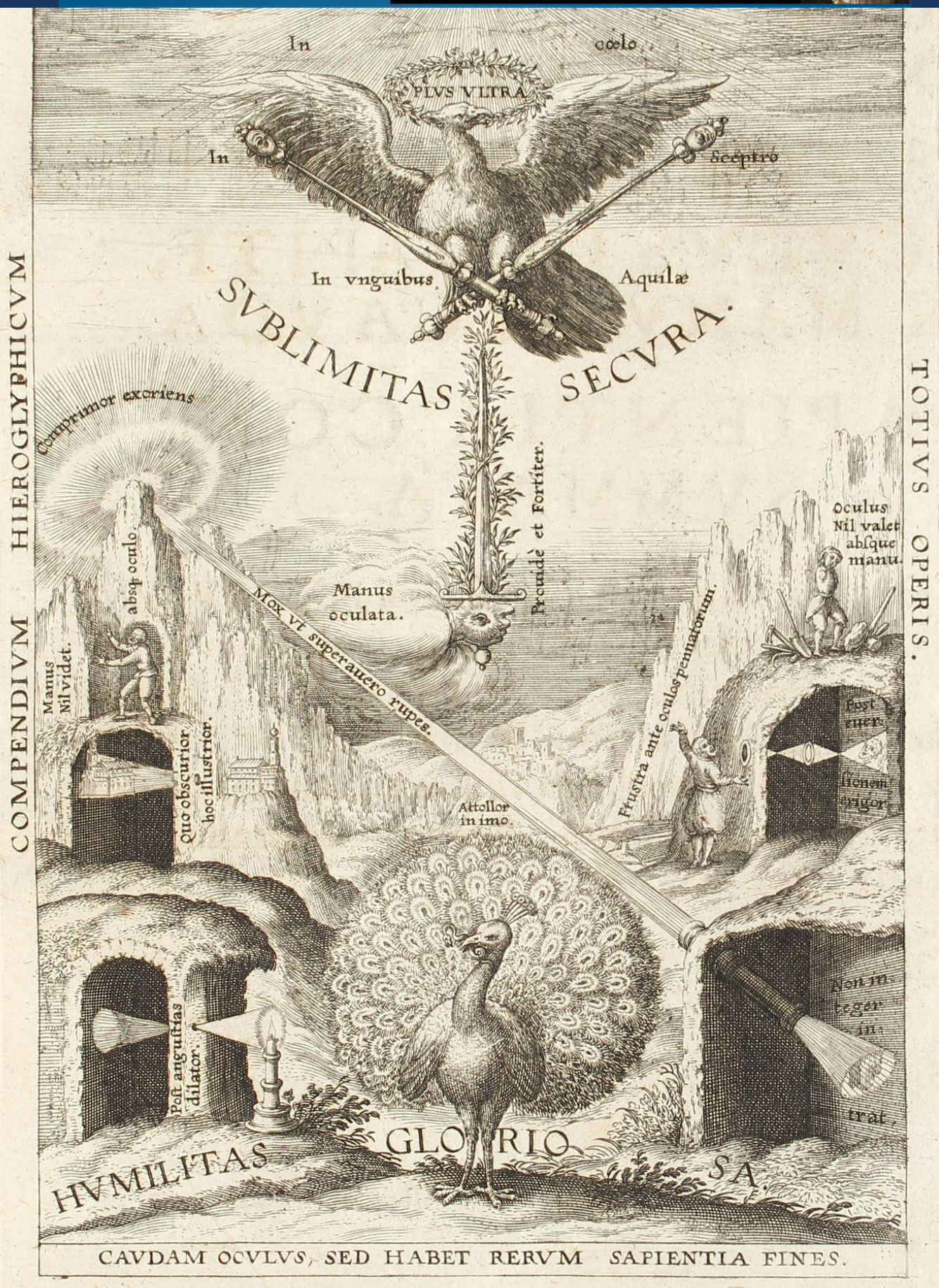

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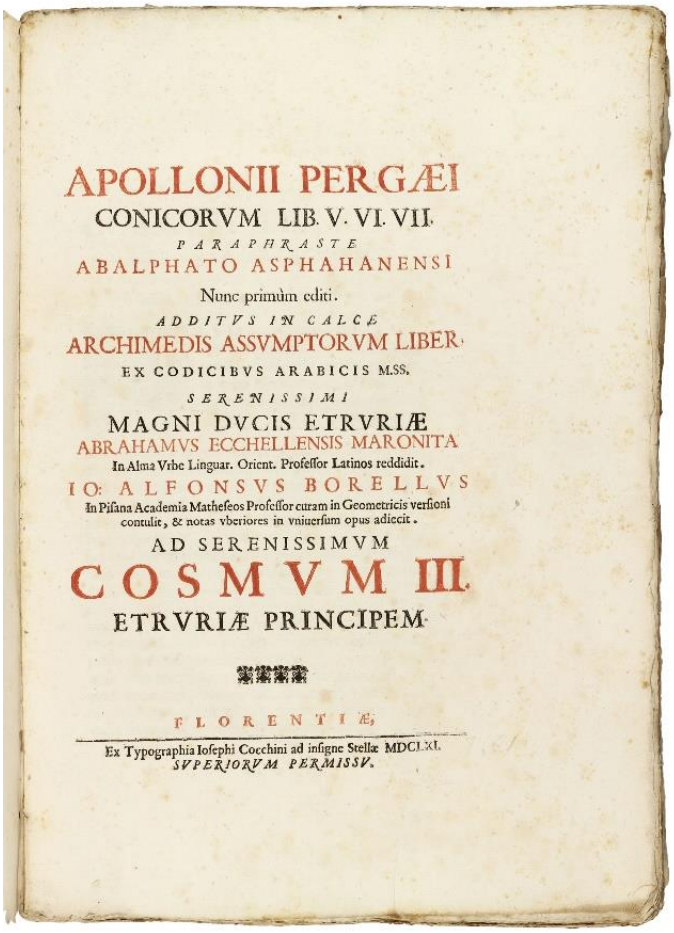
1 **APOLLONIUS Pergaeus**. *Conicorum lib. V. Vl. VII. paraphraste Abalphato Asphahanensi nunc primum editi. Additus in calce Archimedis assumptorum liber, ex codicibus arabicis m.ss. J.A.Borellus contulit, & notas adiecit*. Florence: Joseph Cocchini, 1661. Folio (365 x 255 mm). [36], 415 [1] pp., half-title, first title printed in red and black, woodcut initials, head- and tailpieces, numerous woodcut diagrams in text, separate title-page to second part, final leaf of errata. Signatures: [cross]^{6}, **-****^{4}, A-Fff^{4}. The second part (p. [377]-413) has the title "*Archimedis liber assumptorum interprete Thebit Ben-Kora exponente Almochtasso ex codice arabico manuscripto sereniss. magni ducis Etruriae, Abraham Ecchellensis latinè vertit. Jo: Alfonsus Borellus notis illustravit.*" All pages uncut. Simple contemporary paper wrappers (spine with multiple splits, some edge chipping and fraying) protected in mylar foil. Text generally crisp and clean with only very minor occasional spotting, marginal dust-soiling, pp. 312 and 352 with paste-over slip, hole in blank margin of leaves cc3-4, leaf Eee3 browned. An exceptional, unsophisticated copy. (#003291) € 6500

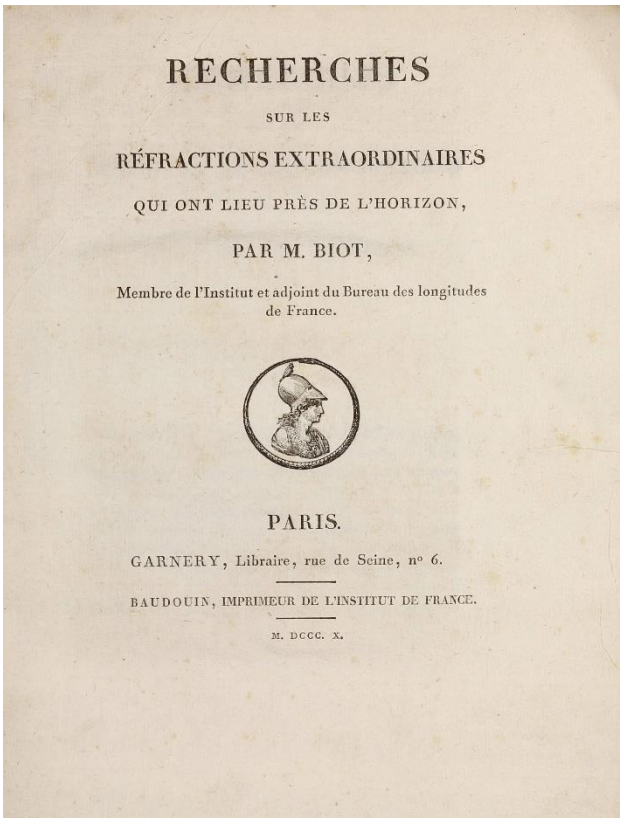

APOLLONII PERGÆI
CONICORVM LIB. V. VI. VII.
PARAPHRASTE
ABALPHATO ASPHAHANENSI
Nunc primùm editi.
ADDITVS IN CALCE
ARCHIMEDIS ASSVMPTORVM LIBER.
EX CODICIBVS ARABICIS M.SS.
SERENISSIMI
MAGNI DVCIS ETRVRIÆ
ABRAHAMVS ECCHELLENSIS MARONITA
In Alma Vrbe Linguar. Orient. Professor Latinos reddidit.
IO: ALFONSVS BORELLVS
In Pisana Academia Matheseos Professor curam in Geometricis versioni contulit, & notas vberiores in vniuersum opus adiecit.
AD SERENISSIMVM
COSMVM III.
ETRVRIÆ PRINCIPEM
FLORENTIÆ,
Ex Typographia Iosephi Cocchini ad insigne Stellæ MDCLXI.
SVPERIORVM PERMISSV.

Roller-Goodman I, p.42; Sotheran, Suppl. 1, 762. DSB I, pp. 179-193; Riccardi 1/1, 158. FIRST EDITION of these three parts of the *Conics* of Apollonius of Perga (c. 262-c. 190 B.C.), previously unknown to the Latin west. The *Conics* consisted of 8 books but only the texts of the first 4 had been received by the Latins. In the 17th century the Medici acquired an Arabic manuscript of the text of the fifth, sixth and seventh books, which Borelli translated in collaboration with the Syrian-born Maronite scholar Abraham Ecchellensis (1605-1664). The Arabic version was made by Thabit ibn Qurra (836-901 AD). The appended *Liber assumptorum* was taken from another manuscript. In his work Apollonius showed that a plane intersecting a cone will generate an ellipse, a parabola, or a hyperbola, depending on the angle of intersection. He may have studied at the school established by Euclid at Alexandria, especially since much of his work was built on Euclidean foundations. Apollonius' *Conics* is still used today in astronomy, ballistic science, and rocketry. It already was an important source of mathematics for Newton and Descartes.

Biot's important monograph on mirages and horizontal refraction

2 **BIOT, Jean-Baptiste**. *Recherches sur les réfractions extraordinaires qui ont lieu près de l'horizon*. Paris: Garnery, 1810. 4to (272 x 218 mm). [4], 268 pp., including half-title, woodcut vignette on title, 9 engraved folding plates at end. Original sprinkled paper-wrappers, printed paper-label to spine (paper-label and spine ends partially chipped, upper wrapper partially split towards foot, wrappers slightly creased and corners dog-eared). All pages uncut and unpressed. Light age-toning of text and plates, occasional spotting, foxing and marginal dust-soiling, fraying of edges in places. All in all a very good, unsophisticated copy. (#003265) € 4500

EXCEPTIONALLY RARE FIRST EDITION of one of the fundamental analytical studies on atmospheric refraction near the horizon by Jean Baptiste Biot. Biot's calculations provide an explanation for the observed flattening of the setting sun and why refraction behaves differently near the horizon than it does over most of the sky. A theorem about the magnification at the horizon is named after Biot. "Heinrich Wilhelm Brandes (1807) published a monograph on mirages and refraction in which he tabulated thousands of observations of terrestrial refraction, together with temperature differences measured at different heights up to 16-1/2 feet (5 m) above the ground. In a summary paper, Brandes (1810) stated as his first result that ''if one frequently observes the apparent height of individual objects above the Earth, and simultaneously investigates the heat of the air each time at different heights, one finds quite generally that the apparent height of each object is the greater, the warmer the higher layers of the air are in comparison with the lower ones.' In the same year, J.-B. Biot (1810) published his own monograph on horizontal refraction and mirages, in which the theory was worked out in detail and extensive quantitative comparisons between measured altitudes and temperature gradients were used to confirm it. Biot's monograph is exceedingly thorough; it encompasses refraction, dip of the horizon, superior as well as inferior mirages, looming, etc. So the importance of temperature gradients in the very lowest part of the atmosphere was already well established early in the 19th century." (Andrew T. Young, *Sunset Science. IV. Low-altitude refraction.* In: The Astronomical Journal, vol. 127, 2004, p.3624). Biot's work is quite rare in the trade with no copy traced at auction in the past 20+ years.



RECHERCHES

SUR LES

RÉFRACTIONS EXTRAORDINAIRES

QUI ONT LIEU PRÈS DE L'HORIZON,

PAR M. BIOT,

Membre de l'Institut et adjoint du Bureau des longitudes de France.

PARIS.

GARNERY, Libraire, rue de Seine, n° 6.

BAUDOUIN, IMPRIMEUR DE L'INSTITUT DE FRANCE.

M. DCCC. X.

3 **BOLTZMANN, Ludwig**. *Vorlesungen über Gastheorie*. Two parts in one volume. Leipzig: Johann Ambrosius Barth, 1896-1898, 8vo (211 x 137 mm). viii, 204; x, 265 [1] pp., including half-titles, woodcut devices to titles, diagrams in text. Contemporary three-quarter roan over marbled paper, spines with 4 raised bands and gilt-lettered label (rubbing of leather and extremities, paper over lower board scratched). Very little age-toning of text. Provenance: Ignatiuskolleg Valkenburg (ink stamps on first half-title and title); Peter and Margarete Braune. A fine, clean and unmarked copy. (#003318) € 1800

Stanitz 79; Poggendorff IV, p. 153; DSB II, p. 266-7. FIRST EDITION of both parts. "In 1872, the Austrian physicist Ludwig Boltzmann (1844-1906) derived the transport equation for distribution of velocity among the molecules of a gas. This equation, which is so important in the kinetic theory of gases, had been previously derived by Maxwell, but the form in which Boltzmann derived it led him immediately to the concept of entropy as related to the probability of various velocity distributions among an assembly of gas molecules. This major contribution and many others that Boltzmann made to the kinetic theory of gases were summarized in his masterpiece of theoretical physics, *'Vorlesungen über Gastheorie*'. This work can rightly be considered the peak of development achieved in the modern kinetic theory of gases." (Stanitz, *Sources of Science & Technology*, no. 79).

4 **BOYLE, Robert**. *The philosophical works of the Honourable Robert Boyle Esq : in three volumes / abridged, methodized, and disposed under the general heads of physics, statics, pneumatics, natural history, chymistry, and medicine, the whole illustrated with notes, containing the improvements made in the several parts of natural and experimental knowledge since his time by Peter Shaw*... London: Printed or W. and J. Innys ... and J. Osborn, and T. Longman, 1725. Three volumes. 4to (242 x 195 mm). Vol. I: [4], xliii, 1-136, 129-350, 367-730 pp., engraved portrait frontispiece, 1 folding engraved plate at end; vol. II: xx, 726, [2] pp., 19 folding engraved plates; vol. III: [4], xv [1], 1-249, [3], ccliii-cclx, 261-756 pp., 1 folding plate. Contemporary calf, rebacked and recornered, each spine with two gilt-lettered morocco labels, gilt ruling to boards, red-dyed edges (boards rubbed and scratched, extremities worn). Little browning of text and plates more pronounced at outer margins, frontispiece and title in vol. I dust-soiled and foxed, torn-off patch near gutter of title in vol. III not affecting text, first preliminary leaves in vol. I partly split at gutter, occasional mainly marginal spotting and foxing; plates in vol. II soiled and foxed at fore-margin. Very good, wide-margined set, collated complete. (#003302) € 2400

FIRST EDITION. Bibliography: Fulton 244.

Signed author's presentation copy

5 **BRYAN, Margaret**. *A Compendious System of Astronomy, in a Course of Familiar Lectures*. . . London: Printed for the Author, and sold by Leigh and Sotheby, and G. Kearsley, 1797. 4to (276 x 218 mm). xxx, [2], 311 [3] pp., including errata leaf (corrections inserted by hand), stipple-engraved frontispiece portrait of the author and her daughters, 17 folding engraved plates, list of subscribers, advertisement leaf at end, bound without blank leaf 2H2. Early 19th century straight-grain blue morocco presentation binding, spine and boards with elaborate decoration and ruling in blind and gold, gilt-lettering to spine, all edges gilt, marbled endpapers (rubbing to extremities, lower board scratched, corners bumped and scuffed, hinges with short split at spine ends). Portrait foxed and dampstained at corners at outer margins, occasional minor spotting, but generally quite crisp and clean throughout. Provenance: Thomas Pinkett, present from the author (inscribed on third flyleaf "To Thomas Pinkett Esq. from the authoress as a token of her respect for the friend of the fatherless and widow, Margaret Bryan"). (#003362) € 5000

RARE FIRST EDITION, AUTHOR'S DEDICATION COPY. Margaret Bryan was a pioneering female teacher of the natural sciences, running a boarding school for girls in Blackheath from 1795 to 1806. When she relocated to Margate the "curriculum in her schools differed from that of most peer institutions by including mathematics and science as suitable subjects for girls" (ODNB). In 1797 she published by subscription this *Compendious System of Astronomy*, with a portrait of herself and two daughters as a frontispiece, the whole engraved by William Nutter from a miniature by Samuel Shelley. She dedicated her book to her pupils. The lectures of which the book consisted had been praised by Charles Hutton after he received from her the manuscript fo his persual. In a letter dated Jan. 6, 1797 he replied: "I herewith return the ingenious MS. of Astronomical Lectures you favored me with the sight of, which I have read over with great pleasure; and the more so, to find that even the learned and more difficult Sciences are thus beginning to be successfully cultivated by the extraordinary and elegant talents of the female writers of the present day. Should you, Madam, give to your friends and to the public to benefit by the publication of these your learned and useful labours, I beg to have the honor of being considered one of the encouragers of so useful a work; Your most obedient, and most humble

servant, Charles Hutton." Margaret was so pleased with Hutton's comments that she had the book printed before the year was out. Hutton's letter of praise was printed and dated at the end of the preface. Ref: W. B. Ashworth jr, *Scientist of the Day - Margaret Bryan*, Jan. 6, 2020, Linda Hall Library (web resources).

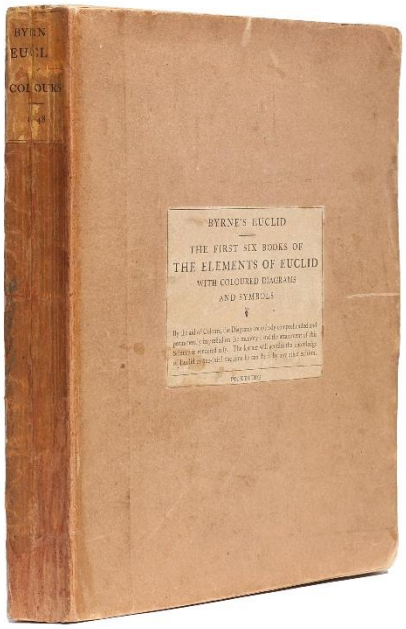
Signed author's presentation copy

6 **BRYAN, Margaret**. *Lectures on Natural Philosophy: the result of many years' practical experience of the facts elucidated. With an appendix: containing, a great number and variety of astronomical and geographical problems: also some useful tables, and a comprehensive vocabulary*. London: Printed by Thomas Davison for the Authoress, 1806. 4to (270 x 215 mm). [36], 388, [2] pp., engraved frontispice portrait by Heath after Kearsley, 36 engraved plates, errata-leaf at end. Early 19th century straight-grain blue morocco presentation binding, spine and boards stamped and ruled in blind and gilt, gilt-lettering to spine, all edges gilt, yellow silk endpapers (wear to extremities, boards scratched, corners bumped and scuffed, spine ends chipped, second flyleaf working loose). Portrait foxed, text little evenly browned, some occasional minor spotting and foxing (some plates a bit stronger), light offsetting from plates in places. Provenance: Thomas Pinkett, present from the author (inscribed on second flyleaf "To Thomas Pinkett Esq. this book is presented, as a testimony of her respect for his character and esteem for his friendship by the authoress Margaret Bryan"). (#003363) € 4000

FIRST EDITION, AUTHOR'S DEDICATION COPY. Margaret Bryan was a pioneering female teacher of the natural sciences, running a boarding school for girls in Blackheath from 1795 to 1806. When she relocated to Margate the "curriculum in her schools differed from that of most peer institutions by including mathematics and science as suitable subjects for girls" (ODNB).

"The most attractive edition of Euclid the world has ever seen"

7 **BYRNE, Oliver [EUCLID]**. *The First Six Books of the Elements of Euclid, in which Coloured Diagrams and Symbols are used instead of Letters for the Greater Ease of Learners*. London: Charles Whittingham for William Pickering, 1847. 4to (242 x 196 mm). [7] xviii-xxix [1], 268 pp. Including half-title, four-line woodcut initials, color diagrams throughout printed in red, blue, yellow and black. Original publisher's drab boards with printed paper labels to upper board and spine (covers somewhat soiled and spotted, unobtrusive repair to upper corner of lower cover and of chipped spine label with loss of a few letters), all edges untrimmed. Uneven brown spotting of text as usual*, minor age-toning of paper, but in all quite crisp and clean. (#003307) € 11,500



FIRST AND ONLY EDITION OF BYRNE'S SPECTACULAR RENDERING OF EUCLIDEAN GEOMETRY USING FOUR-COLOR PRINTING, AND "THE MOST ATTRACTIVE EDITION OF EUCLID THE WORLD HAS EVER SEEN" (Oechslin). The stark use of primary colors was envisaged by Byrne as a teaching aid. "Each proposition is set in Caslon italic, with a four line initial engraved on wood by Mary Byfield: the rest of the page is a unique riot of red, yellow and blue . . . attaining a verve not seen again on book pages till the days of Dufy, Matisse and Derain" (McLean).

