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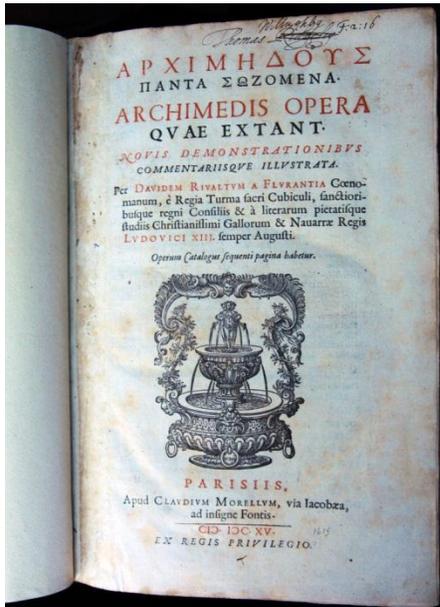
MATHEMATICS CATALOGUE SUMMER, 2012

RARE EDITION WITH SUPERB WOODCUTS

1. ARCHIMEDES

Αρχιμηδους παντα σωζομενα. *Archimedes opera.* Paris: Claude Morel, 1615. Folio. [xliv], 549 pp. Title in red and black with printer's device, ornamental initials, head- and tailpieces, woodcut mathematical diagrams throughout. Greek, Roman and Italic type. Contemporary calf, rebacked; inner margins of last dozen leaves waterstained, otherwise a very nice copy with contemporary annotations and the contemporary ownership signature of Thomas Willughby on the title page.

\$ 7500.00



The complete works of Archimedes, the first edition edited by David Rivault. It contains all Archimedes' monumental contributions to science: his discovery of the principle of specific gravity and methods for calculating the centres, circle measurements, the quadrature of the parabola and spirals, techniques of analysis, his theoretical work on mechanics and hydrostatics, an approximation of the value of π , and his treatment of the numeration of large numbers.

Archimedes of Syracuse (c. 287–212 BC) was the finest scientist and mathematician of the ancient world. He created mechanics and was a pioneer in the fields of statics and hydrostatics. According to Gauss, Archimedes had only Newton as a mathematical equal.

Dibner, 137; Horblit, 5; *Printing & the Mind of Man*, 72 (all cite the 1544 ed.)

RARE SOUTH AMERICAN MATHEMATICAL CONTESTS

2. AYALA, Manuel

Elementos de matematicas . . . para el uso de los ss. oficiales del batallon Cuzco e impresos a expensas de los mismos. Cuzco: Evaristo Gonzalez, 1832.

(bound with) *Certamen o conclusiones matematicas defendidas en este convictorio nacional de San Bernardo.* Cuzco: Imprenta del Govieno, 1825;

(bound with) *Certamen o conclusiones matematicas defendidas en esta Universidad de San Simon Colegio de Ciencias y Artes.* Cuzco: Imprenta del Gobierno, 1826;

(bound with) *Certamen matematico sostenido en el Colegio de Ciencias y Artes del Cuzco. Universidad de San Simon.* Cuzco: Imprenta del Gobierno, 1826;

(bound with) *Ecsamen de mecanica sostenido en el Colegio de Artes y Ciencias, Universidad de San Simon.* [Cuzco: n.p., n.d.]. Five works in one. 4to. vii, [i], 160 (including index and “Advertencia”); 24; 8; 3, [1]; 8 pp. Woodcut tailpieces in first work. Full contemporary calf, rubbed and stained, small hole in spine, small strip of decorated paper laid down on front cover; some interior staining and soiling, 2-inch vertical slit cut into pages 119-126. Contemporary ownership inscriptions to last two books. \$ 600.00

First (and only?) edition of the first work, *Elementos de matematicas*, intended for the instruction of the military serving the Cuzco area. General principles of basic mathematics are discussed and explained, as well as rules of interest and probability, plus specific “mathematical” needs for those in the local areas. The three *Certamen* are contests (perhaps competitions for placement or for “firsts”) in mathematics conducted at different institutions in Peru and name the specific students interested in these more advanced concepts for whom they were created. The first of these defines key terms, then presents examination questions specifically oriented toward military applications. The remaining works are similar in character.

These works reflect the educational and social reforms in Peru that followed the liberation by Simon Bolivar. The remarks in the preface concerning the conflict between religion and science, reflect the repression of religious orders in Peru that took place the same year.

Early Cuzco imprints are quite scarce.
Not in Sabin

VALUABLE MATHEMATICS SAMMELBAND

3. Six papers bound together in contemporary half-calf and marbled boards. The condition is excellent. The name G. Thieme is hand-written on the first blank (most likely the noted publisher of scientific journals). \$ 10,500.00

(1). DEDEKIND, Richard

Was sind und was sollen die Zahlen. Braunschweig: Vieweg and Son, 1888. 8vo. xviii, 58 pp., including half-title.

First edition, rare, of Dedekind’s important work on set theory. His epochal 1872 publication, *Stetigkeit und irrationale zahlen*, gave the first rigorous definition of the system of real numbers, laying the foundation for much of modern day real analysis and point-set topology. This, his follow-up work, elaborates on his attempts “to derive a purely logical foundation for arithmetic, and devised a number of axioms that formally and exactly represented the logical concept of whole numbers” (DSB). Dedekind (1831-1916), a German mathematician, friend and colleague of Georg Cantor, claimed all of mathematics to be a branch of logic. In this work (The nature and meaning of numbers), he “presents a theory of the integers using set-theoretic concepts and outlines a possible approach to placing the rationals on a logistically well-founded axiomatic basis” (Parkinson, p. 415).

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(2). FISCHER, Otto

Konforme abbildung sphärischer dreiecke auf einander mittelst algebraischer funktionen. Leipzig: von Metzger & Wittig, 1885. 8vo. 76 pp. Complete with half-title and 2 large folding plates on heavier stock.

First edition of the author's thesis on conforming images of spherical triangles by means of algebraic functions. Fischer (1861-1916) was a German physiologist and mathematician, earning a doctorate degree from the Franke Foundation in Halle an der Saale in 1885 under Felix Klein. His main interest was the mechanics of the muscles and joints of the human musculoskeletal system. He was a professor at the University of Leipzig, where he taught both medicine and mathematics.

