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

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

'First correct description of the eye and of its accessory organs'

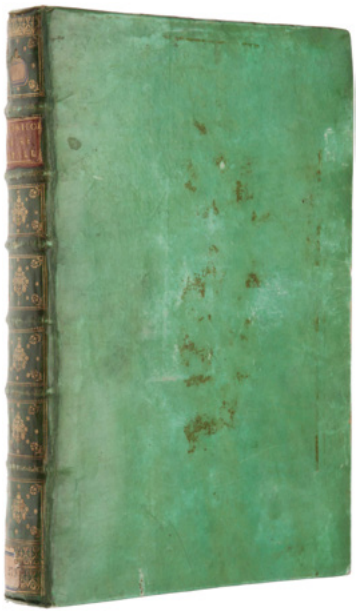
CASSERI: *Pentaestheseion, 1609*
 # 9

'One of the first technological books of modern times'

1. AGRICOLA, Gerorgius. *De re metallica.* Basel: Froben & Bischof, 1556.

$75,000

A beautiful copy in 17th century German vellum of "the first systematic treatise on mining and metallurgy and one of the first technological books of modern times... The *De Re Metallica* embraces everything connected with the mining industry and metallurgical processes, including administration, prospecting, the duties of officials and companies and the manufacture of glass, sulphur and alum. The magnificent series of two hundred and seventy-three large woodcut illustrations by Hans Rudolph Manuel Deutsch add to its value. Some of the most important sections are those on mechanical engineering and the use of water-power, hauling, pumps, ventilation, blowing of furnaces, transport of ores, etc., showing a very elaborate technique." (*Printing and the Mind of Man).*



❧PMM 79; Dibner 88; Grolier/Horblit 2b; Sparrow, *Milestones of Science* 4.

A classic work on osteology

2. ALBINUS, Bernhard Siegfried. *Icones ossium foetus humani.* Leiden: Verbeek, 1737.

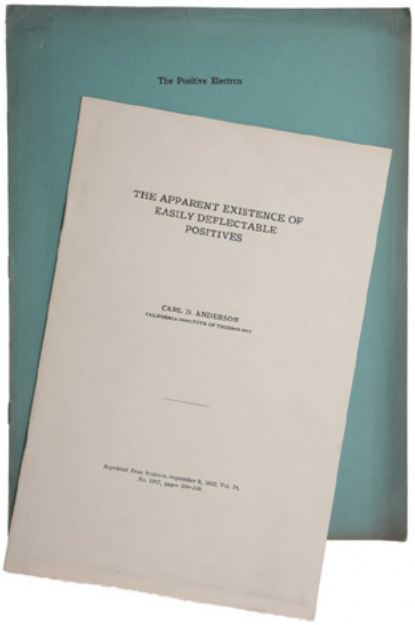
$3,200

First edition, in contemporary Dutch vellum, of this beautiful book with 32 plates by the master engraver Jan Wandelaar. "Albinus is particularly remembered for his descriptions of the bones, and this first edition of his treatise on fetal bones is one of his finest atlases. All of the fetal bones are illustrated with great detail and are finely lined in the sixteen plates and sixteen line drawings. (*Heirs of Hippocrates*). "These plates are also engraved by Wandelaer [as in his celebrated *Tabulae sceleti*, 1747]. The illustrations were engraved upon the plates directly from the preparations. The first bears the signature: 'Wandelaar omnes ad exemplaria in aes incidit'. The other plates are not signed. There are altogether sixteen finished plates, containing a total of one hundred and sixty-three representations. Each one of these plates is supplemented by an identical outline-plate containing the same figures with letters engraved upon them. The different bones are reproduced with an unsurpassed fidelity and delicacy" (Choulant). Albinus, the celebrated professor of anatomy and surgery in Leiden, was no doubt the best descriptive anatomist of his day and the pioneer of a new epoch in human anatomy. Besides his own writings he edited the works of Eustachio, Fabricius and Harvey. In collaboration with Herman Boerhaave he edited a new edition of Vesalius' works (1725), in which the two-hundred-year-old woodcuts are beautifully copied on copperplates by the master engraver Jan Wandelaar.

The discovery of anti-matter

3. ANDERSON, Carl David. *The Apparent Existence of Easily Deflectable Positives.* Offprint from Science, 1932. *[Offered with:] The Positive Electron.* Offprint from Physical Review, 1933.

$25,000



First editions, in the extremely rare offprint form, of the two papers constituting the first announcement, and the later detailed account (containing the famous cloud chamber photograph), of Carl Anderson's discovery of the positron, an elementary particle with the same mass as the electron but carrying a positive charge. This was the first example of a particle consisting of antimatter. Its existence had been predicted by P. A. M. Dirac three years earlier in his paper 'Quantised Singularities in the Electromagnetic Field.' "The prediction and subsequent discovery of the positron rank among the great triumphs of modern physics" (Pais, *The Genius of Science*, p. 60). "It was this note [the *Science* paper] which established Anderson's priority as discoverer of the positron' (Brandt, *Harvest of a Century*, p. 216). The name 'positron' first appeared in print in the second offered paper (Dirac called it an 'anti-electron'). Anderson shared the 1936 Nobel Prize in Physics "for his discovery of the positron." We know of no other copy of the first offprint having appeared on the market, and only one of the second.

The first book on orthopaedics

4. ANDRY, Nicolas. *L'orthopédie ou l'art de prevenir et de corriger dans les enfans, les difformités du corps.* Paris: Chez la veuve Alix; Lambert & Durand, 1741.

$16,000

Rare first edition, and a very fine copy, of the "first book on orthopedics" (Garrison-Morton). A work "of supreme importance" (Bick)."Nicholas Andry coined the word *orthopaedics* in French as *orthopédie*, derived from the Greek words orthos ('correct' , 'straight') and paidion ('child'), when he published *Orthopedie* (translated as *Orthopaedia: or the Art of Correcting and Preventing Deformities in Children*) in 1741. Though as the name implies it was initially developed with attention to children, the correction of spinal and bony deformities in all stages of life eventually became the cornerstone of orthopedic practice" (*Wikipedia*).

❧Grolier/Medicine 42; Lilly, *Notable Medical Books* 113; Norman 55; *Heirs of Hippocrates* 697; Garrison-Morton 4301.

One of the great rarities of chemistry - inscribed

5. AVOGADRO, Amadeo. *Fisica de' Corpi Ponderabili ossia Trattato della Costituzione Generale de' Corpi del Cavaliere.* Turin: Stamperia Reale, 1837-41.

$36,500

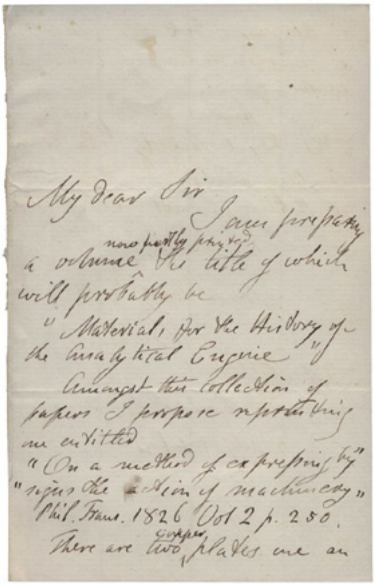
First edition, a very fine copy in the original state, of one of the great rarities of chemistry. This monumental work is the only large-scale publication of Avogadro (1776-1856), famous for his eponymous hypothesis (1811) that equal volumes of all gases at the same pressure and temperature contain the same number of molecules. Although his molecular hypothesis is widely considered to be Italy's great contribution to chemistry in the 19th century, his 1811 memoir was largely ignored for another half century, partly because it was published first in Italian (when Italy was at the periphery of scientific research) and subsequently only in minor French, German and English scientific journals. Emil Offenbacher, the distinguished dealer who specialized in chemistry, wrote (cat. 39, item 4, 1986) "a complete set [of the present work] is today of great rarity". ABPC/RBH list just four other copies between the Honeyman sale (1978) and the present copy.

❧Norman 89; Honeyman 168; Sparrow, *Milestones of Science* 16 [1811 memoir]. *Provenance*: the front covers of the last two volumes are inscribed to the Italian general Giuseppe Dabormida (1799-1869), who was Minister of War in 1848 (the Norman copy also had presentation inscriptions to the last two volumes).

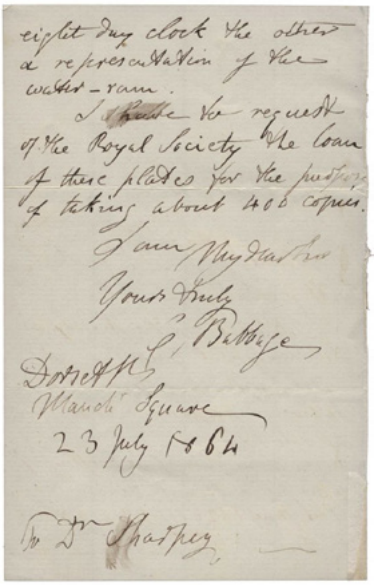
Historically important letter by Babbage

6. BABBAGE, Charles. *Autograph letter relating to the Analytical Engine, signed 'C. Babbage' to 'Dr Sharpey,' dated 23 July 1864 and addressed from his house at Dorset Street, Marylebone.*

$8,500



A Babbage letter of great historical interest in which he refers to a book on the history of the Analytical Engine he is preparing, and which he says is 'partly printed.' Babbage (1791-1871) did not live to see the work published, but it was completed by his son Henry Prevost and appeared as *Babbage's Calculating Engines* in 1889. This is still the principal source of information for the technical operation of Babbage's Difference and Analytical Engines. Babbage writes: 'I am preparing a volume, now partly printed, the title of which will probably be "Materials for the History of the Analytical Engine." Amongst this collection of papers I propose reprinting one entitled "On a method of expressing by signs the action of machinery," Phil. Trans. 1826, Oct. 2, p. 250. There are two copper plates one an eight day clock the other a representation of the water-ram. I have to request of the Royal Society the loan of these plates for the purpose of taking about 400 copies'. Babbage's request seems to have been granted as his 'On a method of expressing by signs the action of machinery' duly appeared in the published work (pp. 236-41).



His most famous work - containing the 'Bernoulli equation'

7. BERNOULLI, Daniel. *Hydrodynamica, sive De Viribus et Motibus Fluidorum Commentarii. Opus Academicum.* Strasbourg: Johann Reinhold Dulsseker, 1738.

$13,500

First edition of Bernoulli's epochal work on fluid dynamics and the kinetic theory of gases, containing the famous 'Bernoulli equation' for fluid flow. "Besides introducing the first hydraulic theory of fluid flow, this book is the most remarkable general work in theoretical and applied mechanics written in the pre-Lagrangian period of the 18th century, based on a deep physical understanding of mechanical phenomena and presenting many new ideas … Bernoulli's treatise was to influence the entire development of mechanics and, especially, of applied mechanics, for at least a century" (*Landmark Writings*, pp. 131-2). "In 1738 Bernoulli published *Hydrodynamica*. In this treatise, which was far in advance of his time in many ways, is his famous equation governing the flow of fluids in terms of speed, pressure, and potential energy, upon which much modern technology is based, especially aerodynamics" (DSB).

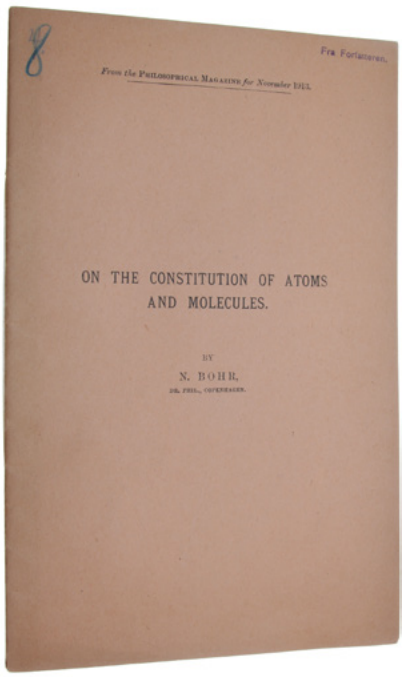
"In this book Bernoulli presented the earliest adequate theory of motion of an incompressible fluid in tubes (vessels) and fluid outflow through orifices, introducing the notion of hydrodynamic pressure. However, the treatise is not restricted to theoretical hydraulics. In the subsequent sections, he opens up new branches of physics and mechanics. He develops the first model of the kinetic theory of gases, approaches the principle of conservation of energy, establishes a foundation for the analysis of efficiency of machines, and develops a theory of hydroreactive (water-jet) ship propulsion, including a solution of the first problem of motion of a variable-mass system.

❧Norman 215; *Landmark Writings in Western Mathematics* 9; Barchas 175.

The birth of modern atomic physics

8. BOHR, Niels Henrik David. *On the Constitution of Atoms and Molecules, I-III.* London: Taylor & Francis, 1913.

$50,000

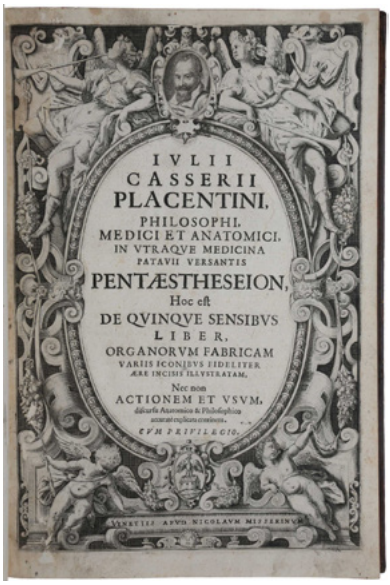


Extremely rare author's presentation offprints of his great trilogy, which constitutes the birth of modern atomic physics. "Bohr's three-part paper postulated the existence of stationary states of an atomic system whose behavior could be described using classical mechanics, while the transition of the system from one stationary state to another would represent a non-classical process accompanied by emission or absorption of one quantum of homogeneous radiation, the frequency of which was related to its energy by Planck's equation" (Norman). In the beginning of 1913 Bohr heard about Rydberg's remarkable discovery in spectroscopy. Rydberg's formula could represent the frequencies of the lines of the hydrogen spectrum in the simplest form in terms of two integers. As soon as Bohr saw this formula, he immediately recognized that it gave him the missing clue to the correct way to introduce Planck's law of quantum of action into the description of the atomic systems. The rest of the academic year was spent reconstructing the whole theory upon the new foundation and expounding it in a large treatise, which was immediately published as these three papers in the 'Philosophical Magazine'. It was in these papers that Bohr first gave his postulates of the orbital structure of the electrons and their quantized radiation. Bohr's atomic theory inaugurated two of the most adventurous decades in the history of science. In 1922 Bohr was awarded the Nobel Prize "for his services in the investigation of the structure of atoms and of the radiation emanating from them."

Early anatomy of the sense organs

9. CASSERI, Giulio Cesare. *Pentaestheseion, hoc est De quinque sensibus liber, organorum fabricam variis iconibus fideliter aere incisis illustratam, nec non actionem et usum, discursu anatomico & philosophico accurate explicata continens.* Venedig: Misserino, 1609.

