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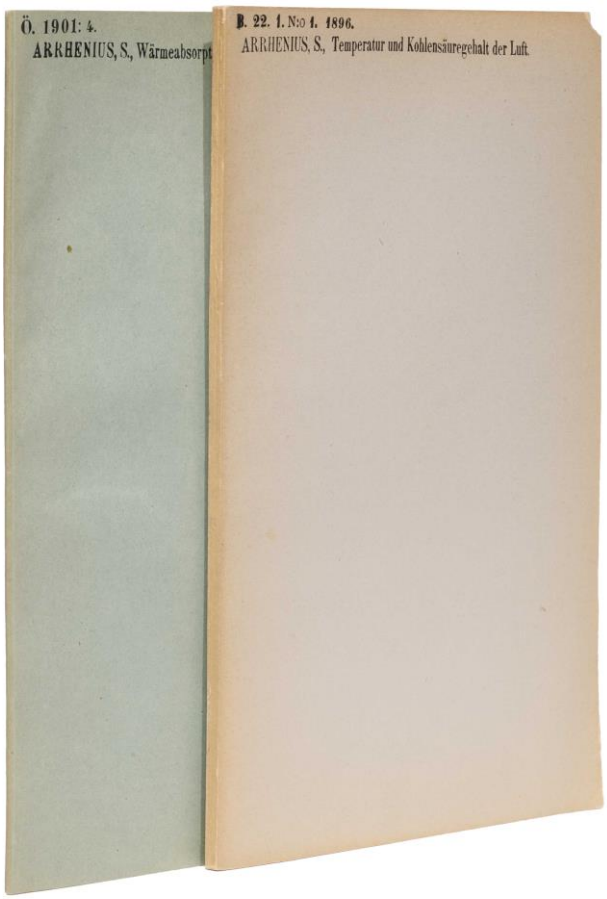
Formulating the Greenhouse Effect - the rare offprint issues

1 **ARRHENIUS, Svante**. *Ueber den Einfluss des atmosphärischen Kohlensäuregehalts auf die Temperatur der Erdoberfläche*. Offprint: Bihang Till K. Svenska Vet.-Akad. Handlingar, Bd. XXII/I, 1. Stockholm: Kungl. Boktryckeriet P. A. Norstedt & Söner, 1896. 8vo (215 x 140 mm). 102 pp. Original wrappers with publisher's ink stamp at top margin. Text generally clean and crisp. [WITH:] *Ueber die Wärmeabsorption durch Kohlensäure und ihren Einfluss auf die Temperatur der Erdoberfläche.* Offprint: Ofversigt af Kongl. Vetenskaps-Akademiens Förhandlingar 1901, no. 1. Stockholm, 1901. 8vo (215 x 140 mm). pp. 25-58. Original wrappers with publisher's ink stamp at top margin (wrappers very lightly browned at margins, upper corner of first part with small chip). Light even age-toning internally. A near pristine set. (#003823) € 5500

DSB I, p. 302; Poggendorff IV, 40. FIRST EDITION of Arrhenius' landmark works on global warmimg, exceptionally rare with the final part published in 1901 and in the offprint wrappers intended for private discribution (not to compare with the regular journal issues which have printed wrappers with price stated). That the true offprints are frequently mixed up in literature and sales catalogues is owned to the fact that the regular issues of this supplement series to the 'Proceedings of the Royal Swedish Academy of Sciences' were distributed in single numbers with printed wrappers. None of latter are offprints in the classical sense (i.e. copies given by the publisher to the author for distribution to colleagues and friends).



In developing a theory to explain the ice ages Arrhenius was the first to use basic principles of physical chemistry to calculate the extent to which increases in atmospheric carbon dioxide (CO2) will increase Earth's surface temperature through the greenhouse effect. These calculations led him to conclude that human-caused CO2 emissions, from fossil-fuel burning and other combustion processes, are large enough to cause global warming. This conclusion has been extensively tested, winning a place at the core of modern climate science. Arrhenius, in this work, built upon the prior work of other famous scientists, including Joseph Fourier, John Tyndall and Claude Pouillet. Arrhenius wanted to determine whether greenhouse gases could contribute to the explanation of the temperature variation between glacial and inter-glacial periods. (cf. H. Rodhe et al. *Svante Arrhenius and the Greenhouse Effect*. In: Ambio, vol. 26, no. 1, 1997, pp. 2-5). In the second and final part, Arrhenius also replies to the criticism of his global warming theory by Knut Ångström.

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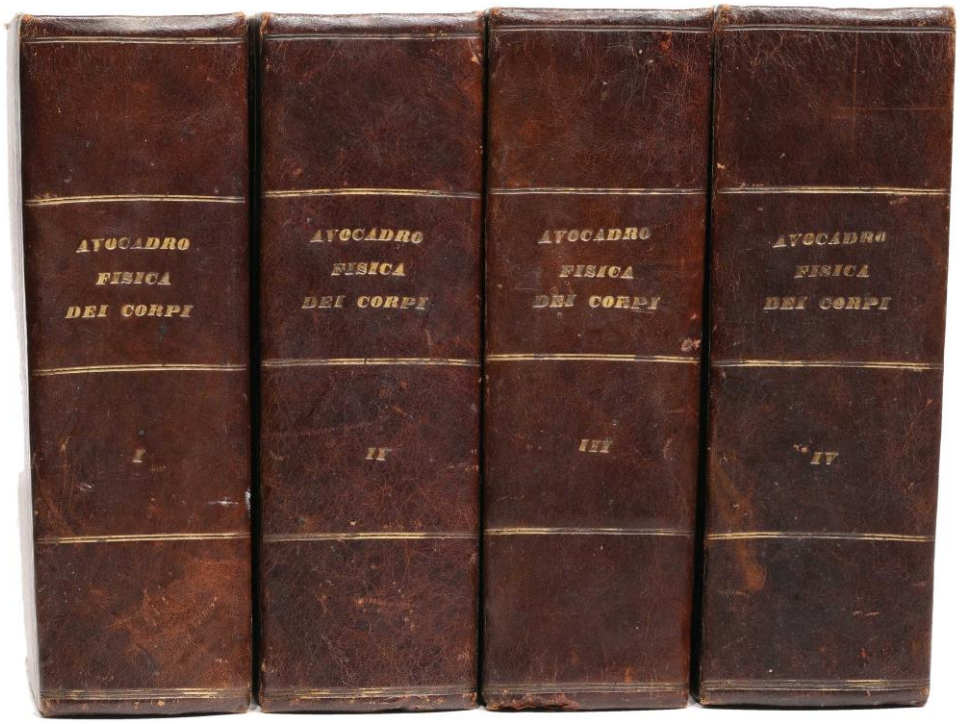
Formulating Avogadro's number

2 **AVOGADRO, Amedeo**. *Fisica de' corpi ponderabili, ossia Trattato della costituzione generale de' corpi*. Torino: Stamperia Reale, 1837-1841. 4 volumes. 8vo (220 x 141 mm). [4], xxxi [1], 910, [2] pp., 9 engraved plates; xv [1], 980 pp., 5 plates; xiii [1], 932 pp., 2 plates; xiii [1], 926, [2], LIII [1], [2] pp., 2 plates. Half-title to each volume; blank leaves present as called for; general index and final "con permissione" leaf in vol. IV. In total 18 lithographed folding plates. Bound in uniform contemporary half calf over marbled boards, flat spines ruled and lettered in gilt, blue-sprinkled edges (light wear to extremities, front flyleaf of vol. IV stuck to pastedown). Text and plates crisp and bright throughout, half-title of vol. I with light smudge, occasional very minor spotting. Provenance: Libreria Antiquaria Mediolanum, Milan (stickers to front-pastedown of vol. I). A fine set in untouched bindings; collated and complete. (#003889) € 15,000

FIRST AND ONLY EDITION of Avogadro's major work, containing the first announcement of 'Avogadro's Number'. "Avogadro's treatise contains an account of his famous hypothesis that the number of molecules in a gas, is always proportional to the volume. Avogadro's hypothesis allowed molecular weights to be determined directly, as the relative wights of the molecules of any two gases are the same as the ratios of the densities of these two gases under equal conditions. Avogadro introduced this hypothesis in his 'Essai d'une maniere de determiner les masses relatives des molecules elementaires des corps, et les proportions selon lesquelles; elles entrent dans ces combinations,' published in Vol. 73 of the *Journal de physique* (1811)" (Norman).



"Struck by the discovery of Gay-Lussac's volumetric law [Avogadro] detected an incompatibility between this law and Dalton's hypothesis attributing chemical combination to the simple juxtaposition of a small number of 'atoms' of different bodies; To resolve the contradiction, he formulates the hypothesis that gases under the same conditions all contain the same number of molecules in equal volumes, and proposes to admit that, during chemical combinations, gaseous molecules can divide into two or more parts. He shows how this hypothesis, combined with the results of Gay-Lussac's experiments, can be used to calculate the vapor volume of a number of simple bodies whose gas densities are not known" (M. Scheidecker-Chevallier, L'Hypothèse d'Avogadro (1811) et d'Ampère (1814): la distinction atome/molécule et la théorie de la combinaison chimique, in *Revue d'histoire des sciences*, 1997, vol. 50, no. 1, p. 162).

Because his work was published at first only in Italian, the importance of his hypothesis was largely overlooked until many years later. Based on his hypothesis, it was possible to arrive at a constant that

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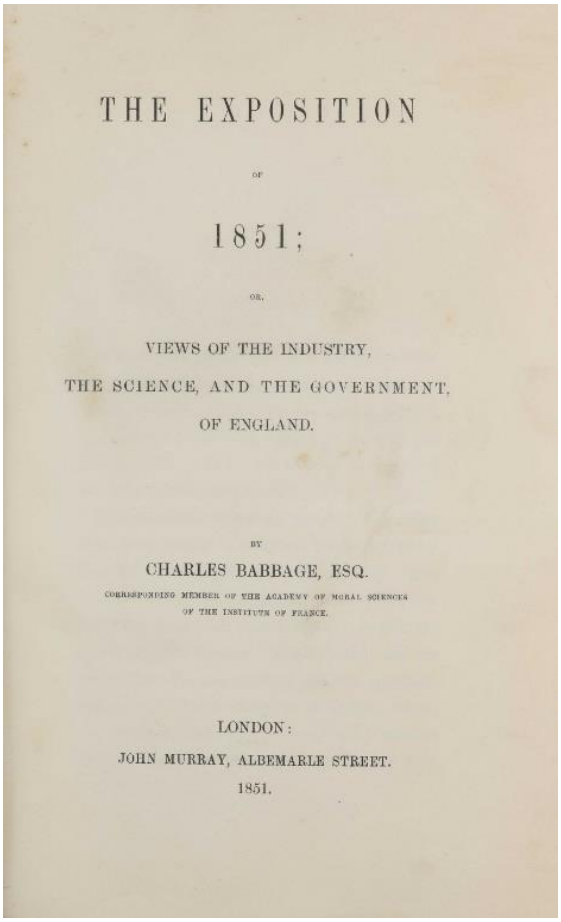
determined the number of molecules in a mole (a unit of measurement of the amount of a substance), equal to 6.02214076 x 10^23. Years after his death, this number was named the "Avogadro number" in his honor. References: Norman 89; Honeyman 168.

Presentation copy to the 3rd Earl of Rosse, inscribed by the author:

3 **BABBAGE, Charles**. *The Exposition of 1851; or, Views of the Industry, The Science, and the Government of England*. London: John Murray, 1851. 8vo (221 x 140 mm). xvi, 231 [1]; [3], 376-391 [1]; [3], 2-11 [1] pp., including half title and appendix of two reprints bound in by publisher, 1. *The Eleventh Chapter of the History of The Royal Society*, by C.R. Weld (London: Richard Clay, 1849) and *Mr. Babbage Calculating Machine*, by De Morgan (from: The Athenaeum, London, October 14, 1848); four pages of adverts by Babbage at end (undated). Original publisher's blindtooled green cloth, front board and spine lettered in gilt (binding weak, spine sunned with upper joint partially split at head, head of spine frayed, corners bumped), original yello endpaper, all pages uncut, a few pages crudely opened. The appendix smaller in size. Text with light even age-toning, half-title and advert pages with faint foxing, a few pencil marking in text. Provenance: William Parsons, 3. Earl of Rosse, Birr Castle (presented to him by the author and inscribed on half-title "To the Earl of Rosse K.P. & .. from the Author"); ticket of Remnant & Edmonds on rear pastedown. (#003833) € 12,000

RARE FIRST EDITION, PRESENTATION COPY INSCRIBED BY THE AUTHOR. The Great Exhibition of 1851, held in the famous Crystal Palace, was intended to showcase British arts and industry. "Babbage had been proposed to head the Industrial Commission for the Great Exhibition [. . .], but was rejected because of his early radicalism and his conflicts with the government over the Difference Engine. Resentful over this treatment, Babbage decided to publish a book on the Exhibition to set before the public the ideas that he otherwise would have presented to the Exhibition's governing committees. Babbage's Difference Engine, although certainly one of the engineering marvels of the nineteenth century, was not included in the Exhibition, and Babbage had to content himself with reprinting the account of the project published in Charles Weld's *History of the Royal Society* (1848)" (Norman).


THE EXPOSITION

OF

1851;

OR,

VIEWS OF THE INDUSTRY,

THE SCIENCE, AND THE GOVERNMENT,

OF ENGLAND.

BY

CHARLES BABBAGE, ESQ.

CORRESPONDING MEMBER OF THE ACADEMY OF MORAL SCIENCES OF THE INSTITUTE OF FRANCE.

LONDON:

JOHN MURRAY, ALBEMARLE STREET.

1851.

"In this polemic, Babbage not only criticized the policies of the organizers of the exhibition but also broadened his censure to include the low estate to which science in Great Britain had fallen. To remedy the Exposition Committee's failure to recognize the importance and value of the Difference Engine, Babbage included a chapter on the machine and its history (pp. 173–188) in the main body of the text. In an appendix he provided a copy of a previously published (1849) pamphlet containing articles by Charles Weld and Augustus DeMorgan that present Babbage and his work on the Difference Engine in an objective and factual light. Within a few years, this work inspired a reply in defense of the British establishment written by Richard Sheepshanks, A letter to the Board of Visitors of the Greenwich Royal Observatory in reply to the calumnies of Mr. Babbage at their meeting in June 1853, and in his book entitled *The Exposition of 1851* (London, 1854)" (Tomash).

References: Norman 95; Hook & Norman *Origins of Cyberspace* 67 ; Van Sinderen 1980, 61; Tomash & Williams B24; Honeyman 177.

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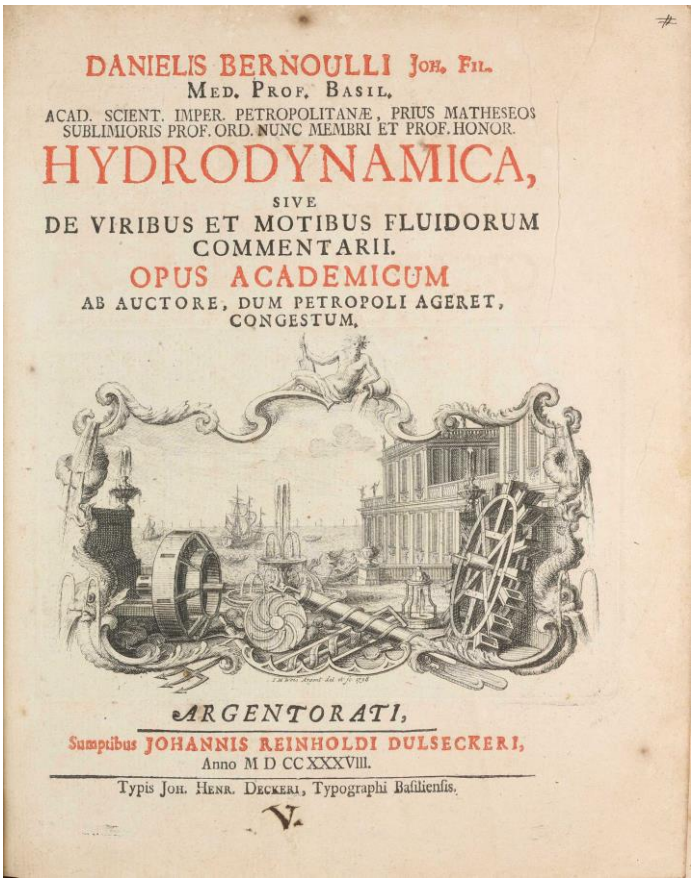
The Foundation of modern hydrodynamics

4 **BERNOULLI, Daniel.** *Hydrodynamica; sive, de viribus et motibus fluidorum commentarii*. Strassburg: Johann Heinrich Decker for Johann Reinhold Dulsecker, 1738. 4to (238 x 195 mm). [8], 304 pp. Title and first text page with large engraved vignette, first dedication leaf verso with large woodcut intitial, 12 folding engraved plates by I.M. Weis bound at end. Extra illustrated with engraved portrait of the author's father Johann I Bernoulli bound in as frontispiece. Signatures: [pi]^4 A-2P^4. Contemporary French calf, spine with 5 raised bands gilt-tooled in compartments and with gilt-lettered red morocco label to second compartment, red-dyed edges, marbled endpapers (rubbing and scratching of leather over boards, upper spine slightly chipped, small worm holes to joints near foot of spine, corners scuffed and slightly bumped). Text and plates crisp and clean throughout with only light even browning and minor occasional spotting (few gatherings a bit stronger). Collated and complete. A very good copy in untouched contemporary binding. (#003865) € 7800


DANIELIS BERNOULLI Joh. Fil.
Med. Prof. Basil.
ACAD. SCIENT. IMPER. PETROPOLITANÆ, PRIUS MATHESEOS SUBLIMIORIS PROF. ORD. NUNC MEMBRI ET PROF. HONOR.
HYDRODYNAMICA,
SIVE
DE VIRIBUS ET MOTIBUS FLUIDORUM COMMENTARII.
OPUS ACADEMICUM
AB AUCTORE, DUM PETROPOLI AGERET, CONGESTUM.
ARGENTORATI,
Sumptibus JOHANNIS REINHOLDI DULSECKERI,
Anno M D CC XXXVIII.
Typis Joh. Henr. Deckeri, Typographi Basilienſis.