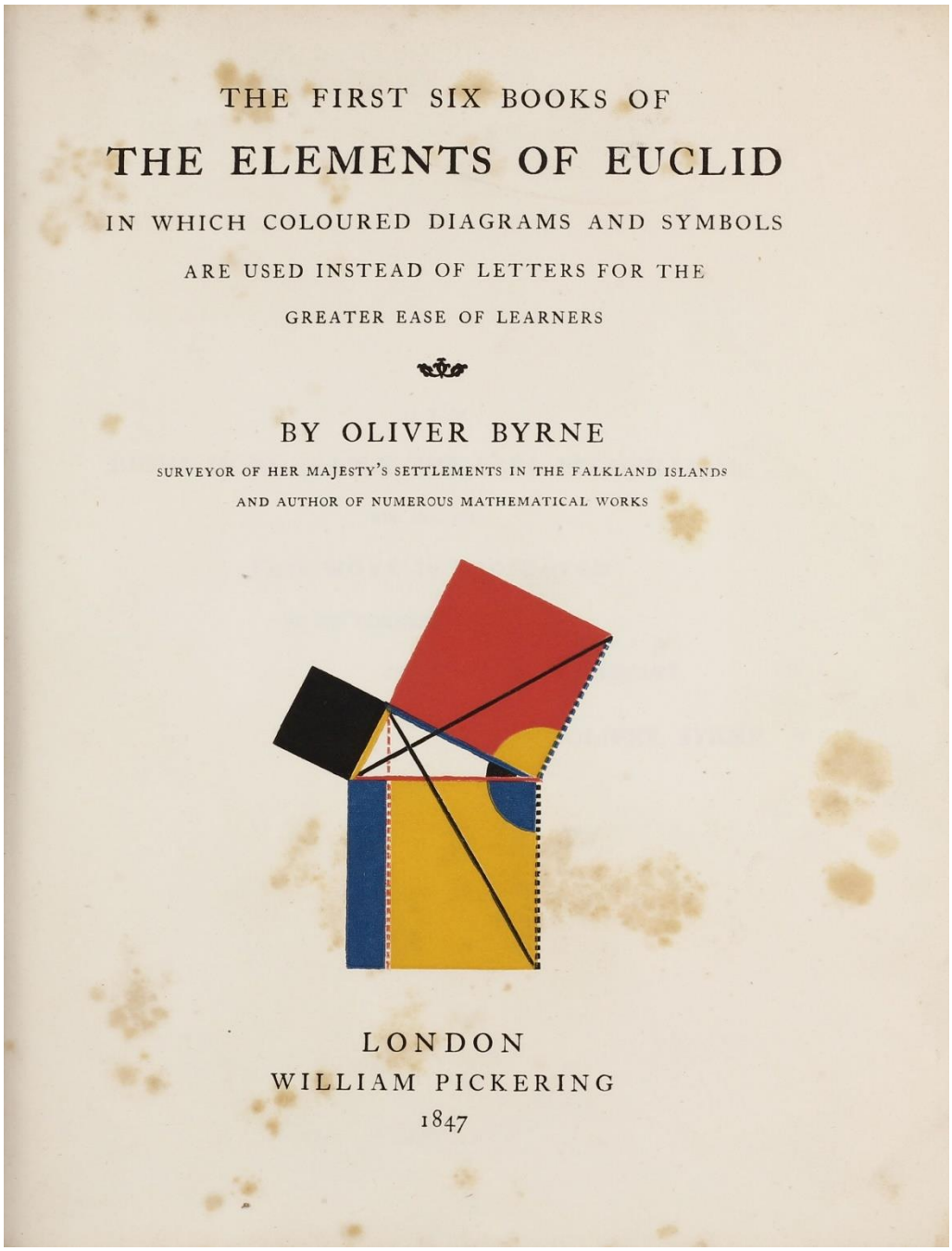
"This truly visual Euclid discards the letter-coding native to geometry texts. In a proof, each element names itself by consistent shape, color, and orientation; instead of talking about angle DEF, the angle is shown - appropriately enough for geometry" (Tufte). Byrne's depiction of Pythagoras is a classic, with the squares being visually interpreted so in vivid blocks of colour. In a technical tour-de-force, Whittingham skillfully aligned the different color blocks for printing to produce "One of the oddest and most beautiful books of the whole century" (McLean).

"According to Julie L. Mellby, graphic arts librarian at Princeton University, in her online article "Euclid in Color," Byrne's *Euclid* was

exhibited in London at the Great Exhibition of 1851. Praise was given for its beauty and the artistry of the printing, which may have influenced future publications and artwork. However, the book was sold for an extravagant price by contemporary standards, placing it out of the reach of educators who were supposed to make use of this new way of teaching geometry"

*Virtually all copies of this print show more or less heavy brown spotting due to the used paper stock.

References: Janet Ing, *Charles Whittingham, Printer*, 46; Keynes, *Pickering*, pp. 37, 65; R. McLean, *Victorian Book Design and Colour Printing* p. 50-51 (illustration facing p. 53); E. R. Tufte, *Envisioning Information*, p.84; P. Lynch, *That's Maths: The rebel who brought Technicolour to Euclid*, Irish Times, February 20, 2014; W. Oechslin, ed., *Oliver Byrne: The Elements of Euclid* (Cologne, Germany: Taschen America LLC, 2013), p.15; J. L. Mellby, *Euclid in Color*, Princeton University Library, Princeton, New Jersey, 2008.


THE FIRST SIX BOOKS OF

THE ELEMENTS OF EUCLID

IN WHICH COLOURED DIAGRAMS AND SYMBOLS

ARE USED INSTEAD OF LETTERS FOR THE

GREATER EASE OF LEARNERS

BY OLIVER BYRNE

SURVEYOR OF HER MAJESTY'S SETTLEMENTS IN THE FALKLAND ISLANDS

AND AUTHOR OF NUMEROUS MATHEMATICAL WORKS

LONDON

WILLIAM PICKERING

1847

A milestone work on magnetism

8 **CABEO, Niccolo**. *Philosophia magnetica in qua magnetis natura penitus explicatur, et omnium quae hoc lapide cernuntur causae propriae afferuntur*. Ferrara: Francesco Succio, 1629. Folio (315 x 225 mm). [16], 412, [12] pp., engraved architectural title, 4 small engravings, including a world map (repeated), woodcut initials, head- and tailpieces, and nearly 240 woodcut text illustrations and diagrams. 18th-century Italian xylographic cardboard binding, ink-lettered paper label to spine, red-marbled edges (wear and minor chipping to hinges, extremities and paper label, corners bumped and scuffed, spine rubbed). Internally only little browned, leaves P2 and Nn1 somewhat soiled, occasional minor spotting, a little worming to pastedowns and gutter of a few leaves, but generally quite crisp and clean. Provenance: old faint library stamp to title. A fine, wide-margined copy in untouched binding. (#003274) € 7000

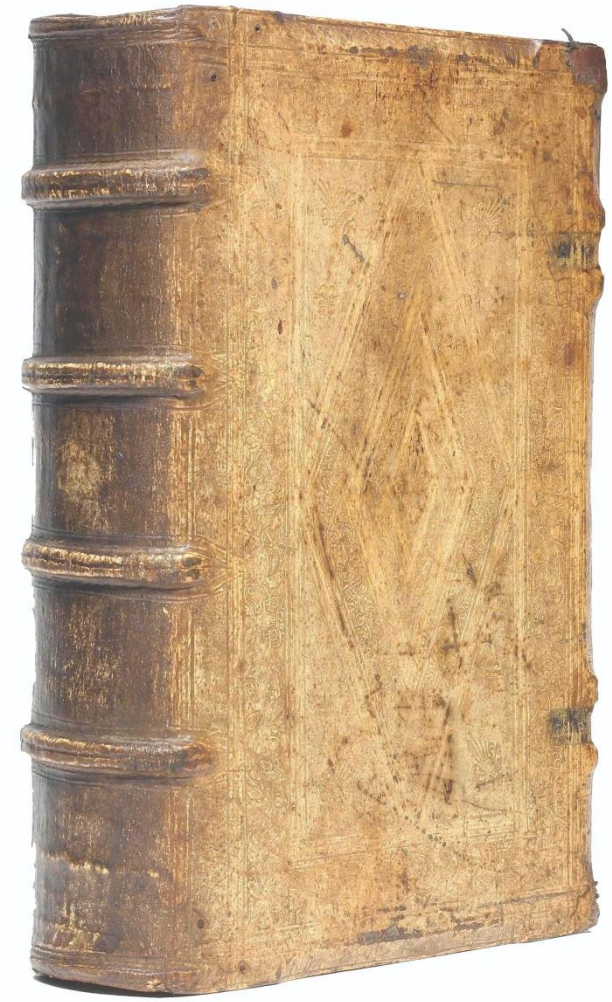
Ferguson I, 136; Riccardi I, 205; Wheeler Gift 97. FIRST EDITION, FIRST ISSUE. Cabei (1586-1650) was a Jesuit father born in Ferrara and a contemporary of Athanasius Kircher, who taught theology and mathematics in Parma and then in Genoa. His ‘’Philosophia magnetica’ is a milestone in studies on magnetism, containing the first printed account of electrical repulsion.

Niccolo Cabeo (1586-1650), critically examines Gilbert's discoveries and theories, opposing the latter's views on terrestrial magnetism and sympathetic telegraphy. First edition, first issue, of the first work to discuss electrical repulsion, 'perhaps the most significant discovery of the century following Gilbert' (Wolf A History of Science (1939)). In fact, this book is only the second, after Gilbert's De Magnete, to discuss the phenomenon of magnetism. Cabei explored telegraphic communication by means of magnetized needles and provided the first visual image of the sympathetic telegraph: "Perhaps the most important discovery of the century following Gilbert" (Wolff). The first issue from Ferrara is distinguished from the second (issued at Cologne in the same year) by the arms of Louis XIII at the head of the title and its dedication to "Rex Christianissime".

Cabeo was the first to notice electrical repulsion, 'perhaps the most significant discovery of the century following Gilbert' (Wolf). In the presentation inscription to Corado, Cabeo praises him fulsomely for his knowledge and wisdom. The variant engraved title appears to represent an early state, with the text altered to make room for a brief inscription naming Corado in manuscript, and before the Jesuit emblem was added to the shield above.

9 **CARDANO, Girolamo**. I. *In C.L. Ptolemaei Pelusiensis IIII de Astrorum Iudiciis . . . quae non solum Astronomis & Astrologis, sed etiam omnibus philosophiae studio. . .* Basel: Henricus Petri, March 1554. Two parts in one volume. [20], 363 [1]; [2], 403-513, [3] pp. Signatures: a^6 b^4 A-Z^6 aa-ee^6 ff-gg^4 hh^6 Aa-Hh^6 Ii^4 Kk^6. Printer and date from colophon on Kk6r. Separate title-page to second part. Title with oval woodcut portrait medaillon of author within ornamental cartouche, historiated and decorative initials, text illustrated throughout with numerous woodcut diagrams, final leaf Kk6 with colophon recto and woodcut printer's device verso. Ptolemy's text printed in large roman type, with Cardano's commentary below in smaller roman type. [**Bound with**] II. *De Subtilitate Libri XXI. nunc demum recogniti atque perfecti.* Basel: Ludovicus Lucius, March 1554. [24], 561, [1] pp. Signatures: α^4 β^4 γ^4 a-z^4 A-Z^4 Aa-Zz^4 Aaa^6. Title with woodcut printer's device recto and medaillon portrait of the author verso, colophon on leaf 3A5v, woodcut illustrations and diagrams in text, historiated woodcut initials, final blank leaf. 2 works in 1 volume. Folio (314 x 211 mm). Bound in contemporary pigkin over wooden boards, spine with 4 raised bands, boards richly stamped and ruled in blind (lacking metal clasps, corners worn, leather soiled and darkened), author's name inked on fore-edge. Light browning of text, first title-page a bit dust-soiled, faint minor marginal staining in places, very minor occasional spotting, a few ink markings and annotations in contemporary hand, vellum index tabs at fore-edge throughout (two torn off). Provenance: Ink ownership inscription of a Basel citizen ("Sum Jacobi ?Ryf..") dated 1560 at foot of first title, additional contemporary ink inscription on titles and beneath colophon partly cancelled; The Birmingham Assay Office Library (small ink stamp to first free endpaper), acquired from London-based bookseller W. M. Voynich (his letter to the Assay Office, dated Dec. 5, 1912 loosely attached). An exceptional copy in untouched original binding. (#003273) € 14,500

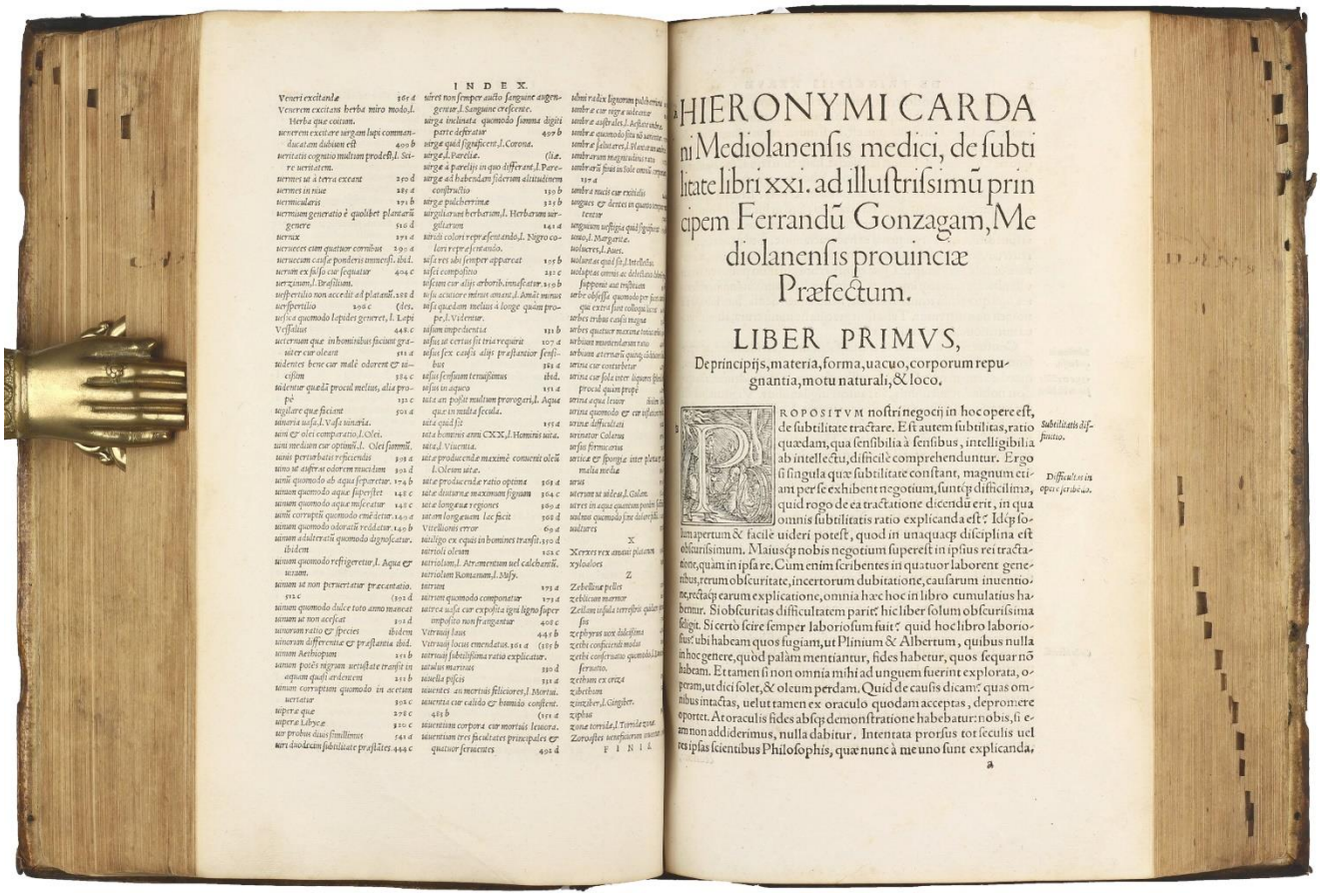
I. FIRST EDITION of Cardano's most important astrological work, the commentary on Ptolemy's textbook of astrology, *Quadripartitum*, (or *Tetrabiblos* in Greek). For having cast the horoscope of Jesus Christ (pp. 163-66) and attributing the events of His life to the influence of the stars, Cardano was prosecuted by the Roman Inquisition for heresy in 1570 until he recanted after a few months spend in prison. Cardano's dedicatory preface addressed to John Hamilton, Archbishop of Edinburgh is dated June 16 (XVI Calendas Iulij) 1553 in Milan. That same year, Cardano had cured Hamilton of a disease which had left him unable to speak and was thought to be incurable. John Hamilton's horoscope is cast by Cardano on p.613.



"In 1548, a complete translation of Ptolemy's *Tetrabiblos* by A. Gogava was published. The new editions, in particular the second, made it possible to read Ptolemy separately from the Hermetical interpretations and to measure all the better the distance between the *Tetrabiblos* and the *Centiloquium* . . . Cardano was quick to grasp such an increase of quality. He fell upon Gogava's translation by chance, in the midst of a long voyage to Scotland which took him to the sick-bed of the archbishop of Edinburgh, John Hamilton. Having immediately understood that the renewal of astrology depended on the recovery of the real Ptolemy, the Pavian scholar decided to write a new, precise commentary, which was published in 1554. He claimed that the *Centiloquium* was not a work by Ptolemy, but of someone else who had misunderstood and even deformed the Ptolemaic doctrine. He asserted the conjectural nature of the art of astrology, to be understood as a part of natural philosophy, and not as superstition, prophesising, magic, auguries, omens and such like ... From the outset he was critical of popular astrology, which he regarded as ignorant and unreliable. In his first astrological writings, he kept to the forms sanctioned

by tradition, publishing, among others, a Prognostic for the years 1534 to 1550, as well as a collection of Astrological Aphorisms in seven books. Thus, for the young Cardano, the question of the certitude and truthfulness of prediction remained still unproblematic, taken from the Arab astrologers and works of Stoic inspiration. It was subsequently the direct reading of Ptolemy which convinced him about the conjectural nature of that portion of astrological predictions which referred more specifically to individual events. In his texts . . . we find this conception connected with the more general thesis about the conjectural nature of all knowledge. Knowledge, for Cardano, comes by way of the deciphering of signs that reveal, obscurely, the hidden order which God has impressed on the world. On this point, which he owed to suggestions from Neo-Platonism, Cardano set himself apart, subtly and perhaps even unconsciously, from the Peripateticism of Ptolemy, to which, by contrast, the prevailing natural philosophy of the 'Ptolemaic' astronomers of the 16th and 17th century subscribed. Cardano's commentary is the most authoritative among the many which the astrological culture of the first modern era devoted to Ptolemy, astrologorum princeps." (Dooley). References: DSB III, p.65; Houzeau & Lancaster 4856; VD16 C898; Mellon 25; B.Dooley, *A Companion to Astrology in the Renaissance*, Brill, 2014, p. 93-94.

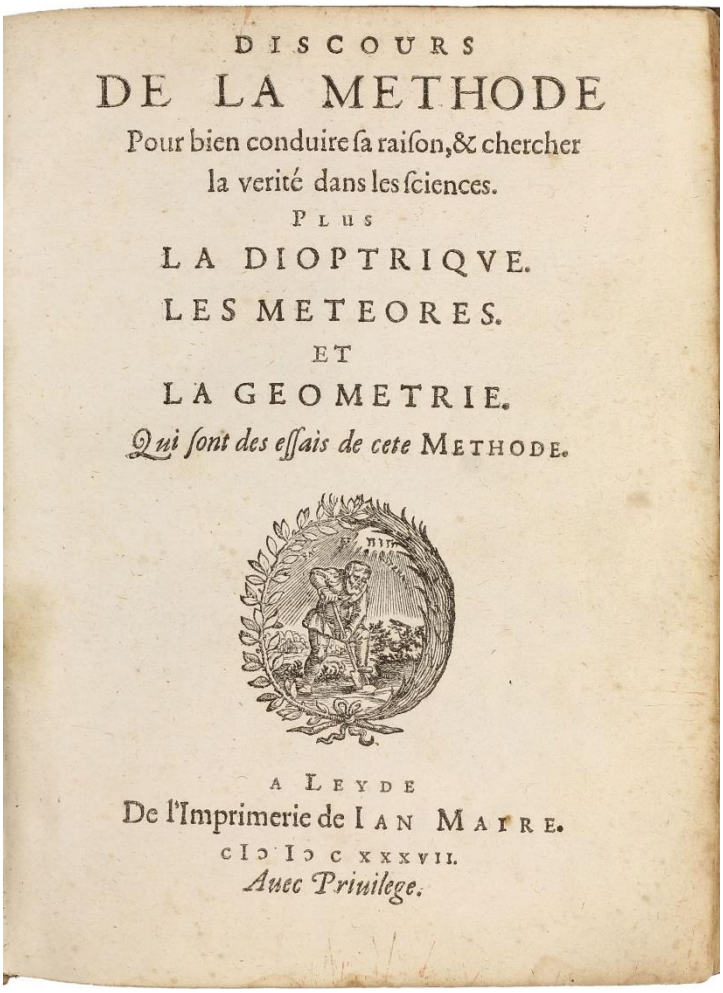
II. SECOND FOLIO EDITION (the 4th overall) of Cardano's encyclopedia of natural sciences, which DSB calls "a mine of facts, both real and imaginary; of notes on the state of science; of superstition, technology, alchemy, and various branches of the occult." The 1554 edition, the most complete, is considered the definitive text. The dedication and the table of the 1550 first edition have disappeared, the text corrected and enlarged. A new errata is printed (p. 561). In this edition, Cardano retains his dangerous and heretical assertion that Nobody knows God, neither what he Is, nor if he Is (*Nemo novit Deum, nec quid sit, quisque sit*) which disappears, with other text passages, in all subsequent editions. Literature: DSB III, p.66; NLM/Durling 847; Adams C670; Houzeau and Lancaster 4856; VD 16 P 5255.



In untouched original binding

10 **DESCARTES, René**. *Discours de la methode pour bien conduire sa raison, & chercher la verité dans les sciences. Plus la Dioptrique. Les Météores, et la Géométrie qui sont des essais de cete methode*. Leiden: Jan Maire, 1637. 4to (191 x 146 mm). 78, [2], 413, [35] pp., woodcut printer's device on title, 3 section-titles, woodcut initials, numerous woodcut text diagrams and illustrations, errata, French and Dutch privilege on Kkk3-4. Bound in contemporary French calf, gilt-decorated spine with 5 raised bands and gilt lettering in first compartment, red-sprinkled edges, marbled pastedowns (leather rubbed and scratched, wear to extremities, corners bumped and scuffed, spine ends somewhat scuffed, short split to upper hinge near head of spine). Only little even browning and minor occasional spotting of text, a few small light dampstains to blank margins, lower outer corner of gatherings L to X somewhat gnawed (up to 7 mm from corner but well away form text), upper margin of leaf 3K3 verso trimmed just touching initial headline letter. Provenance: from the library of French journalist and publisher Frédéric Decazes de Glücksbierg (1958-2018). In all a very good copy, unrestored and with the hinges quite sound and flexible. (#003348) € 75,000

FIRST EDITION of the author's first published work, the foundation of all modern scientific and philosophic thought. In the first part, Descartes sets out his method of inquiry, and then illustrates it in three essays on optics, meteorology and geometry. "The purpose of the *Discours* of Descartes is to find the simple indestructible point which gives to the universe and thought their order and system. Three points are made: the truth of thougth, when thought is true to itself (thus *cogito, ergo sum*), the inevitable elevation of its partial state in our finite consciousness to its full state in the infinite existence of God, and the ultimate reduction of the material universe to extension and local movement. From those central proposition in logic, metaphysices and physics came the subsequent inquiries of Locke, Leibniz and Newton. This great work also contains scientific material of fundamental importance - his invention of analytical geometry which is the basis of geometry as we know it, treatises on optics and meteors, and the first mention of Harvey's discovery by a prominent foreign scholar" (PMM).