$45,000

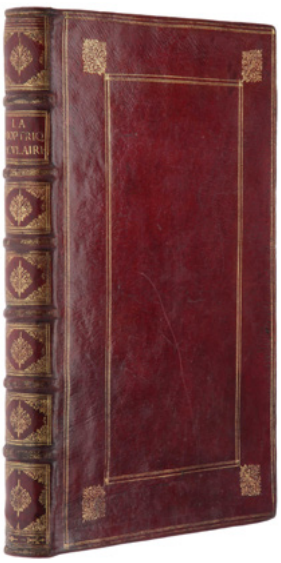


First edition, exceptionally rare, of Casserius' second important contribution to the comparative anatomy not only of the ear and the vocal organs, as in his more common work of 1600/01 [*De Vocis Auditusque Organis*], but also of the other four sense organs and especially of the eye. The very fine anatomical plates for which this book is noted are both drawn and engraved by the Swiss artist Joseph Maurer, a pupil of Tobias Stimmer who lived in Casserius' house. The 12 plates pertaining to the ear are the same as those of Casserius' earlier work; they constitute "the first accurate pictorial presentation of the internal ear" (Sellers, *Annals of Otology* 68). Those dealing with the other four sense organs are new. Among them, in the particularly important section dealing with the eye and vision (pp. 257-346) are the first pictorial representations of the conjunctival glands, later known as the Meibomian glands (cf. Garrison-Morton 1481). All the plates, according to Choulant-Frank, "are done with unusual care and are anatomically exact." Casserius' anatomy of the sense organs is of great importance in medical history, since for the first time he adds to a complete account of each human organ a full study of the same organ in various animal forms. Choulant-Frank never saw a copy of this first edition, describing only the Frankfurt edition of 1622, with the same number of plates but "reduced and certainly executed by another artist. Some of them are even reversed and show much inferior workmanship" (p. 224).

'The most exhaustive treatise on lens making in the seventeenth century'

10. CHERUBIN d'Orléans, Capuchin. *La dioptrique oculaire, ou la théorique, la positive, et la mechanique de l'oculaire dioptrique en toutes ses espèces.* Paris: Thomas Jolly and Simon Benard, 1671.

$38,500



Exceptional copy in contemporary red morocco of "the most exhaustive treatise on lens making in the seventeenth century. It is a six-hundred folio page long, comprehensive, cogently-argued treatise on telescope making. It contains an impressive amount of theoretical and practical, first-hand information on all of its facets — from explanations of the telescope's working principles, to descriptions of lens grinding and polishing, to rules for the right distances between lenses, to methods to find the right apertures, to descriptions of the shapes and articulations of the wooden parts and bolts and screws needed to properly point a telescope to the skies, to the construction of tubes, and so on and so forth." (Albert et al, *The origins of the telescope*, pp. 289-291). "The French Capuchin friar Cherubin d'Orleans (1613-97), real name Michel Lassere, published a large volume in 1671 on optics, in which, among other subjects, he describes his invention of a rhombic pantograph apparatus attached to telescope and drawing board, by which accurate drawings of distant objects could be made" (Whittaker, *Mapping and naming the moon*, p. 76).

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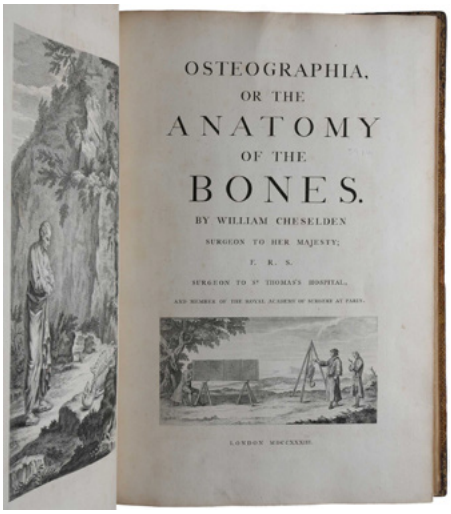
Unique presentation copy with additional plates in red morocco

11. CHESELDEN, William. *Osteographia, or the Anatomy of the Bones.* London: [William Bowyer for the author], 1733.

$54,000



First edition, presentation copy, in contemporary red morocco, inscribed by Cheselden to Martin Folkes, and with seven additional plates not found in any other copy. "The most famous and among the most artistically interesting osteological atlases ever produced" (Norman). Cheselden was the first to use a camera obscura to give precision to his work and this use is illustrated on the title page. This is a fine association copy: Martin Folkes was a scientist-scholar who at the age of 23 was elected fellow of the Royal Society. He was held in such esteem that he acted as president of the society in the absence of Isaac Newton, and was formally elected President in 1741, succeeding Sir Hans Sloan.

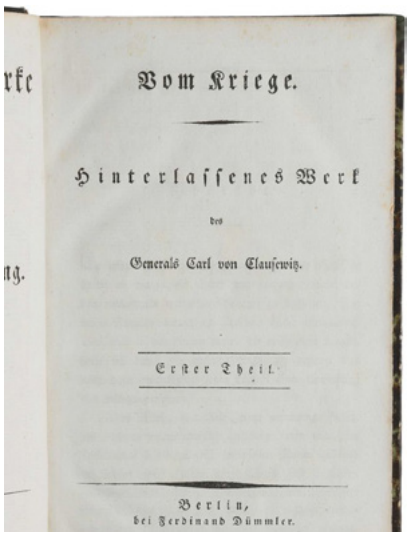
Provenance: Martin Folkes (1690-1754), presentation inscription from the author: "These last seven plates are only in this book of my much honour'd friend Martin Folkes, Esq. W. Cheselden 3 Feb. 1736/7"; Sir John Hayford Thorold (1773-1831), Syston Park bookplate, his notes on rear pastedown?; Anson W. Ward (label presenting the book to; American Museum of Natural History.

❧Choulant-Frank, p.261; Garrison-Morton 395; *Heirs of Hippocrates* 814; Norman 466; Russell 173; Waller 1941; Wellcome II, p. 335. Allister, 'The Truth about Our Bones: William Cheselden's *Osteographia*,' Medical History (2010) 54, 517–528.

PMM 297 - The philosophy of war

12. CLAUSEWITZ, Carl von. *Hinterlassene Werke über Krieg und Kriegführung.* Berlin: Ferdinand Dümmler, 1832-1837.

$65,000


Vom Kriege.

Hinterlassenes Werk

des

Generals Carl von Clausewitz.

Erster Theil.

Berlin,
bei Ferdinand Dümmler.

Very scarce complete set of Clausewitz's writings on warfare, with all 10 volumes in fine contemporary uniform bindings, which includes the celebrated *Vom Kriege* (PMM 297), appearing in the first 3 volumes. "These thousand pages of 'On Warfare' occupy a unique position among military writings of any age and nation. The book is less a manual of strategy and tactics, although it incorporates the lessons learned from the French revolutionary and Napoleonic wars, than a general inquiry into the interdependence of politics and warfare and the principles governing either or both. War, Clausewitz maintained, must always be regarded 'as a political instrument'; for war, his most famous aphorism runs, 'is nothing but politics continued by different means'. Consequently, he scorns the notion of 'the harmful influence of politics upon the conduct of war', since blame, or praise, must be attached to politics itself. If the course of politics is sound, political influence on the conduct of war can only be advantageous: 'The French revolutionary victories over twenty years resulted mainly from the faulty politics of the opposing governments'..., the book was published by his widow and won immediate recognition as the most profound exposition of the philosophy of war - a place that has never been disputed." (*Printing and the Mind of Man*).

"La plus grand ouvrage existent sur la gnomonique" (Houzeau & Lancaster).

13. CLAVIUS, Christoph. *Gnomonices libri octo, in quibus non solum horologiorum solarium, sed aliarum quoque rerum, quae ex gnomonis umbra cognosci possunt, descriptiones geometrice demonstrantur.* Rome: Francesco Zanetti, 1581.

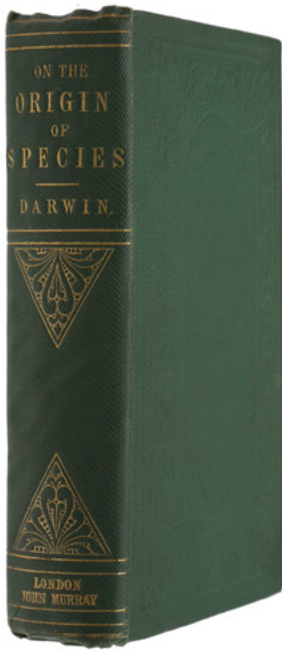
$7,000

First edition of Clavius' masterwork on the theory and construction of sundials, "la plus grand ouvrage existent sur la gnomonique" (Houzeau & Lancaster). Clavius considers the astronomical background, the geometrical theory and the various construction methods. The design of sundials occupied many mathematicians in this period, such as Giovanni Battista Benedetti, Federico Commandino and Sebastian Münster. This topic, which requires the stereographic projection of circles on the celestial sphere onto the plane of the equator, was related to that of perspective and the study of the shadows of curves, which was of course also of interest to painters such as Albrecht Dürer. "Clavius describes fixed and portable dials, and includes diagrams for most of them. In common with earlier texts, some instruments are illustrated with two diagrams, one showing the construction details, and one showing the finished instrument" (Eagleton, p. 151). Clavius' edition of Euclid (1574) led him to being given the respectful title of "the Euclid of the 16th century", he substantiated (and also taught) Galileo's work on the heliocentric cosmology, and he was also deeply involved in the construction of the Gregorian calendar.

'The most important biological work ever written'

14. DARWIN, Charles. *On the Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life.* London: John Murray, 1859.

$200,000



First edition, a fine untouched copy in its original binding, of "the most influential scientific work of the nineteenth century" (Horblit) and "the most important biological work ever written" (Freeman). "Darwin not only drew an entirely new picture of the workings of organic nature; he revolutionized our methods of thinking and our outlook on the natural order of things. The recognition that constant change is the order of the universe had been finally established and a vast step forward in the uniformity of nature had been taken" (*Printing and the Mind of Man*). Bern Dibner's *Heralds of Science* describes *On the Origin of Species* as "the most important single work in science." Darwin had assimilated the researches and observations from his five years as naturalist aboard the survey ship H.M.S. Beagle into the essential formulation of his theory of natural selection more than two decades before *On the Origin of Species* appeared, but he may not have published his revolutionary theory during his lifetime had not Alfred R. Wallace independently come to a nearly identical conclusion about the transmutation of species. After the Linnean Society read and published jointly Darwin and Wallace's preliminary expositions of the theory of evolution, Darwin rushed to prepare for publication an epitome of the 'big species book' that he had been working on since 1856. Originally conceived as a work that might be printed on four or five sheets of paper, *Origin* evolved during the eight months of its writing into a volume of nearly 500 pages. *On the Origin of Species* caused an immediate sensation.

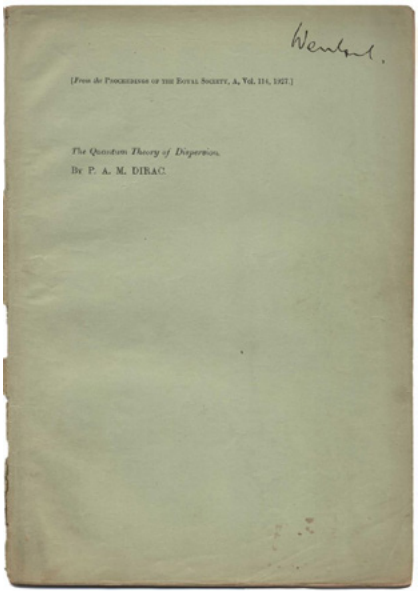
❧Dibner *Heralds of Science* 199; *Heirs of Hippocrates* 1724; Freeman 373; Garrison-Morton 220; Grolier/Science 23b; Norman 593; PMM 344b; Sparrow *Milestones* 49; Waller 10786.

Dirac discovers 'divergences' in quantum electrodynamics

15. DIRAC, Paul Adrien Maurice. *The quantum theory of dispersion.* [London: Harrison & Sons for the Royal Society, 1927].

$8,500

First edition, the very rare offprint issue, and with a distinguished provenance, of the second of Dirac's two 1927 papers (the first being "The quantum theory of the emission and absorption of radiation") in which Dirac "laid the foundations of quantum electrodynamics" (Pais, p. 7). In this paper, "Dirac presented a complete theory of dispersion [the scattering of a photon by an electron], including derivations of the Kramers-Heisenberg formula and the Thomson formula for scattering of radiation by atoms. He was also able to treat the case of resonance, which theretofore had eluded quantum radiation theory" (Kragh, p. 125). It was also in this paper that the 'divergences' which were to plague the development of quantum electrodynamics were first encountered. "Dirac's publications on quantum electrodynamics in 1927 completed the scheme of quantum mechanics. At the same time, they initiated a new field of research that soon wasto move to the forefront of theoretical physics" (Kragh, p. 127). This copy of the offprint of Dirac's paper is from the library of theoretical physicist Gregor Wentzel, who was also involved in the development of quantum mechanics in the 1920s. In 1960 Wentzel described the effect of Dirac's two 1927 papers as follows: "Today the novelty and boldness of Dirac's approach to the radiation problem may be hard to appreciate . . . Dirac's explanation in terms of the quantized vector potential came as a revelation" (quoted in Kragh, p. 126).


Wentzel.

[From the Proceedings of the Royal Society, A, Vol. 114, 1927.]

The Quantum Theory of Dispersion.

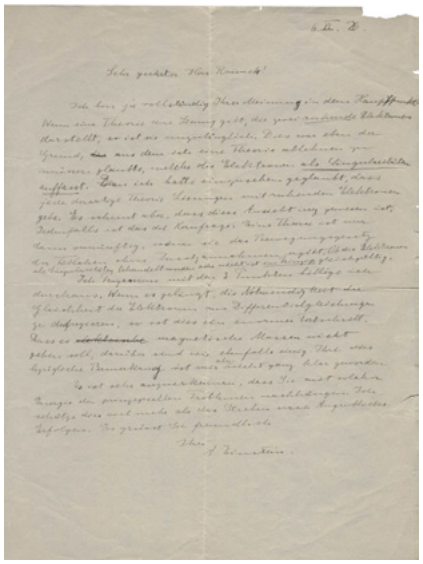
By P. A. M. DIRAC.

❧H. Kragh, Dirac: *A Scientific Biography*, 1990; A. Pais, *Paul Dirac: Aspects of his life and work*, in *Paul Dirac: The Man and his Work*, ed. P. Goddard, 1998, pp. 1-45.

Einstein discusses unified field theory

16. EINSTEIN, Albert. *Autograph letter signed 'A. Einstein' to physicist Rainich discussing field theory.* [Berlin], 6 June 1926.

$35,000



Important autograph letter in which Einstein discusses the Einstein-Maxwell unified theory of gravitation and electromagnetism. George Yuri Rainich (1886 – 1968) was a leading mathematical physicist whose research centered around general relativity and, in particular, the unified field theory of gravity and electromagnetism. In 1924, Rainich found a set of equivalent conditions for a Lorentzian manifold to admit an interpretation as an exact non-null electrovacuum solution in general relativity; these are now known as the Rainich conditions. Einstein took great interest in Rainich's work. In the present manuscript Einstein discusses an aspect of electron theory and explains that any theory which postulates a solution representing two electrons at rest is unacceptable. He admits he was mistaken in his earlier views and states it would be an enormous step forward to be able to prove through differential equations the need for electrons to be identical. He concludes his letter praising Rainich for his tenacious research on the problem which he finds far more valuable than the search for instant success.

Provenance: Sold Sotheby's 2 December 1987, lot 13, $7,000.

One of Euler's rarest publications

17. EULER, Leonhard. *Theoria Motus Lunae Exhibens Omnes Eius Inaequalitates.* St. Petersburg: Academiae Imperialis Scientiarum, 1753.

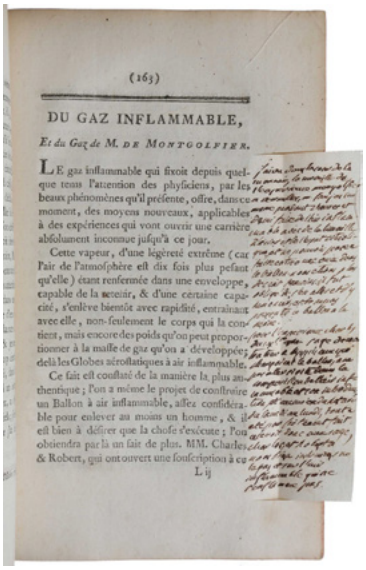
$15,000

Very rare first edition, untouched and unopened in its original wrappers, of Euler's 'first lunar theory', the theoretical basis for Tobias Mayer's lunar tables that won the British Parliament prize for the longitude problem (see below). "Based on Newton's universal law of gravitation, Euler first developed his first lunar theory with the aid of his method of variation of orbital parameters. This method is fairly general in the sense that it cannot only be applied to the theory of lunar motion, but also to the planetary motion. Euler published his first lunar theory in his celebrated treatise 'Theory of lunar motion' in 1753. He continued his research for almost the next three decades to make significant improvement of his first lunar theory including the lunar orbit, Moon's position, equations for the Moon's motion, lunar eclipses and the period of revolution of the Moon." (Debnath, *The Legacy of Leonhard Euler*, p.365). "Astronomy owes to Euler the method of variation of arbitrary constants. By it he attacked the problem of perturbations, explaining, in case of two planets, the secular variations of eccentricities, nodes, etc. He was one of the first to take up with success the theory of the moon's motion by giving approximate solutions to the 'problem of three bodies'. He laid a sound basis for the calculation of tables of the moon." (Cajori, *History of Mathematics*, p.240).

