# Catalogue 55:

# *Classics of Science, Medicine & Computing*

*For the 49th California International Antiquarian Book Fair*

*Pasadena Convention Center, February 12 – 14, 2016*

*Booth 802*

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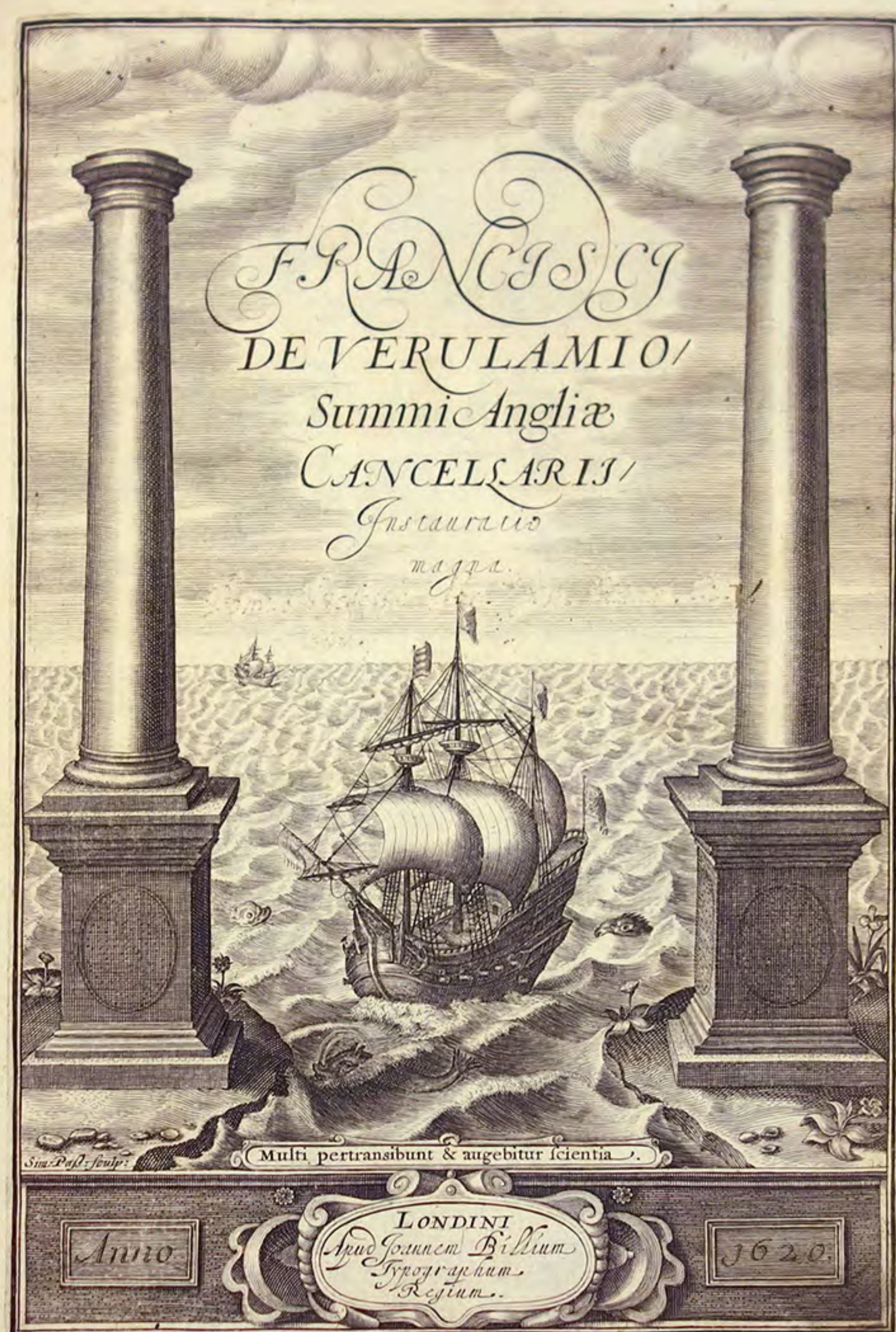

FRANCISCI
DE VERULAMIO,
Summi Angliæ
CANCELLARII,
Instauratio
magna.
Multi pertransibunt & augebitur scientia.
Sim: Pass: sculp:
Anno
LONDINI
Apud Joannem Billium
Typographum
Regium.
1620.