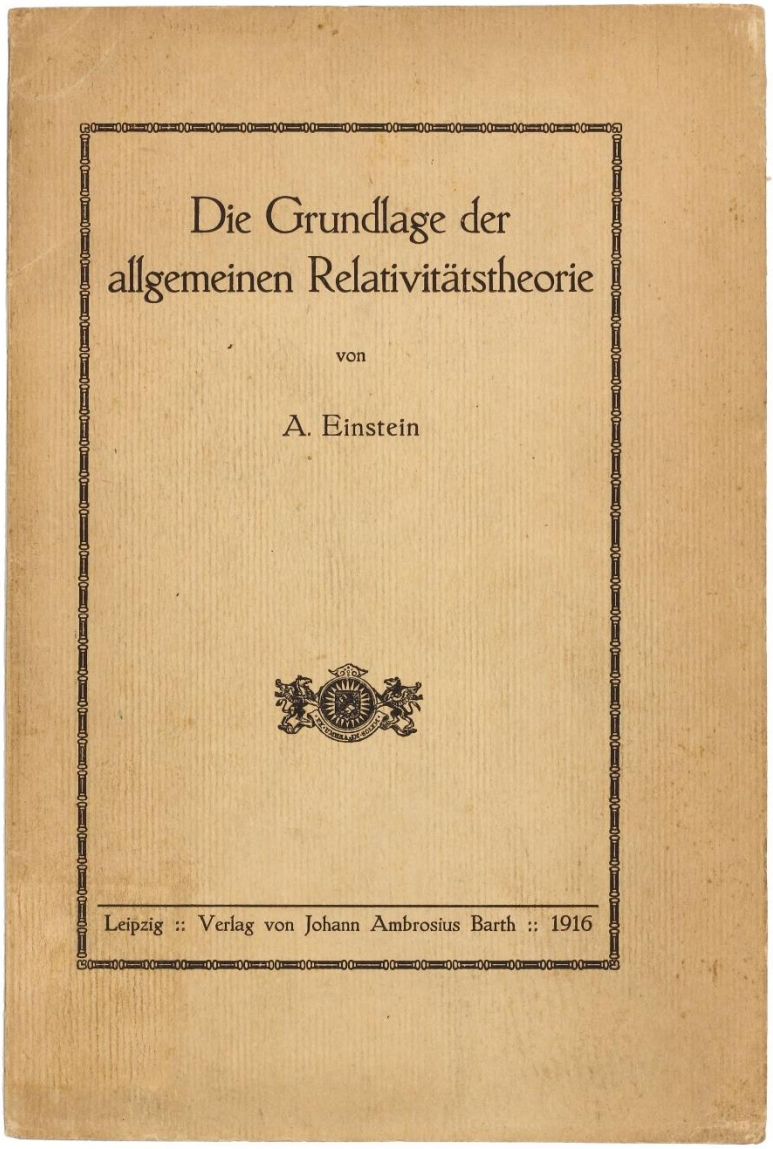

DISCOURS
DE LA METHODE
Pour bien conduire ſa raiſon,& chercher
la verité dans les ſciences.
PLUS
LA DIOPTRIQVE.
LES METEORES.
ET
LA GEOMETRIE.
Qui ſont des eſſais de cete METHODE.
A LEYDE
De l'Imprimerie de IAN MAIRE.
cIↃ IↃ c XXXVII.
Auec Priuilege.

"Descartes contributions to the mathematical, physical and astronomical sciences were many, but his major contribution was his anonymous, first published work - a discourse on method. In this he discussed Harvey's circulation (the first distinguished foreigner to do so), advanced the necessity of mathematical proof and proposed accepting those things that cannot be doubted ... In the appendices he explained his method of analytic geometry (Vartesian co-ordinates) and treated on optics and meteors. The Dioptrique (Discourse II) contains the earliest statement of Willebrord Snell's law of refraction" (Dibner).

References: PMM, *Printing and the Mind of Man* 129; Dibner, *Heralds of Science* 81; Grolier/Horblit 24; Guibert, *Bib. Descartes* 1; NLM/Krivatsky 3114; Norman 621; Tchemerzine IV, 286; Peyré, *En français dans le texte* 90.

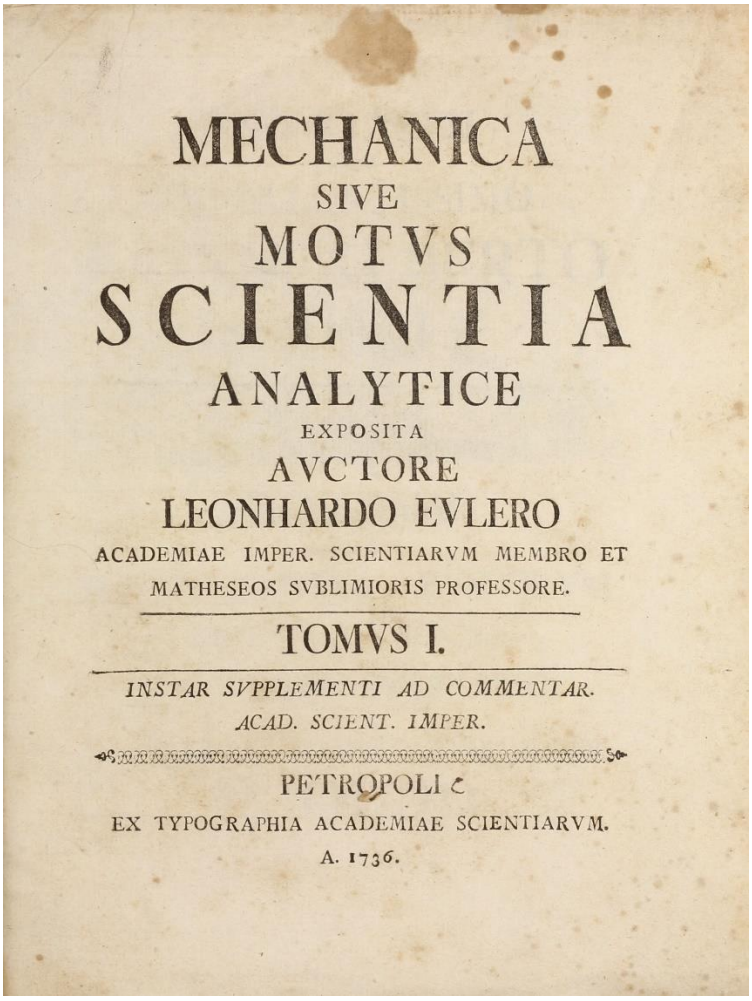
11 **EINSTEIN, Albert.** *Die Grundlage der allgemeinen Relativitätstheorie.* Offprint from: Annalen der Physik, vol. 49. Leipzig: Johann Ambrosius Barth, 1916. 8vo (245 x 163 mm). [1-2] 3-64 pp. Publisher's original printed wrappers (a triffle dust-soiling and spotting, upper left corner slightly bumped, light discoloration from former sticker wrapped around foot of spine). Text very little age-toned, but in all a crisp, clean and unmarked copy. (#003368) € 4800

Grolier/Horblit 26c; PMM 408; Weil *80a. Norman 696 - FIRST EDITION, FIRST PRINTING of Einstein's fundamental statement of the General Theory of Relativity. "Whereas Special Relativity had brought under one set of laws the electromagnetic world of Maxwell and Newtonian mechanics as far as they applied to bodies in uniform relative motion, the General Theory did the same thing for bodies with the accelerated relative motion epitomized in the acceleration of gravity. But first it had been necessary for Einstein to develop the true nature of gravity from his principle of equivalence. Basically, he proposed that gravity was a function of matter itself and that its effects were transmitted between contiguous portions of space-time. Thus the universe which Newton had seen, and for which he had constructed his apparently impeccable mechanical laws, was not the real universe. Einstein's paper gave not only a corrected picture of the universe but also a fresh set of mathematical laws by which its details could be described. [The Haskell Norman Library of Science and Medicine. Part III. R.WE. Clark, Einstein, New York, 1984. "The theory of relativity has transformed astrophysics, and indeed the whole scientific outlook" (PMM 408). "What is today known as the general theory of relativity bears upon the notion of gravity and corrects certain problems in Newtonian physics. It was developed from 1907 until its publication in 1916. The general theory is effectively an extension of the special theory to systems in accelerated motions, such as bodies in space. From the general theory of relativity issues all of 20th-century cosmology - from an explanation of the 'red shift' that indicates the universe is expanding, to the notion of black holes... The great consequence [of the theory] is that gravitation is not simply the force in nature by which all objects are attracted to each other. It is rather the 'warping' of space and time by physical mass. The existence of mass shows that space must be 'curved'-non-Euclidian in shape and measurable, given the speed of light. Although general relativity and classical laws give basically the same results in the ordinary world, Einstein's theory not only can describe the elliptical orbits of the planets, but corrects certain Newtonian anomalies, such as the orbit of Mercury around the sun. Einstein became, virtually overnight, a great public celebrity. On November 7, 1919, the London Times announced: 'Revolution in Science. New Theory of the Universe. Newtonian Ideas Overthrown'" (Simmons, Scientific 100, 11-13). "There were several reprints and facsimiles. The first edition may be identified by the presence of the printer's imprint 'Druck von Metzger & Wittig in Leipzig' on the verso of the title and the shorter imprint 'Metzger & Wittig, Leipzig' on the back wrapper" (Norman).

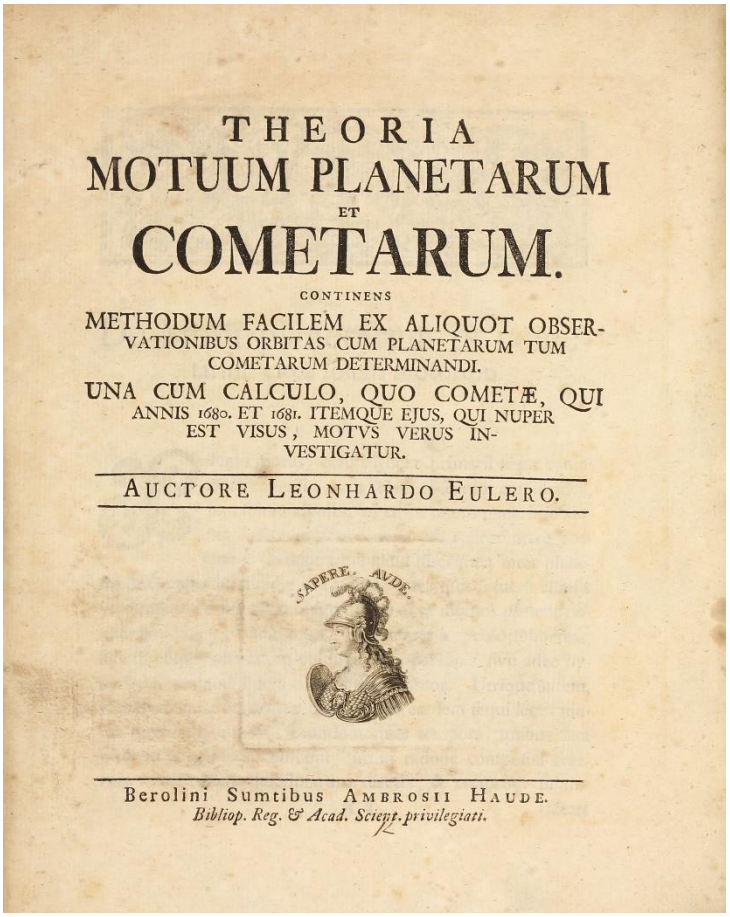

Die Grundlage der
allgemeinen Relativitätstheorie
von
A. Einstein
Leipzig :: Verlag von Johann Ambrosius Barth :: 1916

12 **EULER, Leonhard**. *Mechanica sive motus scientia analytice exposita.* St. Petersburg: Academy of Sciences, 1736. Two volumes. 4to (249 x 188 mm). [16] 1-232, 225-480 (i.e., 488); [8], 500 pp. Engraved vignette on dedication leaf, woodcut head- and tail pieces, and 32 engraved folding plates, some mispaginations. Contemporary half calf over marbled boards, spine with 5 raised bands richly gilt in compartments (lettering pieces gone, partial fraying and chipping of spine ends, wear and chipping of board edges, corners scuffed). Text and plates with light even browning and occasional spotting mostly to outer margins, few pages dust-soiled at top margin, short pencil corrections and rare annotations in places, light occacional unobtrusive dampstains, including to the final 5 plates in vol. I, ink smudges on p. 389 in vol. I, numbering added in pencil to diagrams of plates in vol. II, offset plate VIII in vol. II slightly shaved at fore-margin, clean tear to lower blank margin of leaf E4 in vol. II. Provenance: mathematician Paul Stäckel (booklate to front-pastedowns), 19th century ownership inscription to first flyleaf of both volumes. A very good, wide-margined set. (#003351) € 5500

Roberts-Trent, *Bibliotheca Mechanica*, p.103-104; DSVB IV, p.480; Enestrom 15 and 16; Roller-Goodman I, 374; Honeyman 1058. - FIRST EDITION of Euler's seminal work on mechanics. *Mechanica* won the praise of many leading scientists of the time: Johann Bernoulli said of the work that 'it does honor to Euler's genius and acumen,' while Lagrange in his own *Mécanique analytique* acknowledges Euler's mechanics to be 'the first great work where Analysis has been applied to the science of motion.' In the introduction he outlines a program of studies covering every branch of science, but it is his focus on the systematic application of analytical methods that sets the book apart by laying down a foundation of analytical mechanics. Euler was a talented Swiss mathematician, astronomer, physicist and engineer, who studied at the University of Basel, but spent most of his life in St. Petersburg, teaching at the Imperial Russian Academy of Sciences, and later taking a post at the Berlin Academy. He eventually fell out of favor with the Prussian court and returned to St. Petersburg. He made important discoveries in mathematics, contributing to the development of infinitesimal calculus, along with the Bernoullis, with whom he was closely acquainted. He also made considerable contributions to analytic number theory, graph theory, empirical logic and even music theory. Much of today's mathematical notation was introduced in Euler's work. "Euler was the first to appreciate the importance of introducing uniform analytic methods into mechanics, thus enabling its problems to be solved in a clear and direct way" (DSB).


MECHANICA
SIVE
MOTVS
SCIENTIA
ANALYTICE
EXPOSITA
AVCTORE
LEONHARDO EVLERO
ACADEMIAE IMPER. SCIENTIARVM MEMBRO ET
MATHESEOS SVBLIMIORIS PROFESSORE.
TOMVS I.
INSTAR SVPPLEMENTI AD COMMENTAR.
ACAD. SCIENT. IMPER.
PETROPOLI
EX TYPOGRAPHIA ACADEMIAE SCIENTIARVM.
A. 1736.

13 **EULER, Leonhard.** *Theoria motuum planetarum et cometarum. Continens methodum facilem... orbitas cum planetarum cum cometarum determinandi, una cum calculo, quo cometae, qui annis 1680 et 1681... motus verus investigatur*. Berlin: Ambrosius Haude, 1744. 4to (228 x 188 mm). [3] 4-187 (i.e. 186) pp., engraved frontispiece by F.H. Fritsch, engraved device on title, woodcut head- and tailpieces, 4 folding engraved plates bound at end; bound without the cancel leaf A4 as in most copies. 18th century marbled paper wrappers (minor rubbind to extremities, short tear at head of lower wrapper). Minor mostly marginal spotting and browning. Very good, wide-margined copy. (#003340) € 3000


THEORIA
MOTUUM PLANETARUM
ET
COMETARUM.
CONTINENS
METHODUM FACILEM EX ALIQUOT OBSERVATIONIBUS ORBITAS CUM PLANETARUM TUM COMETARUM DETERMINANDI.
UNA CUM CALCULO, QUO COMETÆ, QUI ANNIS 1680. ET 1681. ITEMQUE EJUS, QUI NUPER EST VISUS, MOTUS VERUS INVESTIGATUR.
AUCTORE LEONHARDO EULERO.
SAPERE AUDE.
Berolini Sumtibus AMBROSII HAUDE.
Bibliop. Reg. & Acad. Scient. privilegiati.

FIRST EDITION OF EULER'S FIRST TREATISE ON ASTRONOMY and "a fundamental work on calculation of orbits" (DSB). Leonhard Euler (1707-1783) drew up lunar tables in 1744, clearly already studying gravitational attraction in the Earth, Moon and Sun system. In his "*Theoria*" he calculates the orbits of planets and comets, later refined by Lagrange. "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* . . . Euler gave a complete mathematical treatment of the two-body problem consisting of a planet and the Sun." (Debnath). References: Houzeau/Lancaster 11948; Honeyman 1063; Enestrom "Euler" 66; DSB IV, p.471; Roller-G. I, 375; Debnath, *The Legacy of Leonhard Euler*, p.364.

14 **FARADAY, Michael**. *Chemical Manipulation; Being Instructions to Students in Chemistry, on the methods of performing experiments of demonstration or of research, with accuracy and success.* London: W. Phillips, 1827, 8vo (214 x 136 mm). vii [1], ix [1], 11-656 pp. Woodcut illustrations in text. Original cloth-backed boards with gilt-lettered label to spine (wear to extremities, corners bumped, boards little soiled). Internally little age-toned with minor occasional spotting and dust soiling. Provenance: The library of Hugh Selbourne. (#002461) € 1600

Bolton I, 434; Duveen p.207. FIRST EDITION. This is the only separate book published by Faraday. All other books that bear his name were collections of published papers or edited reports of his lectures. The purpose of this work was to make the general methods of chemistry, as distinguished from its results, the subject of special study and popular exposition. As a chemist, Faraday discovered benzene, investigated the clathrate hydrate of chlorine, invented an early form of the Bunsen burner and the system of oxidation numbers, and popularised terminology such as anode, cathode, electrode, and ion. Faraday ultimately became the first and foremost Fullerian Professor of Chemistry at the Royal Institution of Great Britain, a lifetime position. (Wikisource). This first edition has become quite rare in the trade. We could trace just five copies as having sold at auction in the past 40 years.

15 **FRANKLIN, Benjamin**. *A Letter from Mr. Franklin to Mr. Peter Collinson, F.R.S. concerning the Effects of Lightning*. In: Philosophical Transactions of the Royal Society of London, vol. 47, pp. 289-291. [Ibid] *A Letter of Benjamin Franklin, Esq; to Mr. Peter Collinson, F.R.S. concering an electrical Kite*, pp.

565-567. London: C. Davis, 1753. 4to (224 x 173 mm). Entire volume 47, for the Years 1751 and 1752 offered: [18], 571, [17] pp., 20 folding engraved plates, folding table, text illustration and diagrams. Bound in 20th century half green calf, spine gilt lettered, blue-sprinkled edges, new endpapers (light tanning of spine). Text somewhat browned mostly at outer margins, occasional minor dust-soiling and spotting of text and plates, clean tear at upper margin of leaf 3H1 with old repair, contemporary ink annotation to p. 184. (#003316) € 3500

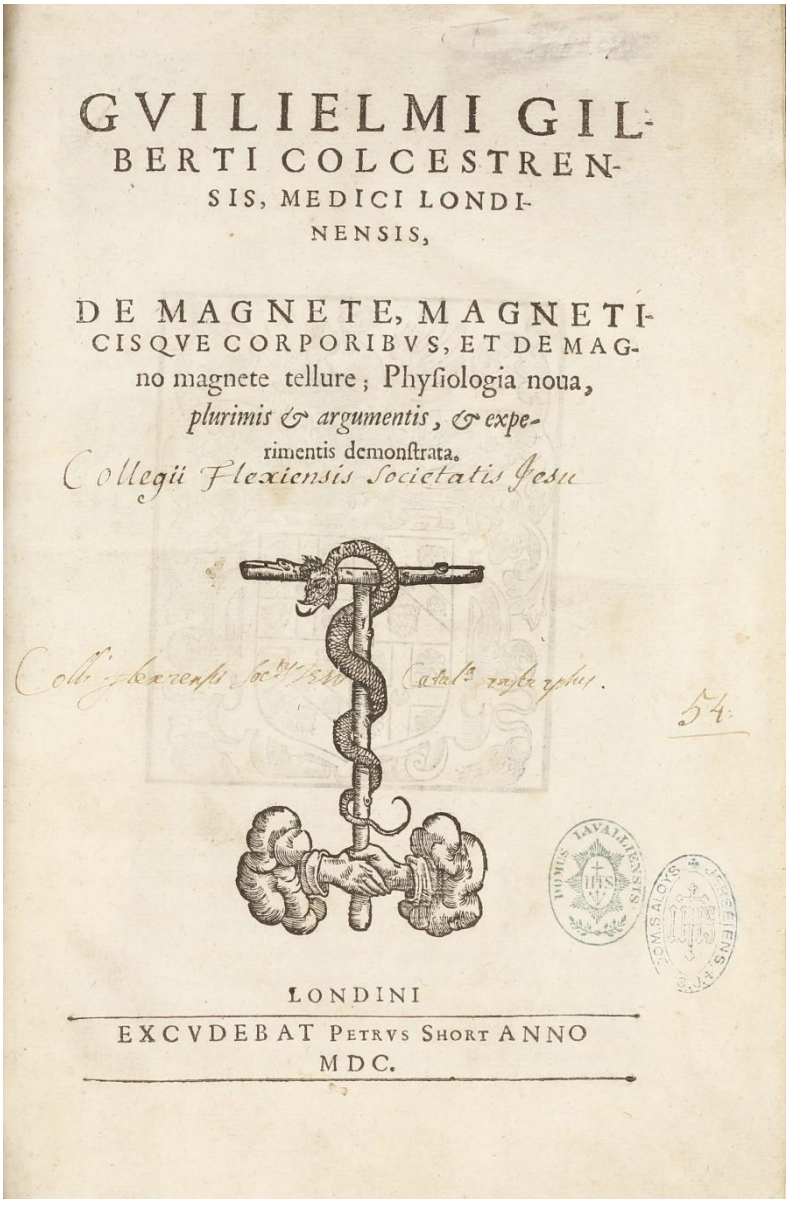
FIRST EDITION of both letters in which Franklin describes his lightning experiment and in which he proves that lightning is an electrical phenomenon. "Benjamin Franklin was the first American to win an international reputation in pure science and the first man of science to gain fame for work done wholly in electricity. His principle achievement was the formulation of a widely used theory of general electrical 'action' (explaining or predicting the outcome of manipulations in electrostatics: charge production charge transfer, charging by electrostatic induction). He advanced the concept of a single 'fluid' of electricity, was responsible for the principle of conservation of charge, and analyzed the distribution of charges in the Leyden jar, a capacitor. He introduced into the language of scientific discourse relating to electricity such technical words as 'plus' and 'minus,' 'positive' and 'negative,' 'charges' and battery. By experiment he showed that the lightning discharge is an electrical phenomenon, and upon this demonstration (together with his experimental findings concerning the action of grounded and of pointed conductors) he based his invention of the lightning rod . . . Franklin devised a second experiment to test the electrification of clouds, one which has become more popularly known: the lightning kite. Franklin reported this experiment to Collinson in a letter of 1 October 1752, written after Franklin had read 'in the publick papers from Europe, of the success of the Philadelphia-Experiment for drawing the electrick fire from clouds by means of pointed rods of iron erected on high buildings. . . .' Actually, Franklin appears to have flown his electrical kite prior to having learned of Dalibard's successful execution of the sentry-box experiment. The kite letter, published in the philosophical Transactions, referred to the erection of lightning rods on public buildings in Philadelphia. The lightning experiments caused Franklin's name to become known throughout Europe to the public at large and not merely to men of science. Joseph Priestley, in his History . . . of Electricity, characterized the experimental discovery that the lightning discharge is an electrical phenomenon as 'the greatest, perhaps, since the time of Sir Isaac Newton.' Of course, one reason for satisfaction in this discovery was that it subjected one of the most mysterious and frightening natural phenomena to rational explanation. It also proved that Bacon had been right in asserting that a knowledge of how nature really works might lead to a better control of nature itself: that valuable practical innovations might be the fruit of pure disinterested scientific research." (DSB V, pp. 129, 134-135).

