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(The descriptions in this list are abbreviated; full descriptions are available)

Stand E-39
New York Book Fair List
12-15 April 2012

Illustrated by Rubens

1. **AGUILON, François d'.** *Opticorum libri sex philosophis iuxta ac mathematicis utilis.* Antwerp: Plantin, 1613. First edition. Folio, contemporary green suede.

$18,750

A fine copy of this "master treatise on optics that synthesized the works of Euclid, Alhazen, Vitellion, Roger Bacon, Pena, Ramus, Risner, and Kepler." (DSB). "His treatise has acquired a great deal of attention because of its seven engravings (by Theodore Galle) after drawings by [Peter Paul] Rubens. It is not so well known that Aguilon's color theory and his prescriptions for the mixing of colors were actually used by Rubens in his paintings" (Ashworth).

Norman 25; Honeyman 43; Ashworth, Jesuit Science in the age of Galileo 8.

The Foundation of Electromagnetism

2. **AMPERE, André-Marie.** *Recueil d'observations électro-dynamiques, contenant divers mémoires, notices, extraits de lettres ou d'ouvrages périodiques sur les sciences, ...*
Paris: Crochard, 1822[1821-23]. First complete edition. Fine contemporary red morocco.

$9,500

Very rare complete collection, and a magnificent copy, with all 27 parts and 10 plates (the Norman copy ended in the middle of the 26th part and had 9 plates). In addition to his own memoires Ampère included various groundbreaking papers by Faraday, Berzelius, and Savary.

Norman 45; Wheeler Gift Catalogue 784 (both copies incomplete); See Dibner 62.

The First Proponent of a Heliocentric System

3. **ARISTARCHUS.** *De magnitudinibus et distantiis solis et lunae.*
Pesaro: Franciscanus, 1572. First edition. The Macclesfield copy, fine 17th century calf with crowned monogram of Gaston, Duke of Orléans (1608-1660).

$18,500

This treatise is the sole extant work of Aristarchus - the first proponent of a heliocentric system - and marks "the first attempt to determine astronomical distances and dimensions by mathematical deductions based upon a set of assumptions." (DSB).

Sparrow, Milestones of Science 10; Barchas 82.

The Foundation Work of Physical Chemistry

4. **AVOGADRO, Amadeo.** *Fisica de' Corpi Ponderabili ossia Trattato della Costituzione Generale de' Corpi del Cavaliere.* Torino: Stamperia Reale, 1837-41. First edition. Four volumes uniformly bound in contemporary half-calf. A very fine set.

$28,500

One of the great rarities of chemistry. This monumental work is the only major publication of Avogadro (1776-1856), one of the founders of physical chemistry in the early 19th century. The famous hypothesis which bears his name - that equal volumes of all gases and vapors contain the same number of ultimate molecules at the same pressure and temperature - demonstrated the link between Gay-Lussac's law of volume and Dalton's atomic theory, and provided a much needed key to the problems of 19th-century chemistry by distinguishing between atoms and molecules.

Norman 89; Honeyman 168

PMM 393 – Radioactivity

5. **BECQUEREL, Antoine Henri.** *Recherches sur une propriété nouvelle de la matière. Activité spontanée ou radioactivité de la matière.* Paris: Firmin-Didot, 1903. First edition. A fine copy, uncut and unopened in original wrappers.

$3,250

Becquerel's landmark treatise on radioactivity. After publishing several papers on the subject, Becquerel wrote the present memoir describing all of his researches and conclusions to that point, and containing an extensive bibliography of works on radioactivity. It was published the same year that he and the Curies received the Nobel Prize in physics for their researches into radioactive phenomena.
PMM 393; Dibner 163; Norman 158.

A Milestone in Observational Astronomy

6. **BESSEL, Friedrich Wilhelm.** *Fundamenta astronomiae pro anno MDCCLV deducta ex observationibus viri incomparabilis James Bradley in specula astronomica Grenovicensi per annos 1750-1762 institutis.*
Königsberg: Nicolovius, 1818. First edition. A fine copy in contemporary red moiré boards.

$3,000

This work "constitutes a milestone in the history of astronomical observations, for until then positions of stars could not be given with comparable accuracy: through Bessel's work, Bradley's observations were made to mark the beginning of modern astrometry" (Walter Fricke in DSB).
Norman 226; Houzeau & Lancaster 10117.

A Magnificent Copy

7. **BETTINI, Mario.** *Aerarium Philosophiae Mathematicae, In Quo Elementa Philosophiae Geometricae de Planis, Curvis, & Solidis figuris Applicata, ...*
Bologna: Ferroni, 1648. First edition. The Macclesfield copy printed on thick paper.

$19,500

An outstanding copy of this rare compendious scholastic mathematical work by the Jesuit mathematician Mario Bettini (1582-1657), encompassing all the major fields of mathematics, but paying special attention to geometry. Bettini's *Aerarium* covers a wealth of information not just in mathematics but also astronomical geometry, all of which had, as with Bettini's previous *Apiaria* of 1645, gone through the Collegio Romano's rigorous censorship under the eye of Christoph Grienberger (d.1636), who as Clavius' successor was responsible for enforcing adherence to Aristotle in matters of natural philosophy.
Riccardi I 125; Baillie, Clocks and watches, p. 46.

An Important Correspondent with Fermat

8. **BILLY, Jacques de.** *Diophantus geometra siue Opus contextum ex arithmetica et geometria simul*
Paris: Michel Soly, 1660. First edition. Near contemporary overlapping vellum.

$15,800

A very good copy of this rare work on the indeterminate problems of Diophantus' *Arithmetica*. Billy corresponded actively with Fermat on number theory, and it is mainly through his collection of letters from Fermat, published under the title *Doctrinae Analyticae Inventum Novum* as an appendix to the 1670 edition of Bachet's *Diophantus*, that we know of Fermat's methods for solving Diophantine equations. The offered work was published a decade before the *Inventum Novum*, and also deals with Diophantine problems, in which both arithmetical and geometrical solutions are given. The second part is devoted to 59 algebraic problems that are not found in *Diophantus*.
OCLC records two US locations: Michigan and University of California.

9. **BOHR, Niels.** *On the Quantum Theory of Line-Spectra, I-III.*
    Copenhagen: Bianco Lunos, 1918-22. Rare presentation-offprint issues; with 'Separate Copy' printed on the front wrappers. Inscribed by Bohr to physicist Axel Waldbuhm Marke.

    $26,000

    It was in this fundamental paper that Bohr first gave a clear formulation of, and fully utilized, his 'correspondence principle'. Besides his derivation of the Balmer formula (1913), this is by many considered to be Bohr's greatest contribution to physics. Bohr's correspondence principle (or postulate) states loosely that although classical physics is incomplete there must be a fundamental analogy between quantum theory and classical physics. Bohr's method was the principle guide to the progress of quantum theory during the early twenties, until it was finally built into the foundation of quantum mechanics.
    Plotnick 22 (a made-up set).

A Milestone in the History of Astronomy

10. **BRAHE, Tycho.** *Astronomiae Instauratae Mechanica.*
    Nuremberg: Hulsius, 1602. First trade edition. Contemporary vellum. Copy of Dreyer & Duarte.

    $60,000

    A fine copy with provenance, of one of Brahe's most important works, a description of his famous astronomical instruments (the most advanced in the world for their time), his globe, and his observatory on the island of Hven. "Brahe's observations formed the basis upon which Kepler established his three laws of planetary motion" (Sparrow). "The two observatories and principal instruments, including the great globe, now preserved in Copenhagen, are illustrated and fully described in the present catalogue, which also contains a short autobiography and a summary of the principal results of Brahe's observations. The first edition of 1598 was printed on Brahe's own press; it consisted of about 40 copies which Brahe distributed privately" (Norman). Provenance: The Danish astronomer John Louis Emily Dreyer (1852-1926), wrote the standard biography of Brahe and published in 1864 a supplement of approximately 1000 new 'nebulae' to Herschel's A General Catalogue of Nebulae and Clusters of Stars (London 1864), bookplate, signature dated 1875 and a few notes laid in; Francisco J.M. Duarte (owner's signature).
    Sparrow, Milestones of Science 29; Norman 320.

The Steam Turbine

11. **BRANCA, Giovanni.** *Le machine. volume nuovo et di molto artificio da fare effetti maravigliosi tanto spiritali quanto di animale operatione, ...*
    Rome: Manuci, 1629. First edition. Contemporary vellum.

