Short version Fall 2026



Rare and important books & manuscripts
in the history of science,
by Christian Westergaard M.Sc.

SOPHIA RARE BOOKS

CHRISTIAN
WESTERGAARD
M.SC.

A selection of books and manuscripts
in the exact and natural sciences, 1486–1966
Fall 2026

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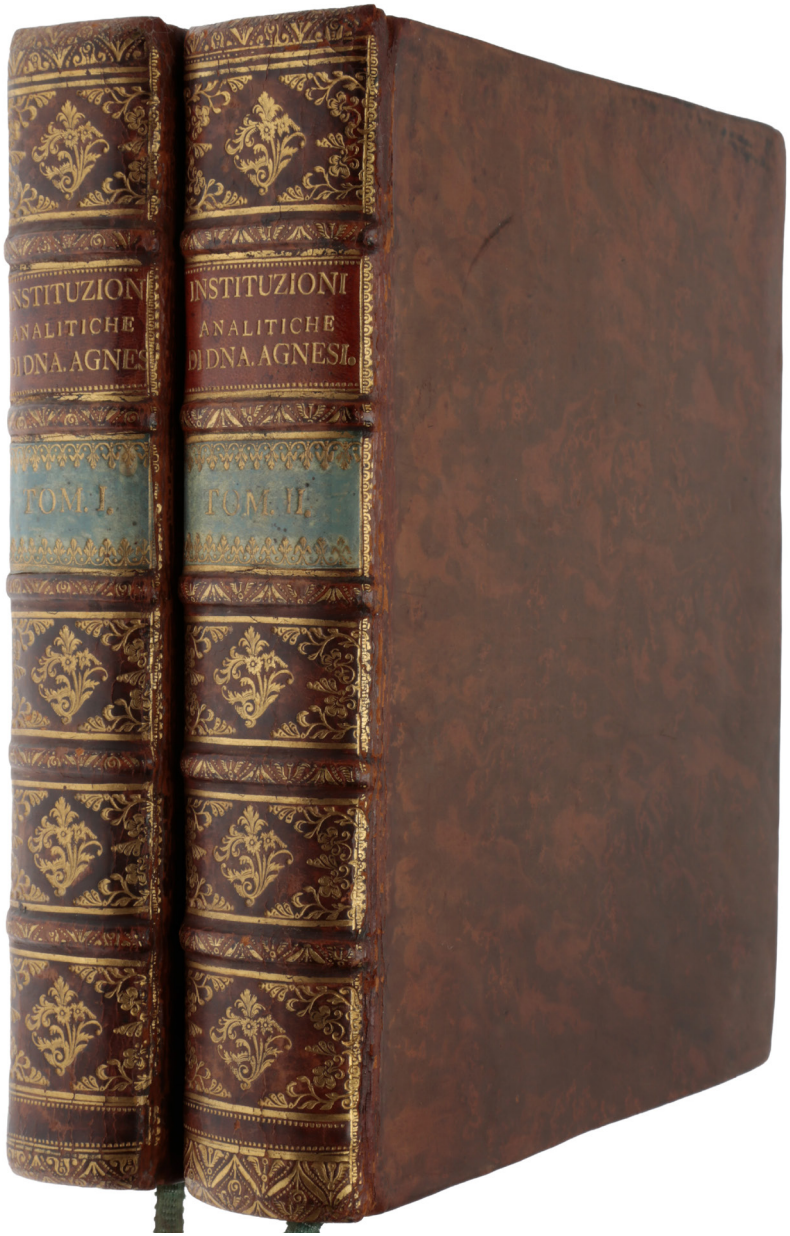
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The First Mathematics Treatise by a Woman

AGNESI, Maria Gaetana. *Instituzioni Analitiche ad uso della gioventù italiana di D.na Maria Gaetana Agnesi Milanese Dell' Accademia delle Scienze di Bologna.* Milan: nella Regia-Ducal Corte [Giuseppe Richini], 1748.

$15,000

First edition of one of the earliest comprehensive textbooks of both the differential and the integral calculus, and the first mathematics treatise published by a woman. Agnesi wrote it in Italian 'for the youth', refined it over a decade in collaboration with the Riccati circle, and had the printer Richini set up his press inside the family palace so that she could correct every formula at the case. The *Nova Acta Eruditorum* gave it five admiring pages; the Paris Académie authorised a French translation; Pope Benedict XIV appointed her to the chair of mathematics at Bologna. The *versiera*, the curve Agnesi treats in Tomo I and again at Tomo II, p. 561, became through Colson's rendering the 'Witch of Agnesi'. The present copy carries a uniquely articulate contemporary reception dossier: flyleaf extracts from Bougainville (1754) and Montucla (1758) with a reference to the *Acta* review, a gift inscription *Regalo del Signor Wergen*, and a manuscript slip preserved at the Tomo II versiera page crediting Grandi with the curve's name. Grolier, *Extraordinary Women*, no. 68.

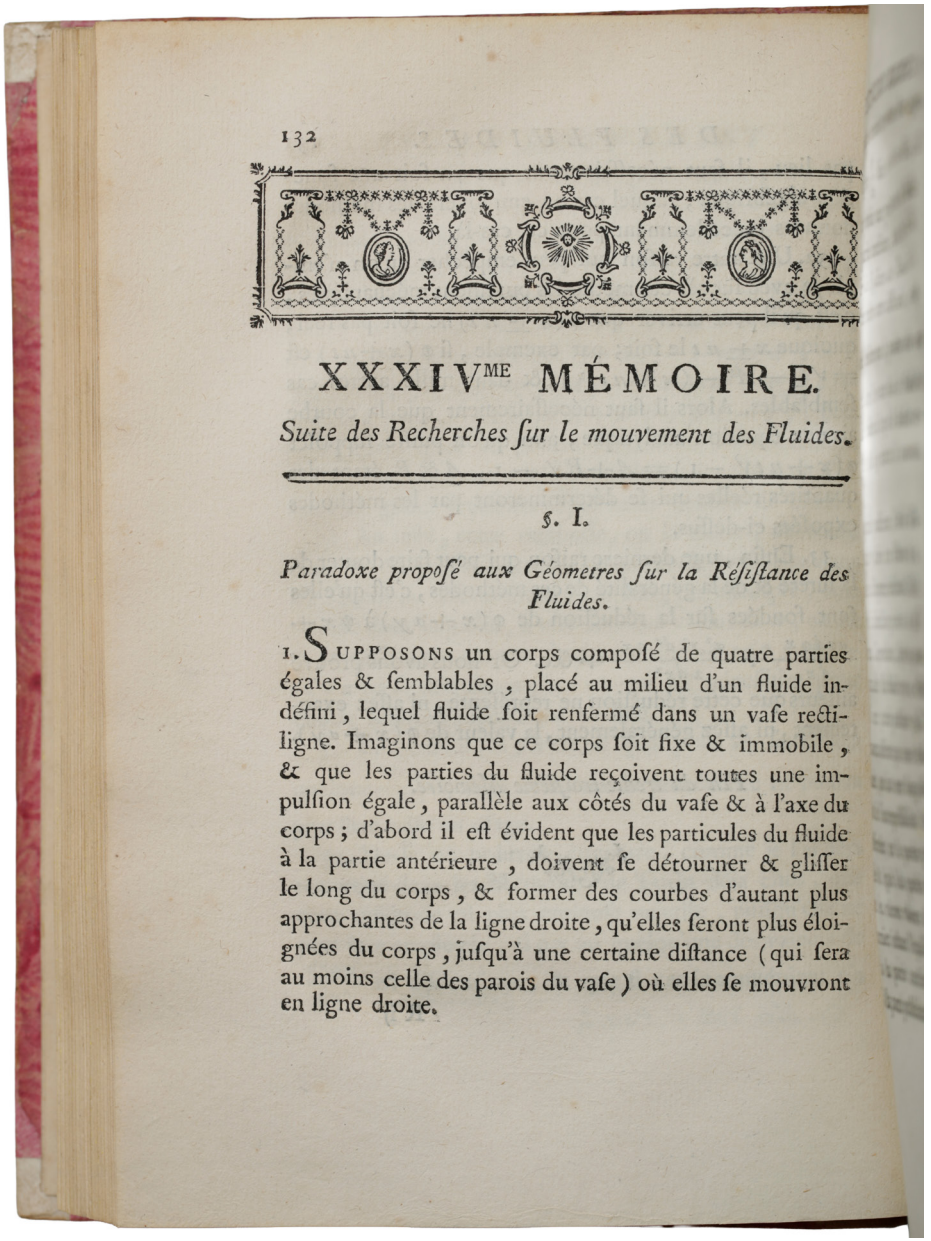


D'Alembert Names His Paradox

ALEMBERT, Jean le Rond d'. *Opuscules mathématiques, ou Mémoires sur différens sujets de géométrie, de méchanique, d'optique, d'astronomie, &c.* Paris: David [vols. I–II]; Briasson [III–VI]; C.-A. Jombert [VII–VIII], 1761–1780.

$5,500

First edition, the only edition of his lifetime, of the eight volumes in which d'Alembert collected the fifty-eight memoirs of his later career, issued as a serial of his own between 1761 and 1780 after he had fallen out with the academies of Paris and Berlin. The fifth volume, of 1768, is the place where d'Alembert's paradox is first named as such — a rigorous theory of fluids gives a symmetrical body no resistance at all, a 'paradoxe singulier' he leaves to the geometers to resolve — and, thirty-three pages later, where the convergence criterion by the ratio of consecutive terms, the ratio test, is first set down. The third volume is a four-hundred-page treatise on achromatic lenses written in answer to Dollond's doublet of 1758; the second carries the doubts on probability and the attack on Daniel Bernoulli's arithmetic of smallpox inoculation, and the comet and lunar dispute with Clairaut. With all thirty folding plates, entirely untrimmed in contemporary pink paste-paper boards.



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XXXIV^ME MÉMOIRE.

Suite des Recherches ſur le mouvement des Fluides.

§. I.

Paradoxe propoſé aux Géometres ſur la Réſiſtance des Fluides.

1. SUPPOSONS un corps compoſé de quatre parties égales & ſemblables, placé au milieu d'un fluide indéfini, lequel fluide ſoit renfermé dans un vaſe rectiligne. Imaginons que ce corps ſoit fixe & immobile, & que les parties du fluide reçoivent toutes une impulſion égale, parallèle aux côtés du vaſe & à l'axe du corps; d'abord il eſt évident que les particules du fluide à la partie antérieure, doivent ſe détourner & gliſſer le long du corps, & former des courbes d'autant plus approchantes de la ligne droite, qu'elles ſeront plus éloignées du corps, juſqu'à une certaine diſtance (qui ſera au moins celle des parois du vaſe) où elles ſe mouvront en ligne droite.

A Sixteenth-Century Anticipation of Projective Geometry

BENEDETTI, Giovanni Battista. *De gnomonum umbrarumq[ue] solarium usu liber...* Turin: Heirs of Nicolò Bevilacqua, 1574.

$5,500

First edition of the most comprehensive treatise on sundials of its time — the book in which Benedetti, in Stillman Drake's words in *DSB* "the most important immediate forerunner of Galileo", set out the theory and construction of dials at every inclination and on cylindrical and conical surfaces, and closed with an Appendix on a new instrument for drawing conic sections — the copy of Aloys Thomas Raimund, Count Harrach (1669–1742), Viceroy of Naples, with his memorial ex-libris. The Appendix is what gives the book a place in the history of mathematics beyond dialling. To explain how his instrument works Benedetti proved eleven propositions about the conic section in relation to the cone that defines it, and Judith V. Field has argued that this three-dimensional way of looking at conics, which Apollonius had set aside and which Girard Desargues would take up in the Brouillon project of 1639, entitles Benedetti to be regarded as a precursor of projective geometry and an anticipator of Desargues — a precursor who set up the configuration but, on Field's own reading, did not see where it led.

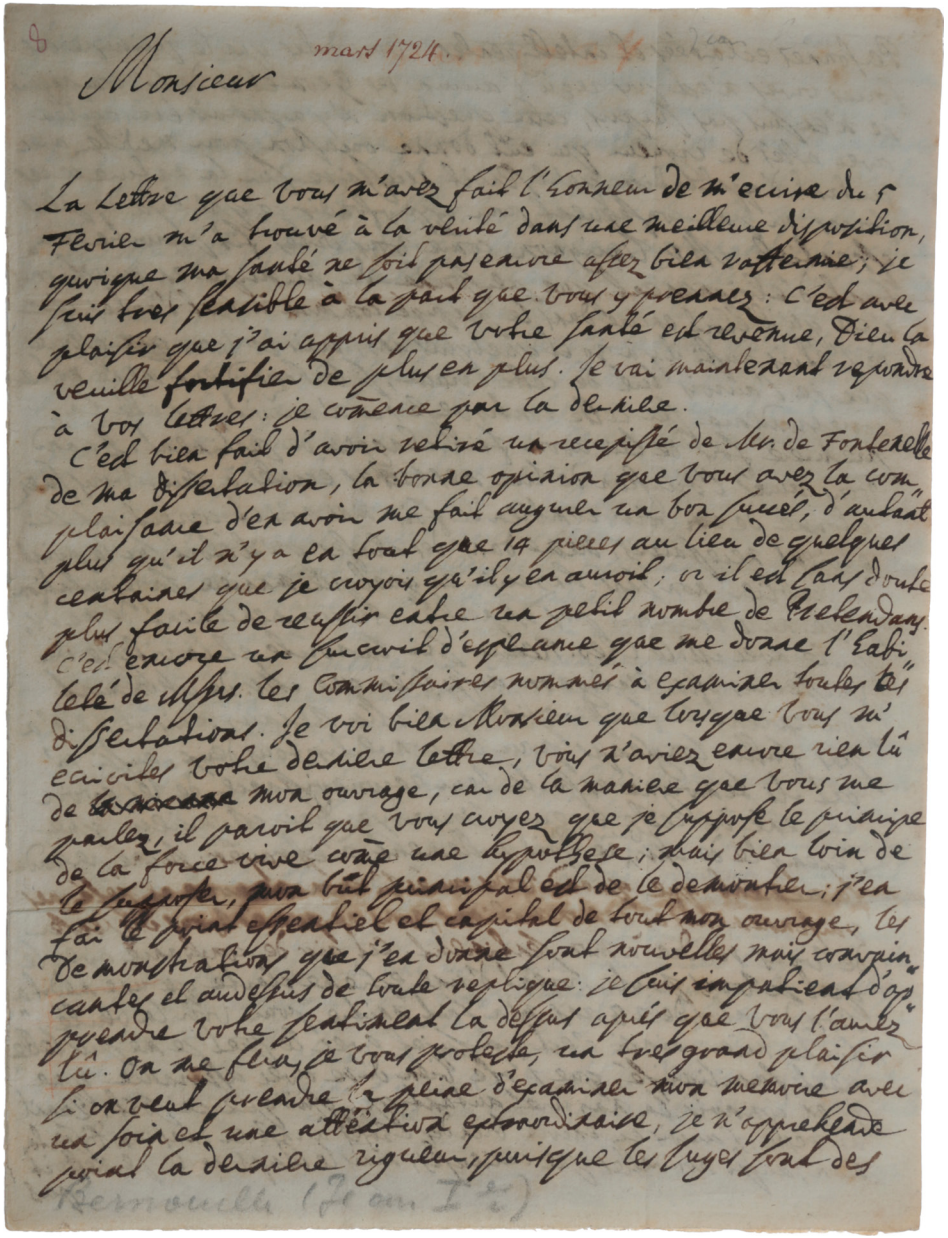


Vis Viva, the Shape of the Earth, and the Nature of Infinity

BERNOULLI, Johann. *Autograph letter signed ("J. Bernoulli") to Jean-Jacques Dortous de Mairan* Basel, 1 March 1724.

$55,000

A highly important 12-page autograph letter signed from Johann I Bernoulli to Jean-Jacques Dortous de Mairan in answer to Mairan's letters of 9 January and 5 February. Three weeks before the Paris Academy would award its 1724 prize on the laws governing the collision of perfectly hard bodies, of fourteen submissions Bernoulli alone had refused the question's premise: perfectly hard bodies do not exist, and the conserved measure is not Cartesian quantity of motion but Leibnizian living force. The prize would go to Maclaurin; Bernoulli's entry would appear in 1727 as the *Discours sur les loix de la communication du mouvement*. The letter then turns to a nineteen-correction peer review of Mairan's 1720 memoir on the figure of the Earth (engaging Newton, Cassini, Huygens, and L'Hôpital), a discussion of the nature of mathematical infinity prompted by Fontenelle's forthcoming book of 1727, and a defence of the editor Johann Burkhard Mencke of the *Acta Eruditorum*.

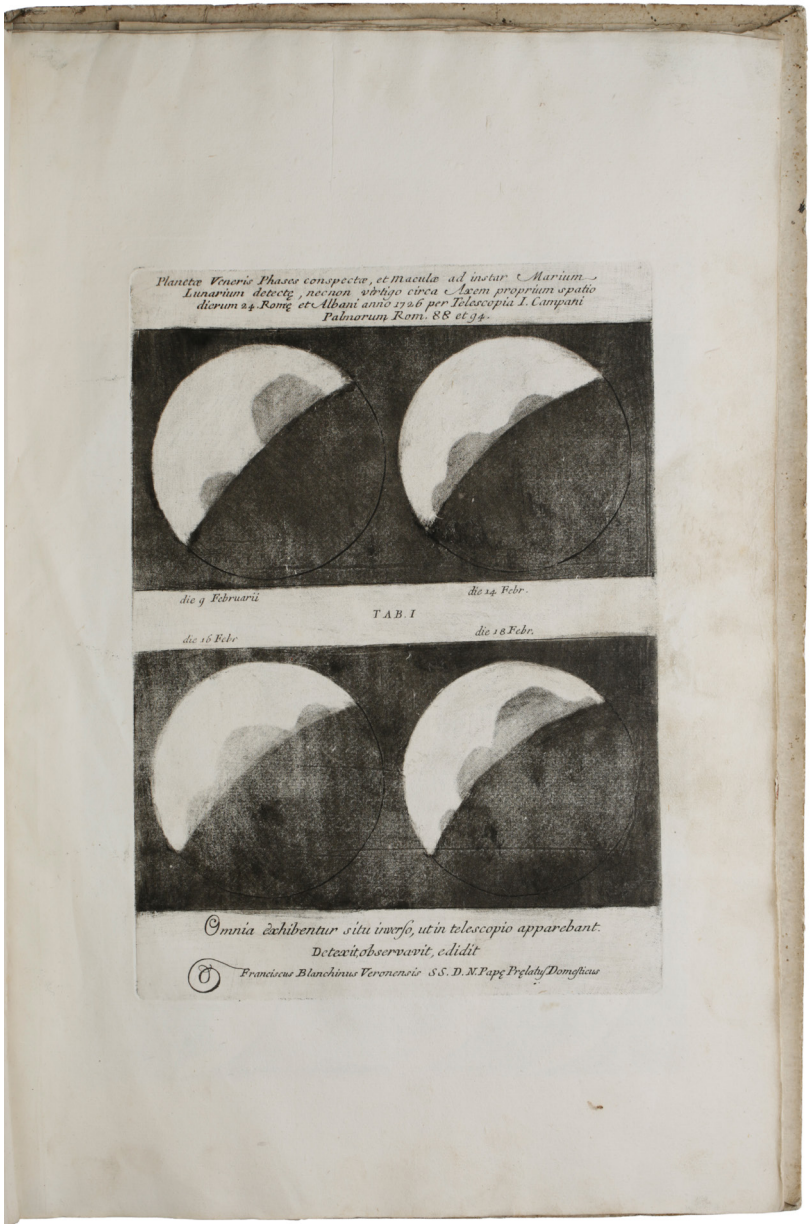


The First Book of Telescopic Observations of Venus

BIANCHINI, Francesco. *Hesperi et Phosphori nova phaenomena sive observationes circa planetam Veneris unde colligitur. I. Descriptio illius macularum… II. Vertigo circa axem proprium … III. Parallelismus axis in orbita octimestri circa solem. IV. Et quantitas parallaxeos methodo Cassiniana explorata …* Rome: Giovanni Maria Salvioni, 1728.

$12,500

First edition of the first book of telescopic observations of the planet Venus, including descriptions and illustrations of the dark spots on the surface of Venus; the work also contains important illustrations of lunar topography, notably the crater Plato and the Alpine Valley. Bianchini (1662–1729) sought to determine the rotational period of Venus from the dark patches on the disc, and to draw a map of its surface; equipped with one of the excellent telescopes of the Roman telescope maker Giuseppe Campani, he thought to have identified several Venus 'continents' and 'oceans' which he proposed to name after Portuguese and Italian celebrities. Although his results on the rotational period were incorrect, due to Venus's thick cloud cover, his observations were pioneering efforts in investigating the planet. Bianchini's book is perhaps best known today for two often reproduced plates of aerial telescopes, of extremely long focal length, with lenses by Campani. With engraved frontispiece, three engravings in the text (two in mezzotint), and 10 engraved plates (4 folding).

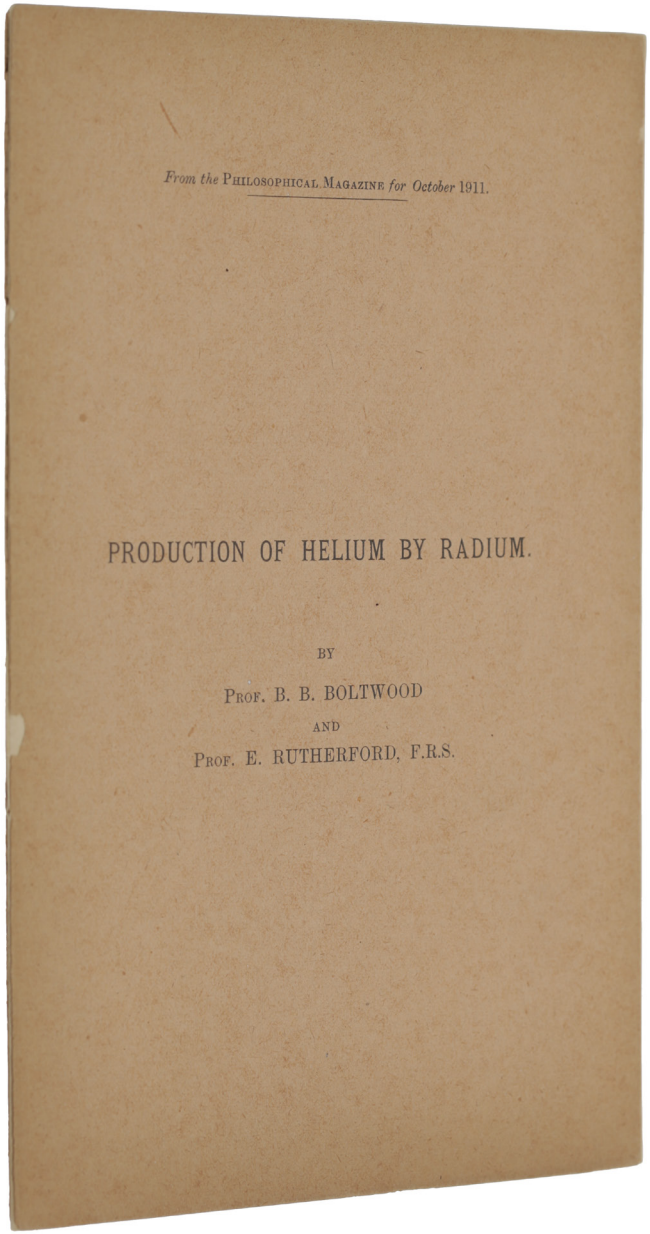


Transmutation Measured to the Cubic Millimetre

BOLTWOOD, Bertram Borden.; RUTHERFORD, Ernest.
Production of Helium by Radium. London: Taylor & Francis, 1911.

$1,250

First English-language printing, in the rare separately-issued offprint, of the experiment that put a number on transmutation itself (the complete paper had appeared in German in the Vienna Academy's *Sitzungsberichte* the previous March). Working in Rutherford's Manchester laboratory with radium lent by the Vienna Academy of Sciences, Boltwood and Rutherford measured, to fractions of a cubic millimetre, the rate at which one element manufactures another — the volume of helium that a known quantity of radium generates in a known time. The measurement closed the ledger that Rutherford had been keeping on the α particle for a decade: the counted number of particles leaving radium, their proven identity with helium, and now the gas itself, collected and measured, all had to agree — and did. It also supplied the working constant of the earliest radiometric clocks, the figure that turned the helium found trapped in a mineral into a statement of that mineral's age.