(3). PHRAGMÉN, [Lars] E[dvard]

Über die Berechnung der einzelnen Glieder der Riemann'schen primzahlformel. Stockholm: Kongliga vetenskaps-Akademiens Förhandlingar, 1891. 8vo. pp. 721-744.

First edition of this famous work on the calculation of the individual members of the Riemann prime number formula.

The son of mathematics teachers, Phragmén (1863-1937) also taught mathematics before obtaining his degree at the University of Uppsala. He was an editor at the *Acta Mathematica*, where he corresponded with Poincaré to correct a book in which he found a number of errors. He was also president of the Swedish Society of Actuaries. He is best known, however, for the Phragmén-Lindelöf principle, an extension of the maximum modulus principle of complex analysis to unbounded domains.

(4). NEUMANN, Carl

Ueber den Satz der virtuellen verrückungen; Ueber das princip der virtuellen oder facultativen verrückungen. [Leipzig: von Breitkopf und Härtel, 1869]. Two separate papers. 8vo. pp. [257]-280; [53]-64. In *Königl. Sachs. Gesellschaft der Wissenschaften*. With annotations on the first couple of pages. At the end of the second paper, a thank you by C.F. Gauss.

Two works on virtual displacements. Neumann created the second-type boundary, which, when imposed on an ordinary or partial differential equation, if specifies the value that the derivative of a solution is to take on the boundary of the domain.

Neumann (1832-1925) was professor of mathematics at both the Universities of Tübingen and Leipzig. His main interests were in applied mathematics, and he wrote on mathematical physics, potential and electrodynamics. He was also editor of *Mathematische Annalen*.

(5). LERCH, M[atyaš]

Contributions à la théorie des fonctions; Addition au mémoire présenté dans la séance du 15 Octobre [Prag, 1886]. Two separate papers. 8vo. pp. 571-582; pp.423-432. With a 4 page letter containing mathematical symbols handwritten by Lerch to Karl Weierstrass (1815-1897) tipped in between the two papers. The letter is signed by Lerch and dated October 1890. A small section of page 582 is crossed out in the same hand.

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First printings of Lerch's contributions to general mathematical functions. These papers are the first in a series dealing with the general theory of functions, the most significant of which constitutes construction of continuous functions having no derivative. These works were written quite early. Lerch (1860-1922) showed exceptional abilities while still studying at the Czech Technical University at Prague. Before 1896 he published more than 110 scientific papers in domestic as well as prominent foreign journals. Much of his work concerned mathematical analysis, including theories of infinite series, of the gamma function, of elliptic functions, and the integral calculus.

Weierstrass is generally referred to as the father of modern analysis. He made significant contributions and advancements in the field of calculus of variations. Numerous theories and functions bear his name.

(6). MÉRAY, [Hugues Ch[arles Robert]

Théorie des radicaux fondée exclusivement sur les propriétés générales des séries entières. Dijon, Darantiere, [1885]. 8vo. 75, [1] pp. Title page in manuscript signed by Méray and dated Dijon, 1891. With annotations throughout probably by the author for another edition.

First edition of Méray's famous work, Radical theory based exclusively on the general properties of power series.

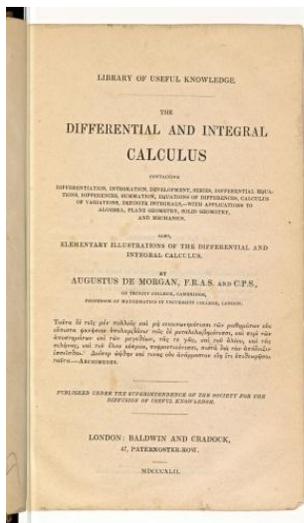
Méray (1835-1911) is remembered for having anticipated, clearly and with only minor differences of style, Cantor's theory of irrational numbers, one of the main steps in the arithmetization of analysis. Of interest, an earlier "arithmetical" theory of irrational numbers was propounded by Weierstraass in his lectures when he introduced the real numbers as sums of sequences of rational numbers. Dedekind also seems to have developed his theory of irrationals at an earlier date.

No copies of Phragmén, Lerch or Méray are located by OCLC

4. DE MORGAN, Augustus

The differential and integral calculus containing differentiation, integration, development, series, differential equations, differences, summation, equations of differences, calculus of variations, definite integrals, with applications to algebra, plane geometry, solid geometry, and mechanics. Also, elementary illustrations of the differential and integral calculus. London: Baldwin and Cradock, 1842; 1836. 8vo. xx, 64; 785, [3] pp. With errata, and numerous figures throughout. Contemporary long-grained morocco, rebacked, lightly rubbed; an excellent copy from the library of John Gotch Hepburn with his armorial bookplate.

\$ 750.00



First edition of one of the author's most distinguished work. "His memoirs on the foundation of algebra and his treatise on the differential calculus is a work of great ability and noticeable for the rigorous treatment of infinite series; his articles on the calculus of functions and on the history of probabilities are of special note" (Ball, *History of Mathematics*, pp. 474-75).