    $24,000

    Among the fine series of 77 full-page woodcuts, of this treatise on machinery, is the first printed representation of a steam turbine, first described by Leonardo in the Codex Leicester. It shows a pair of turbine-operated mortars which are driven by propelling steam which issues from the mouth of a bronze head; it marks the earliest depiction of the use of steam as motive power. Numerous other machines are shown, including a reversing hoisting engine.
    Dibner 175; Norman 333.

The First Illustrated Italian Arithmetic

12. **CALANDRI, Filippo.** *Arithmetrice introductor.*
Florence: Bernardo Zuchetta, 1518. A fine and genuine copy in contemporary vellum.

$60,000

Extremely rare second edition of the first illustrated Italian arithmetic, containing the first printed example of the modern method of long division, and the first printed use of the word 'zero'. Calandri's work was used to teach elementary mathematical techniques necessary for business, both for craftsmen and merchants. This edition follows the first of 1491, with the same illustrations (although there are some reversals and rearrangements) but a different printer. This second edition is even rarer than the first: only one copy has appeared at international auctions in the last 50 years.
Honeyman 568; Smith, Rara Arithmetica, pp. 47-49 (describing the book as a quarto, suggesting that he has not seen a copy); Sotheran 6673 ('of excessive rarity... whereas 6 copies of the edition of 1491 have been sold in the last 10 years, no copy of the present one can be traced at all').

A Milestone in Modern Geometry

13. **CARNOT, Lazare Nicolas Marguerite.** *Géométrie de Position.*
Paris: Duprat, 1803. First edition. A fine copy in contemporary calf.

$1,600

Carnot's main work in mathematics. "In *Géométrie de Position* Carnot developed what he had first intended as a somewhat fuller edition of the *Corrélation des figures* (1801) into a vastly more extensive exploration of the problem-solving reaches of geometry" (DSB). "Monge and his school concerned themselves especially with the relations of form, and particularly with those of surfaces and curves in a space of three dimensions. Inspired by the general activity of the period, but following rather the steps of Desargues and Pascal, Carnot treated chiefly the metrical relations of figures. In particular he investigated these relations as connected with the theory of transversals, a theory whose fundamental property of a four-rayed pencil goes back to Pappos, and which, though revived by Desargues, was set forth for the first time in its general form in Carnot's *Géométrie de Position*, and supplemented in his *Théorie des Transversales* (1806). In these works he introduced negative magnitudes, the general quadrilateral and quadrangle, and numerous other generalizations of value to the elementary geometry of to-day" (David Eugene Smith).
Honeyman 597; Kline, Mathematical Thought, p.836.

The Very Rare First Edition

14. **CASATI, Paolo.** *Terra machinis mota ejusque gravitas et dimensio.*
Rome: Typis haeredum Corbeletti, 1655. Contemporary vellum.

$24,000

Very rare first edition of this work on the theory of machines and the nature of gravity. A thesis presented viva voce at the Collegio Romano, the work imaginatively envisions a Latin dialogue, in two parts, between three great physicists of the preceding generation: Galileo; Marin Mersenne, his greatest champion outside of Italy, and Paul Guldin, the leading Jesuit physicist at the Collegio Romano during the same period. The first part is devoted to the comparison between the forces produced by various machines, involving cog wheels, ropes and pulleys. The second is devoted to gravity and the problem of lifting the earth using the machines described in the first part. That a work sympathetic to Galileo, the arch rival of the Jesuits, should be printed in Rome, the intellectual capital of the Order, suggests that the power of Galileo's condemnation was already waning, and that in areas other than astronomy, public adherence to Galileian views was becoming increasingly acceptable. This work appeared in the same year as the first collected edition of Galileo's Opera (Bologna, Dozza, 1656-55).
Macclesfield 483 (1658 edition); Riccardi I.270; Not in Roberts & Trent.

A Worthy Successor to Newton's Enumeratio

15. **CRAMER, Gabriel.** *Introduction a l'Analyse des Lignes Courbes Algébriques.*
Geneve: Freres Cramer & Cl. Philbert, 1750. First edition. A fine copy in contemporary calf.

$4,000

First edition of this major treatise on analytic geometry, containing Cramer's rule and paradox, "the most complete exposition of algebraic curves existing at that time" (Struik), and "a worthy successor to Newton's *Enumeratio.*" (Boyer). According to Cantor, this together with Euler's *Introductio*, forms the first actual text-book on algebraic curves, and it "contains the earliest demonstration that a curve of the nth degree is in general determined if $\frac{1}{2}n(n+3)$ points on it be given." (Ball). *Honeyman 775; Sotheran's Catalogue 770, 1917 ('very rare').*

PMM 261 - Uncut in the Original Boards

16. **DALTON, John.** *A New System of Chemical Philosophy, I-III.*
Manchester: S. Russell for R. Bickerstaff, 1808; 1810; 1827. First edition, first issue.

$65,000

Extremely rare complete set with all half-titles, and the finest copy (uncut in original boards) to appear on the market for several decades. The foundation work of atomic theory. The rarity of complete sets of this work is well known. In 1921 Sotheran's described a complete set as being 'excessively scarce', and during the past thirty years only a handful of copies have appeared on the market, all inferior to ours: Richard Green 2008 (a made-up set lacking the half-titles); Friedman 2001 (modern bindings); the Freilich-Norman copy 2001/1998 (non-uniform cloth-backed boards); Honeyman 1979 (rebacked and made-up). The copy which comes closest in condition to ours is the Freilich-Norman copy (Sotheby's 2001, $43,875). However, that copy was bound in three different types of boards (plain grey, blue, and marbled), with the cloth laid over the boards, and the spine labels were hand-lettered. All three parts of our copy are bound in uniform cloth-backed plain grey boards, with the cloth laid under the paper of the boards, and have the original printed spine labels intact.
PMM 261; Horblit 22; Dibner 44; Evans 54; Sparrow 47.

The Most Influential Edition of the Géométrie

17. **DESCARTES, René.** *Geometria. Cum notis F. de Beaune, opera atque studio F. a Schooten.*
Amsterdam: Elzevier, 1659-61. A fine copy in contemporary calf with the often missing portrait.

$3,800

Van Schooten's important second edition of the *Géométrie* – "the mathematical community learned about the wealth of Descartes's new ideas through the works of van Schooten ... In the second edition the commentaries were enlarged, and van Schooten included the work by his students van Heuraet, Hudde, Huygens and de Witt. This edition served as the basic textbook for the generation that, in the last quarter of the century, took the lead in introducing differential and integral calculus" (Jahnke). It was this particular edition of Descartes' *Géométrie* that Newton owned and annotated during the 1660's.
Honeyman 859; Willems 1244.

The Reflecting Telescope First Described

18. **DIGGES, Leonard & Thomas Digges.** *A geometrical practical treatize named Pantometria, divided into three bookes, longimetra, planimetra, and stereometria.*
London: Abell Jeffes, 1591. Contemporary limp vellum, a superb copy.

$35,000

Second and best edition of this important mathematical work on practical geometry, in which "for the first time, we have indications of an instrument which we may call a reflecting telescope" (King, The History of the Telescope, p.29). This second edition contains several appendices by Thomas Digges, not present in the first edition, which constitute 'the first serious ballistic studies in England' (DSB). The book also contains the first description and illustration of the theodolite. The first edition (1571) is an extremely rare book – no copy has sold at auction since the Kenney copy in 1966 (and that copy was defective). A fascinating feature of the present copy is the contemporary astronomical diagram drawn on the back cover. It depicts the twelve concentric spheres of the heavens, labeled with the names of the heavenly bodies and the relevant signs of the zodiac. Small pin-pricks in the vellum reveal where compasses were placed to draw the neat circles. It affords tantalizing evidence of the contemporary use of the present book.
Frank Streeter sale 151.

His Annus Mirabilis

19. **EINSTEIN, Albert.** *Zur Elektrodynamik bewegter Körper; Über einen die Erzeugung und Verwandlung des Lichtes betreffenden heuristischen Gesichtspunkt; Über die von der molekularkinetischen Theorie der Warme geforderte Bewegung von in ruhenden Flussigkeiten suspendierten Teilchen. [In: Annalen der Physik, vol 17].*
Leipzig: Johann Ambrosius Barth, 1905. First edition. Contemporary half calf.