Roberts & Trent, *Bibliotheca Mechanica*, pp. 34-35. Norman 215, PMM 179 (mentioned). - FIRST EDITION of Daniel Bernoulli's most important work, the foundation of modern hydrodynamics (a term first employed in this book), and containing his formulae for calculating the velocity, duration and quantity of liquid issuing from an opening in a container. Other chapters deal with water oscillations, a theory of machinery (including an extensive treatment of the screw of Archimedes) and an important section which introduces his kinetic gas theory.

Author's Presentation Copy

5 **BESANT, Annie**. *Light, Heat, and Sound. Hall of Science Manuals. Specially adapted for the Elementary Examinations, South Kensington, on Sound, Light, and Heat*. London: Freethought Publishing Co., 1881. 8vo (183 x 124 mm). 144 pp., 2 folding lithographed plates. Original publisher's blindstamped red cloth, upper board lettered in black, original yellow endpapers, folding plate in pocket (spine and inner upper hinge repaired, spine ends scuffed, boards soiled and spotted). Even light browning internally, light dust-soiling to title-page and outer margins, occasional minor dump-soiling, one detached plate placed in slip pocket at inner rear board. Provenance: Wigan Public Library (paper label to front pastedown with printed presentation, signed and dated April 1884 by the author; blind stamps to folding plate and title-page, shelf-mark stamp to verso of title-page). Still very good copy. (#) € 2800

EXCEEDINGLY RARE FIRST AND ONLY EDITION OF THIS EDUCATIONAL MANUAL, SIGNED PRESENTATION COPY. Annie Besant (1847-1933) was a British socialist, theosophist, freemason, women's rights and Home Rule activist, educationist, and campaigner for Indian nationalism. Regarded as a champion of human freedom, she was a prolific author with over three hundred books and pamphlets to her credit. For fifteen years, Besant was a public proponent in England of atheism and

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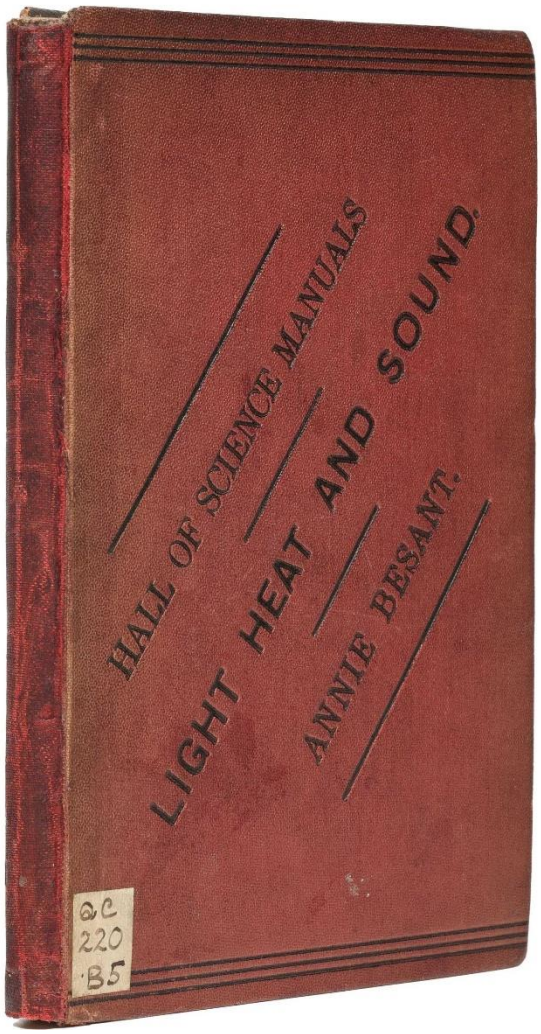
scientific materialism. Besant's goal was to provide employment, better living conditions, and proper education for the poor.

In 1879 she became a student at the University of London. This was also through the intercession of her tutor, Edward Aveling, who taught comparative anatomy at the London Hospital. Aveling joined the National Secular Society and began fighting for secularisation alongside his students in Whitechapel, which soon cost him his teaching post at the hospital. Besant took as many courses as possible at the various institutes accredited by London University. "Besant chose a number of experimental science classes, without doubt hoping to put her as yet theoretical scientific knowledge into practice. She studied sound, light, and heat, as well as electricity and magnetism at Birkbeck Institute. She also took courses in acoustics, biology, animal physiology, botany, and mathematics at several other institutions. This demonstrates Besant's vast scientific curiosity, but also her sincerity, for such serious studies went beyond making a symbolic point. Moreover, she had chosen to join the extreme minority of Victorian women who studied science: there were only three women out of the thirty-seven students in her animal physiology class, for instance. Besant proved an excellent student. The *National Reformer* adopted a Women's Rights habit of reporting her exam results, along those of other female students, in an openly feminist perspective. Besant took up the pen herself, in her 'Daybreak' editorial of 9 July 1882, to rejoice that 'in the awards made by UCL, it is gratifying to notice that where the women students have competed with the men, the women have taken a large proportion of the prizes.' The *National Reformer* announced that Besant came out of her first year having passed chemistry, mathematics, theoretical mechanics, electricity and magnetism, botany, biology, animal physiology, acoustics, and the study of light" (Muriel Pécastaing-Boissière, p. 112).



"Besant stopped trying for a BSc. when she realized that her chemistry teacher had unjustly failed her, even though she had received a First Class ranking in this subject during her first year. Anyway, by then, she had joined the socialist cause: so this was more a matter of priorities to her than really giving up on a struggle. After being dismissed from the London Hospital, Edward Aveling organized adult classes in the even more aptly named Hall of Science of the NSS. In 1883, no fewer than thirteen weekly science and Latin classes were offered there over thirty weeks, under the Science and Art Department at South Kensington, as well as London University matriculation classes. Besant had taken advanced certificates and qualified as a science teacher in eight different topics. From 1880, she taught some of these classes, soon joined by Alice and Hypatia Bradlaugh, who also took teaching certificates. Over eight years, Besant taught weekly science classes to up to thirty working or lower-middle-class young men and women. She taught elementary animal physiology, advanced chemistry, acoustics, light and heat, electricity and magnetism, and published textbooks. Her students' results stand as proof that Besant must have been an excellent science teacher: in June 1881, the *National Reformer* proudly announced that two of her fourteen students in elementary animal physiology had received a First Class ranking in South Kensington examination" (Muriel Pécastaing-Boissière, pp. 115-16).

This book is of great rarity. OCLC locates only eight copies in public libraries (two in Europe at British Library and Göttingen University and five in the USA). No copy is recorded at auction. Reference: Muriel Pécastaing-Boissière, *Annie Besant (1847-1933) - Struggles and Quest*, Theosophical Publishing House, London, 2017, pp. 112-16. Bibliography: OCLC 1467691.

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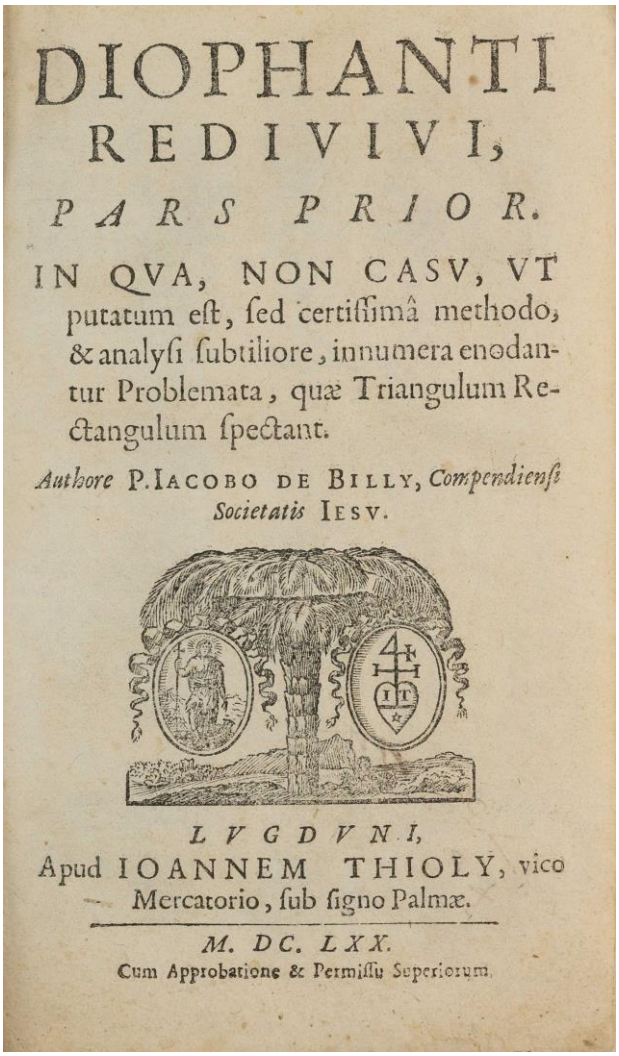
6 **BILLY, Jacques de.** *Diophanti redivivi pars prior [- posterior], in qua, non casu, ut putatum est, sed certissimâ methodo, & analysi subtiliore, innumera enodantur problemata, quae triangulum rectangulum spectant*. Lyon: J. Thiolly, 1670. Two parts in one volume. 8vo (166 x 102 mm). [8], [1-2] 3-302, [2]; [1-2] 3-140, [4] pp., including separate title to each part, part I with blank leaves ā4 and T8, part II with final two blanks I7-8; unnumbered preliminary leaves of gathering $ā^4$ misbound between pp. 16 and 17 of part I. Titles and some final pages of chapters with woodcut printer's device, woodcut initials, head- and tailpieces. Signatures: A^8(A1+$ā^4$(-ā4)) B-T^8; ^{2}A-I^8. Contemporary French vellum, spine lettered in ink, original endpapers, sprinkled edges (spine and joints with worm holes, vellum soiled, 3 gatherings working loose). Text with even light browning, worm track to lower corner of some leaves of part I not affecting text, occasional minor brown spotting. Provenance: Old collectors stamp with the initials F.T. to front pastedown. Very good copy in untouched binding, collated and complete with all blanks present as called for. (#003858) € 5500

VERY RARE FIRST EDITION of this mathematical treatise. Jacques de Billy, Jesuit, mathematician and astronomer, was born in Compiègne in 1602 and died in Dijon in 1679. He taught mathematics at several Jesuit colleges (Reims, Dijon, Grenoble) and was rector of the colleges at Langres, Sens and Châlons-en-Champagne. His pupils included Ozanam and Claude-Gaspard Bachet de Méziriac. "This work contains many of the discoveries on the theory of numbers made by Fermat ... by 1659 Fermat was engaged in correspondence with J. de Billy. This correspondence is reflected in Billy's writings. Fermat's innovations were to prove formative for modern number theory ... Billy's work ... represents an intriguing testament to the early development of this branch of mathematics" (DSB).


DIOPHANTI
REDIVIVI,
PARS PRIOR.
IN QVA, NON CASV, VT putatum eſt, ſed certiſſimâ methodo, & analyſi ſubtiliore, innumera enodantur Problemata, quæ Triangulum Rectangulum ſpectant.
Authore P. IACOBO DE BILLY, Compendienſi Societatis IESV.
LVGDVNI,
Apud IOANNEM THIOLY, vico Mercatorio, ſub ſigno Palmæ.
M. DC. LXX.
Cum Approbatione & Permiſſu Superiorum.

Contents: *Pars prior: in qua, non casu, ut putatum est, sed certissima methodo, & analysi subtilore, innumera enodantur problemata, quae triangulum rectangulum spectant - Pars posterior: in qua, non casu, ut putatum est, sed certissima methodo, & analysi subtilore, innumera enodantur problemata, quae aliud quam triangulum rectangulum spectant*.

References & Bibliography: J. Itard, "Billy, Jacques de". In: *Dictionary of Scientific Biography*. Vol. II., p. 131 (DSB); Brunet I, 946: "Recherché et rare"; DeBacker/Sommervogel I, 1479).

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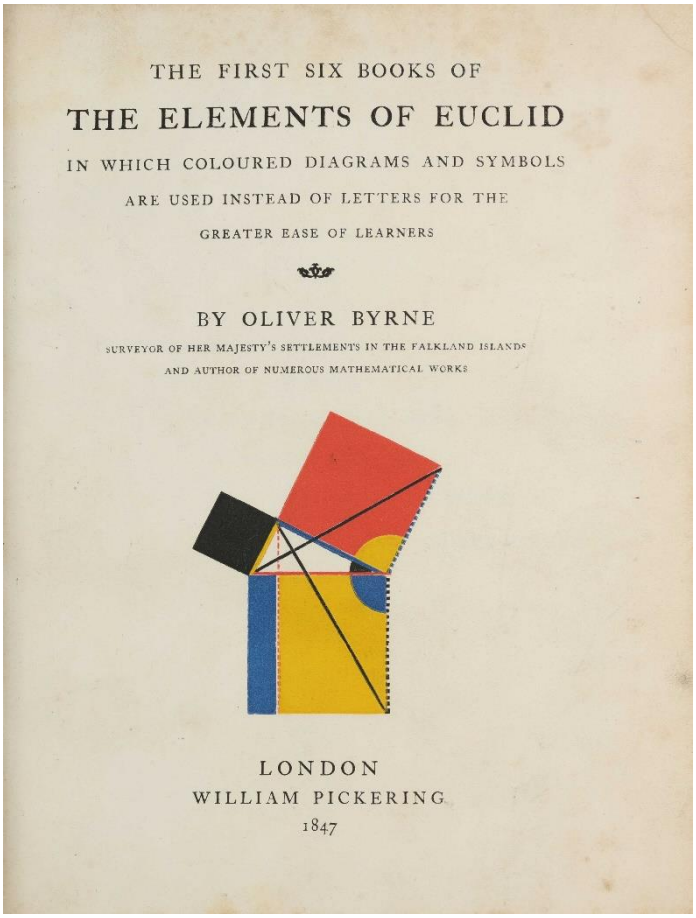
"The most attractive edition of Euclid the world has ever seen"

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 (236 x 186 mm). [7] viii-xxix [1], 268 pp. Including half-title, four-line woodcut initials, color diagrams throughout printed in red, blue, yellow and black. Contemporary three-quarter calf over cloth, spine-ends and raised bands with gilt-decoration, gilt-lettered red morocco spine-label, original blue endpapers (extremities rubbed, corners bumped). Some pale brown spotting of text as usual*, minor age-toning of paper, but in all a better-than-average, crisp and clean copy. (#003806) € 14,000

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).


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

"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 (or foxing) due to the used paper stock, but this copy is less affected than most copies we have seen.

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.