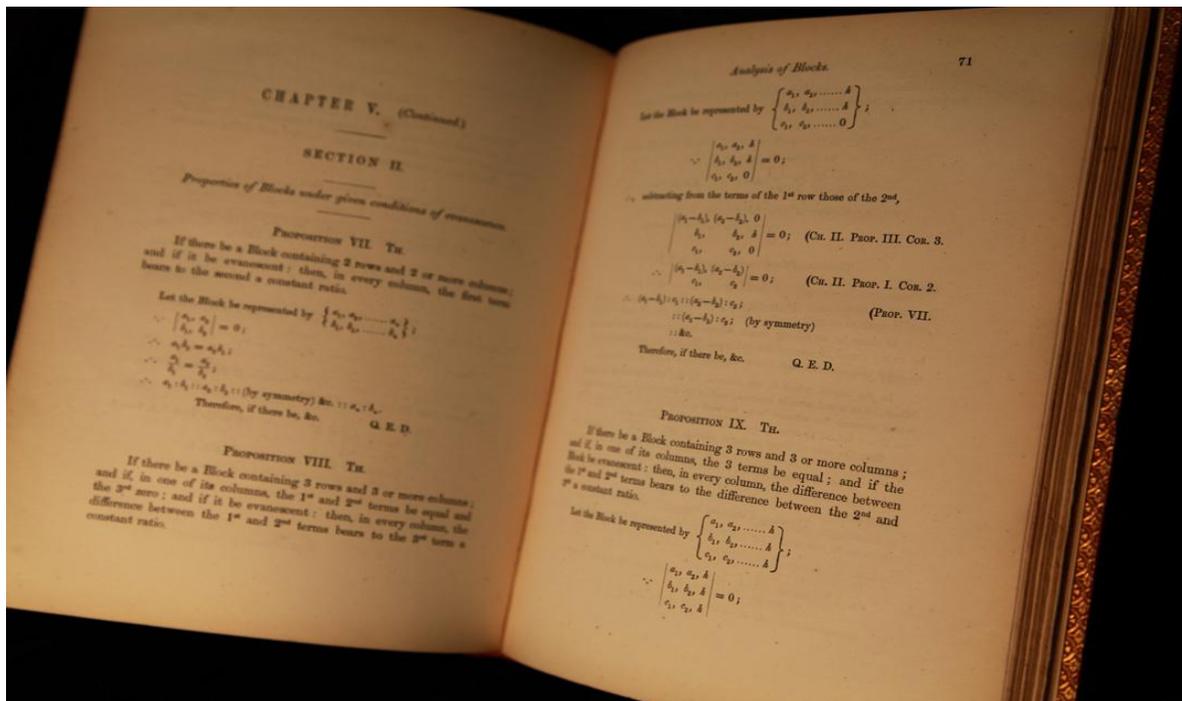
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De Morgan (1806–71) was a British mathematician whose main field was the study of logic. In 1828, he became professor of mathematics at the University of London. There, through his works and pupils, he exercised a wide influence on mathematicians. Together with George Boole, De Morgan can be credited with stimulating the upsurge of interest in logic that took place in the mid-nineteenth century.

Cajori, *A History of Mathematics*, p. 331; Porter & Ogilvie, *The Biographical Dictionary of Scientists*, I, pp. 291

5. DODGSON, Charles L.

An elementary treatise on determinants with their application to simultaneous linear equations and algebraical geometry. London: Macmillan, 1867. 4to. viii, 143 pp. A magnificent copy with the original cloth covers mounted and bound into full red calf by Rivière, with an elaborate gilt spine and morocco labels. \$ 8500.00



First edition of Dodgson's only full mathematics textbook, which presents his ingenious method for computing the determinant of a square matrix, greatly simplifying what was until then a tedious process of multiple computations. Determinants are useful in the analysis and solution of linear equations. Emerging in connection with the theory of equations, by the nineteenth century determinants had become an increasingly significant area of mathematical study.

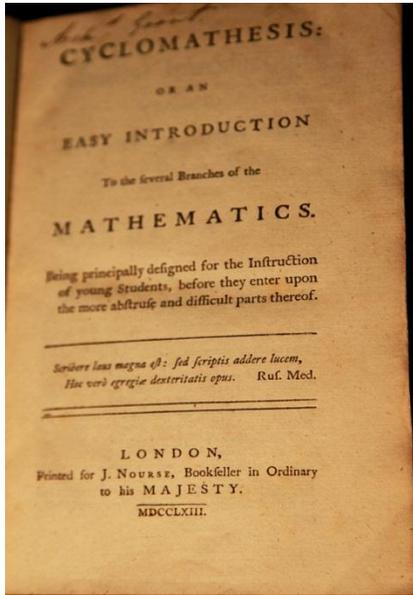
Dodgson (1832–1898), a logician and lecturer in mathematics at Christ Church, Oxford, is best known as the author of *Alice's Adventures in Wonderland*, *Through the Looking Glass*, and *The Hunting of the Snark*, written under his pseudonym Lewis Carroll.

Dictionary of National Biography, Vol. XXII, Supplement, pp. 567–569; Peterson, "Lewis Carroll and His Telescoping Determinants," in *The Mathematical Tourist* (https://www.maa.org/mathtourist/mathtourist_03_19_07.html); see Adrian Rice and Eve Torrence, "Shutting up like a telescope: Lewis Carroll's Curious Condensation Method for Evaluating Determinants" in *College Mathematics Journal*, 38, (March) 2007, pp. 85–95

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6. [EMERSON, William]

Cyclomathesis: or an easy introduction to the several branches of the mathematics. Being principally designed for the instruction of young students, before they enter upon the more abstruse and difficult parts thereof. London: Printed for J. Nourse, 1763. 8vo. xvi, 8, 244 pp. With tables and mathematical equations. Contemporary speckled sheep, neatly rebacked in calf, 2 morocco spine labels. Early ink signature on title, pencil signature of Robert S. Dunham on front paste-down. A very good copy. \$ 1200.00



First edition. According to Zeitlinger, *Cyclomathesis* “forms the first volume of a proposed cyclopaedia of mathematics, and contains (with sub-title) *A treatise of arithmetic, containing all the practical parts thereof, with the theory of numbers.* It was reprinted in 1791; the above first edition was unknown to Prof. De Morgan.”

Emerson (1701-82) was one of a handful of teachers to young men seeking an education that would qualify them for mathematical practice. Known as an eccentric with a bad temper and worse disposition, Emerson turned out simple textbooks on all branches of pure and applied mathematics, designed primarily for the self-educated man (or “mechanic” as he put it). Emerson produced a couple of dozen of such books, and there is evidence that they were widely used, and their author held in great esteem.

Taylor, *Hanoverian*, 168; Zeitlinger, I, 7545

EDITIO PRINCEPS

THE EARLIEST CONTRIBUTION TO THE PHILOSOPHY OF MATHEMATICS

7. EUCLID

[Greek:] *Elementa geometriac.* Basle: Johann Herwagen, 1533. Folio (310 x 200 mm). [vi], 268, 115 pp. With woodcut device on title and colophon, decorated woodcut border to first page of text and numerous woodcut diagrams. Contemporary English calf, neatly rebacked, remains of ties, later endpapers. A very good copy.

\$ 45,000.00



Editio princeps of Euclid’s *Elements*, an epic-making text with the important commentary by Proclus on the first book. The first printing of Euclid in 1482 was a Latin translation from an Arabic manuscript, but the original Greek text did not appear for a further half-century. The Greek text was edited by Simon Grynaeus, a German Protestant theologian and philologist. This edition is also important for the innovation of geometrical diagrams within the text, rather than in the margins as had been the case with the earlier printed editions.