$22,500

"One of the most remarkable volumes in the whole scientific literature. It contains three papers by Einstein, each dealing with a different subject and each today acknowledged to be a masterpiece, and the starting point of a new branch of physics." (Max Born). "It is probably no exaggeration to say that Einstein and Newton have been the greatest physicists of all times. Einstein's name is generally associated with the theory of relativity, which has profoundly revolutionized man's ideas of space and time. But as Max Born said in one of his articles, Einstein would probably have been one of the greatest scientists, even had he not written a single line on relativity. Einstein made a spectacular appearance on the physics scene in 1905 [his 'annus mirabilis'] when he published these three papers in one and the same volume of the Annalen der Physik, the three papers having been submitted within a period of only three and half months." (Emil Wolff).
Dibner 167; Grolier/Horblit 26b; Norman 691a.

20. **EINSTEIN, Albert. PODOLSKY, Boris. ROSEN, Nathan.** *Can Quantum-Mechanical Description of Physical Reality Be Considered Complete?*
Lancaster: American Physical Society, 1935. First edition, offprint issue. Original wrappers.

$19,500

Very rare offprint of the famous 'EPR-paper' - one of the most discussed and debated papers of modern physics, and the foundation for the new fields of quantum computing and cryptography.

"In the May 15, 1935 issue of *Physical Review* Albert Einstein co-authored a paper with his two postdoctoral research associates at the Institute for Advanced Study, Boris Podolsky and Nathan Rosen. The article was entitled *Can Quantum Mechanical Description of Physical Reality Be Considered Complete?*. Generally referred to as 'EPR', this paper quickly became a centerpiece in the debate over the interpretation of the quantum theory, a debate that continues today. The paper features a striking case where two quantum systems interact in such a way as to link both their spatial coordinates in a certain direction and also their linear momenta (in the same direction). As a result of this 'entanglement', determining either position or momentum for one system would fix (respectively) the position or the momentum of the other. EPR use this case to argue that one cannot maintain both an intuitive condition of local action and the completeness of the quantum description by means of the wave function." (Stanford Encyclopedia of Philosophy). "The EPR paradox inspired many authors afterwards; in particular, discussion emerged on the revival of the hidden parameter idea by David Bohm and others after the early 1950's. John Bell's analysis of the situation in the 1960's showed that hidden variables resulted in an inequality (for the 'local condition') which could be tested by experiment and found not to be satisfied." (Pais: Twentieth Century Physics, I, p.229).
Weil 195.

21. **EUCLID of Alexandria.** *Das sibend, acht vnd neünt Buch, des hochberühmbten Mathematici Euclidis Megarensis.* Augsburg: Valentine Ottmar, 1555. Very rare first appearance of any part of Euclid's work in German. Contemporary German calf gilt, super ex-libris of Jakob Fugger and bookplate of Constantin Caratheodory. A fine and unrestored copy.

$28,500

A very fine copy with distinguished provenance of the first German translation of any part of Euclid. Although this work contains only three of Euclid's 'books' 7-9, it contains essentially all of his results relating to arithmetic and number theory, and forms a coherent collection. The six earlier books, first published in German translation in 1562, treat the geometry of lines and circles, while the later books deal mainly with three-dimensional geometry. Provenance: (1) Jakob Fugger (1542-98), member of the famous German family of merchant princes. Then the richest family in Europe, the Fuggers were generous patrons of the arts and learning and philanthropists, notably at Augsburg, their principal residence. Their fortune was largely built on a virtual monopoly in the mining and trading of silver, copper, and mercury. (2) Constantin Caratheodory (1873-1950) was a distinguished mathematician who made significant contributions to the theory of functions, the calculus of variations and measure theory. He held a number of academic posts, eventually succeeding Felix Klein at Göttingen. Very rare: No copies in the major collections of Macclesfield, Honeyman, Horblit, or De Vitry. The last collection included just under 200 editions of Euclid. We can locate no auction records from the past 50 years. OCLC: Brown, Columbia, British Library, National Library of Wales.
Thomas-Stanford, Early editions of Euclid's Elements, XVI (p. 54); Steck, M. Bib. Euclideana, III.54 (p. 65); Not in Schweiger, STC German, or Adams.

An Exceptionally Fine Copy

22. **EULER, Leonhard.** *Methodus inveniendi Lineas Curvas Maximi Minimive proprietate gaudentes, sive Solutio Problematis isoperimetrici latissimo sensu accepti.*
Lausanne & Geneve: Bosquet, 1744. First edition. Fine polished contemporary calf.

$15,000

An exceptionally fine copy of "Euler's most valuable contribution to mathematics in which he developed the concept of the calculus of variations." (Norman). "This work displays an amount of mathematical genius seldom rivaled." (Cajori). "The book brought him immediate fame and recognition as the greatest living mathematician." (Kline).
Horblit 28; Evans 9; Dibner 111; Sparrow 60; Norman 731.

Uncut in the Original Boards

23. **EULER, Leonhard.** *Tentamen Novae Theoriae Musicae Ex Certissimis Harmoniae Principiis Dilucide Expositae.*
St. Petersburg: Academiae Scientiarum, 1739. First edition. A fine copy in original boards.

$4,750

"Euler contributed more to theoretical acoustics than has any other man ... Acoustics was one of his favorite subjects. His notebooks show that as a boy of 19 he planned to write a treatise on all aspects of music, including form and compositions as well as acoustics and harmony. The only part of this project to come to fruition was his *Tentamen Novae Theoriae Musicae* ... written about 1731 ... in this he presented a theory of consonance based upon mathematical laws and derived from ideas of the ancients. He also included the most complete system of scales or modes yet published, as well as a theory of modulation. To him acoustics owes the statement of many classes of fundamental problems through partial differential equations (or 'wave equations') in terms of which the subject is taught today." (New Grove Dictionary of Music).
Eneström 33

The First of His Three Chief Works on Astronomy

24. **EULER, Leonhard.** *Theoria motuum planetarum et cometarum. Continens methodum facilem ex aliquot observationibus orbitas cum planetarum tum cometarum determinandi. Una cum calculo, quo cometae, qui annis 1680 et 1681. Itemque ejus, qui nuper est visus, motus verus investigatur.*
Berlin: Ambrosius Haude, 1744. First edition. Contemporary boards.

$7,800

In this work Euler gives "the solutions of the main problems of theoretical astronomy dealing with the structure, nature, motion and action of comets and planets. With regard to the theory of perturbed motion of celestial bodies, Euler formulated the perturbation theory in general terms so that it can be used to solve the mathematical problem of dynamic models and particular problems of theoretical astronomy ... He gave an extensive mathematical treatment of the problem of improving approximations of orbits within the framework of the two-body problem and taking perturbations into account. In his *Theoria motuum planetarum et cometarum* published in 1744, Euler gave a complete mathematical treatment of the two-body problem consisting of a planet and the Sun." (Debnath, The Legacy of Leonhard Euler, p. 364).
Eneström 66; Honeyman 1063.

The Copy of Peter Guthrie Tait

25. **FOURIER, Jean-Baptiste-Joseph.** *Théorie Analytique de la Chaleur.*
Paris: Firmin Didot, 1822. First edition. Slightly later half calf. Tait's signature to title.

$42,000

A very good copy with distinguished provenance of this celebrated book, the first mathematical study of heat diffusion and a landmark in the development of mathematical physics. "This work marks an epoch in the history of both pure and applied mathematics. It is the source of all modern methods in mathematical physics … The gem of Fourier's great book is 'Fourier series'." (Cajori, A History of Mathematics). Fourier showed that heat diffusion was subject to simple physical constants that could be discerned through observation and expressed mathematically. His theory of heat became one of the most important branches of general physics. Fourier's achievements were twofold: the first was his "formulation of the physical problem as boundary-value problems in linear partial differential equations, which… achieved the extension of rational mechanics to fields outside those defined by Newton's Principia;… second, the powerful mathematical tools he invented for the solution of the equations… yielded a long series of descendants and raised problems in mathematical analysis that motivated much of the leading work in that field for the rest of the century and beyond." (DSB).
Provenance: Peter Guthrie Tait (1831-1901) was a Scottish mathematical physicist, collaborator with Kelvin and Maxwell, and one of the founders of the kinetic theory of gases.
Dibner 154; Evans 37; Sparrow, Milestones of Science, 68.