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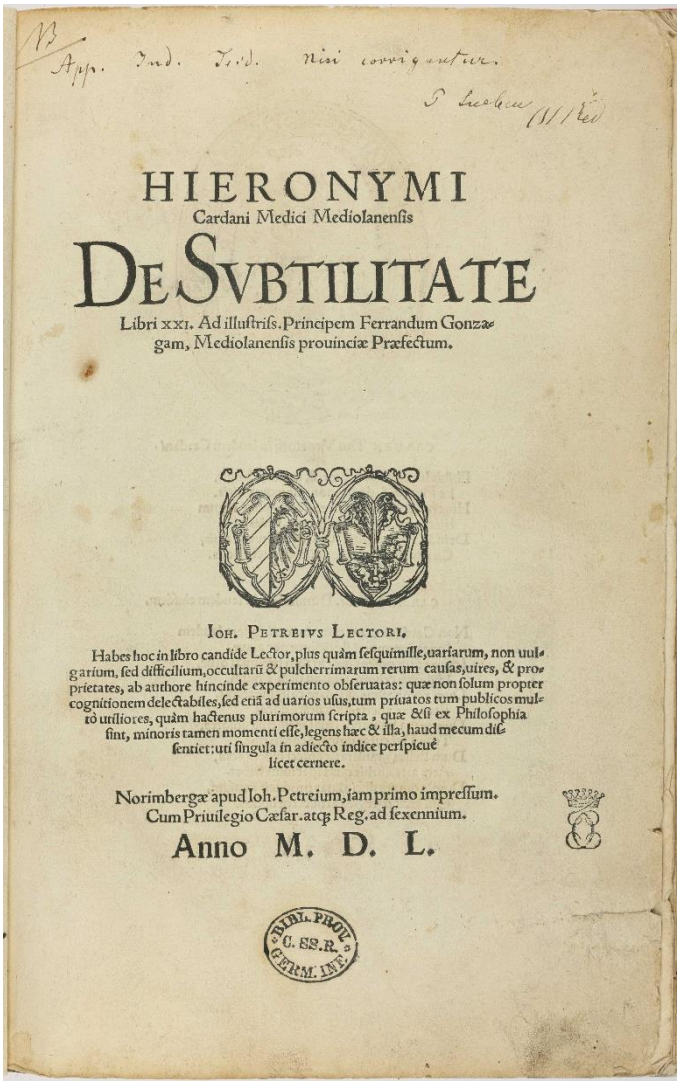
Exceptionally rare first edition of Cardano's most celebrated book

8 **CARDANO, Girolamo**. *De subtilitate libri XXI*. Nürnberg: J. Petreius, 1550. Folio (309 x 201 mm). [36], 371 [1] pp. Roman type, italic marginalia. Woodcut printer's device on title, woodcut portrait of the author on title verso, numerous woodcut illustrations and diagrams in text, blank leaf D6. Signatures: A-C^4 D^6 a-z^4 aa-yy^4 zz^6. 204 leaves. Bound in 20th-century half-vellum and pastepaper boards. Text quite crisp and clean throughout with only minor occasional spotting. Last 10 gatherings with light waterstaining to inner margins; small marginal tears to title; p. 195 with text corrections in contemporary hand. Provenance: old ownership entry at head of title-page; Former Redemptorist order, Hennef-Geistingen* (ink stamp "Bibl. Prov. Germ. Inf. C.SS.R" on title page). A very good, tall copy. (#003813) € 28,000

EXCEPTIONALLY RARE FIRST EDITION OF CARDANO'S MOST CELEBRATED WORK. This encyclopaedia of natural science "represents the most advanced representation of physical knowledge up to his time and the idea that all creation is in progressive development" (Dibner). It contains a wide variety of subjects and facts, both real and imaginary, which include: cosmology, the construction of machines, the laws of mechanics, cryptology, alchemy, and various branches of the occult. De subtilitate went through many editions in the sixteenth century, and as well numerous editions of the French translation. A supplement to De subtilitate was published in 1557, entitled *De rerum varictate*, and was equally popular in its day. "It is a mine of facts, both real and imaginary; of notes on the state of the sciences; of superstition, technology, alchemy, and various branches of the occult" (DSB). The woodcuts show geometric figures, chemical experimental arrangements, physical apparatuses, etc.


HIERONYMI
Cardani Medici Mediolanensis
DE SVBTILITATE
Libri xxi. Ad illustriss. Principem Ferrandum Gonzagam, Mediolanensis prouinciæ Præfectum.
IOH. PETREIVS LECTORI.
Habes hoc in libro candide Lector, plus quàm sesquimille, uariarum, non uulgarium, sed difficilium, occultarũ & pulcherrimarum rerum causas, uires, & proprietates, ab authore hincinde experimento obseruatas: quæ non solum propter cognitionem delectabiles, sed etiã ad uarios usus, tum priuatos tum publicos multo utiliores, quàm hactenus plurimorum scripta, quæ &si ex Philosophia sint, minoris tamen momenti esse, legens hæc & illa, haud mecum dissentiet: uti singula in adiecto indice perspicuè licet cernere.
Norimbergæ apud Ioh. Petreium, iam primo impressum. Cum Priuilegio Cæsar. atq; Reg. ad sexennium.
Anno M. D. L.
BIBL. PROV. C. SS. R. GERM. INF.

This first edition is quite rare. RareBookHub only records two copies at auction in the past 50 years: one copy at Sothebys sold for €18,000 in 2007 and the Norman copy at Christies for $8050 in 1998.

* The Redemptorists officially named the Congregation of the Most Holy Redeemer (Latin: Congregatio Sanctissimi Redemptoris), abbreviated CSsR is a Catholic clerical religious congregation of pontifical right for men (priests and brothers). It was founded by Alphonsus Liguori at Scala, Italy, for the purpose of labouring among the neglected country people around Naples. It is dedicated to missionary work and they minister in more than 100 countries. Members of the congregation are Catholic priests and consecrated religious brothers. The Redemptorist library in Hennef was sold and dispersed in the early 2000s.

References: Dibner 139; Duveen pp. 116-117; Norman 401; DSB III, p.66; Wellcome I, 1290; Sinkankas 1145; Adams C 668; Riccardi I/I, 252, 6.1.

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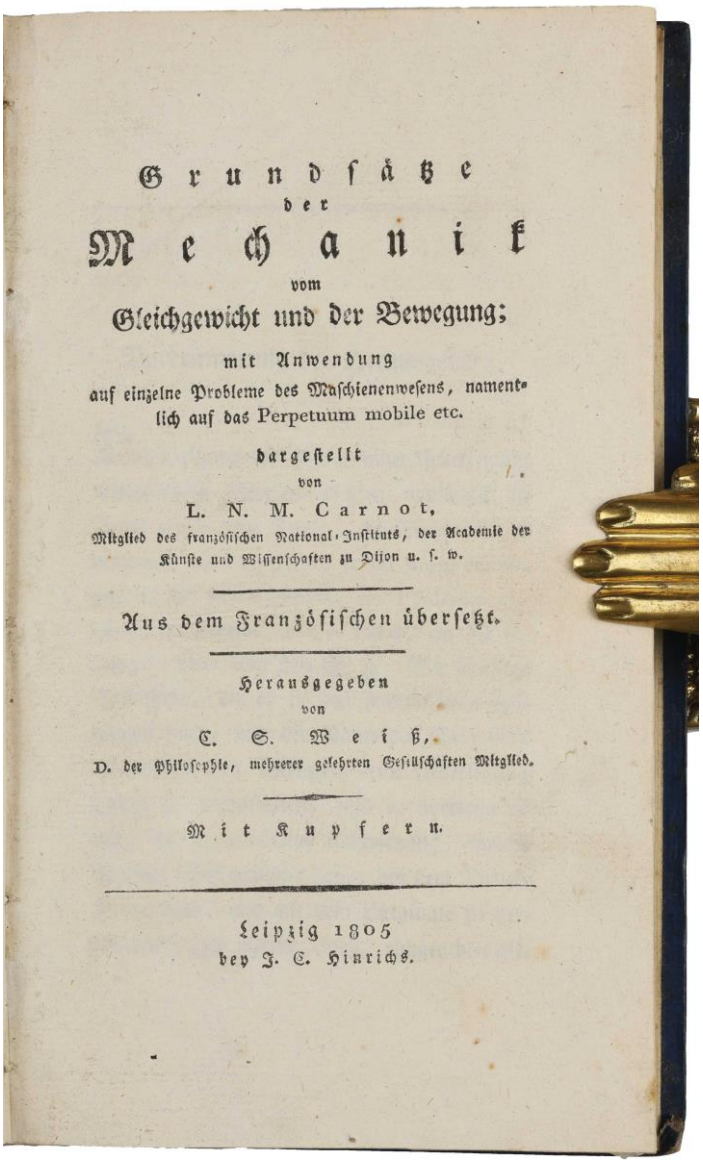
From the Sadi-Carnot family library

9 **CARNOT, Lazare-Nicolas-Marguerite.** *Grundsätze der Mechanik vom Gleichgewicht und der Bewegung: mit Anwendung auf einzelne Probleme des Maschienenwesens, namentlich auf das Perpetuum mobile etc.; aus dem Französischen übersetzt*. Leipzig: Hinrichs, 1805. 8vo (199 x 115 mm). xxviii, 303 [1] pp., 2 folding engraved plates. Bound in late 19th century cloth over blue card boards, spine lettered and ruled in black (minor soiling of spine, extremities rubbed, corners bumped and scuffed). Text crisp and clean throughout. Provenance: from the Library of the Sadi-Carnot family (catalogue of the sale "Carnot : la bibliothèque d''une dynastie" by Astrid Guillon, Paris 27 Oct. 2022, lot 86). A near pristine copy internally. (#003860) € 650



Grundſätze
der
Mechanik
vom
Gleichgewicht und der Bewegung;
mit Anwendung
auf einzelne Probleme des Maſchienenweſens, namentlich auf das Perpetuum mobile etc.
dargeſtellt
von
L. N. M. Carnot,
Mitglied des franzöſiſchen National-Inſtituts, der Academie der Künſte und Wiſſenſchaften zu Dijon u. ſ. w.
Aus dem Franzöſiſchen überſetzt.
Herausgegeben
von
C. S. Weiß,
D. der Philoſophie, mehrerer gelehrten Geſellſchaften Mitglied.
Mit Kupfern.
Leipzig 1805
bey J. C. Hinrichs.

VERY RARE FIRST GERMAN EDITION of "Principes fondamentaux de l'équilibre et du movement" translated from a new edition, published in Paris in 1803. Itself a work that first appeared in Dijon in 1783 under the title *Essai sur les machines en général*. The author explains in the preface that he has made changes in the light of recent discoveries. "These developments have necessitated a new order in the subjects, and made the writing more voluminous. . . the result is a work that is in some ways entirely new. . ." (see DSB III, p.75 and 78). "Carnot remains one of the very few men of science and of politics whose career in each domain deserves serious attention on its own merits" (DSB). Famous as the French Revolution's 'Organizer of Victory,' who in 1793 successfully united fourteen armies to defend France against an immense European horde, Carnot is equally well known as a mechanical engineer and mathematician, being the author of this first theoretical treatise on engineering mechanics, in which he was the first to prove explicitly the loss of kinetic energy in the collision of bodies. Carnot's abstract approach to the problems of mechanics makes him one of the important forerunners in the field of the physics of energy.

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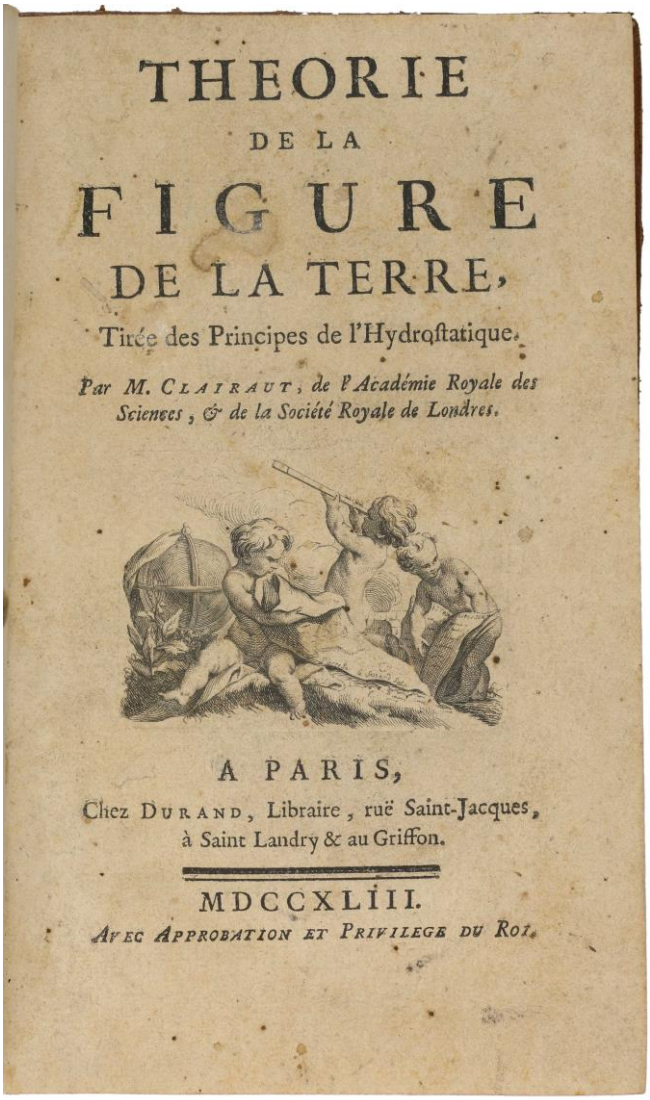
10 **CLAIRAUT, Alexis-Claude**. *Théorie de la figure de la Terre, Tirée des Principes de l'Hydrostatique*. Paris: chez David fils, 1743. 8vo (188 x 113 mm). xl, 305, [5] pp., engraved title vignette, woodcut initials, head- and tailpieces, numerous woodcut text diagrams. Contemporary French mottled calf, spine with 5 raised bands gilt-tooled in compartments, gilt lettering piece, red sprinkled edges (wear to extremities, worming at spine ends, boards scratched, corners slightly scuffed). Quite crisp and clean throughout internally with only very minor spotting in places, title page a bit browned and soiled, ink stain to p. iii, long clean tear to leaf H4 without loss, final page spotted and with small abraded patch affecting a few letters, two oversized formula on p. 289 slightly shaved at fore-margin. Single page with annotations in light pencil. Provenance: from a French private collection. Very good copy, collated and complete. (#003861) € 1500


THEORIE
DE LA
FIGURE
DE LA TERRE,
Tirée des Principes de l'Hydroſtatique.
Par M. CLAIRAUT, de l'Académie Royale des Sciences, & de la Société Royale de Londres.
A PARIS,
Chez DURAND, Libraire, ruë Saint-Jacques, à Saint Landry & au Griffon.
MDCCXLIII.
AVEC APPROBATION ET PRIVILEGE DU ROI.

FIRST EDITION of this important geophysical treatise in which the author lays the foundations of modern hydrostatics and states his famous theorem which enabled him to confirm Newton's theory of the flattening of the Earth at the poles. Alexis-Claude Clairaut (1713-1765) studied mathematics under his father Jean-Baptiste and entered the Académie des Sciences at the age of 18. In 1736-1737, he was part of Maupertuis' geodesic expedition to Lapland. Bibliography: Lalande, p. 419; Zeitlinger-Sotheran, 799.

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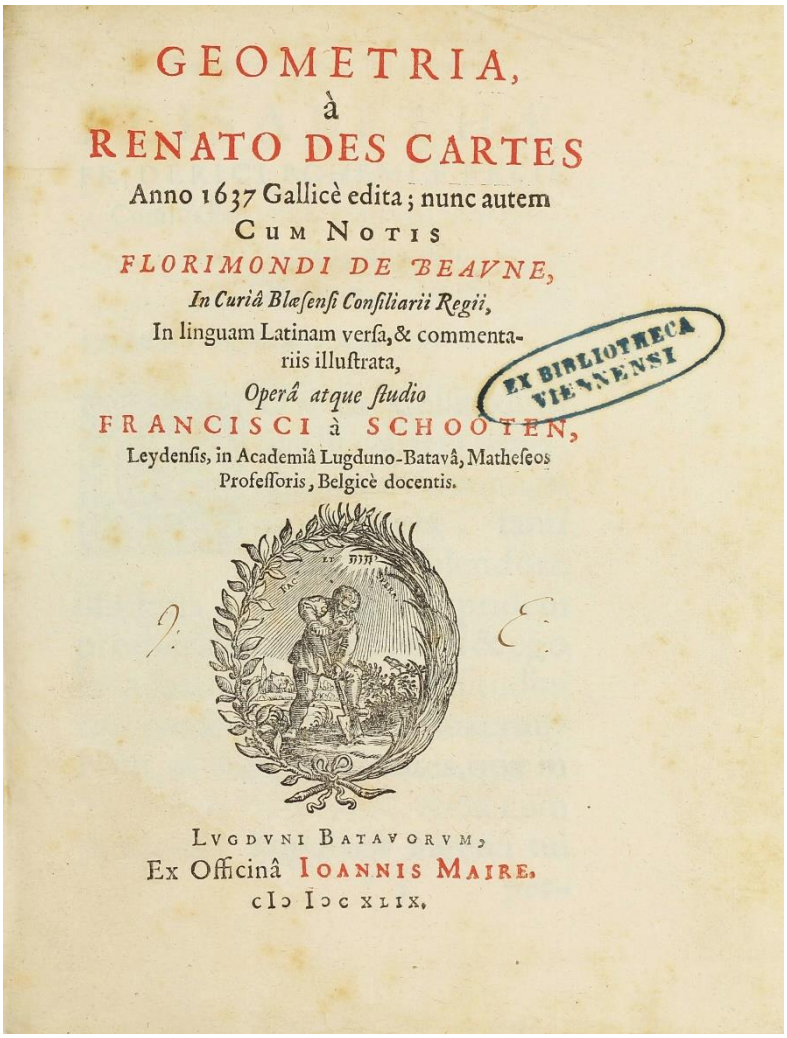
11 **DESCARTES, Rene**. *Geometria; Anno 1637 Gallicè edita; nunc autem cum notis Florimondi de Beaune. Opera atque studio F. à Schooten.* Leiden: Jean Maire, 1649. 4to (204 x 156 mm). [12], 336, [4] pp., including final blank leaf, title printed in red and black, woodcut text diagrams, woodcut initials and tailpieces. Signatures: $*^4$ $**^2$ A-2T^4 2V^2. Bound in contemporary vellum with yapp edges, ink lettering on spine, blue sprinkled edges, original endpapers (vellum cleaned except for hand-lettered spine area, slight bending of lower board). Text with light even browning, occasional pale waterstaining to outer margins. Provenance: Ex Bibliotheca Viennensi (stamp and old ink monogram to title). (#003454) € 8500

RARE FIRST LATIN EDITION. Although the original French version was published some years earlier, it was this Latin translation by Frans van Schooten which disseminated Descartes' treatise to the scientific community in Europe. Descartes originally published *La Géométrie* as an appendix to his *Discourse on Method* (1637) which he had entrusted to the same printer, Jean Maire. The Latin version and the commentaries of Frans van Schooten, his fervent disciple, received the approval of the master, hardly accommodating to those who considered the treatise rather obscure ("Et pour ceux qui se mêlent de médire de ma Géométrie sans l'entendre, je les méprise" (And for those who meddle in slandering my *Geometry* without hearing it, I despise them).