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The commentary by the Neoplatonist mathematician and philosopher Proclus on the first book of the *Elements* is the earliest extant criticism of Euclid's fifth postulate on the existence of parallel lines, the study of which led, after a further fifteen hundred years of effort, to the discovery of non-Euclidean geometry by Gauss, Bolyai and Lobachevsky. It is also the first printing of the earliest work on the philosophy of mathematics. "Because of his interest in the principles underlying mathematical thought and their relation to ultimate philosophical principles, Proclus' commentary is a notable - and also the earliest - contribution to the philosophy of mathematics. Its numerous references to the views of Euclid's predecessors and successors, many of them otherwise unknown to us, render it an invaluable source for the history of science" (DSB).

Boyer, *A History of Mathematics*, pp. 111-15; Sanford, *A Short History of Mathematics*, pp. 268-75

"ANALYSIS INCARNATE"

8. EULER, Leonhard

Introductio in analysin infinitorum. Lausanne: Marc-Michel Bousquet, 1748. Two volumes. 4to. [ii], xvi, 320; [ii], 398, [2] pp. Titles in red and black with engraved vignettes, frontispiece by Soubeyran after De la Monce, and portrait of the dedicatee, Jean Jacques Dourtous de Mairan, by Frequet after Tocquet (mounted); initials, head- and tailpieces, chapter vignettes, directions to the binder and 41 folding engraved plates (plates 37 and 38 misbound). Contemporary mottled calf, gilt-ornamented spine; marbled paste-downs, spotting and soiling, especially to preliminary and endleaves. \$ 9000.00

First edition. This definitive work on analytical mathematics caused a revolution in this branch of mathematics, a subject which had hitherto never been presented in such a general and systematic manner. Treating trigonometry as a branch of analysis, Euler introduced the now current abbreviations for trigonometric functions, and pointed out the relation between trigonometric and exponential functions. He was also the first to discuss the equation of the second degree in three variables and to classify the surfaces represented by it. Euler's work on infinite series culminated in the creation of the theory of definite integrals, known as Eulerian integrals. He further developed the calculus of finite differences, and established the theorem of homogeneous functions.

Euler (1707-1783), one of the most important Swiss mathematicians, was a student of Johann Bernoulli, and later went to St. Petersburg to teach mathematics and physics. He published important works in other fields of science, including dynamics, chemistry, medicine, and astronomy.

Bell, *Men of Mathematics*, pp. 139-52 (Chapt. 9, "Analysis Incarnate"); *Printing & the Mind of Man*, 196; Struik, *Source Books in Mathematics*, pp. 345-351

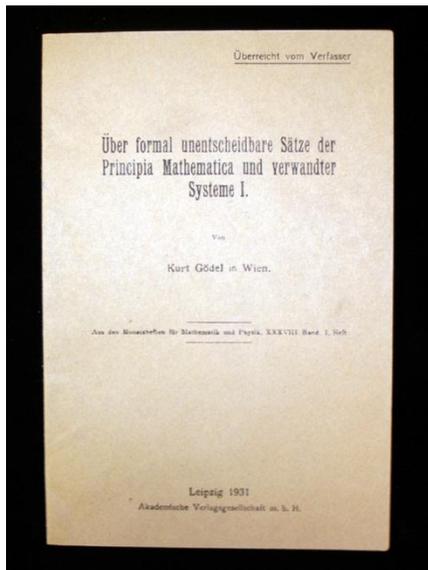


GÖDEL'S PROOF

9. GÖDEL, Kurt

“Über formal unentscheidbare Sätze der Principia Mathematica und verwandter Systeme I.” Offprint from *Monatsheften für Mathematik und Physik*, XXXVIII, Band I. Leipzig: Akademische Verlagsgesellschaft, 1931. 8vo. pp. [173]-198. Original printed back wrapper; front wrapper in facsimile (from the copy owned by Princeton University, with *Überreicht vom Verfasser* printed on top); small stain (from tape?) on bottom corner of first page. Preserved in a full morocco clamshell case. \$ 75,000.00

First edition of the first printing of **Gödel's Proof**, the single most celebrated result in mathematical logic. This paper, **On Formally Undecidable Propositions** (Incompleteness Theorem) is of legendary rarity. We were only able to locate one copy at Princeton University. Famed mathematician Kurt Gödel proved two extraordinary theorems. His paper showed that arithmetic was incomplete. In any consistent formal system able to describe simple arithmetic, there are propositions that can be neither proved nor disproved on the basis of the system. Thus a larger system may have to be used to prove consistency, and its consistency assumed; all pretty unsatisfactory.



Accepted by all mathematicians, these propositions have revolutionized mathematics, showing that mathematical truth is more than logic and computation. It helped tear down the notion that there was anything certain about the universe.. According to philosophy professor Rebecca Goldstein, Gödel was an intellectual heir to Plato, whose sense of alienation from the positivists and post-modernists of the 1940's was only ameliorated by his friendship with Einstein. As Goldstein writes, "That his work, like Einstein's, has been interpreted as not only consistent with the revolt against objectivity but also as among its most compelling driving forces is . . . more than a little ironic."

Gödel (1906-1978), an Austrian born philosopher and mathematician, studied at Vienna. He saw much of the development of the positivist school of philosophy and was apparently unconvinced. He investigated the larger logical system put forward by Russell and Whitehead in their *Principia mathematica* and his resulting paper (above) may well be the most significant event in 20th century mathematics.