## *The Novum Organum*

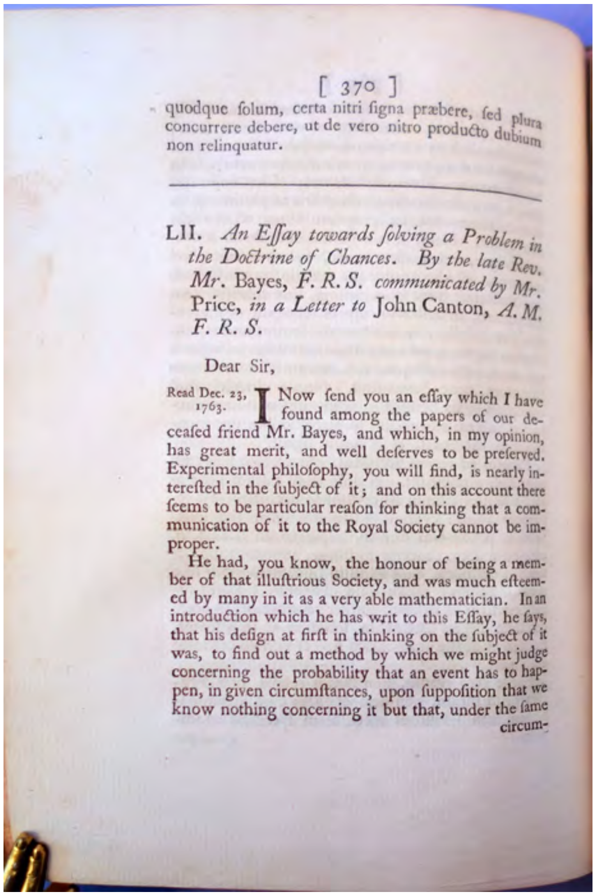
**1. Bacon, Francis** (1561-1620). Instauratio magna. [Novum organum sive indicia vera de interpretatione naturae.] Small folio. [12, including blank leaf conjugate with engraved title], 172, 181-360, 36, [2]pp. Beautiful engraved title-page by Simon de Passe (1595-1647); early inscriptions partially erased from top margin and center of engraving. London: John Bill, 1620. 292 x 192 mm. Vellum ca. 1620, leather spine labels, a bit soiled. Remnants of blue paper on front and back pastedowns, first leaves a bit soiled but a very good to fine copy with full margins. Leather booklabel of Frederick Spiegelberg.

$30,000

**First Edition** of the philosophical exposition of the experimental method in science, which greatly influenced the creation and development of the first scientific academies—the "Invisible College," the Royal Society, and the Académie Royale des Sciences, with inestimable effect on the development of scientific thought. This is the second issue; only a handful of copies of the first issue exist.

At a time when scholars still relied on classical authority and metaphysical speculation to learn about the world they lived in, Bacon conceived a new means of acquiring true knowledge of the world via observation, experiment and inductive reasoning, the type of logical thinking that ascends from specific facts to the establishment of general laws and principles. Bacon saw this *novum organum,* or "new instrument" as the means of bringing about a "great revolution" (*instauratio magna*) in thought. Once taught the new experimental method, everyone would be capable of engaging in scientific investigation, unlocking the secrets of nature and applying the results (ideally) for the betterment of humankind.

Bacon originally envisioned the *Instauratio magna* in six parts, of which only two were completed: *De augmentis scientiarum* (1623), and *Novum organum*, which, along with the introduction to the third part (*Parasceve ad historiam naturalem et experimentalem*), and two sets of Aphorisms, makes up the present work. The second issue has the errata leaf and colophon reading "Londini/Apud Joannem Billium/Typographum Regium/M.DX.XX." STC 1163. Horblit, *One Hundred Books Famous in Science,* 8b. Dibner, *Heralds of Science,* 80. *Printing and the Mind of Man* 119. Gibson, *Bacon* (1950), 103b. Eiseley, "Francis Bacon," *Makers of Modern Thought* (1972). Norman 98.
43494


[ 370 ]

quodque ſolum, certa nitri ſigna præbere, ſed plura concurrere debere, ut de vero nitro producto dubium non relinquatur.