Galileo's Precursor to the 'Discorsi'

26. **GALILEI, Galileo.** *Della Scienza Mecanica e delle Vtilita, Che si traggono da gl'Instromenti di quella Opera Cavata da manoscritti …*
Ravenna: Camerali, 1649. A large and clean copy.

$24,000

Rare first edition in the original Italian of Galileo's early treatise on mechanics, a precursor to the research that he would present in his *Discorsi*. This popular treatise, widely circulated in manuscript form, is effectively a "bridge between statics and dynamics," and according to Drake, "far superior to other available works on the subject". "Galileo presents… the analysis of simple machines… in an unusual way. He is justly celebrated in this tract for his use and explication of the principle of virtual velocities" (Clagett in Drake). Incorporating elements from Aristotle, Archimedes, Pappus, Philoponus, Jordanus and others, *Della Scienza Mecanica* offers "a coherent and illuminating exposition of the foundations of mechanics." Drake explains that while little of the content of *Della Scienza Mecanica* found its way into the *Discorsi* (with the exception of a discussion of the lever, Galileo omitted the time-honored topic of simple machines, choosing to emphasize his newer findings on dynamics), the *Scienza* shows "unmistakable novelty," and represents an important stepping stone in Galileo's intellectual development; early investigations into conservation of energy and the principle of inertia can be traced here.
OCLC lists CalTech, Iowa, and l'Institut de France.
Cinti 121; Riccardi I.517.161 and Danesi I.388.1; Carli-Favaro 227; Houzeau-Lancaster 3386 (1655 ed.); Gamba 479; Sotheran, First Suppl. 3157; not in Bibliotheca Mechanica, which had only the reprint in the 1655 Dozza Opera.

With Five Hundred Pages of Previously Unpublished Material

27. **GALILEI, Galileo.** *Opere di Galileo Galilei Nobile Fiorentino Accademico Linceo.*
Florence: G.G. Tartini & Santi Franchi, 1718. Three volumes, contemporary calf.

$7,200

Second collected edition of the works of Galileo containing nearly 500 pages of writings, not included in the first collected edition in two volumes from 1656-55, and previously unpublished. In the third volume of the present edition appears here for the first time Galileo's remarkable treatise on probability *Sopra la scoperte dei dadi* (see Hald and David), his notes on the *Sidereus Nuncius* and a large number of important letters to and from supporters and antagonists alike. The present edition reprints such epoch-making titles as the *Sidereus Nuncius*, the treatise on the proportional compass – generally considered the forerunner of the modern calculator -, and Galileo's greatest achievement in physics, the *Discorsi e Dimostrazioni Matematiche* but does not contain the *Dialogo*.

Hald, A History of Probability and Statistics and their Applications before 1750, p. 41. An English translation by E.H. Thorne of Galileo's treatise *Sopra la scoperte dei dadi* (On a discovery concerning dice) is appended to David's Games, Gods and Gambling.

Cinti 170; Carli & Favaro 431; Riccardi I, 520; Honeyman 1419.

The Precursor to Diderot & D'Alembert's Encyclopédie

28. **GALLON, Jean Gaffin.** *Machines et Inventions approuvées par l'Académie Royale des Sciences, depuis son établissement jusqu'à présent; avec leur Description. Dessinées et publiées du consentement de l'Académie, par M. Gallon. Depuis 1666 jusqu'en 1754.*
Paris: Martin, 1735 & 1777. First edition. 7 volumes in contemporary calf. Nearly 500 plates.

$26,000

Rare complete set, with the often lacking seventh volume, of this invaluable collection illustrating the inventions of all the machines and instruments approved by the Academy of Sciences from its establishment in 1666 to 1735. In 1729, the Academy commissioned the engineer Gallon (1706-75), to edit all descriptions of machines examined and approved by the Academy. Gallon's work documents the technological explosion that occurred in France in the arts, sciences, engineering, and manufacturing. New scientific instruments, clocks, textile machinery, paper-making machines, hydraulic engineering devices, steam shovels, street lights, umbrellas, and calculating machines are among the many inventions covered. The work includes the first published illustrations of Pascal's calculating machine (with five plates) together with descriptions and illustrations of calculating machines by Perrault, Lespine, De Hillerin, and De Mean.

Stanitz 187

A Very Fine and Uncut Copy

29. **GAUSS, Carl Friedrich.** *Disquisitiones Arithmeticae.*
Leipzig: Gerh. Fleischer, 1801. First edition. Uncut in near contemporary calf.

$55,000

A very fine, uncut, and unusually clean, copy of Gauss' masterpiece which created a new epoch in the history of mathematics. "Gauss ranks, together with Archimedes and Newton, as one of the greatest geniuses in the history of mathematics" (Printing and the Mind of Man). "Published when Gauss was just twenty-four, Disquisitiones arithmeticae revolutionized number theory. In this book Gauss standardized the notation; he systemized the existing theory and extended it; and he classified the problems to be studied and the known methods of attack and introduced new methods ... The Disquisitiones not only began the modern theory of numbers but determined the direction of work in the subject up to the present time." (Norman).

PMM 257; Evans 11; Horblit 38; Dibner 114.

30. **GELLIBRAND, Henry.** *A Discourse Mathematical on the Variation of the Magneticall Needle. Together with its admirable Diminution lately discovered.*
London: William Jones, 1635.

$55,000

The extremely rare first edition of Gellibrand's discovery of the secular change in magnetic declination, or variation. This discovery not only disproved certain claims made by Gilbert in his *De Magnete* (1600), but was of great significance for the practice of navigation, since magnetic variation was used by sailors as a method of determining their position at sea.

This copy, formerly in the collection of Harrison D. Horblit, is among just three copies having been auctioned the past 50 years – the other two being the Kenney copy (Sotheby's 1968) and the Streeter copy, 'Closely trimmed with loss of some headlines and shoulder notes' (Christie's 2007, $21,600). All three copies were either disbound or in modern bindings. The Kenney sales catalogue states: 'VERY RARE. Only two copies are recorded as having been sold by auction in England since 1902. The book is of considerable historical importance, its main contribution being the confirmation of the secular or annual magnetic variation'.

Provenance: Eighteenth-century bookplate of Lord Dalrymple on verso of title page; Harrison D. Horblit (book label inside slip case); Henry Faul, University of Pennsylvania geophysicist, d. 1981 (book label inside slip case). The offered copy is very large and has no cropping of headlines or side-notes. OCLC lists 5 copies of Gellibrand in the US (Smithsonian, Chicago, Harvard, MIT, Oklahoma), and 3 in the UK (BL, Cambridge, National Library of Scotland).
Adams & Waters 1156; STC 11712; Taylor Mathematical Practitioners 162-3.

Presentation Copies Inscribed to C.N. Hickman

31. **GODDARD, Robert Hutchins.** *A Method of Reaching Extreme Altitudes [with:] Liquid Propellant Rocket Development.*
Washington DC: Smithsonian Institution, 1919 & 1936. First editions. Original wrappers, inscribed by Goddard to his collaborator Clarence N. Hickman (1889-1981).

$55,000

An exceptional set, with important provenance, of the two most famous papers by the father of modern rocketry. In the first paper Goddard developed the theory of rocket propulsion independently of Tsiolkovsky and Oberth, and in the second paper he gave the first public description of his historic 1926 liquid-fueled rocket launch. C.N. Hickman was a pioneer himself in rocketry and collaborated on several projects with Goddard. In 1917, as a young student, he solved an important problem for Goddard related to multiple-charge rockets and together they developed the 'Rocket-Powered Recoilless Weapon', also known as the bazooka. In 1940, Hickman headed Section H of the National Defense Research Committee, an organization created 'to coordinate, supervise, and conduct scientific research on the problems underlying the development, production, and use of mechanisms and devices of warfare', and appointed Goddard as a consultant. But Goddard's work was rejected by the US authorities, a decision they came to regret as it eventually fell into the hands of Werner von Braun, who used it to develop the V-1 and V-2 rockets which the Germans used to devastating effect in the latter part of the War.
Ciancone 84 & 85; Richard Green 147 & 148; Honeyman 1521 & 1522; Parkinson 489.

Rare Set Containing all of Gödel's Contributions to this Series

32. **GÖDEL, Kurt.** *Ergebnisse eines mathematischen Kolloquiums. I-VII.*
Leipzig, 1931-36. First editions. Seven issues in mint wrappers.