GEOMETRIA,
à
RENATO DES CARTES
Anno 1637 Gallicè edita; nunc autem
CUM NOTIS
FLORIMONDI DE BEAVNE,
In Curiâ Blæsensi Consiliarii Regii,
In linguam Latinam versa, & commentariis illustrata,
Operâ atque studio
FRANCISCI à SCHOOTEN,
Leydensis, in Academiâ Lugduno-Batavâ, Matheseos Professoris, Belgicè docentis.
EX BIBLIOTHECA VIENNENSI
LVGDVNI BATAVORVM,
Ex Officinâ IOANNIS MAIRE,
cIↃ IↃC XLIX.

The influence of the translation commented on by Schooten and Florimond de Beaune was immense: It became the fundamental work in which all of Europe was educated (ref. René Poirier). Descartes professes that algebraic problems can be represented by geometry. He explains how to solve quadratic equations with the ruler and the compass; those of a higher degree involving the intersection of geometric curves. He also introduced modern algebraic notation: x, y, z, for unknowns, as well as exponential notation for any exponent (a2, a3, ...). Thus, Cartesian geometry, independently of Fermat, contributed to create by a decisive impetus what we will call, around 1800, "analytical geometry."

References: Chemerzine II, p. 796; Samueli & Boudenot, *Trente livres de mathématiques qui ont changé le monde*, 2006, pp. 65-69; Guibert, *Descartes. Bibliographie des œuvres publiées au XVIIe siècle*, 1976, pp. 27-29. René Poirier, *L'ouvrage fondamental où toute l'Europe s'est instruite*.

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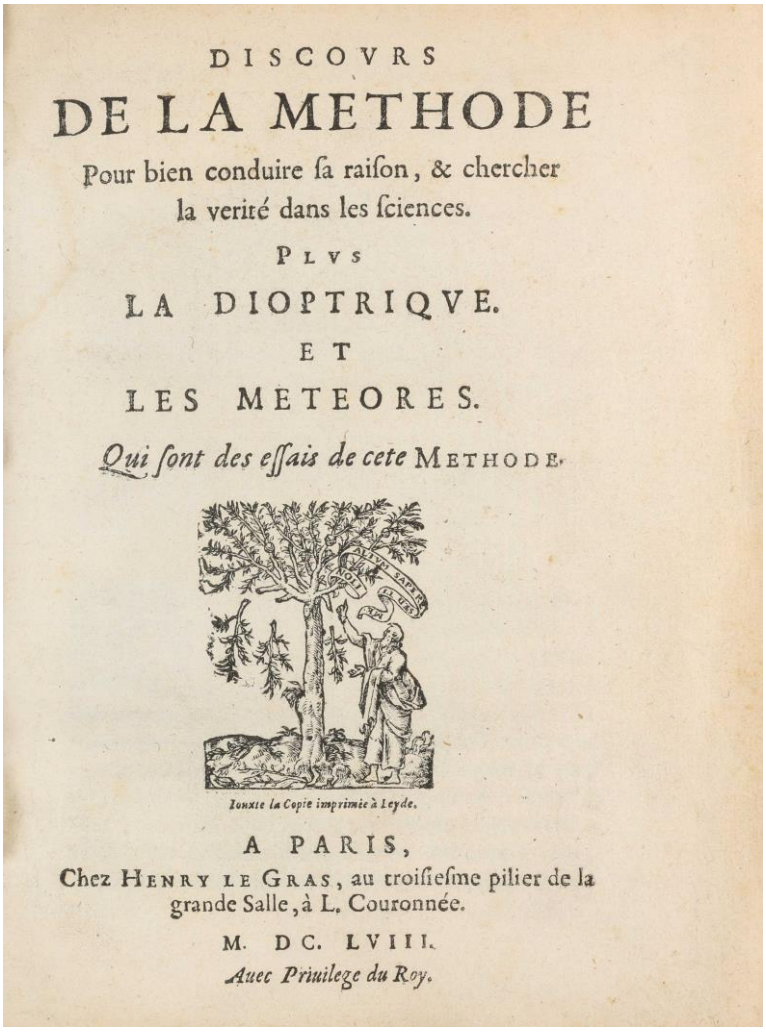
The first *Discours de la Methode* edition published in France

12 **DESCARTES, Rene**. *Discours de la méthode pour bien conduire sa raison, & chercher la verité dans les sciences. Plus la dioptrique. Et les météores. Qui sont des essais de cete Methode. Jouxte la copie imprimée à Leyde*. Paris: Henry Le Gras, 1658. 4to (197 x 148 mm). 78; [2], 294, [26] pp., woodcut device on title-page, woodcut initials, half-titles for "La dioptrique" and "Les météores" (the former outside pagination), woodcut text illustrations and diagrams throughout (some full page). Signatures: a^4 b-k^4 A-Z^4 Aa-Rr^4. Bound in contemporary untouched rigid full vellum with yapp edges, spine hand-lettered and initials "B.C." on upper board, sprinkled edges, original endpapers (boards slightly bent outwards, vellum soiled and spotted, head of spine slightly damaged with cap gone). Text with even light browning throughout, occasional very minor spotting; minor pale dampstaing to fore-margin of a few leaves at beginning; a few ink marginals and text markings, rear free endpaper torn off, light dust-soiling of final text page. A very good+ copy in untouched binding. (#003887) € 4500


DISCOVRS
DE LA METHODE
Pour bien conduire ſa raiſon, & chercher
la verité dans les ſciences.
PLVS
LA DIOPTRIQVE.
ET
LES METEORES.
Qui ſont des eſſais de cete METHODE.
Iouxte la Copie imprimée à Leyde.
A PARIS,
Chez HENRY LE GRAS, au troiſieſme pilier de la grande Salle, à L. Couronnée.
M. DC. LVIII.
Auec Priuilege du Roy.

RARE SECOND EDITION in French and the first published in France, of this famous work by Descartes. The original appeared in Leiden in 1637. The edition includes numerous woodcuts and diagrams in the text and on full pages from the original edition, illustrating the two treatises that follow the discourse.

References: Tchémerzine, II, 778; Guibert, 17.

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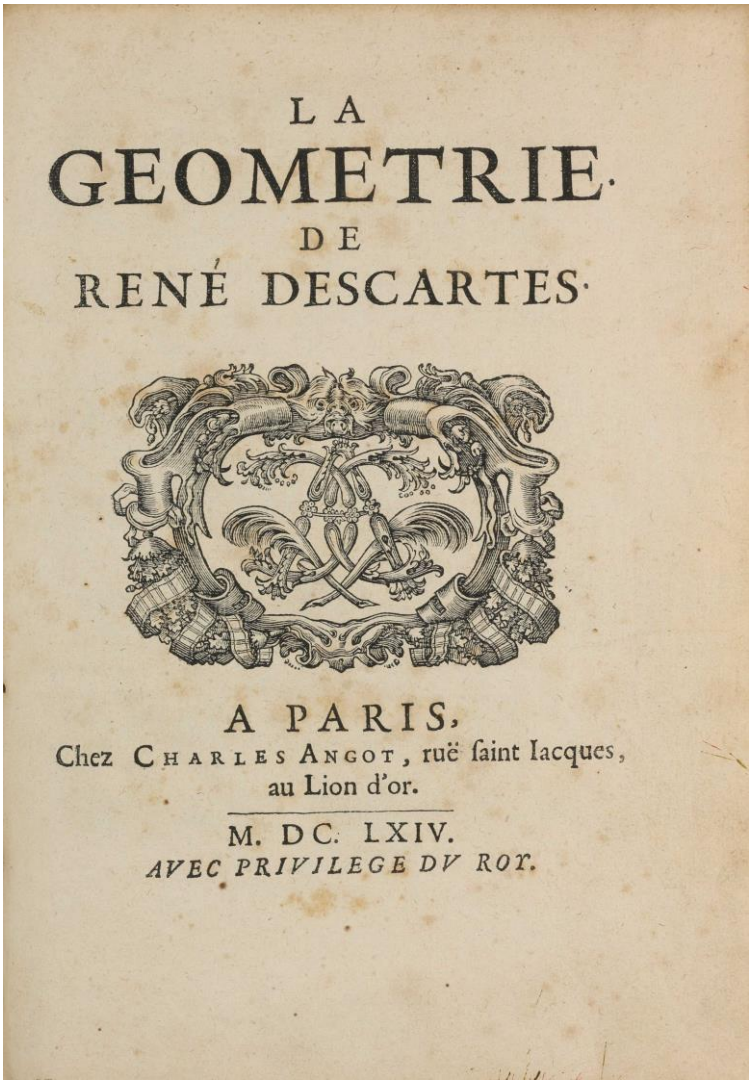
13 **DESCARTES, Rene**. *La geometrie de René Descartes*. Paris: chez Charles Angot, 1664. 4to (227 x 164 mm), [2], 3-119, [9] pp., title page with large woodcut device, woodcut diagrams in text, leaf of privilege bound at end. Contemporary French calf, spine with 5 raised bands, compartments with gilt tooling and lettering piece, red sprinkled edges, neatly gilt tooled board edges (old repairs to spine ends, joints and corners; minor edgechipping of lettering piece, boards soiled). Engraved author's portrait added from another work and laid down on front pastedown). Title and text with little even browning and minor pale brown spotting. Provenance: handwritten acquisition notes dated 1756, 1767 and 1880; Stephanus Baudon (cancelled ownership inscription on first flyleaf). (#003859) € 4800


LA
GEOMETRIE.
DE
RENÉ DESCARTES.

A PARIS,
Chez CHARLES ANGOT, ruë saint Iacques,
au Lion d'or.

M. DC. LXIV.
AVEC PRIVILEGE DV ROY.

RARE FIRST SEPARATE FRENCH EDITION of this work marking the invention of analytical geometry, which first appeared as part of the appendix of the *Discours de la methode* (Leiden, 1637). This groundbreaking text brought geometry to a wider audience beyond the narrow confines of the university, as Descartes developed a codification of mathematical symbols that quickly gained acceptance. "His application of modern algebraic arithmetic to ancient geometry created the analytical geometry which is the basis of the post-Euclidean development of that science" (PMM). Bibliography: Tchémerzine II, 796; PMM 129 (note).

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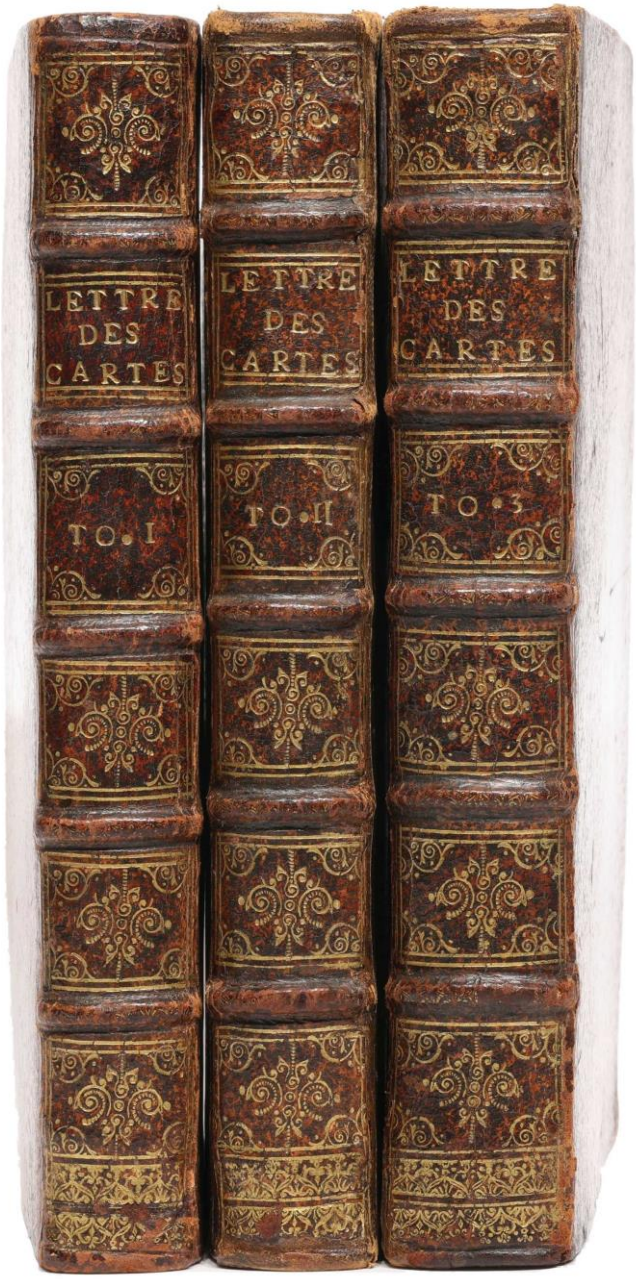
14 **DESCARTES, Rene**. *Lettres de Mr Descartes où sont traitées plusieurs belles questions touchant la morale, physique, médecine et les mathématiques. Nouvelle édition revue et augmentée*. Paris: Charles Angot, 1666-1667. Three volumes. 4to (222 x 168 mm). [24], 540; [16], 564, [4]; [24], 646 pp., titles with woodcut device, woodcut initials and headpieces, woodcut text illustrations and diagrams throughout. Bound without final blank leaf 4M4 in vol. III. Contemporary uniform sprinkled calf, spines with 5 raised bands each, gilt-lettered and gilt-decorated in compartments, sprinkled edges, original endpapers (minor rubbing to extremities). Text somewhat browned (some gatherings stronger), occasional minor spotting. First pp. of vol. I with minor brown-staining to outer margins, upper corner of first flyleaf and text leaf H3 of vol. I torn off not affecting text; short wormtrack at lower inner blank margin of vol. III. Provenance: from a French private collection. In all a very good, textually complete set. (#003899) € 1900



VERY RARE FIRST COMPLETE EDITION OF THE LETTERS OF DESCARTES, by Claude Clerselier. FIRST EDITION FOR VOLUME III. These letters, which deal with philosophy, optics, medicine, chemistry and mathematics, are a landmark in the history of ideas and Cartesianism. The volume titles are: I: *Où sont traittées plusieurs belles questions touchant la morale, [la] physique, [la] medecine, & les mathematiques*; II: *Où sont expliquées plusieurs belles difficultez touchant ses autres ouurages*; III: *Où il répond a plusieurs difficultez qui luy ont esté proposées sur la Dioptrique, la Geometrie & sur plusieurs autres sujets*.

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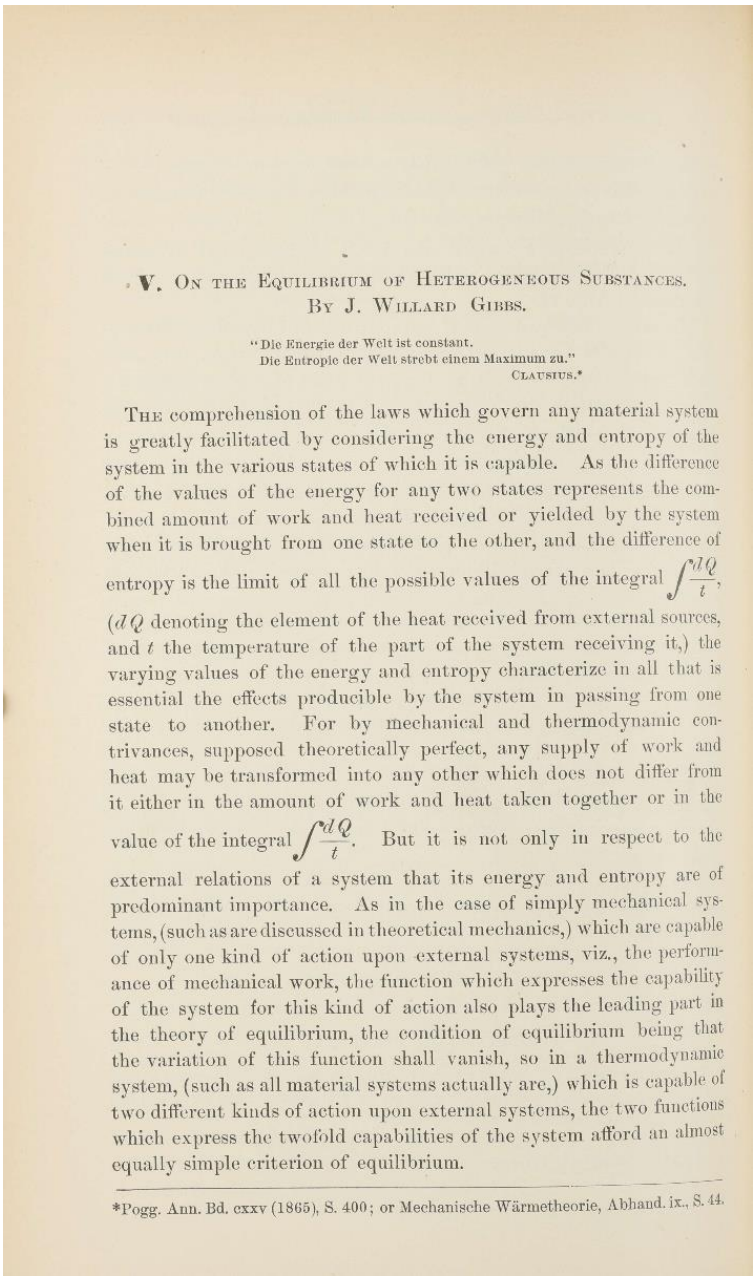
By the greatest American mathematical physicist