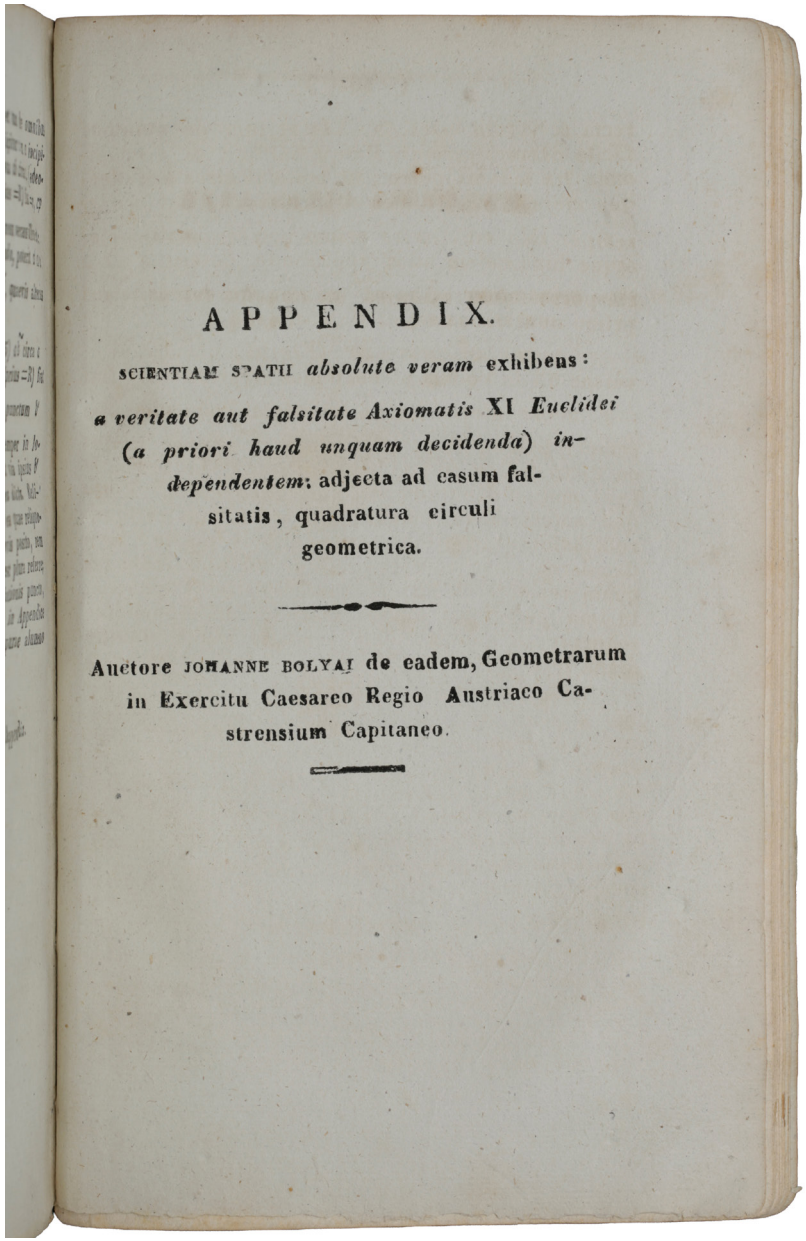


A New World from Nothing

BOLYAI, János.; BOLYAI, Farkas. *Appendix. Scientiam spatii absolute veram exhibens: a veritate aut falsitate Axiomatis XI Euclidei (a priori haud unquam decidenda) independentem: adjecta ad casum falsitatis, quadratura circuli geometrica. Tomus primus [-secundus].* Maros Vásárhely: Joseph and Simeon Kali, at the press of the Reformed College, 1832-1833.

$150,000

First edition of the twenty-six pages in which János Bolyai built a geometry that does without Euclid's parallel axiom, in the two-volume textbook of his father that carried them into print — a copy documented in Lemley's census of the twenty-five survivors, with the first volume in the early state that only Gauss's own copy and the Teleki copy share, and a Transylvanian provenance that runs through the mathematics master of the very college whose press printed it. Bolyai's *Appendix* is, in Halsted's phrase, 'the most extraordinary two dozen pages in the whole history of thought': it does not merely deny the parallel postulate, as Lobachevsky had done in Kazan a few years earlier, but constructs an absolute science of space — the body of geometry that holds whether Euclid's axiom is true or false — and shows that the question can never be settled a priori. The work was printed at the Reformed College of Marosvásárhely in Transylvania in an edition financed by subscription; the two subscribers' lists account for 156 copies, Lemley estimates that 175 to 200 were printed, and his census records 25, seven of them outside institutional collections.



APPENDIX.

SCIENTIAM SPATII *absolute veram* exhibens:

a veritate aut falsitate Axiomatis XI *Euclidei (a priori haud unquam decidenda) independentem*; adjecta ad casum falsitatis, quadratura circuli geometrica.

Auctore JOHANNE BOLYAI de eadem, Geometrarum in Exercitu Caesareo Regio Austriaco Castrensium Capitaneo.

The Apparatus Behind The New Astronomy

BRAHE, Tycho. *Astronomiae Instauratae Mechanica.*
Nuremberg: Levin Hulsius, 1602.

$32,500

Second (first trade) edition of one of Brahe's most important works, an illustrated description of Uraniborg and of its astronomical instruments, "the most advanced in the world for their time" (Norman), that produced, between 1576 and 1597, the most accurate naked-eye observations made before the telescope, and on which Kepler in 1609 built the *Astronomia Nova*. The first edition of 1598 was printed on Brahe's own press at Wandsbek, near Hamburg, in a small run — modern estimates range from about 40 to 100 copies — which Brahe distributed privately; a copy-by-copy census documents 61 exemplars, of which 21 are verified extant today, and only a handful of copies have appeared at auction since the Honeyman sale. With the exception of the portrait, which is new, and the engraving of an armillary sphere on C6 verso, the illustrations of this edition were printed from the blocks and plates of the first edition, sold by the author's heirs to Levinus Hulsius. *Provenance*: the Trotter family of Mortonhall.

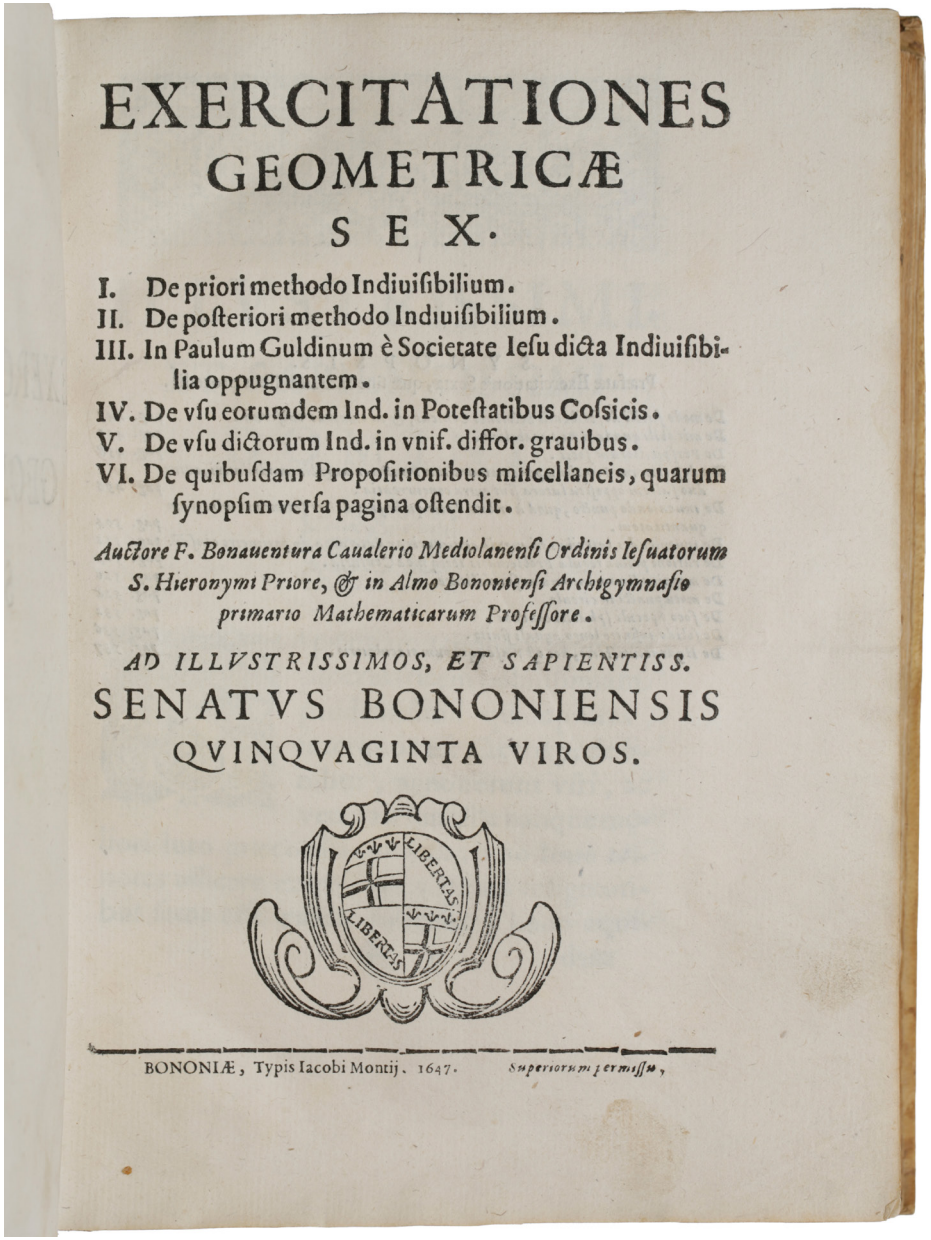


Cavalieri's Second Work on Indivisibles

CAVALIERI, Bonaventura. *Exercitationes geometricae sex. I. De priori methodo indiuisibilium. II. De posteriori methodo indiuisibilium. III. In Paulum Guldinum è Societate Iesu dicta indiuisibilia oppugnantem. IV. De vsu eorumdem ind. in potestatibus cossicis. V. De vsu dictorum ind. in vnif. diffor. grauibus. VI. De quibusdam propositionibus miscellaneis, quarum synopsim versa pagina ostendit.* Bologna: Giacomo Monti, 1647.

$25,000

First edition, scarce, of Cavalieri's second work on integration methods, a sequel to and elaboration of his *Geometria indivisibilibus* (1635), one of the most important forerunners of the integral calculus. Cavalieri's 'method of indivisibles' considers an area as made up of an indefinite number of equidistant parallel line segments, and a solid as made up of an indefinite number of parallel plane areas; his principle provided an effective alternative to the Archimedean method of exhaustion, and was anticipated by Kepler and used by Galileo, Cavalieri's pupil Torricelli, Wallis, and Pascal. The present work contains numerous applications of the method, including the integration of x^n and the first general proof of 'Pappus' theorem', as well as replies to Guldin and others who criticised the earlier work, and an important analysis of the focal properties of spherical surfaces and lenses. De Morgan judged this the work which most established Cavalieri's claim to have "ushered in the dawn of the integral calculus".



EXERCITATIONES
GEOMETRICÆ
SEX.

I. De priori methodo Indiuiſibilium.
II. De poſteriori methodo Indiuiſibilium.
III. In Paulum Guldinum è Societate Ieſu dicta Indiuiſibilia oppugnantem.
IV. De vſu eorumdem Ind. in Poteſtatibus Coſsicis.
V. De vſu dictorum Ind. in vnif. diffor. grauibus.
VI. De quibuſdam Propoſitionibus miſcellaneis, quarum ſynopſim verſa pagina oſtendit.

Auctore F. Bonauentura Caualerio Mediolanenſi Ordinis Ieſuatorum S. Hieronymi Priore, & in Almo Bononienſi Archigymnaſio primario Mathematicarum Profeſſore.

AD ILLVSTRISSIMOS, ET SAPIENTISS.
SENATVS BONONIENSIS
QVINQVAGINTA VIROS.

LIBERTAS

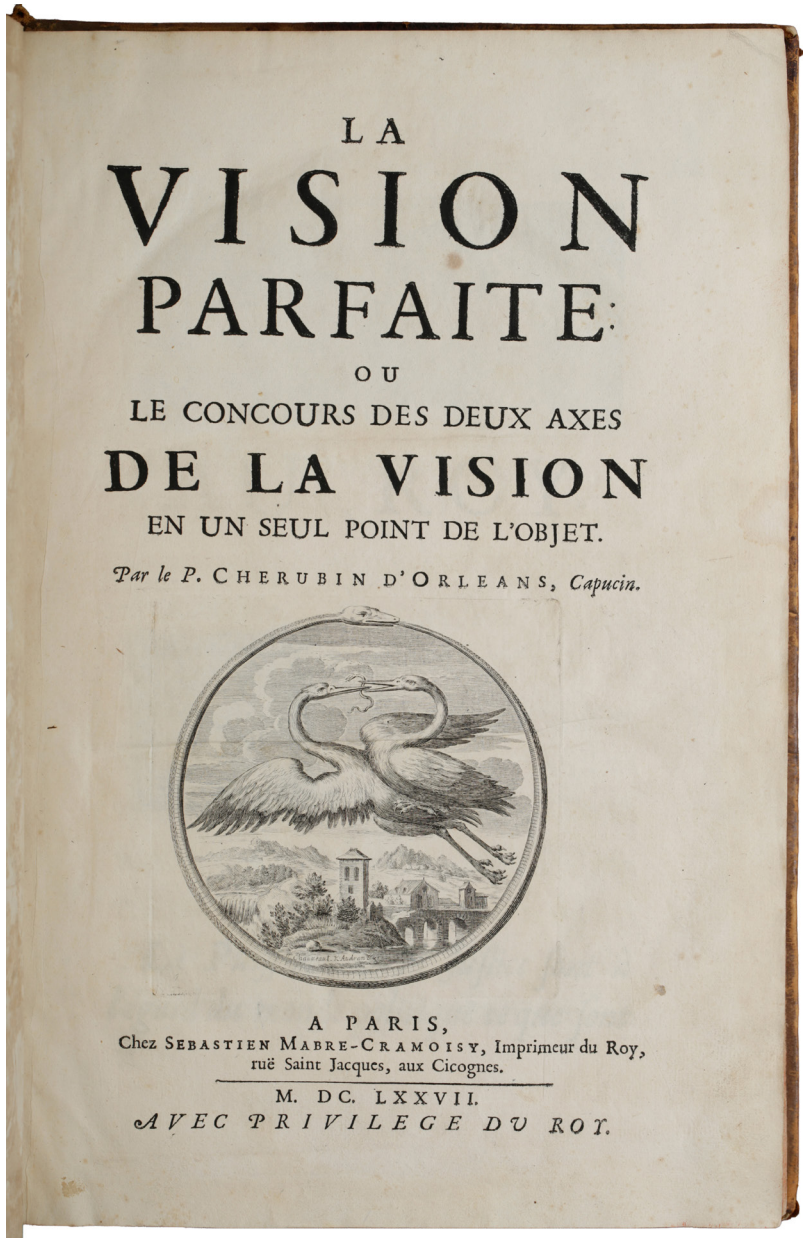
BONONIÆ, Typis Iacobi Montij. 1647. *Superiorum permiſſu.*

Chérubin's Binocular Instruments: The Riccardi–Nachet Set

CHÉRUBIN D'ORLÉANS. *La vision parfaite: ou le concours des deux axes de la vision en un seul point de l'objet.* [With:] *La vision parfaite: ou la veue distincte par le concours des deux axes en un seul point de l'objet. Tome II.* Paris: Sébastien Mabre-Cramoisy; Edme Couterot, 1677; 1681.

$36,000

First edition of both volumes, with the second volume of 1681 that is seldom found with the first, from the libraries of Pietro Riccardi (1828–1898), the Modena bibliographer of Italian mathematics, and of the Nachet family of Paris microscope-makers, whose bookplate is in both volumes. The Capuchin optician argues that the two visual axes concur in one point of the object and that an instrument serving both eyes must be two exactly equal telescopes kept centrally parallel by one movement; the folding plate by Simonneau shows his *Oculaire royal*, and the second part specifies, lens by lens, the binocular microscope he had presented to the Dauphin. His preface attacked the figures of the micrographers, and Hooke answered him in 1678. The second volume adds levels, a method of re-centring an objective he had kept secret, binocular astroscopes, and a microscope with eight interchangeable objectives, and defends his priority against Rheita and the *Journal des Sçavans*. Robert Smith wrote in 1738 that Chérubin had written immensely upon the binocular telescope.

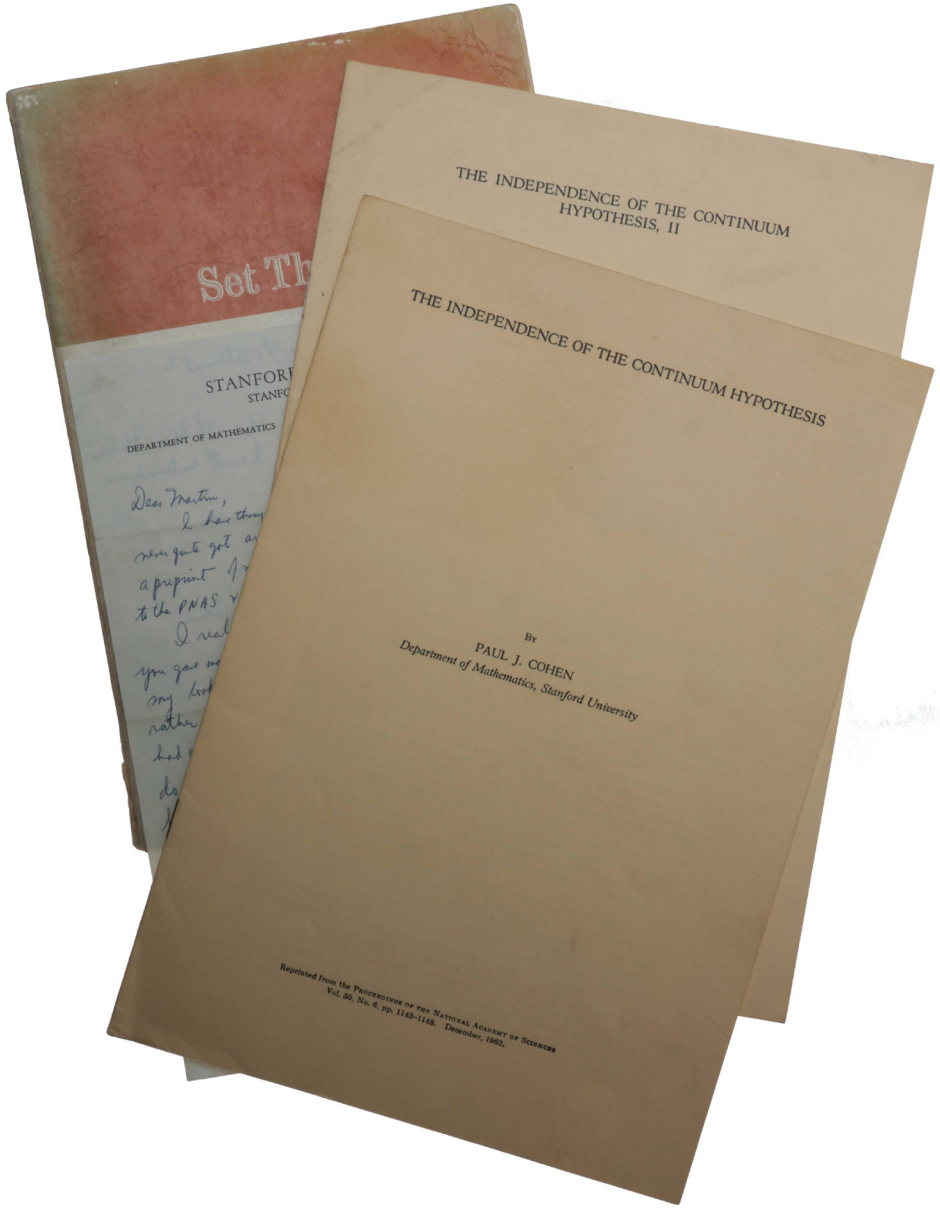

LA
VISION
PARFAITE:
OU
LE CONCOURS DES DEUX AXES
DE LA VISION
EN UN SEUL POINT DE L'OBJET.
Par le P. CHERUBIN D'ORLEANS, *Capucin.*
A PARIS,
Chez SEBASTIEN MABRE-CRAMOISY, Imprimeur du Roy,
ruë Saint Jacques, aux Cicognes.
M. DC. LXXVII.
AVEC PRIVILEGE DU ROY.

The Method of Forcing

COHEN, Paul. *The Independence of the Continuum Hypothesis [I–II].* [With:] *Set Theory and the Continuum Hypothesis.* [And:] *autograph letter signed from Cohen to Martin Davis.* Washington, D.C.; Stanford; New York: National Academy of Sciences; W. A. Benjamin, 1963; 1964; 1966.

$50,000

First edition, in the rare author's offprints, of the two papers in which Paul Cohen proved that the continuum hypothesis and the axiom of choice cannot be derived from the standard axioms of set theory — and devised, in order to prove it, the method of forcing that has governed the subject ever since. The offprints are here joined by the first edition of Cohen's book and, at the heart of the group, an autograph letter signed in which Cohen tells the logician Martin Davis that he was 'directly responsible for my looking once more at Set Theory'. The whole comes from Davis's own library, his ownership signature and his working annotations in the book: the result, the man Cohen credited with turning him to it, and the proof in Cohen's hand of that debt, kept together. It was for this work Cohen received the Fields Medal in 1966, the first ever awarded for mathematical logic.

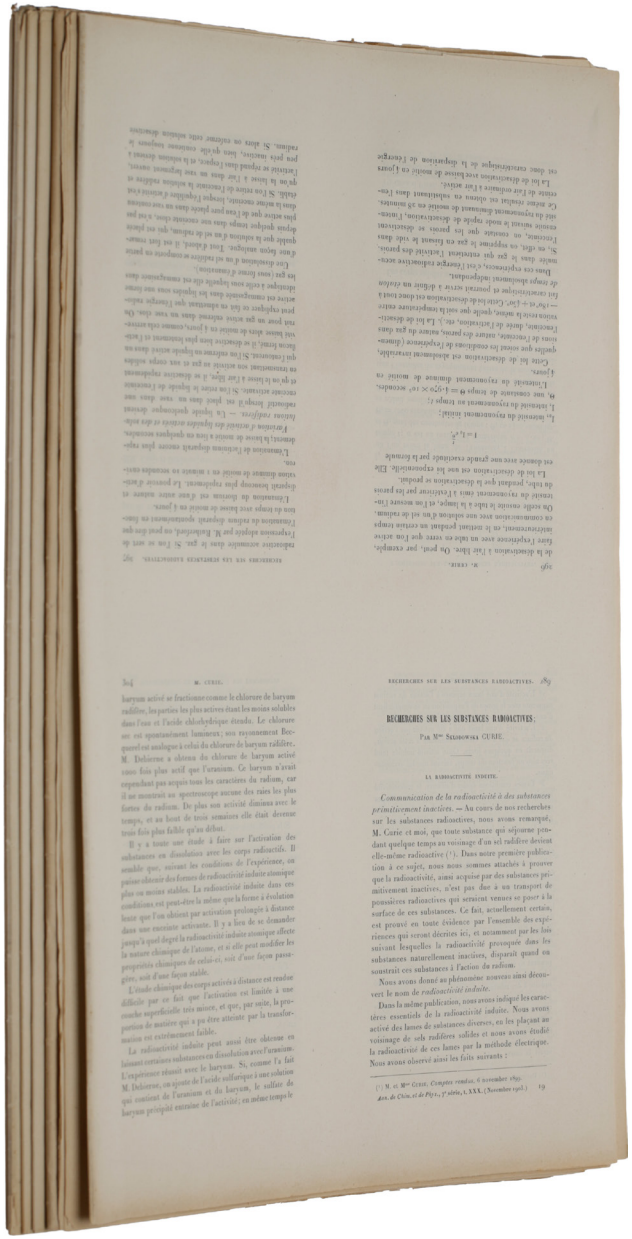


The Curie Theses as they left the Press

CURIE, Marie.; CURIE, Pierre.; CURIE, Jacques.; LANGEVIN, Paul. *Recherches sur les substances radioactives.* [With:] *Pierre Curie, Propriétés magnétiques des corps à diverses températures.* [And:] *Paul Langevin, L'ionisation des gaz.* [And:] *Jacques Curie, Recherches sur le pouvoir inducteur spécifique et la conductibilité des corps cristallisés.* [Paris]: [Masson et Cie], 1889; 1895; 1903.

$15,000

The doctoral theses of Marie Curie, Pierre Curie, Jacques Curie and Paul Langevin as the *Annales de Chimie et de Physique* printed them, on forty sheets that never went to the binder. Marie Curie's is the thesis of June 1903 that laid the discovery of polonium and radium before the examiners, in the form she revised for the Annales the same autumn and the first form in which anyone could buy it: the academic printing had run to some hundred copies for the jury and her circle, and the three monthly parts of September, October and November 1903 carried the text, with a page of new matter, into every physics library in Europe while the Swedish Academy was deciding the prize she shared that winter. Around it stand three theses from the same school and the same press: her husband's of 1895, which found the law of paramagnetism and the temperature at which iron ceases to be a magnet; her brother-in-law's of 1888, which described the piezoelectric quartz with which she would measure radioactivity; and Langevin's of 1902, on the ions in a gas whose current her electrometer read.