$9,800

An exceptional set, containing all the issues to which Gödel contributed with fifteen important papers and remarks on the foundations of logic and mathematics. "By invitation, in October 1929 Gödel began attending Menger's mathematics colloquium, which was modeled on the Vienna Circle. There in May 1930 he presented his dissertation results, which he had discussed with Alfred Tarski three months earlier, during the latter's visit to Vienna. From 1932 to 1936 he published numerous short articles in the proceedings of that colloquium (including his only collaborative work) and was coeditor of seven of its volumes. Gödel attended the colloquium quite regularly and participated actively in many discussions, confining his comments to brief remarks that were always stated with the greatest precision." (DSB).
Dawson 1932a-c, 1933,1933a-i, 1936, 1936a.

One of the Founding Papers of Quantum Electrodynamics

33. **HEISENBERG, Werner; PAULI, Wolfgang.** *Zur Quantendynamik der Wellenfelder I-II (all published). Berlin: Julius Springer, 1929-30. First editions. Original wrappers, fine.*

$3,250

The two papers in which Heisenberg and Pauli gave "for the first time the foundations for quantum electrodynamics in the way we know it today." (Abraham Pais). "Three years before the discovery of the positron Heisenberg and Pauli – in two papers [citing these two articles] – took a decisive step forward to develop a consistent theory of quantum electrodynamics." (Mehra & Milton). "Heisenberg's foremost scientific concern after 1927 involved the search for a consistent extension of the quantum formalism that would yield a satisfactory unification of quantum mechanics and relativity theory ... In 1929, drawing upon the work of Dirac, Jordan, Oskar Klein, and others, Heisenberg and Pauli succeeded in formulating a general gauge-invariant relativistic quantum field theory by treating particles and fields as separate entities interacting through the intermediaries of field quanta.

"The formalism led to the creation of a relativistic quantum electrodynamics, equivalent to that developed by Dirac, which, despite its puzzling negative energy states, seemed satisfactory at low energies and small orders of interaction. But at high energies, where particles approach closer than their radii, the interaction energy diverged to infinity. Even at rest, a lone electron interacting with its own field seemed to possess an infinite self-energy, much as it did in classical electrodynamics. Attention was directed to the resolution of such difficulties for more than two decades." (DSB under Heisenberg).

"Heisenberg and Pauli were well aware of the shortcomings of their theory: the divergence difficulties and the problem of negative energies for the electron. However, the importance of the Heisenberg-Pauli theory cannot be exaggerated; it opened the road to a general theory of quantized fields and thereby prepared the tools, albeit not perfect ones, for the Pauli-Fermi theory of beta-decay and for the meson theories." (Mehra & Milton).

General Relativity

34. **HILBERT, David.** *Die Grundlagen der Physik, I-II (all published).*
Göttingen: K. Gesellschaft der Wissenschaften, 1915-17. First edition, offprint issues, wrappers.

$4,200

Hilbert's two papers in which he derived the field equations of general relativity independently of Einstein; Einstein himself submitted a paper to the Prussian Academy containing the same equations, but this was five days later than Hilbert's first paper. "Hilbert began to work on problems of physics in 1912, when he published two papers, the first on kinetic gas theory and the second on radiation theory... [This work] represented only the prelude to a still more ambitious project: to establish a theory of matter based on the principle of relativity. Hilbert was stimulated principally by two developments: the attempt of Gustav Mie in Greifswald to build a complete theory of the electron and of matter by invoking systematically the field concept, and Einstein's attempt to generalize the theory of relativity. In summer 1915 Einstein visited Göttingen to give a lecture on the status of his efforts concerning the new theory... and in the following months [Hilbert] worked hard to complete a paper entitled *Die Grundlagen der Physik*, which he presented to the Göttingen Academy on 20 November 1915. In this paper he obtained, independently of Einstein, the field equations of gravitation... 'Following the axiomatic method', he remarked in the introduction to *Die Grundlagen der Physik*, in fact from two simple axioms, I would like to propose a new system of basic equations of physics. They are of ideal beauty and, I believe, they contain the solution of the problems of Einstein and Mie at the same time'" (Mehra & Rechenberg). In Hilbert's second communication, presented on 23 December 1916, he reminded his readers that he had already laid down a complete system of fundamental equations for physics, and asserted that he now intended to show how the equations could be solved, but first he found it necessary to discuss certain questions of 'a logical as well as of a physical nature'.

Dibner 113 – Bound with Twenty-One Other Pamphlets on the Metric System

35. **HAÜY; LAGRANGE; LAPLACE; MONGE; BORDA; LAVOISIER.** *Instruction sur les mesures déduites de la grandeur de la terre, uniformes pour toute la République, et sur les calculs relatifs à leur division décimale.*
Paris: 1793-98. Contemporary boards, uncut.

$7,500

A rare and comprehensive sammelband of pamphlets on the metric system – including the true first edition of the official manual, i.e., Norman 1499 (that copy lacking the plate), Dibner 113 (citing a reprint). "The metric system was one of the few permanent social reforms that stemmed from the violent French Revolution. First proposed by Mouton in 1670, it is based on a decimal unit of length (meter), being one-millionth part of a quadrant of the earth through Paris. In 1790 the National Assembly appointed a commission to select a standard unit of length and the arc of a meridian between Dunkirk and Barcelona was thereafter measured. Another commission used the unit of standard length finally adopted in 1799, on which were based standards of weight and volume; the system became compulsory in France in 1801." (Dibner). "In 1793/94 (the French Revolutionary calendar year began in September), the Temporary Commission On Republican Weights and Measures published three introductory works to the metric system: the present work [offered here], which emphasized mathematics and theory; and 'abridged' introduction containing a shorter and simpler presentation of the system (see Norman 1504); and a précis of the system for distribution to the public. *Instruction sur les mesures* was also issued by several other French Publishers in the same year; (see Norman 1500-1503). Dibner, Heralds, 113 (citing the reprint [no. 1502])." (Norman).
The offered copy is fully complete with the engraved plate which the Norman copy lacked, and is contemporarily bound with 21 other rare pamphlets on the metric system.
Norman 1499; Dibner 113.

A Very Fine Copy

36. **LAGRANGE, Joseph Louis de.** *Méchanique Analitique.*
Paris: Veuve Desaint, 1788. First edition. Fine contemporary calf, entirely unrestored.

$18,250

"Perhaps the most beautiful mathematical treatise in existence. It contains the discovery of the general equations of motion, the first epochal contribution to theoretical dynamics after Newton's *Principia*" (Evans). "Lagrange's masterpiece, the *Méchanique Analitique*, laid the foundations of modern mechanics, and occupies a place in the history of the subject second only to that of Newton's *Principia*." (Wolf).
Grolier/Horblit 61; Evans 10; Dibner 112; Sparrow 120; Norman 1257.

The First Scientific Work on the Mechanics of Flight

37. **LANA TERZI, Francesco.** *Prodromo overo saggio di alcune inventioni nuove premesso all'arte maestra..* Brescia: Rizzardi, 1670. First edition. An exceptional copy; completely untouched in the original printer's interim-boards.

$15,500

"In this volume is presented the earliest concept of flight derived from demonstrable aerostatic principles." (Norman). An important work in the history of aeronautics. In the *Prodromo* Lana Terzi presented several technological innovations, of which the best known is his proposal for a 'flying boat:' to be airborne by four spheres of thin copper from which air had been exhausted. Although the vehicle was never tested, and would have proved unworkable, since the copper would not have been able to withstand the atmospheric pressure, Lana Terzi's reasoning was correct. In surmising that a vessel containing a semi-vacuum would weigh less than the surrounding air and would consequently become buoyant, Lana Terzi formulated the earliest concept of flight based on aerostatic principles. "While Lana apparently originated the method of reducing air density in a vessel by heating it, the implications of this phenomenon in relation to flight were not fully understood until the advent of the Montgolfier brothers a century later" (Norman).
Dibner 125; Norman 1272.

The Most Influential Book on Probability and Statistics Ever Written

38. **LAPLACE, Pierre Simon.** *Théorie Analytique des Probabilités.*
Paris: Courcier, 1812. Contemporary half calf.

$32,000

"In the *Théorie* Laplace gave a new level of mathematical foundation and development both to probability theory and to mathematical statistics. ... [It] emerged from a long series of slow processes and once established, loomed over the landscape for a century or more." (Stephen Stigler: Landmark Writings in Western Mathematics).
Evans 12; Honeyman 1923; Landmark Writings in Western Mathematics 24.

