148 mm
- Reference: DSB, vol. 15, pp. 128–130

After Wallace Eckert (not to be confused with J. Presper Eckert, chief engineer of the ENIAC) received his Ph.D. degree in astronomy from Yale University, he joined the faculty of Columbia University and, except for wartime service, spent his entire career there. Eckert was influenced by the work of L. J. Comrie in England, who had pioneered the application of commercial office machines to scientific computation. He successfully used the punched card equipment of the Columbia University Statistical Bureau (a gift to the University from IBM)
for the reduction of astronomical data and the solution of planetary equations. During World War II, Eckert was director of the U. S. Nautical Almanac Office. He then returned to Columbia to establish the Watson Scientific Computing Laboratory at Columbia University, an organization sponsored by IBM and named in honor of Thomas J. Watson, chairman of IBM. Rebecca Jones was a staff member at the laboratory.

This work is a semi-popular description of the NORC (Naval Ordnance Research Calculator). NORC was manufactured under contract with the U. S. Navy by IBM. It was delivered and operational by December 1954, two years after IBM had made delivery of its first commercial computer—the IBM 701. It used the same technology as the 701—electrostatic memory and vacuum tubes—but to achieve the precision that the Navy required for its ballistic calculations, it had a much longer word length (64 bits or 16 binary-coded-decimal digits). It was one of the most powerful machines of its day. During the dedication ceremony, John von Neumann spoke of the types of problems that it might be used to solve and the advances this could bring to areas such as fluid mechanics.

The book provides a basic non-technical description of a first-generation stored program computer and how it executes instructions. This is followed by a description of the machine components and the types of applications (illustrated with a ballistics example) for which it might be used. McGraw-Hill published the commercial edition of this book, and IBM published a promotional edition.
The two are identical except for the title page. This collection holds three copies of the McGraw-Hill version and one copy of the IBM version.

Illustrations available:
- McGraw-Hill title page
- IBM title page
- Frontispiece of the NORC
- CRT memory unit

**E 3**

**Eckert-Mauchly Computer Corporation**


Year: 1949
Place: Philadelphia
Publisher: Franklin Institute
Edition: 1st
Language: English
Binding: Buckram
Pagination: pp. 360–362
Size: 232x155 mm

The Eckert-Mauchly Computer Corporation (originally named the Electronic Control Company) was formed in late 1946 by John Presper Eckert and John Mauchly, the developers of the ENIAC at the Moore School of Engineering at the University of Pennsylvania. Eckert, a brilliant engineer, had been introduced to the notion of electronic computing by Mauchly, a physicist who had a long-standing interest in methods for carrying out large-scale meteorological calculations.

The BINAC was the first computer shipped by Eckert-Mauchly. It was built to fulfill the requirements for a guidance computer for an early guided-missile project at Northrop Aircraft, Inc. It was also intended to serve as a test bed and pilot model for the much larger and more complex UNIVAC system with which Eckert-Mauchly hoped to make its mark. The BINAC was delivered to Northrop in 1949 but evidently was never used extensively. There are, in fact, no records of its ever having been used except for these demonstration programs and to pass acceptance tests. Unlike the ENIAC and UNIVAC, the machine was binary and could only read and write octal numbers. During this demonstration, BINAC apparently solved Poisson’s Equation and found twenty-six solutions in two hours. The reporter noted that the audience was asked for numbers at random for which BINAC would then calculate the square and cube roots. Entry was made on a small keyboard having only 8 keys.

Illustrations available:
- None

**E 4**

**Ekelöf, Stig (1904–)**


Year: 1951
Place: Gothenburg
Publisher: Erlanders Boktryckeri Aktiebolag
Edition: 1st
Language: French
Binding: original printed wrappers
Pagination: pp. 26
Size: 248x176 mm

This is a discussion of the calculating machines constructed in Sweden. It begins with the Scheutz and Wiberg difference engines, continues with BARK...
Erwin Tomash Library

(a relay-based digital computer) and the Chalmers University differential analyzer (one of the best in the world), and concludes with several specialized electrical machines for tasks such as Fourier analysis.