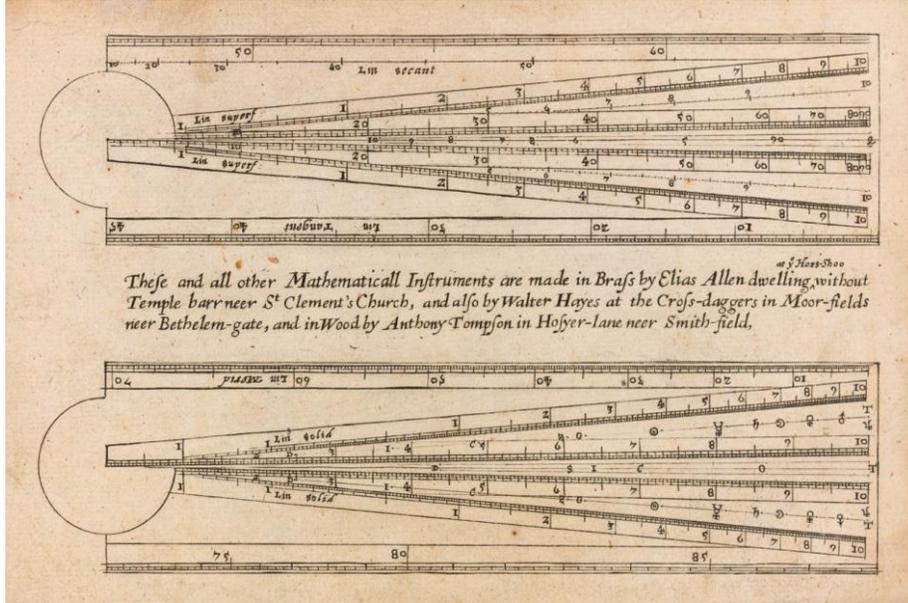
Goldstein, *Incompleteness, the Proof and Paradox of Kurt Gödel* (2005); Nagel & Newman, *Gödel's Proof*; Porter & Ogilvie, *The Biographical Dictionary of Scientists*, I, pp. 422-23

10. GUNTER, Edmund

The workes of Edmund Gunter, containing the description of the sector, cross-staff, and other instruments; with a canon of artificial sines & tangents &c. Much enlarged by the authour. Together with a new treatise of fortification. (with) FOSTER, Samuel. *Whereunto is now added the further use of the Quadrant, fitted for daily practise.* By Sam. Foster late professor of astronomie in Gresham-Colledge, London. Third edition.

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London: F. N[eile] for Fr[anciscus] Eglesfield, 1653. Four books in one. 4to. [xii], 163, [1]; 306 (i.e. 316); 75 (i.e. 71), [1]; [cxii] pp. Engraved frontispiece of Gunter's scale, engraved allegorical title, and additional title for *Canon triangulorum, or tables of artificiall sines and tangents* dated 1652; numerous woodcut text illustrations, diagrams and charts, many full-page, woodcut initials, head- and tailpieces. Complete with the 4 slips tipped in, all uncut in their original sheets, including the often-lacking volvelle, *The Nocturnall*. Contemporary speckled calf, re-backed and re-cornered; signature Pp browned and foxed, otherwise an excellent copy from the library of Frank L. Streeter, with his bookplate. \$ 8500.00



First edition of the collected works of Gunter. Although the title states that this is a third edition, neither STC, Wing, nor NUC record anything earlier; it is most likely that earlier editions of the *Canon* and the *Sector* were taken into account. Included is Gunter's first published work, the *Canon triangulorum* (first printed 1620), which was the first table of trigonometric functions to be published, and which includes at the end *The first thousand logarithmes now againe set forth by the author Henrie Briggs*. Gunter is widely considered to be one of the inventors of the logarithm, along with Napier (1550–1617) and Gunter's close friend Henry Briggs (1561–1630). Gunter's important descriptions of his ground-breaking instruments as well as his considerable work on surveying figure in the present work.

Gunter (1581–1626), mathematician and professor of astronomy, was one of the great instrument-makers of the seventeenth century. He made numerous scientific contributions to mathematics, and invented a number of important nautical and surveying instruments including the surveying-chain, a quadrant, a scale, and a simple form of the slide-rule. He was also the first to use the terms cosine, cotangent and cosecant for the sine, tangent and the secant for the complement of an arc. Foster (d. 1652) succeeded Gunter as professor of astronomy at Gresham College.

Cajori, *On the History of Gunter's Scale and the Slide Rule during the Seventeenth Century* (University of California Press, February 17, 1920); *Dictionary of Scientific Biography*, V, pp. 593–94; Taylor, *The Mathematical Practitioners of Tudor & Stuart England*, p. 196; Wing, G2239; Zeitlinger, I, 1719 (2nd ed.)

FIRST PUBLISHED SOLUTION OF THE INCLINED PLANE PRINCIPLE
COMMANDINO'S COPY (?)

11. JORDANUS DE NEMORE

Opusculum de ponderositate Nicolai Tartaleae correctum, novisque figuris auctum. Venice: Curzio Troiano Navò, 1565. 4to. 20 [4] pp. With printer's device on the title and numerous text diagrams throughout. Bound in old vellum; a fine copy with what may be the contemporary signature of Frederico Commandino (1509-1575) of Urbino on the title. Commandino was a mathematician and a humanist, known for translating works of ancient mathematicians, and was responsible for publishing the works of Archimedes. \$ 9500.00



First edition of this remarkable treatise on mathematics demonstrating the principle of the lever. "The last two theorems of the first book of the *De ratione ponderis* have no precedent in any of the earlier medieval statical treatises; they give to this work its highest mark of distinction, since they develop, in a wholly correct and mathematically elegant manner, the first valid solution to the problem of force required to hold a weight in equilibrium on an inclined plane . . . Galileo, who resolved the problem correctly as the thirteenth century author of the *De ratione ponderis* had done, has traditionally been credited with the first discovery of the correct solution of the inclined plane problem . . . he may well have discovered this solution without help or suggestion from his medieval predecessor, but the medieval solution was accessible to Galileo's generation in the edition of *De ratione ponderis* published at Venice in 1565 by Curtius Trojanus, from a manuscript which

has belonged to Niccolo Tartaglia" (Moody).

Along with Leonardo Fibonacci, Jordanus de Nemore was the dominant mathematician during the first half of the thirteenth century. Jordanus is best known for his work on mechanics, but also wrote influential works on arithmetic, geometry, and algebra. Little is known about his life; some believe Jordanus Nemore and Jordanus of Saxony, second Grand Master of the Dominican Order are the same person.

Tartaglia (1506-1559) was an Italian mathematician who contributed greatly to the development of the relationship between mathematics and mechanics. He originated the science of ballistics with his work *Nova Scientia* (1537). He was also very influential as a teacher; it is believed that Ostilio Ricci, Galileo's teacher of mathematics, had been a pupil of his. He is famous for his system for solving third-degree cubic equations, as well as his fundamental work on impetus theory. The array of binomial coefficients now known as Pascal's triangle was first published by him, as was the first translation of Euclid into Italian and of Archimedes into Latin.