39. **LYELL, Charles.** *Principles of Geology, being an Attempt to Explain the Former Changes of the Earth's Surface, by Reference to Causes Now in Operation. 3 vols.*

London: John Murray, 1830-33. All first editions, contemporary calf, re-backed with original spines laid-down.

$13,000

"A classic by the 'father of modern geology', presenting the doctrine of uniformitarianism, namely, that the processes of the past must be judged by those of the present. This was important in the development of the Darwinian theory of evolution" (Horblit). "Lyell's Principles of Geology revolutionized the science of geology. The work had two major and controversial goals: First, to establish a strict uniformitarian theory of the earth based upon a knowledge of the existing causes and effects of geologic change; and second, to give a specific meaning to the term 'geology' and establish its proper position relative to the other physical sciences. Unlike many geologists of his day, who believed that the earth had been subjected in the past to events unparalleled in modern times, Lyell argued that the order of nature in the past was uniform with that in the present, and that therefore all geological phenomena should be attributed to the gradual action, over sufficient time, of modern geological processes. Lyell's work had profound influence upon Charles Darwin, who read the *Principles* aboard the Beagle. Not only did the work shape Darwin's understanding of geology, but its discussion of the problems of evolution stimulated Darwin's thinking on the subject." (Norman).

Horblit 70; Dibner 96; Sparrow, Milestones of Science 140; Norman 1398; PMM 344(note).

A Large Fine Copy

40. **MACLAURIN, Colin.** *A Treatise of Fluxions. In Two Books.*

Edinburgh: T.W. and T. Ruddimans, 1742. First edition. Fine contemporary English calf.

$13,500

"The earliest logical and systematic publication of the Newtonian methods. It stood as a model of rigor until the appearance of Cauchy's *Cours d'Analyse* in 1821." (DSB). "The Fluxions contained for the first time the correct way of distinguishing between maxima and minima, and explained their use in the theory of multiple points." (Cajori).

Norman 1408; Honeyman 2084.

Of Legendary Rarity

41. **MAUROLICO, Francesco.** *Theodosii sphaericorum elementorum libri III ex traditione Maurolyci, Messanensis Mathematici.*

Messina: Petruccio Spira, 1558. A fine copy in unrestored contemporary vellum.

$38,000

First edition, 'excessively rare' (Sotheran 1918), of Maurolico's Latin translations of works on sphaerics by four ancient Greek writers, Autolycus, Menelaus, Euclid and Theodosius, those of the first two authors constituting the first printed editions. Appended are Maurolico's own original propositions on sphaerics, probably based on astronomical observations made from 1548 to 1550 in Sicily, as well as a number of trigonometrical tables, including the first printed tables of secants. These works were included by Mersenne in his *Synopsis Mathematica* (Paris, 1626), although Mersenne reproduced only the propositions, corollaries, lemmata and scholia, omitting the proofs. This material was reprinted again in Mersenne's *Universae Geometriae* (Paris, 1644).

The present volume is of legendary rarity: In the *Biographie Générale* it is mentioned that the work was completely lost in a shipwreck and was not reprinted until long after the death of Maurolico, using a copy found in 1681. Brunet describes the volume as so rare that despite the testimony of Nic. Heinsius, the existence seemed doubtful to Ebert. *Riccardi* points out that the present volume was unknown to Libri, who gives a detailed account of the life and work of Maurolico in his History of Mathematics in Italy.

OCLC lists copies at Burndy, Michigan State and Oklahoma.

*Riccardi I, part 2, 140-141; Sotheran 15229.

The Möbius Band

42. **MÖBIUS, August Ferdinand.** *Ueber die Bestimmung des Inhaltes eines Polyëders.*

In: Berichte der Königlichen Sächsischen Gesellschaft der Wissenschaften zu Leipzig, 17 (1865).

$2,800

A fine copy, in original printed wrappers, of the famous Möbius strip paper. "Möbius is now most frequently remembered for his discovery of the one-sided surface called the Möbius strip, which is formed by taking a rectangular strip of paper and connecting its ends after giving it a half-twist. The Paris Academy had offered a prize for research on the geometrical theory of polyhedrons, and in 1858 Möbius began to prepare an essay on this subject. The results of his essay were for the most part given in two important papers: *Theorie der elementaren Verwandtschaft* of 1863 and *Ueber die Bestimmung des Inhaltes eines Polyëders* of 1865. The latter contains his discovery of the "Möbius strip" and proof that there are polyhedrons to which no volume can be assigned" (DSB). From an examination of Möbius's notebooks it is known that he discovered the Möbius strip in 1858. It was discovered independently by Johann Listing in the same year. The issue containing Möbius's 1863 paper *Theorie der elementaren Verwandtschaft* (mentioned above) is also included here.

*Parkinson, Breakthroughs 1858.

The Most Important Book on Mechanics Published in the 16th Century

43. **MONTE, Guidobaldo, Marchese del.** *Mechanicorum liber.*
Pesaro: Hieronymus Concordia, 1577. Contemporary vellum, a fine copy.

$19,500

First edition of the author's first work, generally regarded as the most important treatise on mechanics since Archimedes and a critical influence on Galileo. "From the time of its publication in 1577 [it was] the most authoritative treatise on statics to emerge since antiquity, and it remained pre-eminent until the appearance of Galileo's *Two New Sciences* in 1638. It marks the high point of the Archimedean revival of the Renaissance. Not only did Guidobaldo establish statics on the rigorous mathematical procedures of Archimedes, but he also introduced a historiography of mechanics which was designed to legitimize the Archimedean revival" (Rose).

Stillman Drake, Galileo at Work ('the most important book on mechanics published in the sixteenth century', p. 13); P. L. Rose, The Italian Renaissance of Mathematics; Bibliotheca Mechanica, pp 228-9.

By One of the Greatest Influences on Galileo

44. **MONTE, Guidobaldo, Marchese Del.** *Problematum Astronomicorum Libri Septem.*
Venice: Bernardo Giunta & G.B. Ciotti, 1609. Contemporary stiff vellum, a fine copy.

$19,500

Rare first edition of the main astronomical work by one of the greatest influences on Galileo. "Guidobaldo was Galileo's patron and friend for twenty years and was possibly the greatest single influence on the mechanics of Galileo." (Rose in DSB). In this work, originally composed in the 1580s but published posthumously by his son, Guidobaldo deals with mathematical and observational astronomy and the improvement of astronomical instruments. "Guidobaldo helped to develop a number of mathematical instruments, including the proportional compass, the elliptical compass, and a device for dividing the circle into degrees, minutes, and seconds [described and illustrated in this work]." (DSB). "In general Guidobaldo's attitude to mathematical instruments paralleled his attitude towards machines. Through these material devices, he felt, abstract mathematical truth could be made completely visible." (Rose, The Italian Renaissance of Mathematics, p.224)

Riccardi I 180; Houzeau & Lancaster 2912.

45. **MOORE, Sir Jonas; PERKINS, Peter; FLAMSTEED, John; HALLEY, Edmund.**
A New Systeme of the Mathematicks.
London: Godbid & Playford for Scott, 1681. First edition. 2 vols., contemporary calf.

$32,000

Very rare complete set of this mammoth work on algebra, geometry, trigonometry, cosmography, navigation, astronomy and geography, which includes extensive trigonometrical and logarithmic tables and many finely engraved illustrations of instruments such as the forestaff, quadrant, astrolabe, semi-cross, plough, bow, Davis's quadrant, and nocturnal and azimuth compass. As Surveyor of Ordnance (appointed in 1673) and a Fellow of the Royal Society, Moore had made the Tower of London a center of scientific observation and patronage. Most notably, Moore instructed the young John Flamsteed and Edmund Halley. Flamsteed and another pupil, Peter Perkins, prepared the present work for posthumous publication, after Moore's sudden death in 1679. Flamsteed included his own *Doctrine of the sphere*, which contains his important lunar theory and his very accurate solar tables. He introduces his method of calculating parallaxes invented in 1676, acknowledging that this was also simultaneously discovered by Wren and 'our southern Tycho Mr Edmund Halley'. Halley himself contributed A New Geography, with maps to each country, and tables of longitude and latitude in Vol. II, in which several parts of America are described. This part includes 9 maps of the Americas (New England; Virginia; New Mexico; Florida; New Spain [Mexico]; Guiana; Brazil and La Plata; Peru, Chili and Magellanica; and the Leeward Islands), many of which were engraved by Herman Moll (1654?-1732), the Dutch engraver, who had moved to London c.1680. The works by Flamsteed and Halley have separate title pages dated 1680 and 1681, respectively.
Frank Streeter Sale 368 (Christie's 2007, $38,400); Taylor 413.