16 **GAUSS, Carl Friedrich.** *Neue Entdeckungen*. In: Intelligenzblatt der Allgemeinen Literatur-Zeitung vom Jahre 1796, No. 66 (June 1, 1796), col. 554. Jéna: Joh. Christ. Gottfr. Göpferdt, 1796. 4to (292 x 195 mm). Entire vol.: half title, drop title for each number, 1536 collumns. Bound in contemporary German marbled cardboard with varnish-painted spine, hand-lettered paper spine label, red-dyed edges (rubbing and paper-chipping to extremities, corners scuffed and bumped). Text evenly browned, occasional minor spotting. Provenance: Landeskirchliche Bibliothek Hamburg (ink stamp including deaccession stamp to half-title verso). (#003345) € 2200

EXCEPTIONALLY RARE FIRST EDITION OF GAUSS' FIRST PUBLICATION, which is a short announcement of his discovery of the constructibility by ruler and compass of the regular polygon of seventeen sides. This discovery is a major, if not unhoped-for, advance in the solution of a problem that has been sought since Greek Antiquity. At barely 19 years of age, Gauss (1777-1855) had thus secured universal fame and the title of "prince of mathematicians." It is said that Gauss, carrying this feat so high, requested that a 17-sided regular polygon be engraved on his tombstone. Raymond Clare Archibald, in his paper about the history of Gauss' discovery, cites from a letter of Gauss to Gerling dated Jan. 6, 1819: "The history of this discovery has up to the present nowhere been publicly alluded to by me; I can give it very exactly, however. The day was the March 29, 1796 and chance had absolutely nothing to do with it. Before this, indeed during the winter of 1796 (my first semester in Göttingen), I had already discovered everything related to the separation of the roots of the equation $x^p-1/x-1=0$ into two groups, on which the beautiful theorem on the lower part of page 637 depends, without making note of the day. After intensive consideration of the relation of all the roots to one another on arithmetical grounds, I succeeded during a holiday in Braunschweig, on the morning of the day alluded to (before I had got out of bed), in viewing this relation in the clearest way, so that I could immediately make special application to the 17-side and to the numerical verification. Of course still other investigations of the seventh section of the D.A. were added later. I announced this discovery in the Literaturzeitung of Jena where my advertisement was published

in May or June 1796" (Archibald p.324). Literature: DSB V, p.299; R. C. Archibald, *Gauss and the Regular Polygon of Seventeen Sides*, in: The American Mathematical Monthly, 1920, vol. 27, 7/9, pp. 323-326).

17 **GILBERT, William**. *De magnete, magneticisque corporibus, et de magno magnete tellure; Physiologia nova, plurimis & argumentis, & experimentis demonstrata*. London: Peter Short, 1600. Folio (270 x 180 mm). [16], 240 pp. Signatures: *^{8}, A-V^{6}. Woodcut title device and large woodcut arms on verso, one folding plate, 87 woodcuts in text of which 4 full-page, decorative woodcut initials, head- and tailpieces (a little soiling to the title, first and last leaf lightly browned, a few occasional scattered rust spots). 19th-century quarter calf, sides covered with black marbled paper, flat spine filleted and lettered in gilt (spine worn, extremities rubbed). Provenance: Jesuit Collège Royal Henry-Le-Grand, La Flèche, France (17th-c. inscriptions on title); Jesuit residence in Laval, France (neat stamp on title, ticket on front paste-down); Jesuit Maison Saint-Louis, Jersey, Channel Islands (neat ink stamp on the titlepage); Peter & Margarethe Braune (bookplate to front pastedown). A very good, well-margined, and internally crisp and clean copy. (#003286) € 19,000


GVILIELMI GIL-
BERTI COLCESTREN-
SIS, MEDICI LONDI-
NENSIS,

DE MAGNETE, MAGNETI-
CISQVE CORPORIBVS, ET DE MAG-
no magnete tellure; Physiologia noua,
plurimis & argumentis, & expe-
rimentis demonstrata.

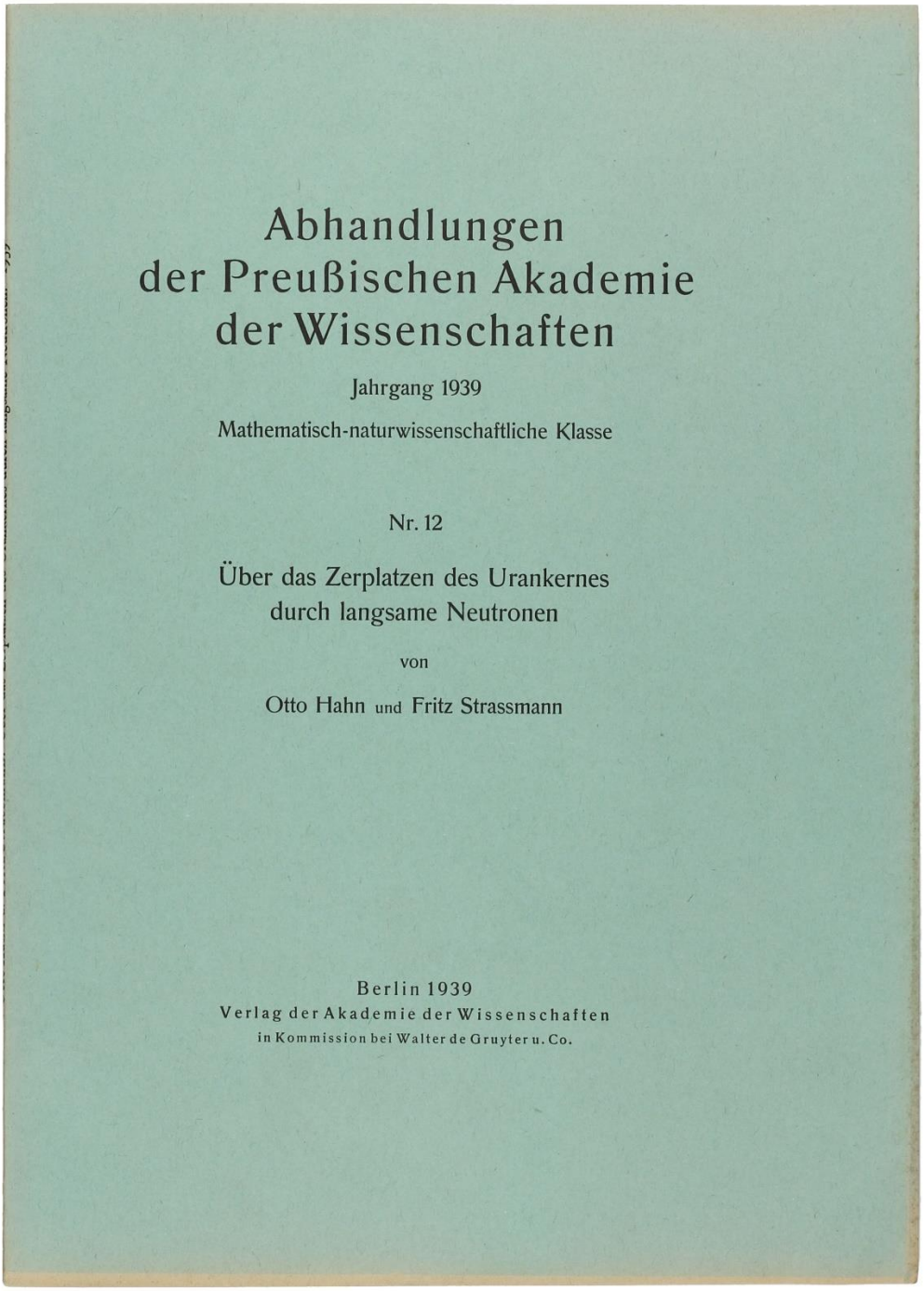
Collegii Flexiensis Societatis Jesu

LONDINI
EXCVDEBAT PETRVS SHORT ANNO
MDC.

Dibner 54; Horblit 41; Norman 905; PMM 107; Sparrow 85; Wellcome 2830. FIRST EDITION of the first great scientific book printed in England. "Gilbert coined the terms 'electricity', 'electric force' and 'electric attraction' and may rightly be considered the founder of electrical science" (PMM); further, he "provided the only fully developed theory dealing with all five of the then known magnetic movements and the first comprehensive discussion of magnetism since the thirteenth-century Letter on the Magnet of Peter Peregrinus" (DSB). *De magnete* exemplifies pre-Baconian experimental philosophy by supporting new theories with empirically-derived experimental evidence, and these experiments were described in sufficient detail for the reader to recreate them. Gilbert also described his scientific instruments in great detail, including new ones such as the 'versorium': the first instrument to be used for the study of electric phenomena. Gilbert observed that the earth was a gigantic magnet and provided a physical basis for the Copernican theory. His work was cited by Digby, Boyle, Kepler and Huygens, and Galileo drew on Gilbertian magnetism to support his belief in a Copernican heliocentric cosmology in his Dialogo.

18 **HAHN, Otto & STRASSMANN, Fritz.** *Über das Zerplatzen des Urankernes durch langsame Neutronen*. Offprint from: *Abhandlungen der Preussischen Akademie der Wissenschaften*, No. 12. Berlin: Verlag der Akademie der Wissenschaften, 1939. 4to (296 x 210 mm). [1-3] 4-20 pp., text diagrams. Original publisher's printed wrappers (very light fading along spine and edges). Text very little age-tonend, mostly to outer margins. An almost pristine copy. (#003367) € 1900

Dibner 168; Norman 963; DSB VI, pp. 16-17. FIRST EDITION, OFFPRINT ISSUE, of one of Hahn and Strassmann's fundamental papers on nuclear fission. In their radiochemical investigations they observed that neutron bombardment of uranium produced highly radioactive material, including the chemical elements barium, lanthanum and cerium. It was their collaborator Lise Meitner (at that time in Swedish exile from Nazi Germany), who interpreted their observations as nuclear fission. It remained to Bohr and Fermi to apply fission to the making of the atomic bomb, a project with which neither Hahn nor Strassmann had any involvement. Hahn was awarded the 1944 Nobel Prize in chemistry. (R. Sohlmann et al. *Nobel, the man and his prizes*, p. 387).



Abhandlungen
der Preußischen Akademie
der Wissenschaften

Jahrgang 1939

Mathematisch-naturwissenschaftliche Klasse

Nr. 12

Über das Zerplatzen des Urankernes
durch langsame Neutronen

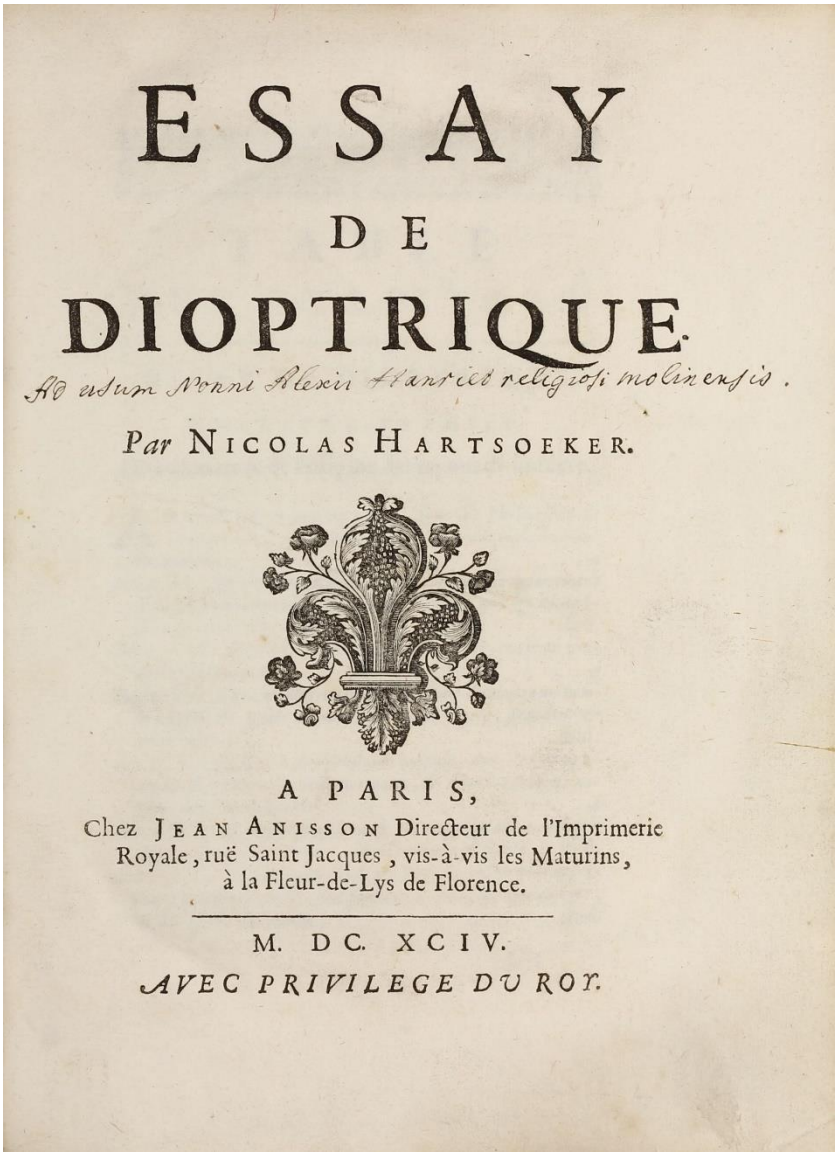
von

Otto Hahn und Fritz Strassmann

Berlin 1939
Verlag der Akademie der Wissenschaften
in Kommission bei Walter de Gruyter u. Co.

19 **HARTSOEKER, Nicolaas**. *Essay de Dioptrique*. Paris: Jean Anisson, 1694. 4to (249 x 184 mm). [24], 1-179, [2], 180-233 [1] pp. Woodcut printer's device on title, woodcut initials, head- and tailpieces, one unsigned double leaf with engraved lunar map and facing explanatory text inserted before p. 179, several diagrams and a few illustrations in text. Bound in contemporary French sprinkled calf, gilt-decorated spine with 5 raised bands and gilt-lettered label in first compartment, red-sprinkled edges, original endpapers (wear to extremities, spine-ends chipped, minor unobtrusive old repair to corners and hinges). Bright and crisp internally, the inserted plate just a bit browned and spotted. Provenance: Alexis (Nicolas-François) Hanriet* (neat inscription "Ad usum Nonni Alexii Hanriet religiosi molinensis" on title). Exceptional, wide-margined copy in original binding. (#003350) € 8500

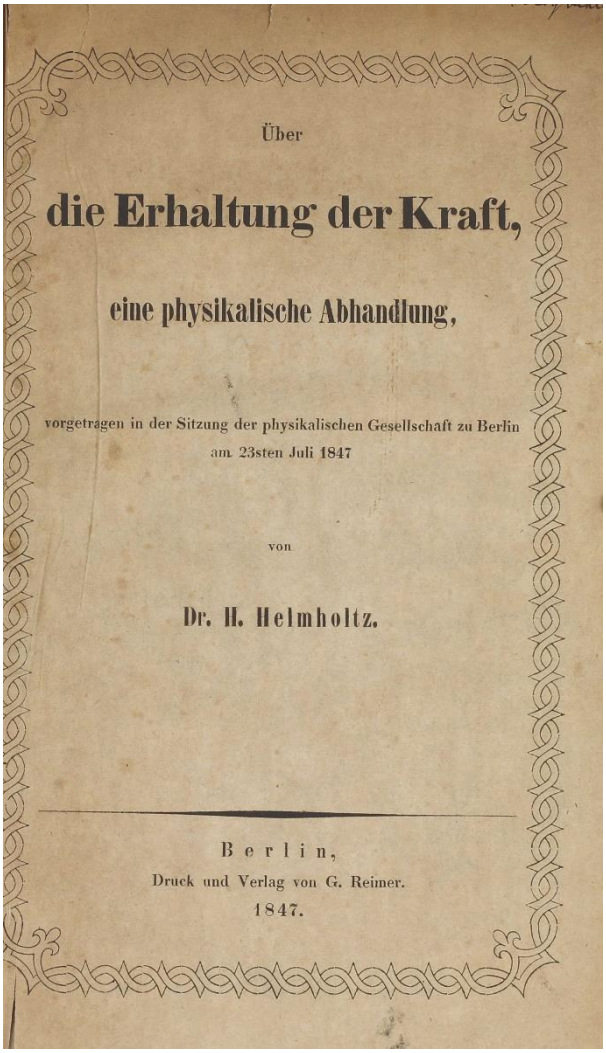
Bierens de Haan 1925; Wellcome III, p.217; DSB VI, 148f; A.J.J. Vandevelde, *Bijdr. tot de bibliogr. geschied. v.h. microscoop*, pp. 1174-76. - RARE FIRST EDITION. Nicolaas Hartsoeker (1656-1725) was a Dutch mathematician, physicist and inventor of the screw-barrel simple microscope. Starting as a lens maker in Rotterdam, he was instructed in optics by Antonie van Leeuwenhoek. In 1674, he and a fellow student, assisted by Van Leeuwenhoek, were the first to observe semen, a situation that would later lead to a priority dispute between Hartsoeker and Leeuwenhoek over the discovery of spermatozoids. "In addition to his instrument work, Hartsoeker did research in embryology. In 1674 he recognized small 'particles' in the sperm, which he at first thought to be signs of desease . . . As a result of his investigations, Hartsoeker believed that the fetus was preformed in the sparmatozoon and published illustrations of the humunculus crouched there" (DSB). He never claimed to have seen humunculi; he only postulated their existence as part of his Spermist theory of conception. His *Essay on dioptrics*, in which this hypothesis was formulated, "was a highly lauded book, in fact tackling several misconceptions of the time. For example, Hartsoeker disavows the contemporary position (e.g. of Robert Hooke) that with refractor telescopes one soon would be able to see man-sized creatures on the moon, if any in fact existed." (Wikisource).


ESSAY
DE
DIOPTRIQUE.
Ad usum Nonni Alexii Hanriet religiosi molinensis.
Par NICOLAS HARTSOEKER.
A PARIS,
Chez JEAN ANISSON Directeur de l'Imprimerie Royale, ruë Saint Jacques, vis-à-vis les Maturins, à la Fleur-de-Lys de Florence.
M. DC. XCIV.
AVEC PRIVILEGE DU ROY.

With the original printed wrappers

20 **HELMHOLTZ, Hermann von.** *Über die Erhaltung der Kraft, eine physikalische Abhandlung, vorgetragen in der Sitzung der physikalischen Gesellschaft zu Berlin.* Berlin: G. Reimer, 1847. 8vo (220 x 139 mm). [4], 72 pp. Contemporary German half cloth over marbled boards, hand-lettered paper label to upper board, original printed wrappers bound in, original endpapers, custom black cloth clamshell case (rubbing of boards and extremities, smaller patches of frayed cloth along hinges). Light age-toning of text, minor occasional foxing, vertical crease in printed wrappers, text marking in light pencil on two pages. Provenance: C. Bergmann (signature on front wrapper and title); Rostock University Library (ink stamp repeated 4 times); Peter & Margarethe Braune (bookplate to front pastedown). A very good copy in untouched binding. (#003287) € 37,500

PMM 323; Horblit 48; Dibner 159; Norman 1039; Sparrow 96; Garrison-Morton 611; DSB VI, p.244-246. FIRST EDITION, AND EXCEPTIONALLY RARE WITH THE ORIGINAL PRINTED WRAPPERS PRESERVED. "The first comprehensive statement of the first law of thermodynamics: that all modes of energy, heat, light, electricity, and all chemical phenomena, are capable of transformation from one to the other but are indestructible and cannot be created" (PMM). In his brilliant analysis of the conservation of energy, Helmholtz classified different forms of energy and kinds of force and motion, into kinetic or potential. He gave mathematical expression to the energy of motion, thus providing "a fundamental measure in research of all forces including muscular and chemical" (Dibner).


Über

die Erhaltung der Kraft,

eine physikalische Abhandlung,

vorgetragen in der Sitzung der physikalischen Gesellschaft zu Berlin
am 23sten Juli 1847

von

Dr. H. Helmholtz.

Berlin,
Druck und Verlag von G. Reimer.
1847.