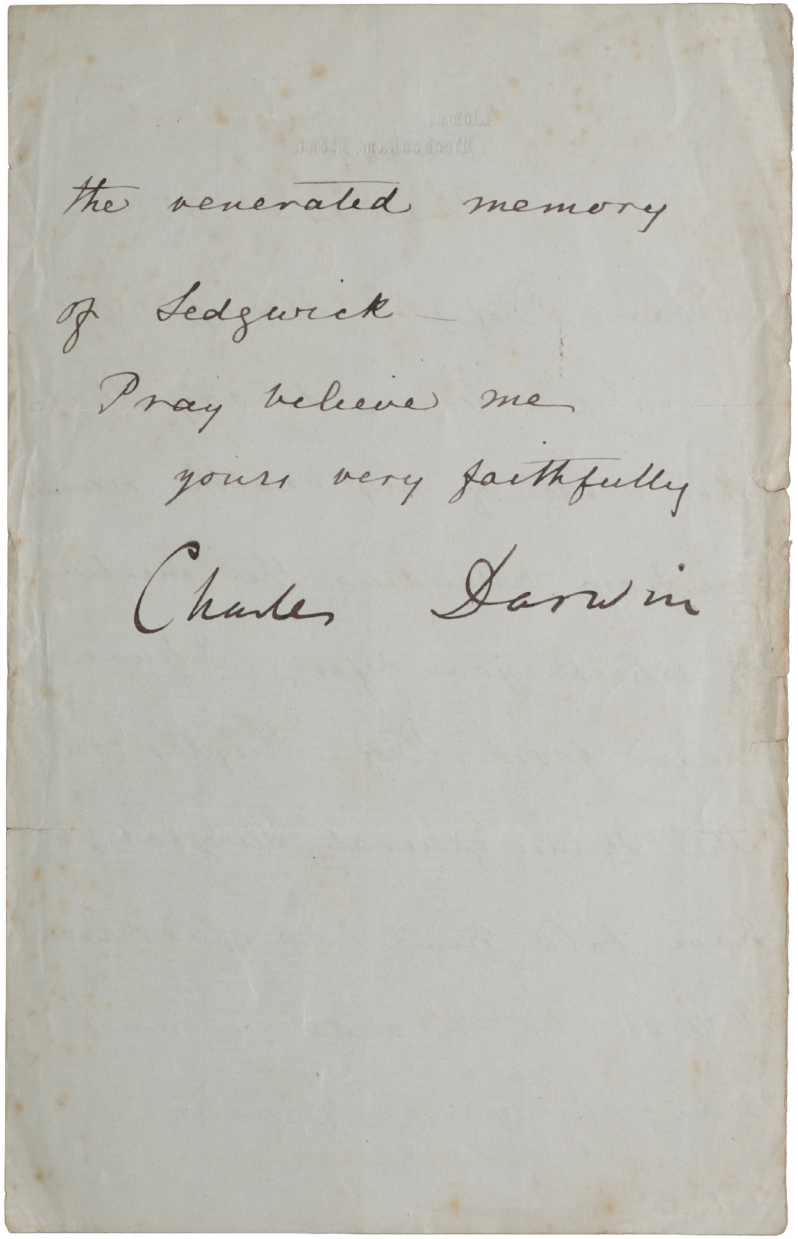


The Venerated Memory of Sedgwick

DARWIN, Charles. *Letter signed, to Professor George Murray Humphry, on the memorial to Adam Sedgwick.* Down, Beckenham, Kent, 14 March 1873.

$15,000

Darwin's answer to the printed circular that called the friends of Adam Sedgwick to a meeting in the Cambridge Senate House to settle what form his memorial should take. Darwin was too unwell to travel and said so; but he turned the refusal into a commitment, undertaking to aid in any way the honouring of what he called the venerated memory of Sedgwick. Sedgwick had taught him field geology in North Wales in the summer of 1831, in the months before the Beagle sailed, and had then read *On the Origin of Species* and told its author, in November 1859, that he had deserted the true method of induction for a machinery as wild as the locomotive Bishop Wilkins had proposed to sail with us to the moon; four months later, anonymously in the *Spectator*, he declared near the end of a hostile notice his detestation of a theory he thought unflinchingly materialist. Six weeks after Sedgwick died, Darwin was helping to build his monument, and within a fortnight of writing this letter he had put fifteen guineas into the fund and his name on its London committee.

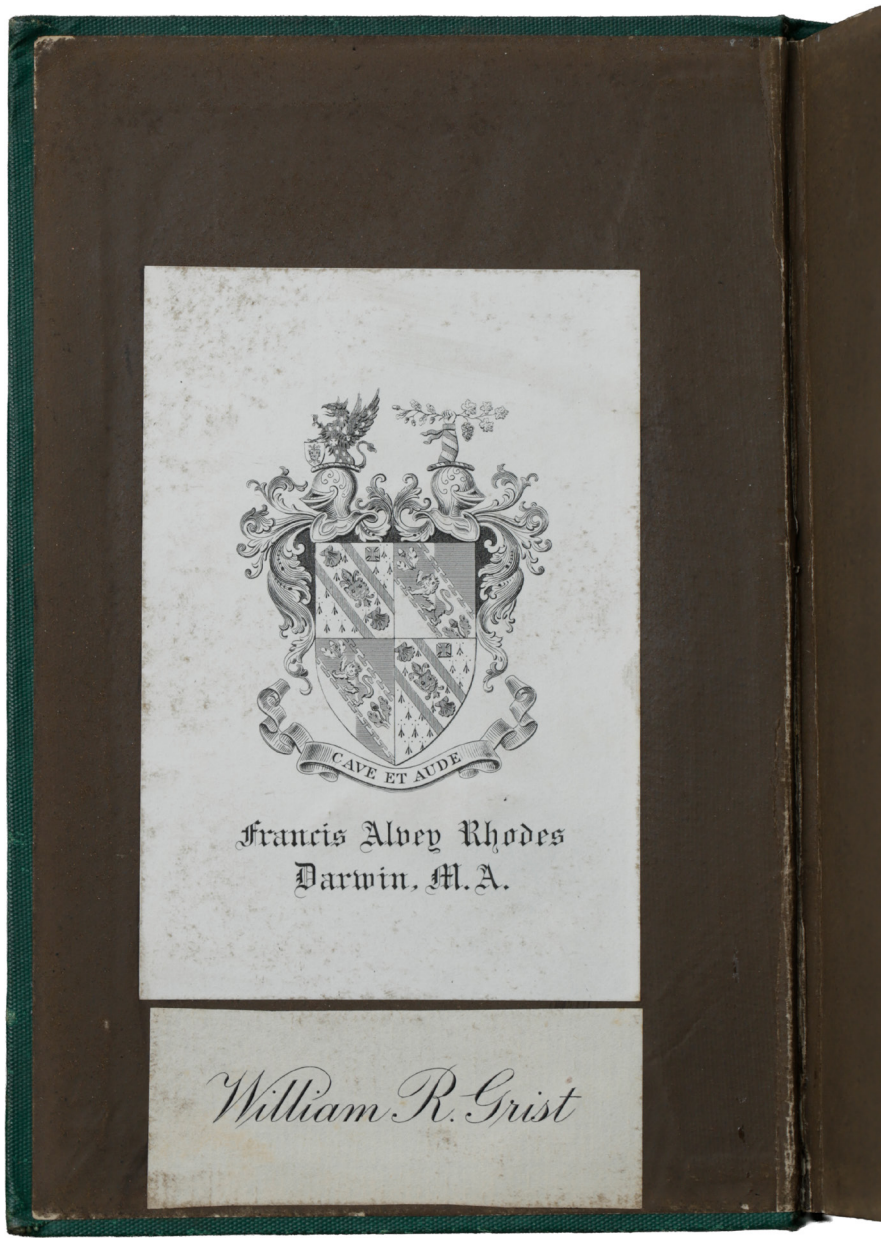

the venerated memory
of Sedgwick
Pray believe me
yours very faithfully
Charles Darwin

The Tip Acts Like a Brain

DARWIN, Charles.; DARWIN, Francis. *The Power of Movement in Plants.* London: John Murray, 1880.

$5,000

First edition, first issue, of Darwin's penultimate book, the record of the experiments he made with his son Francis in a private house in Kent, which established that a seedling senses light at its tip while the bending happens lower down, and that something passes from the one place to the other. The Darwins slipped blackened tin-foil caps over the top few hundredths of an inch of canary-grass seedlings: capped ones stood still, uncapped ones bent hard toward the window, and the conclusion on page 474 — 'some influence is transmitted from the upper to the lower part' — is the observation from which the science of plant hormones grew; the influence was isolated half a century later and named auxin. At the other end of the plant the book earned the sentence it is remembered by: the tip of the radicle 'acts like the brain of one of the lower animals'. The copy comes from the library of Francis Alvey Rhodes Darwin, Charles Darwin's second cousin once removed, whose armorial bookplate stands on the front pastedown beneath the Darwin motto Cave et Aude — the motto Charles Darwin chose for his own seal — facing the pencil signature of his younger brother Gerard Lascelles Darwin: two brothers of the Elston line, in a copy of the book their cousin published in 1880.

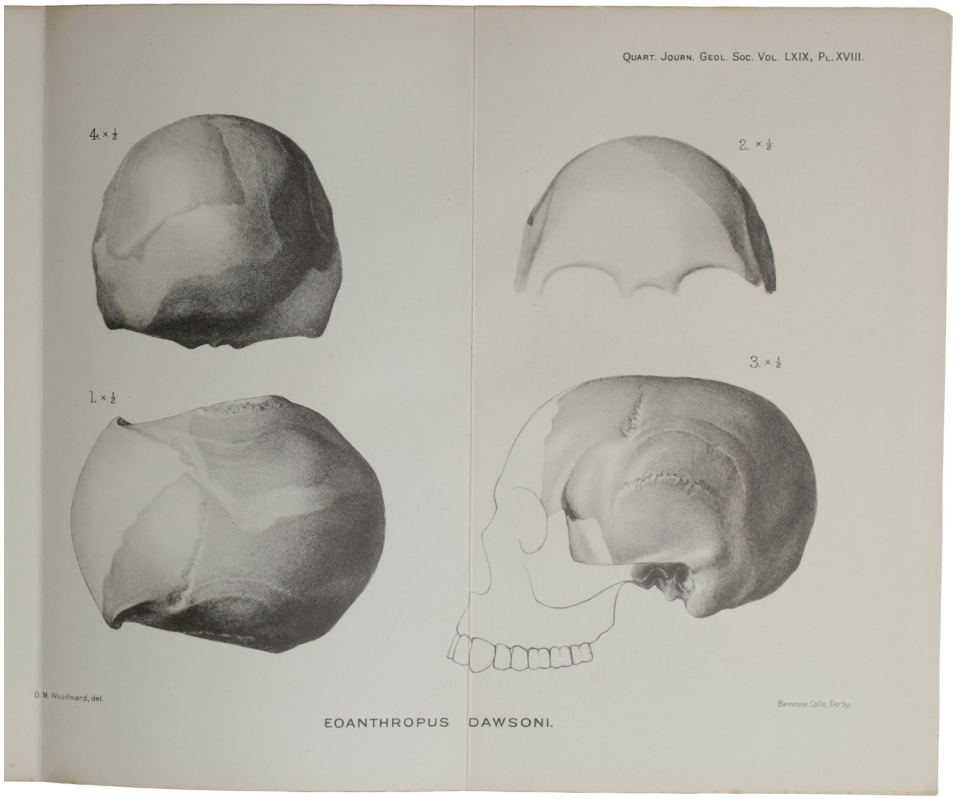


The Piltdown Man Papers

DAWSON, Charles.; SMITH WOODWARD, Arthur. *On the Discovery of a Palaeolithic Human Skull and Mandible in a Flint-bearing Gravel overlying the Wealden (Hastings Beds) at Piltdown, Fletching (Sussex).* [With:] *Supplementary Note on the Discovery of a Palaeolithic Human Skull and Mandible at Piltdown (Sussex).* [And:] *On a Bone Implement from Piltdown (Sussex).* [And:] *Fourth Note on the Piltdown Gravel, with Evidence of a Second Skull of Eoanthropus dawsoni.* London: Longmans, Green, and Co., 1913; 1914; 1915; 1918.

$8,500

First edition, in the four original quarterly parts, of the whole published case for Piltdown Man. The first paper announced a new genus of the human family, *Eoanthropus dawsoni*, before the Society at Burlington House on 18 December 1912; the second added the canine tooth and nasal bones of the following season; the third the bone implement of 1914; and the fourth the second skull with which Smith Woodward closed the argument in 1917. For forty years these pages were the evidence for the earliest Englishman, a creature with a brain of modern size and the jaw of an ape, and they shaped what a generation of anatomists expected a human ancestor to look like. In 1953 Weiner, Oakley and Le Gros Clark showed that the jaw and the canine were deliberate fakes, by 1955 the verdict had reached every find the papers describe, and in 2016 a team led by Isabelle De Groote traced the jaw and the teeth of both skulls to a single orang-utan, most probably from Borneo. The four parts are the primary record of the most successful forgery in the history of science.

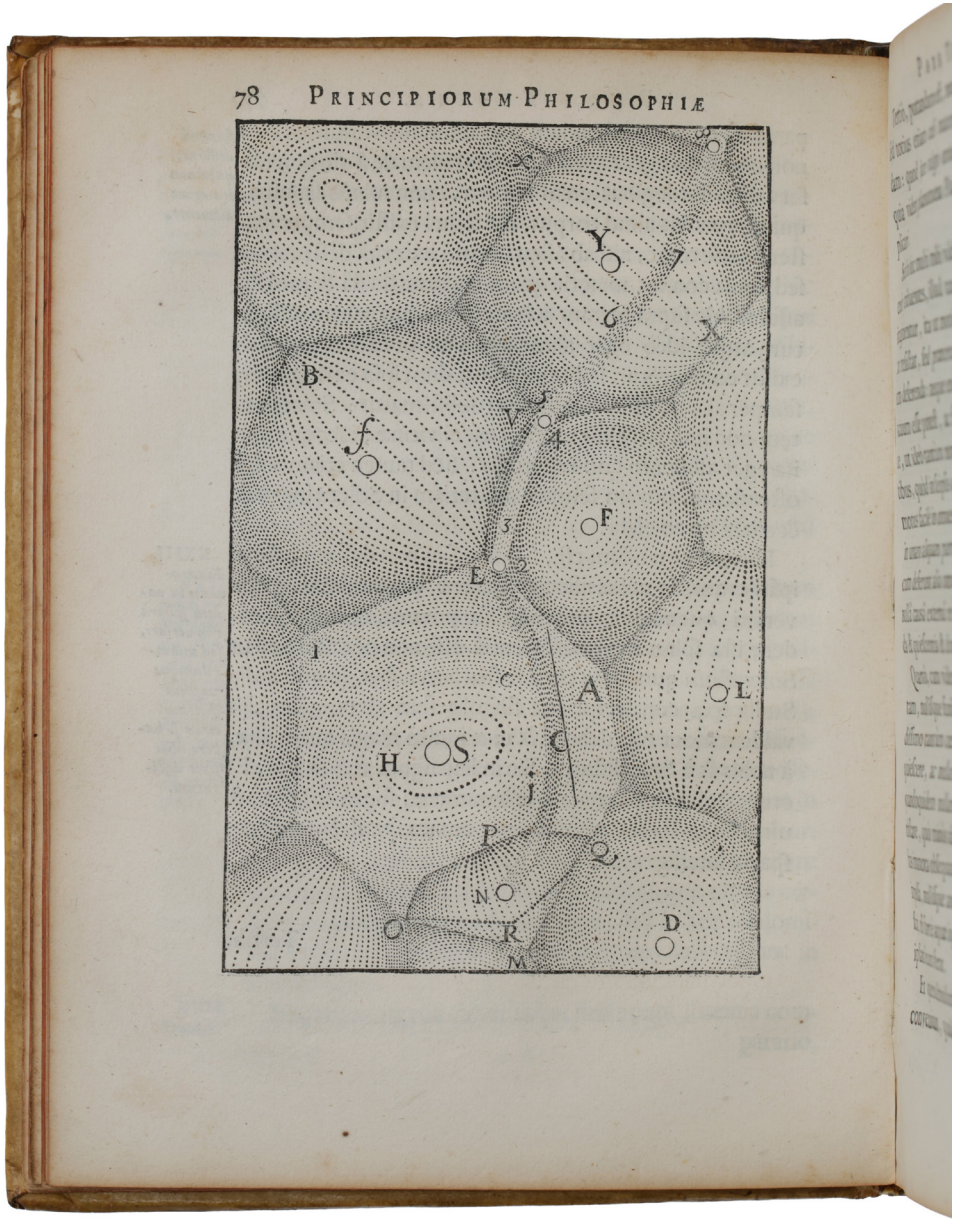


The Universe as Machine

DESCARTES, René. *Principia philosophiae.* Amsterdam: Louis Elzevier, 1644.

$9,500

First edition of the charter of the mechanical universe — the book in which Descartes published his complete system of nature, from the first principles of knowledge to the constitution of the heavens and the earth, and in which the laws of nature received their first systematic statement in print: that matter remains in its state of rest or motion until something changes it, and that all motion, of itself, is in a straight line. Newton absorbed both principles, and under his name the first of them still opens every textbook of physics as the first law of motion. The *Principia philosophiae* is at once the boldest and the most careful book of Descartes's life: boldest, because it replaces the qualities and forms of the scholastic world-picture with a single universe of matter in motion, governed everywhere by the same laws and filled with the swirling vortices that carry the planets around their suns; most careful, because it was engineered, clause by clause, to survive the fate of Galileo. The present copy, in untouched contemporary vellum with the title inked on the spine in an early hand, carries a mid-seventeenth-century Latin ownership inscription — the book as its first readers bought and shelved it; copies of the Principia alone, without the Specimina philosophiae usually bound with it, are the less common form.

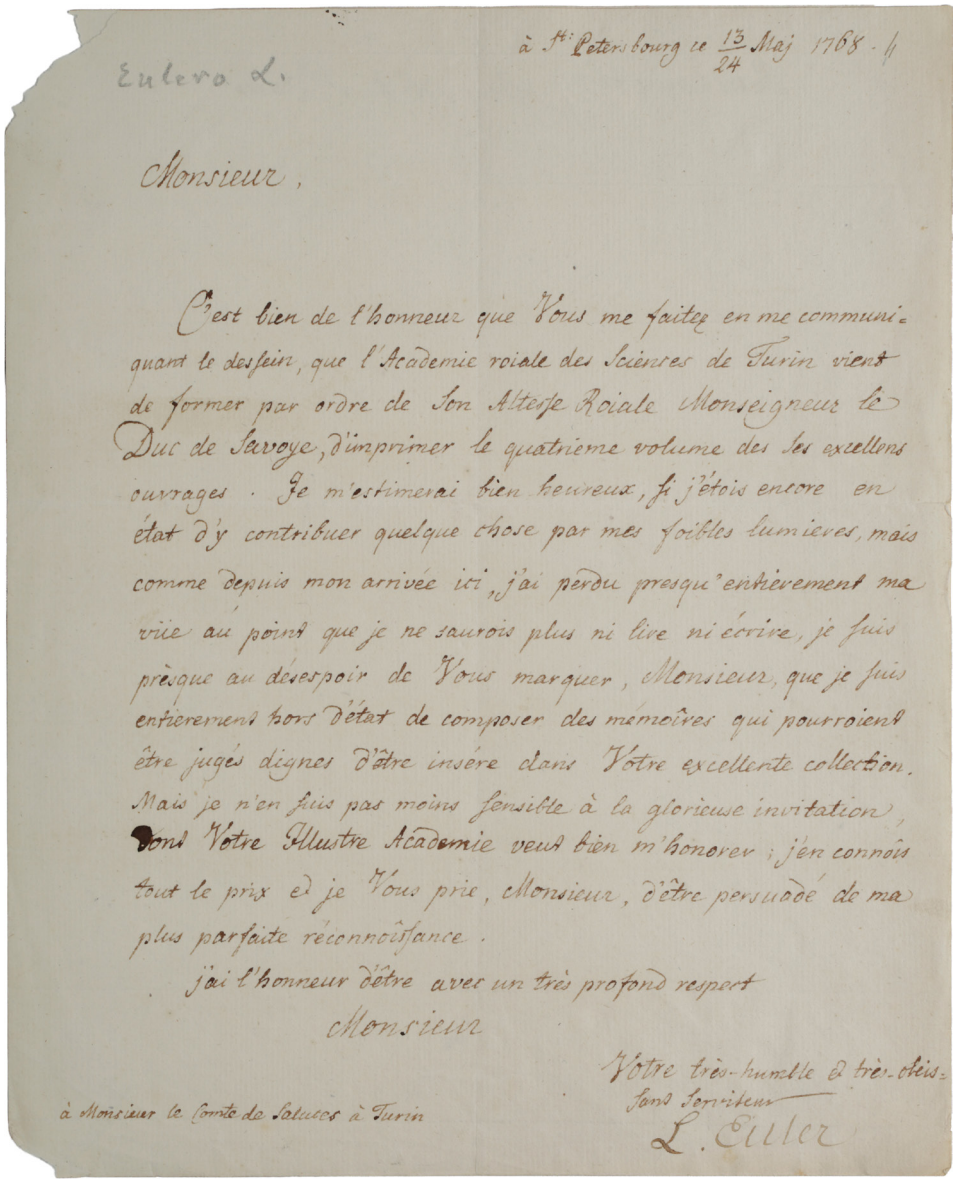


Euler on His Own Blindness

EULER, Leonhard. *Letter signed ('L. Euler') to Giuseppe Angelo Saluzzo di Monesiglio, Comte de Saluces, at Turin, declining to contribute to the fourth volume of the Mélanges of the Turin society because he can no longer read or write* St Petersburg, 13/24 May 1768.

$8,500

Euler, two years into the blindness that lasted the rest of his life, tells the Turin academy's founder why he will not write for it. Saluzzo had written on 26 March 1768 that the Duke of Savoy had ordered a fourth volume of the society's *Mélanges*, which had printed Euler's letter to Lagrange in its second volume and five of his memoirs in its third; the reply, dictated to an amanuensis and signed *L. Euler* in a larger, paler hand, says that since his arrival at St Petersburg he has lost his sight almost entirely, can neither read nor write, and is wholly unable to compose a memoir worthy of the collection. He had used the same words to Lagrange in February, and he went on dictating: the *Dioptrica* and the new lunar theory followed that October. The register of his correspondence records no other letter from Euler to Saluzzo, and the text is not found in print. The volume appeared in 1773 with Lagrange, d'Alembert, Condorcet and the young Laplace, and without him.



à St. Petersbourg ce 13/24 Maj 1768.

Eulero L.

Monsieur,

C'est bien de l'honneur que Vous me faites en me communiquant le dessein, que l'Academie roiale des Sciences de Turin vient de former par ordre de Son Altesse Roiale Monseigneur le Duc de Savoye, d'imprimer le quatrieme volume des ses excellens ouvrages. Je m'estimerai bien heureux, si j'étois encore en état d'y contribuer quelque chose par mes foibles lumieres, mais comme depuis mon arrivée ici, j'ai perdu presqu'entierement ma vûe au point que je ne saurois plus ni lire ni écrire, je suis presque au désespoir de Vous marquer, Monsieur, que je suis entierement hors d'état de composer des memoires qui pourroient être jugés dignes d'être insére dans Votre excellente collection. Mais je n'en suis pas moins sensible à la glorieuse invitation, dont Votre Illustre Academie veut bien m'honorer; j'en connois tout le prix et je Vous prie, Monsieur, d'être persuadé de ma plus parfaite réconnoissance.