"The first serious treatise on aerostation" (PMM)

18. FAUJAS DE SAINT-FOND, Barthélémy. *Description des expériences de la machine aérostatique de MM. de Montgolfier: et de celles auxquelles cette découverte a donné lieu: suivie de recherches sur la hauteur à laquelle est parvenu le ballon du Champ-de-Mars ... ouvrage orné de neuf planches en taille douce, représentant les diverses machines qui ont été construites jusqu'a ce jour.* Paris: [Chardon for] Cuchet, 1783.

$12,000


(163)

DU GAZ INFLAMMABLE,

Et du Gaz de M. de Montgolfier.

LE gaz inflammable qui sroit depuis quelque tems l'attention des physiciens, par les beaux phénomènes qu'il présente, offre, dans ce moment, des moyens nouveaux, applicables à des expériences qui vont ouvrir une carrière absolument inconnue jusqu'à ce jour.

Cette vapeur, d'une légèreté extrême (car l'air de l'atmosphère est dix fois plus pesant qu'elle) étant renfermée dans une enveloppe, capable de la retenir, & d'une certaine capacité, s'enlève bientôt avec rapidité, entraînant avec elle, non-seulement le corps qui la contient, mais encore des poids qu'on peut proportionner à la masse de gaz qu'on a développée; delà les Globes aérostatiques à air inflammable.

Ce fait est constaté de la manière la plus authentique; l'on a même le projet de construire un Ballon à air inflammable, assez considérable pour enlever au moins un homme, & il est bien à désirer que la chose s'exécute; l'on obtiendra par là un fait de plus. MM. Charles & Robert, qui ont ouvert une souscription à ce

L ij

First edition of "the first serious treatise on aerostation as a practical possibility" (PMM). The year 1783 marks the beginning of the history of flight, and the present work offers the first contemporary chronicle of the first aerial voyage. ""French geologist and traveller Barthélémy Faujas de Saint-Fond published [the present work] from Paris in two volumes in 1783 and 1784. Saint-Fond's work was the first full-length account of the historic experiments with balloon flight conducted by paper manufacturers Joseph-Michel and Jacques-Étienne Montgolfier in 1783" (historyofinformation.com).

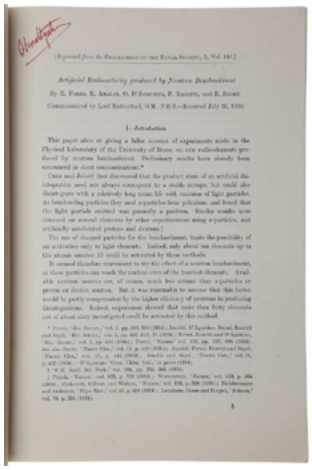
❧PMM 229; Dibner, *Heralds of Science* 179; *En français dans le texte* 75; Norman 769; Sparrow, *Milestones of Science* 179; Tissandier 21; Brockett 302; Davy, *Interpretive History of Flight* 37-41.

Discoveries that led to the atomic bomb and nuclear energy - inscribed

19. FERMI, Enrico, AMALDI, Edoardo, D'AGOSTINO, Oscar, RASETTI, Franco & SEGRÈ, Emilio. [With:] **AMALDI, E., D'AGOSTINO, O., FERMI, E., PONTECORVO, Bruno, RASETTI, F. & SEGRÈ, E.** *Artificial Radioactivity produced by Neutron Bombardment, I-II.* [London: Harrison], 1934-35.

$15,000

First edition, extremely rare offprint issues, inscribed by one of the authors, of the first detailed description of artificial radioactivity produced by neutron bombard- ment, and the enhanced effect due to slowing of the neutrons. These were the discoveries that later made possible both the nuclear reactor and the atomic bomb. "Fermi's laboratory was the first to create and identify elements with atomic numbers greater than 92 (uranium), the highest naturally occurring element. In honor of this work, the artificial element number 100 is named "Fermium" ... Fermi's work with slow neutrons prepared the way for the discovery of nuclear fission, the key to extracting energy from nuclear reactions" (Marburger, 'Enrico Fermi's impact on science,' *Nuclear News*, Vol. 45 (2002), pp. 27-30). Fermi's team had actually observed nuclear fission four years before Hahn and Strassmann, although at the time they placed a different interpretation on their results. Fermi was awarded the 1938 Nobel Prize in Physics "for his demonstrations of the existence of new radioactive elements produced by neutron irradiation, and for his related discovery of nuclear reactions brought about by slow neutrons."



Provenance: Oscar d'Agostino (1901-75), inscribed by him on the title page of both parts. D'Agostino was one of the 'Via Panisperna boys,' the group of young scientists led by Fermi at the Physics Institute of the University of Rome La Sapienza.

The first systematic treatise on pathology - Nicolas Fouquet's copy

20. FERNEL, Jean François. *Medicina.* Paris: André Wechel, 1554.

$35,000


IO. FERNELII
AMBIANI,
Medicina.
AD HENRICVM. II. GALLIARVM
REGEM CHRISTIANISSIMVM.
LVTETIÆ PARISIORVM,
APVD ANDREAM WECHELVM, SVB
PEGASO, IN VICO BELLOVACO.
1554.
Cum Priuilegio Regis.

Exceptionally fine copy, and with distinguished provenance, of "the first systematic treatise on pathology, which also introduced the names for the sciences of pathology and physiology. In the second part, entitled 'Pathologia', Fernel provided the first systematic essay on the subject, methodically discussing the diseases of each organ. Fernel was the first to describe appendicitis, endocarditis, etc. He believed aneurysms to be produced by syphilis, and differentiated true from false aneurysms" (Garrison-Morton).

Provenance: 'Double-phi' cipher of Nicolas Fouquet (1615-80), finance minister to Louis XIV penned on upper margin of title. From the renowned, but undocumented library of the French non-practicing physician, music publisher, and connoisseur, Jean Blondelet. Contemporary marginalia, including index of diseases related to biblical names on final flyleaf.

❧Norman 785; Pincus 107; PMM 68n; Garrison-Morton 2271.

The speakable and unspeakable in quantum mechanics - inscribed

21. FEYNMAN, Richard. *The Concept of Probability in Quantum Mechanics.* Berkeley: University of California, 1951.

$15,000

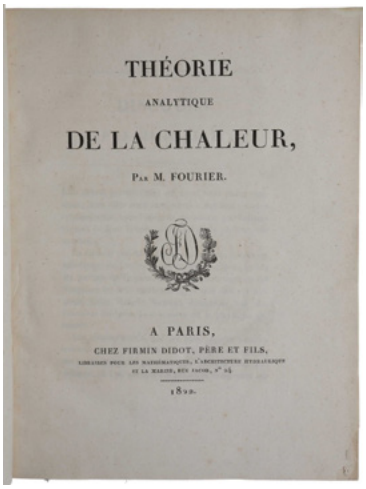
First edition, extremely rare offprint, inscribed by Feynman, of this famous lecture in which Feynman for the first time argues the necessity for a 'quantum probability' (a well developed subject in its own right today), and sets out clearly his own interpretation of the meaning of quantum mechanics, particularly what John Bell later called 'the speakable and unspeakable in quantum mechanics.' All this is done through a brilliant analysis of the 'double-slit' experiment, in which electrons pass through two holes and then fall on a screen. His analysis later became famous when it was included in the Feynman *Lectures on Physics*, but this is its first appearance in print. No copies of this offprint located in institutional collections worldwide. Although signed works by Feynman occasionally appear on the market, they are almost always his popular autobiographical works; technical scientific works inscribed by Feynman are extremely rare in commerce (none are located in auction records).

'The source of all modern methods in mathematical physics'

22. FOURIER, Jean-Baptiste-Joseph. *Théorie Analytique de la Chaleur.* Paris: Firmin Didot, 1822.

$32,000

First edition of the first mathematical study of heat diffusion, the first major mathematization of a branch of physics outside me- chanics. "This work marks an epoch in the history of both pure and applied mathematics. It is the source of all modern methods in mathematical physics ... The gem of Fourier's great book is 'Fourier series'" (Cajori, *A History of Mathematics*, p. 270). "In this groundbreaking study, arguing that previous theories of mechan- ics advanced by such outstanding scientists as Archimedes, Galileo, Newton and their successors did not explain the laws of heat, Fourier set out to study the mathematical laws governing heat diffusion and proposed that an infinite mathematical series may be used to ana- lyse the conduction of heat in solids: this is now known as the 'Fourier Series'. His work paved the way for modern mathematical physics" (Introduction to the 2009 reprint by Cambridge University Press). "There is no doubt that today this book stands as one of the most daring, innovative, and influential works of the nineteenth century on mathematical physics" (González-Velasco, p. 428).

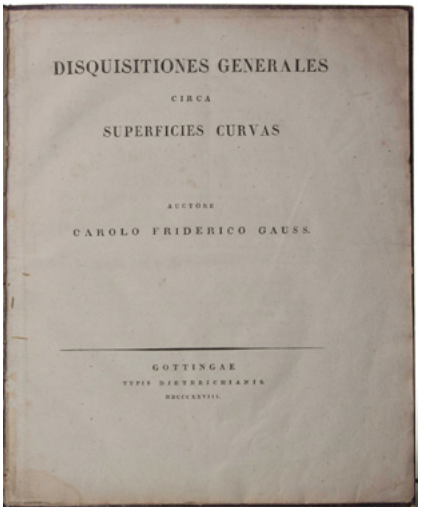


❧Dibner 154; Evans 37; Sparrow 68; *Landmark Writings in Western Mathematics* 26; Norman 824; *En Francais dans le Texte* 232. González-Velasco, 'Connections in mathematical analysis: the case of Fourier series,' American Mathematical Monthly 99 (1992), 427-41.

A founding work in modern geometry

23. GAUSS, Carl Friedrich. *Disquisitiones generales circa superficies curvas.* Göttingen: Dieterich, 1828.

$15,000


DISQUISITIONES GENERALES
CIRCA
SUPERFICIES CURVAS
AUCTORE
CAROLO FRIDERICO GAUSS.
GOTTINGAE

First edition, the rare offprint, from the library of Haskell F. Norman, of the founding paper of modern differential geometry, a "masterpiece of the mathematical literature" (Zeidler, *Quantum field theory*). This work provided the foundations for Riemann's famous 1854 Habilitationsschrift 'Uber die Hypothesen welche die Geometrie zu Grunde liegen' (i.e., PMM 293b). "... the crowning contribution of the period, and his last great breakthrough in a major new direction of mathematical research, was *Disquisitiones generales circa superficies curvas* (1828), which grew out of his geodesic meditations of three decades and was the seed of more than a century of work on differential geometry" (DSB). "A decisive influence on the entire course of development of differential geometry was exerted by the publication of [the present] paper of Gauss . It was this paper, carefully polished and containing a wealth of new ideas, that gave this area of geometry more or less its present form and opened a large circle of new and important problems whose development provided work for geometers for many decades" (Kolmogorov & Yushkevitch, *Mathematics of the 19th century*). "In his approach to differential geometry, Riemann used ideas from Carl Friedrich Gauss's theory of surfaces, but liberated them from the restriction of being embedded in (three-dimensional) Euclidean space" (*Companion Encyclopedia*, p. 928).

❧Norman 880 (this copy).

The first comprehensive discussion of magnetism; founded electrical science

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

$70,000


GVILIELMI GIL
BERTI COLCESTREN
SIS, MEDICI LONDI
NENSIS,
DE MAGNETE, MAGNETI
CISQVE CORPORIBVS, ET DE MAG
no magnete tellure; Physiologia nova,
plurimis & argumentis, & expe
rimentis demonstrata.
LONDINI
EXCVDEBAT PETRVS SHORT ANNO
MDC.

First edition of "the first major English scientific treatise based on experimental methods of research. Gilbert was chiefly concerned with magnetism; but as a digression he discusses in his second book the attractive effect of amber (electrum), and thus may be regarded as the founder of electrical science. He coined the terms 'electricity,' 'electric force' and 'electric attraction.' His 'versorium', a short needle balanced on a sharp point to enable it to move freely, is the first instrument designed for the study of electrical phenomena, serving both as an electroscope and electrometer. He contended that the earth was one great magnet; he distinguished magnetic mass from weight; and he worked on the application of terrestrial magnetism to navigation. Gilbert's book influenced Kepler, Bacon, Boyle, Newton and, in particular, Galileo, who used his theories [in the *Dialogo*] to support his own proof of the correctness of the findings of Copernicus in cosmology" (PMM). "Gilbert provided the only fully developed theory … and the first comprehensive discussion of magnetism since the thirteenth century *Letter on the Magnet* of Peter Peregrinus" (DSB). Although this book does appear with some regularity on the market, copies such as ours in fine condition and in untouched contemporary bindings are rare.

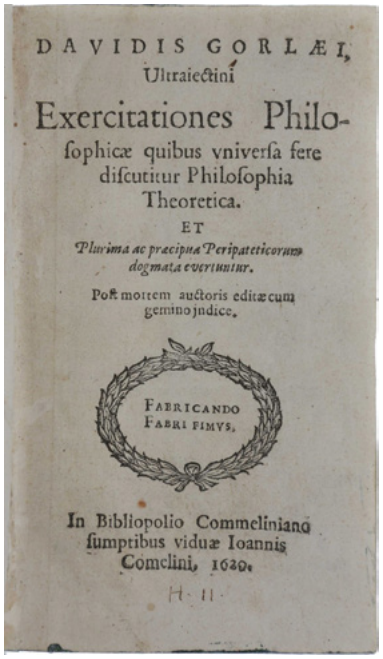
❧Dibner *Heralds of Science* 54; Grolier/Horblit 41; Heilbron, *Electricity in the 17th and 18th Centuries*, pp. 169-179; Norman 905; PMM 107; STC 11883; Wellcome 2830.

Founder of modern atomism

25. GORLAEUS (VAN GOORLE, VAN GOOIRLE), David. *Exercitationes philosophicæ quibus universa fere discutitur philosophia theoretica, et plurima ac præcipua Peripateticorum dogmata evertuntur ... cum gemino indice.* [Leyden]: in bibliopolio Commeliniano sumptibus viduae Joannis Comelini, 1620.

$65,000

First edition, extremely rare, of one of the earliest modern works on atomism. "Gorlaeus is counted among the founders of modern atomism, which he proposed as an alternative to Aristotelian matter theory. Because of his notion of atomic compounds, he is also regarded as a contributor to the evolution of chemistry" (DSB). "When David Gorlaeus (1591-1612) passed away at 21 years of age, he left behind two highly innovative manuscripts. Once they were published [as the present work, and as *Idea physicae* (1651), his work had a remarkable impact on the evolution of seventeenth-century thought. However, as his identity was unknown, divergent interpretations of their meaning quickly sprang up. Seventeenth-century readers understood him as an anti-Aristotelian thinker and as a precursor of Descartes. Twentieth-century historians depicted him as an atomist, natural scientist and even as a chemist. And yet, when Gorlaeus died, he was a beginning student in theology. His thought must in fact be placed at the intersection between philosophy, the nascent natural sciences, and theology" (Lüthy). This is a very rare book. In his review of Lüthy's book in 2012, Henri Krop wrote: "until now Gorlaeus's life and ideas have remained basically unknown because both his elaborate *Exercitationes philosophicae* and his *Idea physicae* are extremely rare and copies were unavailable in Dutch public libraries. " We have been unable to locate any copies in auction records.