Illustrations available:
Title page

Elbourn, Robert D. and Richard P. Witt

Elliott, W. (~1893)
A description of the slide rule. With particular directions for the use of the glass slide rule invented by M. Leon Lalanne

Year: 1852
Place: London
Publisher: William Elliott and Sons
Edition: 1st
Language: English
Binding: original heavy paper wrappers; embossed covers
Pagination: pp. 48, 4
Collation: A–B²y²
Size: 175x107 mm

There are a number of Elliots who were involved in the instrument business during the nineteenth century. The relationship among them is not clear, and, in particular, it is not known if W. Elliott, the author, was the same person as the William Elliott who published this work.

Lalanne is known to have made his glass slide rule in 1851. He actually called it règle à calcul à enveloppe verre (calculating rule in a glass envelope), which is a more accurate description. Rather than being a slide rule made from glass, it had a set of scales on thin material sandwiched between two glass plates—a situation that at least kept the scales flat but did not allow for a sliding cursor. The Lalanne slide rule is shown in the illustrations noted below. These come from the instrument itself and not from the illustrations found in the publication, which are of the simplest possible sort.

Elliott Brothers (London) Limited
The Elliot Journal, Volume 1, Number 2, September 1951

Year: 1951
Place: London
Publisher: Elliott Brothers
Edition: 1st
Language: English
Binding: original paper wrappers
Pagination: pp. 37–68
Size: 254x203 mm

This issue of the journal contains a general description of a differential analyzer constructed by Elliot Brothers for use in its engineering department. The machine used the usual mechanical integrators; however, the interconnection between units was done via servo-links and electrical connections, and this eliminated the need for the torque amplifiers that had proved troublesome in earlier machines.

Illustrations available:
Title page
This work is a general discussion of the slide rule, with only occasional reference to the Lalanne instrument.

Illustrations available:
- Title page
- Illustration of Lalanne glass slide rule (from the actual instrument)

This arithmetic is the final book in a three-part series. The first was designed for children aged five to eight, the second was simply a set of exercises, and this volume, while reviewing the simple arithmetic operations, was designed to teach commercial business practice. It also includes some material on roots and mechanical calculations.

Illustrations available:
- Title page
- Rate of exchange table

E 8

**Emerson, William, M. T. (1701–1782)**

*Calculation, libration, and mensuration; or the arts of reckoning, weighing, and measuring. Being a mechanical work, adapted to the business and practice of tradesmen and artificers, in the shortest method possible; and designed purely for common use.*

Year: 1770  
Place: London  
Publisher: J. Nourse  
Edition: 1st  
Language: English  
Figures: 4 engraved folding plates  
Binding: contemporary mottled leather; rebacked  
Pagination: pp. 168  
Collation: A–K£L  
Size: 280x125 mm  
Reference: DeM AB, 78; Tay MP II, #168; Pogg, p. 662

William Emerson, the son of a schoolmaster, was born in Hurworth-on-Tees, Durham, and sent for his education to York. Upon graduation he returned to Hurworth and took private pupils but possessing no gift of teaching and his temper being warm, he soon lost them and determined to live off the income of £70 or £80 left him by his father (*Dictionary of National Biography*).

Emerson decided to occupy himself as a writer of mathematical texts and in 1763 is reputed to have walked about 250 miles to London to arrange for their publication. His works proved to be too advanced for beginners but were commended for their clarity. He was an eccentric
and uncouth in dress and behavior and was regarded by local citizens as someone who had secret powers. He wrote for popular journals under pseudonyms, one being Philopulentimechanalgegeomastrolongo.

This is a book designed to provide rules for performing the calculations encountered in trade or business. Emerson's explanations are terse, and the book is clearly intended as a reference work rather than as a textbook. Emerson makes no effort to cater to his audience. For example, in the first paragraph of the preface, he refers to his audience as the lower sort of readers.

The first part of the book concentrates on weights and measures while the second portion deals with geometric problems such as area, volume, gauging, and how to handle these calculations using Coggeshall's Sliding rule.

Illustrations available:
Title page
Preface

CALCULATION, LIBRATION, AND MENSURATION;
Or the Arts of RECKONING, WEIGHING, AND MEASURING.
BEING A MECHANICAL WORK, ADAPTED TO the Business and Practice of Trade, in which the several Methods of calculation are explained, and the Nature of Numbers fully exposed.