Adams, J326; *Biblioteca Mechanica*, pp. 176-178; Duhem, Pierre, *The Origin of Statistics*, 1991; Moody, E.A., ed., "Liber Jordani de Nemore de ratione ponderis" in *The Medieval Science of Weights*, Madison, WI, 1952

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**THE FOUNDATION OF ANALYTIC MECHANICS
H.C. SCHUMACHER'S COPY**

12. LAGRANGE, Joseph Louis

Mécanique analytique. Paris: la Veuve Desaint, 1788. 4to. xii, 512 pp. Contemporary polished calf, spine with morocco label and gilt floriated compartmental designs, covers with gilt borders, gilt dentelles and marbled edges; a₃ with small stain in paper, and other than some occasional soiling and browning, interior clean. From the library of H.C. Schumacher with his small ownership inscription dated 1810 on the verso of half-title. \$ 18,000.00

First edition of the author's masterpiece which laid the foundation of modern mechanics. "Perhaps the most beautiful mathematical treatise in existence; called by Hamilton, 'a kind of scientific poem.' It contains the discovery of the general equations of motion, the first epochal contribution to theoretical dynamics after Newton's *Principia*, next to which it has been ranked" (Evans). The book is divided into two parts: statics and dynamics, each of which addresses the subdivisions of solid bodies and fluids. Lagrange presents his discovery of the general equations of motions applicable to any system of bodies, having improved upon the calculus of variation set forth by the Bernoullis and Euler by substituting analytical treatment for their geometrical one.

Lagrange (1763-1813) was born in Turin and studied under Beccaria. He is noted for his contributions to mathematics, celestial mechanics and astronomy. Ball considered him the foremost mathematician of his period.

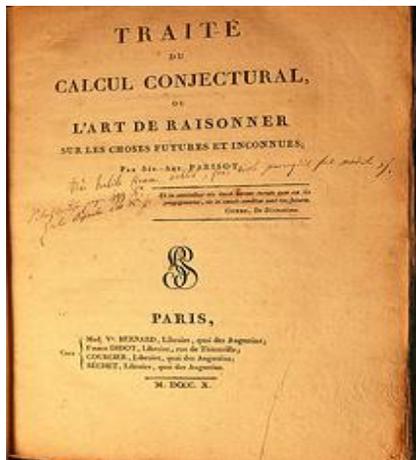
Schumacher (1780-1850), who studied astronomy under the direction of his good friend Gauss, established an observatory in Altona in 1821. He also founded the journal *Astronomische Nachrichten* in 1823, which is still published today.

Ball, *A History of Mathematics*, pp. 411-22; Dibner, 112; *En Français dans le Texte*, 179; Evans, *Exhibition of First Editions of Epochal Achievements in the History of Science*, 10; Horblit, 61; Sparrow, *Milestones of Science*, 120 (plate 105)

GAMES OF CHANCE

13. PARISOT, Séb[astien]-Ant[oine]

Traité du calcul conjectural, ou l'art de raisonner sur les choses futures et inconnues. Paris: Bernard, etc., 1810. 4to. xxiv, 654, [1] pp., including half-title and errata. With 2 folding engraved plates illustrating board and other games. Original wrappers. A wonderful, uncut copy, minor browning, with the contemporary annotation on title: (translated) "very clever man forgotten, probably because it was small" referring to the number of copies printed. \$ 8500.00



First and only edition of this rare work on mathematics and probability. The author treats the probability theories of Bernoulli, de Moivre, Montmort, Fermat, Pascal, Ozanam, and others, detailing their strengths and errors. Based upon the previously written accounts of these authors, Parisot develops his own theories of probability with specific applications. The first part treats pure mathematics and game theory, with

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applications to cards, tokens, tickets and random numbers. The second part deals with other games of chance, including roulette, pass-ten, the lottery and the martingale, a betting strategy which is a model of a fair game where no knowledge of past events can help to predict future winnings.

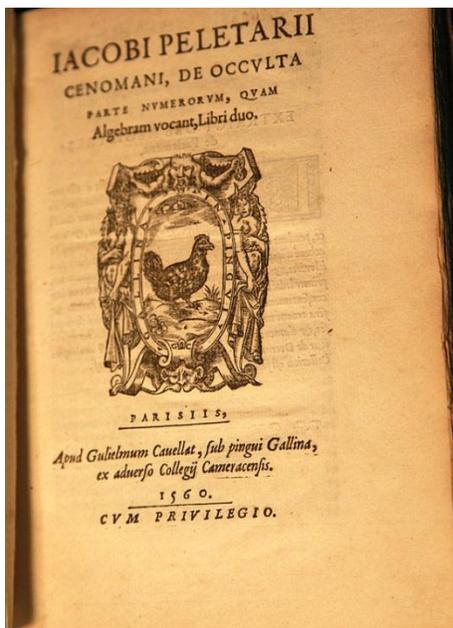
In the third part he applies the principles of his probability theories to various issues of political economy and commercial transactions such as loans, mortality rates, and annuities. He includes interesting statistics on population. The final part contains a broader discussion on the solution to curious and recreational issues, including an analysis of five problems introduced by Huygens. The book concludes with an essay on systematic physics and metaphysics, in which Parisot examines the positions of Descartes and Newton on the issues of light and matter in the universe.

Little is known of this author. He wrote one other book on the lottery (*L'art de conjecturer a la loterie*, 1801).

Zeitlinger, SSI, 2142

14. PELETIER, Jacques

De occulta parte numerorum, quam algebra vocant, libri duo. Paris: Gulielmum Cavellat, 1560. 4to. [iv], 62, [6] ff. (61,62 misnumbered 56, 57), including the final errata leaf. Lovely printer's device on title, illustrated and decorated initials, text diagrams. Contemporary vellum; apart from a worm trail running through the lower blank inner margin and minor age browning, a generally good copy of a rare book with contemporary annotations and underlining. \$ 3500.00



First edition in Latin from his scarce and little known treatise *L'Algebra*, described by Smith as “one of the first practical textbooks on algebra, and one in which he inaugurated the use of literal symbols, later made popular by Viète” (*Rara Arithmetica*, p. 245). The present translation represents a rare occasion in which Peletier wrote in Latin, for despite his enthusiasm to publish in the vernacular, his peculiar French orthography in previous works had been met with disdain. “In this work he adopted several original and ingenious ideas from Stifel’s *Arithmetica itegra* and showed himself to be strongly influenced by Cardano” (DNB). Peletier studied the foundations of geometry and in 1557 he published *In Euclidis elementa demonstrationum* in which he rejected the method of superposition.