J'ai l'honneur d'être avec un très profond respect

Monsieur

Votre très-humble et très-obeissant serviteur

L. Euler

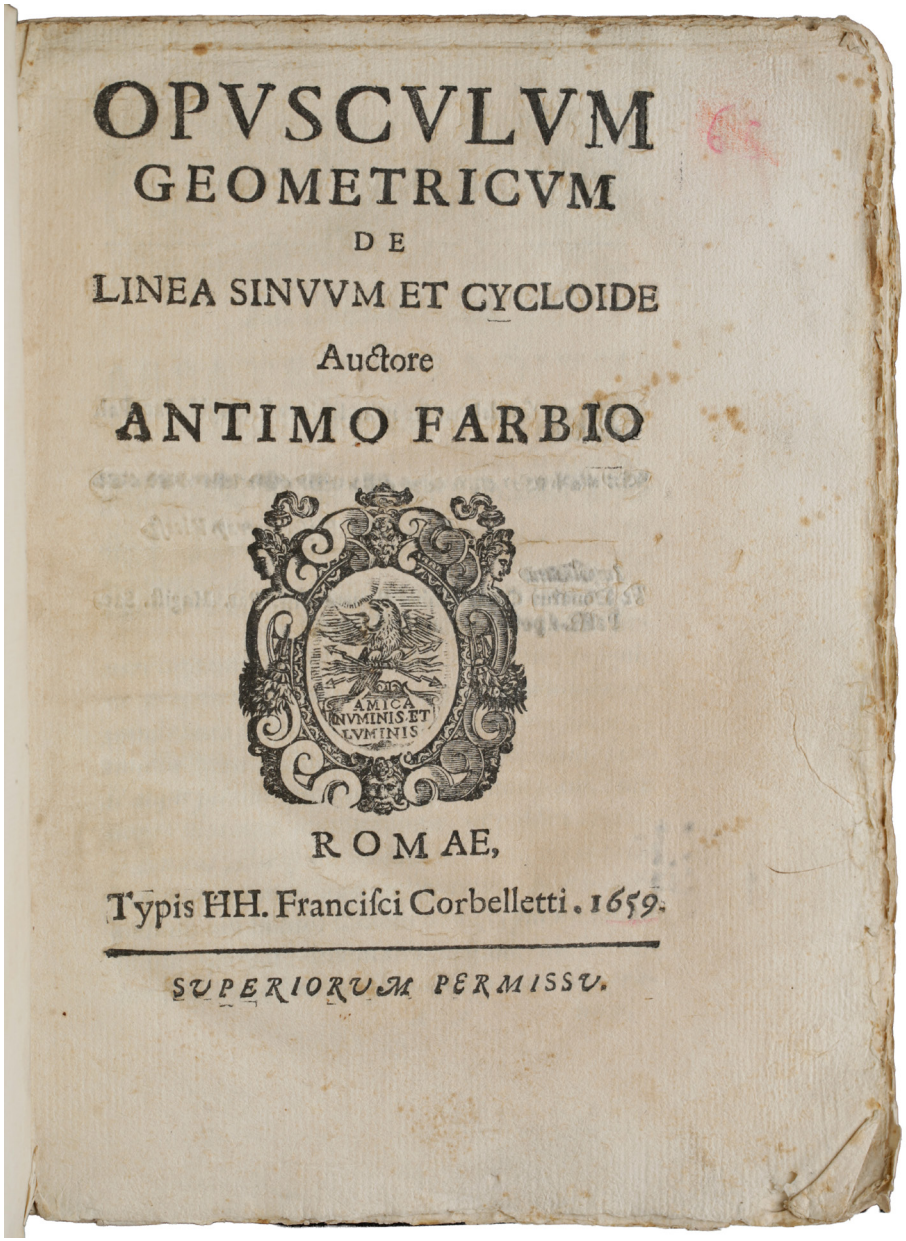
à Monsieur le Comte de Saluces à Turin

Fabri Answers Pascal

FABRI, Honoré. *Opusculum geometricum de linea sinuum et cycloide. Auctore Antimo Farbio.* Rome: Heirs of Francesco Corbelletti, 1659.

$9,500

First edition of the Roman answer to Pascal's cycloid challenge — the forty-four pages, issued under the pseudonym Antimus Farbius, in which Honoré Fabri dated his dedication 1 October 1658, the very day the contest in Paris closed, squared the cycloid four separate ways, found the centres of gravity of its segments and the solids it sweeps out about its base and its axis, and, before any of that, gave the sine curve what appears to be its first sustained treatment in print as a curve in its own right, with quadratures and centroids of its own. It is the tract that Leibniz read in Paris in 1673 on Huygens's advice, counted among his sources for the calculus, and named in 1705 in the sentence about Newton's fluxions that Newton later treated as the opening charge of the priority war. A dozen or so copies are recorded in the libraries of Europe and one in America; the only copy recorded at auction was the one in the Macclesfield sammelband, bound in English calf and trimmed. The present copy was never bound at all — stitched into its original paper wrappers as it was sold in Rome, untrimmed and nearly three centimetres taller than the Macclesfield leaf, the spine lettered in ink by an early reader who took the pseudonym at its word: Farby.

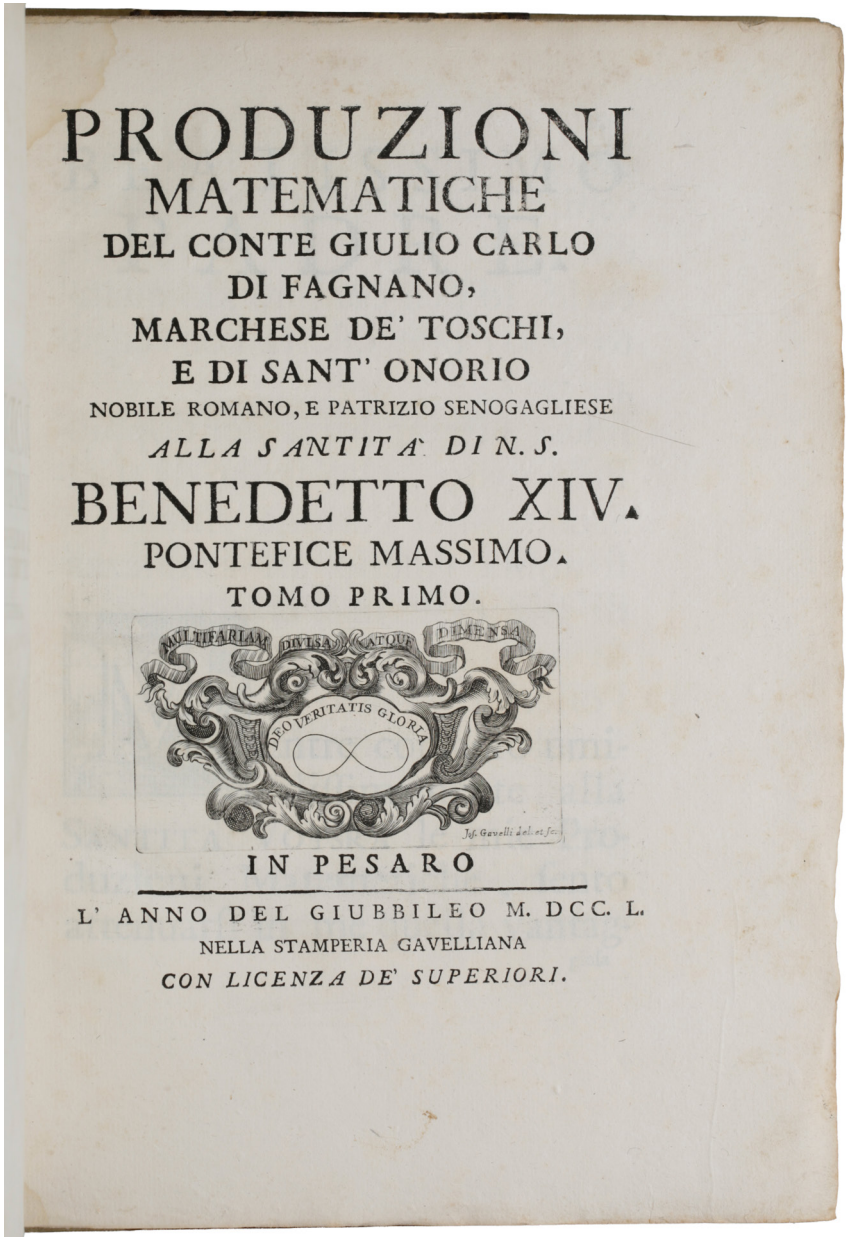

OPVSCVLVM
GEOMETRICVM
DE
LINEA SINVVM ET CYCLOIDE
Auctore
ANTIMO FARBIO
AMICA NVMINIS ET LVMINIS
ROMAE,
Typis HH. Franciſci Corbelletti. 1659.
SUPERIORUM PERMISSU.

The Birth of the Theory of Elliptic Functions

FAGNANO, Giulio Carlo. *Produzioni matematiche.* Pesaro: Stamperia Gavelliana, 1750.

$6,500

First edition of the collected mathematical writings of Fagnano — the only collected edition issued in his lifetime, and the two quarto volumes which, laid before the Berlin Academy on 23 December 1751, put his doubling of the arc of the lemniscate in front of Leonhard Euler. Five weeks after the volumes were handed to him for examination Euler read to the Academy the first of his papers on the comparison of arcs, the papers from which the addition theorem for elliptic integrals descends, and Jacobi, going through the Academy's minutes a century later, fixed on that examination as the moment the theory of elliptic functions came into being. The work at the centre of the story had been in print since 1718, in an Italian literary journal where its implications had gone unremarked; it was the Pesaro reprint, in these volumes, that carried it north. Around it Fagnano gathered the twenty-five or so papers he had printed between 1713 and 1749 and three large pieces never printed before — a general theory of proportion, a new algorithm for the equations of the second to the fourth degree, and a treatise on the geometry of the triangle — the whole reviewed for Benedict XIV by the two Minim editors of the Geneva *Principia* and dedicated to him in the Holy Year of 1750.



PRODUZIONI
MATEMATICHE
DEL CONTE GIULIO CARLO
DI FAGNANO,
MARCHESE DE' TOSCHI,
E DI SANT' ONORIO
NOBILE ROMANO, E PATRIZIO SENOGAGLIESE
ALLA SANTITA' DI N. S.
BENEDETTO XIV.
PONTEFICE MASSIMO.
TOMO PRIMO.

MULTIFARIAM DIVISA ATQUE DIMENSA
DEO VERITATIS GLORIA

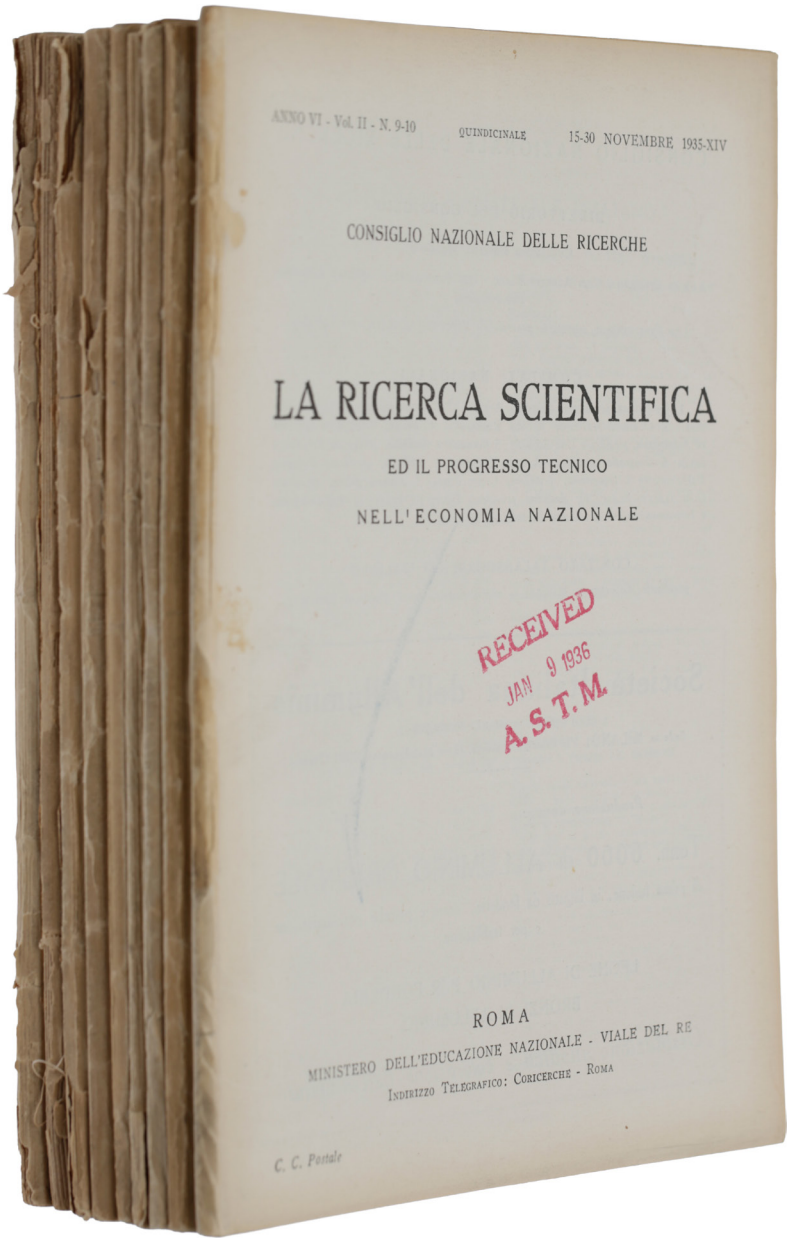
IN PESARO
L' ANNO DEL GIUBBILEO M. DCC. L.
NELLA STAMPERIA GAVELLIANA
CON LICENZA DE' SUPERIORI.

Slow Neutrons on Via Panisperna — Nobel Prize in Physics 1938

FERMI, Enrico.; AMALDI, Edoardo.; RASETTI, Franco. *Sull'assorbimento dei neutroni lenti I–III.* [With:] *Sul cammino libero medio dei neutroni lenti nella paraffina.* [With:] *Sui gruppi di neutroni lenti.* [With:] *Sulle proprietà di diffusione dei neutroni lenti.* [With:] *Sopra l'assorbimento e la diffusione dei neutroni lenti.* [With:] *Sul moto dei neutroni nelle sostanze idrogenate.* [With:] *Un generatore artificiale di neutroni.* [With:] *Azione del boro sui neutroni caratteristici dello iodio.* [With:] *Recenti risultati della radioattività artificiale.* Rome: Consiglio Nazionale delle Ricerche, 1935–38.

$6,500

First editions, the complete run of the ten papers in which Enrico Fermi and his last two collaborators in Rome turned the slow neutron from an accident with a block of paraffin into a measured branch of physics. Each paper is here in the complete original fortnightly issue of the journal of Italy's National Research Council. Between November 1935 and October 1938 these papers sorted the neutrons leaving a block of paraffin into groups, identified the thermal group, measured the four constants of their diffusion and the probability that a proton captures one, read the widths and energies of the resonances Bohr had just predicted, and, in the forty-page theoretical memoir at the centre of the run, derived the slowing-down calculation, the extrapolation length and the delta-function potential that still carry Fermi's name. Fermi restated these results as the substance of his Nobel lecture in December 1938; four years later they were the working constants of the pile under the Chicago stands.



Inaugurated the Modern Epoch in Electricity

GALVANI, Luigi. *De viribus electricitatis in motu musculari commentarius.* [Bound with:] **ALDINI, Giovanni.** *De animali electricitate dissertationes duae. Bologna: Press of the Academy of Sciences, 1794.* [With:] **GALVANI, Luigi.** *De viribus electricitatis in motu musculari commentarius cum Joannis Aldini dissertatione et notis. Accesserunt epistolae ad animalis electricitatis theoriam pertinentes. Modena: apud Societatem Typographicam, 1792.* Bologna: Press of the Academy of Sciences, 1791.

$195,000



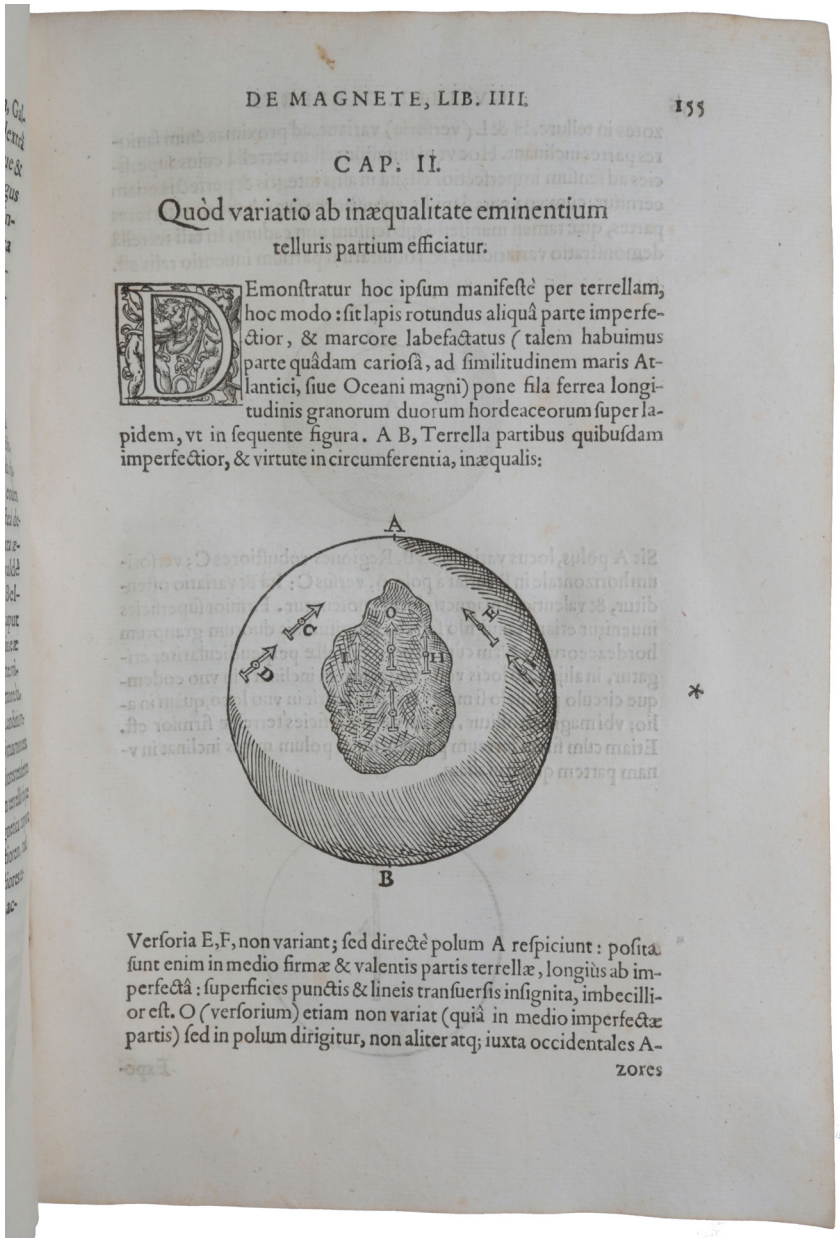
First edition — the separately issued offprint, distributed before the journal volume appeared and therefore the true first edition — of the paper 'which inaugurated the modern epoch in electricity' (Evans): Galvani's report that the leg of a dissected frog contracts when nerve and muscle are joined through two different metals, the animal itself serving as the instrument that reveals the current. The journal volume was not published until early 1792; it was an offprint that reached Volta, who repeated the experiments, read the effect as contact electricity between the metals, and was led directly to the pile, the first source of a continuous current. The four engraved plates of dissections and apparatus are, with Harvey's plate of the veins of the arm, the most famous illustrations in the history of biology. Well over a dozen copies of the offprint are traced, few of them ever at auction; the copy Volta inscribed 'Ex dono Auctoris' passed into the Burndy Library. Bound with Aldini's two *Dissertationes* of 1794 — no copy in any American institution — and the Modena book edition of 1792 with Aldini's commentary.

Copernicus in England, Before Kepler and Galileo

GILBERT, William. *De magnete, magneticisque corporibus, et de magno magnete tellure; Physiologia nova, plurimis & argumentis, & experimentis demonstrata.* London: Peter Short, 1600.

$50,000

First edition, and a very fine copy, of the book which has been celebrated for four centuries as the foundation of the sciences of magnetism and electricity — but, no less, one of the earliest printed books to explain and argue for Copernican cosmology. Its sixth book asserts the daily rotation of the earth as a magnetic motion — the first physical account of why the earth should turn — dissolves the sphere of the fixed stars into lights at vast and varying distances, answers Tycho Brahe's objections by name, and expounds Copernicus's theory of precession; and the prefatory address by Edward Wright meets the scriptural objection with the argument that Moses accommodated himself to common speech as nurses do to infants, fifteen years before Galileo made the same case to Christina of Lorraine. The cosmology was taken exactly as seriously as the magnetism: Kepler built the magnetic sun of the *Astronomia nova* on this book, Galileo carried its philosophy into the *Dialogo* as the natural ally of the moving earth, and the Collegio Romano's copy survives with Book VI torn out.



DE MAGNETE, LIB. IIII. 155

CAP. II.

Quòd variatio ab inæqualitate eminentium telluris partium efficiatur.

DEmonſtratur hoc ipſum manifeſtè per terrellam, hoc modo: ſit lapis rotundus aliquâ parte imperfectior, & marcore labefactatus (talem habuimus parte quâdam carioſâ, ad ſimilitudinem maris Atlantici, ſiue Oceani magni) pone fila ferrea longitudinis granorum duorum hordeaceorum ſuper lapidem, vt in ſequente figura. A B, Terrella partibus quibuſdam imperfectior, & virtute in circumferentia, inæqualis:

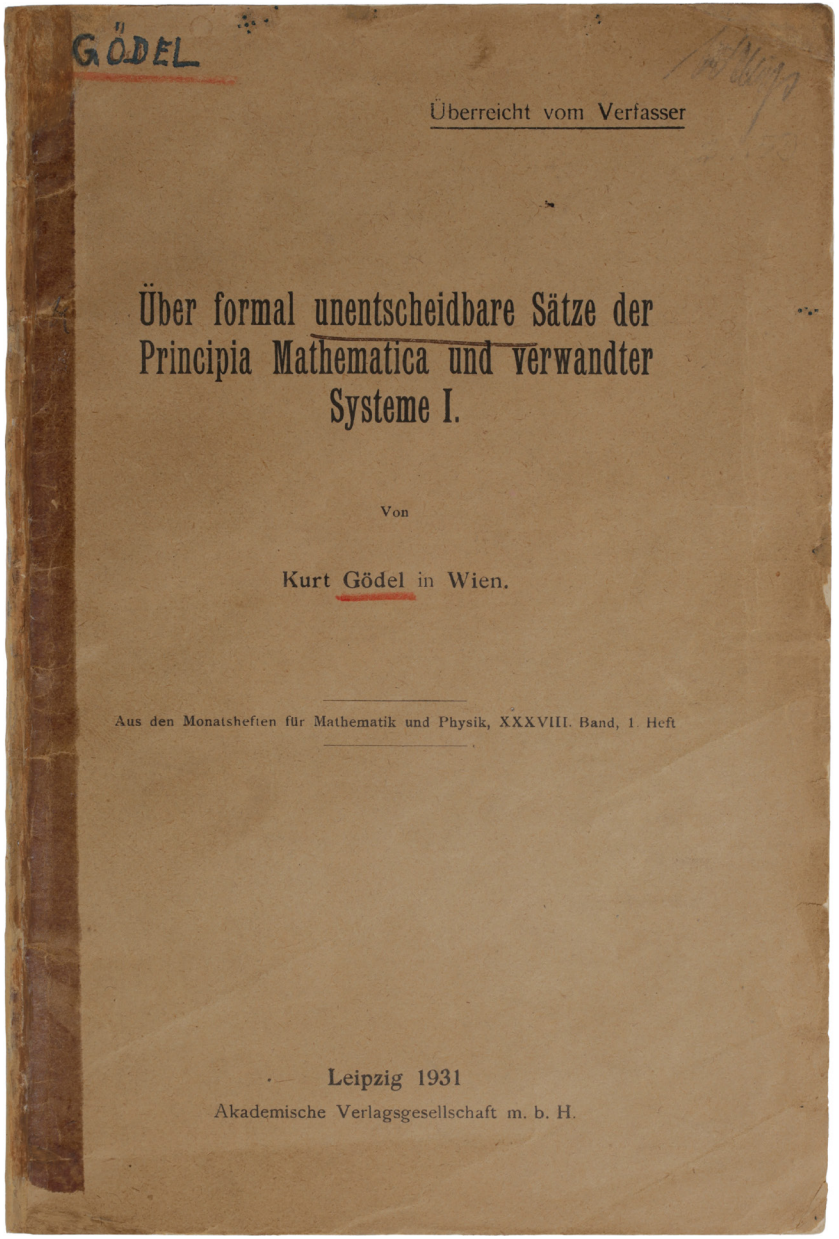
Verſoria E,F, non variant; ſed directè polum A reſpiciunt: poſita ſunt enim in medio firmæ & valentis partis terrellæ, longiùs ab imperfectâ: ſuperficies punctis & lineis tranſuerſis inſignita, imbecillior eſt. O (verſorium) etiam non variat (quiâ in medio imperfectæ partis) ſed in polum dirigitur, non aliter atq; iuxta occidentales Azores

Carnap's Working Copy of Gödel's Incompleteness Paper

GÖDEL, Kurt. *Über formal unentscheidbare Sätze der Principia Mathematica und verwandter Systeme I.* Leipzig: Akademische Verlagsgesellschaft, 1931.

$285,000

First edition, the author's presentation offprint, and Rudolf Carnap's own working copy of Gödel's incompleteness paper — signed by him on the wrapper and annotated in pencil, in German cursive and his Stolze-Schrey shorthand, on fifteen pages, in two campaigns, the later dated 1938 in his hand. Gödel's twenty-six pages carry the two theorems that ended Hilbert's formalist programme as Hilbert had conceived it. Carnap was among the first Gödel told of the result, in Vienna in August 1930, and within four years had made Gödel's arithmetisation the technical core of his *Logische Syntax der Sprache* (1934). The undated notes apply the vocabulary of that book to the paper: beside Gödel's numbering of class signs Carnap cites page 272 of his own 1934 paper on the antinomies in the first person, and his glosses on Gödel's axioms follow the comparison he printed as §33. The notes of 1938 carry his turn from syntax to semantics into the margin: his earlier reading of Gödel's recursive functions as expressions is retracted in favour of what the signs designate, and a nine-line note on Gödel's Theorem IX contrasts the true undecidable sentences of arithmetic with the unrefutable false ones of first-order logic. The shorthand has been transcribed by the Rudolf Carnap Digital project at LMU Munich. Apart from Gödel's own corrected copy at Princeton, no other recorded copy carries substantive annotation by a major logician in his own hand.