LONDON:
Printed for J. Nourse, in the Strand, at the Sign of the Anchor, in Ordinary to his Majesty.
MDCCCLXX.

Encyclopaedia Britannica

A treatise of the construction of logarithms: to which are added, tables of logarithms, sines, and tangents.
From the encyclopedia.

Year: 1802
Place: Philadelphia
Publisher: Thomas Dobson
Edition: 1st
Language: English
Figures: 1 engraved plate

This is the separately issued entry on logarithms from the eighteen-volume Encyclopaedia, or, A dictionary of arts, sciences, and miscellaneous literature, printed by Thomas Dobson in 1798. This was the name given to the first American edition of the Encyclopaedia Britannica, and the contents were identical to those of the third edition of the Britannica. The work was issued in parts from 1790 through 1797, and Dobson evidently printed a number of the entries (e.g., logarithms, chemistry, etc.) and sold them separately, sometimes augmented, as in this case, with the actual logarithmic tables.

The preface is the most informative part of this work. It begins with an extensive history of logarithms, followed by a lengthy section on the different methods of constructing logarithms used by Napier, Kepler, Briggs, Mercator, Gregory and Hutton. Each description is accompanied by examples.

Illustrations available:
Title page

Encyclopaedia Britannica

Mystik und Magie der Zahlen

Year: 1951
Place: Zurich
Publisher: Rascher
Edition: 3rd

Endres, Franz Carl (1878–1954)
This book looks at numbers and their relation to magic. It repeats the erroneous origin for Roman numerals (a “V” coming from the V-shaped gap between the thumb and first finger and an “X” representing two hands, etc.), then examines magic squares and a variety of mystic symbols.

Illustrations available:
Title page

Engalfred, Manauld

*Le manuel calendrier, par lequel est facile savoir le lieu & discours du soleil & de la lune, ensemble les festes fixes ou mobiles, en leglise Romaine celebree*

Year: 1548
Place: Lyon
Publisher: Jean de Tournes
Edition: 1st
Language: French
Figures: 12 full-page woodcuts of hands; rubricated copy
Binding: modern vellum
Pagination: pp. 55, [1]
Collation: A–C⁴D⁴
Size: 163x102 mm
Reference: Mort HFB, p. 199; Bru MLAL III, 1353

Nothing is known about Manauld Engalfred (which may be a pseudonym for André Ugel—who is unknown as well).

The book is a description of a perpetual calendar using the fingers and joints of the left hand. There is no ability to calculate with this technique; it serves only as an aide-memoir for the user (see the illustration for the hands showing the Sunday letter). The text is divided into eight chapters, each of which deals with an aspect of the calendar—cycles of the sun, the moon, leap years, the fixed and movable feasts of the Catholic church, etc.

Engalfred wrote a provocative preface in which he pleads for others to share their knowledge. Such sharing, he believes, would lead in the future to men learning to fly like birds just as in the past men had learned to conquer the sea and swim like fish.

Illustrations available:
Title page
The hand showing the Sunday letters
ERA contracted to complete the development of this system with the federal government. It was a continuation of the Bush Rapid Selector project started at MIT in 1940. Several members of the ERA staff had worked on this MIT project, so it was natural that ERA be asked to complete it after the war. The machine could read microfilm at the rate of 10,000 frames per minute and, via an associated six-item encoding frame, select those frames of potential interest and recopy them onto a separate roll of 35mm microfilm through the use of high-speed photoflash techniques.

Illustrations available:
None
provides the best picture of the state of the industry in its infancy. Ostensibly written as a report to the Office of Naval Research, the work was really undertaken on behalf of the Naval cryptographic establishment. Engineering Research Associates, ERA, was a group formed primarily from demobilized World War II naval cryptographers. It presents a discussion of the mechanical and electrical (both analog and digital) devices that could be usefully incorporated into computing machines. Although it does not survey the computer projects then underway, it does occasionally discuss individual machines in the context of integrating devices into complete systems.

Engineering Research Associates (ERA) later became a division of Remington Rand and then of Sperry Rand. This copy is autographed by John Parker, founding president of ERA. A second copy is available, autographed by Thomas Wilder III, an early UNIVAC programmer at the Livermore National Laboratory.