15 **GIBBS, Josiah Willard.** On the Equilibrium of Heterogeneous Substances, pp. 108-248 [With:] On the Equilibrium of Heterogeneous Substances (concluded), pp. 343-524, in: *Transactions of the Connecticut Academy of Arts and Sciences*, vol. III. New Haven: Published by the Academy, 1874-78. 8vo (227 x 143 mm). Entire volume: xi [1], 529 [1] pp., including 60 photo-lithographed plates and errata on final unnumbered page. Contemporary half sheepskin over marbled boards, spine blind-ruled and lettered in gilt, red-sprinkled edges (extremities rubbed, traces of white paint on spine). Text with light browning mostly to outer margins, otherwise crisp and clean throughout. Provenance: William North Rice* (1845-1928) (signature on front free endpaper and ink stamp on first page of contents dated 23 May 1938); Wesleyan College (library bookplate on front paste-down). Very good+ copy. (#003659) € 15,000

VERY RARE FIRST EDITION, in the complete journal volume, of Gibbs' epoch-making work which can be regarded "A foundation treatise on physical chemistry, the interpretation of chemical processes by application of thermodynamics and mathematics" (Horblit 40). Here, "Gibbs showed by the use of mathematical processes how thermodynamics may be used in the interpretation of chemical processes, and gave the first demonstration of the Phase Rule" (Evans 60). "This work of over three hundred pages was of immense importance. When scientists finally realized its scope and significance, they praised it as one of the greatest contributions of the century" (Crowe, p. 151). "Gibbs, the greatest American mathematical physicist, introduced in ['On the Equilibrium of Heterogeneous Substances'] the 'phase rule' to solve the intricate problem of the equilibrium of such mixtures as chemical solutions and metal alloys. Largely ignored both in America and abroad for more than ten years after this initial appearance, its impact upon modern industrial technology was enormous, leading directly to the modern manufacture of plastics, drugs, dyes and organic solvents. His mathematical equations relieved scientists of immeasurable numbers of experiments in order to ascertain the precise conditions for successful chemical processes" (Norman 899). His "early papers, as well as Gibbs's major memoir on thermodynamics that soon followed them, appeared in the *Transactions of the Connecticut Academy of Arts and Sciences*, a new and relatively obscure journal whose non-local circulation consisted largely of exchanges with other learned societies, including some 140 outside the United States. Gibbs did not count on finding his potential readers among those who checked the contents of the *Transactions*" (DSB, p. 389). "Though Gibbs's work was published in one of the most obscure of American scientific



V. On the Equilibrium of Heterogeneous Substances.
By J. Willard Gibbs.

"Die Energie der Welt ist constant.
Die Entropie der Welt strebt einem Maximum zu."
Clausius.*

The comprehension of the laws which govern any material system is greatly facilitated by considering the energy and entropy of the system in the various states of which it is capable. As the difference of the values of the energy for any two states represents the combined amount of work and heat received or yielded by the system when it is brought from one state to the other, and the difference of entropy is the limit of all the possible values of the integral $\int \frac{dQ}{t}$, (dQ denoting the element of the heat received from external sources, and t the temperature of the part of the system receiving it,) the varying values of the energy and entropy characterize in all that is essential the effects producible by the system in passing from one state to another. For by mechanical and thermodynamic contrivances, supposed theoretically perfect, any supply of work and heat may be transformed into any other which does not differ from it either in the amount of work and heat taken together or in the value of the integral $\int \frac{dQ}{t}$. But it is not only in respect to the external relations of a system that its energy and entropy are of predominant importance. As in the case of simply mechanical systems, (such as are discussed in theoretical mechanics,) which are capable of only one kind of action upon external systems, viz., the performance of mechanical work, the function which expresses the capability of the system for this kind of action also plays the leading part in the theory of equilibrium, the condition of equilibrium being that the variation of this function shall vanish, so in a thermodynamic system, (such as all material systems actually are,) which is capable of two different kinds of action upon external systems, the two functions which express the twofold capabilities of the system afford an almost equally simple criterion of equilibrium.

*Pogg. Ann. Bd. cxxv (1865), S. 400; or Mechanische Wärmetheorie, Abhand. ix., S. 44.

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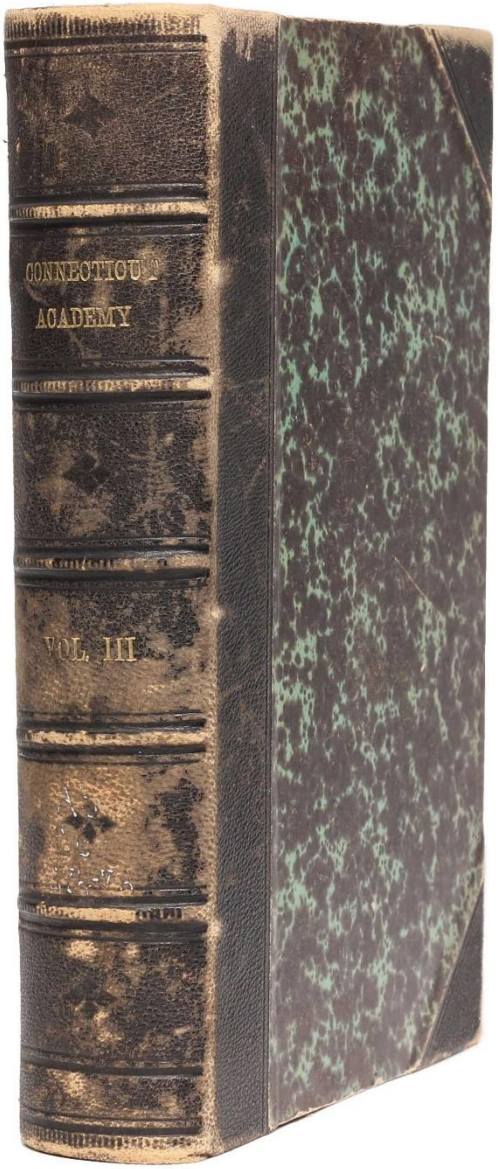

periodicals, Gibbs attempted to gain wider circulation for his ideas by mailing a larger than usual number of offprints of the papers to scientists he believed would be interested [. . .] Gibbs mailed nearly 100 copies of [the offprint of] each of the two parts of his paper, mostly to individuals, and 10 each to institutions. Of these few appear to have survived" (historyofinformation online resources). The work is rare on the market in any form: ABPC/RBH list four copies in the last 25 years including only the Norman copy in the offprint form.

*William North Rice (1845–1928) was an American geologist, educator, and Methodist minister and theologian concerned with the reconciliation of science and religious faith. Rice served as professor of geology and natural history at Wesleyan University in Middletown, Connecticut, beginning in 1868. He served as acting president of Wesleyan on three occasions – in 1907, from 1908 to 1909, and again in 1918.

References: Dibner 49; Evans 60; Horblit 40; Honeyman 1495; Norman 899 (offprint issues); DSB V, pp. 286-93; Crowe, *A History of Vector Analysis*, 1967.

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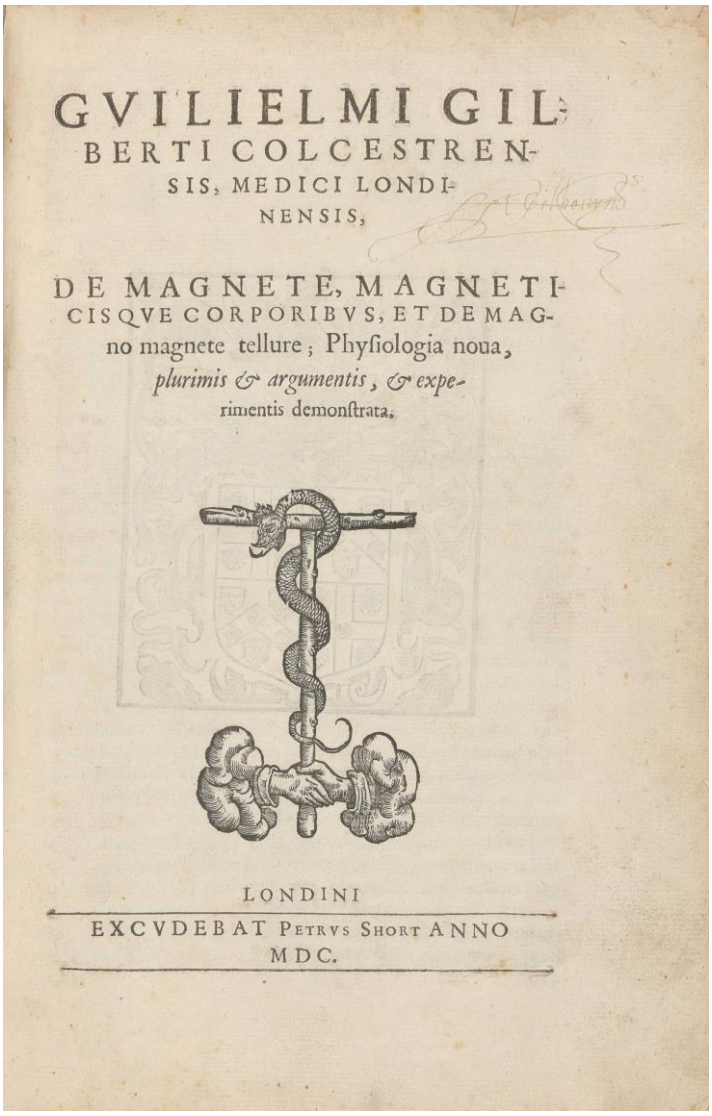
The first great scientific book printed in England

16 **GILBERT, William**. *De magnete, magneticisque corporibus, et de magno magnete tellure; Physiologia nova, plurimis & argumentis, & experimentis demonstrata*. London: Peter Short, 1600. Folio (278 x 190 mm). [16], 240 pp. Signatures: *^{8}, A-V^{6}. Woodcut title device and large woodcut arms on verso, one folding plate facing p. 200, 87 woodcuts in text of which 4 full-page, decorative woodcut initials, head- and tailpieces. In its original contemporary limp vellum binding, leather ties mostly preserved, original endpapers, sprinkled edges (vellum repaired including torn vellum over spine and added endbands, vellum dust soiled and spotted). Housed in custom-made half morocco over cloth cassette. Little even browning throughout, occasional minor mostly marginal brown spotting, faint dampstaining to upper outer corner in places, final two gatherings with pale dampstain to blank fore-margin, minor dust soiling to outer margins. Provenance: Gilbournd (early ownership signature on title); 18th century manuscript notes in English about this work to final free endpaper; Christie's sale 6950, London, 5 July 1995, lot no. 75*. A very good+, crisp, clean and well-margined copy in typical contemporary (most likely English) binding. (#003871) € 36,000

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).


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.
LONDINI
EXCVDEBAT PETRVS SHORT ANNO
MDC.

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*.

*Christie's incorrectly states in their catalogue entry for this lot that the binding is a "reimboitage". However, this is highly unlikely unless the earlier book was also a *De magnete* copy. The rear free endpaper with the 17th or 18th-c manuscript note by the former owner of the copy is certainly integral part of the limp vellum binding and this note refers to two works in which Gilbert's *De magnete* is discussed (Digby's *Nature of bodies* and Leigh's *Treatise of Learned Men*).

Bibliography: PMM 107; Dibner 54; Horblit 41; Norman 905; Sparrow 85; Evans 26; Wellcome 2830.

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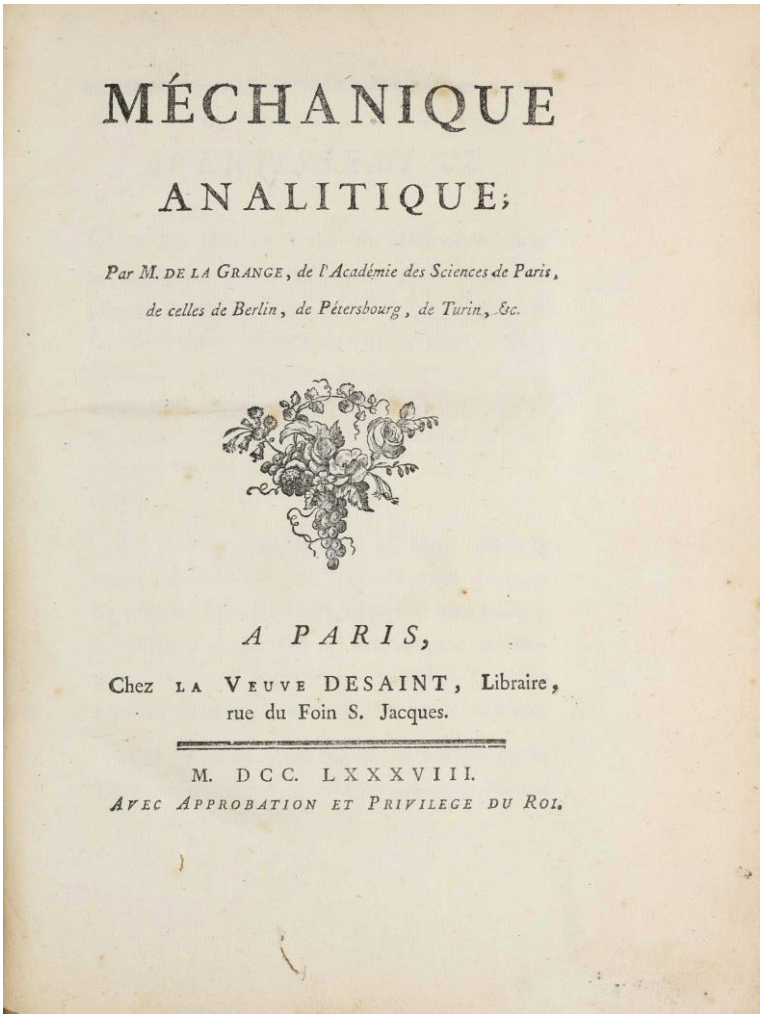
17 **LAGRANGE, Joseph Louis**. *Méchanique Analitique*. Paris: chez la Veuve Desaint, 1788. 4to (271 x 215 mm). xii, 512 pp., including the half title. Half calf over marbled boards, marbled endpapers (rebacked, extremities worn). Leaves at bottom and fore-edge uncut. Interior clean with only little browning and minor occasional spotting, some worming throughout mostly to blank margins but affecting a few letters on final pages and mostly repaired with browned tissue paper, minor occasional dust soiling and fraying to uncut margins. Provenance: French private collection. Still good, wide-margined copy of this important work. (#003482) € 3400



MÉCHANIQUE

ANALITIQUE;

Par M. de la Grange, de l'Académie des Sciences de Paris, de celles de Berlin, de Pétersbourg, de Turin, &c.

A PARIS,

Chez la Veuve DESAINT, Libraire, rue du Foin S. Jacques.

M. DCC. LXXXVIII.

Avec Approbation et Privilege du Roi.

FIRST EDITION OF LAGRANGE'S FOUNDATION WORK ON ANALYTICAL MECHANICS. Lagrange's masterpiece was an extension on Newton's work on mechanics. In it he moulded theoretical mechanics into a system from which fundamental equations describing the motions of any systems of bodies could be derived. To achieve this Lagrange combined the principle of virtual velocities with d'Alembert's principle. He thereby set down the principle of virtual velocities as applied to mechanics. In his preface, Lagrange draws attention to the absence of diagrams in the book, which he believed the lucidity of his own presentation had rendered superfluous. "With the appearance of the Mechanique Analitique in 1788, Lagrange proposed to reduce the theory of mechanics and the art of solving problems in that field to general formulas, the mere development of which would yield all the equations necessary for the solution of every problem... [it] united and presented from a single point of view the various principles of mechanics, demonstrated their connection and mutual dependence, and made it possible to judge their validity and scope" (DSB).

References & Bibliography: Dibner 112; Horblit 61; Norman 1257; Sparrow 120; Honeyman 1880; En Francais dans le texte 179.