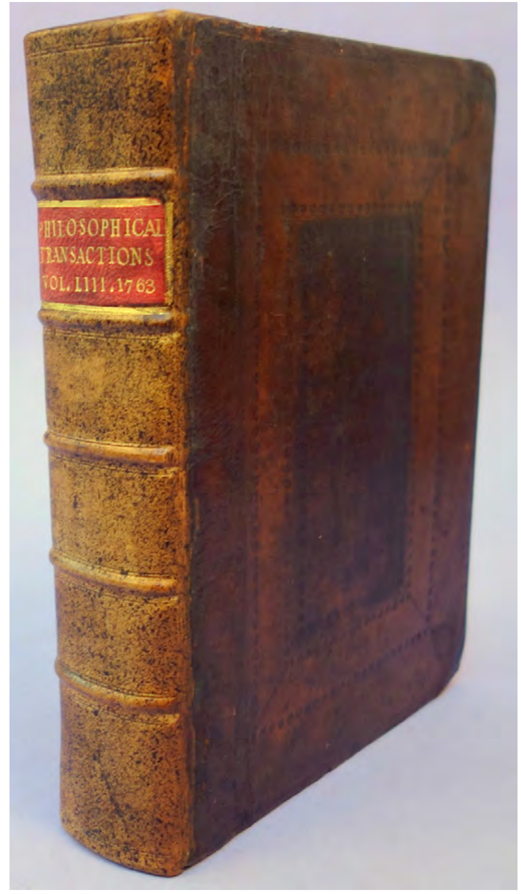
LII. *An Eſſay towards ſolving a Problem in the Doctrine of Chances. By the late Rev. Mr.* Bayes, *F. R. S. communicated by Mr.* Price, *in a Letter to* John Canton, *A. M. F. R. S.*

Dear Sir,

Read Dec. 23, 1763.

I Now ſend you an eſſay which I have found among the papers of our deceaſed friend Mr. Bayes, and which, in my opinion, has great merit, and well deſerves to be preſerved. Experimental philoſophy, you will find, is nearly intereſted in the ſubject of it; and on this account there ſeems to be particular reaſon for thinking that a communication of it to the Royal Society cannot be improper.