"*Ueber die Erhaltung der Kraft* (1847) set forth the philosophical and physical basis of the conservation of energy. It drew heavily on the works of Sadi Carnot, Clapeyron, Holtzmann, and Joule, although it was far more comprehensive than those previous treatises. The philosophical introduction clearly illustrated the influence of Kantianism on Helmholtz' thought. Science, he began, views the world in terms of two abstractions, matter and force. The goal of science is to trace phenomena to their ultimate causes in accordance with the law of causality; such ultimate causes are unchangeable forces. We can, Helmholtz implied, know the nature of such forces virtually a priori. If we imagine matter dispersed into its ultimate elements, then the only conceivable change which can occur in the relationship of those elements is spatial. Ultimate forces, then, must be moving forces radially directed. Only the reduction of phenomena to such forces constitutes an explanation to which we may ascribe the status of 'objective truth' . . . That ultimate forces must be of this nature can also be inferred from the impossibility of producing work continually from nothing. That impossibility, Helmholtz demonstrated, is equivalent to the well-known principle of the conservation of *vis viva*. Assuming that principle to hold for a system of bodies in motion, Helmholtz attempted to prove that the forces under which those bodies move must be functions only of position (and hence not of velocity or acceleration) and also radially directed . . . Helmholtz then demonstrated how the conservation principle could be applied to various physical phenomena. The principle of the conservation of *vis viva* had already been applied to gravitation, wave motion, and inelastic collision. Previously an absolute loss of force had been assumed in inelastic collision and friction. Helmholtz argued to the contrary that the *vis viva* apparently lost in such cases is merely converted to tension forces or heat; on the latter assumption Joule had recently measured a mechanical equivalent of heat equal to 521' meter-kilograms per calorie in mks units. Helmholtz then proceeded to an extended defense of the dynamic theory of heat against the caloric theory, arguing that the free heat of a body consists in the microscopic motion of its particles, its latent heat in the tension forces between its atoms. He then introduced the equations of Clapeyron and Holtzmann for the expansion of gases. The derivation

of Clapeyron's equations, he pointed out, rests upon the untenable assumption that no heat is lost when work is done by a gas in expanding. He concluded by applying the conservation principle to electrostatic, galvanic, and electrodynamic phenomena." (DSB VI, pp. 243-244).

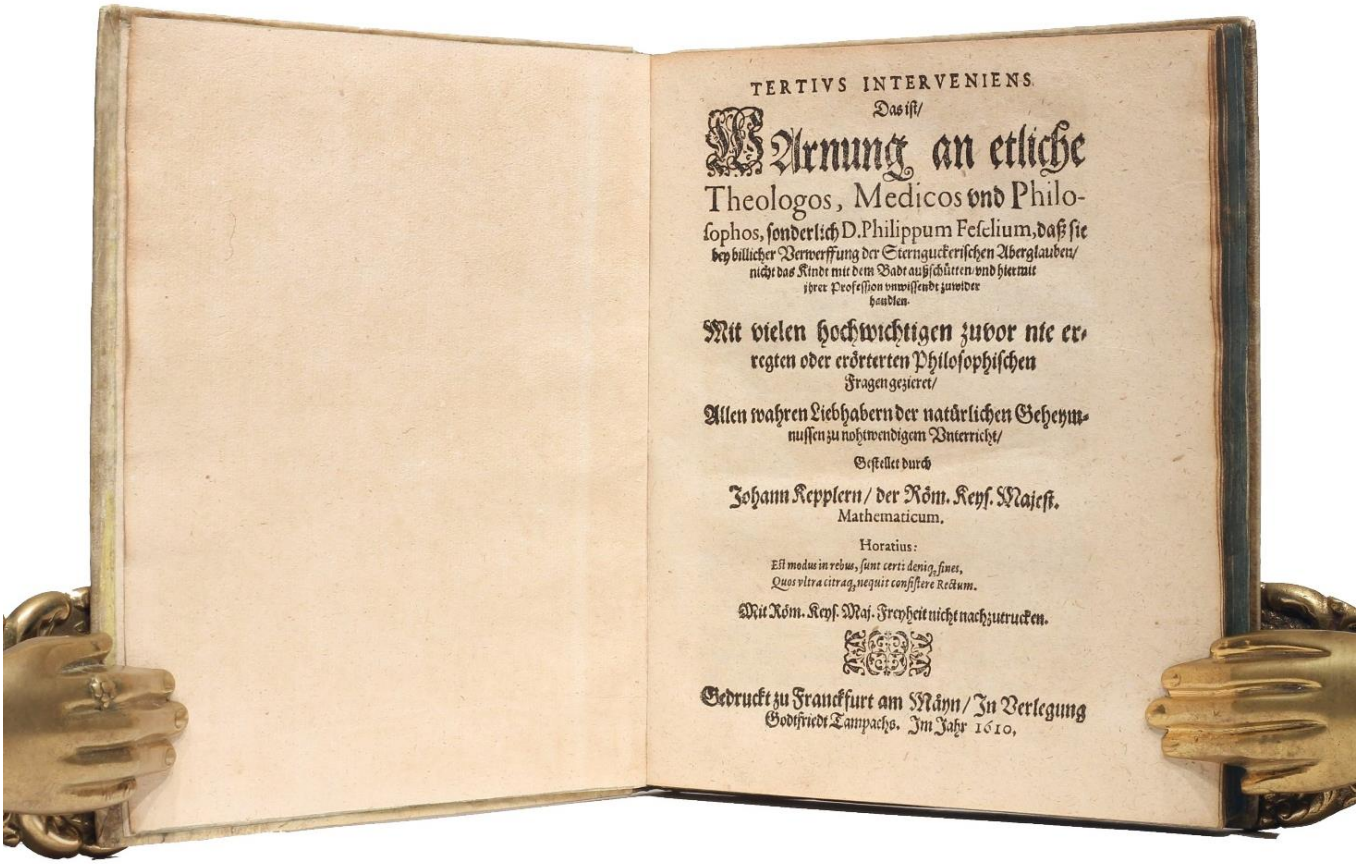
21 **HUMBOLDT, Alexander von**. *Über die Haupt-Ursachen der Temperatur-Verschiedenheit auf dem Erdkörper . . . Gelesen in der öffentlichen Versammlung der Königlichen Akademie der Wissenschaften zu Berlin am 3. Julius 1827*. Berlin: Gedruckt in der Druckerei der Königlichen Akademie der Wissenschaften, in Commission bei F. Dümmler, 1827. 4to (282 x 232 mm). 24 pp. Later plain wrappers, pages uncut and unopened, contained in modern cloth pocket folder. Text crisp and clean, lower blank corner of p.21/22 torn. Provenance: Peter and Margarete Braune. A fine, unsophisticated copy. (#003320) € 750

Löwenberg 257. Poggendorff I, 1158. RARE FIRST SEPARATE EDITION by one of the founders of studies in meteorology and climatology. This lecture, in which he describes the main causes of temperature differences over the face of the earth, is one of his most important contributions.

No copy in US libraries

22 **KEPLER, Johannes.** *Tertius Interveniens, das ist Warnung an etliche Theologos, Medicos und Philosophos, sonderlich D. Philippum Feselium, dass sie bey billicher Verwerffung der Sternguckerischen Aberglauben, nicht das Kindt mit dem Badt außschütten, und hiermit ihrer Profession unwissendt zuwider handlen. . .* Frankfurt am Main: Godtfriedt Tampach, 1610. 4to (185 x 156 mm). 90 unnumbered leaves. Signatures:)(^{4},)()(^{4} A-V^4 X^2. Including title with small woodcut device, 2 woodcut initials, 4 preliminary leaves of dedication to Markgraf Georg Friedrich von Baden, 3 leaves of registrum, and final blank leaf X2. Bound in later plain vellum, blue-dyed edges. Paper browned, several stronger within text block area, a few brown spots, occasional annotations and text markings in contemporary red and black ink. Provenance: from a private Hungarian collection. A very good, clean and ample-margined copy. (#003374) € 35,000

EXCEEDINGLY RARE FIRST EDITION of Kepler's response to the discussion paper of Philip Feselius, *Gründtlicher Discurs von der Astrologia Judiciaria* (Strassburg, 1609), in which Feselius completely rejects astrology, especially attacking Helisaeus Röslin. This piece is a part of the huge polemic among scholars like Helisaeus Röslin, Philip


TERTIVS INTERVENIENS.
Das ist/
Warnung an etliche
Theologos, Medicos vnd Philosophos, sonderlich D. Philippum Feselium, daß sie bey billicher Verwerffung der Sternguckerischen Aberglauben/ nicht das Kindt mit dem Badt außschütten vnd hiermit jhrer Profession vnwissendt zuwider handlen.
Mit vielen hochwichtigen zuvor nie erregten oder erörterten Philosophischen Fragen gezieret/
Allen wahren Liebhabern der natürlichen Geheymnussen zu nohtwendigem Vnterricht/
Gestellet durch
Johann Kepplern/ der Röm. Keys. Majest. Mathematicum.
Horatius:
Est modus in rebus, sunt certi denig, fines,
Quos vltra citraq, nequit consistere Rectum.
Mit Röm. Keys. Maj. Freyheit nicht nachzutrucken.
Gedruckt zu Franckfurt am Mäyn/ In Verlegung Godtfriedt Tampachs. Im Jahr 1610.

Feselius and Kepler himself, in which Kepler defends Röslin, although he has previously criticized its exaggerations.

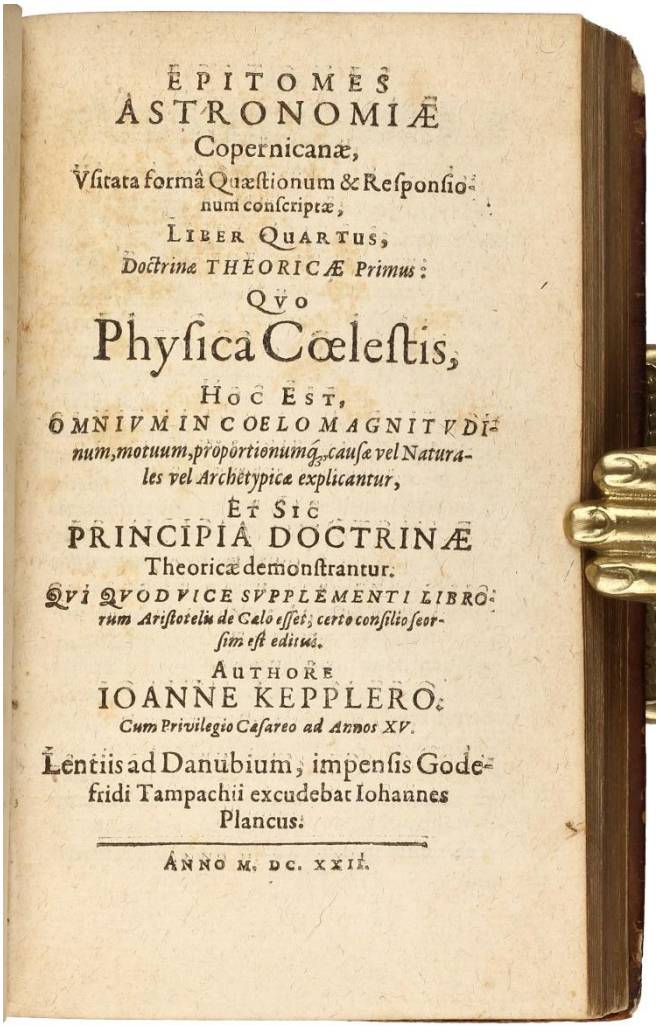
In his *Tertius Interveniens* Kepler set out his general views on astrology including some hypothesised mechanisms of interaction between planets and individual souls and "played the role of the 'third man in the middle' both against those who uncritically accepted grotesque astrological predictions and against those critics who would 'throw out the baby with the bath.' Writing in the vernacular German interspersed with numerous scraps of Latin, Kepler argued: 'No one should consider unbelievable that there should come out of astrological foolishness and godlessness also cleverness and holiness . . . out of evil-smelling dung a golden corn scraped for by an industrious hen.' As part of the dung he counted most astrological rules, including the distinctions of the zodiacal signs and the meanings of the twelve houses. Kepler insisted, however, on the harmonic significance of the configurations of the planets among themselves and with ecliptic points such as the ascendant. The stars do not compel, he said, but they impress upon the soul a special character." (DSB).

According to the German national bibliography, there is another variant known (VD17 547: 738138C) with "Thambach" in the imprint on the title-page. The book is rare outside Germany. Whereas OCLC/Worldcat locates 15 libraries in Germany and 4 in the UK, only one copy is traced in Canada and no copy in the US. References: Caspar 33; DSB VII, p.299; VD 17 39:120046N.

First edition of Kepler's longest and most influential work

23 **KEPLER, Johannes.** *Epitome astronomicae Copernicanae [libri I. II. III] de doctrina sphaerica*. Linz: Johann Planck, 1618. - *Epitomes astronomiae Copernicanae Liber quartus. Doctrinae theoricae primus: quo physica Coelestis.* Linz: Johann Planck and Frankfurt: Gottfried Tampach, 1622. - *Epitomes astronomiae Copernicanae libri V. VI. VII. quibus proprie doctrina theorica*. Frankfurt: for Gottfried Tampach, 1621. Three parts in one volume, 8vo (156 x 93 mm). [28], 1-400, 409-417, [3]; [2], 419-622, [2]; [12], 641-932, [16] pp. Several mispaginations. Signatures: *6 (**-***)4 (A-2B)8 2C6 (C6 blank); [2 daggers]8 (3A-3M)8; [dagger]6 (4A-4S)8 4T2 4V8. Numerous woodcut illustrations and diagrams in text, woodcut initials, head- and tailpieces, folding letterpress table facing p.821, errata leaf after p.622, blank C6. Bound in French 17th-century calf, spine with 5 raised bands and gilt decoration, ruling and lettering in compartments, boards with gilt Duseuil decoration and central medaillon monogrammed "C I", marbled pastedowns, all edges gilt (extremities worn, spine ends chipped with loss, corners scuffed, hinges split but cords holding firmly). Text little evenly browned throughout, occasional very minor spotting, a few contemporary ink annotations, tiny hole in Eee7 costing two letters recto/verso. Provenance: ownership inscription on first title ink-canceled (offsetting of ink to following leaf) and another erased causing small hole backed by paper (no text affected), P. Brauman (20th century stamp on first flyleaf). A very good copy with ample margins and in untouched binding; collated complete. (#003361) € 48,000

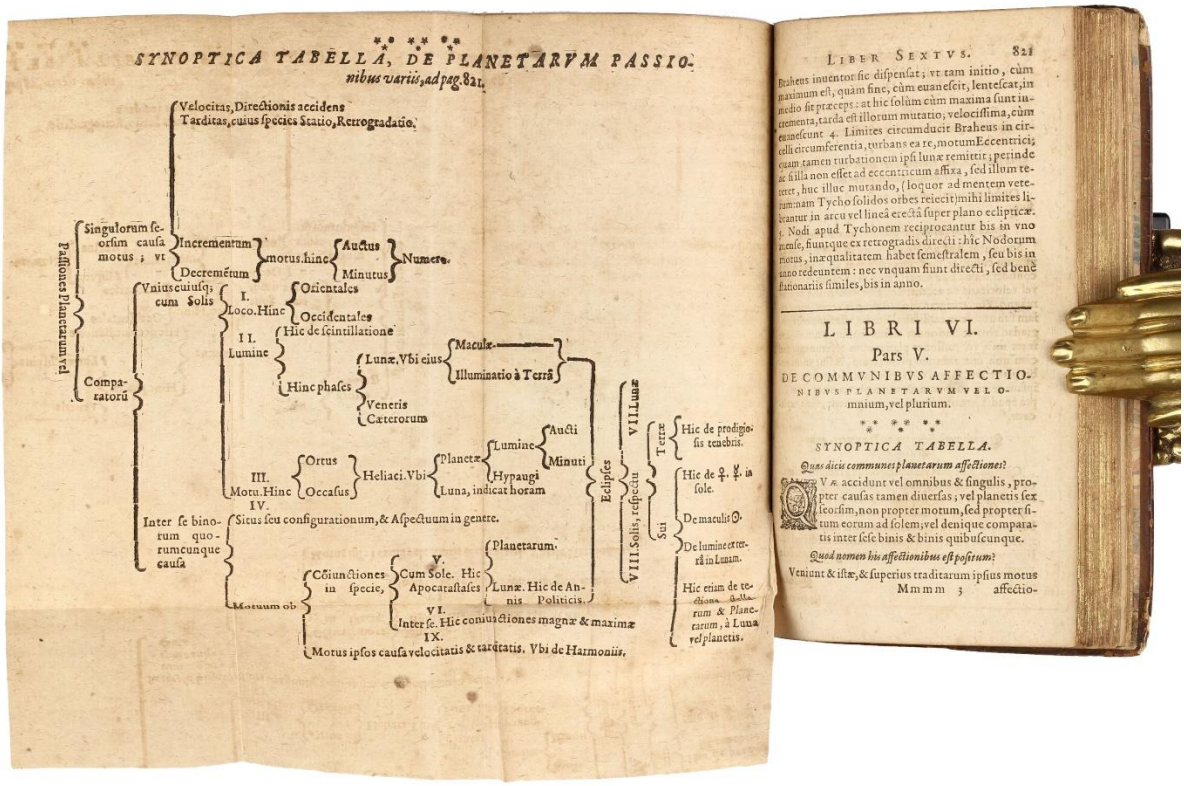
FIRST EDITION, second issue of part II. Following the publication of his *Astronomia nova* in 1609, Kepler was asked to write a more popular exposition of Copernican astronomy; however, "despite its title, Kepler's *Epitome* was more an introduction to Keplerian than to Copernican astronomy" (DSB, p.302). The work was written during a period of upheaval (Kepler's mother had been charged with witchcraft and threatened with torture, and the first volume's advocacy of the Copernican system soon earned it a place on the Index librorum prohibitorum), and the seven books were issued in three installments of inexpensive octavo volumes, titled "*Doctrina spherica*," "*Physica coelestis*," and "*Doctrina theorica*," over a period of four years. Despite its physical appearance, it is "Kepler's longest and most influential work. J. L. Russell has maintained that from 1630 to 1650 the Epitome was the most widely read treatise on theoretical astronomy in Europe." (DSB, p.302). Intended as an easily-comprehensible textbook of the new heliocentric astronomy, the *Epitome* was laid-out in a catechetical form which imparted the information through questions and answers, employing a technique typical of many astronomical textbooks of the period. Beyond its stated educational purpose, the *Epitome* also expanded on Copernican theory - with regard to the motions of the earth, Kepler extended Copernicus' work and correctly



EPITOMES
ASTRONOMIÆ
Copernicanæ,
Vsitata formâ Quæstionum & Responsionum conscriptæ;
LIBER QUARTUS,
Doctrinæ THEORICÆ Primus:
QVO
Physica Cœlestis,
HOC EST,
OMNIVM IN COELO MAGNITVDInum, motuum, proportionumq; causæ vel Naturales vel Archetypicæ explicantur,
ET SIC
PRINCIPIA DOCTRINÆ
Theoricæ demonstrantur.
QVI QVODVICE SVPPLEMENTI LIBRO-rum Aristotelis de Cælo esset; certo consilio seorsim est editus.
AUTHORE
IOANNE KEPPLERO.
Cum Privilegio Cæsareo ad Annos XV.
Lentiis ad Danubium, impensis Godefridi Tampachii excudebat Iohannes Plancus.
ANNO M. DC. XXII.

formulated the principles which Galileo would in turn discuss in more detail in his *Dialogo* of 1632 -- and served to enlarge upon Kepler's own work: "the most remarkable section . . . was book IV, on theoretical astronomy, subtitled, '*Celestial* Physics' . . . to a great extent it epitomized both the *Harmonice mundi* [of 1619] and the new lunar theory that Kepler completed in April 1620 . . . The harmonic law, which Kepler had discovered in 1619 and announced virtually without comment in the *Harmonice mundi*, received an extensive theoretical justification in the *Epitome*" (DSB, p.303).

There are two issues of part II, *Liber quartus*: one with the original title page by Johann Planck of Linz, dated 1620, and a second issue, with the title page mentioning Gottfried Tampach (Frankfurt) as printer and dated 1622. The latter issue has the first gathering *Praefatio* (pp. 419-432) reset with slightly differing type and woodcut ornaments, whereas the main text is completely identical with the Linz edition which leads to the assumption that the remaining original sheets of this part printed in Linz were used up in the reissue. References: Caspar 55, 69 and 66; Cinti 60, 72, and 67; DSB VII, pp.302-4; Houzeau & Lancaster 11831.

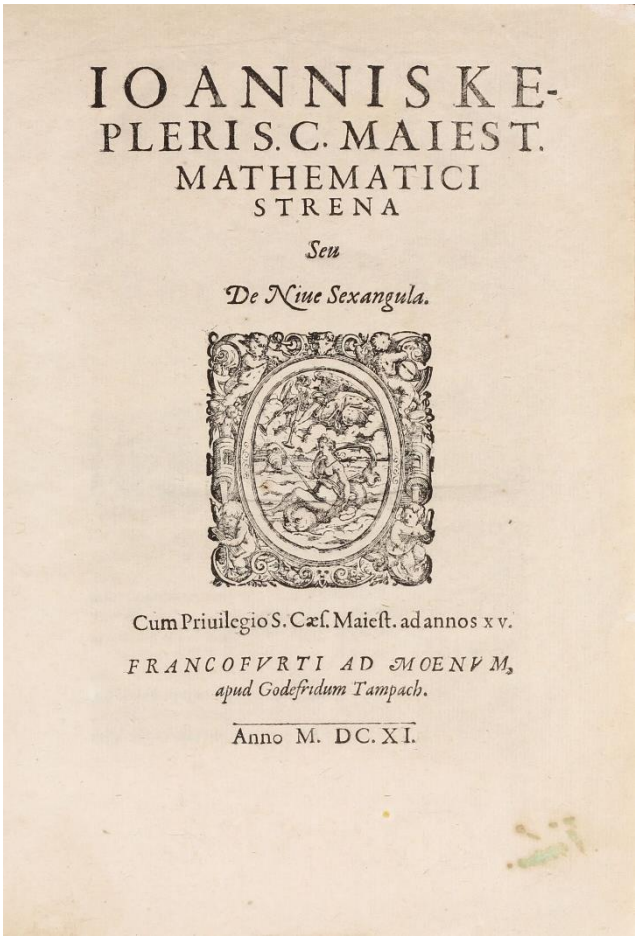


LIBER SEXTVS. 821
Braheus inuentor sic dispensat; vt tam initio, cùm maximum est, quàm fine, cùm euanescit, lentescat, in medio sit præceps: at hic solùm cùm maxima sunt incrementa, tarda est illorum mutatio, velocissima, cùm euanescunt. 4. Limites circumducit Braheus in circelli circumferentia, turbans ea re, motum Eccentrici; quam tamen turbationem ipsi lunæ remittit; perinde ac si illa non esset ad eccentricum affixa, sed illum terreret, huc illuc mutando, (loquor ad mentem veterum: nam Tycho solidos orbes reiecit) mihi limites libranturin arcu vel lineâ erectâ super plano eclipticæ. 5. Nodi apud Tychonem reciprocantur bis in vno mense, fiuntque ex retrogradis directi: hic Nodorum motus, inæqualitatem habet semestralem, seu bis in anno redeuntem: nec vnquam fiunt directi, sed bene stationariis similes, bis in anno.