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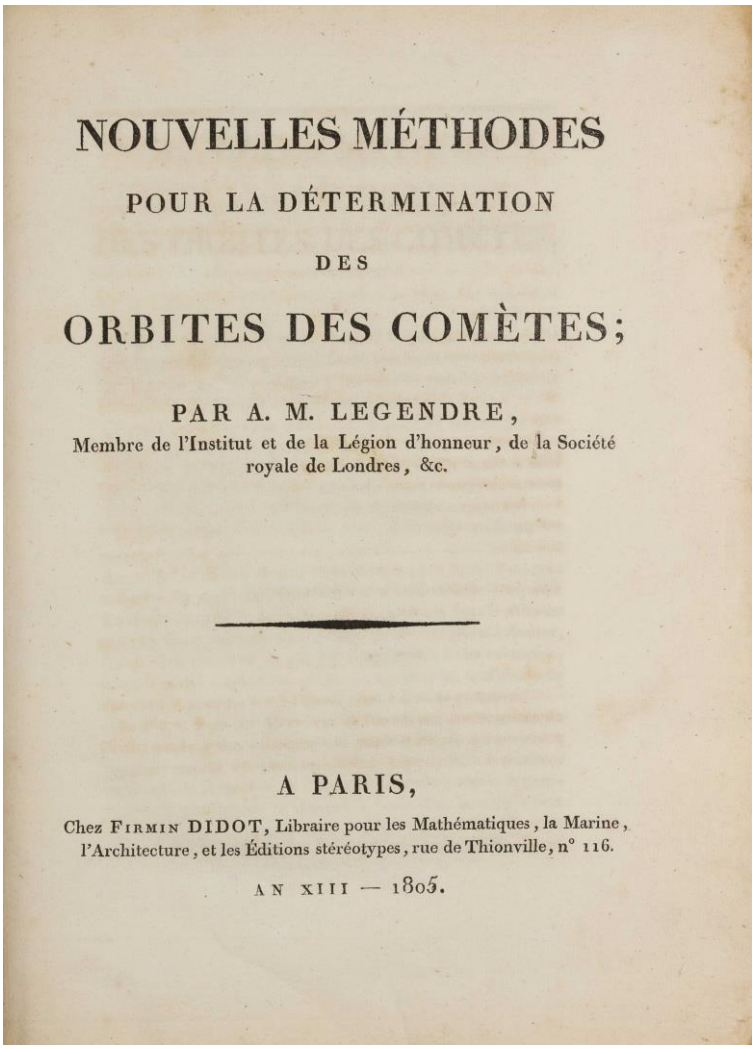
18 **LEGENDRE, Adrien-Marie**. *Nouvelles méthodes pour la détermination des orbites des comètes*. Paris: chez Firmin Didot, 1805 (an XIII). 4to (264 x 212 mm). viii, 80 pp., engraved plate bound at end. Simple pink paper wrappers, all pages uncut and partly unopened (somewhat frayed and dust-soiled and spotted, endpapers browned). Light even browning and spotting, exposed outer margins of first leaves tanned, minor fraying of outer edges, light offsetting from plate to p. 80. Provenance: from a French private collection. A very good, unsophisticated copy. (#003866) € 6500

EXCEPTIONALLY RARE FIRST EDITION, FIRST ISSUE of this treatise with important implications in the history of statistics. Legrende is in fact believed to be the originator of the method of least squares, developed in the field of astronomy as part of statistical analysis for the observation of celestial bodies. The authorship of the method was debated as Gauss claimed its use as early as 1795. "The method of least squares is the automobile of modern statistical analysis: despite its limitations [. . .] this method and its numerous variations carry the bulk of statistical analyses. Adrien Marie Legrende published the method in 1805. [He] appears to have discovered the method in early 1805 but in 1809 Gauss had the temerity to claim that he had been using the method since 1795" (Stigler, *Statistics on the Table, The History of Statistical Concepts and Methods*, pp. 320-325. A first supplement was published in 1806 together with a reprint of the first edition and a second one in 1820.



NOUVELLES MÉTHODES

POUR LA DÉTERMINATION

DES

ORBITES DES COMÈTES;

PAR A. M. LEGENDRE,

Membre de l'Institut et de la Légion d'honneur, de la Société royale de Londres, &c.

A PARIS,

Chez FIRMIN DIDOT, Libraire pour les Mathématiques, la Marine, l'Architecture, et les Éditions stéréotypes, rue de Thionville, n° 116.

AN XIII — 1805.

Bibliography: Houzeau-Lancaster I, 11968; DSB VIII, p. 137-138.

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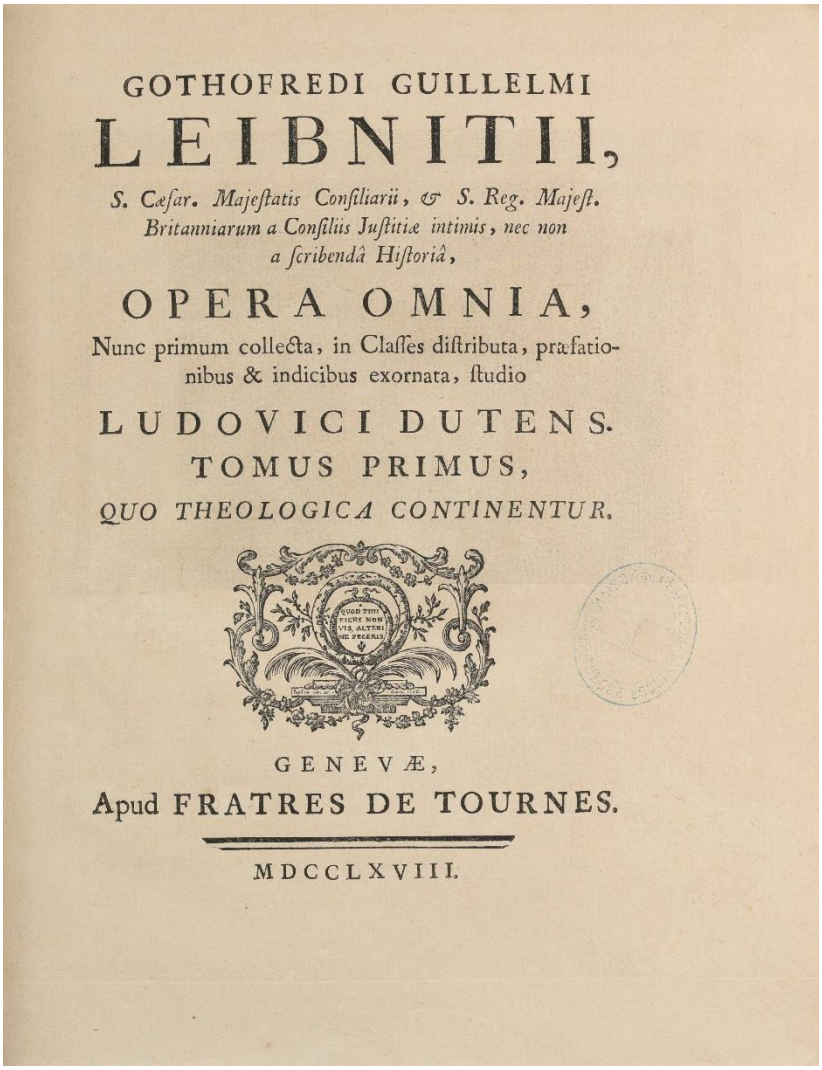
19 **LEIBNIZ, Gottfried Wilhelm**. *Opera omnia, nunc primum collecta, in classes distributa, praefationibus & indicibus exornata, studio L. Dutens*. Geneva: de Tournes, 1768. 6 volumes. 4to (245 x 201 mm). Each volume with general title and index bound at the end; each part with separate title-page and pagination. Woodcut head- and tailpieces, author's portrait by Pierre Savart, 2 folding letterpress tables, woodcut text illustrations and diagrams, and a total 41 copper-engraved plates (several folding). Bound c. 1830 for Esquirol in uniform half-calf over marbled boards, spines with gilt lettering and decoration, marbled edges, marbled endpapers (light rubbing of extremities and leather over spines). Light uneven browning and very minor occasional spotting of text and plates, vol. IV with light waterstaining to a few pages. Provenance: Esquirol library, Maison de Charenton (ink stamps to flyleaves, title of vol. I and a few text pages). A fine, virtually unread set; exceptionally crisp, clean and wide-margined. Vol. I: [2], iv, [2], ccxliv, 790 pp. including half-title, frontispiece portrait of the author separated from title by tissue paper. Vol. II: [2], viii, 400, 291 [1] pp., 14 engraved plates (12 folding), woodcut text illustrations and diagrams. Minor browning of plates. Vol. III: [4], viii, lv [1], 663 [1] pp., woodcut diagrams, folding letterpress table facing p.375 and 25 engraved plates. Plates a bit browned and spotted, minor spotting of text, leaf Xx2 with clean tear at upper blank margin; pp. 61-64 misbound after p. 56. Vol. IV: viii, 216; 285 [1]; [2], 647 [1] pp., woodcut text diagrams, part III with engraved plate facing p. 512 and folding letterpress table facing p. 169. Light browning of text, a few leaves with light waterstaining towards lower corner. Vol. V: viii, 632 pp. Vol. VI: vi, [2], 334; 344 pp., woodcut diagram, 1 folding engraved plate facing p. 80. Bound without blank leaf Tt4 after p. 334 of part I. (#003847) € 4500


GOTHOFREDI GUILLELMI

LEIBNITII,

S. Cæſar. Majeſtatis Conſiliarii, & S. Reg. Majeſt. Britanniarum a Conſiliis Juſtitiæ intimis, nec non a ſcribendâ Hiſtoriâ,

OPERA OMNIA,

Nunc primum collecta, in Claſſes diſtributa, præfationibus & indicibus exornata, ſtudio

LUDOVICI DUTENS.

TOMUS PRIMUS,

QUO THEOLOGICA CONTINENTUR.

GENEVÆ,

Apud FRATRES DE TOURNES.

MDCCLXVIII.

The most important early edition of the complete works of Leibnitz. Edited by Louis Dutens, it covers a large part of the sciences and letters. Leibnitz is considered the last "universal genius" and is best known for his work in rationalist philosophy and his ontological proofs of the existence of God. His contributions to mathematics are also notable with the development of the binary system and infinitesimal calculus. "The position of Leibniz at the beginning of modern science is analogous to that of Aristotle at the beginning of ancient science" (DSB VIII, p.151). Content of the volumes: T.I Theology, T.II: Logic, Metaphysics, Physics, Chemistry, Botany and Natural History. T. III: Mathematics. T. IV: Philosophy, History and Antiquities, Law. T.V and VI: Philology and Linguistics.

References: Ravier 473; Faber du Faur 1544; Roller-G. II, 93; Cantor IV, 17; Zeitlinger 2531.

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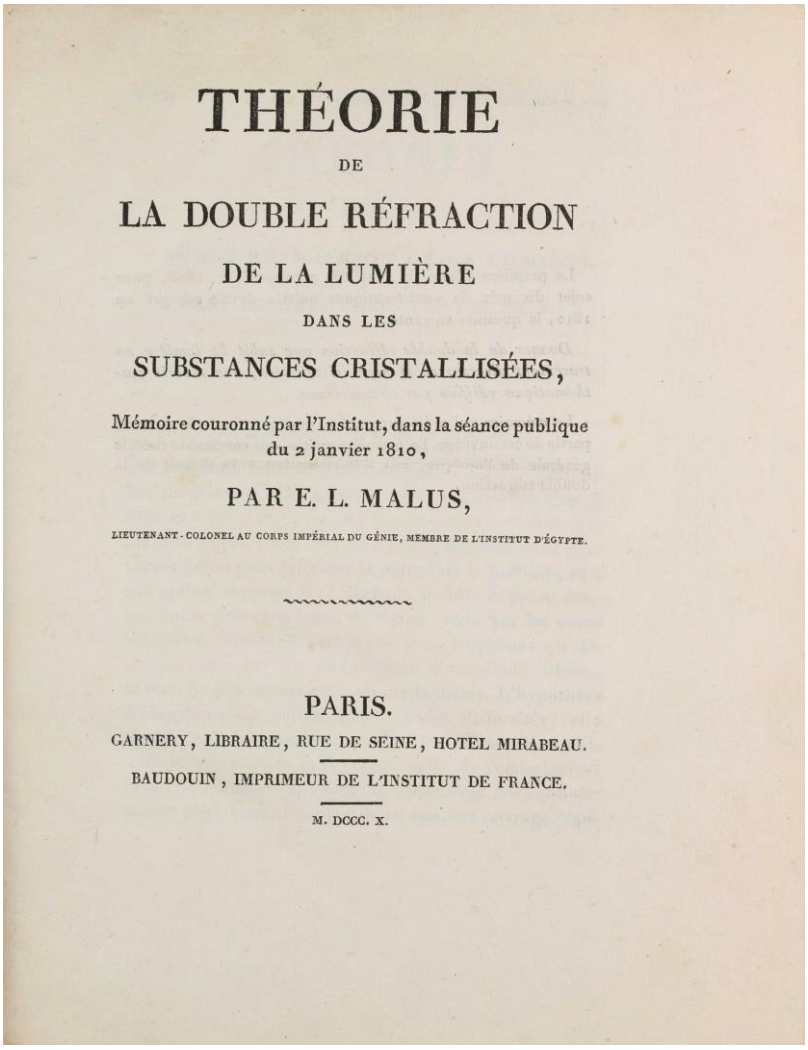
20 **MALUS, Etienne Louis**. *Théorie de la double réfraction de la lumière dans les substances cristallisées: mémoire couronné par l'Institut, dans la séance publique du 2 janvier 1810*. Paris: Garnerey & Baudoin, 1810. 4to (252 x 204 mm). 302 pp., including half-title and 3 engraved folding plates. Contemporary French prize binding of the Collège Royal de Versailles in full sprinkled calf, spine and boards tooled in gilt, spine with gilt-lettered black morocco label, marbled edges and endpapers (extremities rubbed, joint at foot of upper board with wormhole in leather, spine and boards toward spine a trifle sunned). Text and plates crisp and bright throughout with light age-toning, occasional minor spotting, a few marginal paper flaws. Provenance: Collège Royal de Versailles (bookplate to front-pastedown printed in Latin with donee "Oscar Leevy(?)" and date 18 Aug. 1810 added in manuscript). A fine copy in untouched binding. (#003882) € 4800



THÉORIE

DE

LA DOUBLE RÉFRACTION

DE LA LUMIÈRE

DANS LES

SUBSTANCES CRISTALLISÉES,

Mémoire couronné par l'Institut, dans la séance publique du 2 janvier 1810,

PAR E. L. MALUS,

LIEUTENANT-COLONEL AU CORPS IMPÉRIAL DU GÉNIE, MEMBRE DE L'INSTITUT D'ÉGYPTE.

PARIS.

GARNERY, LIBRAIRE, RUE DE SEINE, HOTEL MIRABEAU.

BAUDOUIN, IMPRIMEUR DE L'INSTITUT DE FRANCE.

M. DCCC. X.

RARE FIRST EDITION of Malus' prize-winning work on double refraction. Malus took part in the Egyptian expedition as an engineering officer. Director of Studies at the Ecole Polytechnique in 1811, he died the following year at the age of thirty-seven. Malus took up the work of Huygens, Newton and Wollaston. He deduced Huygens's law by means of the principle of the least action. Also of great importance is his law for the relative intensities of the ordinary and extraordinary rays. After a century of discussion, his research led to the law on the intensity of polarized light that bears his name. He studied the polarization of light by reflection and showed that his theory of double refraction was compatible with the principle of least action and the corpuscular hypothesis.

References: DSB IX, pp.72-74; Schuh's Annotated Bio-Bibliography.

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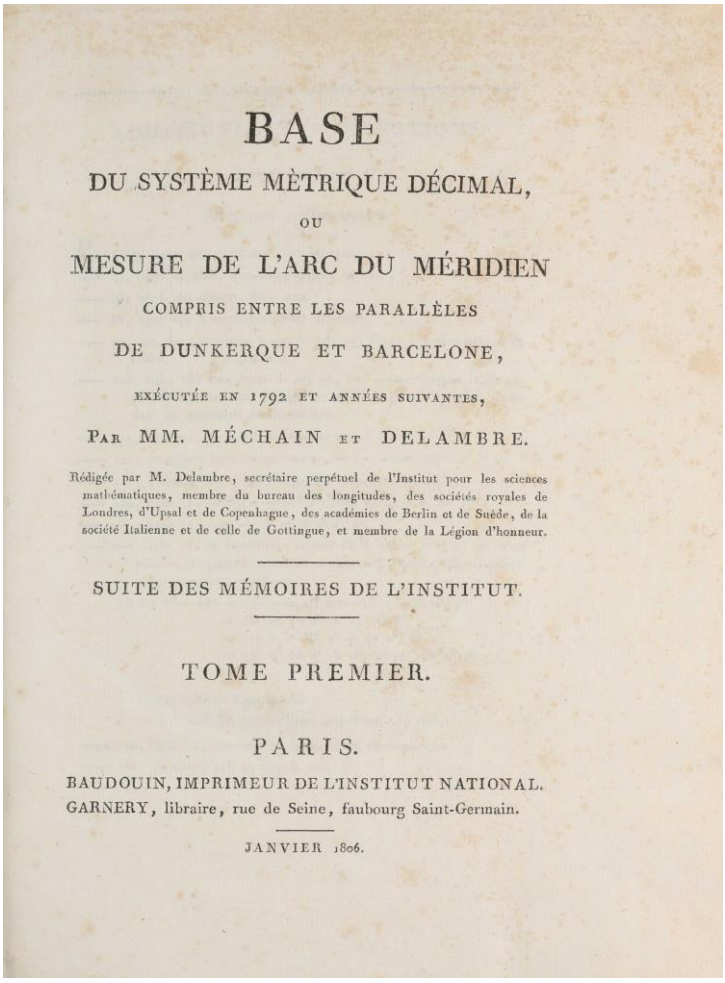
21 **MECHAIN, Pierre Francois Andre & DELAMBRE, Jean Baptiste Joseph**. *Base du système métrique décimal ou mesure de l'arc du méridien compris entre les parallèles de Dunkerque et Barcelone, exécutée an 1792 et années suivantes*. Paris: Baudouin, imprimeur de l'Institut National. 1806-1810. Three parts in three volumes. 4to (253 x 197 mm). [4], ii, 180, 551 [1]; xxiv, 844; [4], 4, 16, 704, 62 pp. Half title to each volume, text diagram on p. 680 of vol. III; 28 folding engraved plates. Bound in near contemporary uniform half sheep over marbled boards, plain spines lettered and ruled in gilt, brown sprinkled edges (light rubbing of extremities, small wormhole at upper joint of vol. I). Text generally crisp and clean throughout, a few gatherings somewhat browned and somewhat spotted, a few paper flaws at blank outer margins, dampstain to fore-margin of one leaf in vol. I and to foot of pp. 393-400; long clean tear to p.675/6 of vol. III. A near fine, wide-margined set. (#003880) € 18,000



BASE

DU SYSTÈME MÈTRIQUE DÉCIMAL,

OU

MESURE DE L'ARC DU MÉRIDIEN

COMPRIS ENTRE LES PARALLÈLES

DE DUNKERQUE ET BARCELONE,

EXÉCUTÉE EN 1792 ET ANNÉES SUIVANTES,

PAR MM. MÉCHAIN ET DELAMBRE.