PMM 206 - A Magnificent Copy

46. **MORGAGNI, Giovanni Battista.** *De Sedibus, et Causis Morborum per anatomen Indagatis libri quinque.*
Venice: Remondini, 1761. First edition, first issue (see below).

$25,000

An exceptional copy, completely untouched in the original printer's interim-boards, of "one of the most important [works] in the history of medicine" (Garrison & Morton). "After Antonio Benivieni [1443-1502], Giovanni Battista Morgagni is considered the founder of pathological anatomy. His *De sedibus*, regarded as one of the most important books in the history of medicine, established a new era in medical research." (Haskell F. Norman). "Morgagni's contribution to the understanding of disease may well rank with the contributions of Vesalius in anatomy and Harvey in physiology." (Heirs of Hippocrates). "The first issue of *De sedibus* had the title page of Volume I printed in red and black. In a second issue, also of 1761, the title page was printed entirely in black" (Haskell Norman in Grolier/Medicine).
PMM 206; Evans 98;; Dibner 125; Grolier/Medicine 46; Heirs of Hippocrates 792; Norman 1547; Garrison-Morton 2276.

First English Edition of the 'Principia'

47. **NEWTON, Isaac.** *The Mathematical Principles of Natural Philosophy... Translated... by Andrew Motte. To which are added, the lawes of the moon's motion, according to gravity. By John Machin... In two volumes.*
London: Motte, 1729. A very good and clean set in contemporary calf, skillfully re-backed.

$85,000

This first English translation, published two years after Newton's death, was prepared by Andrew Motte (1696-1734). The son of the well-known printer Benjamin Motte, who printed Andrew Motte's Treatise on the mechanical powers (1727), as well as the present work, Motte was very briefly a lecturer on geometry at Gresham College. The translation is based on the 1726 third edition of the Latin text, edited by Henry Pemberton, and is dedicated to Sir Hans Sloane as President of the Royal Society. John Machin's attempt to rectify Newton's lunar theory is appended to the main work.
Babson 20; Norman 1587; Wallis 23.

Ohm's Law

48. **OHM, Georg Simon.** *Die galvanische Kette, mathematisch bearbeite.*
Berlin: T.H. Riemann, 1827. Contemporary half-cloth.

$29,500

A very good copy of this pioneering work which contains one of the most important discoveries in electrical science - Ohm's law – the fundamental law that E (electromotive force) equals I (current) $\times R$ (resistance). "Ohm was the first the first to measure the rate of electric current flow and the effects of resistance on the current ... *Die galvanische Kette* contains the fully developed presentation of Ohm's electrical theory, which was adopted in the 1830s by the younger German electrical physicists, and spread to France and England in the late 1830s and early 1840s" (Norman).
PMM 289; Dibner 63; Grolier/Horblit 81; Sparrow, Milestones of Science 154.

The Best and Most Complete Edition - Dibner 124

49. **PARACELSUS, Theophrastus.** *Opera Omnia Medico-Chemico-Chirurgica.*
Geneva: Tournes, 1658. Unrestored contemporary vellum with the often missing portrait.

$16,000

A fine copy of "the best and most complete edition of Paracelsus' collected works" (Neville). "According to Sudhoff, bibliographer of Paracelsus' works, this compendium of the works of Paracelsus, edited by Friedrich Bitiskius, is the most complete of the Latin collected editions. It contains virtually all of Paracelsus' medical and philosophical writings, as well as Tintoretto's beautiful portrait of Paracelsus, which is often missing" (Heirs of Hippocrates no. 215).
Dibner 124; Heirs of Hippocrates 215; Dorbon 3522 ("Edition de la plus insigne rareté"); Sotheran, Cat. 800 [1926] 11703 ("Rare"); Neville Historical Chemical Library 260; Bolton 718; Osler 528.

The Birth of Bacteriology - Original Wrappers

50. **PASTEUR, Louis.** *Mémoire sur la Fermentation Appelée Lactique.*
Paris: Mallet-Bachelier, 1857. In: *Comptes Rendus*, vol 45. Original wrappers.

$8,000

A fine copy of Pasteur's famous paper in which he gave the "first demonstration of the connection between a specific fermentation and the activity of a specific living micro-organism. This paper is often considered the beginning of bacteriology as a modern science" (Garrison-Morton).
Dibner 198; Grolier/Horblit 82; Garrison-Morton 2472.

51. **PROCLUS DIADOCHUS.** *Procli… in primum Euclidis Elementorum librum commentariorum… libri IIII.*

Padua: Gratiosus Perchacino, 1560. Contemporary Parisian limp vellum binding, gilt oval centre-piece, gilt fillets on covers with fleurons at corners, flat spine in six compartments, decorated with small gilt leaf tool, all edges gilt. Entirely unrestored.

$42,000

The first Latin edition of Proclus' important commentary on the first book of Euclid's Elements, edited by Federico Barozzi, a member of the first generation of mathematically literate Northern Italian humanists. This edition was much praised by the editor of Proclus, Gottfried Friedlein in his edition of the Greek text (1873). The present work of the Neoplatonist Proclus is considered one of his most important writings: "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 resource for the history of the science" (DSB). The original text appeared previously in the Greek Euclid of 1533 (Basel), but lacked illustrations, and contained other deficiencies, remarked upon by Barozzi in the preface to the present edition. Proclus' commentary can also be regarded as the first work on non-Euclidean geometry (Sommerville, p. 2). It gives a penetrating discussion of Euclid's fifth postulate, also known as the parallel postulate'.

Provenance: Pierre Daniel Huet, Bishop of Avranches with bookplate commemorating his legacy in 1692 to; Jesuit College at Paris, with printed pressmark label XLVII.C, and with label on title-page 'Ne extra hanc bibliothecam efferatur. Ex obedientia.'; Michel Chasles (bookplate), bought at his sale Paris, 7 July 1881 by P. Laffite.

*Riccardi I, 82: 'Bella e rara ediz… Questo opera e la prima traduzione del greco degli importanti commentari di Proclo'. For Huet's library, see F. Pelisson-Karo, 'La bibliotheque de Pierre-Daniel Huet…'

52. **RAYLEIGH, Lord; RAMSAY, William.** *Argon, A New Constituent of the Atmosphere.* London: Harrison and Sons, 1894. First edition, offprint issue. Original printed wrappers.

$3,600

True first edition of their discovery of argon preceding the expanded version published in the *Philosophical Transactions* 1895 (i.e., Dibner 50). "Rayleigh and Ramsay had noted that nitrogen obtained from the air had a density greater than that of nitrogen liberated from its compounds by about one-half percent. This led to the isolation of the first of the inert gases which they called *argon."* (Dibner). "It was largely because of this discovery that Rayleigh was awarded the Nobel Prize in physics in 1904, while Ramsay received the Nobel Prize in chemistry the same year." (DSB).

One of Two Known Copies

53. **RECORDE, Robert.** *The Grounde of Artes: teaching the work and practise of arithmetike, bothe in whole numbers and fractions, after a more easyer and exacter sorte than any like hath hitherto bin sette foorthe ... And now of late diligently ouerseene and augmented with new and necessarie additions. I.D. [John Dee].*
London: John Harison, 1579. Contemporary blind-paneled calf. A fine and unrestored copy.

$24,000

A very rare and early edition of 'the first commercial arithmetic of any note used in the English schools' (Smith), by 'the founder of the English school of mathematical writers' (DSB). Only one other complete copy of this issue is known. All sixteenth-century editions of this book are rare. "Recorde is primarily remembered for his mathematical texts. His first publication was his most basic and popular, *The Grounde of Artes* (1543), an elementary introduction to arithmetic written in dialogue form. After several reissues, the book was enlarged in 1552 with a new dedication to Edward VI which draws on Recorde's mint experience ... After Recorde's death the Grounde was edited first by John Dee and then by a string of successors, passing through at least forty-five editions up to 1699" (ODNB).