LIBRI VI.
Pars V.
DE COMMVNIBVS AFFECTIONIBVS PLANETARVM VEL OMNIVM, vel plurium.
SYNOPTICA TABELLA.
Quæ dicis communes planetarum affectiones?
QVæ accidunt vel omnibus & singulis, propter causas tamen diuersas; vel planetis sex seorsim, non propter motum, sed propter situm eorum ad solem; vel denique comparatis inter sese binis & binis quibuscunque.
Quod nomen his affectionibus est positum?
Veniunt & istæ, & superius tradita rum ipsius motus
Mmmm 3 affectio-

24 **KEPLER, Johannes**. *Strena seu de Nive sexangula*. Frankfurt am Main: Godfried Tampach, 1611. 4to (225 x 154 mm). [2], 1, 4-24 pp. Signatures: a-c^4. Woodcut printer's device on title, 3 woodcut text illustrations, woodcut headpiece and initial. Lower margin partially uncut. Bound in modern boards of diced tropical wood, calfskin spine, reverse lambskin pastedowns, no free endpapers, protected in clamshell box. Text only very little browned, a few brown spots in places, title and final page with erased old ownership entry (caused thinning on final page repaired with paper, no text loss), pp. 17 and 19 trimmed close at fore-margin just touching sidenotes. Provenance: Jean de Gonet (sticker on front pastedown). An exceptionally well preserved, crisp, clean and tall copy. (#003293) € 25,000

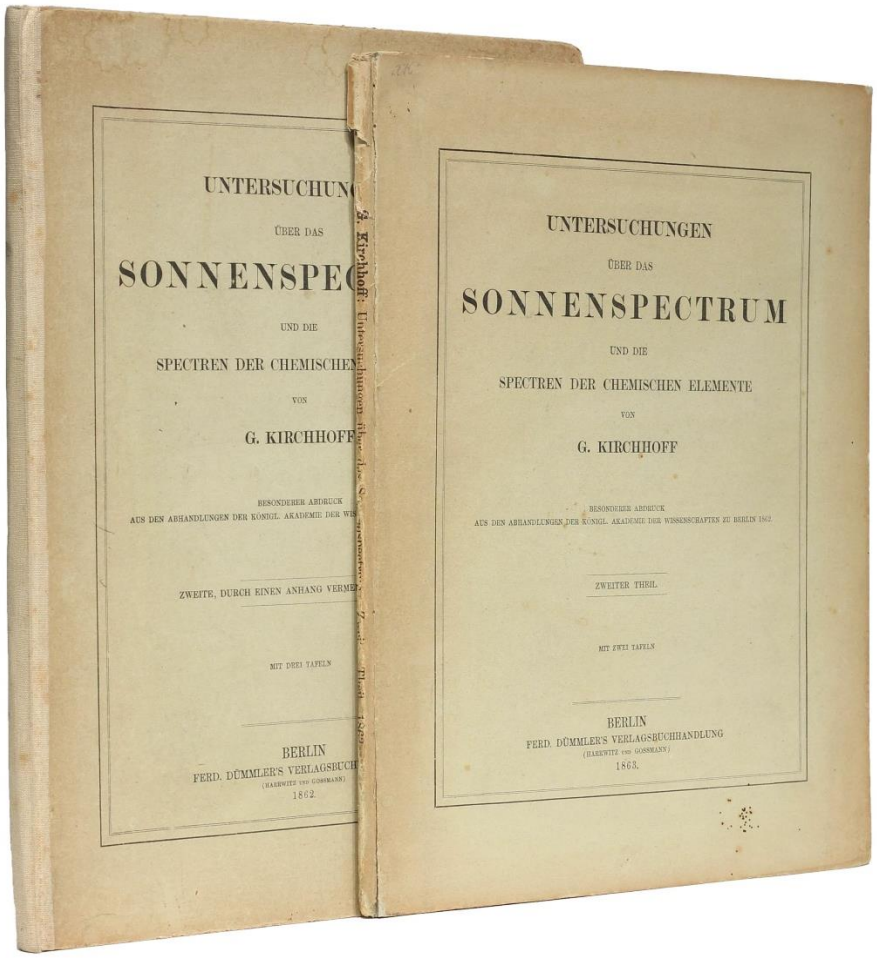
RARE FIRST EDITION OF A FUNDAMENTAL WORK ON CRYSTALLOGRAPHY. Kepler composed the *Strena* in the form of letter and as a New Year's gift for a friend at court, Counselor Wackher von Wackhenfels. In it, he ponders the problem of why snowflakes are hexagonal. His work here was completed long before the solution was discovered by Rasmus Bartholin in 1669, and Romé de l'Isle in 1672. "It is not only a charming letter, lighthearted and full of puns, but also a perceptive, pioneering study of the regular arrangements and the close packing that are fundamental in crystallography" (DSB).


IOANNIS KE-
PLERI S. C. MAIEST.
MATHEMATICI
STRENA
Seu
De Niue Sexangula.
Cum Priuilegio S. Cæſ. Maieſt. ad annos x v.
FRANCOFVRTI AD MOENVM,
apud Godefridum Tampach.
Anno M. DC. XI.

Kepler adduces various examples of hexagonal patterns from the natural world of geometric construction or packing - bee-hives, pomegranates, pea-pods etc. He writes: "For in general equal spheres (globi) when collected in any vessel, come to a mutual arrangement in two modes according to the two modes of arranging them in a plane. If equal spheres are loose in the same horizontal plane and you drive them together so tightly that they touch each other, they come together either in a three-cornered or in a four-cornered pattern. In the former case six surround one; in the latter four. Throughout there is the same pattern of contact between all the pellets except the outermost. With a five-sided pattern uniformity cannot be maintained. A six-sided pattern breaks up into three-sided. Thus there are only the two patterns as described. "Now if you proceed to pack the solid bodies as tightly as possible, and set the files that are first arranged on the level on top of others, layer on layer, the pellets will be either squared, or in triangles. If squared, either each single sphere of the upper range will rest on a single sphere of the lower, or, on the other hand, each single sphere of the upper range will settle between every four of the lower. In the former mode any sphere is touched by four neighbours in the same plane, and by one above and one below, and so on throughout, each touched by six others. The arrangement will be cubic, and the spheres, when subjected to pressure, will become cubes. But this will not be the tightest pack. In the second mode not only is every sphere touched by its four neighbours in the same plane, but also by four in the plane above and by four below, and so throughout one will be touched by twelve, and under pressure spherical spheres will become rhomboid. This arrangement will be more comparable to the octahedron and pyramid. This arrangement will be the tightest possible, so that in no other arrangement could more pellets be stuffed into the same container" (Denis Weaire, Tomaso Aste, *The Pursuit of Perfect Packing*, CRC Press, 2008, p.15-16). This is what is called the "Kepler conjecture". This natural method of stacking the spheres creates one of two similar patterns called cubic close packing and hexagonal close packing. The Kepler conjecture says that this is the best that can be done - no other arrangement of spheres has a higher average density than this. It seems in its origin to go back to a problem posed by the Englishman Thomas Harriot who corresponded with Kepler, and who tried, without success, to interest Kepler in atoms etc. (a brief reference to Epicurus and his atoms is found on page 1), but who had sought in 1591 an explanation of how one constructed piles of bullets or cannon balls. References: Caspar *Bibliographia Kepleriana* 39; Honeyman sale 1786; O. Gingerich, *The delights of a roving mind*. In: *Nims, The Six-Cornered Snowflake*, 2010.

25 **KIRCHHOFF, Gustav Robert**. *Untersuchungen über das Sonnenspectrum und die Spectren der chemischen Elemente. [Erster Teil] - Zweiter Teil*. Two volumes. Offprints from: *Abhandlungen der königlichen Akademie der Wissenschaften zu Berlin*, 1861-1862. Berlin: Ferd. Dümmler, 1862-1863. 4to (305 x 238 mm). [4], 43 [1]; [3] 4-16 pp., 5 lithographed plates (3 for part I and 2 for part II; 4 folding). Pages of part II unopened. Original printed boards, part I cloth backed, part II printed paper spine (minor soiling and spotting of covers, slight wear to extremities, spine of part II rubbed and partly split at head). Text generally crisp and clean with only minor age-toning, little spotting of part II, minor dust-soiling to outer margins of plates in part I. Cutout of newspaper article dated 2. February 1866 pasted to inner front-cover of part I. A very good, unsophisticated set, free of library stamps or markings. (#003301) € 3800

PMM 278b; Horblit 59; Sparrow 117; Norman 1219 (all for 1st ed. of part 1); DSB VII, p.379-82. - ENLARGED SECOND EDITION OF PART I, FIRST EDITION OF PART II, OFFPRINT ISSUE, with "Zweite, durch einen Anhang vermehrte Ausgabe" on the front cover of Part 1. "Kirchhoff found that by exposing in the flame of a Bunsen burner a platinum wire dipped in salt he obtained in the spectrum the characteristic bright yellow lines of sodium superimposed on the spectrum of platinum.



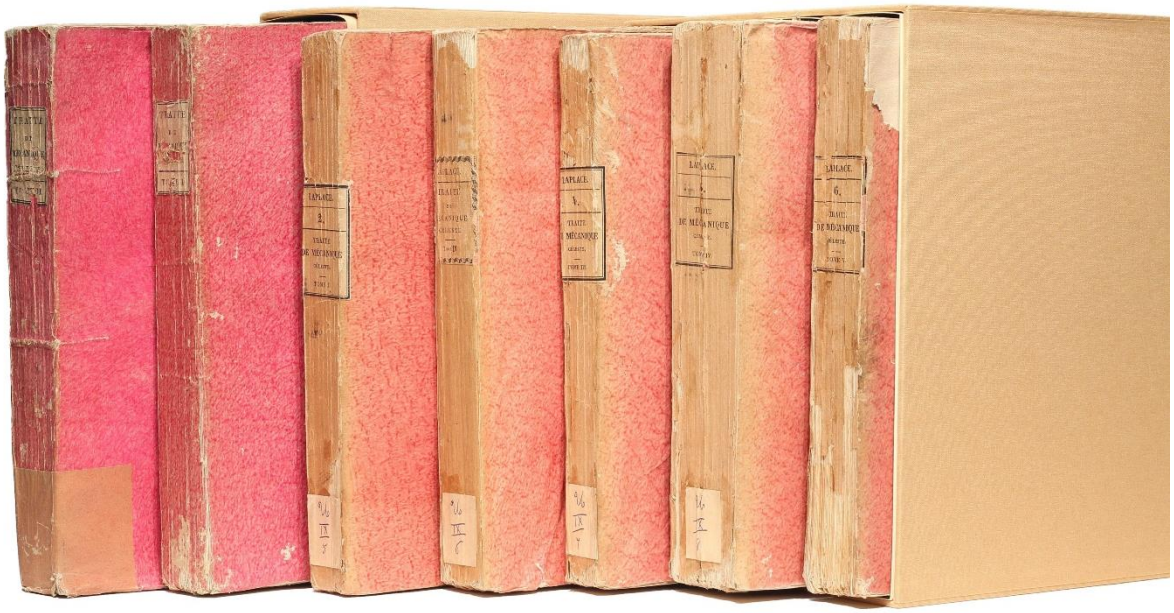
By repeating the process and introducing vaporized sodium between the incandescent wire and the screen, the yellow lines were replaced by dark lines. With great ingenuity he repeated the experiment with sunlight and got the same result. The fact that the dark lines were produced when a beam of light from an incandescent element passed through the same substance at a lower temperature suggested that this was due to absorption. In the solar spectrum, for example, the dark lines were caused by absorption in the gases of the sun's atmosphere . . . With these experiments Kirchhoff and his colleague Robert Wilhelm Eberhard Bunsen (1811-1899), inventor of the eponymous burner, created the new science of spectroscopy, brought "the stellar universe into the laboratory and showed that the basic materials of the universe are everywhere the same" (PMM 278b). Kirchhoff "was able to elaborate a quantitative relationship between the absorptive and emissive power of electromagnetic radiation for all material bodies, as a universal function of wavelength and temperature. "Thus Kirchhoff's law was the key to the whole thermodynamics of radiation.

The complete set in the rare original wrappers

26 **LAPLACE, Pierre Simon.** *Traité de mécanique céleste*. 5 volumes and 4 supplements of the first edition plus 2 volumes of the second edition of part 1 and 2, all in the original wrappers as issued. Paris: Crapelet for Duprat, An VII [1799] (vol. I-II), Crapelet for Duprat, An XI-1802 (vol. III), Courcier, An XIII-1805 (vol. IV), Bachelier, 1825 (i.e., 1823-1827) (vol. V). Bachelier, 1829 (2nd edition, vol. I-II). 4to (270 x 215 mm). Half-title to each volume, vol. III with "*Supplément au Traité de mécanique céleste …présenté au Bureau des Longitudes, le 17 août 1808*" (pp. 1-24) bound at end; vol. IV with folding engraved plate and two supplements, "*Supplément au dixième livre du Traité de mécanique céleste. Sur l'action capillaire"* (pp. [2], 1-65); and *Supplément à la théorie de l'action capillaire* (pp. 1-78), one unnumbered leaf with "*Table des matières*" on recto and the "*errata*" on verso bound at end; vol. V with "*Supplément au 5e volume du Traité de mécanique céleste. . .*" dated 1827 (pp. [2], 1-35) bound at end. Vol. V without the section titles as usual (not included in this issue). All volumes in the original pink mottled wrappers with original printed spine labels (additional hand-lettered shelf-mark labels to vols. III-V), all pages uncut, vols. I and II of first edition mostly unopened, housed in a custom-made slip-case (spines mostly sun-faded, chipping and wear to spines, spine ends and extremities, wrappers partially torn with some loss). A few pages in vols. III-V little browned, occasional minor spotting, light occasional dampstaining mostly to blank margin of few gatherings, but in all very crisp and clean. Provenance: from a French private collection. A very fine set in original condition, rarely found that complete as here with all the supplements present. (#003346) € 32,500

Dibner, Heralds of Science 14; Grolier/Horblit 63; PMM 252; Sparrow, Milestones of Science 125; Norman 1277; Roberts-Trent, p.197. LAPLACE'S FUNDAMENTAL WORK ON CELESTIAL MECHANICS. FIRST EDITIONS OF ALL PARTS, with the first two volumes I and II in FIRST STATE (without the added Berlin imprint). Also included here is the second edition of volumes I and II, which are reprints of the first edition shortly issued after the final vol. V appeared. With these, all French separate editions of the *Traité* are represented in our set in unsophisticated state.

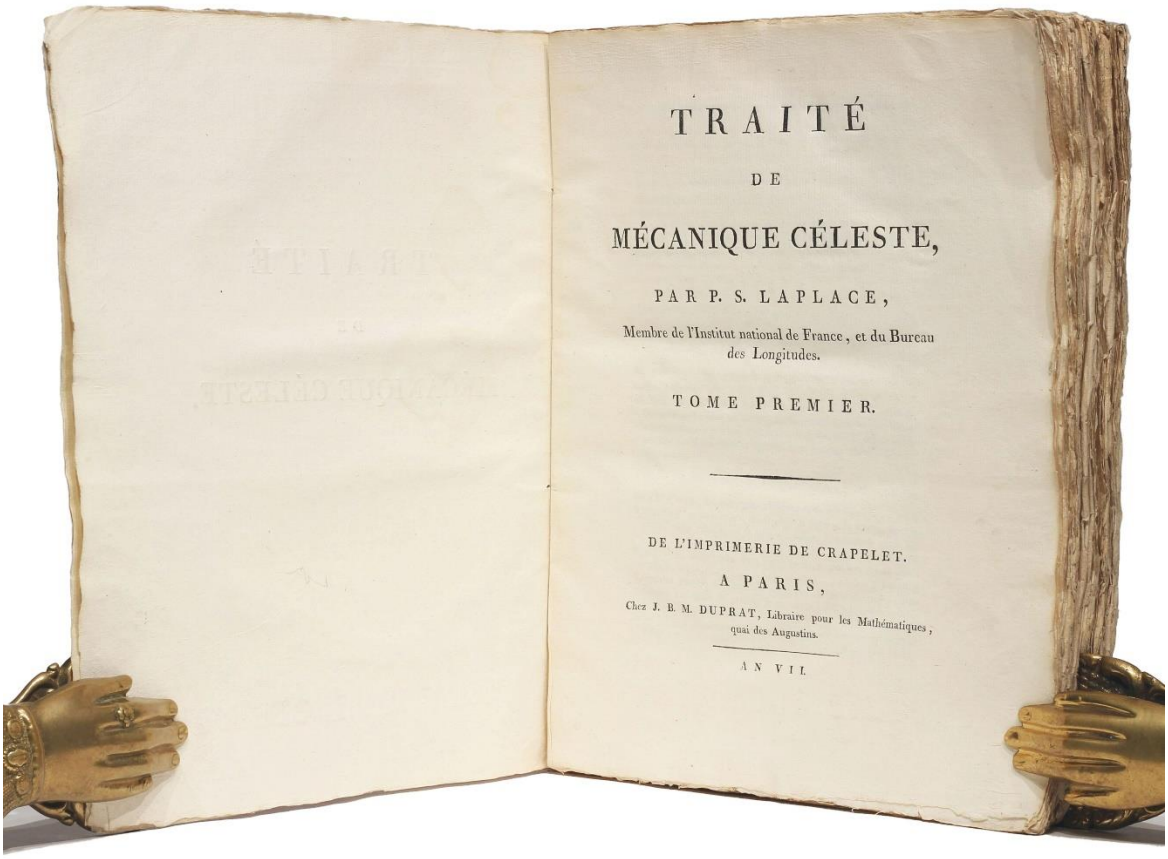
Published over a period of 27 years, Laplace's monumental work codified and developed the theories and achievements of Newton, Euler, d'Alembert and his contemporary Lagrange. In the tradition of Newton's *Principia*, Laplace "applied his analytical mathematical theories to celestial bodies and concluded that the apparent changes in the motion of planets and their satellites are changes of long periods, and that the solar



system is in all probability very stable" (Dibner 14). Newton remained uncertain with respect to the continuity of our solar system. In this work, Laplace also offered explanations unsolved by his predecessors and contemporaries. He "offered a brilliant explanation of the secular inequalities of the mean motion of the moon about the earth - a problem which Euler and Lagrange had failed to solve. He proved that these irregularities are connected with certain solar actions and changes in the orbit of the earth. He also investigated the theory of the tides and calculated from them the mass of the moon" (PMM 252). The first four volumes of the work appeared from 1799 through 1805, and contain the laws of mechanics for their application to the motions and figures of

the heavenly bodies. The final parts of the fourth volume and the entire fifth volume really constitute a separate work and contain important material on physics not already included in the original sequence.

Only few volumes of the *traité* have survived in original wrappers and complete sets are of utmost rarity. The Haskell Norman set for example had the first 4 volumes in original wrappers but vol. V rebound in modern quarter morocco (see his sale at Christie's 1998, lot 597, sold at $16,100).



TRAITÉ

DE

MÉCANIQUE CÉLESTE,

PAR P. S. LAPLACE,

Membre de l'Institut national de France, et du Bureau des Longitudes.

TOME PREMIER.

DE L'IMPRIMERIE DE CRAPELET.

A PARIS,

Chez J. B. M. DUPRAT, Libraire pour les Mathématiques, quai des Augustins.

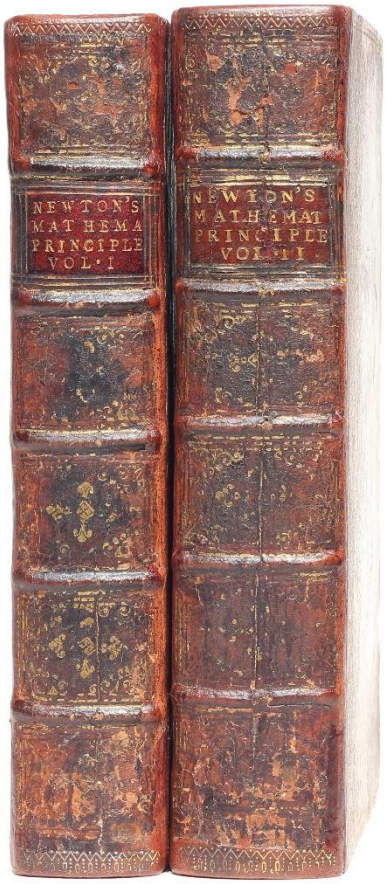
AN VII.

In the original wrappers

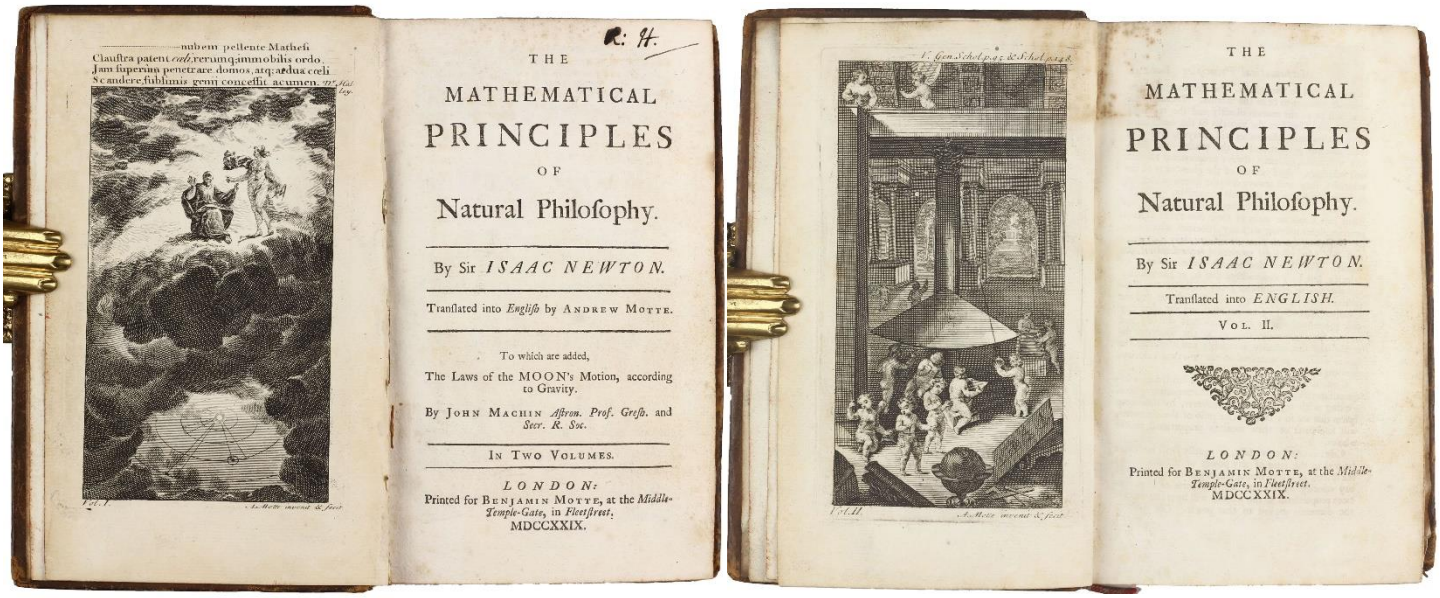
27 **LAPLACE, Pierre Simon.** *Exposition du Systeme du Monde*. Paris: Imprimerie de Crapelet, An VII [1799]. 4to (270 x 215 mm). [i-vi] vii-viii, 351 [1] pp. including half title. Preserved in the original pink mottled wrappers with original printed spine label, all pages uncut (minor chipping and fraying of paper over spine. Text light even browning, a few small brown spots in places, but in all very crisp and clean. Provenance: from a French private collection. A fine, unsophisticated copy. (#003347) € 1200

Sparrow 123; Houzeau & Lancaster 8940 - SECOND EDITION, revised and enlarged by the author, of one of the most brilliant and successful popularizations of science ever composed. "In the sixth, and last, chapter of Book V, Laplace introduced a speculation on the origin of the solar system and another on the nature of the universe beyond its confines... The former speculation, which has quite generally come to be misnamed the nebulous hypothesis, was presented with the "misgivings" [défiance] that anything should arouse that is in no way the product of observation or calculation... If we were to find a phrase that would characterize what Laplace had in mind... it would not be 'nebular hypothesis'. It would be 'atmospheric hypothesis'. And if, further, we were to identify the context in which he raised the question at all, it would not be the evolution of history of nature. It would be the probability of cause" (DSB Suppl. I, 344). Laplace merits one of the longest articles in DSB and a 5-page section in it devoted to *The System of the World* was specially commissioned from Dr C.A. Whitney.