Illustrations available:
- Title page
- Survey instrument (sector), E 15
- Instrument usage, E 15

Jean Errard, a native of Bar-le-Duc in France, studied mathematics and engineering in Italy. Upon his return to France, he entered military service with Charles III, Duke of Lorraine, and later became military engineer to Henri IV during the latter’s short reign. He is known to have been active in military campaigns from 1595 to 1609. His books on fortification, the first systematic treatment of the subject in the French language, along with the present volume on surveying and the use of surveying instruments, were intended for the instruction of military cadets.
This work demonstrates the validity of the statement (see Appendix essay on the sector) that simple versions of the sector were known and used by the military before either Galileo or Hood published their versions. However, it should be noted that calculations made with the Errard device would only have been approximate. The device could not be used with a pair of dividers (the scales ran along the edge of the rulers and thus offered no easy place for the points to sit). Rather, it relied on a cross-arm that was itself hinged and movable—a combination that would have performance resulted in inaccuracy.

The second section of this work deals with area measurement and the third with volumes and gauging.

Illustrations available:
- Title page
- Survey instrument
- Instrument in use 1
- Instrument in use 2

Erskine, the 11th Earl of Buchan, was the founder of the Society of Antiquaries of Scotland. Minto had studied at the University of Pisa and then returned to Scotland. The year before this work was published, Minto was appointed professor of mathematics at the College of New Jersey (later renamed Princeton University), presumably after having written his part of this work. Erskine had been attempting to write biographies of eminent Scotsmen for some time but had received little encouragement. He decided to begin with Napier and, according to an advertisement, hoped the work’s reception would encourage him to continue with others.

This biography of John Napier describes his major inventions. Napier, who is best known for the invention of logarithms, created other aids to calculation (Napier’s bones, his chessboard abacus, the multiplicationis promptuarium). He also made advances in mathematics, particularly in spherical trigonometry. All of these accomplishments are described in this volume. Erskine wrote the biographical material, and Minto was responsible for the technical portions. This is one of the very few places where a complete description, in English, of the chessboard abacus (also known as local arithmetic) appears, and thus that complete section is
reproduced in the illustrations. An engraved frontispiece portrait of Napier was taken from a portrait owned by Erskine. This copy does not have the errata sheet that evidently was part of later issues. This copy contains the signature and book plate (Dunnichen Library) of George Dempster, an MP for Fife, and later bookplates of John Farquhar Fulton (biographer of Boyle and others) and Haskell Norman (Janus Foundation).

Some catalogs list the first edition as 1778, but this error presumably arose from the simple transposition of the last two digits.

Illustrations available:
- Title page
- Frontispiece portrait of Napier
- Plates of multiplicationis promptuarium and local arithmetic
- Description of local arithmetic procedures (3)

Leurechon, a Jesuit priest, was rector and professor of mathematics at the Collège de Bar-le-Duc, where he was influential in the court of the dukes of Lorraine. Van Etten (van Netten) was evidently Leurechon’s nephew and pupil.

This book is a collection of ninety-one problems and amusements. Although the title implies they are mathematical in nature, the problems actually cover arithmetic, geometry, cosmography, clock making, astronomy, navigation, music, optics, mechanics, and several other fields. Many of the problems are illustrated with small woodcuts, one of them a very early illustration of the thermometer.

There are varied opinions as to the actual author of this work. Some authorities attribute it to Leurechon, suggesting that he published it under his pupil’s name for reasons unknown. Others suggest that the work is Van Etten’s and that Leurechon and others (Claude Mydorge and Denis Henrion) all made significant contributions, particularly to later editions. Van Etten is given credit in the English translation produced by William Oughtred (Etten, Mathematical recreations, 1653), but even the attribution of the translation to Oughtred is in doubt. For further information, consult Trevor H. Hall, Mathematical recreations, 1969.

Illustrations available:
- Title page
- Thermometer problem

Estrin, Gerald

See Institute of Radio Engineers; Diagnosis and prediction of malfunctions in the computing machine at the Institute for Advanced Study. In Convention Record of the I. R. E. Part 7 - Electronic computers. March 23–26, 1953.