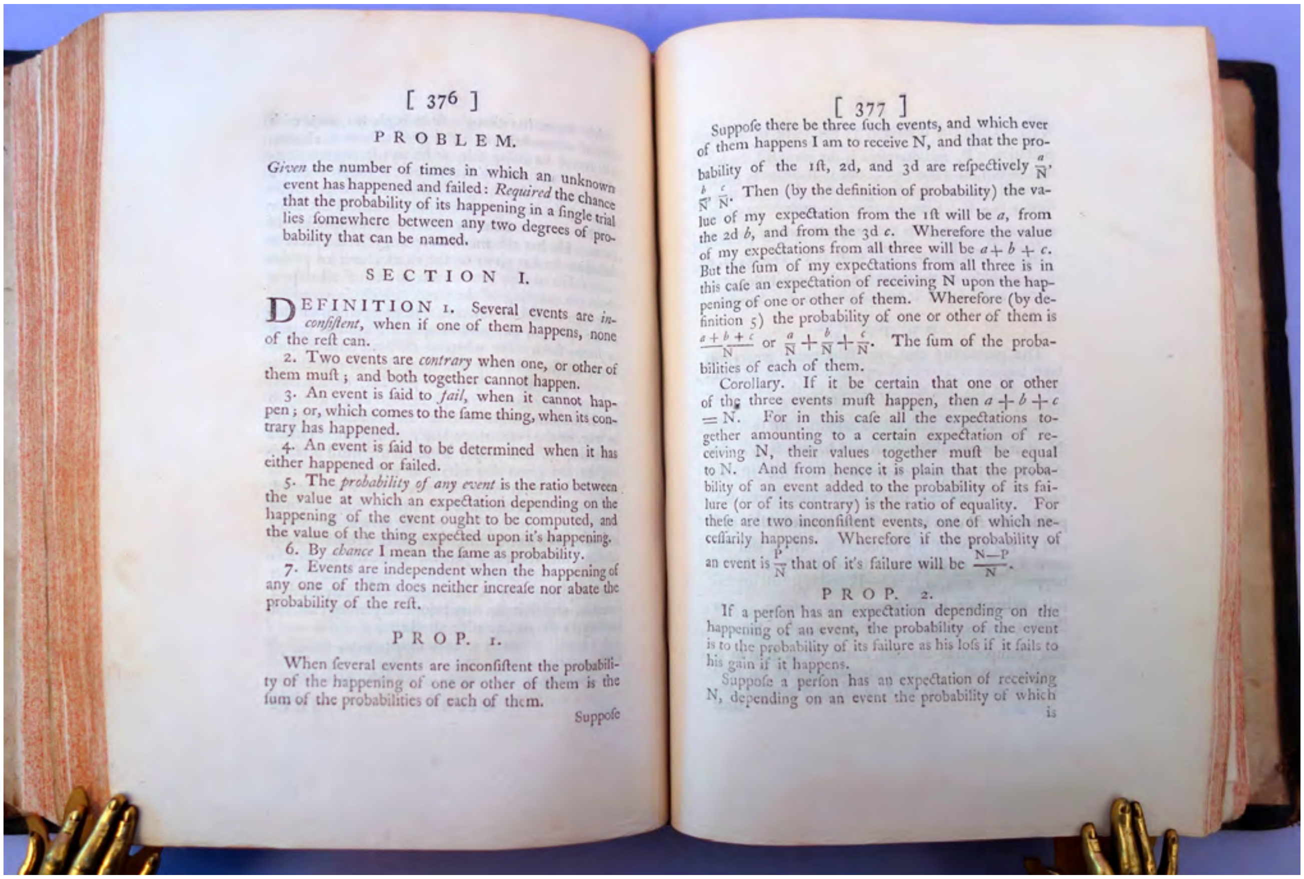
He had, you know, the honour of being a member of that illuſtrious Society, and was much eſteemed by many in it as a very able mathematician. In an introduction which he has writ to this Eſſay, he ſays, that his deſign at firſt in thinking on the ſubject of it was, to find out a method by which we might judge concerning the probability that an event has to happen, in given circumſtances, upon ſuppoſition that we know nothing concerning it but that, under the ſame circum-




## *Bayesian Statistics, Bayesian Inference, Bayesian Networks, &c.*

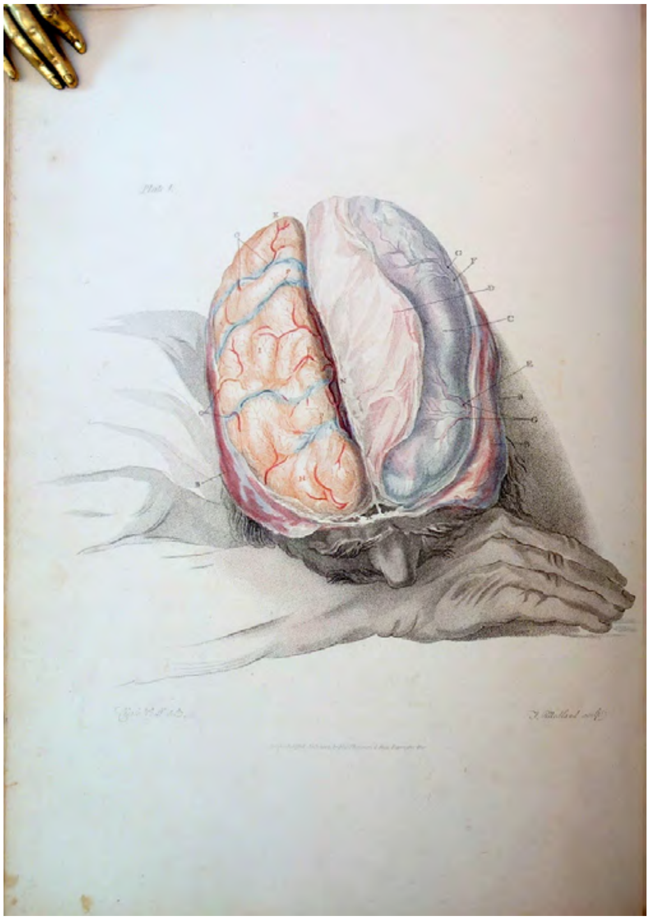
**2. Bayes, Thomas** (1702–61). An essay towards solving a problem in the doctrine of chances. In *Philosophical Transactions* 53 (1763): 370–418. Whole volume. [12], 529, [15, including index and errata] pp. 25 engraved plates. 225 x 170 mm. 18th century paneled calf, rebacked, lower corners bumped. Fine, crisp copy. Small ownership stamp on general title. $6500