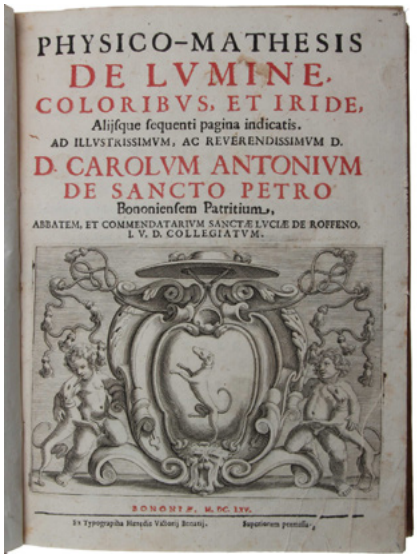

DAVIDIS GORLÆI,
Vltraiectini
Exercitationes Philo-
sophicæ quibus vniversa fere
discutitur Philosophia
Theoretica.
ET
Plurima ac præcipua Peripateticorum
dogmata evertuntur.
Post mortem auctoris editæ cum
gemino indice.
FABRICANDO
FABRI FIMVS.
In Bibliopolio Commeliniano
sumptibus viduæ Ioannis
Comelini, 1620.

❧Lüthy, David Gorlaeus (1591-1612): An Enigmatic Figure in the History of Philosophy and Science, 2012.

Discovery of diffraction of light

26. GRIMALDI, Francesco Maria. *Physico-mathesis de lumine, coloribus, et iride, aliisque adnexis libri duo, in quorum primo asseruntur nova experimenta, & rationes ab iis deductae pro substantialitate luminis...* Bologna: heirs of Vittorio Benacci for Girolamo Bernia, 1665.

$65,000


PHYSICO-MATHESIS
DE LVMINE,
COLORIBVS, ET IRIDE,
Alijsque sequenti pagina indicatis.
AD ILLVSTRISSIMVM, AC REVERENDISSIMVM D.
D. CAROLVM ANTONIVM
DE SANCTO PETRO
Bononiensem Patritium,
ABBATEM, ET COMMENDATARIVM SANCTÆ LVCIÆ DE ROFFENO.
I. V. D. COLLEGIATVM.

A fine copy of Grimaldi's only publication. This very important book contains the first account of the diffraction of light discovered by the author and it marks the first scientific attempt to establish a comprehensive wave theory of light. The diffraction experiments which Grimaldi describes here show "that a new mode of transmission of light had been discovered and that this mode contradicts the notion of an exclusively rectilinear passage of light. Diffraction thus gave prima facie evidence for a fluid nature of light. The name 'diffraction' comes from the loss of uniformity observed in the flow of a stream of water as it 'splits apart' around a slender obstacle placed in its path." (*DSB*). Grimaldi repeatedly states that colors are not something different from light but are modifications of light produced by the fine structure of the bodies which reflect it, and probably consisting of an alteration in the type of motion and in the velocity of the light. The different colors are produced when the eye is stimulated by light oscillations whose velocities differ. All these views were of fundamental importance for the subsequent development of optics.

❧Macclesfield 943 (lacking the 2nd title); Arnoud de Vitry 429; Honeyman 1559.

Invention of the air pump and the first electric generating machine

27. GUERICKE, Otto von. *Experimenta Nova (ut vocantur) Magdeburgica de Vacuo Spatio.* Amsterdam: Johanned Jansson Waesberge, 1672.

$57,500

First edition and a fine copy in contemporary binding. A book of prime importance in electrical discovery, air-pressure and the vacuum pump. "At Ratisbon in 1654 Guericke had performed one of the most dramatic experiments in the history of science, when, before the Imperial Diet, he showed how two teams of eight horses each could not separate a bronze pair of hemispheres from which he had exhausted the air" (Dibner, *Founding Fathers of Electrical Science*). To create the vacuum, Guericke invented the air-pump, and in a series of experiments that followed he demonstrated the weight and elasticity of air. The air- pump became of fundamental importance for the study of the physical properties of gases. Guericke also demonstrated electrical attraction and repulsion, the discharging power of points, and constructed the first electrical generator. "Guericke constructed a spherical rotor of sulphur mounted on a crank; its rotation and contact upon it generated the first visible and audible electric sparks" (*ibid.*). As the Wheeler Gift catalogue remarks, "this remarkable work on experimental philosophy ranks next to Gilbert's in the number and importance of the electrical discoveries described." Guericke's experiments were motivated by his profound Copernican cosmological views on the nature and composition of space, which are fully set forth in the present work (see DSB).

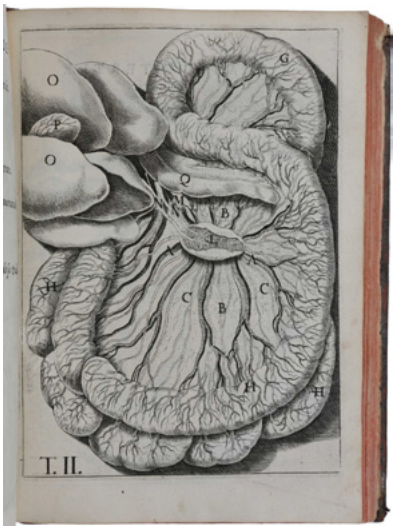
❧Dibner 55; Evans 30; Horblit 44; Norman 952; Sparrow 99; Wheeler Gift 170.

'The most important book in the history of medicine'

28. HARVEY, William. *De motu cordis & sanguinis in animalibus, anatomica exercitation: cum refutationibus Aemylii Parisani … et Jacobi Primirosii; [Bound with:] ASELLI, Gasparo. De lactibus, sive lacteis venis, quarto vasorum masaraicorum genere.* Leyden: Johann Maire, 1639/1640.

$54,000

A very fine copy of the third, but second complete, edition of the single most important and famous medical book ever published, containing Harvey's discovery and experimental proof of the circulation of the blood, which created a revolution in physiology comparable to the Copernican revolution in astronomy. Harvey's discovery was to become "the cornerstone of modern physiology and medicine" (Garrison-Morton). *De motu cordis* "is probably the most important book in the history of medicine. What Vesalius was to anatomy, Harvey was to physiology; the whole scientific outlook on the human body was transformed, and behind almost every important medical advance in modern times lies the work of Harvey" (*Heirs of Hippocrates*). This is the earliest edition that collectors can reasonably expect to obtain, the first edition (Frankfurt, 1628) being of the greatest rarity. The second edition (Venice, 1635), published with the *Exercitationes* of Emilio Parigiano was fragmentary, lacking the plates, parts of the introduction and chapters I and XVI. In this edition, the publisher Maire restored these passages and included the illustrations.

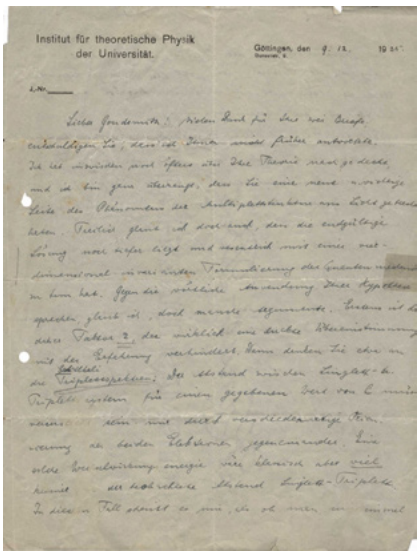


❧*Heirs of Hippocrates* 417 (this edition); Grolier/Medicine 27; PMM 127 (describing the first edition).

The inventor of quantum mechanics confronts the new concept of spin

29. HEISENBERG, Werner. *Autograph letter, in German, to Samuel Goudsmit, signed 'Werner Heisenberg'.* Göttingen, 9 December 1925.

$15,000

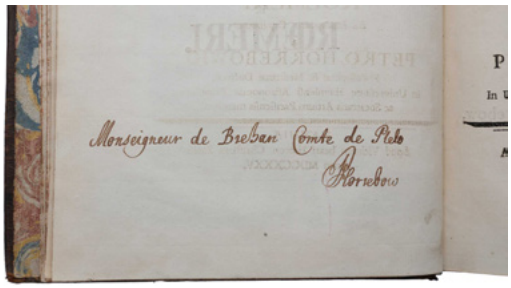

Institut für theoretische Physik
der Universität.

Historically important, very detailed, scientific letter showing how Heisenberg, who had invented quantum mechanics just six months earlier, grappled with the difficulties presented by a basic new discovery in quantum physics, that of electron spin by Goudsmit and George Uhlenbeck. When this letter was written, Heisenberg was not convinced that their proposal was correct, citing in this letter calculations he has carried out (partly with Pascual Jordan) which show that Goudsmit and Uhlenbeck's theory predicts a splitting of spectral lines twice as large as the observed values. Nevertheless, Heisenberg was keeping an open mind, and following a meeting with Niels Bohr in Göttingen just a few days after this letter, he accepted the concept of electron spin, even though the paradoxical factor of two remained unresolved. Later in the letter Heisenberg is, even at this early stage in the development of quantum mechanics, starting to think about the quantum theory of radiation, later called quantum electrodynamics. Heisenberg was at this time teaching at the University of Göttingen, having studied there under Arnold Sommerfeld and Max Born.

Ole Rømer's observatory

30. HORREBOW, Peder. *Basis astronomiae sive astronomiae pars mechanica. In qua describuntur observatoria, atque instrumenta astronomica Roemeriana Danica; simulque eorundem usus, sive methodi observandi Roemerianae...* Copenhagen: widow of Hieronimo Christian Paulli, 1735.

$18,500



First edition, large-paper inscribed presentation copy, of Horrebow's classic work, illustrated with an engraved frontispiece (repeated at p.16) and 11 engraved plates depicting Ole Rømer's Copenhagen observatory and his astronomical instruments. Rømer is famous for having been the first to show that the speed of light is finite and measure its speed; he also constructed the first meridian transit circle with a telescopic sight. The present work is "the chief source of information concerning Rømer's methods and ideas" (DSB, under Rømer). Rømer intended to publish a book on his own astronomical instruments and observations, and commissioned several of the engravings in the present work (several of them are dated 1704), but the book was never published.

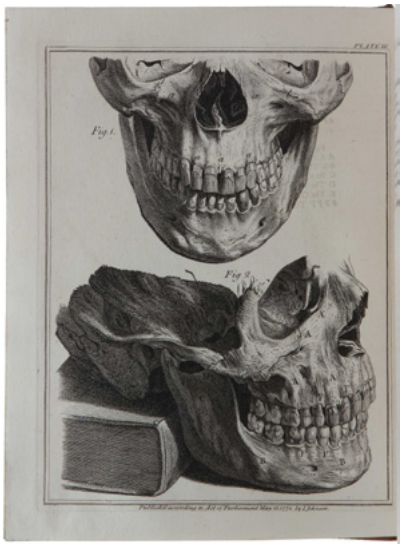
Provenance: inscribed on the title by Horrebow: "Monseigneur de Breban Comte de Plelo // P Horrebow." Louis-Robert-Hippolyte de Breban, comte de Plelo, was born in 1699 into an ancient Breton family. He served in the army, acting as colonel of a regiment named after him. In 1729 he was appointed ambassador to Denmark.

❧DSB VI, 513; Bruun II, 76; not in Houzeau & Lancaster.

'Basic to all modern dentistry'

31. HUNTER, John. *The Natural History of the Human Teeth.* London: J. Johnson, 1771.

$12,500



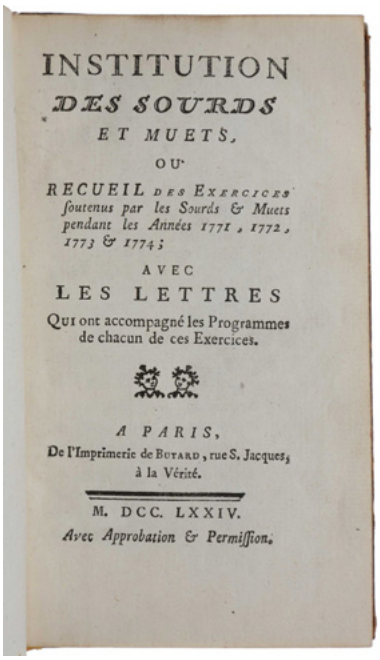
An exceptionally fine copy of "the first scientific study of the teeth and basic to all modern dentistry" (*Heirs of Hippocrates*). "Hunter's work on the structure and diseases of the teeth began a new era for dentistry in England, placing what had been an empirical art upon a basis of careful scientific observation, and providing a foundation for further research. In the *Natural history*, Hunter gave detailed accounts of the anatomy and physiology of the oral cavity and jaw, introduced the modern scientific nomenclature for the teeth, established the tooth's construction of bone, pulp and enamel, and examined the processes of tooth development in fetuses and children" (Norman). "In a busy life devoted to research, teaching, and the practice of surgery, Hunter found time to study the structure, development, and diseases of the teeth and to collect and arrange a series of dental specimens… In [the present] book, Hunter classified the teeth in the system still used today and was the first to state definitely that the human teeth 'are never more than thirty-two.' He traced their development in the fetus and the child and established their structure of pulp, bone, and enamel. At the end of the book are descriptions of devices to correct malocclusion and even suggestions for a method of transplantation" (Lilly).

❧Norman 1116; Lilly, *Notable Medical Books* 131; *Heirs of Hippocrates* 968; Garrison-Morton 3675.

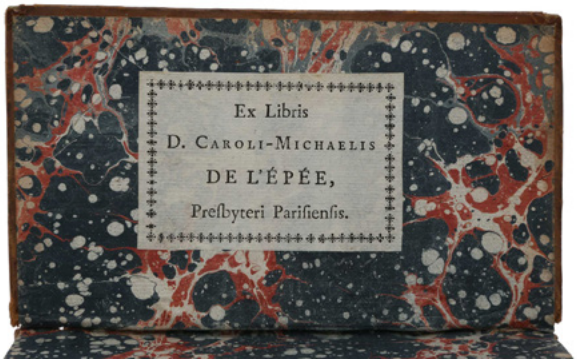
The introduction of French sign language

32. L'EPEE (Abbé de C.M.) *Institution des sourds et muets, ou recueil des exercices soutenus par les sourds & muets pendant les années 1771, 1772, 1773 & 1774; avec les lettres qui ont accompagne les Programmes de chacun de ces exercices.* Paris: Butard, 1774.

$3,500


INSTITUTION
DES SOURDS
ET MUETS,
OU
RECUEIL DES EXERCICES soutenus par les Sourds & Muets pendant les Années 1771, 1772, 1773 & 1774;
AVEC
LES LETTRES
Qui ont accompagné les Programmes de chacun de ces Exercices.
A PARIS,
De l'Imprimerie de BUTARD, rue S. Jacques, à la Vérité.
M. DCC. LXXIV.
Avec Approbation & Permission.

The true first edition, and the author's own copy, of the work that introduced French Sign Language. His method was used all over Europe, and through its English translation reached the United States, where it was adapted into American Sign Language a few decades after his death. "The Abbé de L'Epée met two deaf girls, decided to educate them, and soon had a class of 60 devoted pupils, whom he supported and amongst whom he lived. He based his methods in those of Bonet and Amman, and was first to attach great importance to signs" (Garrison-Morton). Charles-Michel de l'Epée (1712-1789) founded the first public school for the hearing-impaired in France, and devoted his life to developing the world's first sign alphabet for the deaf. This edition was unknown to Guyot when he compiled his bibliography of works on the deaf and dumb, and also to Brunet.


Ex Libris
D. CAROLI-MICHAELIS
DE L'ÉPÉE,
Presbyteri Parisiensis.