Peletier (1517–1582) of Le Mans, was a noted French mathematical writer of the Renaissance who was also educated in the law, philosophy, medicine, and poetry.

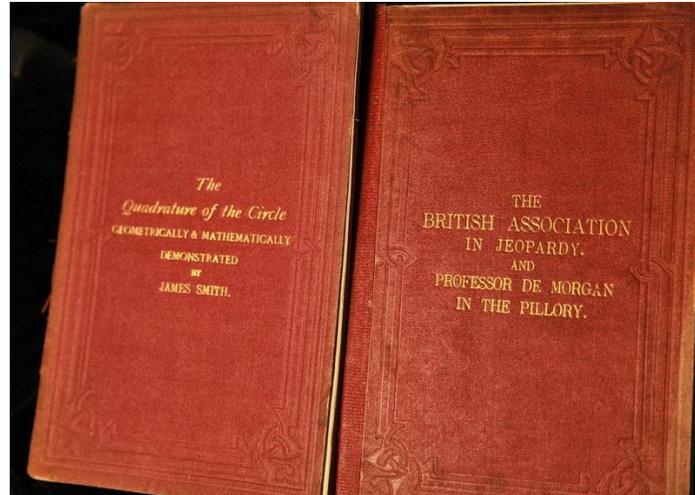
Although his work presented achievements already reached in Germany and Italy, he was the first mathematician to see relations between coefficients and roots of equations.

Adams, 584; *Dictionary of Scientific Biography*, X, 493–494; Grasse, V, 188; Smith, *Rara arithmetica*, pp. 245, 601; Richard Westfall, “The Galileo Project” (html)

FROM THE LIBRARY OF CHARLES DODGSON (LEWIS CARROLL)

15. SMITH, James

The quadrature of the circle or the true ratio between the diameter and circumference geometrically and mathematically demonstrated. Liverpool: Edward Howell, 1865. 8vo. [iii], [i], 101 pp., including half-title and errata. With 1 folding plate. Original pebbled cloth, rebounded, blindstamped borders, gilt lettering on front cover; excellent condition. From the library of Charles Dodgson (Lewis Carroll). \$ 950.00



First edition. Nothing like a bit of personal enmity to spark interest in a subject. So must have believed Charles Dodgson, who owned these two books by James Smith. The first is Smith's proof of squaring the circle, in the form of a letter to Augustus De Morgan (which follows the publication of De Morgan's series of articles in the *Athenaeum*, in October, 1863, entitled "A budget of paradoxes." Smith first explains that it was a friend who believed that "the area of a square on the side of an equilateral triangle inscribed in a circle, was equal to the area of a circle." He clarifies that he never before believed he was a mathematician, but became enamored with this idea and had to explore it further. The preface contains his correspondence with William Rowan Hamilton, who apparently supported Smith's efforts. In addition to his proof, he includes, in various appendices, his calculations "on the relations existing between the dimensions and distances of the sun, moon, and earth" and "on the Druidical remains at Stanton Drew, near Bath," with a discussion on the (mystical number of) seven stone and the mathematical "order" to which they are placed. **(together with)**

SMITH, James

The british association in jeopardy and professor de morgan in the pillory without hope of escape. London: Simpkin, Marshall & Co, 1866. 8vo. vi, [3]-94 pp. Original pebbled cloth, blindstamped borders, gilt lettering on front cover. Stamped "Charles Dodgson" on the free endpaper.

First edition of these controversial arguments defending the author's proof of his quadrature of the circle. The attacks were provoked by Professor De Morgan, whose anecdotes and stories (many about Smith himself) played a prominent role in various articles and his book, *A budget of paradoxes* (edited and published by his wife in 1872, the year after his death). Contained is a group

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of letters back and forth between the author, De Morgan, and others, where the author demonstrates his research. The popularity of the problem of squaring the circle existed for years and years. De Morgan, in his book, suggested the term “morbus cyclometricus” as being the “circle squaring disease.” Clearly De Morgan found himself having to try to persuade these circle-squarers that their methods were incorrect, yet many stubbornly held to their views despite the best efforts of the professional mathematicians. In the case of Smith and his attempts to prove that the circle could be squared, neither he, Hamilton, nor others could convince him of his errors. He writes:



“He (Smith) is beyond a doubt the ablest at reasoning and the greatest hand at writing it, of all who have tried to attach their names to an error. Common cyclometers sink into puny orthodoxy by his side.... We can only say this: he is not mad. Madmen reason rightly upon wrong premises. Mr. Smith reasons wrongly upon no premises at all.”

See Nowlan

16. STEINER, Jacob

Systematische Entwicklung der Abhängigkeit geometrischer Gestalten. . . . Berlin: G. Fincke, 1832. 8vo. xvi, 322 pp., plus 2 pages publisher’s advertisements. With 4 folding lithographic plates containing 56 mathematical diagrams. Contemporary cloth, gilt lettering on spine. Deutsches Museum Library bookplate and withdrawal stamp. Light browning as usual, but a nice copy on blue tinted paper. \$ 800.00

First edition. Steiner set himself the task of reforming geometry, outlining his plan in the preface of this work. It includes, for the first time, a full discussion of the principle of duality, and of the projective and homographic relations of rows, pencils, and other items, based on metrical properties. This book laid the foundation on which synthetic geometry in its later form rested.