Ettet, Hendrik van [Jean Leurechon] (ca.1591–1670)

Recreation mathematique composee de plusieurs problemes plaisants et facetieux. En faict d’arithmetique, geometrique, mechanique, optique, catoptrique, & autres parties de cette belle science. Augmente de plusieurs notes ou remarques, faisans à l’intelligence, & corrections de plusieurs problemes.
Etten, Hendrik van [Jean Leurechon] (ca.1591–1670)

Mathematicall recreations, or, a collection of many problems, extracted out of the ancient and modern philosophers, as secrets and experiments in arithmetick, geometry, cosmographie, horologiographie, astronomie, navigation, musick, opticks, architecture, statick, mechanicks, chemistry, water-works, fire-works, &c. Not vulgarly manifest till now. Written first in Greeke and Latin, lately compi’ld in French, by Henry Van Etten, and now in English, with the examinations and augmentations of divers modern mathematicians. Whereunto is added the description and use of the general horologicall ring: and the double horizontall diall. Invented and written by William Oughtred.

b/w: Oughtred, William; The description and use of the double horizontal dyal, 1674.

Year: 1653
Place: London
Publisher: William Leake
Edition: 2nd (English)
Language: English
Figures: 97 text engravings; additional engraved folding frontispiece bound in
Binding: modern panelled leather; red leather label
Pagination: pp. [38], 288 (mistly 286 as 285, 287 as 286), [16]
Collation: A"*§B–R'S'T''V"X"*6
Size: 162x105 mm
Reference: Win ESTC, L1790

See entry for Etten, Recreation mathematique, 1626. This English translation has long been attributed to William Oughtred because his work, bound after the main material, is mentioned on the title page. This edition was apparently translated from editions published after the French edition in this collection (see Etten, Recreation mathematique, 1626) because the problems are not always identical (the thermometer, for example, is not included). It has two additional sections that were not included in the original. The first of forty-five additional problems is usually attributed to Denis Henrion and/or Claude Mydorge. The second, a treatise on fireworks, gives directions for creating rockets, mortars, and other highly dangerous amusements.

The printing of this edition was apparently done in two stages, with the illustrations being printed after the text was complete. This process has resulted in some of the woodcuts slightly overlapping the text in places and at least one being upside down. There are two title pages to the work, one typeset and the other engraved. The Oughtred work, obviously meant to be included in the volume, has its own title page.
Etten, Hendrik van

Mathematicall RECREATIONS. OR,

LONDON:
Printed for William Leake, at the Signe of the Crown in Fleet-street, between the Two Temple Gates, MDCCCLII.

Typeset title page, E 18

E 19

Etten, Hendrik van [Jean Leurechon] (ca.1591–1670)

Mathematical recreations: or, a collection of many problems extracted out of the ancient and modern philosophers: as, secrets and experiments in arithmetick, geometry, cosmography, horolography, astronomy, navigation, musick, opticks, architecture, statick, mechanicks, chymistry, water-works, fire-works, &c. Not vulgarly manifest till now. Written first in Greek and Latin, lately compiled in French, by Henry Van Etten, and now in English, with the examinations and augmentations of divers modern mathematicians. Whereunto is added, the description and use of the double horizontal dial, and the general horological ring: invented and written by William Oughtred.

b/w: Oughtred, William; The description and use of the double horizontal dial, 1674.

See entry for Etten, Recreation mathematique, 1626.

This English edition appears identical to the one from 1653 with minor exceptions (e.g., the difference between mathematicall and mathematical on the typeset title pages) and has a similar, but not identical, engraved title page.

Illustrations available:
- Title page – typeset
- Title page – engraved

Euclid

Euclid - [Egnatio Danti] (1537–1586), translator

La prospettiva di Euclide, nella quale si tratta di quelle cose, che per raggi diritti si veggon: & di quelle, che con raggi restessi nell specchi appariscono.

b/w: Danti; Primo volume dell’uso ..., 1578

This is a translation of the works of Euclid by Danti.

Illustrations available:
- Title page
Thomas Everard, of whom little else is known, was a gauger working for the Excise in Southampton.