En français dans le texte 168; Garrison-Morton 3358. *Provenance*: the author's own copy, with his bookplate on front paste-down and several manuscript corrections and additions, probably in his hand.

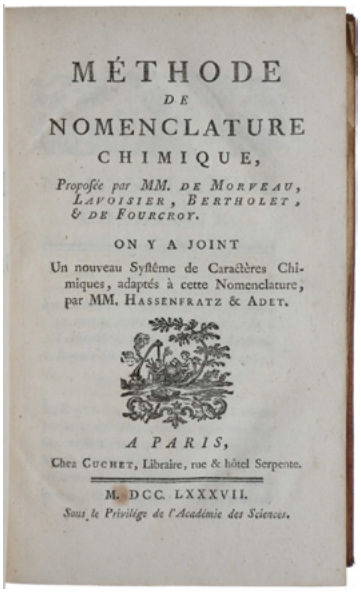
❧*En français dans le texte* 168; Garrison-Morton 3358

'The Nomenclature was extremely influential and widely read' (DSB)

33. LAVOISIER, Antoine-Laurent, BERTHOLLET, Claude-Louis, FOURCROY, Antoine-François de, comte, & GUYTON de MORVEAU, Louis Bernard. *Méthode de nomenclature chimique, proposée par MM. de Morveau, Lavoisier, Berthollet, & de Fourcroy. On y a joint un nouveau systême de caractères chimiques, adaptés à cette nomenclature, par MM. Hassenfratz & Adet.* Paris: Cuchet, 1787.

$5,000

First edition, first issue, and a very fine copy. "The first salvo in Lavoisier's campaign to convert the scientific world to his antiphlogistic "new chemistry" was this collaborative work by Lavoisier, Claude Berthollet, Antoine de Fourcroy and Guyton de Morveau. The new chemical nomenclature, originally developed by de Morveau before he had converted to anti-phlogisticism, was adopted by Lavoisier as a means for communicating his new chemistry; its publication in the present work marked a complete break with the past" (Norman). "The *Nomenclature* was extremely influential and widely read" (DSB VIII: 80). This is the first of two issues published in the same year; the second issue has a woodcut floral ornament on the title and no colophon on page 314. There were few editions of this work because its contents were incorporated into Lavoisier's *Traité de Chimie* (1789). An English translation was published in 1788.


MÉTHODE
DE
NOMENCLATURE
CHIMIQUE,
Proposée par MM. de Morveau, Lavoisier, Berthollet, & de Fourcroy.
ON Y A JOINT
Un nouveau Systême de Caractères Chimiques, adaptés à cette Nomenclature, par MM. Hassenfratz & Adet.
A PARIS,
Chez Cuchet, Libraire, rue & hôtel Serpente.
M. DCC. LXXXVII.
Sous le Privilége de l'Académie des Sciences.

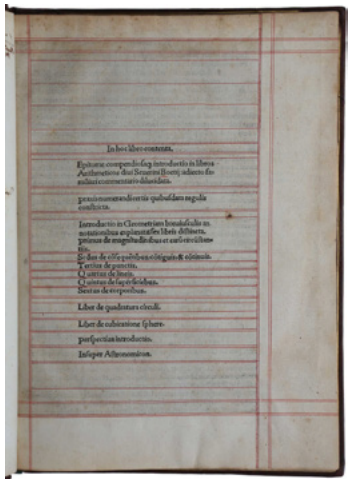
❧Sparrow, *Milestones of Science* 125; Norman 1291; Honeyman 1937.

16th century mathematics in a Roger Payne binding

34. LEFÈVRE D'ÉTAPLES, Jacques, BO[U]VELLES, Charles de, & CLICHTOVE, Josse. *Josse. Epitome compendiosaq[ue] introductio in libros arithmeticos divi Severini Boetii [Lefevre], adiecto familiari commentario dilucidata [Clichtove]. Introductio annotationibus explanata, sex libris distincta. Liber de quadratura circuli, liber de cubicatione spherae; perspectivae introductio [Bovelles]. Praxis numerandi certis quibusdam regulis constricta [Clichtove]. Insuper Astronomicon [Lefèvre].* Paris: H. Estienne & W. Hopyl, 27 June 1503.

$20,000

First edition of this very rare collection of works, in an attractive Roger Payne binding. The individual works are all first editions with the exception of Lefèvre's *Epitome* of Boethius' *De arithmetica* (first, 1496) and an unattributed *Opusculum de p[r]axi numerorum quod Algorismum vovant*, actually the *Algorismus* of Sacrobosco (no earlier printing than this one in auction records). This latter text was the first to introduce Hindu-Arabic numerals into the European university curriculum, thereby greatly simplifying the procedures of practical calculation. The geometrical part of the volume comprises several works of Bovelles (ca. 1479-1567), which deal with the classical problems of the quadrature of the circle and duplication of the cube, and contain a highly original study of stellated polygons. Bovelles also gives here the first published account of the cycloid, a curve that was to be of great significance in the seventeenth century development of mathematics leading up to the invention of calculus and for Huygens' isochronous pendulum clock. The volume concludes with Lefèvre's treatise on astronomy.

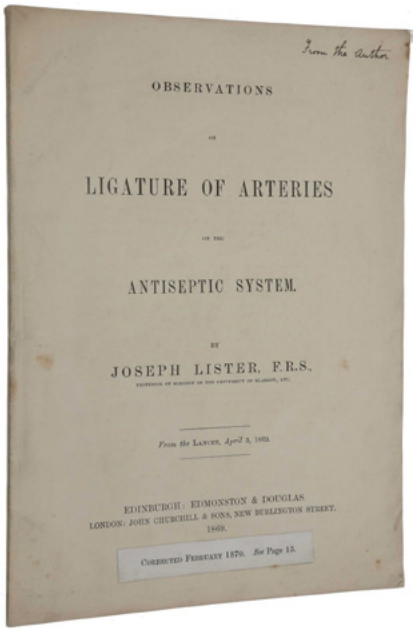


Antiseptic ligatures - presentation offprint

35. LISTER, Joseph. *Observations on Ligature of Arteries on the Antiseptic System.* Edinburgh; London: Edmonston & Douglas; John Churchill & Sons, 1869 [1870].

$2,500

First edition, second offprint issue, presentation copy. Following Lister's introduction of the methods of antisepsis in 1867, he turned to the methods of tying arteries with a view to reducing infection. Hitherto threads of waxed silk had been used, and he first suggested soaking the silk in carbolic acid before use. Although this did reduce post-operative infection, the silk was not absorbed by the body and he found that it could give rise to abscesses. He therefore tried catgut instead of silk, and found that it was absorbed by the body over time ('catgut' is actually a misnomer as it is usually collagen taken from healthy mammals, usually sheep). This also enabled Lister to cut the ends of his ligatures short and leave them within the closed wound, contrary to previous surgical practice, in which the ends of a non-absorbent ligature were cut long and left to protrude from the wound for later removal. Lister's catgut ligature thus eliminated a major source of post-operative infection.


From the Author.

OBSERVATIONS

ON

LIGATURE OF ARTERIES

IN THE

ANTISEPTIC SYSTEM.

BY

JOSEPH LISTER, F.R.S.

From the Lancet, April 3, 1869.

EDINBURGH: EDMONSTON & DOUGLAS.
LONDON: JOHN CHURCHILL & SONS, NEW BURLINGTON STREET.
1869.

Corrected February 1870. See Page 13.

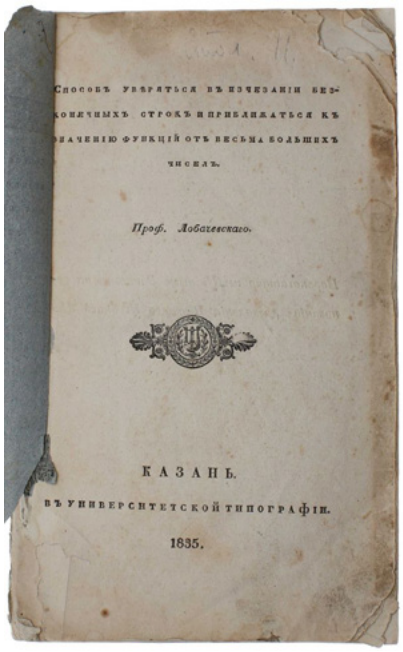
Provenance: Inscribed 'From the author' on front wrapper in a secretarial hand. The recipient was probably the Cumbrian physician and biographer Henry Lonsdale (1816-76), fellow of the Royal College of Physicians of Edinburgh (1841), senior president of the Royal Medical Society (1843), for two sessions the senior president of the Hunterian Medical Society. In 1846 he was appointed physician to the Cumberland Infirmary, an office he held for 22 years. The paper was first published in the *Lancet* 1 (1869), pp. 451-55.

❧Norman 1369; Garrison-Morton 2964.

Lobachevsky on the foundations of calculus

36. LOBACHEVSKY, Nikolai Ivanovich. *Sposob uviersit'sia v izchezanii bezkonechnykh strok i priblizhat'sia k znacheniiu funktsii ot ves'ma bol'shikh chisel [Cyrillic] [A method for ascertaining the convergence of infinite series and for obtaining approximate values of functions of a large number of variables].* Kazan: Universitetskaip, 1835.

$8,000


Способъ увѣриться въ исчезаніи безконечныхъ строкъ и приближаться къ значенію функцій отъ весьма большихъ чиселъ.

Проф. Лобачевскаго.

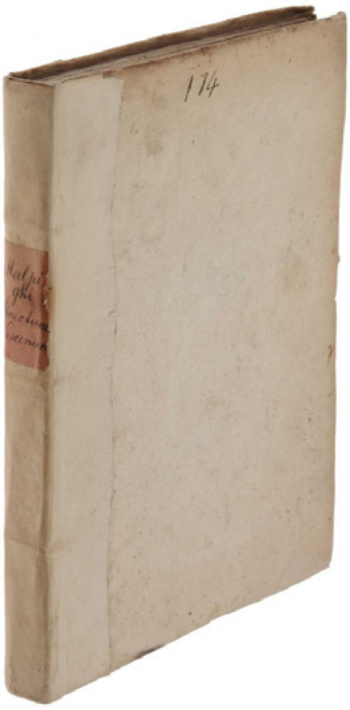
КАЗАНЬ.
ВЪ УНИВЕРСИТЕТСКОЙ ТИПОГРАФІИ.
1835.

First edition, incredibly rare offprint, of this important book-length memoir on the foundations of calculus and real analysis by the first inventor of non-euclidean geometry. "As early as 1835, Lobachevsky showed in a memoir [the of- fered work] the necessity of distinguishing between continuity and differentiabil- ity" (Cajori, *History of Mathematics*, p. 421). This paper was published in the *Scientific Memoirs of Kazan University*, 1835, No. 2, pp. 211-342. The Kazan publications of Lobachevsky are exceptionally rare, even in Russian collec- tions. OCLC lists the Harvard copy only; we are not aware of any other copy having appeared in commerce. This work includes an extensive discussion of infinite series. Much of this parallels the contributions of western European mathematicians, but it includes a new convergence criterion, now known as 'Lobachevsky's test'. Lobachevsky also treats the problem of expressing functions by infinite products. Much space is also devoted in this memoir to definite integrals, motivated by the computation of areas and volumes in Lobachevskian geometry. One year later, Lobachevsky devoted a whole memoir to this subject, 'Primenenie voobrazhaemoi geometrii k nekotorym integralam' ('Application of Imaginary Geometry to Certain Integrals').

Important treatises on the kidney, red blood corpuscles, Hodgkin's disease, …

37. MALPIGHI, Marcello. *De viscerum structura exercitatio anatomica.* Bologna: Giacomo Monti, 1666.

$32,500



Very rare first edition, and a beautiful copy uncut in original boards, of this classic which includes Malpighi's famous treatise on the kidney, *De renibus premium*, in which he described the uriniferous tubules as well as the 'Malpighian bodies', which have perpetuated his name. The book also includes the first description of Hodgkin's disease… "The great detail and clarity of Malpighi's description was unsurpassed until Bowman [1842]" (Garrison-Morton). "This collection of anatomical treatises contains Malpighi's account of the Malpighian bodies (glomeruli) of the kidney (in 'De renibus'), his observation of red blood corpuscles (in 'De polypo cordis"), and the first description of Hodgkin's disease (in 'De liene'). Malpighi's studies of the kidney gave support to his iatromechanical theory of glands as secretion machines; he concluded that the glomeruli were in direct contact with both arteries and veins, and postulated a similar connection between the glomeruli and urinary vessels. In his treatise on heart polyps, Malpighi demonstrated that the polyps consisted of coagulum found in normal blood; it was while examining a clot of coagulum under the microscope that Malpighi observed a number of red 'atoms' (corpuscles) in the interstices of the coagulum fibers" (Norman). The last copy at auction that was untouched in a contemporary binding was the Friedman copy (Sotheby's New York, Nov 16, 2001, lot 121, $49,625).

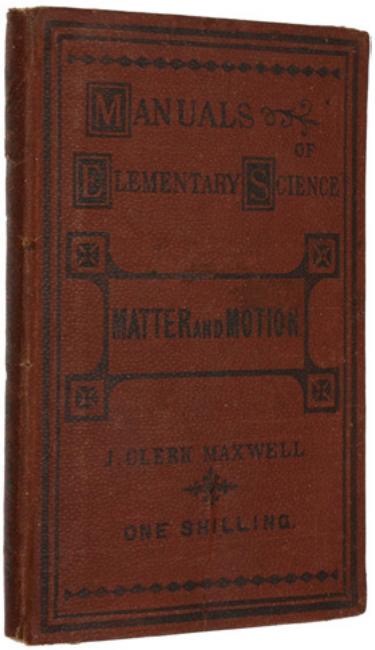
❧Norman 1427; Friedman 121; Pincus 175; Garrison-Morton 535 & 1230.

Maxwell on space, time and relativity

38. MAXWELL, James Clerk. *Matter and Motion.* London: Society for Promoting Christian Knowledge, 1876.

$6,500

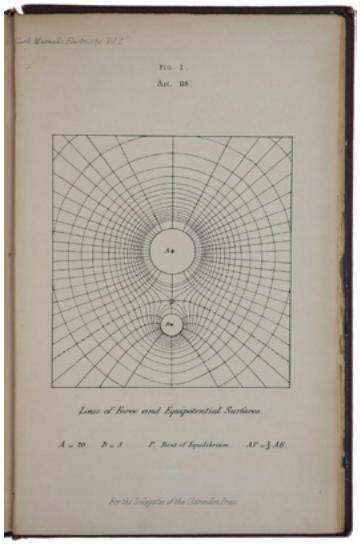
First edition, rare on the market, especially in this condition, of Maxwell's textbook on dynamics, "a masterpiece of natural philosophy, notable especially for introducing into physics the term *relativity* in a passage that combines strenuous scientific insight with a mystical awareness … [It] had a strong influence on [Henri] Poincaré" (*Routledge Encyclopedia of Philosophy*, p. 209). "More light is thrown on Maxwell's own opinions about the problem of relative and absolute motion and the connection between dynamics and other branches of physics by the delightful monograph *Matter and Motion*, published in 1876" (DSB). This book also contains, within a discussion of causality, a foreshadowing of modern ideas about chaos theory. *Matter and Motion* has sometimes been represented in the past as a largely non-mathematical summary of Newtonian dynamics but it is now recognized that it contains an incisive analysis of concepts such as space, time and acceleration that is a clear precursor of Einstein's work that lead to the special theory of relativity. Article 18, 'Absolute Space,' includes the statement: "All our knowledge, both of time and place, is essentially relative." Maxwell also emphasizes from the beginning of the work the notion of 'configuration' of a set of points, which he defines as "the assemblage of relative positions" _ this avoids the arbitrary choice of an 'origin' or 'axes' which would be needed to specify the Cartesian coordinates of the points. In art. 29 he represents such a configuration by a set of bright dots on a black field, to emphasize that there are no absolute measures of distance between the points. This can be viewed as an anticipation of Einstein's use of generalized coordinate systems in his general theory of relativity.