Steiner (1796-1863), a native of Switzerland, is considered one of the greatest geometers of modern times. He studied under J.H. Pestalozzi, and later was professor at Heidelberg and Berlin. Cajori, *History of Mathematics*, pp. 290-92; Zeitlinger, SI, 1853 (“very scarce”)

A MONUMENTAL AND CONTROVERSIAL DISCOVERY

17. TARTAGLIA, Niccolo

Quesiti et inventioni diverse. [Venice: Venturino Ruffinelli, 1546]. 4to. [vi], 5-132 pp. Engraved frontispiece portrait, numerous text illustrations. Later vellum with gilt-tooled border, morocco spine labels; a few leaves cropped without loss of any letters, occasional light spotting on a few leaves, otherwise an excellent, clean copy. \$ 14,000.00

First edition of Tartaglia’s important work on the mathematics of warfare, in which he presents his independently discovered solution to cubic equations. The text is divided into nine books, with the first eight covering ballistics, gunpowder, infantry formations, mechanics, fortifications,

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and the compass. Each topic is illustrated through a series of short dialogues between Tartaglia and his contemporaries. In book nine, the author demonstrates his research on third-degree equations through correspondence with the Italian mathematician and physician Girolamo Cardano (1501-1576). Rather than simply presenting his mathematical findings, Tartaglia lambasts Cardano, his former confidant, for prematurely publishing them in his *Ars magna* (1545).

Tartaglia (1506-1559) was an Italian mathematician who contributed greatly to the development of the relationship between mathematics and mechanics. He originated the science of ballistics with his work *Nova Scientia* (1537). He was also very influential as a teacher; it is believed that Ostilio Ricci, Galileo's teacher of mathematics, had been a pupil of his.

Adams, II, 183; Anderson, et al., *Sherlock Holmes in Babylon and Other Tales of Mathematical History*, pp. 153-163; BMC, *Italian*, p. 658; Cockle, *A Bibliography of Military Books*, 660; Drake & Drabkin, *Mechanics in Sixteenth-Century Italy*, pp. 20-27, 98-143, 174, etc.; Edinburgh University Library, *Catalog of Printed Books*, III, p. 852; Haskell Norman Catalogue, II, 2054-55; Kline, *Mathematics of the Physical World*, pp. 72, 137

18. [THEORETICAL MATHEMATICS]

A collection of mid- to late-twentieth century works in theoretical mathematics. All in excellent condition. From the library of Miles Davis, many with his signature. \$ 850.00

- (1). **ACKOFF, Russell L. & RIVETT, Patrick.** *A manager's guide to operations research.* New York: John Wiley & Sons, 1966. Blue cloth. Fourth printing.
- (2). **BARTEE, Thomas C., LEBOW, Irwin L., and REED, Irving S.** *Theory and design of digital machines.* New York: McGraw-Hill Book Company, 1962. Dust jacket, small tear to front cover and on bottom edges. First edition.
- (3). **BATEMAN, Harry.** *Higher transcendental functions. Volume I.* New York: McGraw-Hill, 1953. Part of the Bateman Manuscript Project at Cal Tech. Publisher's cloth. First of three volumes.
- (4). **BELLMAN, Richard.** *Adaptive control processes: a guided tour.* Princeton: University Press, 1961. Cloth. First edition.
- (5). **BOCHNER, S. & CHANDRASEKHARAN, K.** *Fourier transforms.* Princeton: University Press, 1949. Original printed wrappers. Annals of mathematics series.
- (6). **BOX, George E.P. & JENKINS, Gwilym.** *Time series analysis: forecasting and control.* San Francisco: Holden-Day, 1976. Dust jacket, torn on front. Revised edition.
- (7). **CHENEY, E.W.** *Introduction to approximation theory.* New York: McGraw-Hill, 1966. Dust jacket; excellent condition. First edition.
- (8). **DICKSON, Leonard Eugene.** *Linear groups. With an exposition of the Galois field theory.* New York: Dover Publications, 1958. Original printed boards. First published in 1897.
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- (10). **HAMBURGER, H.L. & GRIMSHAW, M.E.** *Linear transformations in n-dimensional vector space. An introduction to the theory of Hilbert space.* Cambridge: University Press, 1956. Blue cloth. Second edition.
- (11). **HAMMING, R.W.** *Numerical methods for scientists and engineers.* New York: McGraw-Hill, 1962. International series in pure and applied mathematics. Blue cloth. First edition.

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- (19). **MILLER, Kenneth S.** *Multidimensional Gaussian distributions.* New York: John Wiley & Sons, 1964. With the printed dust jacket. First edition. Part of the SIAM Series in Applied Mathematics. First edition.
- (20). **MORSE, Philip M.** *Queues, inventories and maintenance. The analysis of operational systems with variable demand and supply.* New York: John Wiley & Sons, 1958. With the printed dust jacket. First edition, Publications in Operations Research No. 1.
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- (24). **SCHREIER, O. & SPERNER, E.** *Introduction to modern algebra and matrix theory.* New York: Chelsea Publishing Co., 1955. Maroon cloth. Second edition.

9. WEIDLER, Johann Friedrich

Institutiones mathematicae decem et sex purae mixtaeque matheseos disciplinas complexae; sub finem accedunt tabulae sinuum, tangentium et logarithmorum contractae et index generalis. . . . Vitembergae: Georg Marcum Knochium, literis Godofredi Gaerberdti, 1725. 8vo. [xvi], 876, [20], 32 pp. Title in red and black. With 48 leaves of plates. In a contemporary full calf binding dated 1729 in blind on the back cover. Overall in excellent condition, with only minor wear. \$ 3500.00

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Second edition, greatly enlarged with over 100 additional text pages and illustrations. This early encyclopaedia of science is Weidler's most important work, of significant value for its abundance of data and details in each area of science. Among the subjects covered include: arithmetic, geometry, plane trigonometry, optics, perspective, spherical trigonometry, spherical and dynamical astronomy, geography (on the sphere), chronology, dialling, mechanics, hydrostatics, hydraulics, civil and military architecture, fortifications, and mathematical analysis concluding with differential and integral calculus. The work is notable for Weidler's method of stating, defining, and presenting results, or answers to problems. The format was typical of the Continental approach to education. Thus, because it is one of the best examples of its kind, this book is of great value to today's scholar.

Weidler (1691-1755) held the chair of mathematics at the University of Wittenberg, was a Fellow of the Royal Society, and wrote many esteemed books on scientific subjects. His most notable was the first general bibliography of astronomy as well as the first complete history of astronomy (see Houzeau & Lancaster, 11 and 86, and Lalande, pp. 414 and 458).

OCLC locates 5 copies; Poggendorff (1863), II, p. 1281