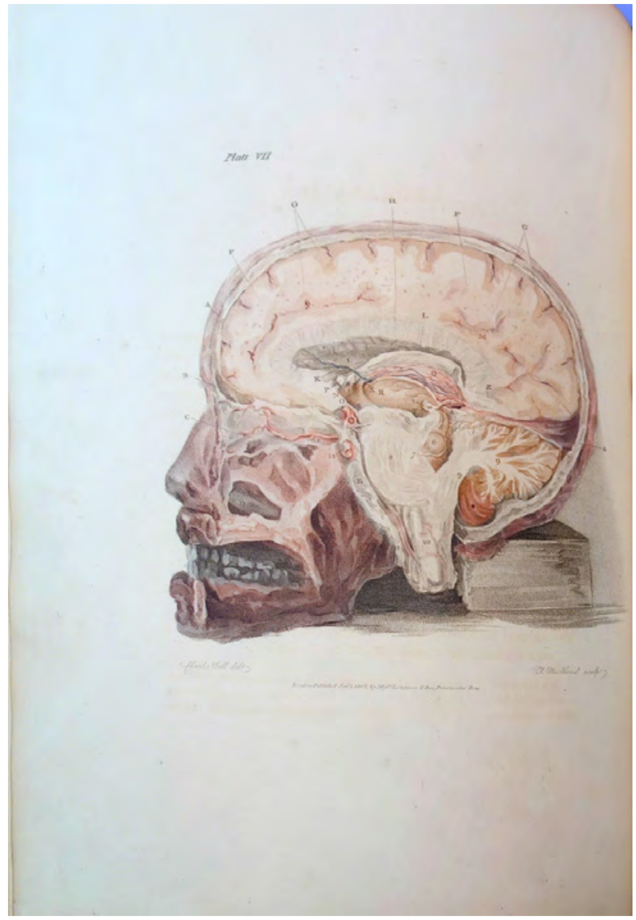
**First Edition** of Bayes's Theorem for calculating "inverse probabilities," which forms the basis for methods of decision analysis, statistical learning machines, and Bayesian networks. Bayesian networks are complex diagrams that organize the body of knowledge in any given area by mapping out cause-and-effect relationships among key variables and encoding them with numbers that represent the extent to which one variable is likely to affect another. These systems can automatically generate optimal predictions or decisions even when key pieces of information are missing. Bayesian or subjective decision theory is arguably the most comprehensive theory of decision-making; however, until the late 1980s, it had little application due to the stupefying complexity of the mathematics involved. The rapid advances in computing power and the development of key mathematical equations during the late 1980s and early 1990s made it possible to compute Bayesian networks with enough variables to be useful in practical applications; today they are pervasive in artificial intelligence applications.



Bayes, a Nonconformist minister (i.e., one who did not subscribe to the Thirty-Nine Articles of the Established Church of England), published only two works during his lifetime: *Divine Benefits* (1731), a religious treatise; and *Introduction to the Doctrine of Fluxions* (1736), in which he responded to Bishop Berkeley's attack on the logical foundations of Newton's calculus. For the latter work he was elected a member of the Royal Society in 1742. In 1763, two years after Bayes's death, Richard Price, a fellow Nonconformist minister, economist, and actuary to whom Bayes had bequeathed his papers, found Bayes's "Essay" and submitted it to the Royal Society for publication. The arguments in Bayes's paper were adopted by Laplace, who saw in them the basis for statistical inference; they were later challenged by George Boole in his Laws of Thought.