28 **NEWTON, Isaac**. *The Mathematical Principles of Natural Philosophy. Translated by Andrew Motte. To Which are Added, the Laws of the Moon's Motion, according to Gravity.* Two volumes. London: Benjamin Motte, 1729. Exceptional set in its original bindings, untouched internally and complete in every respect. 8vo (196 x 122 mm). Volume I with engraved frontispiece by A. Motte, [38], 320 pp. and with 25 folding engraved plates (numbered I to XXV, plate I of vol. II misbound here after p.16); volume II with engraved frontispiece by A. Motte, [2], 393, [13], viii, 71 [1] pp. and with 19 folding engraved plates (numbered I to XIX, pl. I misbound in vol. I), 3 unnumbered additional folding engraved plates bound after first leaf of index, and 2 folding tables. In all, there are 2 frontispieces, 47 plates, 2 tables and 3 head-pieces by Motte, as called for. Both volumes are uniformly bound in contemporary English calf and housed in a custom-made slipcase. Joints, spine-ends and board corners are expertly restored and a missing spine label to vol. I renewed (no rebacking, no previously detached boards, only repair of cracked joints with sound cords), red-sprinkled edges. There is gilt ruling and partly abraded floral decoration to spines as well as gilt ruling to boards. Internally, both volumes are crisp with only little occasional spotting and dust-soiling to outer margins, the frontispiece and title of vol. II is slightly stained at upper inner margin from paper slip formerly laid in, a clean tear to blank lower margin of leaf X7 in vol. I, plate III in vol. I slightly soiled and spotted. The leaves between pp. 16 and 33 of second part in vol. II are bound in wrong order. Otherwise, both volumes are in near fine condition, with full margins, and in its first bindings. Provenance: Binder's ticket to front pastedown of each volume: Thackray Bookseller, 51 Shude Hill, Manchester; contemporary owner inscription to front free endpaper of vol. I, 'Roger Hesketh', and his initials to title page of the same. (#003338) € 77,500

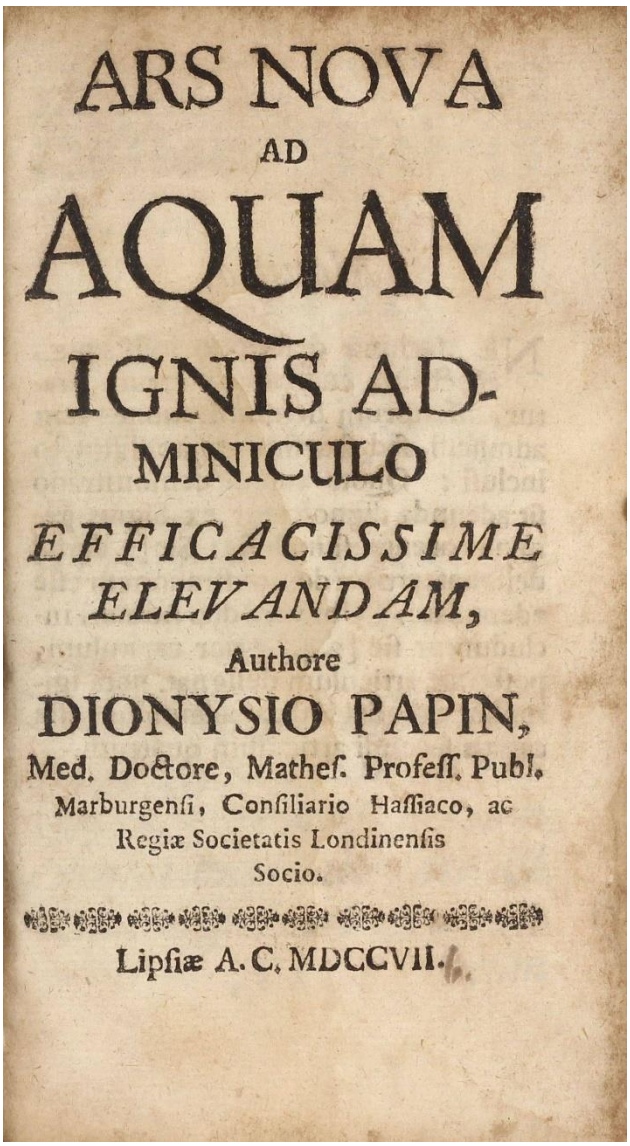


Babson 20; Norman 1587; PMM 161 (1st Lat. ed.); Wallis 23. - FIRST EDITION IN ENGLISH OF NEWTON'S "PRINCIPIA", widely regarded to be the greatest work in the history of science. Motte's translation is highly regarded, and subsequent scholars have made revisions and corrections to the later editions, rather than undertake a new translation themselves. The first edition of Newton's Principia was in Latin, published in 1687. Two further London editions followed, in 1713 and 1726, in addition to a 1714 Amsterdam edition, before the revolutionary work (which Einstein described as "perhaps the greatest intellectual stride it has ever been granted



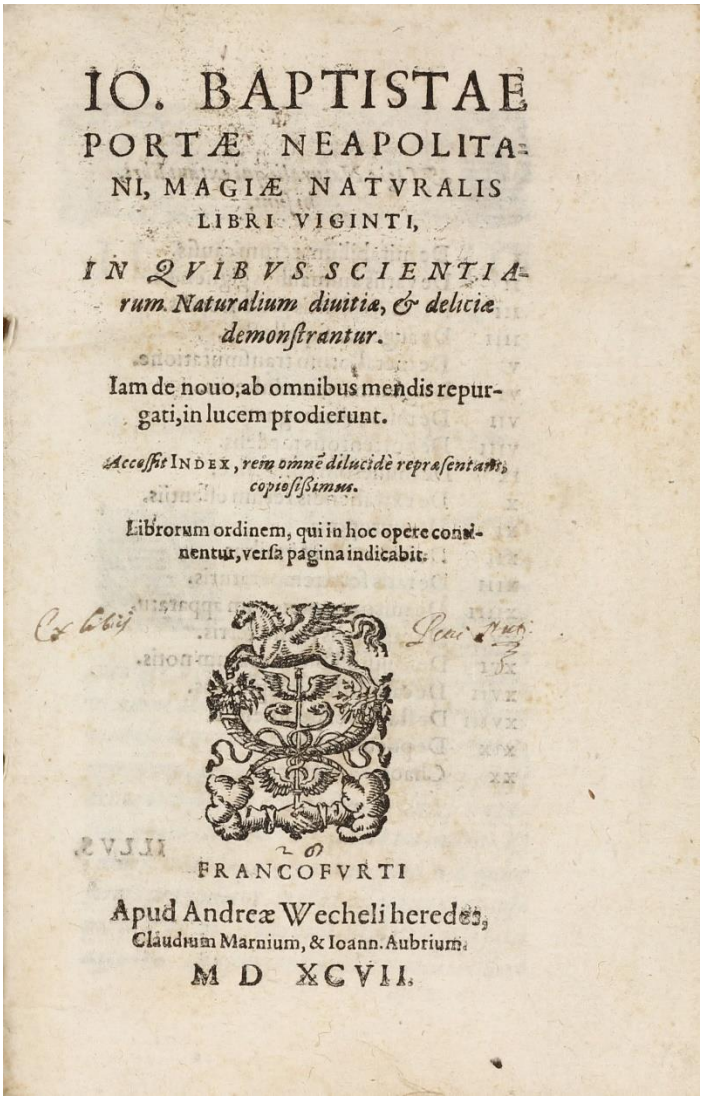
for any man to make") became available to a wider lay audience with this handsomely printed English translation by Motte. It contains John Machin's attempt to rectify Newton's lunar theory, *The Laws of the Moon's Motion*, according to Gravity, here added to the end of the second volume. Motte's translation of Newton's *System of the World* occupies page 200 on in the second volume. Because the book saw wide circulation and is of enduring interest, with commensurately heavy use, copies as fresh as this in contemporary bindings are of genuine rarity.

29 **PAPIN, Denis**. *Ars Nova Ad Aquam Ignis Adminiculo Efficacissime Elevandam*. Leipzig: 1707. 8vo (167 x 95 mm). 94, [2] pp. With one engraved folding plate, one final leaf of index. Bound in contemporary French calf, spine with 5 raised bands gilt in compartments and with gilt-lettered morocco label, red-dyed edges, marbled endpapers (hinges split but holding firmly, slight wear to extremities). Text somewhat browned throughout, light dampstaining to plate and text in places. Provenance: bookplate monogrammed "P.I." and with motto "fortiter recta via" to front pastedown. All in all still a very good copy in untouched original binding. (#003271) € 3500


ARS NOVA
AD
AQUAM
IGNIS AD-
MINICULO
EFFICACISSIME
ELEVANDAM,
Authore
DIONYSIO PAPIN,
Med. Doctore, Mathef. Profeff. Publ.
Marburgenfi, Confiliario Haffiaco, ac
Regiæ Societatis Londinenfis
Socio.
Lipfiæ A. C. MDCCVII.

VERY RARE FIRST EDITION of one of the earliest works on steam power, the basis of the Industrial Revolution. "In 1707 [Papin] sent the Royal Society a monograph [the present work] describing a design of engine which he had developed on far-sighted high-pressure principles. The following year he returned to London to seek support for his invention. Although Leibniz admired it and suggested refinements, Sir Isaac Newton turned it down and Thomas Savery criticized it most severely, accusing Papin of poaching his ideas" (Smith, p. 139). Papin used the engine described in this book to power the first steam-driven vehicle. Published simultaneously in 1707 in French at Cassel and in Latin at Frankfurt, this Leipzig imprint is not recorded in bibliographies. Only one copy is listed on OCLC (Freiberg University of Mining and Technology); no copy on COPAC. The Latin edition is more complete than the French for, as the preface to the French edition tells us: "It was thought right to suppress in this French edition the demonstrations needed to prove all that is proposed . . . those who enjoy such kinds of reasoning [may] find them easily at the end of the work in the Latin edition" (translation from Smith, p. 147). These 'demonstrations' occupy pp. 62-94 of the present work.

30 **PORTA, Giovanni Battista, della**. *Magiae Naturalis Libri Viginti, in quibus scientiarum naturalium divitiae, et deliciae demonstrantur...* Frankfurt am Main: Heirs of Andreas Wechel, Claude de Marne & Johann Aubry, 1597. 8vo (165 x 110 mm). [36], 669 [3] pp. Signatures:)(^{8}):(^{8})::(^{2} A-2T^8. Final two leaves of index misbound at beginning, final leaf blank. Woodcut printer's device on title, woodcut initials and headpieces, woodcut illustrations in text depicting alchemical apparatus and laboratory equipment. Bound in contemporary limp vellum, gilt morocco label and ink title to spine, yapp edge, title also inked to lower edge, remains of leather ties, yapp edges, slightly soiled. Leaf Ss2 with paper flaw to lower right corner, text somewhat browned (stronger towards end), light foxing throughout. Provenance: early eligible ex-libris on title. Very good copy. Collated complete. (#003275) € 4500


IO. BAPTISTAE
PORTÆ NEAPOLITA-
NI, MAGIÆ NATVRALIS
LIBRI VIGINTI,
IN QVIBVS SCIENTIA-
rum Naturalium diuitiæ, & deliciæ
demonſtrantur.
Iam de nouo, ab omnibus mendis repur-
gati, in lucem prodierunt.
Accesſit INDEX, rem omnē dilucidè repræſentans,
copioſiſsimus.
Librorum ordinem, qui in hoc opere conti-
nentur, verſa pagina indicabit.
FRANCOFVRTI
Apud Andreæ Wecheli heredes,
Claudium Marnium, & Ioann. Aubrium.
M D XCVII.

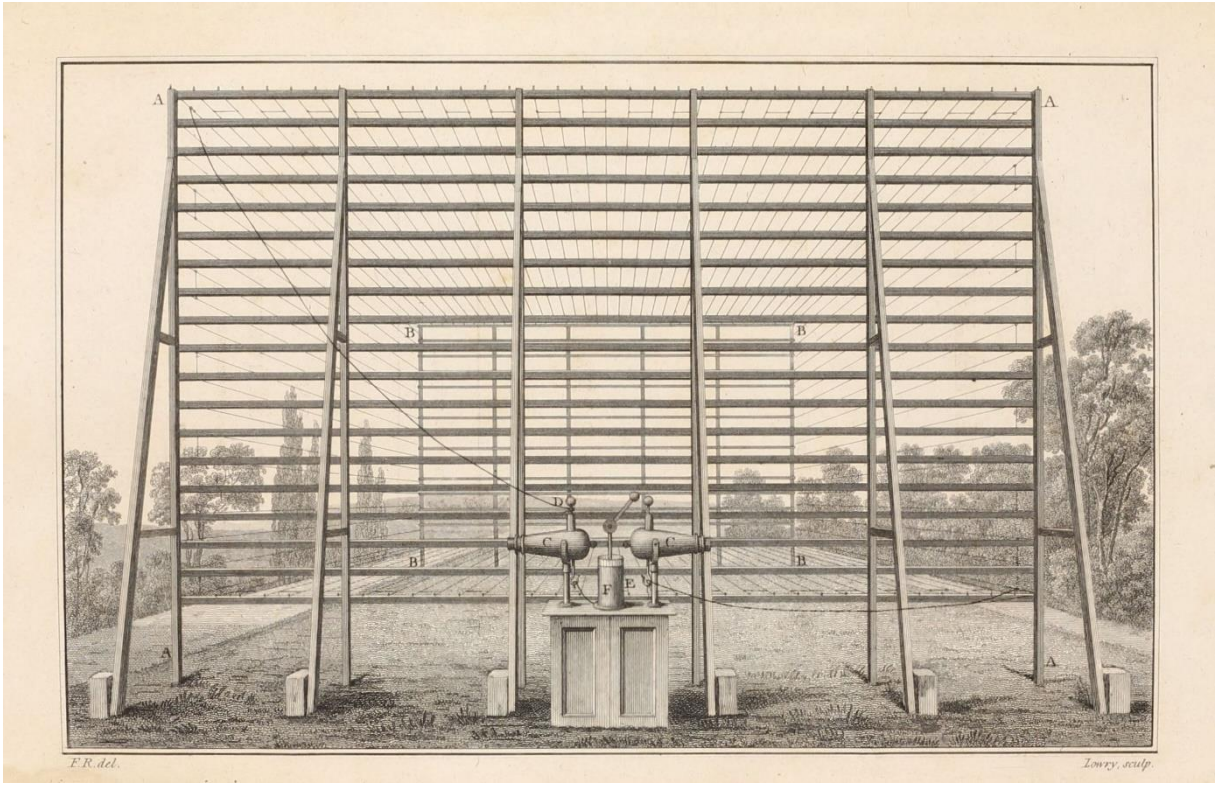
RARE SECOND EDITION of Della Porta's *Magia Naturalis* (Natural Magic), complete in 20 books. The work embraces a number of interesting subjects: the wonders of nature; the origin of species; the preservation of food, the preparation of bread, liqueurs, oils, etc .; the transmutation of metals; the creation of fake gems; magnetism; the preparation of various types of medical remedies and women's cosmetics; distillation, the preparation of ointments, pyric powder, etc.; how to treat iron; the art of cooking (pp. 501-525); hunting techniques for small birds through the use of traps; how to write secret letters; the burning mirrors and the refraction; the weights; pneumatic experiments, and a last chapter entitled 'Chaos' on various topics from the bite of the viper to flying dragons. The book was first published in Naples in 1589 and then soon forbidden for a decade. This edition precedes the lifting of the ban, granted in 1598. Perhaps the most remarkable part of the book is 'De Catoptrici', a treatise on optics and lens-making which established the technical and practical pre-conditions to Galileo's observations. See Mortimer, Harvard Italian 400 and Riccardi I(ii) 307 (both the 1589 edition).

31 **PRIESTLEY, Joseph**. *Observations on different Kinds of Air ... Read March 5, 12, 19, 26, 1772.* In: *Philosophical Transactions, Giving Some Account of the Present Undertakings, Studies, and Labours, of the Ingenuious in Many Considerable Parts of the World*. Vol. 62, pp. 147-264. London: Printed for Lockyer Davis, in Holbourn, Printer to the Royal Society, 1772. 4to (220 x 163 mm). Entire volume: xiv, 494, [2] pp., 14 folding engraved plates (one illustrating Priestley's contribution), errata leaf at end. 2 plates torn without loss, occasional light spotting and staining. Bound in contemporary calf, spine with two hand-lettered labels, gilt ruling to boards (binding rebacked and recornered, boards rubbed and scratched), red-dyed edges, original endpapers. Provenance: Belfast Society (stamped in gilt on upper board); Peter and Margarete Braune. Very little even browning throughout, occasional minor spotting and dust soiling, small worm hole to fore-edge of first 4 leaves, 2 plates torn without loss. A very good and clean copy in original binding. (#003322) € 2800

Dibner 40; Honeyman 2535; PMM 217; Norman 1749. FIRST EDITION of the author's most important work on gas theory, published in the Philosophical Transactions two years before its first appearance in book form under the title *Experiments and Observations on Different Kinds of Air* in 1774). "The paper here cited, for which the Royal Society awarded Priestley the Copley medal, announced the discovery of hydrochloric acid and nitric oxide, and the use of the latter in measuring the purity of air, which led through the work of Cavendish, Fontana and others to exact eudiometry. Priestley also observed that plants consume carbon dioxide and give out oxygen, thereby purifying air which has been vitiated by combustion, respiration or putrefaction, and that this action takes place only under daylight. This proved of the greatest value for the subsequent work on respiration by Ingenhousz and Senebier." (PMM). "Priestley showed that in air collected after the processes of combustion, respiration or putrefaction, one-fifth of the volume disappeared. He had also observed that mint grew vigorously in air tainted by animal respiration and that evidently plants reversed the process of polluting the air as respiration did. In this paper he also announced two new gases that he had obtained: nitrous oxide and carbonic oxide" (Dibner).

32 **RONALDS, Francis**. *Descriptions of an Electrical Telegraph, and of Some Other Electrical Apparatus*. London: Printed for R. Hunter, 1823. 8vo (227 x 140 mm). [6], 83 [1], [2] pp., 8 plates (7 engraved, 1 folding, 1 bound as frontispiece), all but one engraved by Lowry after Francis Ronalds, errata leaf at the end. Near contemporary grey drab boards, pages uncut (light soiling and browning, upper inner hinge partly split). Title and a few text leaves lightly browned with minor offsetting from plates, occasional light spotting. Provenance: Peter and Margarete Braune. (#003323) € 4000

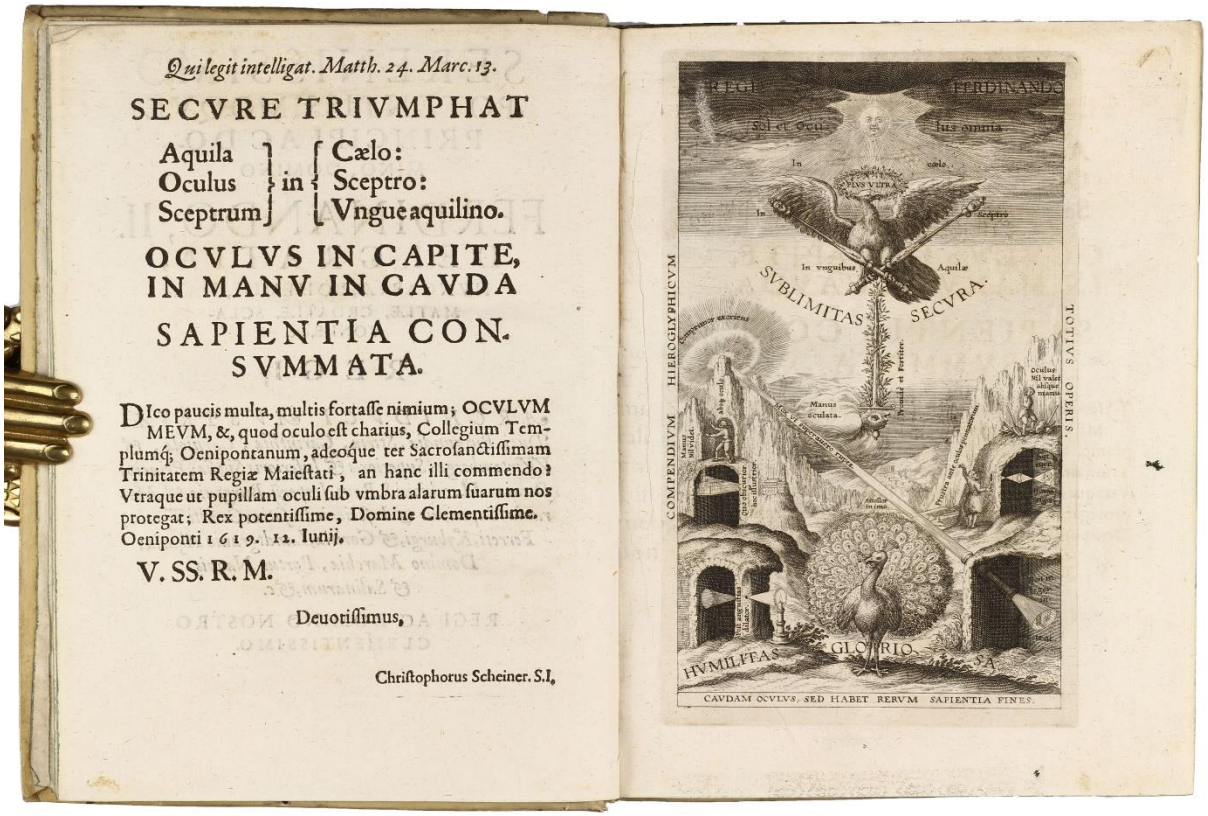
Wheeler-Gift 803, Mottelay, p.438; Bakken, p. 292. RARE FIRST EDITION OF A MILESTONE IN THE HISTORY OF COMMUNICATIONS. Francis Ronalds was the inventor of the electric telegraph. In 1816 he laid down eight miles of wire in the garden of his house in Upper Mall, Hammersmith (subsequently known as Kelsmcott House, and occupied by William Morris), to produce the first working telegraph and this is the first published account of his invention. The author, commenting on the experiments with electrical transmissions which are described in the book, states: "The result seemed to be, that that most extraordinary fluid or agency, electricity, may actually be employed for a more practically useful purpose than the gratification of the philosopher's inquisitive research, the schoolboy's idle amusement, or the physician's tool; that it may be compelled to travel as many hundred miles beneath our feet as the subterranean ghost which nightly haunts our metropolis, our provincial towns, and even our high roads; and that in such an enlightened country and obscure climate as this its travels would be productive of, at the least, as much public and private benefit. Why has no serious trial yet been made of the qualifications of so diligent a courier? And if he should be proved competent to the task, why should not our



kings hold council at Brighton with their ministers in London? Why should not our government govern at Portsmouth almost as promptly as in Downing Street? Why should our defaulters escape by default of our foggy climate? And since our piteous inamorati are not all Alphei, why should they add to the torments, of absence those dilatory tormentors, pens, ink, paper and posts? Let us have electrical conversazione offices, communicating with each other all over the kingdom, if we can ..." (pp.2-3).