Rédigée par M. Delambre, secrétaire perpétuel de l'Institut pour les sciences mathématiques, membre du bureau des longitudes, des sociétés royales de Londres, d'Upsal et de Copenhague, des académies de Berlin et de Suède, de la société Italienne et de celle de Gottingue, et membre de la Légion d'honneur.

SUITE DES MÉMOIRES DE L'INSTITUT.

TOME PREMIER.

PARIS.

BAUDOUIN, IMPRIMEUR DE L'INSTITUT NATIONAL.
GARNERY, libraire, rue de Seine, faubourg Saint-Germain.

JANVIER 1806.

RARE FIRST EDITION of the foundation of the metric system. "For many centuries there were no general standards of measurement: every trade and craft had its own peculiar units and they differed even in various regions of the country. Since the development of international trade in the Middle Ages this chaotic situation had become more and more tiresome, but all efforts towards standardization were strongly resisted by vested interests. The earliest books to advocate a universal system were Stevin's *De Thiende,* 1585 and Mouton's *Observationes Diametrorum Solis et Lunae apparentium,* Lyons, 1670, which proposed to adopt as a standard the length of an arc of one minute of a great circle of the earth, with decimal subdivisions. Huygens and others had proposed to use the length of a pendulum beating one second, or one-third of this length, as a unit. These proposals had to be rejected as they were not sufficiently precise; the length of the pendulum would differ from place to place and the meridian arc would vary at different latitudes. We owe the introduction of an international metric system to the French Revolution. In 1790 the Academie des Sciences, at the request of Talleyrand, set up a commission to consider the question; among its members were J. C. Borda, Lagrange, Laplace, G. Monge and Condorcet. In 1791 they reported that the fundamental unit of length should be derived from a dimension of the earth: it should be the ten-millionth part of a quadrant of the earth's meridian extending between Dunkirk and Barcelona. As this distance was already approximately known, a provisional metre was at once adopted. The new unit of weight was to be the gramme: the weight of one cubic centimetre of water at 4°C. The Constituent Assembly set up a general commission of weights and measures to carry these proposals into effect and in 1795 a law was passed introducing the metric system into France with provisional standards. The astronomers Jean Baptiste Joseph Delambre and Pierre Francois André Mechain (1744-1805) were charged with the task of measuring accurately the newly adopted length along the meridian arc between Dunkirk and Barcelona. Owing to the disturbances of the revolutionary period their work was much impeded, but in 1799 their measurement was completed. The above work - 'Basis of the Metric Decimal System' - embodies their

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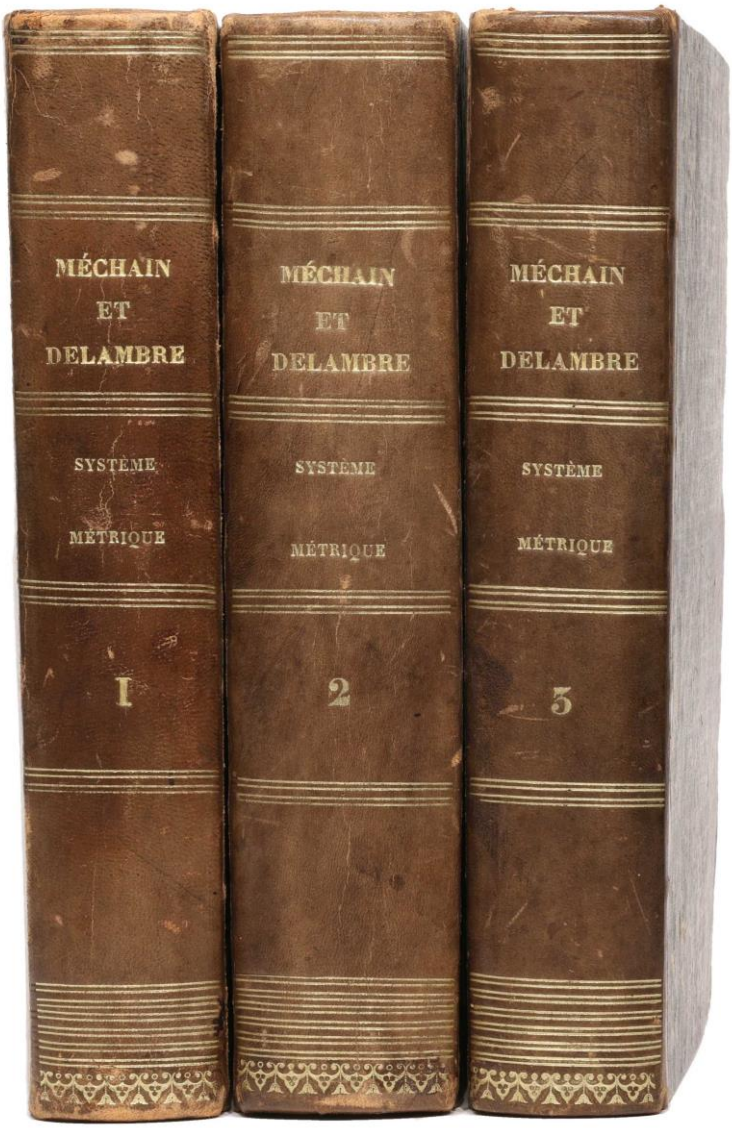

report. The length of a metre (equalling 39.37 English inches) was marked on a platinum bar, and the unit of weight was also constructed of platinum, being the weight of a cubic decimetre, or litre, of pure water at its maximum density. These original bars remained the basic standards until 1875 and are still preserved in Paris. The metric system was gradually accepted by most nations - with the notable exceptions of England and (for weights and measures) the United States; but optional use was legalized in 1864 (England) and 1866 (U.S.A.) and its general adoption in England was proposed in 1965. After meetings of an international commission in 1872 there was set up in 1875 the International Bureau of Weights and Measures. It is now situated near Sevres and has since remained the international centre for all questions of standards. New units made from a bar of platinum alloyed with 10 per cent iridium were constructed, copies of which were distributed to the various participating countries" (PMM 260).

References & Bibliography: PMM 260; Norman 1481; *En Français dans le Texte* 212; Monglond VII, 419 f.; DSB IV, p. 14 ff.

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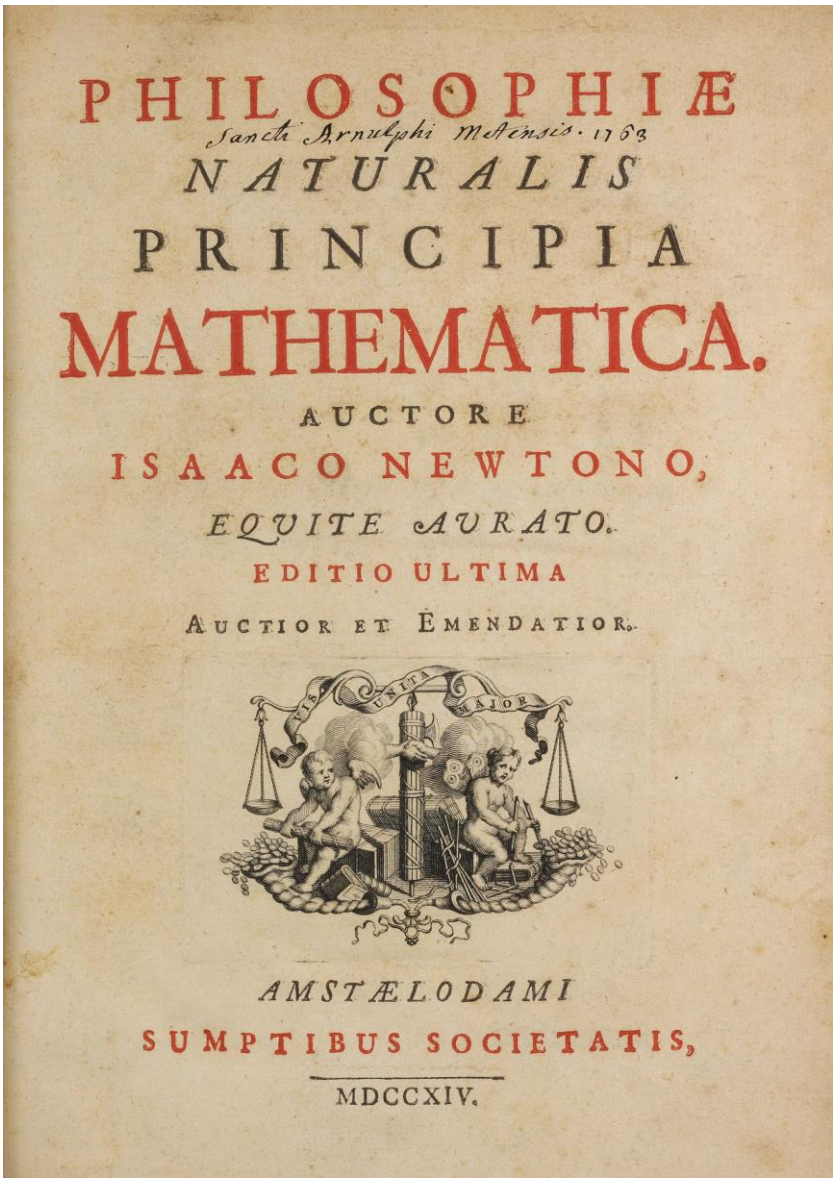
22 **NEWTON, Isaac**. *Philosophiae Naturalis Principia Mathematica*. Amsterdam: Sumptibus Societatis, 1714. 4to (245 x 181 mm). [28], 484, [8] pp. Title printed in red and black and with engraved vignette; engraved folding plate of the cometary orbit facing p. 465; woodcut text diagrams throughout. Bound in full contemporary speckled calfskin, spine with 5 raised bands richly gilt-tooled in compartments and with gilt-lettered label in second compartment, red-sprinkled edges, marbled endpapers (front joint partly split towards head; boards and extremities rubbed; head of spine scuffed with cap bands showing; corners slightly bumped and worn). Pages partially unopened at upper edge. Text with light even browning and pale spotting (folding plate stronger). Provenance: ink inscription "Sancti Arnulphi Mettensis, 1763"* on title page. (#003898) € 9500

FIRST AMSTERDAM REPRINT OF THE SUBSTANTIVE SECOND EDITION AND "A FINE EXAMPLE OF BOOKMAKING" (Macomber-Babson). Newton made constant revisions to the *Principia* which, during the long interim until the second edition, circulated only in manuscript. First published in Cambridge in the previous year, the second edition is the first to include the *Scholium generale*, and shows considerable additions, in particular to the chapters on lunar theory and the theory of comets. The German mathematician and polyhistor Gottfried Wilhelm Leibniz (1646-1716) had published theories that were close to Newton's own, which forced him to sharpen his arguments and therefore this edition was also provided with a long anti-Leibnizian preface by Newton's editor Roger Cotes.


PHILOSOPHIÆ
Sancti Arnulphi Mettensis. 1763
NATURALIS
PRINCIPIA
MATHEMATICA.
AUCTORE
ISAACO NEWTONO,
EQUITE AURATO.
EDITIO ULTIMA
AUCTIOR ET EMENDATIOR.
AMSTÆLODAMI
SUMPTIBUS SOCIETATIS,
MDCCXIV.

Isaac Newton's (1643-1727) work *Philosophiae Naturalis Principia Mathematica* is considered "the greatest work in the history of science. Copernicus, Galileo and Kepler had certainly shown the way; but where they described the phenomena they observed, Newton explained the underlying universal laws. The *Principia* provided the great synthesis of the cosmos, proving finally its physical unity. Newton showed that the important and dramatic aspects of nature that were subject to the universal law of graviation could be explained, in mathematical terms, within a single physical theory. [. . .] The same laws of gravitation and motion rule everywhere; [. . .] It was this grand conception that produced a general revolution in human thought, equalled perhaps only by that following Darwin's *Origin of the Species* [. . .] The second edition of the *Principia* was not published until 1713 and the first English translation, by Andrew Motte, not until 1729" (Printing and the Mind of Man 161).

"Newton's masterwork was worked up and put into its final form in an incredibly short time. His strategy was to develop the subject of general dynamics from a mathematical point of view in book I,

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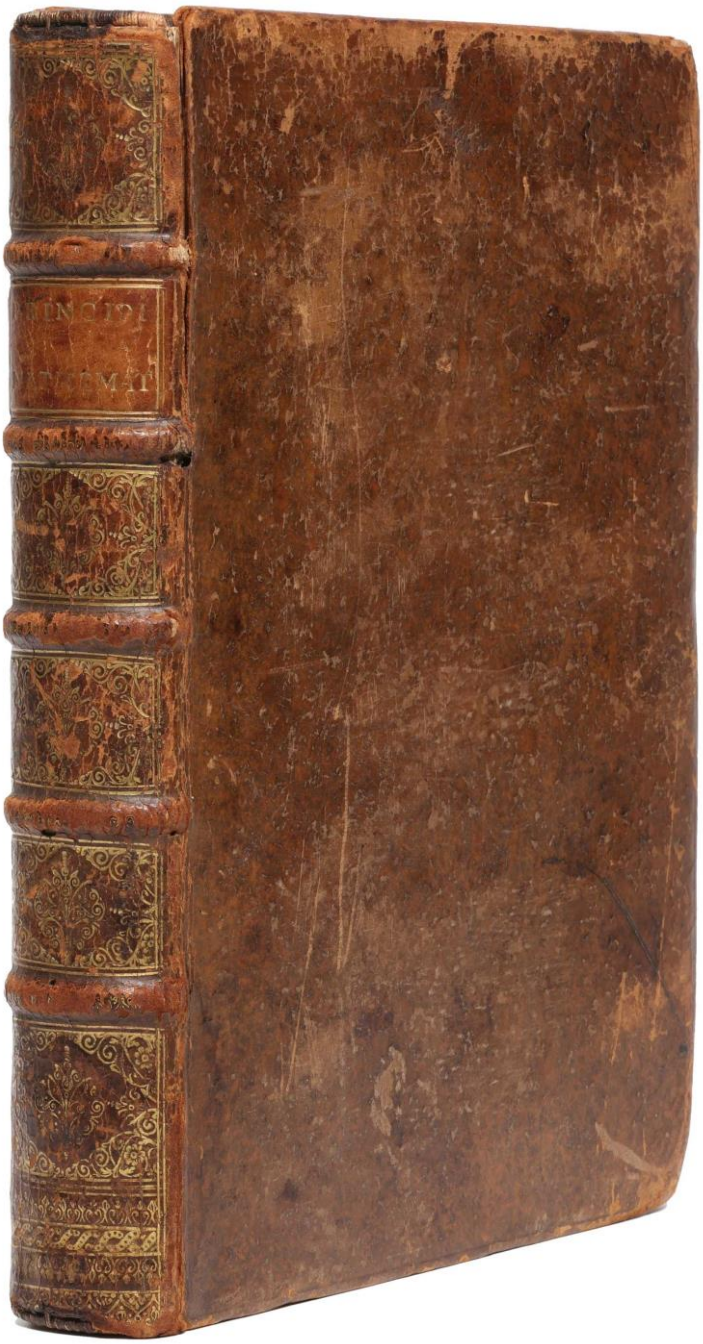

then to apply his most important results to solving astronomical and physical problems in book III. Book II, [. . .] is almost independent, and appears extraneous. [. . .] As Karl Popper has pointed out, although "Newton's dynamics achieved a unification of Galileo's terrestrial and Kepler's celestial physics," it appears that "from a logical point of view, Newton's theory, strictly speaking, contradicts both Galileo's and Kepler's". [. . .] One of the most important consequences of Newton's analysis is that it must be one and the same law of force that operates in the centrally directed acceleration of the planetary bodies (toward the sun) and of satellites (toward planets), and that controls the linear downward acceleration of freely falling bodies. This force of universal gravitation is also shown to be the cause of the tides, through the action of the sun and the moon on the seas" (DSB).

*Arnulf of Metz (c. 582-645), a Frankish bishop of Metz who retired to the Abeey of Remiremont, can certainly not been to owner of this copy, but may be a Benedictine monk who lived in the abbey before it was disestablished in 1790.