"Did for electromagnetism what Newton's Principia had done for mechanics"

39. MAXWELL, James Clerk. *A Treatise on Electricity and Magnetism.* Oxford: Clarendon Press, 1873.

$15,000



First edition, first issue, of Maxwell's presentation of his theory of electromagnetism, advancing ideas that would become essential for modern physics, including the landmark "hypothesis that light and electricity are the same in their ultimate nature" (Grolier/Horblit). "This treatise did for electromagnetism what Newton's *Principia* had done from classical mechanics. It not only provided the mathematical tools for the investigation and representation of the whole electromagnetic theory, but it altered the very framework of both theoretical and experimental physics. It was this work that finally displaced action-at-a-distance physics and substituted the physics of the field" (*Historical Encyclopedia of Natural and Mathematical Sciences*, p. 2539). "From a long view of the history of mankind — seen from, say, ten thousand years from now — there can be little doubt that the most significant event of the 19th century will be judged as Maxwell's discovery of the laws of electrodynamics" (R. P. Feynman, in *The Feynman Lectures on Physics* II (1964), p. 1-6). "[Maxwell] may well be judged the greatest theoretical physicist of the 19th century . Einstein's work on relativity was founded directly upon Maxwell's electromagnetic theory; it was this that led him to equate Faraday with Galileo and Maxwell with Newton" (PMM). "In 1931, on the 100th anniversary of Maxwell's birth, Einstein described the change in the conception of reality in physics that resulted from Maxwell's work as 'the most profound and the most fruitful that physics has experienced since the time of Newton'" (*Britannica*).

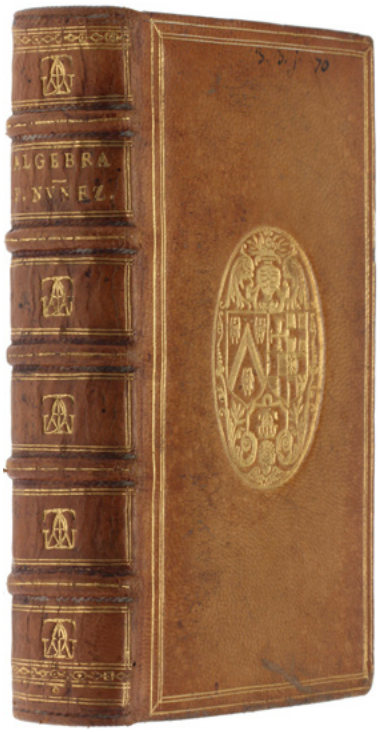
❧Grolier/Horblit 72; Norman 1666; PMM 355; *Landmark Writings in Western Mathematics* 44.

Algebra for navigators, by the greatest Portuguese mathematician

40. NUÑEZ, Salaciense Pedro. *Libro de algebra en arithmetica y geometria.* Antwerp: heirs of Arnold Birckman, 1567.

$52,000

Exceptionally fine copy, bound in citron morocco for Jacques-Auguste de Thou (1553-1617), of this rare and celebrated treatise on algebra. "Considered the greatest of Portuguese mathematicians, Nuñez reveals in his discoveries, theories, and publications that he was a first-rate geographer, physicist, cosmologist, geometer and algebraist" (DSB). Only three other copies have appeared at auction in the last 50 years. J.A. de Thou assembled one of the greatest libraries of his time. Thou's library later became the property of Jean-Jacques Charron, marquis de Ménars (1643-1718) before being sold off in 1789. "Both as Royal Cosmographer under King John III (the Pius) of Portugal and as professor of mathematics at the University of Coimbra, Nuñes gave instruction in the art of navigation to those associated with Portugal's merchant and naval fleets. His Libro de algebra provided the mathematical underpinnings of that instruction — and much more — adopting Pacioli's abbreviated notational style and treating the solution not only of linear and quadratic equations but also that of a cubic equation of the type $x^3 + cx = d$ following the spectacular mid-sixteenth-century work of the Italians Niccolo Tartaglia and Girolamo Cardano" (Katz & Parshall, *Taming the Unknown*, p. 205).



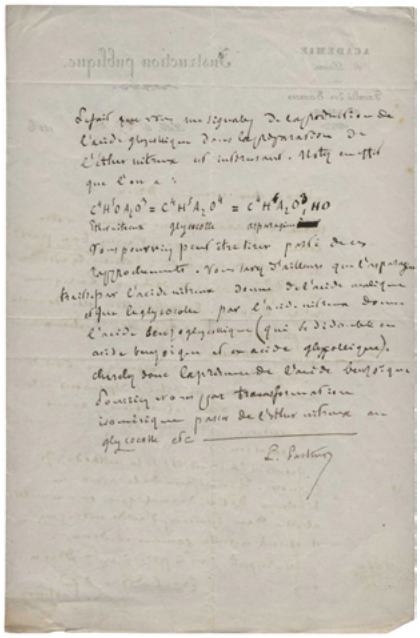
❧Frank Streeter 392; Macclesfield 1548; Honeyman 2354;Peeters-Fontainas 845 (this copy).

Pasteur writes on isomerism

41. PASTEUR, Louis. *Autograph letter signed ("L. Pasteur"), in French, Lille, 25 December, 1856, to Charles Alexandre Drion.*

$14,000

An important letter (in fact, two letters in one), with significant scientific content, both bearing on his work on isomerism and molecular chirality.



"Pasteur rose to the status of a national hero during his lifetime. However, perhaps surprisingly, Geison, a historian who has made a detailed study of Pasteur's life and work, is able to state: 'His contributions to basic science were extensive and very significant, but less revolutionary than his reputation suggests. Pasteur's most profound and most original contributions to science [i.e. these are the ones in the field of molecular chirality and crystallography] are also the least famous, and they came at the very outset of his career.' Bernal, a crystallographer, concurs ' ... his first and in some ways his greatest scientific discovery'" (Flack, *Louis Pasteur's discovery of molecular chirality*.

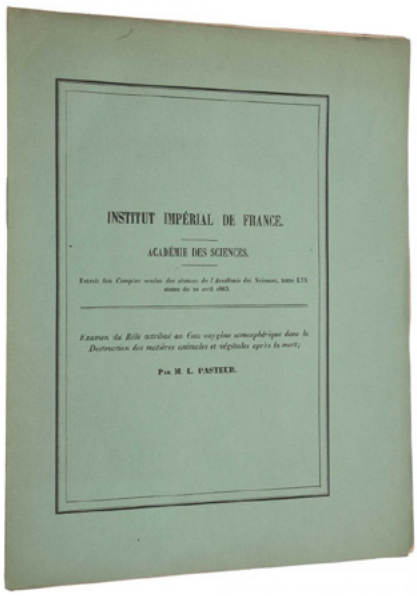
The recipient of this letter, Charles Alexandre Drion (1827-63), was educated at the Ecole Normale Supérieure, graduating in 1847. From 1854 to 1859 he was Professeur de Physique at the Lycée de Versailles. He earned his doctorate in 1859 with a thesis entitled 'Recherches sur la dilatabilité des liquides volatils.' The following year he was appointed Chargé de Cours at the University of Besançon, rising to professor in 1862.

Pasteur confronts the critics of his germ theory

42. PASTEUR, Louis. *Examen du rôle attribué au gaz oxygène atmosphérique dans la destruction des matières et végétales aprés la mort.* [Paris: Mallet-Bachelier, 1863].

$5,850

Extremely rare separately-paginated offprint of the *ne plus ultra* of Pasteur's work on spontaneous generation, and his proof that putrefaction was, like fermentation, caused by living organisms; this paper directly influenced Joseph Lister's research on antisepsis (see below). Pasteur himself regarded the experiments described in this work as the most decisive (Rostand, p. 183), writing at the end of the paper that they struck the final blow against the doctrine of spontaneous generation ("Il sera superflu sans doute de faire remarquer que les expériences dont je viens d'entretenir l'Académie au sujet du sang et de l'urine portent un dernier coup à la doctrine des générations spontanées, aussi bien qu'à la théorie moderne des ferments"). Pasteur's opponents had objected that in the experiments described in Pasteur's earlier paper 'Mémoire sur les Corpuscules organisées qui existent dans l'Atmosphere' (1861), the heating of the fermentable materials may have destroyed the 'vegetative forces' needed to create new life. In the present work, Pasteur therefore collected blood and urine directly from the veins and bladders of healthy cattle. These mediums did not require heating to be sterilized and, as in his previous experiments, micro-organisms appeared only on exposure to atmospheric air.
OCLC lists just one copy of this offprint (University of Colorado).


INSTITUT IMPÉRIAL DE FRANCE.

ACADÉMIE DES SCIENCES.

Examen du Rôle attribué au Gaz oxygène atmosphérique dans la Destruction des matières animales et végétales après la mort,

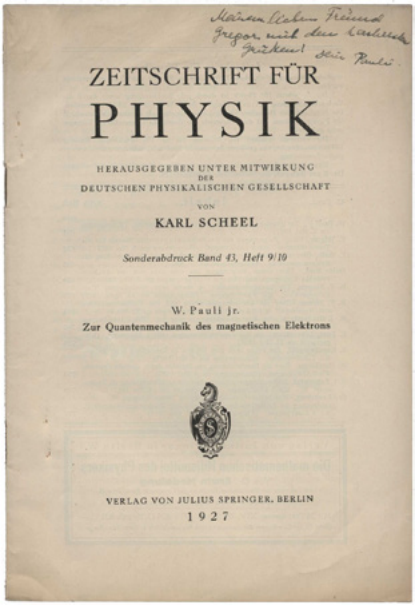
Par M. L. PASTEUR.

❧Garrison-Morton 2477; Graeme K. Hunter, *Vital Forces: The Discovery of the Molecular Basis of Life* (2000); Jean Rostand, *Le courrier d'un biologist* (1970).

Pauli incorporates spin into quantum mechanics - "spin matrices"

43. PAULI, Wolfgang. *Zur Quantenmechanik des magnetischen Elektrons.* Berlin: Springer, 1927.

$7,500



First edition, a remarkable presentation offprint, of this crucially important paper in which Pauli shows how to incorporate the concept of spin into quantum mechanics, introducing his famous 'spin matrices.' "This achievement had profound implications for future studies of the quantum properties of matter since the way was opened up for fully incorporating spin into many different types of quantum mechanical problem, in particular, for systems of more than one electron. These studies led to the development of a self-consistent scheme of spin in quantum mechanics as was able to explain a large number of phenomena in atomic and condensed matter physics" (Longair, *Quantum concepts in physics* (2013), p. 327). "Wentzel was Pauli's closest friend" (Miller, p. 57). "Like Pauli, Wentzel had been a student of Sommerfeld's in Munich. When Pauli was a student Wentzel had been Sommerfeld's assistant and joined them in their café conversations. Two years Pauli's senior, he had already made important contributions to the new atomic physics. He had an easy-going manner, enhanced by his ever-present cigar and readiness for a good time. In his letters Pauli addressed him as "Dear Gregor" and signed himself "Wolfgang" – in those days an extraordinary degree of informality" (*ibid.*, p. 111).

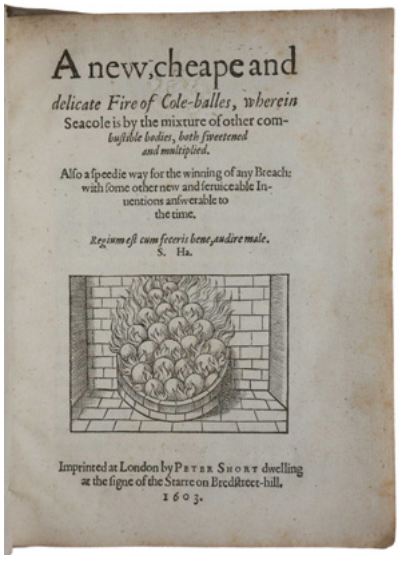
Provenance: Gregor Wentzel (1898-1978), physicist, with Pauli's presentation inscription to Wentzel on the front wrapper: "Meinem lieben Freund Gregor mit den herzlichen Grüßen! sein Pauli." Wentzel made important contributions to quantum mechanics, quantum electrodynamics and meson theory. He is particularly remembered for the WKB method (1926) for finding approximate solutions to linear partial differential equations (especially the Schrödinger equation), named after Hendrik Kramers, Léon Brillouin and himself.

Making coke from coal - essential to the industrial revolution

44. PLAT, Sir Hugh. *A new, cheape and delicate Fire of Cole-balles, wherein Seacole is by the mixture of other combustible bodies, both sweetened and multiplied.* London: Peter Short dwelling at the signe of the Starre on Bredstreet-hill, 1603.

$12,500

First edition, the superb Macclesfield copy bound in contemporary vellum gilt, of this important work by "Elizabethan London's most curious student of nature" (Harkness, p. 8), which first introduced the process of making coke from coal, a technological innovation that proved crucial in the industrial revolution. This is an extremely rare book – indeed, this is probably the only surviving perfect copy (see below). "The technique of making coke from coal [was] suggested in 1603 by Hugh Plat as a process similar to making charcoal from wood" (Osborne, p. 234). "Coke's superior crushing strength allowed blast furnaces to become taller and larger. The ensuing availability of inexpensive iron was one of the factors leading to the industrial revolution" (Newgera, p. 89). "Plat's approach to his many collaborators and the natural knowledge they shared with him was rigorous, and prefigures in significant ways … the scientific method" (Harkness, p. 214). "ESTC locates copies at British Library [lacks A1], Bodleian [lacks A1, ex Juel-Jensen], Birmingham University [lacks A1]; Marsh's Library Dublin [missing], Glasgow University [apparently lacking one leaf – presumably A1 - as pagination is given as 30 pp.], Folger [sheet A frayed, affecting title & text; ex Sion College], Huntington [lacks A1]; no other copy located in auction records."

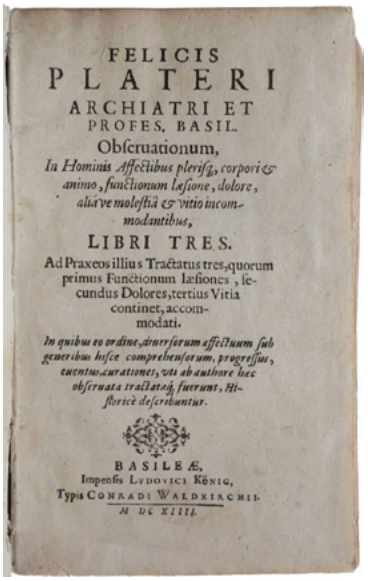

A new, cheape and
delicate Fire of Cole-balles, wherein
Seacole is by the mixture of other com-
bustible bodies, both sweetened
and multiplied.
Also a speedie way for the winning of any Breach:
with some other new and seruiceable In-
uentions answerable to
the time.
Regnum est cum feceris bene, audire male.
S. Ha.
Imprinted at London by Peter Short dwelling
at the signe of the Starre on Bredstreet-hill,
1603.

A classical work in orthopaedics

45. PLATTER, Felix. *Observationum, in hominis affectibus plerisque, corpori & animo, functionum laesione, dolore, aliave molestia & vitio incommodantibus, libri tres.* Basel: Ludwig König for Conrad Waldkirch, 1614.

$2,800

First edition of this important medical work which contains "the first known case report of the death from hypertrophy of the thymus (in an infant) and an account of a meningioma" (Norman). "The work also contains the first mention of the thickening of the palmar fascia which results in retraction of the fingers and later called Dupuytren's contracture". (*Heirs of Hippocrates*). A disciple of Eustachi, Falloppio and Vesalius, Platter was one of the foremost pathologists of the sixteenth and early seventeenth centuries, occupying a place midway between Fernel (1497-1558) and Bonet (1620-89). "Platter proposed a classification of diseases based on symptoms, a system very different from that followed by contemporary practitioners. He performed over 300 dissections, making numerous significant pathological observations, including sublingual calculi, giantism, intestinal parasites, and cystic liver and kidneys associated with terminal anasarca. Platter also made the first attempt to classify mental diseases, grouping them under mental weakness (caused by heredity, trauma or physical illness), mental consternation Oistlessness, stupor, paralysis, agitation or catalepsy), deep sleep (comatose or torpid states) and mental alienation". (Norman).