There are two variants of this edition. Both have the colophon with the joint imprint of Henry Binneman and Harison, and the date 1577; the other variant has Binneman's name only on the title-page. Only one other complete copy of the present issue is known (Princeton); BL holds a 'copy' with the title leaf only. Three copies of the other issue are recorded: Columbia, National Library of Wales, and UCL (imperfect). Remarking on the date at the colophon, Smith states 'this is therefore one of the cases where a large edition was printed, and a new title-page was added from year to year as necessary. This [Binneman] edition is more rare than the date would suggest.' Binneman and Harison first issued the book in 1575, and again in 1582, but no edition of 1577 is recorded.

Smith, Rara Arithmetica, p. 217 (for the Binneman issue). For an account of the evolution of the text see J. B. Easton, 'The Early Editions of Robert Recorde's Ground of Artes,' in Isis, 58 (1967), 515–532.

The Best Computation Book of its Time

54. **RIESE, Adam.** *Rechenung nach der lenge, auff den Linihen und Feder.*
Leipzig: Jacob Berwalt, 1550. Fine contemporary blind-stamped pigskin over wood, with bronze corner-pieces and clasps. Entirely unrestored.

$16,000

First edition of "probably the most popular commercial arithmetic of the sixteenth century. So firmly did it impress itself upon the schools that 'nach Adam Riese' is a common expression in Germany today, ... It was to Germany what Borghi's book was to Italy and Recorde's to England." (Smith).

OCLC records seven US locations, at Columbia, Illinois, Harvard, Williams College, US Naval Observatory, Brown University, and New York Public Library.

Norman 1834; Honeyman 2652; Tomash R93; Smith, Rara Arithmetica, pp. 250-252.

55. **RÖNTGEN, Wilhelm Conrad.** *Ueber eine neue Art von Strahlen (Vorläufige Mittheilung); Ueber eine neue Art von Strahlen (Fortsetzung, II. Mittheilungen); Weitere Beobachtungen über die Eigenschaften der X-Strahlen (Dritte Mittheilungen).*
Würzburg: Stahel, 1895; 1896; 1897. First issue offprints, in original wrappers, of the first two parts and a contemporary unopened extract of the third part.

$19,500

A fine and rare complete set of the three papers in which Röntgen announced his discoveries on X-Rays. Four later issues of the offprint were published in 1896, reimposed to allow for a title-page at the beginning instead of a final blank. Röntgen's second paper, relating his latest discoveries and describing a scale for measuring X-ray intensity, appeared in March 1896 (the journal issue included a plate showing an X-ray of the hand of Röntgen's colleague the anatomist Albert von Kolliker, which is not called for in the offprint); a third paper was published in 1897.
Dibner 162; PMM 380; Norman 1841-42; Grolier/Medicine 83; Sparrow 171 (all only having part 1-2 or the journal issue).

56. **SCHOOTEN, Frans van.** *De Organica Conicarum Sectionum in Plano Descriptione, Tractatus. Geometris, Opticis; Praesertim verò Gnomonicis & Mechanicis Utilis. Cui subnexa est Appendix, de cubicarum Aequationum resolutione.*
Leiden: Elzevir, 1646. First edition. Contemporary vellum.

$9,500

A very fine copy of this beautiful book concerned with the so-called organic description (or generation) of curves. This was an important topic, since in order to determine the point of intersection of curves in the construction of geometrical solutions, it was natural to think of the curves as generated by a continuous motion driven by some instrument. It is the continuity of the motion generating the curves that guarantees a point of intersection can be located exactly. Descartes had devised several mechanisms for generating curves. In *De Organica*, which Newton read, van Schooten had presented several mechanisms for generating conic sections. This research field was connected with practical applications, for instance, lens grinding and sundial design, but it was also sanctioned by classical tradition and motivated the highly abstract needs underlined by Descartes. Newton was able to devise a mechanism for generating conics and to extend it to higher-order curves. In this work Schooten gave the now standard method of drawing an ellipse with the piece of string whose ends are attached to two pegs, and it is the first printed work that contains a mechanical description of the ellipsis, parabola and hyperbola without considering them as conics. The book is among the 24 highlights of the Elsevier Heritage Collection.
Honeyman 2807; Macclesfield 873; Willems 607.

A Unique Copy Bound with the Original Aquarelle Drawings for the Work

57. **SUARDI, Giambatista.** *Nuovi Istromenti per la Descrizione di diverse Curve antiche e moderne, e di molte altre, che servir possons alle speculazione de' Geometri, ed all' uso de Pratici; col Progetto di due nuove Machine, per la Nautica, ed una per la Meccanica.*
Brescia: Gian-Maria Rizzardi, 1752. First edition.

$14,000

First edition of this beautiful work on mathematical instruments in which Suardi first described his invention - the 'geometric pen'. A large paper copy (like the Harvard copy) but having with bound all the original aquarelle drawings for the 34 engraved plates accompanying the work. Suardi's geometric pen is an instrument for drawing geometric curves in which a pen attached to a revolving arm of adjustable length can be indefinitely varied by altering a set of toothed wheels. The following year Suardi was rewarded with membership of the Agiati of Rovereto and the Academy of the Institute of Sciences of Bologna, Italy's equivalent of the Royal Society of London and Paris Academy of Sciences. The work was dedicated to the Doge of Venice, and his engraved portrait forms a beautiful frontispiece.
Tomash S-212.

PMM 254 & 255 - Uncut in Original Boards

58. **VOLTA, Alessandro.** *On the electricity excited by the mere contact of conducting substances of different kinds.*
HERSCHEL, William. *(1) Investigations of the powers of the prismatic colours to heat and illuminate objects, etc. (2) Experiments on the refrangibility of the invisible rays of the sun. (3) Experiments on solar, and on the terrestrial rays that occasion heat.*
London: Bulmer for Elmsley, 1800. In: *Philosophical Transactions* 90, complete volume, untouched in the original blue boards.

$18,000

An exceptional copy of this highly important volume containing two separate great contributions in the history of physics; the famous first announcement of the Voltaic 'pile' (or electric battery) and Herschel's groundbreaking papers in which he discovered infra-red rays.
PMM 254; Sparrow 193; Dibner 60; Evans 35; Horblit 37b; Norman 2164 [Volta]
PMM 255; Sparrow 99; Norman 1059A; Parkinson, Breakthroughs 236 [Herschel]

The Basis of Modern Communication Theory

59. **WIENER, Norbert.** *The Extrapolation, Interpretation and Smoothing of Stationary Time Series with Engineering Applications. DIC Contract 6037, A Research Pursued on Behalf of the National Defense Research Council (Section D2) at The Massachusetts Institute of Technology Cambridge, Mass. February 1, 1942.*

[Washington, DC: National Defense Research Council], 1942. First edition, first issue. Original plain yellow wrappers.

$22,500

Extremely rare first edition of this classic in modern communication theory. "It has been the opinion of many that Wiener will be remembered for his *Extrapolation* long after *Cybernetics* is forgotten. Indeed few computer-science students would know today what cybernetics is all about, while every communication student knows what Wiener's filter is. The work was circulated as a classified memorandum in 1942, as it was connected with sensitive war-time efforts to improve radar communication. This book became the basis for modern communication theory, by a scientist considered one of the founders of the field of artificial intelligence. Combining ideas from statistics and time-series analysis, Wiener used Gauss's method of shaping the characteristic of a detector to allow for the maximal recognition of signals in the presence of noise. This method came to be known as the 'Wiener filter'." (MIT Press). Working with the Fire Control Division of the National Defense Research Committee during World War II, Wiener was assigned the critical problem of anti-aircraft control, specifically the task of designing a gun that could accurately and automatically aim at a high-speed moving target guided by human intelligence. Wiener and his assistant, Julian Bigelow, developed a system whereby they would treat the airplane's path as a stationary time series and use probability theory to extrapolate the airplane's future path from its past actions. The theory Wiener developed and explained in this classified document for internal government use only became a milestone in communication theory. Claude Shannon, in his *Mathematical Theory of Communication* (pp.626-7) notes: 'Communication theory is heavily indebted to Wiener for much of its basic philosophy and theory. His classic NDRC report *The Interpolation, Extrapolation, and Smoothing of Stationary Time Series*, to appear soon in book form, contains the first clear-cut formulation of communication theory as a statistical problem, the study of operations on time series.' Wiener's famous report did indeed appear in book form in 1949, seven years after this classified report. Wiener's report was extremely difficult to read, and thus was known to generations of students after the war as the 'yellow peril' after its plain yellow wrappers." (Origins of Cyberspace).

*OOC 990