GÖDEL

Überreicht vom Verfasser

Über formal unentscheidbare Sätze der Principia Mathematica und verwandter Systeme I.

Von

Kurt Gödel in Wien.

Aus den Monatsheften für Mathematik und Physik, XXXVIII. Band, 1. Heft

Leipzig 1931

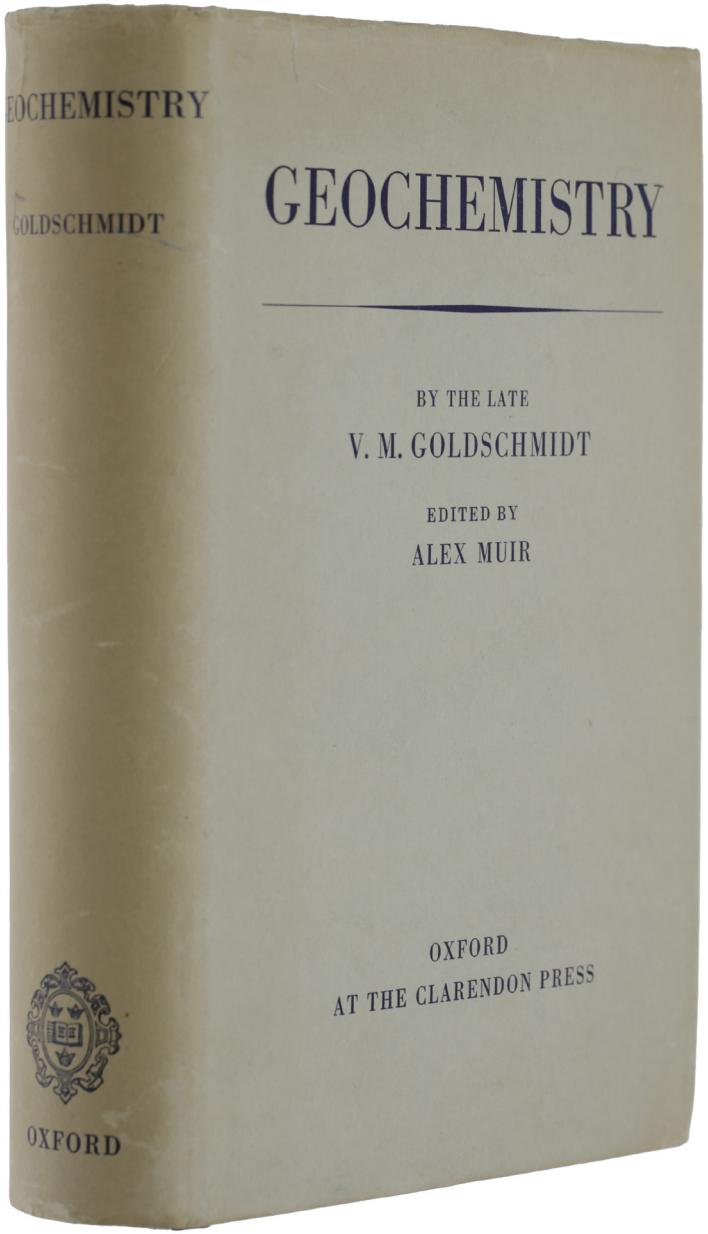
Akademische Verlagsgesellschaft m. b. H.

The Definitive Treatise on the Science of Geochemistry

GOLDSCHMIDT, Victor Moritz. *Geochemistry. Edited by Alex Muir.* Oxford: Clarendon Press, 1954.

$2,500

First edition, first printing, of the founder's own treatise — the book in which Goldschmidt, who had made a science of the chemistry of the earth, put its laws into English: the division of the elements into lithophile, siderophile, chalcophile, and atmophile; the ionic radii and substitution rules that bear his name; the abundance tables running from glacial clays to meteorites and the sun. Arrested as a Jew in occupied Norway and taken off the quayside beside the deportation ship *Donau*, Goldschmidt was flown to Britain in 1943 and drafted the book at Aberdeen and Rothamsted, much of it from hospital beds; he died at Oslo in 1947 with the general part barely begun, and his friend Alex Muir spent years completing the work. Arthur Holmes headed his notice in *Nature* 'A Geochemical Classic'; the *Dictionary of Scientific Biography* calls it 'the definitive treatise on the science of geochemistry'; through Suess and Urey's table of 1956 its abundances passed into the theory of the elements' origin in the stars.

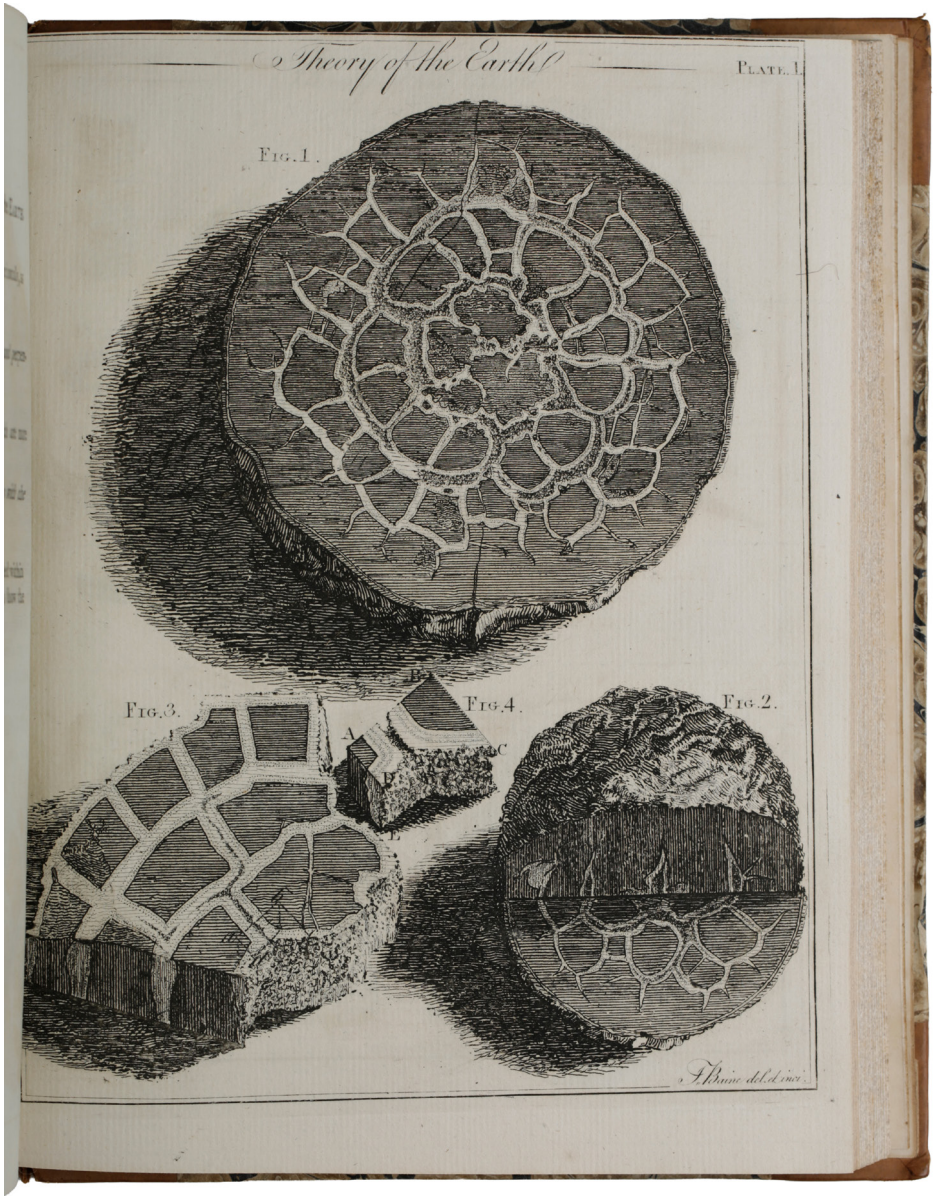


From the Library of James Watt

HUTTON, James.; PLAYFAIR, John.; WATT, Gregory.; HALL, Sir James.; BEDDOES, Thomas. *Theory of the Earth; or an Investigation of the Laws observable in the Composition, Dissolution, and Restoration of Land upon the Globe.* [Bound with:] **PLAYFAIR, John.** *Biographical Account of James Hutton, M.D. F.R.S. Ed.* [And:] **WATT, Gregory.** *Observations on Basalt, and on the Transition from the Vitreous to the Stony Texture.* [And:] **HALL, Sir James.** *Account of a Series of Experiments, shewing the Effects of Compression in modifying the Action of Heat.* [And:] **BEDDOES, Thomas.** *Observations on the Affinity between Basaltes and Granite.* [Edinburgh: for the Royal Society of Edinburgh, c. 1787].

$95,000

First edition of the offprint of Hutton's paper of 1785, the founding statement of modern geology, from the library of James Watt, to whom Hutton sent the paper through the Wedgwoods in August 1787, before the *Transactions* volume of 1788 existed. Hutton argued that land is worn away, laid down as strata beneath the sea, consolidated and raised again by subterranean heat, in a cycle so slow and so often repeated that the rocks show no trace of a first world or a last. Kirwan objected in 1793 that such heat would have burnt limestone to lime and turned basalt to glass. The Watts had the offprint bound with the papers that answered him: Sir James Hall's compression experiments, in the separate printing of 1805, seven years before the journal; Gregory Watt's slow-cooled basalt of 1804, by James Watt's son, dead before the year was out; Beddoes's 1791 paper on basalt and granite, inscribed to the radical Thomas Cooper; and Playfair's life of Hutton. Ten institutional copies of the offprint are recorded.

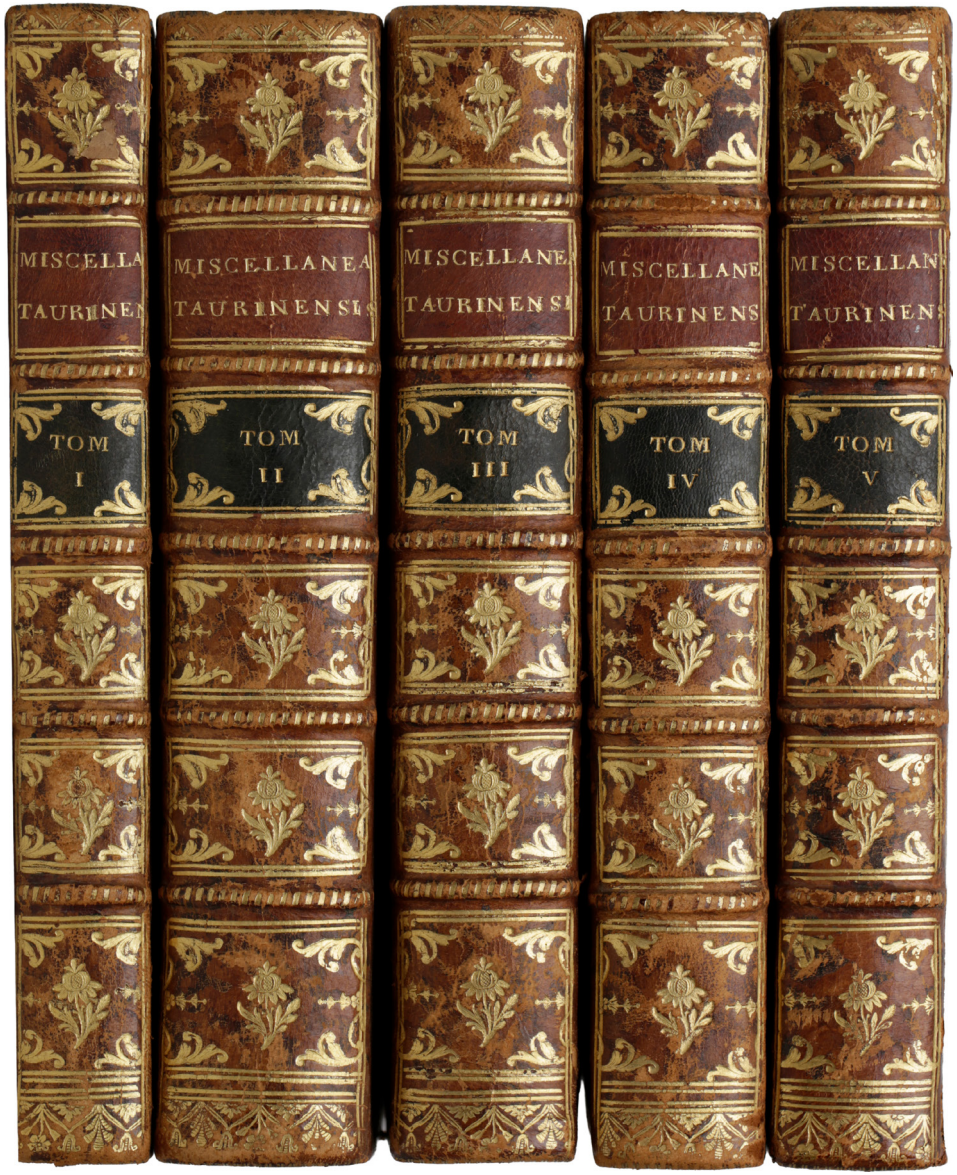


The Birth of the Calculus of Variations

LAGRANGE, Joseph Louis; EULER, Leonhard et al.
Miscellanea philosophico-mathematica Societatis privatae Taurinensis. Tomus primus. [With:] *Mélanges de philosophie et de mathématique de la Société Royale de Turin, pour les années 1760-1761 [-1762-1765; 1766-1769; 1770-1773].* Turin: Ex Typographia Regia; De l'Imprimerie Royale, 1759-[1776].

$22,500

First edition, the complete five-volume run, of the journal of the scientific society Lagrange founded in Turin at twenty-one with Cigna and Saluzzo, containing sixteen of his memoirs, the first of them written before Frederick the Great called him to Berlin in 1766. The second volume (1762) prints the *Essai d'une nouvelle méthode*, in which the calculus of variations first appeared as an analytical method with its own symbol, the δ, and the *Application* that built dynamics on least action and heralds the *Méchanique analitique*; Euler answered by adopting the method and naming the subject. The volumes also carry Euler's letter to Lagrange and five of his memoirs, d'Alembert's letters, one of Laplace's earliest memoirs, and Lagrange's memoir of 1776 on the mean of observations, whose generating functions arrived at the transform that would bear Laplace's name. Issued over seventeen years under two titles, complete runs are uncommon; this set, uniformly bound after 1776, carries the Annunziata bookplate of Carlo Baldassarre Perrone di San Martino (1718–1802), Vittorio Amedeo III's foreign minister.

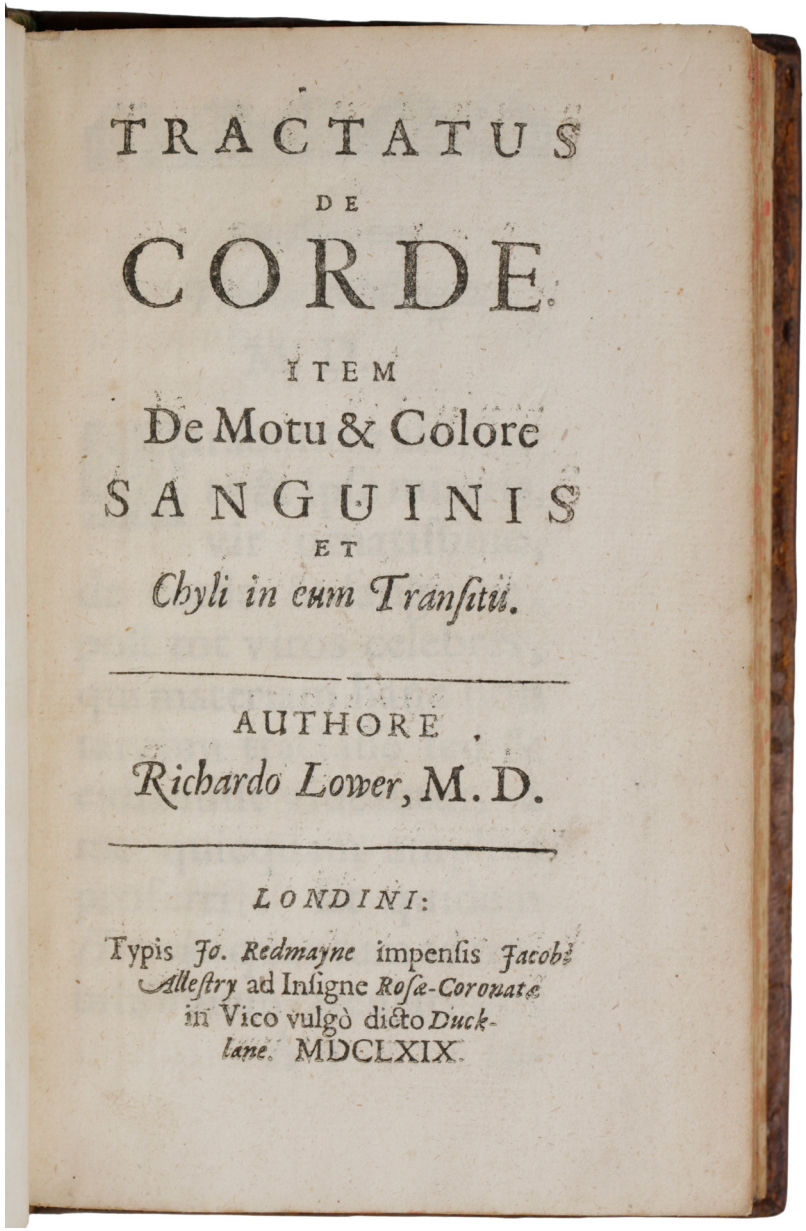


Why the Blood Turns Red

LOWER, Richard. *Tractatus de Corde. Item de Motu & Colore Sanguinis et Chyli in eum Transitu.* London: John Redmayne for James Allestry, 1669.

$20,000

First edition, second issue, of the most important work on the heart and the circulation after Harvey's *De motu cordis*. Richard Lower (1631–1691), the working anatomist of the Oxford circle of Willis, Boyle and Hooke, established three things in one small octavo: that the heart is a single spiral muscle, a structure confirmed again in Mall's dissections of 1911; that dark venous blood is turned bright red in the lungs by contact with air, and not by any heat of the heart — the experiment, made with Robert Hooke, on which the whole later chemistry of respiration was built; and, in the fourth chapter, the first sustained account of blood transfusion, including his own dog-to-dog operation of 1666. The question of why the blood reddens, asked since antiquity, was here answered for the first time by experiment. A clean, fresh copy in contemporary English calf, skilfully re-backed, complete with all seven folding plates, the last showing the transfusion apparatus. PMM 149; Garrison-Morton 761; Norman 1397; Grolier/Medicine 34.


TRACTATUS
DE
CORDE.
ITEM
De Motu & Colore
SANGUINIS
ET
Chyli in eum Tranſitu.

AUTHORE
Richardo Lower, M. D.

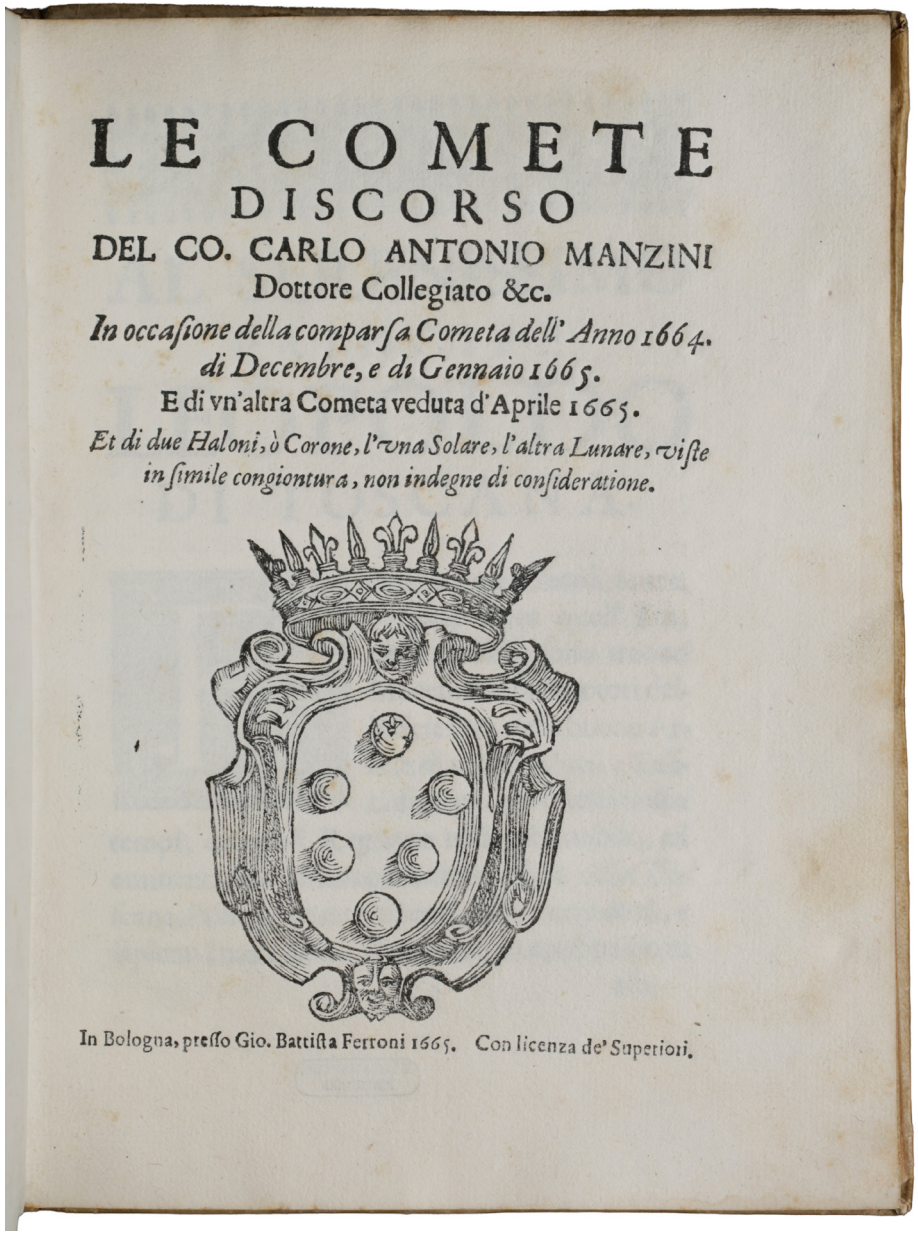
LONDINI:
Typis *Jo. Redmayne* impenſis *Jacobi Alleſtry* ad Inſigne *Roſæ-Coronatæ* in Vico vulgò dicto *Duck-lane.* MDCLXIX.

The Comets of 1664–65: Prince Leopoldo's Copy

MANZINI, Carlo Antonio. *Le Comete. Discorso … In occasione della comparsa Cometa dell'Anno 1664. di Decembre, e di Gennaio 1665. E di un'altra Cometa veduta d'Aprile 1665. Et di due Haloni, ò Corone, l'una Solare, l'altra Lunare, viste in simile congiontura, non indegne di consideratione.* Bologna: Giovanni Battista Ferroni, 1665.

$15,000

First and only edition of Manzini's discourse on the comets of December 1664 and April 1665, dedicated to Prince Leopoldo de' Medici, patron of the Accademia del Cimento — and the copy Leopoldo gave away: the recipient wrote on the flyleaf that the prince, his lord, had given him the book on 6 October 1665, three months after Manzini dated the dedication and sent it to Florence already printed, lest permission be refused. Manzini, author of *L'occhiale all'occhio* (1660), observed the April comet with a Divini telescope of more than thirty-seven palms and records a lunar halo with a comet-like tail and a solar corona. He places comets as exhalations in the pure ether, draws the comet's path as a circle about the Sun's eccentric, and closes with a method for finding a comet's eccentric circle and its eccentricity from three observations. Later in the princely Liechtenstein library and the comet library of the astronomer Philippe Véron; contemporary Italian gilt vellum, edges gilt. Absent from Lalande and Houzeau & Lancaster.



LE COMETE

DISCORSO

DEL CO. CARLO ANTONIO MANZINI

Dottore Collegiato &c.

In occasione della comparsa Cometa dell' Anno 1664. di Decembre, e di Gennaio 1665.

E di vn'altra Cometa veduta d'Aprile 1665.

Et di due Haloni, ò Corone, l'vna Solare, l'altra Lunare, viste in simile congiontura, non indegne di consideratione.