FELICIS
PLATERI
ARCHIATRI ET
PROFES. BASIL.
Obſeruationum,
In Hominis Affectibus pleriſq; corpori & animo, functionum læſione, dolore, aliáve moleſtiâ & vitio incommodantibus,
LIBRI TRES.
Ad Praxeos illius Tractatus tres, quorum primus Functionum læſiones, ſecundus Dolores, tertius Vitia continet, accommodati.
In quibus eo ordine, diuerſorum affectuum ſub generibus hiſce comprehenſorum, progreſſus, euentus, curationes, vti ab authore hæc obſeruata tractatæ, fuerunt, Hiſtoricè deſcribuntur.
BASILEÆ,
Impenſis Ludovici Kœnig,
Typis Conradi Waldkirchii.
M DC XIIII.

❧Norman 1716; *Heirs of Hippocrates* 373; G&M 3789 (endocrinology), 4297.9 (the earliest book listed on orthopaedics), and 4511.1 (neurology).

Editio princeps of 'one of the most influential scientific works of all time' (PMM)

46. PTOLEMY. *De geographia libri octo, summa cum vigilantia excusi.* Basel: Froben & Episcopius, 1533.

$48,500

Editio princeps, the first printing of Ptolemy's celebrated *Geography* or *Cosmology* in the original Greek. This is a fine, unrestored copy in its original binding. A rare book on the market: only one other copy has appeared at auction since 1977, i.e., the Evelyn-Garden copy (Sotheby's 1989) which was bound in restored seventeenth-century calf. "Ptolemy's *Geography* is the only book on cartography to have survived from the classical period and one of the most influential scientific works of all time. Written in the second century AD, for more than fifteen centuries it was the most detailed topography of Europe and Asia available and the best reference on how to gather data and draw maps. Ptolemy championed the use of astronomical observation and applied mathematics in determining geographical locations. But more importantly, he introduced the practice of writing down coordinates of latitude and longitude for every feature drawn on a world map, so that someone else possessing only the text of the *Geography* could reproduce Ptolemy's map at any time, in whole or in part, at any scale" (Berggren & Jones, *Ptolemy's Geography: An Annotated Translation of the Theoretical Chapters,* 2000).

❧PMM 18 (1462 edition); Garden Sale 23 (this edition).

Minimal surfaces and Plateau's problem

47. RIEMANN, Georg Friedrich Bernhard. *Ueber die Fläche vom kleinsten Inhalt bei gegebener Begrenzung. Bearbeitet von K. Hattendorff.* Göttingen: Dieterich, 1867.

$2,850

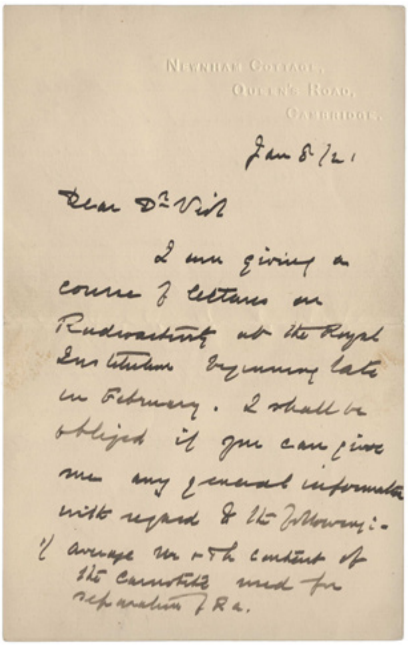
First edition, the very rare offprint issue, of Riemann's important paper on minimal surfaces (i.e. surfaces of least area for a given boundary). "What his work lacks in quantity is more than compensated for by its superb quality. One of the most profound and imaginative mathematicians of all time …" (DSB). The research first published in this paper was carried out in 1860-61; this delay in publication cost Riemann the credit for several fundamental discoveries contained in the present work. Most importantly, Riemann was the first to understand the intimate relationship between minimal surfaces and complex analytic functions, later credited to Karl Weierstrass (1815-97). Indeed, the present paper is a natural outgrowth of Riemann's landmark doctoral dissertation on complex function theory (1851). Riemann also anticipated Hermann Amandus Schwarz (1843-1921) in the construction of a new family of minimal surfaces which provided the first solution to a non-trivial case of *Plateau's problem*, the problem of finding a minimal surface having a given curve as its boundary (this problem was not solved in full generality until 1930). "The problem involves geometry and physics, and its treatment uses real and complex analysis. In other words, problem and treatment involve almost all of Riemann's work areas" (Laugwitz, p. 142). ABPC/RBH list only a single copy.

❧Laugwitz, *Bernhard Riemann 1826-1866*, 1999.

Rutherford requests information on Radium

48. RUTHERFORD, Ernest. *Autograph letter signed 'E Rutherford' to Charles Herman Viol, 8 January 1921. Three pages on two sheets.*

$5,850

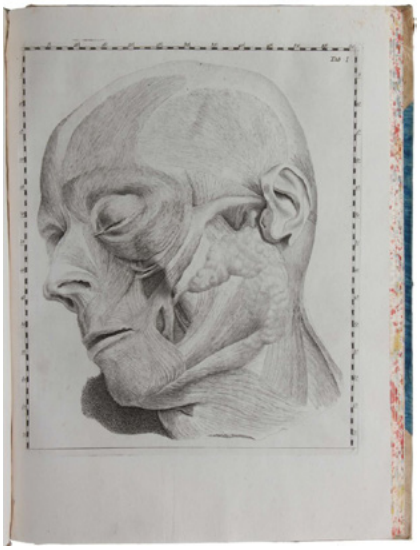

Newnham Cottage,
Queen's Road,
Cambridge.
Jan 8/21
Dear Dr Viol
I am giving a course of lectures on Radioactivity at the Royal Institution beginning late in February. I shall be obliged if you can give me any general information with regard to the following:-
1/ average [illegible] content of the Carnotite used for separation of Ra.

Important letter from Rutherford to Charles Herman Viol requesting information about the production of radium, in preparation for a series of lectures he was to deliver at The Royal Institution. "From 1921, when he succeeded [J. J.] Thomson, until his death, Rutherford was professor of natural philosophy at the Royal Institution in London, a post that entailed several lectures each year" (DSB). Rutherford (1871-1937) had moved in 1919 from Manchester to Cambridge, where he was director of the Cavendish Laboratory. There he continued his research on radioactivity, mainly in collaboration with James Chadwick, work which depended on a steady supply of radioactive materials. Since 1913 Viol had been director of research at the US Standard Chemical Company, the first successful large-scale producer of radium, and editor of its in-house journal Radium. He was thus in an excellent position to respond to Rutherford's request. Rutherford letters with significant scientific content are rare on the market.

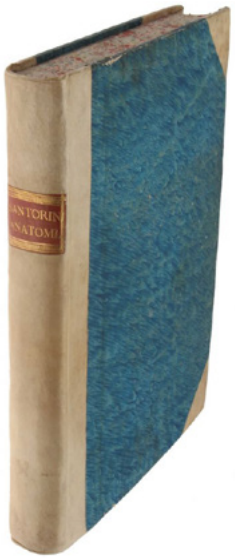
One of the finest anatomies of the eighteenth century

49. SANTORINI, Giovanni Domenico. *Anatomici summi septemdecim tabulae quas nunc primum edit atque explicat iisque alias addit de structura mammarum et de tunica testis vaginali.* Parma: [Giambattista Bodoni], 1775.

$7,500



First edition, and a very fine copy. "The book is one of the finest anatomies of the eighteenth century because of its excellent illustrations and comprehensive commentary." (*Heirs of Hippocrates*). It is also one of the rarest of the few medical books printed at the celebrated Bodoni Press in Parma, as well as one of the few medical books issued by a private press. "Santorini was generally acknowledged as the outstanding anatomist of his time. Many corrections and discoveries in the detailed anatomy of the different organs of the human body go back to Santorini. Even today a facial muscle (risorius), a pair of cartilages (comicula) of the larynx, the emissary veins of the skull, and a part of the superior and inferior turbinates of the ethmoid are named after Santorini" (Hagelin, *Rare and Important Medical Books*, p. 112).



❧Norman 1888; Garrison-Morton 399.1; *Heirs of Hippocrates* 788; Pincus 248.

"Certainly one of the greatest philosophers of the 19th century"

50. SCHOPENHAUER, Arthur. *Die Welt als Wille und Vorstellung: vier Bücher, nebst einem Anhange, der die Kritik der Kantschen Philosophie enthält.* Leipzig: Brockhaus, 1819.

$25,000

First edition, rare, of Schopenhauer's *magnum opus*, a pessimistic view of scientific endeavor explicitly described (on the title page) as a "criticism of Kantian philosophy." Initially ignored, this is now one of the most acclaimed philosophical texts of the nineteenth century. In it he asserts that "the will and the passions ... are the real determinants of all intellectual life," a stance appreciated by both Wagner and Nietzsche. A second volume appeared for the first time as part of the second edition in 1844. Only 750 copies were printed, many of which were later destroyed by the publisher. Eduard Grisebach, in his work, *Edita und inedita Schopenhaueriana*, recounts the dispersal history of *Die Welt als Wille un Vorstellung* as follows: "On February 9, 1820 not even 100 of the original 750 copies had been sold. On November 29, 1828 there were still 150 copies in the warehouse. During those intervening eight years it is known that the publishers mulched a considerable number of this edition for needed paper. In 1830 the records show that another 97 copies were destroyed for the same reason."


Die
Welt
als
Wille und Vorstellung:
vier Bücher,
nebst einem Anhange,
der die
Kritik der Kantischen Philosophie
enthält,
von
Arthur Schopenhauer.
Leipzig:
1819.

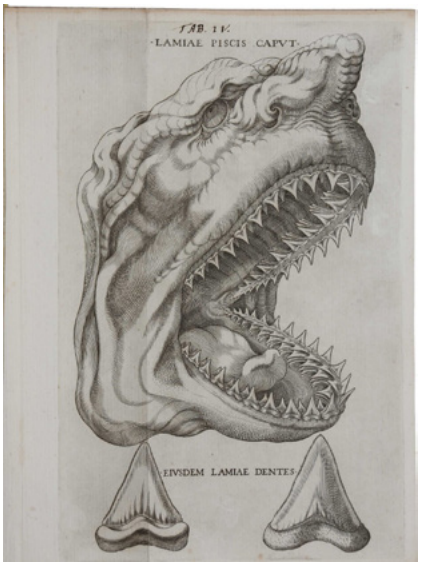
❧PMM 279; Borst 1324; Brieger 2195; Deneke 1280; Grisebach 12 (not mentioning the folding table); Hübscher, Schopenhauer-Bibliographie 10; Laban 35.

Made seminal contributions to myology, embryology and geology

51. STENSEN, Niels (Nicolaus Steno). *Elementorum Myologiae Specimen, seu musculi descriptio geometrica. Cui accedunt canis carchariae dissectum caput, et dissectus piscis ex canum genere.* Florence: [Joseph Cocchini], 1667.

$16,000

First edition of "the first outline of a scientific theory of the development of the earth" (Norman). This is one of the most remarkable of the scientific classics because it made seminal contributions to three quite distinct fields: myology, embryology and geology. In addition to being "The earliest geological treatise" (Garboe, quoted in Garrison-Morton), this work laid the foundation of muscle mechanics, and contains the first recognition of the egg-producing function of the female ovary.



❧G&M 577. Lilly, Notable medical books, p. 79. Norman 2012; NLM/Krivatsy 11432; Osler 4021; Waller 9223. Cobb, Generation, 2006; Garboe, *Nicolaus Steno and the foundation of exact geology and crystallography*, 1954; Garboe, *The earliest geological treatise (1667) by Nicolaus Steno*, 1958; Kardel & Maquet (eds.), Nicolaus Steno: *Biography and Original Papers of a 17th Century Scientist*, 2012.

Stern-Gerlach experiment - "The most compelling evidence for quantum theory"

52. STERN, Otto & GERLACH, Walther. *Der experimentelle Nachweis der Richtungsquantelung im Magnetfeld. [Offered with:] Das magnetische Moment des Silberatoms.* Braunschweig: Vieweg & Berlin, 1922.

$7,500

First edition, the very rare offprints, of the famous Stern-Gerlach experiment, which demonstrated the spatial quantization predicted by the Bohr-Sommerfeld quantum theory of the atom and (although this was not realised until later) the existence of electron spin. "This direct demonstration of spatial quantization was immediately accepted as among the most compelling evidence for quantum theory" (Friedrich & Herschbach, p. 57). "The Stern-Gerlach experiment is undoubtedly one of the great achievements of experimental physics" (Longair, p. 154). In a letter of March 1922 to Max Born, Einstein wrote: "The most interesting achievement at this point is the experiment of Stern and Gerlach." "Perhaps no other experiment is so often cited for elegant conceptual simplicity. From it emerged both new intellectual vistas and a host of useful applications of quantum science" (Friedrich & Herschbach, p. 53). Stern continued his work on atomic and molecular beams, and was awarded the Nobel Prize in Physics 1943 "for his contribution to the development of the molecular ray method and his discovery of the magnetic moment of the proton." No copies of these offprints located on OCLC, and no copies in auction records.

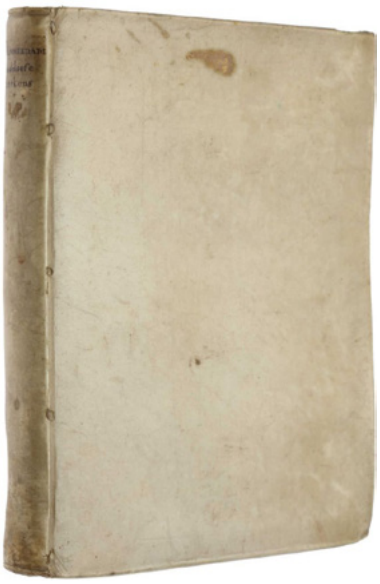
❧Friedrich & Herschbach, 'Stern and Gerlach: How a bad cigar helped reorient atomic physics,' Physics Today 56 (2003), pp. 53-59; Longair, Quantum Concepts in Physics, 2013; Segré, From X-rays to Quarks, 1980.

Spontaneous generation rejected

53. SWAMMERDAM, Jan. *Historia insectorum generalis; ofte, algemeene verhandeling der bloedeloose dierkens.* Utrecht: Merinardus van Dreunen, 1669.

$11,500

The very rare first edition of Swammerdam's important entomology work in which he "rejected spontaneous generation and proposed that the process of decay in organic matter was the result of living organisms" (Dibner on the later reworked edition of this work by Boerhave from 1737, i.e., *Bybel der natuure*). The *Biblia natura*, Swammerdam's major work, was published fifty-seven years after his death by Herman Boerhaave, who assembled it from unpublished manuscript materials integrated with a slightly revised version of Swammerdam's *Historia insectorum generalis* (1669) [the offered work]" (Norman). "The 1669 *Historia* was devoted to the overthrow of the idea of metamorphosis, as its title explains: 'General Account of the Bloodless Animals, in Which Will be Clearly Set Forward the True Basis of their Slow Growth of Limbs, the Vulgar Error of the Transformation, Also Called Metamorphosis, Will be Effectually Washed Away, and Comprehended Concisely in Four Distinct Orders of Changes, or Natural Budding Forth of Limbs.'