33 **SCHEINER, Christoph**. *Oculus hoc est: Fundamentum Opticum, in quo ex accurata Oculi Anatome, abstrusarum experientiarum sedula pervestigatione, ex invisis specierum visibilium tam everso quam erecto situ spectaculis, necnon solidis rationum momentis Radius Visualis eruitur; sua Visioni in Oculo sedes decernitur; Anguli Visorii ingenium aperitur. . .* Innsbruck: Daniel Agricola, 1619. 4to (215 x 164 mm). [12], 1-199, 100-138, 239-254 pp., engraved allegorical plate bound after dedication, several woodcut illustrations and diagrams in text, woodcut initials, head- and tailpieces. Pp. 200-237 mispaginated 100-137. Bound in contemporary vellum, spine painted over and lettered in ink, boards with blind-ruling, blue-dyed edges (worming to boards, joints and pastedowns, hinges split at head of spine, spine with cancelled ink shelf-marks). Preserved in marbled slip-case. Text crisp and clean with only very minor occasional spotting. Provenance: neat inscription on title "Ex dono (cancelled "libris") Eliae Schilleri"; old shelf marks in ink to title and flyleaf. Exceptional copy in unrestored binding. (#003353) € 28,000

RARE FIRST EDITION of one of the most famous and important works in the history of optics. Christoph Scheiner (1573-1650), a Jesuit astronomer and pioneer in physiological optics, here demonstrates for the first time that the retina is the actual organ of sight and explained the pupil changes known as 'accommodation.' He also describes the nasal exit of the optic nerve and, like Kepler, proved that the retina is the seat of vision. "In 1583, the physician Felix Platter . . . was the first to suggest that the structure responsible for sensitivity to light was


Qui legit intelligat. Matth. 24. Marc. 13.

SECVRE TRIVMPHAT

Aquila, Oculus, Sceptrum } in { Cælo: Sceptro: Vngue aquilino.

OCVLVS IN CAPITE, IN MANV IN CAVDA SAPIENTIA CONSVMMATA.

DIco paucis multa, multis fortaſſe nimium; OCVLVM MEVM, &, quod oculo eſt charius, Collegium Templumq; Oenipontanum, adeoque ter Sacroſanctiſſimam Trinitatem Regiæ Maieſtati, an hanc illi commendo? Vtraque ut pupillam oculi ſub vmbra alarum ſuarum nos protegat; Rex potentiſſime, Domine Clementiſſime. Oeniponti 1619. 12. Iunij.

V. SS. R. M.

Deuotiſſimus,

Chriſtophorus Scheiner. S.I.

FERDINANDO

SVBLIMITAS SECVRA.

HVMILITAS GLORIO

CAVDAM OCVLVS, SED HABET REBVM SAPIENTIA FINES.

COMPENDIVM HIEROGLYPHICVM TOTIVS OPERIS.

the optic nerve (seen today's knowledge this is wrong) and the retina (correct). Kepler proposed that the image (he called it 'Pictura') was instead formed on the retina at the back of the eye; this however implicated that the picture was inverted (upside down) and reversed (right and left flipped). In 1604, Kepler rightly assumed that the fact that we see an upright picture is not a question on optics or anatomy but happens in the brain. It was Christoph Scheiner who provided the experimental proof: he dissected the eye of a bull or cow and could see the inverted picture on the translucent retina. He published his findings in 1619, in 'Oculus hoc est: fundamentum opticum'. Unfortunately for Scheiner, in 1637, Descartes wrote his widely-read book 'La Dioptrique' without providing his primary sources. Therefore, Scheiner's major contributions were often missed, and are only re-

discovered in the last years." B.M.Moritz, *Christoph Sceiner SJ - Sunspots and the Human Eye*, Science meets faith, online resources, 2018). The 'Scheiner experiment', a demonstration of the refractive changes occurring in the eye when accommodating, is still taught in ophthalmology to prove defects of the eyes optic system. "The intricate frontispiece depicts a 'camera obscura' and a system of inverting lenses, as well as the newly-invented telescope. The peacock in the foreground carries a double meaning, representing not only the science of optics, but the overly prideful Galileo." (Linda Hall Library). References: Garrison-Morton 1480; Roller-G. II, 404; NLM/Krivatsy 10364; Waller 8585; de Backer-Sommervogel VII, 738; DSB, XII, pp. 151-52; Linda Hall Library, *Jesuit Science in the Age of Galileo*, 9.

34 **SMEATON, John**. *An Experimental Enquiry Concerning e Natural Powers Of Water And Wind To Turn Mills, And Other Machines, Depending On A Circular Motion*. In: Philosophical Transactions of the Royal Society of London, vol. 51, pp. 100-174, 3 folding engraved plates. London: L. Davis and C. Reymers, 1760. 4to (221 x 178 mm). Entire volume 60, part I: [10], 457 [1] pp., 10 folding engraved plates. Bound in 20th century half green calf, spine gilt lettered, blue-sprinkled edges, new endpapers (light tanning of spine and upper rear board). Text crisp and clean with only light age-toning and occasional very minor spotting (title a bit foxed). (#003317) € 750

Roberts/Trent, *Bibliotheca Mechanica* pp. 297-298 (for first separate edition), DSB XII, p.462. FIRST EDITION, journal issue, of Smeaton's paper on waterwheels, for which he received the the Copley Medal of the Royal Society. Of the first work Stanitz says "This treatise, based on skillfully designed and conducted experiments defines (for the first time?) and measures the efficiency of both windmills and watermills and determines the operating conditions for best performance" (Stanitz 59A).

35 **TORRICELLI, Evangelista**. *Lezioni Accademiche ... Lettore delle Mattematiche nello Studio di Firenze e Accademico della Crusca, edited by Tommaso Bonaventuri*. Florence: Nella Stamper. di S. A. R. Per Jacopo Guiducci, 1715. 4to (267 x 193 mm). xlix, [1], 96pp. Half title, title with engraved device of the Accademia della Crusca, engraved portrait of the author after Pietro Anichini, woodcut head- and tailpieces, initials and ornaments, 3 woodcut illustrations in text. All pages uncut except for title and portrait, bound without the imprimatur leaf as often. Contemporary plain wrappers, hand-lettered paper label to spine (paper and label over spine rather worn and chipped, some light staining and creasing). Text crisp and clean with only very minor occasional spotting, a few tiny wormholes in title, portrait and first preliminary leaf, long clean tear in leaf c7 without loss, little dust soiling to outer margins. Provenance: old illegible stamp on title; preface inscribed in an old hand, "Di Tommaso Bonaventuri"; Peter and Margarete Braune. A fine, unsophisticated copy. (#003326) € 1900

Dibner 149; Sparrow 190; Norman 2088; Carli and Favaro 428; Cinti 169; Riccardi I, 544; DSB XIII, pp.437-38; Honeyman 2993. FIRST EDITION of these twelve posthumously-published lectures delivered to the Accademia della Crusca, the Studio Fiorentino and the Academy of Drawing. Torricelli was a student of Galileo, and succeeded him as Professor of Mathematics at Florence. "From the point of view of physics, the lectures on the force of impact and on wind are of particular interest. In the former he said that he was reporting ideas expressed by Galileo in their informal conversations, and there is no lack of original observations. For example, the assertion that 'forces and impetus' (what we call energy) lie in bodies was

interpreted by Maxwell in the last paragraph of *A Treatise on Electricty and Magnetism* (1873) as meaning that the propagation of energy is a mediate and not remote action. In the lecture on wind Torricelli ... advanced the modern theory that winds are produced by differences of air temperature, and hence of density, between two regions of the earth" (DSB). Bonaventuri contributed an essay on Torricelli and his work, and also reprinted his letters on the acclaimed barometric experiment, the subject of the woodcut illustrations.

36 **VOLTA, Alessandro**. *L'Identità del Fluido Elettrico col cosi detto Fluido Galvanico Vittoriosamente Dimostrata*. Pavia: Giovanni Capelli, 1814. 4to (330 x 240 mm). vi, [2], 145, [VII] pp. Uncut, with deckle edges; frontispiece engraved portrait of Volta by G. Garavaglia, without the addenda slip tipped to the last page in only a few copies. 20th-century marbled paper boards. Text generally crisp and clean with just a little dust-soiling of title and last leaf. Provenance: Bergamo seminary (stamp on title); Peter and Margarete Braune. (#003327) € 1500

Honeyman 3076; Wheeler Gift 726. LARGE-PAPER COPY OF THE FIRST EDITION of Volta's last memoir on galvanism, "a lengthy review of his reasons for identifying galvanic and common electricity" (DSB). Volta had published his experiments in 1799. His finding, the voltaic pile, had immediately enabled a rapid succession of other discoveries which accelerated technological process: the electrolysis of water into oxygen and hydrogen by William Nicholson and Anthony Carlisle (1800), the chemical elements sodium (1807), potassium (1807), calcium (1808), boron (1808), barium (1808), strontium (1808), and magnesium (1808) by Sir Humphry Davy. Printed at the end is a bibliography of Volta's publications.

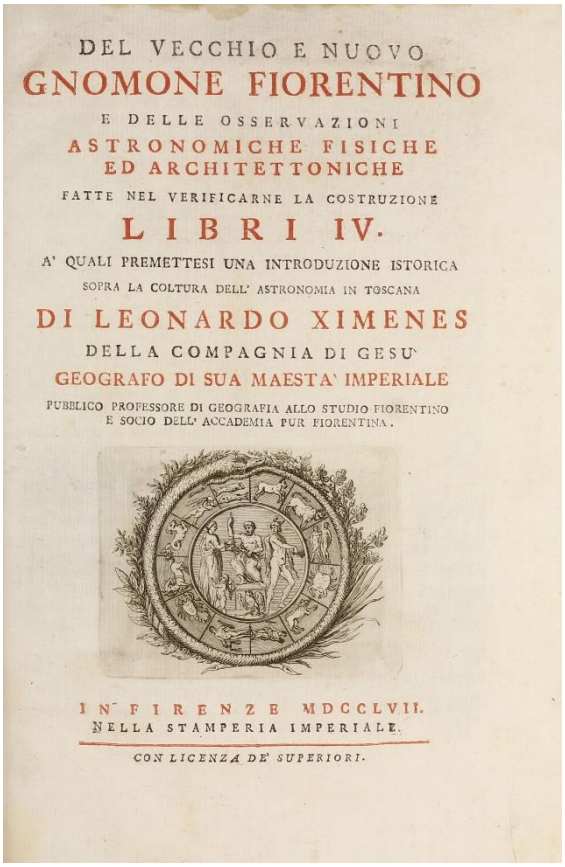
37 **XIMENES, Leonardo**. *Dissertazione meccanica di due strumenti che possono servire alla giusta stima del viaggio maritimo e della velocita delle acque. . .* Florence: nella Stamperia Imperiale, 22 June 1752. 8vo (179 x 129 mm). xxiii [1], 124 pp. Signatures: [par]^{12} A-G^{8} H^{6}. Woodcut printer's device on title-page, woodcut initials, head- and tailpieces, 4 folding engraved plates. Contemporary mottled goatskin, spine with gilt decoration and lettering, blind-ruled boards (extremities rubbed, corners bumped), red-dyed edges. Text quite crisp and clean with only very minor spotting in places, faint dampstain to gutter of title-page, fraying to fore-edge of one plate. Provenance: Antonianum Univ. Coll. (red ink stamp to p.19, erased stamp and shelf marks on title-page); Provenance: Giancarlo Beltrame Library. Very good copy. (#003295) € 1500

Riccardi I, 634:5. - RARE FIRST EDITION of Ximenes treatise on hydraulics which contains a description of his improved instruments for measuring water flow velocity and sea drift. In this work, he illustrates two mechanical devices conceived and constructed by him: the 'stadera a molla' (spring strut) and the ' tamburo con ruote a ventola' (drum with fan wheels), two instruments able to determine the variation of the speed of a fluid in different layers (superficial, intermediate and deep). These hydrometric techniques, developed by him undoubtedly constituted a considerable contribution to the development of the new physical discipline.

From the library of Antonio Favaro

38 **XIMENES, Leonardo**. *Del vecchio e nuovo gnomone fiorentino, e delle osservazioni astronomiche, fisiche ed architettoniche*. Florence: Stamperia Imperiale, 1757. 8vo (252 x 180 mm). [8], cxxiv, 336, [2] pp. Signatures: [cross]^{4} a-g^{8} h^{6}, A-X^{8} [chi]^{1}. Title-page printed in red and black and with engraved vignette, 14 engraved plates (including 2 tables, 13 folding), final errata leaf, woodcut initials and tailpieces. Early 19th-century half mottled calf over marbled boards, flat spine with black morocco label lettered in gilt (little rubbing of extremities and minor wear of corners), blue-dyed edges. Text and plates exceptionally crisp and clean, light brown-staining at top margin of first few pages including title. Provenance: Antonio Favaro, professor of mathematics at Padua, science historian and editor of the Works of Galileo (his bookplate to front pastedown). A very fine copy. (#003294) € 3000

Riccardi II 634-635; Brunet V, 1503. VERY RARE FIRST EDITION of the important study by the great Sicilian scientist Leonardo Ximenes, geographer and engineer of the Grand Duke of Tuscany. Ximenes restored the great sundial of the Dome of Santa Maria del Fiore. At this occasion he performed a series of astronomical and physical


DEL VECCHIO E NUOVO
GNOMONE FIORENTINO
E DELLE OSSERVAZIONI
ASTRONOMICHE FISICHE
ED ARCHITETTONICHE
FATTE NEL VERIFICARNE LA COSTRUZIONE
LIBRI IV.
A' QUALI PREMETTESI UNA INTRODUZIONE ISTORICA
SOPRA LA COLTURA DELL' ASTRONOMIA IN TOSCANA
DI LEONARDO XIMENES
DELLA COMPAGNIA DI GESU'
GEOGRAFO DI SUA MAESTA' IMPERIALE
PUBBLICO PROFESSORE DI GEOGRAFIA ALLO STUDIO FIORENTINO
E SOCIO DELL' ACCADEMIA PUR FIORENTINA.
IN FIRENZE MDCCLVII.
NELLA STAMPERIA IMPERIALE.
CON LICENZA DE' SUPERIORI.

observations of great importance, and marked the meridian line on the floor of the transept of the Croce del Duomo. The present work also contains a compendium of the history of astronomy in Tuscany including a detailed bibliography, where many astronomical works by Tuscan authors are recorded along with some news about their life (see Riccardi).

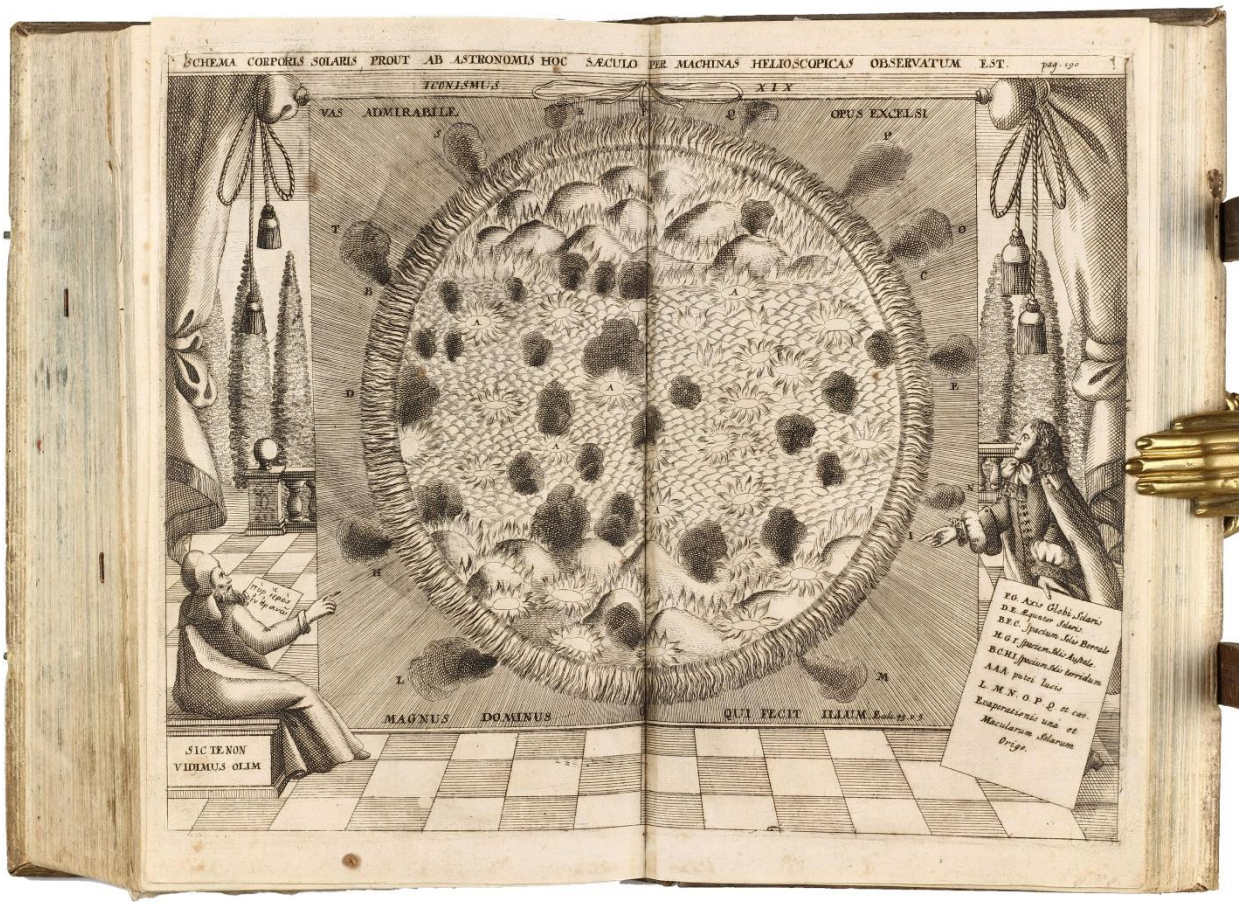
Lo scienzato Leonardo Ximenes restauro il grande gnomone della Cupola di Santa Maria del Fiore, che utilizzo per compiere una serie di rilevazioni astronomiche e fisiche di grande importanza, e installo la linea meridiana sul pavimento del transetto della Croce del Duomo. L'opera contiene anche un compendio della storia dell'astronomia in Toscana: '...abbiamo inoltre dovuto piuvolte citare la erudita introduzione di quest'opera, ove sono registrate molte opere astronomiche d'autori toscani, e non poche notizie intorno alla loro vita' (Riccardi).

39 **ZAHN, Johann**. *Oculus artificialis teledioptricus sive telescopium : ex abditis rerum naturalium & artificialium principiis protractum nova methodo, eaque solida explicatum ac comprimis e triplici fundamento physico seu naturali, mathematico dioptrico et mechanico, seu practico stabilitum. Opus curiosum practico-theoricum magna rerum varietate adornatum . . . adeoque telescopium ex tenebris in lucem asseritur.* Würzburg: Quirinus Heyl, 1685-1686. Three volumes bound in one. Folio (313 x 198 mm). [20], 190 (i.e., 218); [8], 271 [1]; [10], 281 [1] pp. Letterpress title to each volume printed in red and black, engraved additional title and author's portrait in vol. I, 30 engraved plates (4 double-page, 1 folding), 41 (20 full-size) engraved illustrations and woodcut diagrams, 8 double-page letterpress tables, woodcut initials, head- and tailpieces. Bound without the initial blank in vol. III and the final blanks in vols. I and III. Signatures: pi^2 (:)-2(:)^4 A-Z^4 2A-2D^4 2E^2 (-2E2);)(^{4} A-Z^4 2A-2L^4; pi^2 (-pi1))(^{4} A-Z^4 2A-2M^4 2N^2 (-2N2). Bound in contemporary blindstamped pigskin over beveled wooden boards, original laces present but clasps gone, spine chalked-up, fading blue-dyed edges (skin spotted, rubbed and soiled, patch of skin torn off at lower corner of rear board), original endpapers present. Text and plates somewhat browned (some gatherings in vols. II and III stronger), scattered mostly marginal spotting, portrait slightly shaved and with paper extention at fore-margin, plate to p.121 in vol. III detached and frayed at outer margins, folding plate with clean tear at fold. Provenance: Stiftsbibliothek Reichersberg, Austria (old ink stamps to letterpress titles). In all a very good copy. (#003352) € 8500

Norman 2278 (incomplete); Garrison-Morton-263; NLM/Krivatsy 13208; Wailer 11455; Becker Collection 424. - FIRST EDITION, AND EXCEPTIONALLY RARE FOUND COMPLETE, AS HERE, of Zahn's treatise on

the microscope and the telescope. The work is particularly valuable for its illustrations of both simple and compound microscopes of the period, including the type of compound instrument used by Robert Hooke. It also contains the earliest description of a portable camera obscura (part 1, p. 180). The plate "Iconismus XXVII" shows the first images of moving projection. The additional engraved title is dated 1687, the year this edition was completed. There are copies issued earlier without the engraved title and the portrait. In our copy an additional 5 leaves of handwritten tables are bound in.

"The author, a German philosopher who belonged to the Premonstratensian order at Herbipolis (Würzburg), displayed a detailed knowledge of vision, the properties of light, and the structure of the eye. Copiously illustrated ... The final section deals with the grinding and polishing of lenses and the construction of microscopes, telescopes, the camera obscura, and other optical instruments" (Becker Coll.)



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