This book describes the use of two different slide rules—one for gauging and a similar one for Victuallers worts (unfermented beer). Neither instrument is illustrated; however, they are described as being square in cross section (about one third of an inch) and 38 inches long:

... which for conveniency of Carriage ... is put into a Cane, which may also serve to walk with.

Later versions of the Everard rule were produced. They were about one-inch square with four sliding sections, one on each face. The extra rules were added by Shirtcliffe, Leadbetter, and others. By 1705, Everard was able to boast that many thousands had been sold and were in use (Peter Hopp, Slide Rules, Astragal Press, 1999). This form of the slide rule (with markings useful for gauging wine, beer and malt) became a standard for gauging in Britain.

The gauging slide rule has a separate slide on each of its four faces. All four faces are designed to facilitate the imposition of customs duty on the alcohol content of casks. Each of the slides has a single scale, with the same marks and numbers applying to both the top and bottom. This is a device commonly used before the introduction of the cursor. The first face and slide have a single
logarithmic scale along their upper edge and an inverted single logarithmic scale on their lower edge—identical with the D, C, and DI scales on a modern rule. Gage points provided are MB (malt bushel), A (ale gallon), and MD (malt depth). The second face is identified as Seg Ly and provides a means of calculating the content of barrels lying on their side. The third face shares a logarithmic cycle between the top and bottom edges, while the slide has a full logarithmic scale. The gauge points are: WG (wine gallon), AG (ale gallon), C (circumference), MS (malt square), and MR (malt round). The fourth face is identified as Seg St and is intended for the calculation of the content of barrels standing on end.

It should be noted that until 1924, the sizes of a gallon of ale and a gallon of wine differed. Tables are provided for the revenue to be charged for strong and small beer as well as a table of the volume (in ale gallons) of cylinders from 12- to 156-inch diameter for every tenth of an inch.

Everett was the deputy director of the Whirlwind project (under J. Forrester) and eventually took over as head of the MITRE Corporation when that company was created as an offshoot of the Sage Air Defense program.

This reprint of the 1947 first edition was originally written to specify the features of the as yet incomplete Whirlwind I. By 1952, the block diagrams were well out of date, and many of the features, particularly the electrostatic memory, had been completely changed. There was, however, a continuing need for training materials for maintenance workers now that Whirlwind was operational, and to fill that need, these two volumes were republished. The first volume contains the text and the second the logic and timing diagrams.

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**E 22**

**E 23**

**Eves, Howard Whitley** (1911–2004)

An introduction to the history of mathematics

Year: 1953
Place: New York
Publisher: Rinehart
Edition: 1st
Language: English
Binding: original cloth boards
Pagination: pp. 422
Size: 226x150 mm

Eves obtained his Ph.D. from the Oregon State University in 1948, but for most of his career (1954–1976) was a professor at the University of Maine. He wrote this book to accompany a course he gave on the history of mathematics. He desired that his students be required to do more than answer examination questions, so he included a number of problem studies with each section. These were intended to encourage the students to use the mathematical methods and instruments from the previous chapter. The book has been reprinted several times, usually with additions and later with colored illustrations.

Illustrations available:

Title page
Ewing, Alexander (1740–a.1800)

A synopsis of practical mathematics. Containing plain trigonometry, mensuration of heights, distances, surfaces, and solids; surveying of land, gauging, navigation, and gunnery. With tables of logarithms of numbers, and of sines and tangents.

Year: 1791
Place: Edinburgh
Publisher: Printed for J. & J. Fairbairn, and A. Guthrie
Edition: 3rd
Language: English
Figures: 5 engraved folding plates
Binding: contemporary leather
Pagination: pp. iv, 272, [156]
Collation: \[A–E^1\]
Size: 200X115 mm
Reference: Hend BTM, #91, p. 90

On the title page Ewing is described as a teacher of mathematics in Edinburgh, but nothing else is known about him.

This book is a text on practical mathematics. It deals with geometry, trigonometry, surveying, gauging, navigation, gunnery and logarithms (including a table of seven-figure logarithms). It would have been very useful for anyone contemplating a career in the navy. Two previous editions were issued in 1771 and 1779.

Illustrations available:
Title page