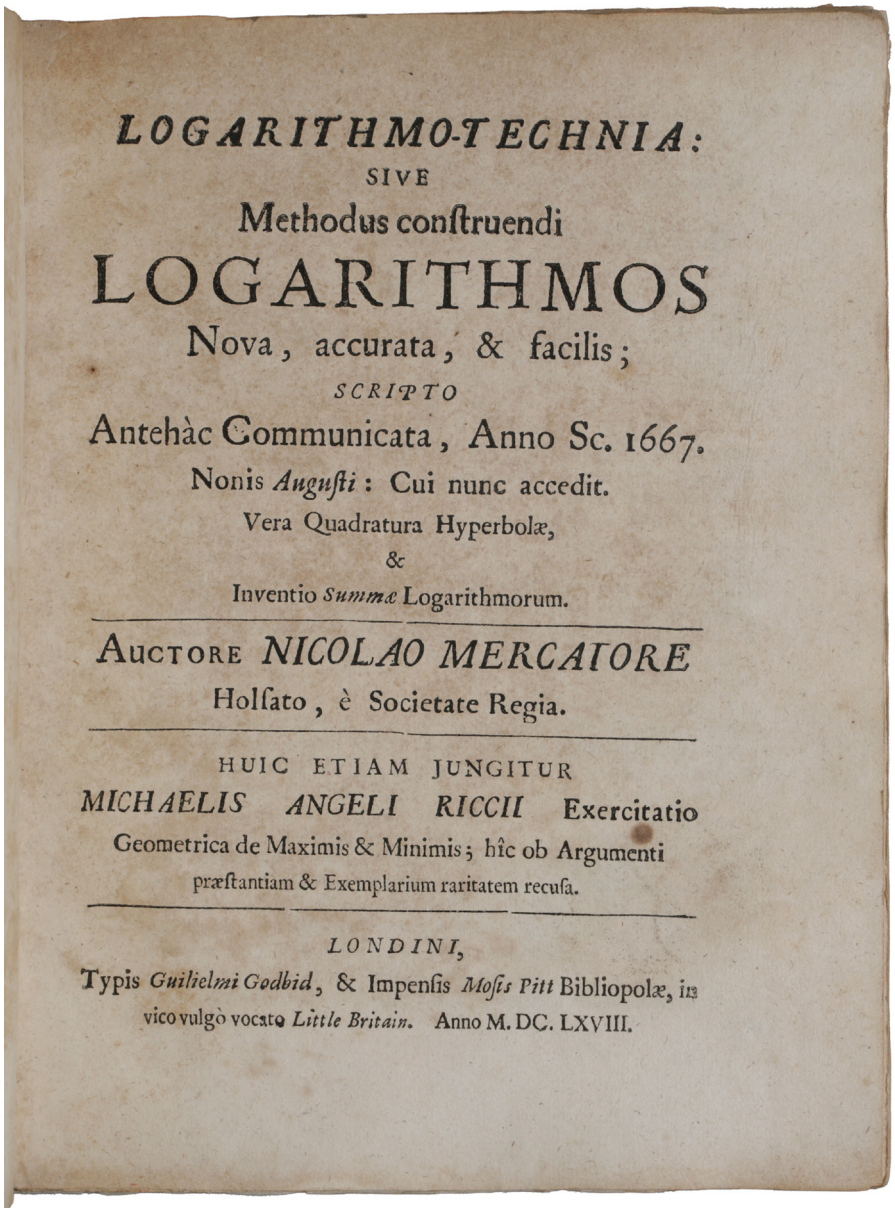
In Bologna, presso Gio. Battista Ferroni 1665. Con licenza de' Superiori.

The Mercator Series

MERCATOR, Nicolaus. *Logarithmo-technia: sive methodus construendi logarithmos nova, accurata, & facilis; scripto antehàc communicata, anno sc. 1667.* London: William Godbid for Moses Pitt, 1668.

$6,500

First edition of the tract that gave the seventeenth century its first power series for a transcendental function. Where Wallis's rule for summing powers failed on the hyperbola, Mercator shifted the axis, expanded the ordinate $1/(1 + x)$ by ordinary long division, applied the rule to each power of the quotient, and so obtained the area under the curve — and therefore the logarithm — as an endless alternating sum, verified by working two areas out to forty-four places and finding one twice the other. A final proposition sums the logarithms themselves. Newton, who had the series in manuscript since 1665, released the *De analysi* in reply; Leibniz, caught out by Pell for not knowing the book, bought it in London in 1673 and built his own series for π on its method. Ricci's scarce Roman tract of 1666 on maxima and minima is reprinted at the end, vouched for by Collins.



LOGARITHMO-TECHNIA:
SIVE
Methodus conſtruendi
LOGARITHMOS
Nova, accurata, & facilis;
SCRIPTO
Antehàc Communicata, Anno Sc. 1667.
Nonis *Auguſti*: Cui nunc accedit.
Vera Quadratura Hyperbolæ,
&
Inventio *Summæ* Logarithmorum.

AUCTORE *NICOLAO MERCATORE*
Holſato, è Societate Regia.

HUIC ETIAM JUNGITUR
MICHAELIS ANGELI RICCII Exercitatio
Geometrica de Maximis & Minimis; hîc ob Argumenti
præſtantiam & Exemplarium raritatem recuſa.

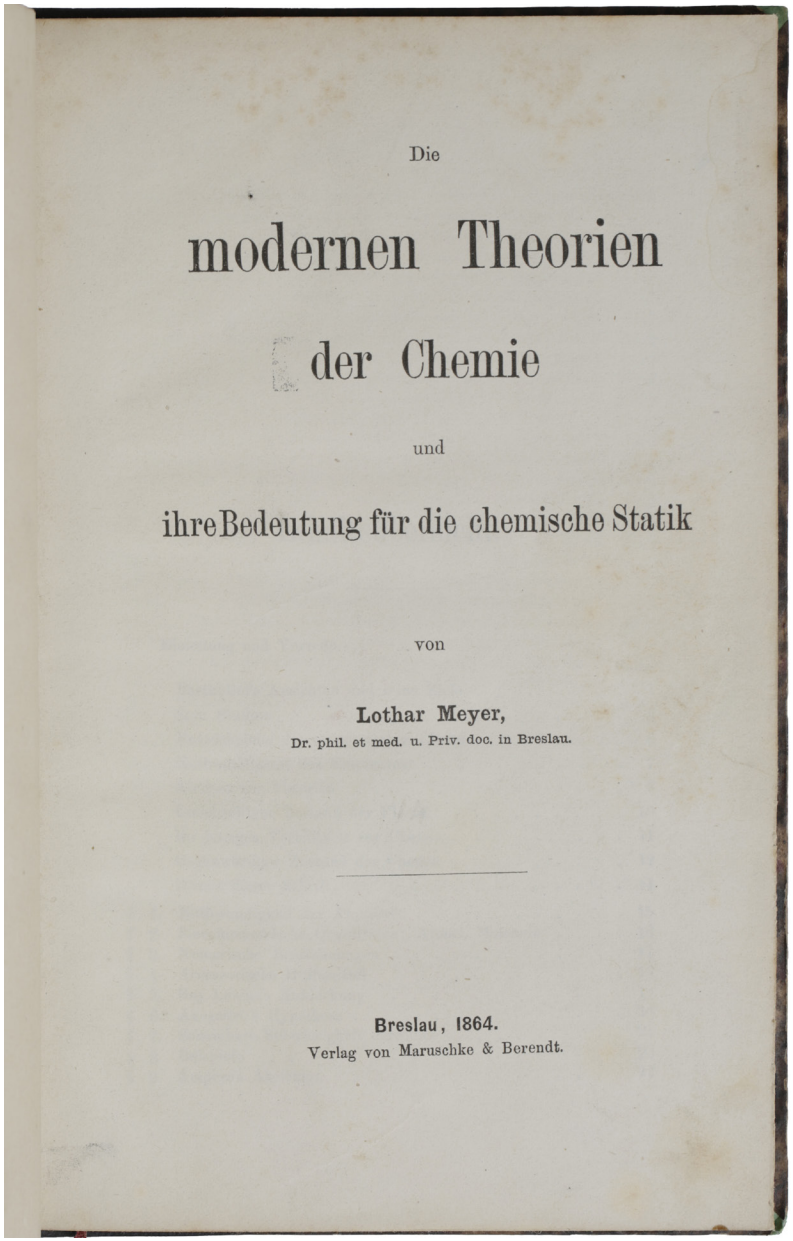
LONDINI,
Typis *Guilielmi Godbid*, & Impenſis *Moſis Pitt* Bibliopolæ, in
vico vulgò vocato *Little Britain*. Anno M. DC. LXVIII.

Meyer's First Periodic Table Published Five Years Before Mendeleev's

MEYER, Lothar. *Die modernen Theorien der Chemie und ihre Bedeutung für die chemische Statik.* Breslau: Maruschke & Berendt, 1864.

$22,500

First edition of the book in which Meyer printed his first periodic table — twenty-eight elements set out in six columns by valence and rising atomic weight, with the arithmetic of the weights written beneath them, five years before Mendeleev's table of 1869 and six before Meyer's own celebrated curve of atomic volumes — a copy from the library of Charles-Adolphe Wurtz, the leader of the atomic theory's cause in France and one of the three chemists who had convened the Karlsruhe Congress of 1860 out of which the chemistry of this book came. The table stands on pages 137 and 138; it is the document Meyer put forward when the priority of the periodic system was fought over in 1880, and two years later the Royal Society closed the quarrel by awarding its Davy Medal in duplicate to Mendeleev and Meyer for their discovery of the periodic relations of the atomic weights.



Die

modernen Theorien

der Chemie

und

ihre Bedeutung für die chemische Statik

von

Lothar Meyer,

Dr. phil. et med. u. Priv. doc. in Breslau.

Breslau, 1864.

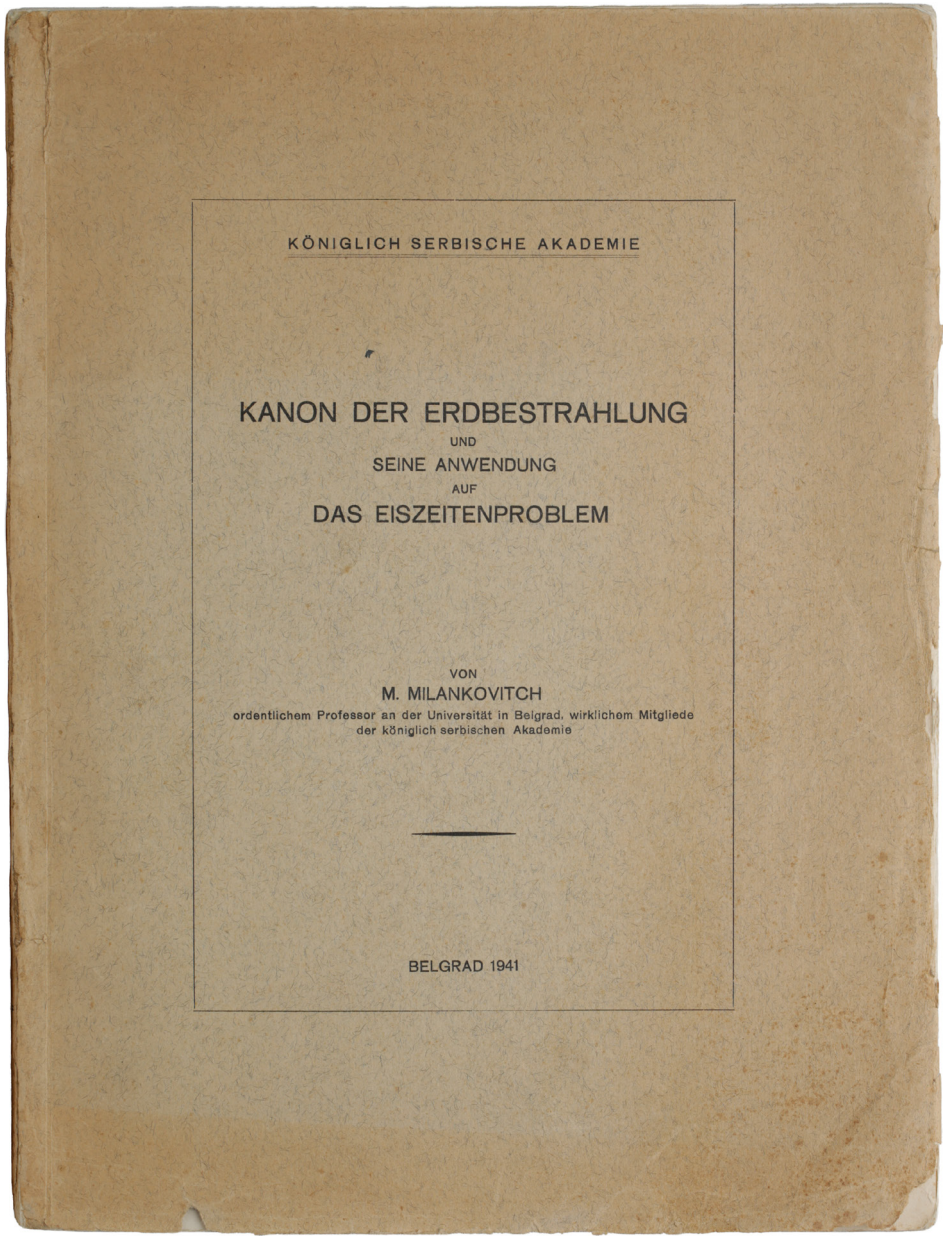
Verlag von Maruschke & Berendt.

The Astronomy of Climate Change

MILANKOVIĆ (or MILANKOVITCH), Milutin. *Kanon der Erdbestrahlung und seine Anwendung auf das Eiszeitenproblem.* Belgrad: Königlich Serbische Akademie, 1941.

$15,000

First edition of the book in which Milanković gave the astronomical theory of the ice ages its complete mathematical form, and the copy of a Dutch geologist who put that theory to the test: signed by an owner named Brouwer, probably Aart Brouwer of Leiden, who in November 1949 asked the Dutch geological society, in a paper printed the following year, whether the radiation curves tabulated here could serve to divide up the Pleistocene of the Netherlands, and who left his working note in Dutch in the margin of the preface. The *Kanon* is the summa of a life's computation. Over six hundred and thirty pages Milanković derives, from Newton's law of gravitation and the law of radiation alone, how the eccentricity of the Earth's orbit, the tilt of its axis and the precession of the equinoxes have redistributed sunlight over the globe through the last six hundred thousand years, and then sets the result against the geological record of the glaciations. He called the result a canon because it was computed with the same tools by which astronomers fix the dates of ancient eclipses, and his own name stuck to the periodicities that Hays, Imbrie and Shackleton found in the deep-sea sediment cores in 1976, now known as the Milanković cycles.


KÖNIGLICH SERBISCHE AKADEMIE

KANON DER ERDBESTRAHLUNG
UND
SEINE ANWENDUNG
AUF
DAS EISZEITENPROBLEM

VON
M. MILANKOVITCH
ordentlichem Professor an der Universität in Belgrad, wirklichem Mitgliede
der königlich serbischen Akademie

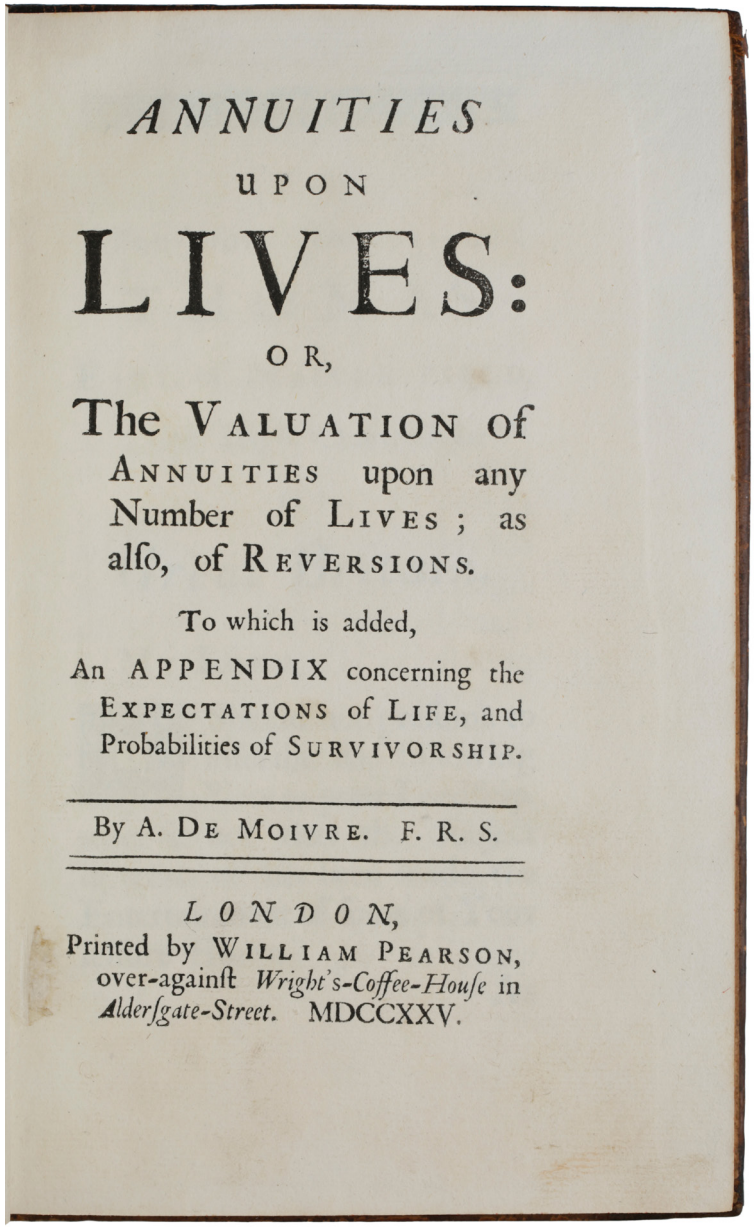
BELGRAD 1941

Probability Theory Applied to Economics

MOIVRE, Abraham de. *Annuities upon Lives: or, The Valuation of Annuities upon any Number of Lives; as also, of Reversions. To which is added, An Appendix concerning the Expectations of Life, and Probabilities of Survivorship.* London: William Pearson, 1725.

$5,500

First edition of de Moivre's application of probability to economics — the short book in which he turned the mathematics of chance on annuities, reversions and leases for lives, working from the Breslau mortality data that Edmond Halley had analysed in the 1690s. Its contribution, in the words of the *DSB*, lies "not in his evaluation of the demographic facts then known" but in the formulas de Moivre derived from a postulated law of mortality and a constant rate of interest on money: joint annuities on several lives, the inheritance of annuities, the fair division of the costs of a tontine, and the other contracts in which both age and interest on capital bear on the price. That mathematics, the *DSB* concludes, became a standard part of all subsequent commercial applications in England. Bellhouse, de Moivre's biographer, argues that historians of probability have misread the book for many years: although it is a foundational work of actuarial science, it has nothing to do with insurance or with the ordinary life annuities on sale in the marketplace of the 1720s, and everything to do with something central to the British economy, property; and it was by de Moivre's method that mathematicians became consultants in the valuation of the life-contingent contracts that property generated.



ANNUITIES

UPON

LIVES:

OR,

The VALUATION of ANNUITIES upon any Number of LIVES; as alſo, of REVERSIONS.

To which is added,

An APPENDIX concerning the EXPECTATIONS of LIFE, and Probabilities of SURVIVORSHIP.

By A. DE MOIVRE. F. R. S.

LONDON,

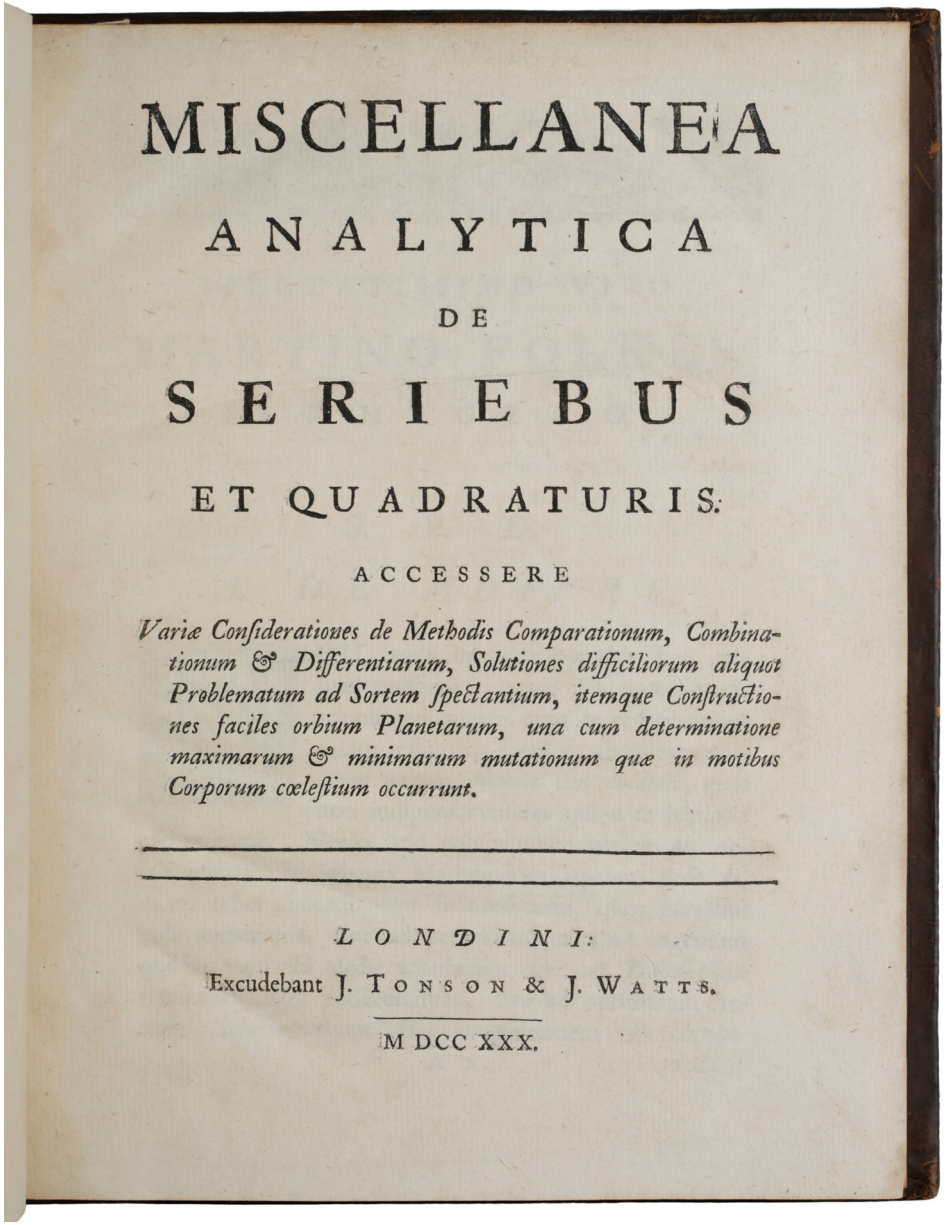
Printed by WILLIAM PEARSON, over-againſt *Wright's-Coffee-Houſe* in *Alderſgate-Street.* MDCCXXV.

The Normal Distribution

MOIVRE, Abraham de. *Miscellanea analytica de seriebus et quadraturis.* [With:] *Miscellaneis Analyticis Supplementum.* London: J. Tonson & J. Watts, 1730.

$5,500

First edition, the Haskell F. Norman copy, of the Latin miscellany that carried De Moivre to the edge of the normal distribution. In Book V he took up the question Jakob Bernoulli had left open in the *Ars conjectandi*, how quickly observed frequencies close on the true chance, and approximated the terms of a binomial raised to an immense power, drawing the curve through the tops of the terms and finding its inflections; the exponential form of 1733 finished what is set up here. The twenty-two-page *Supplementum*, printed after Stirling had caught a fifth-decimal error in De Moivre's table of log *n*! and sent him a better series, gives De Moivre's derivation of what is now called Stirling's formula, with the constant $\sqrt{(2\pi)}$; it postdates Stirling's *Methodus differentialis* and is wanting in many copies. The volume prints the first demonstration of Cotes's theorem on the circle, the generating-function proof of De Moivre's dice formula, and the *Responsio* to Montmort. With the supplement and both errata leaves.



MISCELLANEA

ANALYTICA

DE

SERIEBUS

ET QUADRATURIS.

ACCESSERE

Variæ Conſideratioues de Methodis Comparationum, Combinationum & Differentiarum, Solutiones difficiliorum aliquot Problematum ad Sortem ſpectantium, itemque Conſtructiones faciles orbium Planetarum, una cum determinatione maximarum & minimarum mutationum quæ in motibus Corporum cœleſtium occurrunt.

LONDINI:

Excudebant J. Tonson & J. Watts.