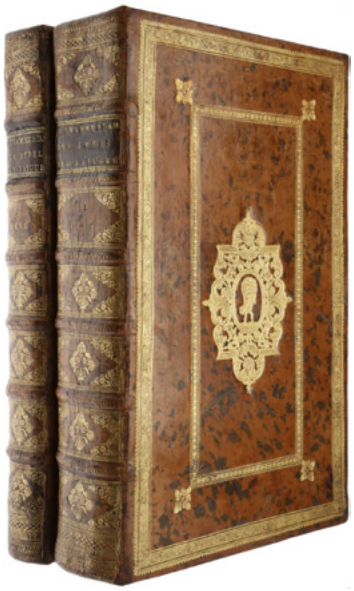
❧Garrison-Morton 294; Barchas 2018. See Dibner 191; Norman 2037; Sparrow 187 for the later *Bybel der natuure*.

18th century anatomy bound by 'The Necklace Bindery'

54. SWAMMERDAM, Jan. *Bybel der Natuure...* Leiden: Isaak Severinus, Boudewyn & Pieter Vander Aa, 1737-38.

$38,000

First edition, a magnificent copy in a spectacular contemporary binding from "The Necklace Bindery", of "the finest collection of microscopical observations ever produced by one worker. The book is consulted by naturalists to this day. Some of the figures have never been excelled" (Singer).



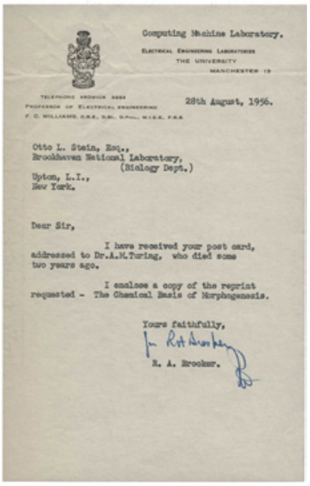
Binding: Sspectacular contemporary marbled calf from "The Necklace Bindery" at Leiden (so called by Storm van Leeuwen because of the characteristic rectangular border surrounding the central cartouche on the covers), "one of the most distinguished Leyden workshops of the 18th century [that] played a decisive role in the field of luxury binding", spine richly gilt in compartments all edges gilt. See *Dutch Decorated Bookbinding in the Eighteenth Century*, 2006, II-A, p. 260-278.

❧ Dibner, *Heralds of Science* 191; Norman 2037. Sparrow, *Milestones of Science* 187

One of his most important works

55. TURING, Alan Mathison. *The Chemical Basis of Morphogenesis.* London: Cambridge University Press, 1952.

$30,000



Computing Machine Laboratory.
Electrical Engineering Laboratories
The University
Manchester 13

Telephone Ardwick 3333
Professor of Electrical Engineering
F. C. Williams, O.B.E., D.Sc., D.Phil., M.I.E.E., F.R.S.

28th August, 1956.

Otto L. Stein, Esq.,
Brookhaven National Laboratory,
(Biology Dept.)
Upton, L.I.,
New York.

Dear Sir,

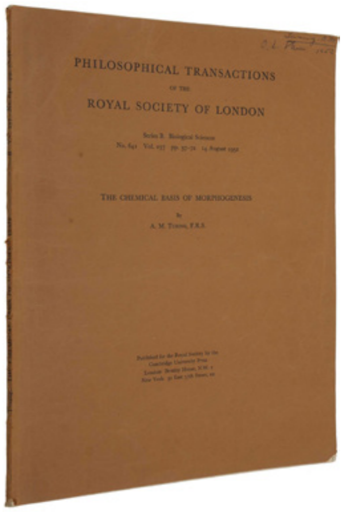
I have received your post card, addressed to Dr.A.M.Turing, who died some two years ago.

I enclose a copy of the reprint requested - The Chemical Basis of Morphogenesis.

Yours faithfully,

R. A. Brooker.

First edition, very rare offprint issue, of Turing's last major published work which has been 'hugely influential' (Maini), and 'in every respect ahead of its time' (Copeland). Taking his cue from the zoologist D'Arcy Thompson, who held that the forms of living things are to be explained in terms of the operation of physical forces and mathematical laws, Turing presents here the first mathematical theory of embryology. Offprints of Turing's papers are extremely rare in institutional holdings, and even more so in commerce. We have located only the copy in the Turing Archive at King's College, Cambridge and that in the Max Newman collection (now at Bletchley Park). "Alan Turing's paper, 'The chemical basis of morphogenesis,' has been hugely influential in a number of areas. In this paper, Turing proposed that biological pattern formation arises in response to a chemical pre-pattern which, in turn, is set up by a process now known as diffusion- driven instability. The genius of this work was that he considered a system which was stable in the absence of diffusion and then showed that the addition of diffusion, which is naturally stabilizing, actually caused an instability. Thus, it was the integration of the parts that was as crucial to the understanding of embryological development as the parts themselves – patterns emerged or self-organized as a re- sult of the individual parts interacting. To see how far ahead of his time he was, one has to note that it is only now in the post-genomic era of systems biology that the majority of the scientific community has arrived at the conclusion he came to 60 years ago…"



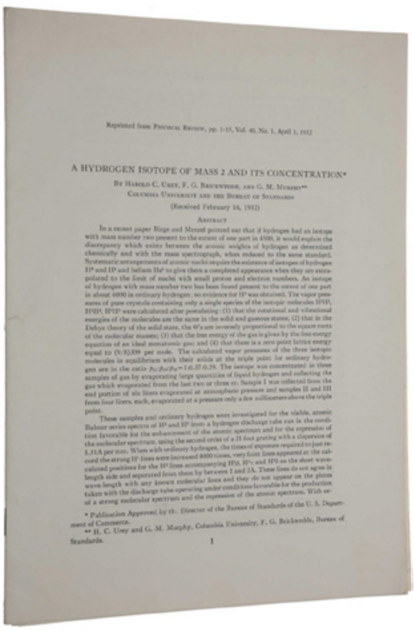
❧Philip K. Maini, in *Alan Turing: his work and impact*, p. 684

The discovery of deuterium - "heavy hydrogen"

56. UREY, Harold C., BRICKWEDDE, Ferdinand G. & MURPHY, George M. *A Hydrogen isotope of mass 2 and its concentration.* [Lancaster, PA: American Physical Society, 1932.

$3,500

First edition, the very rare offprint, of the discovery of deuterium, or 'heavy hydrogen,' an isotope of hydrogen of twice the atomic weight of normal hydrogen. "In 1931 Urey discovered a heavy isotope of hydrogen, later named deuterium, with his colleagues Ferdinand Brickwedde and George Murphy, through spectroscopy of the product of fractional distillation of hydrogen near its triple point. The discovery had a significant influence on chemistry, physics, and medicine (first tracer used to study physiological changes in the human body)" (DSB). Deuterium has many technological applications: in the form of 'heavy water' (deuterium oxide) it is used as a moderator in fission reactors; the nuclear fusion of deuterium atoms has been used in thermonuclear weapons; and deuterium enters into all chemical reactions characteristic of ordinary hydrogen, but it reacts more slowly than ordinary hydrogen, leading to its use as a tracer. The Nobel Prize in Chemistry 1934 was awarded to Harold C. Urey "for his discovery of heavy hydrogen." OCLC locates only one copy of this offprint (Yale Medical Library).



Reprinted from Physical Review, pp. 1-15, Vol. 40, No. 1, April 1, 1932

A HYDROGEN ISOTOPE OF MASS 2 AND ITS CONCENTRATION*

By Harold C. Urey, F. G. Brickwedde, and G. M. Murphy**

Columbia University and the Bureau of Standards

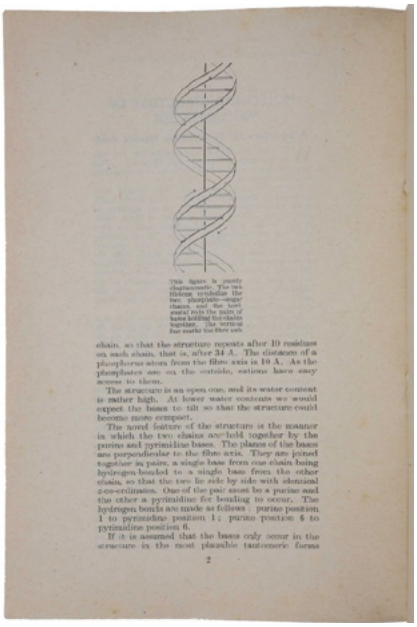
(Received February 16, 1932)

Abstract

The birth of molecular biology

57. WATSON, J. D. & CRICK, F. H. C.; WILKINS, M. H. F., STOKES, A. R. & WILSON, H. R.; FRANKLIN, R. E. & GOSLING, R. G. *Molecular Structure of Nucleic Acids: A Structure for Deoxyribose Nucleic Acid; Molecular Structure of Deoxypentose Nucleic Acids; Molecular Configuration in Sodium Thymonucleate.* St. Albans: Fisher, Knight & Co., 1953.

$17,000



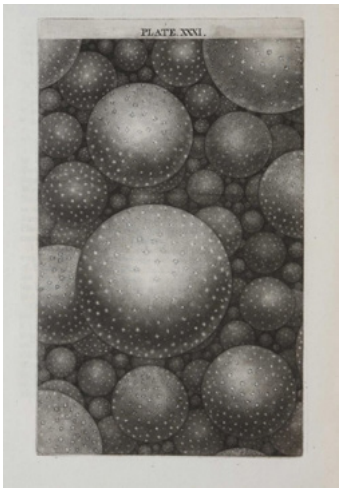
First edition, in the rare offprint form, of one of the most important scientific papers of the twentieth century (accompanied in the same offprint by two related papers), which "records the discovery of the molecular structure of deoxyribonucleic acid (DNA), the main component of chromosomes and the material that transfers genetic characteristics in all life forms. Publication of this paper initiated the science of molecular biology. Forty years after Watson and Crick's discovery, so much of the basic understanding of medicine and disease has advanced to the molecular level that their paper may be considered the most significant single contribution to biology and medicine in the twentieth century" (*One Hundred Books Famous in Medicine*, p. 362). The double helix describing the molecular structure of DNA has not only reshaped biology, it has become a cultural icon, represented in sculpture, visual art, jewellery, and toys. In 1962, Watson, Crick, and Wilkins shared the Nobel Prize in Physiology or Medicine "for their discoveries concerning the molecular structure of nucleic acids and its significance for information transfer in living material."

❧Grolier Club, *One Hundred Books Famous in Medicine*, 99; Dibner, *Heralds of Science*, 200. Garrison-Morton 256.3; Judson, *Eighth Day of Creation*, pp. 145-56.

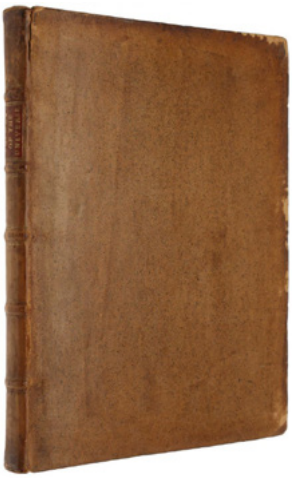
The nature of the Milky Way explained

58. WRIGHT, Thomas. *An original theory or new hypothesis of the universe.* London: Printed for the Author, and sold by H. Chapelle, 1750.

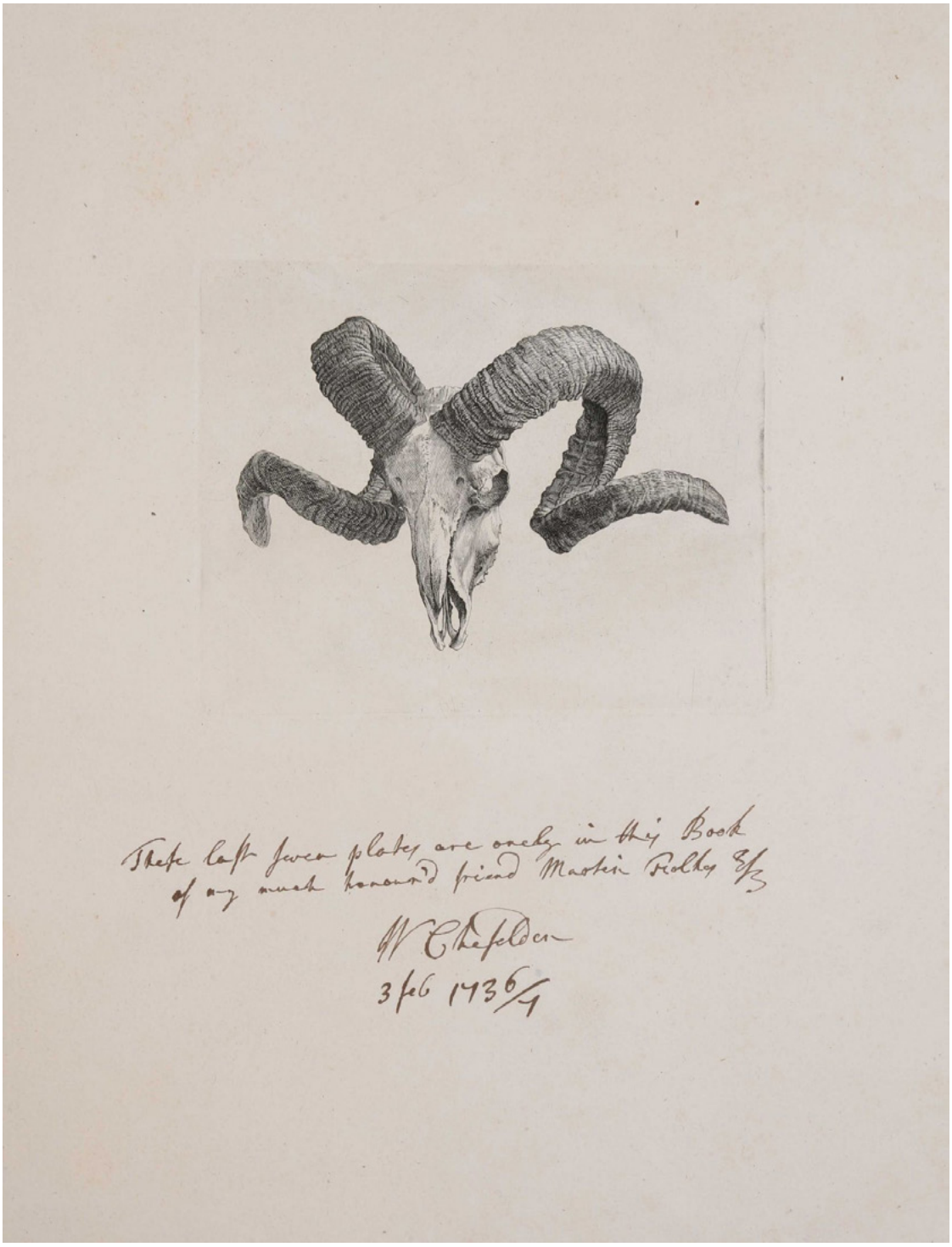
$52,000



Exceptionally fine copy of this extraordinary book, remarkable not only for its prophetic views on cosmology, but also for its mezzotint plates which have an almost surreal beauty not found in any other astronomical work. This is an outstanding copy, free of the foxing that normally affects this book, and in a beautiful, unrestored contemporary English binding in almost perfect condition. "For the first time in the history of astronomy the view is expressed here that the fixed stars are not distributed at random in space, but mainly concentrated in a flat disc" (Paneth). He also speculates on the nature of nebulae. "The dawn of extragalactic astronomy can be attributed to the year 1750, in which Thomas Wright speculated that some of the nebulae observed in the sky were not actually part of the Milky Way, but rather independent Milky Ways themselves" (Beckman & Shrader). "These views were more than 150 years ahead of their time and did not become accepted by the scientific community until they were substantiated by observational evidence in the 1920s" (*Biographical Dictionary of Scientists*). Wright also suggested that the rings of Saturn consisted of a multitude of unconnected particles, each revolving independently round the planet: in 1859, James Clerk Maxwell demonstrated this as the only scientifically tenable theory against the rival hypotheses of fluid or solid rings.



❧Norman 2265; Honeyman 3143; *Parkinson, Breakthroughs*, 1750.



CHESELDEN: *Osteographia, or the anatomy of the bones, 1733*
 # 11

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