References & Bibliography: Macomber-Babson, Supplement, p. 4; Wallis 11; Honeyman 2305; DSB X, p. 60-78

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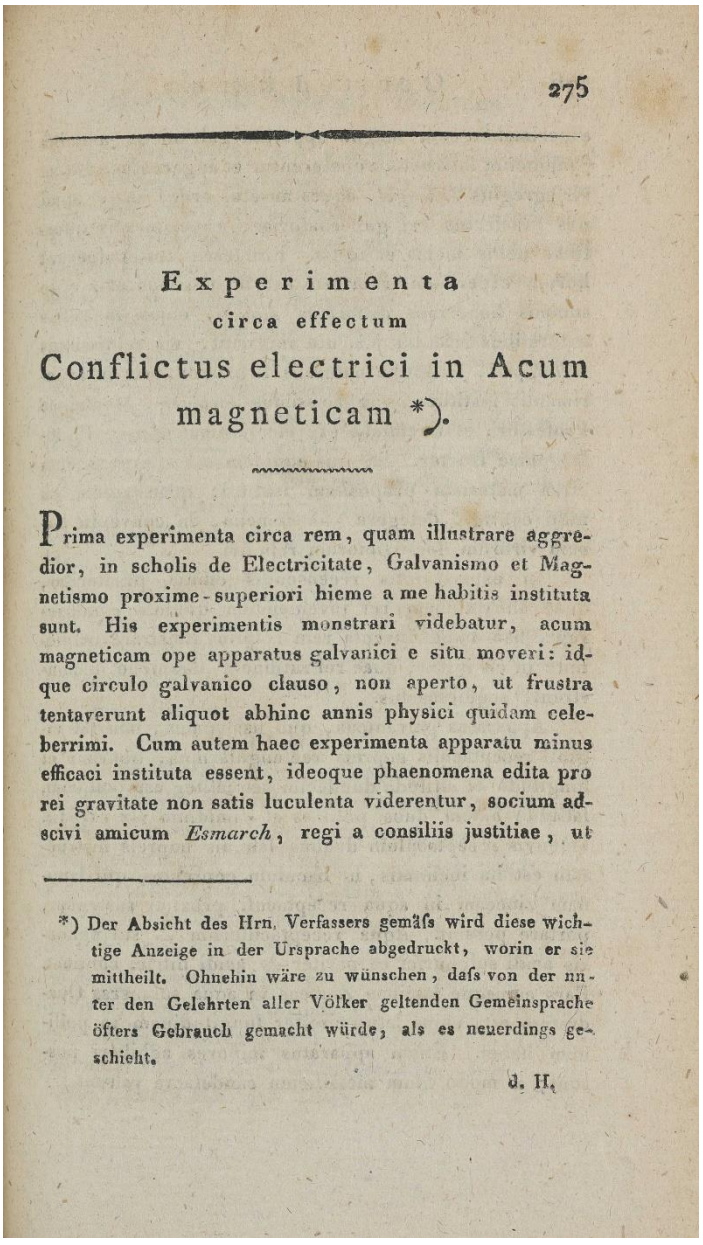
23 **OERSTED, Hans Christian**. Experimenta circa effectum conflictus elecrici in acum magneticam. In: *Journal für Chemie und Physik (Schweigger's Journal)*, vol. 29, pp. 275-281. Nürnberg: In der Schrag'schen Buchhandlung, 1820. 8vo (199 x 118 mm). Entire volume: viii, 1-50, [4], 55-96, [4]; 101-204; 245-256, [4]; 261-384, [4]; 389-520, [4] pp., folding table facing p. 50 and 2 folding engraved plates; pp. 205-44 are skipped (pagination error). Contemporary sprinkled half calf over marbled boards, spine with some gilt tooling and gilt-lettered paper label, red-dyed edges (rebacked, corners slightly bumped, minor rubbing). Text with even light browning, occasional minor spotting. Provenance: Act. Ges. f. Anilin-Fabrikation* (ink stamps to front and rear pastedowns, title and a few text pages). A very good copy, collated and complete. (#003816) € 3800

VERY RARE FIRST PUBLISHED EDITION of the announcement of the electromagnetic effect, preceeded ony by a half-sheet of text privately printed on behalf of the author the same year in a very small number and which is of utmost rarity. Also included in this volume is "Neuere electro-magnetische Versuche von Oerstedt in Kopenhagen" (pp. 364-369), and Oersted's report on the first isolation of piperine (pp. 80-82).



275

Experimenta
circa effectum
Conflictus electrici in Acum magneticam *).

Prima experimenta circa rem, quam illustrare aggredior, in scholis de Electricitate, Galvanismo et Magnetismo proxime-superiori hieme a me habitis instituta sunt. His experimentis monstrari videbatur, acum magneticam ope apparatus galvanici e situ moveri: idque circulo galvanico clauso, non aperto, ut frustra tentaverunt aliquot abhinc annis physici quidam celeberrimi. Cum autem haec experimenta apparatu minus efficaci instituta essent, ideoque phaenomena edita pro rei gravitate non satis luculenta viderentur, socium adscivi amicum *Esmarch*, regi a consiliis justitiae, ut

*) Der Absicht des Hrn. Verfassers gemäfs wird diese wichtige Anzeige in der Ursprache abgedruckt, worin er sie mittheilt. Ohnehin wäre zu wünschen, dafs von der unter den Gelehrten aller Völker geltenden Gemeinsprache öfters Gebrauch gemacht würde, als es neuerdings geschieht.

d. H.

"Oersted was a disciple of die German school of Nationalphilosophie, which believed in the unity of physical forces. He had predicted the existence of the electro-magnetic effect as early as 1812, in defiance of current scientific doctrines disallowing the possibility of conversion of forces and despite Coulomb's apparent proof that electricity and magnetism were distinct phenomena. He set out to deduce from the nature of electricity the conditions under which it was converted to magnetism, and to prove their existence by experiment. His efforts were unsuccessful until, in die winter of 1819-1820, he placed a magnetic needle parallel to a current-carrying wire and saw that the needle was disturbed. Resuming his experiments in the summer of 1820, Oersted ascertained that a circular magnetic field surrounded his current-carrying wire, and that a magnetic needle brought into this field would set itself tangent to the circle. Oersted's discovery opened up a new epoch in the history of physics, making possible Ampère's creation of electrodynamics, and Faraday's demonstration of the unity of all forms of electricity" (Norman).

"In 'Experiments and Observations on Electricity', first published in London, 1751, Benjamin Franklin stated his theory that the nature of lightning is electrical. In 1752, with his kite experiments he proved it and was on the way to demonstrating the identity of all forms of electricity. In 1760, however, J. H. van Swiden dismissed the possibility of an affinity between electricity and magnetism (*De Attractione*, Leiden). In 1802, on the other hand, Adam Walker in the

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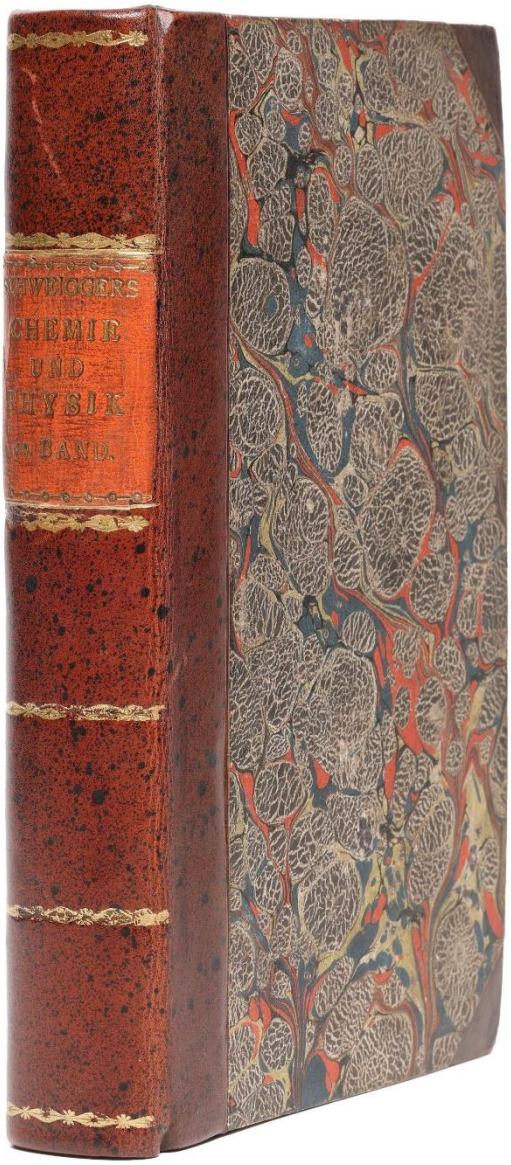
second edition of his *A System of Familiar Philosophy* (first edition, 1799), among many striking opinions on the monistic nature of electricity, light and heat, declared categorically 'I think we have infinite data in favour of an electro-magnetic fluid'. Oersted, the son of an impoverished apothecary in Rudkjoping, in 1812 discussed in his *Ansicht der chemischen Naturgesetze* ('View of the Natural Laws of Chemistry') the identity of chemical and electrical forces. [. . .] It was after lecturing to students in his own rooms in the Noerragade, Copenhagen, in 1819 or 1820 that he invited a few of them to stay on to witness an experiment - the possible deflection of a compass-needle by an adjacent electric current. The experiment was successful; but only just; and Oersted repeated it many times before venturing on 21 July to proclaim the identity of magnetism and electricity in this four-page paper entitled 'Experiments relative to the Effect of the Contiguity of Electricity to a Magnetic Needle'. The results were as important as they were widespread. Oersted's paper was within the year reprinted in England, France, Germany, Italy and Denmark, In 1823 Ronalds and in 1833 Gauss and Weber constructed the first practical electric telegraphs. Faraday's momentous experiments with the sequels by Clerk Maxwell, Hertz and others bore further witness to its significance" (PMM).



The page count in our copy jumps from 204 to 245, but the text is complete; page 373 is erroneously paginated as page 337; the copy corresponds to the copy of the Bayerische Staatsbibliothek and is complete.

*Our copy has been in possession of the original house of Agfa-Gevaert, the Aktiengesellschaft für Anilinfabrikation, founded by Felix Mendelssohn Bartholdy's son Paul Mendelssohn Bartholdy and Carl Alexander Martius; with their stamps on the title page and the upper outer page corner of three other pages and the back of the first table.

References: Sparrow 152 and Evans 36 (both for this journal issue); DSB X, p.185. Dibner 61, PMM 282 and Norman 1606 (for the private print).

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24 **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 (250 x 180 mm). xlix [1], 96, [2] pp. Half title, title with engraved device of the Accademia della Crusca, engraved portrait of the author after Pietro Anichini, imprimatur leaf bound at the end, woodcut initials and ornaments, 3 woodcut illustrations in text. Contemporary limp vellum, spine with hand lettering in ink and printed shelf-mark paper label (minor worming to board edges, spotting and dust soiling of vellum, head of spine chipped). Text crisp and clean with only very minor occasional spotting, ink smudge to title verso. Provenance: Avvocato Ferrara, Biblioteca Mario Dotti (paper label to front pastedown and foot of spine), cancelled old ownership inscription on final flyleaf. A fine, unpressed copy in contemporary Italian binding. (#003853) € 4500


LEZIONI
ACCADEMICHE
D' EVANGELISTA
TORRICELLI
Mattematico, e Filosofo
DEL SERENISS. FERDINANDO II.
GRAN DUCA DI TOSCANA
Lettore delle Mattematiche nello Studio di Firenze
E ACCADEMICO DELLA CRUSCA.
IL PIV BEL FIOR NE COGLIE
IN FIRENZE M. DCC. XV.
Nella Stamp. di S. A. R. Per Jacopo Guiducci, e Santi Franchi.
Con Licenza de' Superiori.

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.

References & Bibliography: Dibner 149; Sparrow 190; Norman 2088; Carli and Favaro 428; Cinti 169; Riccardi I, 544; DSB XIII, pp.437-38; Honeyman 2993.

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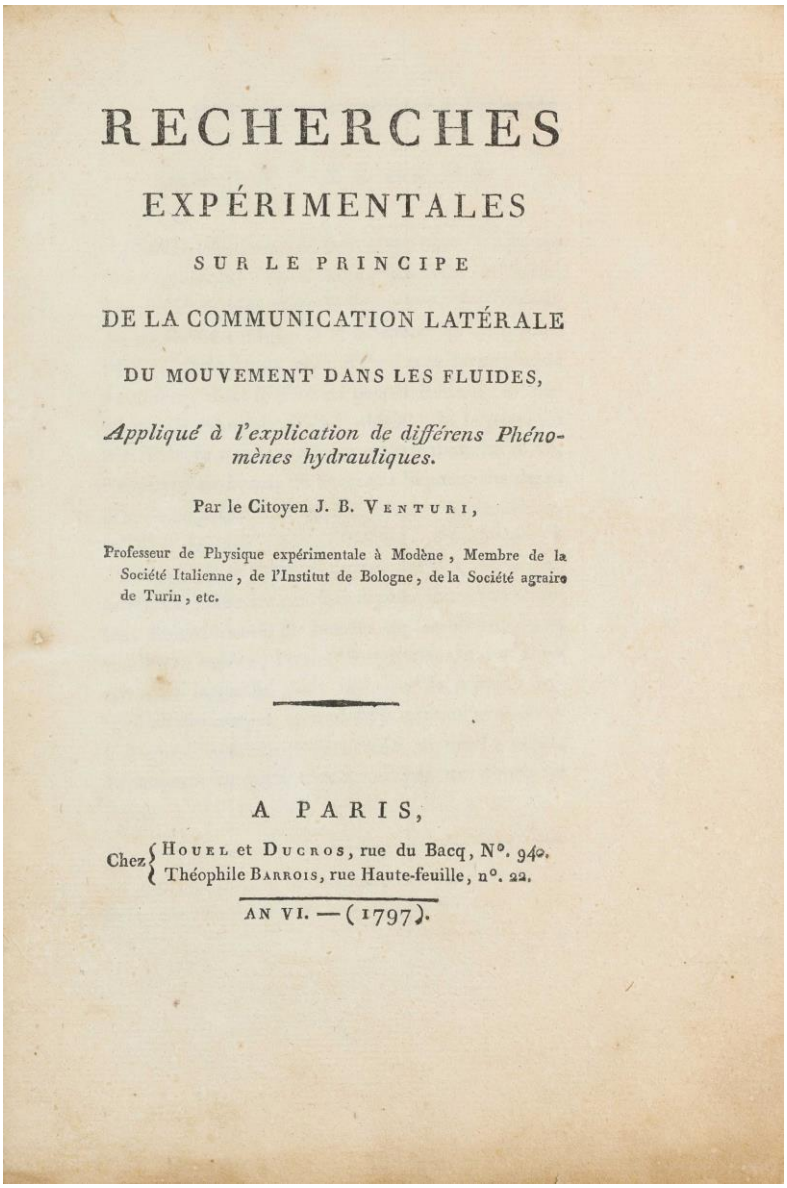
25 **VENTURI, Giovanni Battista**. *Recherches expérimentales sur le principe de la communication latérale du mouvement dans les fluides, appliqué à l'explication de différens phénomènes hydrauliques*. Paris: Houel et Ducros, Théophile Barrois, 1797. 8vo (228 x 154 mm). 88 pp., 2 folding engraved plates by Picquet at the end. Signatures: A-E^{8} [chi]^{4}. Bound in contemporary Italian xylographic paper wrappers, all pages uncut, spine titled in manuscript (wrappers dust-soiled and with chipping at foot, small wormholes in upper wrapper). Title somewhat brown-stained at foot; text little browned and dust-soiled at outer edges, occasional minor spotting. A very good, unsophisticated copy which got an export permit from the Italian authorities. (#003867) € 9500

VERY RARE FIRST EDITION of this treatise important to the history of hydraulics, in which the postulation of the Venturi Effect, the reduction in pressure of a fluid that occurs when it flows through a conduit, first appears. "Venturi's classic and surprisingly rare work in experimental hydrodynamics, describing a series of experiments which he undertook in Italy, using Poleni's efflux apparatus. Venturi demonstrated the effect of eddies formed at abrupt changes of section and the change in discharge resulting from their elimination. He also studied the diffusion of eddies in open-channel flow and indicated that the same phenomena could be found in the atmosphere. This memoir was reviewed and recommended to the Institut by Bossut, Coulomb, and Prony, whose work is mentioned in the text along with that of d'Alembert, Mariotte, Guglielmini, and Daniel Bernoulli. This work was translated into English, appearing first in Nicholson's Journal and later in Tredgold's collection of articles on hydraulics..." (Roberts & Trend, p.340-41).



RECHERCHES

EXPÉRIMENTALES

SUR LE PRINCIPE

DE LA COMMUNICATION LATÉRALE

DU MOUVEMENT DANS LES FLUIDES,

Appliqué à l'explication de différens Phénomènes hydrauliques.

Par le Citoyen J. B. VENTURI,

Professeur de Physique expérimentale à Modène, Membre de la Société Italienne, de l'Institut de Bologne, de la Société agraire de Turin, etc.

A PARIS,

Chez { HOUEL et DUCROS, rue du Bacq, N°. 940.
Théophile BARROIS, rue Haute-feuille, n°. 22.

AN VI. — (1797).

Giovanni Battista Venturi (1746-1822) was professor of philosophy at the University of Modena from 1775. He was sent to Paris as secretary to a delegation representing the Duke of Modena and stayed for a year and a half, coming into contact with many learned French scientists and publishing several treatises, including this one. While in Paris, Venturi also had the opportunity to study Leonardo da Vinci and Galileo. His fields of research were mainly optics and color theory, but it is his research in hydraulics that has gained him the most fame.

References & Bibliography: Roberts & Trent, *Bibliotheca Mechanica*, pp. 339-41; Rouse & Ince, *History of Hydraulics*, pp. 136-137.

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