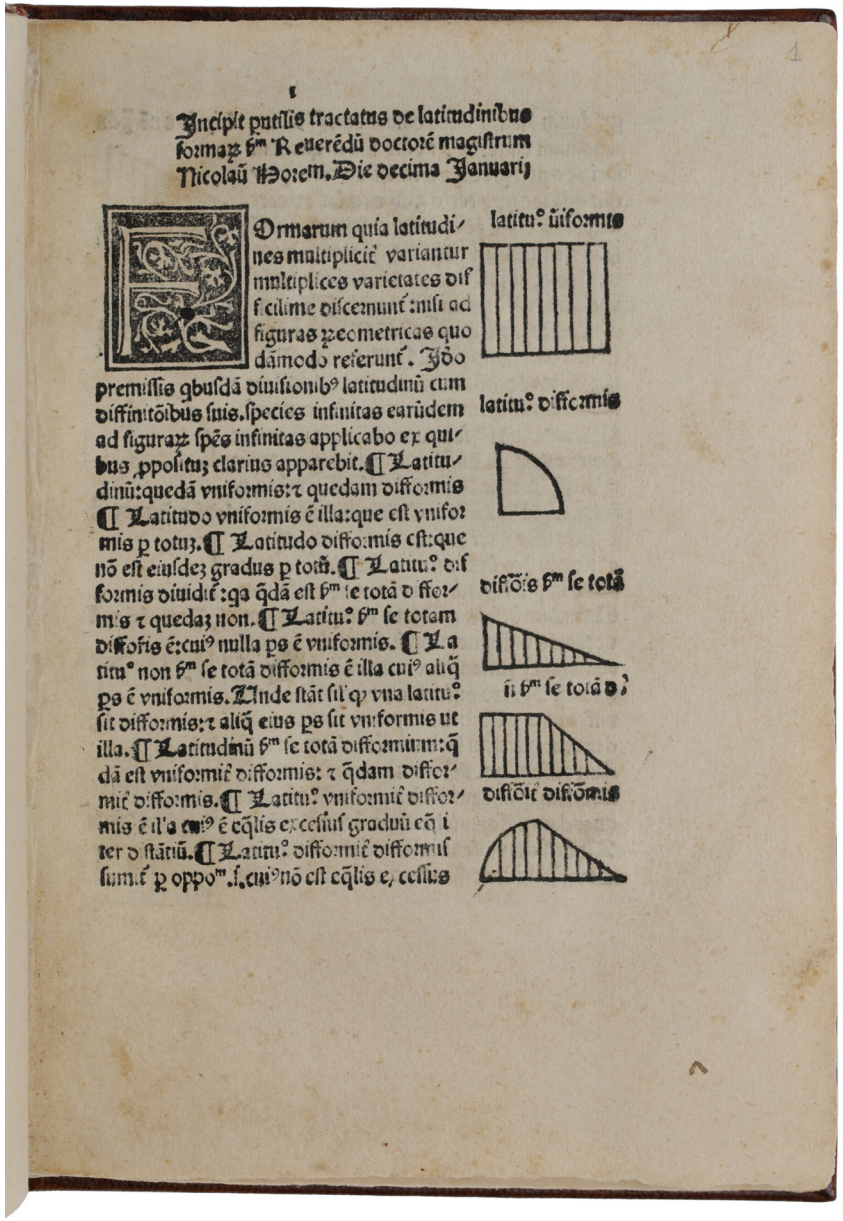
M DCC XXX.

The First Graph

ORESME, Nicole.; PELACANI DA PARMA, Biagio [Blasius of Parma]. *Tractatus de latitudinibus formarum …* [With:] *Quaestiones super tractatu de latitudinibus formarum.* Padua: Matthaeus Cerdonis, 1486.

$75,000

Second edition — the first, printed at Padua in 1482, survives in six institutional copies, all in continental Europe — of Oresme's rare work, composed c. 1350, which introduced the use of graphs to represent the dependence of one variable quantity, such as velocity, upon another, such as time. It is bound, as issued, with Blasius of Parma's *Quaestiones*, which applied its methods to prove the 'mean-speed theorem' of the Oxford calculators, a proof the treatise itself omits. Dijksterhuis, in *The Mechanization of the World Picture*, gives the tract its place in the history of method: for the first time, so far as is known, the varying intensity of a quality, or the velocity of a motion, at any point of a body or any instant of time was represented by a line-segment plotted in a given direction — "thus drawing the first graph". He counted the graphical representation of variability among the methodological expedients whose historical significance can hardly be over-estimated. Funkhouser, writing the history of statistical graphics, made the same point from the other end: Oresme grasped the idea of functionality and set out to represent it graphically, and had a contemporary handed him a body of observed figures the result would have been "statistical graphs four hundred years before Playfair".

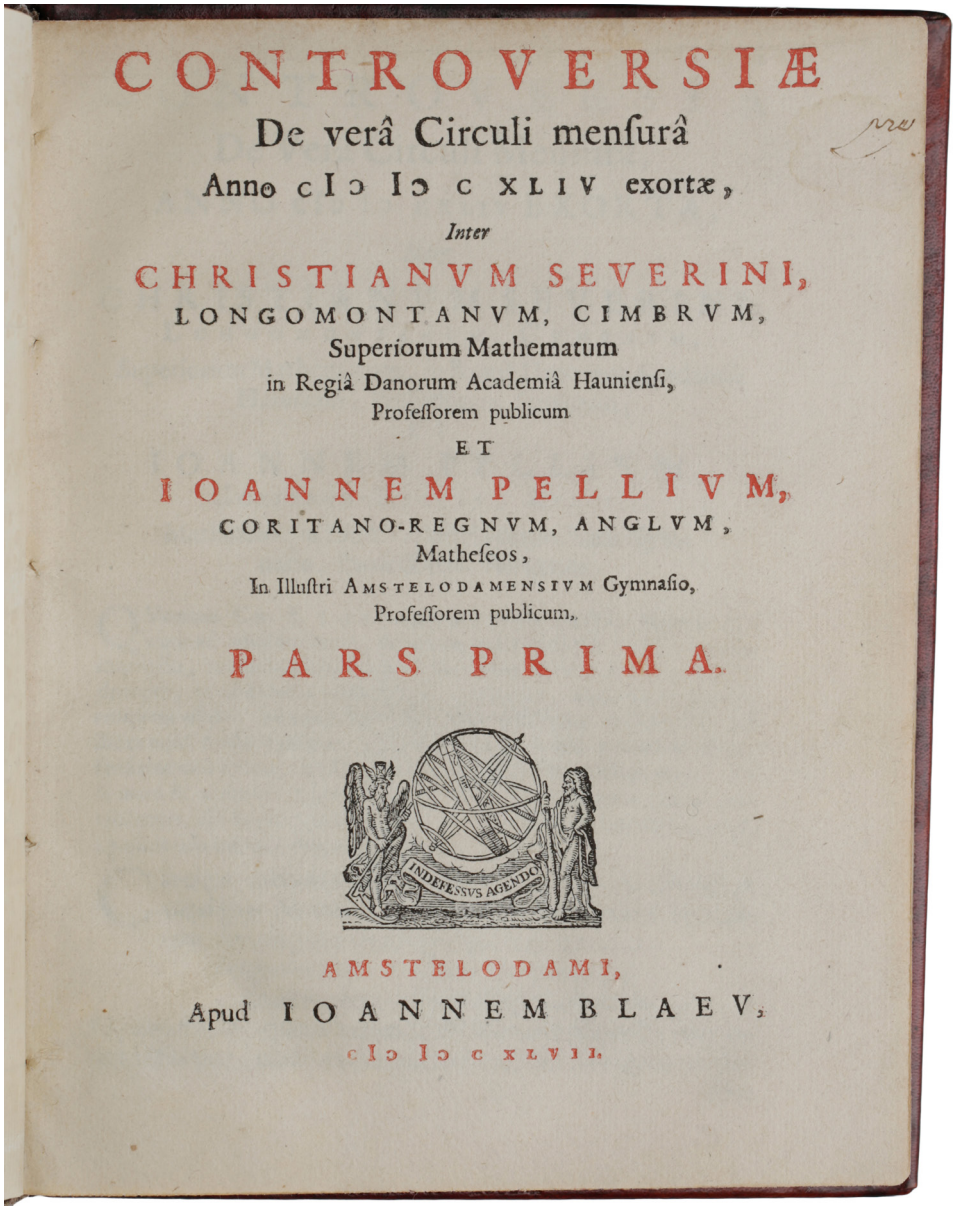


Squaring the Circle

PELL, John. *Controversiæ de vera Circuli mensura Anno 1644 exortæ, inter Christianum Severini Longomontanum … et Joannem Pellium … Pars prima [all published].* Amsterdam: Johan Blaeu, 1647.

$1,500

First edition of Pell's rare refutation of the Danish astronomer Longomontanus's attempt to square the circle. Pell was a gifted mathematician, highly regarded by his contemporaries, but has been somewhat forgotten by history as he published little. The *DSB* credits the book with enhancing Pell's fame at Amsterdam and earning him the approbation of Roberval, Hobbes, Cavendish, Cavalieri, and Descartes. This composite volume presents the history of the controversy together with the principal documents Pell had gathered: Pell's 'refutatiuncula' refuting Longomontanus's demonstration, Longomontanus's replies, and contributions by Roberval, Hobbes, de Carcavi, Mersenne, Descartes and Cavalieri, either commending Pell's work or providing proofs of his principal theorem on tangents. The death of Longomontanus in October 1647 brought the entire dispute to its natural end. Only two other copies are recorded at auction. This copy annotated in the margins by an early mathematical reader.


CONTROVERSIÆ

De verâ Circuli menſurâ

Anno cIↃ IↃ c XLIV exortæ,

Inter

CHRISTIANVM SEVERINI,

LONGOMONTANVM, CIMBRVM,

Superiorum Mathematum

in Regiâ Danorum Academiâ Haunienſi,

Profeſſorem publicum

ET

IOANNEM PELLIVM,

CORITANO-REGNVM, ANGLVM,

Matheſeos,

In Illuſtri AMSTELODAMENSIVM Gymnaſio,

Profeſſorem publicum.

PARS PRIMA.

INDEFESSVS AGENDO

AMSTELODAMI,

Apud IOANNEM BLAEV,

cIↃ IↃ c XLVII.

The First Printed Table of Arctangents

PEUERBACH, Georg. *Quadratum geometricum.* Nuremberg: Johann Stuchs, 1516.

$18,500

First edition, the Otto Schäfer copy, of one of Peuerbach's rarest works, his description of the 'quadratum geometricum,' written in 1455 but not published until 1516. This 'geometric square,' which is illustrated on the title-page, subsequently became a popular instrument for surveying and astronomical observation. The work is also important in the history of trigonometry, as it contains the first printed table of arctangents — set in red and black across a full opening, and computed from Peuerbach's own sine table of radius 600,000, a table now lost and known only because this treatise names it. *Quadratum geometricum* was dedicated to Johannes Vitéz and reprinted in 1544 within Regiomontanus's *Scripta de torqueto*. Gemma Frisius reprinted the table in 1545, and Magini gave a similar one in 1592. Only two other copies have appeared at auction in the past forty years, one of them the Tomash copy sold in 2018. Provenance: Christoph Wilhelm Putsch (1542–1572), poet, historian and chronicler in Innsbruck (inscription on title dated 1558); Otto Schäfer (1912–2000) (monogram stamp, bought in 1966), who formed one of the most important private libraries of the twentieth century.

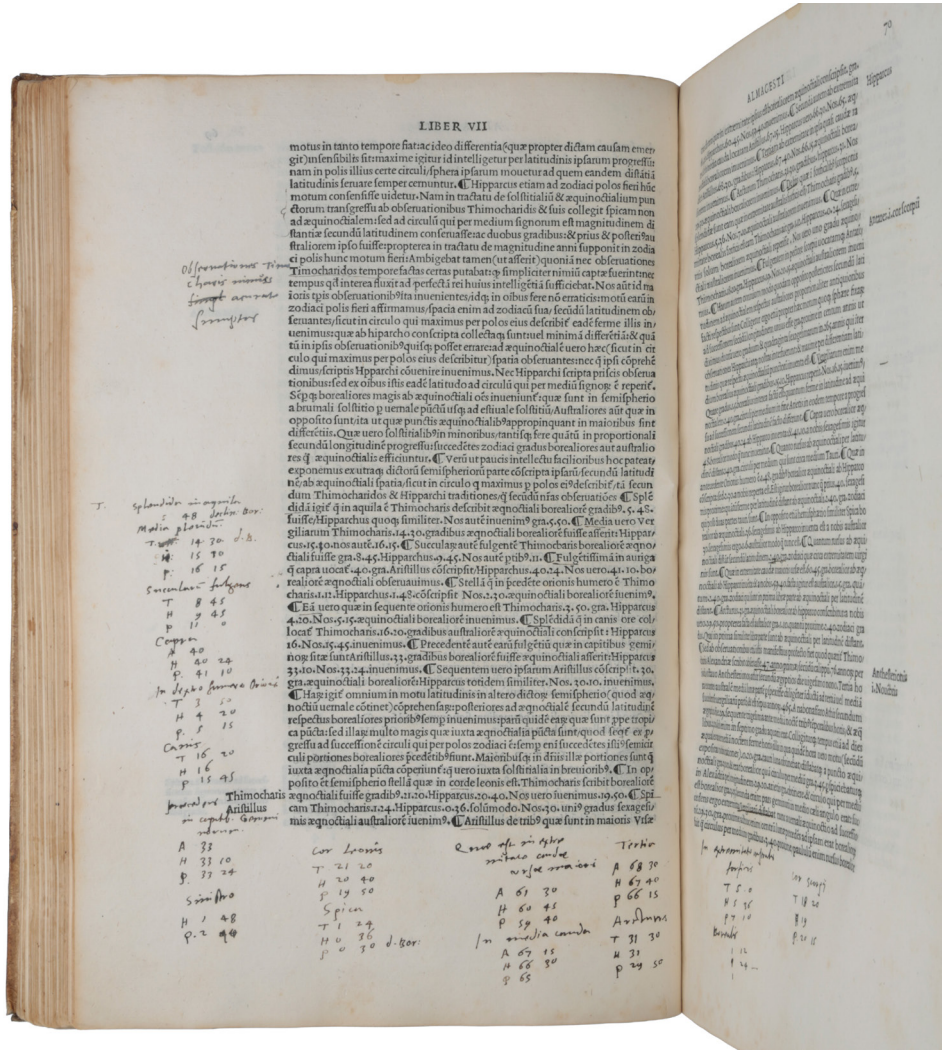


The First Copernican's Working Almagest

PTOLEMY, Claudius. *Almagestum seu magnae constructionis mathematicae opus plane divinum.* [Bound with:] **APIAN, Peter.** *Introductio geographica.* Venice; Ingolstadt: [Lucantonio Giunta]; [Peter Apianus], 1528; [1533].

$285,000

First edition of Trebizond's Latin Almagest, the copy Georg Joachim Rheticus annotated before his journey to Copernicus. The title carries his autograph as *Georgius Ioachimus de porris*, his mother's surname without the by-name Rheticus that he took at Wittenberg in 1536; Burmeister's register of his books begins only in April 1539. Thirteen leaves carry his notes. In Liber VII he drew up the comparison of star declinations between Timocharis, Hipparchus and Ptolemy by which the precession is proved, with the year-counts of the ancient observations; in Liber III and IV he copied out the solar and lunar mean motions and wrote the word *parallaxis*; in Liber V he marked the eclipse of Cambyses. In the Werner volume bound after it, Ptolemy's map projections and Werner's latitude of Rome are worked. These are the materials of the *Narratio prima*, of the *Tabula chorographica* and of the Almagest course he announced at Wittenberg in 1541, for which he printed *De lateribus* in 1542. First state, in Wittenberg pigskin by Conrad Neidel; later the Habsburg physician Polycarpus Bonanno's.



A Court Astrologer's Working Heaven

RANTZAU, Heinrich. *Tractatus astrologicus de genethliacorum thematum iudiciis, pro singulis nati accidentibus. Ex vetustis & optimis quibusque auctoribus … industria Henrici Ranzovii … collectus.* Frankfurt: Johann Wechel, 1593.

$9,500

First edition of Rantzau's handbook of nativities, and the lifelong working copy of a named astrologer: Dr. Samuel Froberg (c.1565–after 1627), physician of Göttingen and Northeim, calendar-maker and town mayor, who bought it on 12 June 1594 and filled it over thirty years in his own hand. Across the margins and flyleaves he underlined the operative rules, entered star longitudes beside Rantzau's fixed-star directions, and set against the printed doctrine the genitures of the Brunswick-Wolfenbüttel dukes he served — Heinrich Julius, copied from Giuntini and corrected for the pole, and Friedrich Ulrich, computed by himself — with notes on Duke Eric, the Emperor Ferdinand II and his own wife, and on a flyleaf his own nativity for 29 November 1565, a birth-moment no other source preserves. The book is hand-coloured, unusually for a working manual: red and green on the woodcut device, the headpieces and some of the zodiacal glyphs. Afterwards in the Nordkirchen (Plettenberg) library. A complete late-Renaissance astrological practice, in one volume, in the practitioner's own hand.

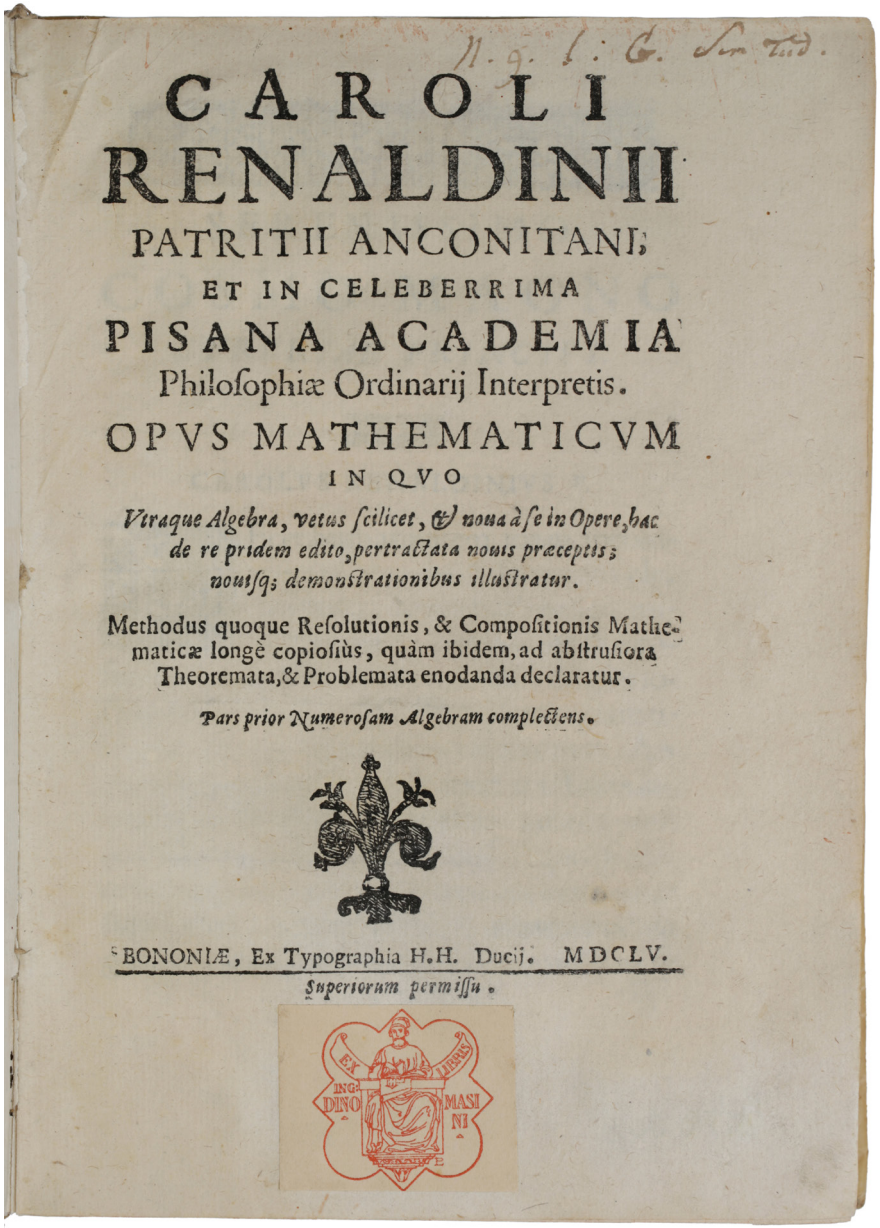


Bridging the Symbolic Algebras of Viète and Descartes

RINALDINI, Carlo. *Opus mathematicum, in quo vtraque algebra, vetus scilicet, & noua à se in opere, hac de re pridem edito, pertractata, nouis præceptis nouisque demonstrationibus illustratur.* Bologna: ex typographia H.H. Ducij [Evangelista Dozza], 1655.

$8,500

First edition, second issue, of this rare exegesis of the work of the great French mathematician François Viète (1540–1603) on the theory of equations; Rinaldini's work acted as a bridge for the transition from the symbolic algebra introduced by Viète to the methods of Descartes. The first part of Rinaldini's work is an explication of Viète's *In artem analyticum isagoge* (1591), the earliest work on symbolic algebra. Epoch-making as the *Isagoge* was, it was remarkably brief at only nine leaves, and thus ripe for the explication and commentary which Rinaldini provides in the present work. This part also discusses the contributions of Diophantus, Michiel Coignet, Albert Girard, Pedro Nunez, and Simon Stevin. It treats the general theory of (polynomial) equations, and methods of solving quadratic equations. The second part is an exposition of Viète's *De numerosa potestatum* (1600); it treats methods of solving higher degree equations by successive approximation. François Viète was "the first extensively to use letters of the alphabet" for numerical quantities (*Hutchinson*), and "the first mathematician of his age to think occasionally as mathematicians habitually think today" (Bell).



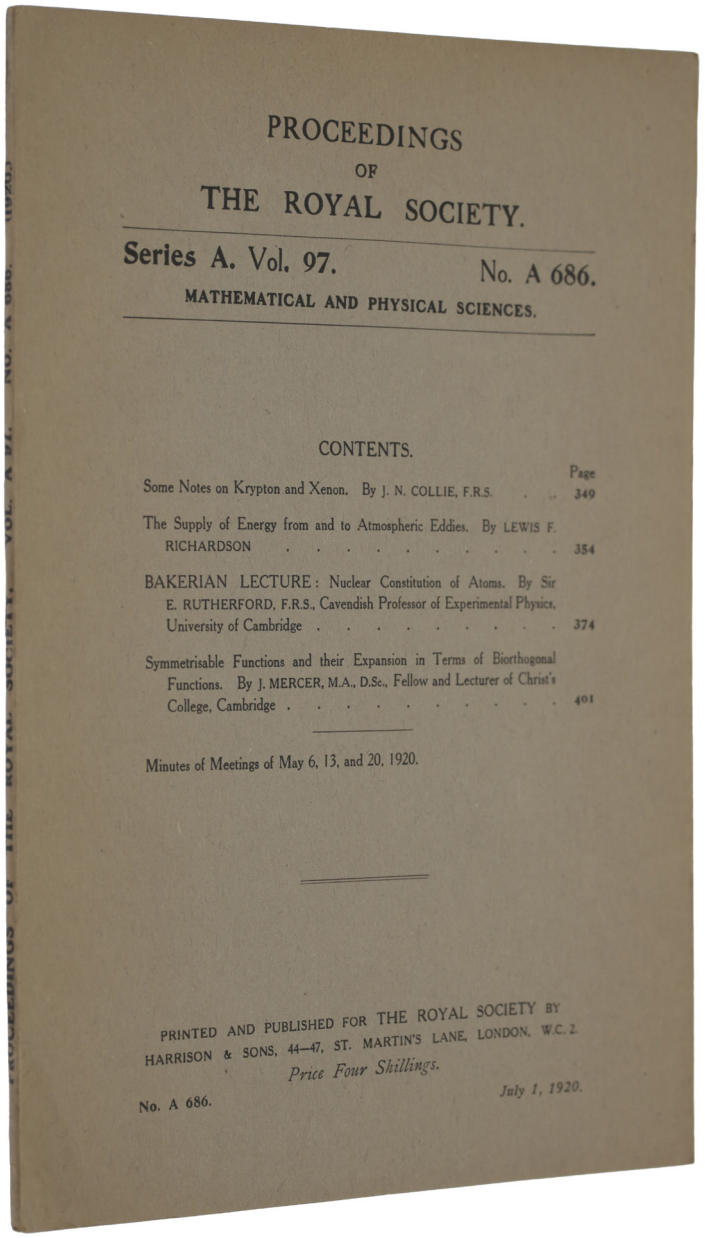
CAROLI
RENALDINII
PATRITII ANCONITANI
ET IN CELEBERRIMA
PISANA ACADEMIA
Philoſophiæ Ordinarij Interpretis.
OPVS MATHEMATICVM
IN QVO
Vtraque Algebra, vetus ſcilicet, & noua à ſe in Opere, hac de re pridem edito, pertractata nouis præceptis; nouiſq; demonſtrationibus illuſtratur.
Methodus quoque Reſolutionis, & Compoſitionis Mathematicæ longè copioſiùs, quàm ibidem, ad abſtruſiora Theoremata, & Problemata enodanda declaratur.
Pars prior Numeroſam Algebram complectens.
BONONIÆ, Ex Typographia H.H. Ducij. MDCLV.
Superiorum permiſſu.

The Prediction of the Neutron

RUTHERFORD, Ernest. *Bakerian Lecture: Nuclear Constitution of Atoms.* [London]: Harrison & Sons, 1920.

$1,250

First edition, in the journal issue as the Royal Society published it, of the paper in which Rutherford predicted the neutron — the neutral particle that his student and colleague James Chadwick found in 1932. Rutherford had discovered the atomic nucleus in 1911 and observed the proton in 1919, and by 1920 the nucleus was known to hold nearly the whole mass of the atom; yet the masses of the elements ran to about twice their atomic numbers, so the protons alone could not account for them. He gave his answer in June 1920 as his second Bakerian Lecture to the Royal Society: an electron and a proton bound so closely together that they form a single particle of mass 1 and no charge. Eve, his biographer, set the two Bakerian Lectures side by side — in the first Rutherford had given the complete foundations of radioactivity, on which all his subsequent work was a development; in the second he "laid the foundations of the transmutation of matter". What kept the idea alive through the twenties was Rutherford's conversation with Chadwick, waiting together in the dark to count scintillations at the Cavendish; Chadwick found the particle in 1932 and took the Nobel Prize for it in 1935. The neutral particle that no sealed vessel could hold, described before anyone had seen it, is the prediction printed in this number.



PROCEEDINGS
OF
THE ROYAL SOCIETY.

Series A. Vol. 97. No. A 686.

MATHEMATICAL AND PHYSICAL SCIENCES.

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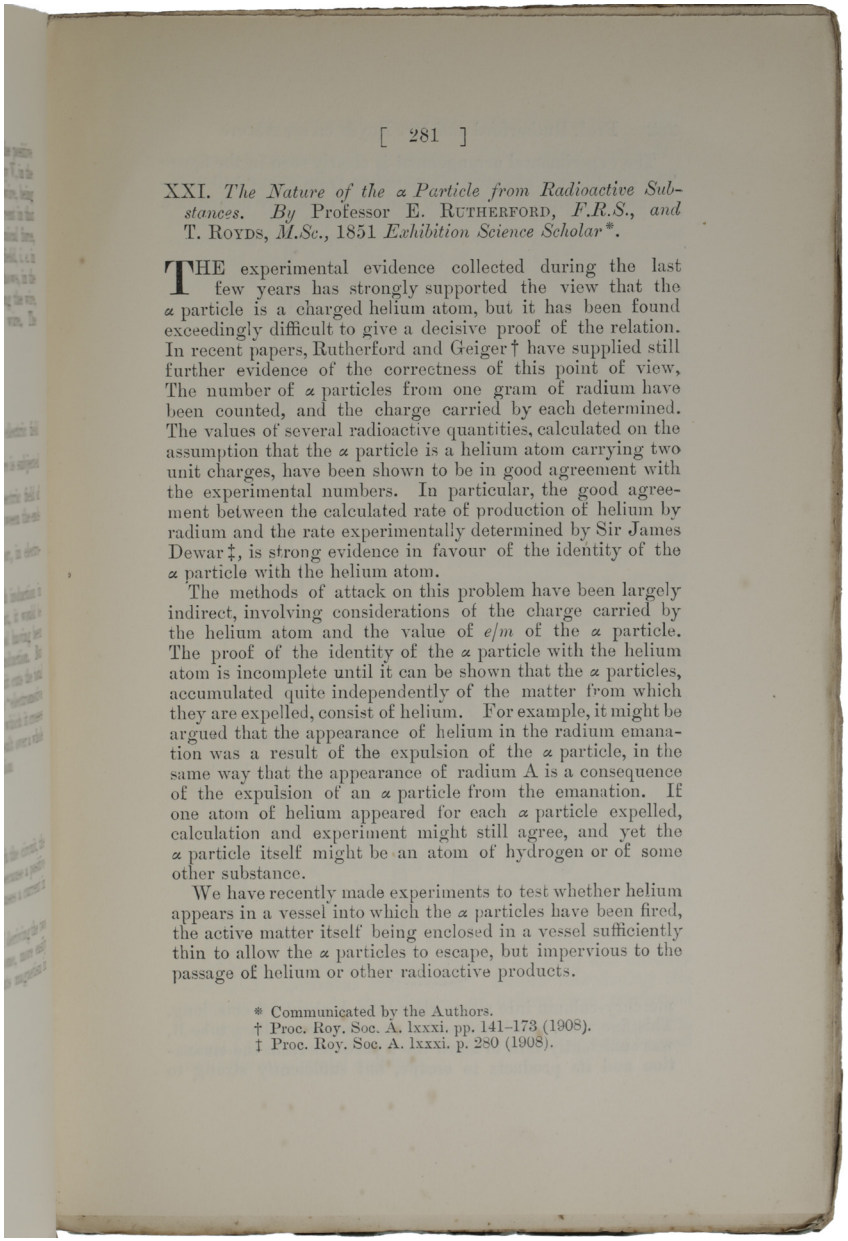
No. A 686. *July 1, 1920.*

Proof That α Particles Are Helium Nuclei

RUTHERFORD, Ernest.; ROYDS, Thomas. *The Nature of the α Particle from Radioactive Substances.* London: Taylor & Francis, 1909.

$1,250

First edition of the full account of the first experimental proof that α particles are helium nuclei — the experiment in which Rutherford and his assistant Thomas Royds let the α particles from radium emanation pass through the wall of a thin glass tube into an evacuated vessel that had held no helium, sparked the gas that collected there, and saw the spectrum of helium. (A three-page preliminary note, read to the Manchester Literary and Philosophical Society on 3 November 1908, had appeared in its *Memoirs* on 19 November; the present paper, dated 13 November 1908, was published in February 1909.) Rutherford had argued since his Montreal years, from measurements of the particle's charge and mass, that it was a doubly charged helium ion, He2+; the spark replaced the inference with an observation, and it was this observation with which Rutherford, who received the Nobel Prize for Chemistry the same year, ended his Nobel lecture in Stockholm. The paper is offered here in the complete February 1909 issue, in its original printed wrappers.



[281]

XXI. *The Nature of the α Particle from Radioactive Substances.* *By* Professor E. Rutherford, *F.R.S.*, *and* T. Royds, *M.Sc.*, 1851 *Exhibition Science Scholar* *.

THE experimental evidence collected during the last few years has strongly supported the view that the α particle is a charged helium atom, but it has been found exceedingly difficult to give a decisive proof of the relation. In recent papers, Rutherford and Geiger † have supplied still further evidence of the correctness of this point of view, The number of α particles from one gram of radium have been counted, and the charge carried by each determined. The values of several radioactive quantities, calculated on the assumption that the α particle is a helium atom carrying two unit charges, have been shown to be in good agreement with the experimental numbers. In particular, the good agreement between the calculated rate of production of helium by radium and the rate experimentally determined by Sir James Dewar ‡, is strong evidence in favour of the identity of the α particle with the helium atom.

The methods of attack on this problem have been largely indirect, involving considerations of the charge carried by the helium atom and the value of *e/m* of the α particle. The proof of the identity of the α particle with the helium atom is incomplete until it can be shown that the α particles, accumulated quite independently of the matter from which they are expelled, consist of helium. For example, it might be argued that the appearance of helium in the radium emanation was a result of the expulsion of the α particle, in the same way that the appearance of radium A is a consequence of the expulsion of an α particle from the emanation. If one atom of helium appeared for each α particle expelled, calculation and experiment might still agree, and yet the α particle itself might be an atom of hydrogen or of some other substance.

We have recently made experiments to test whether helium appears in a vessel into which the α particles have been fired, the active matter itself being enclosed in a vessel sufficiently thin to allow the α particles to escape, but impervious to the passage of helium or other radioactive products.

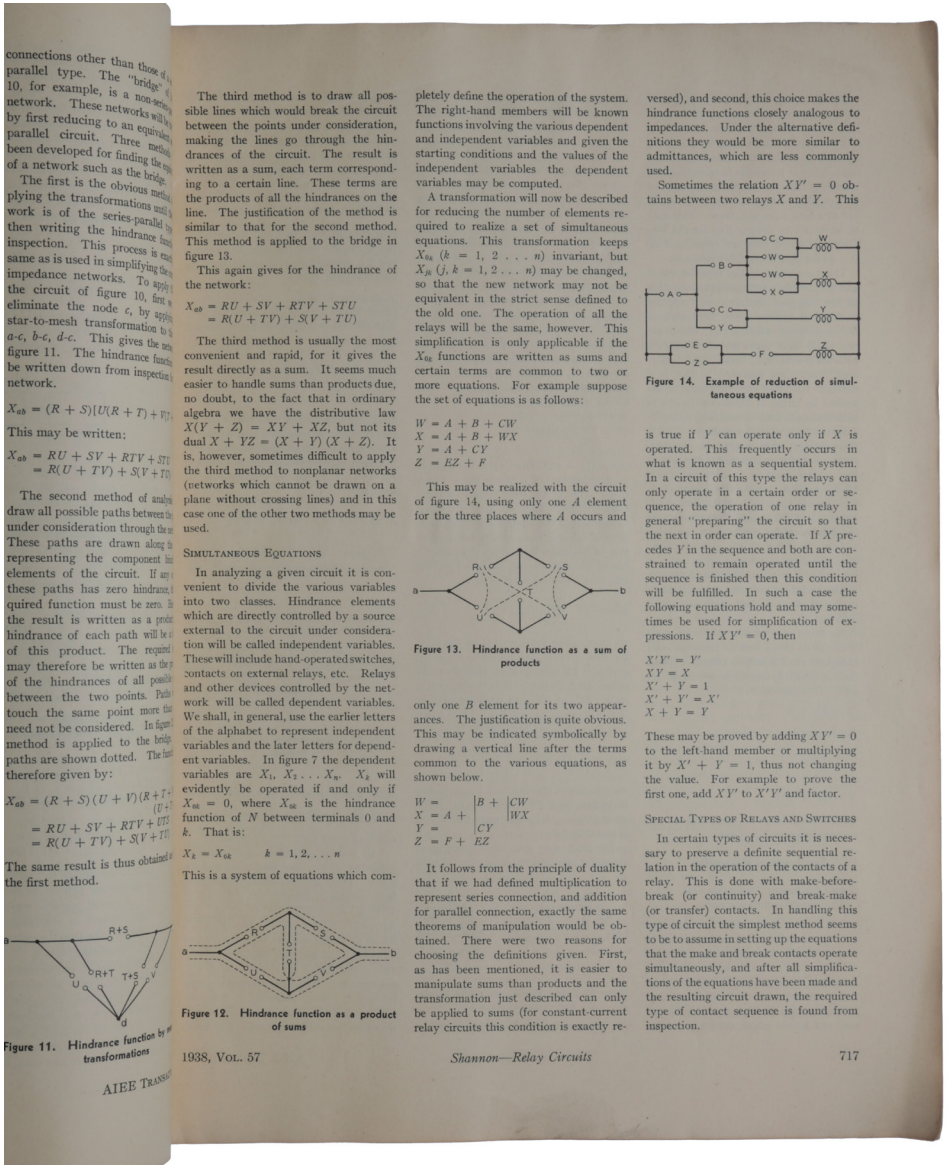
* Communicated by the Authors.
† Proc. Roy. Soc. A. lxxxi. pp. 141–173 (1908).
‡ Proc. Roy. Soc. A. lxxxi. p. 280 (1908).

Shannon's Famous Master's Thesis

SHANNON, Claude Elwood. *A Symbolic Analysis of Relay and Switching Circuits.* New York: American Institute of Electrical Engineers, 1938.

$20,000

First edition, in the original printed wrappers, of Claude Shannon's master's thesis — the paper in which Boolean algebra was first applied to the design of switching circuits, and which has been called the most important master's thesis of the twentieth century. Submitted at MIT on 10 August 1937 by the 21-year-old research assistant who tended Vannevar Bush's differential analyzer, it showed that the two-valued logic of Boole is the natural mathematics of any circuit of two-state switches, demonstrated binary addition by relay, and proved that switching circuits can decide — the conceptual foundation of every digital computer since. It won the Alfred Noble Prize of the combined engineering societies in 1940. The present copy is Shannon's own, preserved among his personal files and documented by accompanying signed letters from his bookseller and his son. It is in the wrappered December 1938 *Transactions Supplement*, printed only against advance orders — the form in which Shannon himself kept his first published work.



connections other than those of ... parallel type. The "bridge" ... 10, for example, is a non-series ... network. These networks will ... by first reducing to an equivalent ... parallel circuit. Three methods ... been developed for finding the ... of a network such as the bridge. ... The first is the obvious method ... plying the transformations ... work is of the series-parallel ... then writing the hindrance ... inspection. This process is ... same as is used in simplifying the ... impedance networks. To apply ... the circuit of figure 10, first ... eliminate the node c, by applying ... star-to-mesh transformation to ... a-c, b-c, d-c. This gives the ... figure 11. The hindrance ... be written down from inspection ... network.

$$X_{ab} = (R + S)[U(R + T) + V(\ldots$$

This may be written:

$$X_{ab} = RU + SV + RTV + STU$$
$$= R(U + TV) + S(V + TU)$$

The second method of analysis ... draw all possible paths between the ... under consideration through the ... These paths are drawn along the ... representing the component ... elements of the circuit. If any ... these paths has zero hindrance, ... quired function must be zero. ... the result is written as a product ... hindrance of each path will be ... of this product. The required ... may therefore be written as the ... of the hindrances of all possible ... between the two points. Paths ... touch the same point more than ... need not be considered. In figure ... method is applied to the bridge ... paths are shown dotted. The ... therefore given by:

$$X_{ab} = (R + S)(U + V)(R + T \ldots$$
$$= RU + SV + RTV + UTS$$
$$= R(U + TV) + S(V + TU)$$

The same result is thus obtained ... the first method.

Figure 11. Hindrance function by ... transformations

AIEE TRANS...

The third method is to draw all possible lines which would break the circuit between the points under consideration, making the lines go through the hindrances of the circuit. The result is written as a sum, each term corresponding to a certain line. These terms are the products of all the hindrances on the line. The justification of the method is similar to that for the second method. This method is applied to the bridge in figure 13.

This again gives for the hindrance of the network:

$$X_{ab} = RU + SV + RTV + STU$$
$$= R(U + TV) + S(V + TU)$$

The third method is usually the most convenient and rapid, for it gives the result directly as a sum. It seems much easier to handle sums than products due, no doubt, to the fact that in ordinary algebra we have the distributive law $X(Y + Z) = XY + XZ$, but not its dual $X + YZ = (X + Y)(X + Z)$. It is, however, sometimes difficult to apply the third method to nonplanar networks (networks which cannot be drawn on a plane without crossing lines) and in this case one of the other two methods may be used.

Simultaneous Equations

In analyzing a given circuit it is convenient to divide the various variables into two classes. Hindrance elements which are directly controlled by a source external to the circuit under consideration will be called independent variables. These will include hand-operated switches, contacts on external relays, etc. Relays and other devices controlled by the network will be called dependent variables. We shall, in general, use the earlier letters of the alphabet to represent independent variables and the later letters for dependent variables. In figure 7 the dependent variables are $X_1, X_2 \ldots X_n$. X_k will evidently be operated if and only if $X_{ak} = 0$, where X_{ak} is the hindrance function of N between terminals 0 and k. That is:

$$X_k = X_{ak} \qquad k = 1, 2, \ldots n$$

This is a system of equations which completely define the operation of the system. The right-hand members will be known functions involving the various dependent and independent variables and given the starting conditions and the values of the independent variables the dependent variables may be computed.

A transformation will now be described for reducing the number of elements required to realize a set of simultaneous equations. This transformation keeps X_{ak} $(k = 1, 2 \ldots n)$ invariant, but X_{jk} $(j, k = 1, 2 \ldots n)$ may be changed, so that the new network may not be equivalent in the strict sense defined to the old one. The operation of all the relays will be the same, however. This simplification is only applicable if the X_{ak} functions are written as sums and certain terms are common to two or more equations. For example suppose the set of equations is as follows:

$$W = A + B + CW$$
$$X = A + B + WX$$
$$Y = A + CY$$
$$Z = EZ + F$$

This may be realized with the circuit of figure 14, using only one A element for the three places where A occurs and

Figure 13. Hindrance function as a sum of products

only one B element for its two appearances. The justification is quite obvious. This may be indicated symbolically by drawing a vertical line after the terms common to the various equations, as shown below.

$$\begin{matrix} W = \\ X = A + \\ Y = \\ Z = F + EZ \end{matrix} \left| \begin{matrix} B + \\ \\ CY \end{matrix} \right| \begin{matrix} CW \\ WX \end{matrix}$$

It follows from the principle of duality that if we had defined multiplication to represent series connection, and addition for parallel connection, exactly the same theorems of manipulation would be obtained. There were two reasons for choosing the definitions given. First, as has been mentioned, it is easier to manipulate sums than products and the transformation just described can only be applied to sums (for constant-current relay circuits this condition is exactly reversed), and second, this choice makes the hindrance functions closely analogous to impedances. Under the alternative definitions they would be more similar to admittances, which are less commonly used.

Sometimes the relation $XY' = 0$ obtains between two relays X and Y. This

Figure 14. Example of reduction of simultaneous equations

is true if Y can operate only if X is operated. This frequently occurs in what is known as a sequential system. In a circuit of this type the relays can only operate in a certain order or sequence, the operation of one relay in general "preparing" the circuit so that the next in order can operate. If X precedes Y in the sequence and both are constrained to remain operated until the sequence is finished then this condition will be fulfilled. In such a case the following equations hold and may sometimes be used for simplification of expressions. If $XY' = 0$, then

$$X'Y' = Y'$$
$$XY = X$$
$$X' + Y = 1$$
$$X' + Y' = X'$$
$$X + Y = Y$$

These may be proved by adding $XY' = 0$ to the left-hand member or multiplying it by $X' + Y = 1$, thus not changing the value. For example to prove the first one, add XY' to $X'Y'$ and factor.

Special Types of Relays and Switches

In certain types of circuits it is necessary to preserve a definite sequential relation in the operation of the contacts of a relay. This is done with make-before-break (or continuity) and break-make (or transfer) contacts. In handling this type of circuit the simplest method seems to be to assume in setting up the equations that the make and break contacts operate simultaneously, and after all simplifications of the equations have been made and the resulting circuit drawn, the required type of contact sequence is found from inspection.

Figure 12. Hindrance function as a product of sums

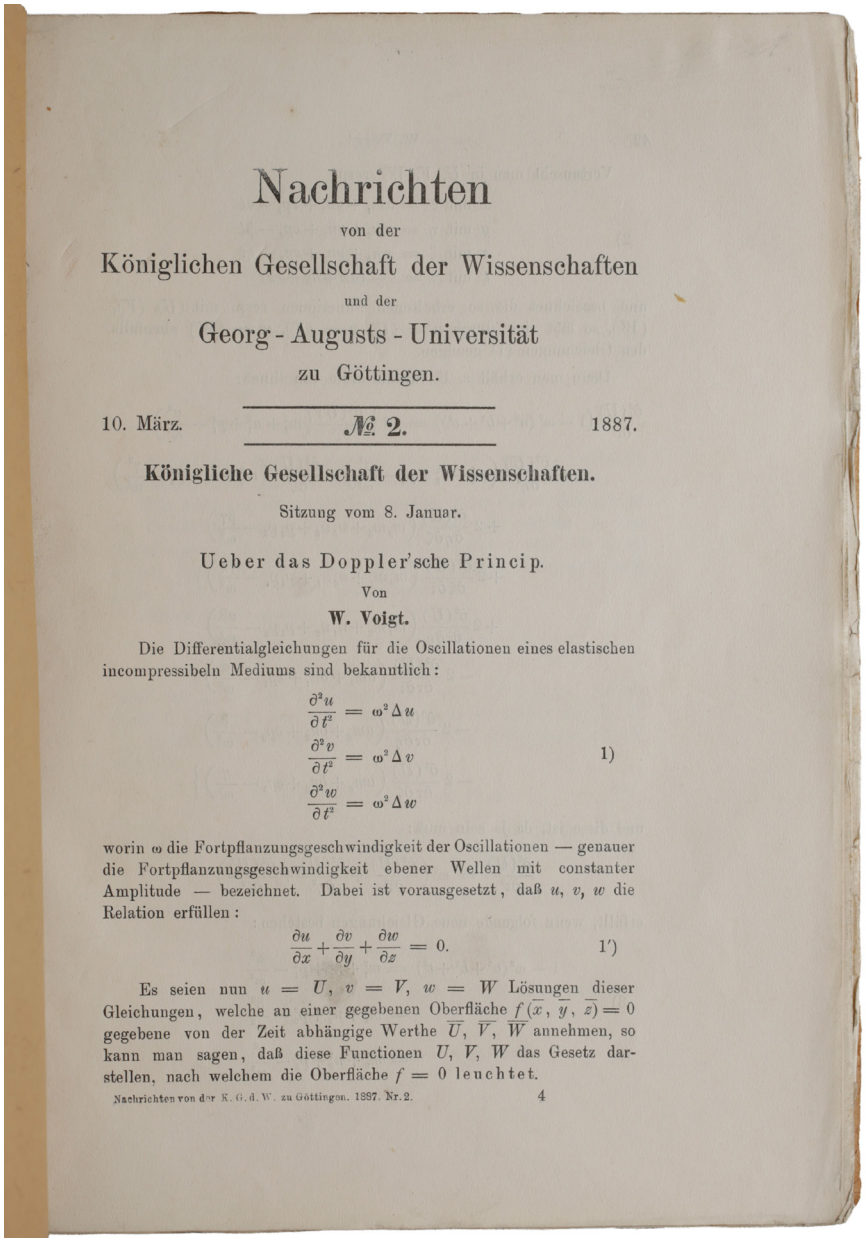
1938, VOL. 57 *Shannon—Relay Circuits* 717

The First Paper on Relativity?

VOIGT, Woldemar. *Ueber das Doppler'sche Princip.* Göttingen: Dieterich, 1887.

$1,250

First edition of the paper in which Voigt worked out what Doppler's principle looks like when light is a wave in an elastic aether, wrote down at the beginning of 1887 a change of the variables of space and time that leaves the wave equation unaltered and gives an observer in motion a time of his own, one that depends on where he stands — the transformation that Lorentz arrived at independently between 1892 and 1904, that Poincaré attached Lorentz's name to in 1905, and that Einstein made the frame of special relativity in the same year. Lorentz himself, when the paper was at last put into his hands in 1908, wrote that the idea of his transformations "might therefore have been borrowed from Voigt", and Hermann Minkowski told the physicists assembled at Cologne that autumn that the transformations at the heart of the relativity principle had first been treated mathematically by Voigt in 1887. The paper had by then lain unread for twenty-one years. It is offered here in the complete number of the Göttingen Society's *Nachrichten* in which it was issued, all twelve pages of the number present and the leaves untrimmed.



Nachrichten

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10. März. № 2. 1887.

Königliche Gesellschaft der Wissenschaften.

Sitzung vom 8. Januar.

Ueber das Doppler'sche Princip.

Von

W. Voigt.

Die Differentialgleichungen für die Oscillationen eines elastischen incompressibeln Mediums sind bekanntlich:

$$\frac{\partial^2 u}{\partial t^2} = \omega^2 \Delta u$$
$$\frac{\partial^2 v}{\partial t^2} = \omega^2 \Delta v \qquad 1)$$
$$\frac{\partial^2 w}{\partial t^2} = \omega^2 \Delta w$$

worin ω die Fortpflanzungsgeschwindigkeit der Oscillationen — genauer die Fortpflanzungsgeschwindigkeit ebener Wellen mit constanter Amplitude — bezeichnet. Dabei ist vorausgesetzt, daß u, v, w die Relation erfüllen:

$$\frac{\partial u}{\partial x} + \frac{\partial v}{\partial y} + \frac{\partial w}{\partial z} = 0. \qquad 1')$$

Es seien nun $u = U$, $v = V$, $w = W$ Lösungen dieser Gleichungen, welche an einer gegebenen Oberfläche $f(x, y, z) = 0$ gegebene von der Zeit abhängige Werthe $\overline{U}$, $\overline{V}$, $\overline{W}$ annehmen, so kann man sagen, daß diese Functionen U, V, W das Gesetz darstellen, nach welchem die Oberfläche $f = 0$ leuchtet.

The Nativity of Wallenstein's Cousin

[WALDSTEIN, Maximilian von, dedicatee.] ANON.
Astrologia Judiciaria. Divinationes prohibitas continens. [Italian manuscript on paper: the nativity of Count Maximilian von Waldstein, with the judgment on the figure and the directions of his life.] [Prague], [1633].

$12,500

The presentation manuscript of the horoscope of Maximilian von Waldstein, Wallenstein's cousin and master of the horse to the future Ferdinand III, written in Italian at Prague by an astrologer who does not give his name. The dedication names the count by four offices only he held together between 1629 and 1637; a marginal gloss on f. 39r dates the writing *1633 febraro*; and on f. 44v the author records the death of the count's brother Berthold, who died of his Lützen wounds in Prague on 1 December 1632 and was moved to Strahov that February. The figure, cast for about sunrise on 16 March 1597 with Regiomontanus houses for the latitude of Prague, is the only known source for the count's birthday; the reference works give 1598 or about 1600 without a day. The judgment and the directions follow him year by year to a death foreseen for 1653 or 1654. The title declares the contents forbidden, as the bulls of 1586 and 1631 had made them. From the Piarist college of Kosmonosy.