Published before offprints became widely produced, Bayes's paper must be collected in the journal volume, which has become very difficult to find. The only copy sold at auction, the *Origins of Cyberspace* copy, was an extract in a modern binding; it sold for $3500 in 2005. *Origins of Cyberspace* (2001) 1. 43747



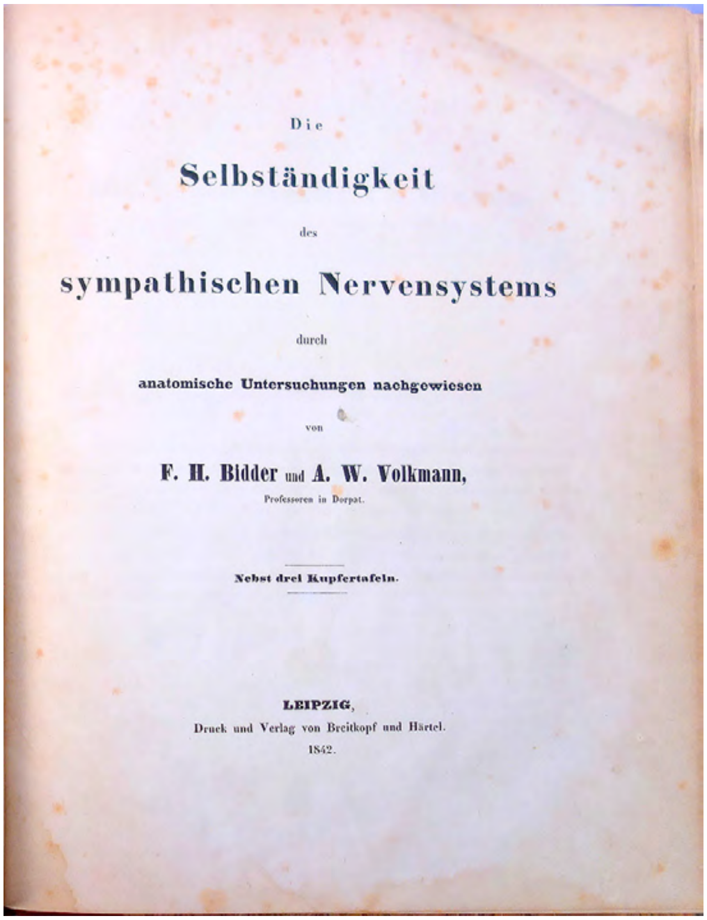


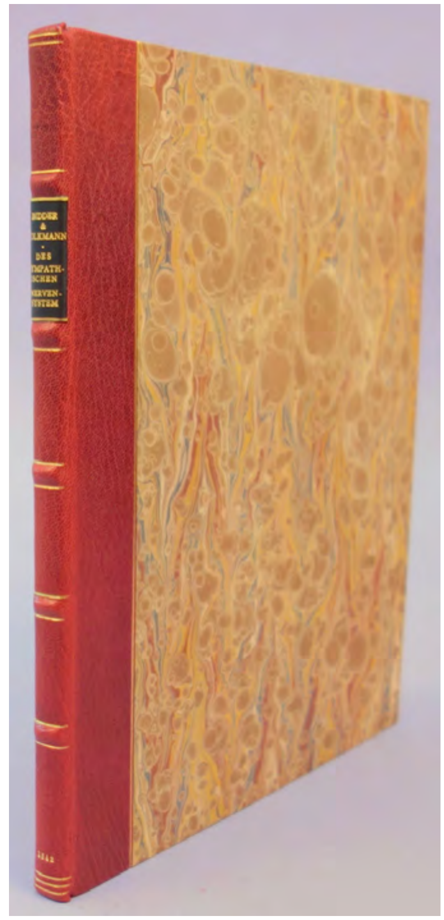
*One of Bell's Most Beautiful Works*

**3. Bell, Charles** (1774-1842). The anatomy of the brain, explained in a series of engravings. 4to. vii, 87pp. 12 stipple-engraved (possibly combined with aquatint) plates, numbered I-XII; the first 11 hand-colored; drawn by Charles Bell and engraved by Thomas Medland, Freeman, John Stewart and William Archibald. Plates I-X printed in colors as well as colored by hand. London: C. Whittingham for T. N. Longman and O. Rees; T. Cadell, Jun. and W. Davies, 1802. 297 x 232 mm. Later quarter calf, marbled boards, hinges cracking, light edge-wear. Minor offsetting from plates, light toning but very good.

$6000

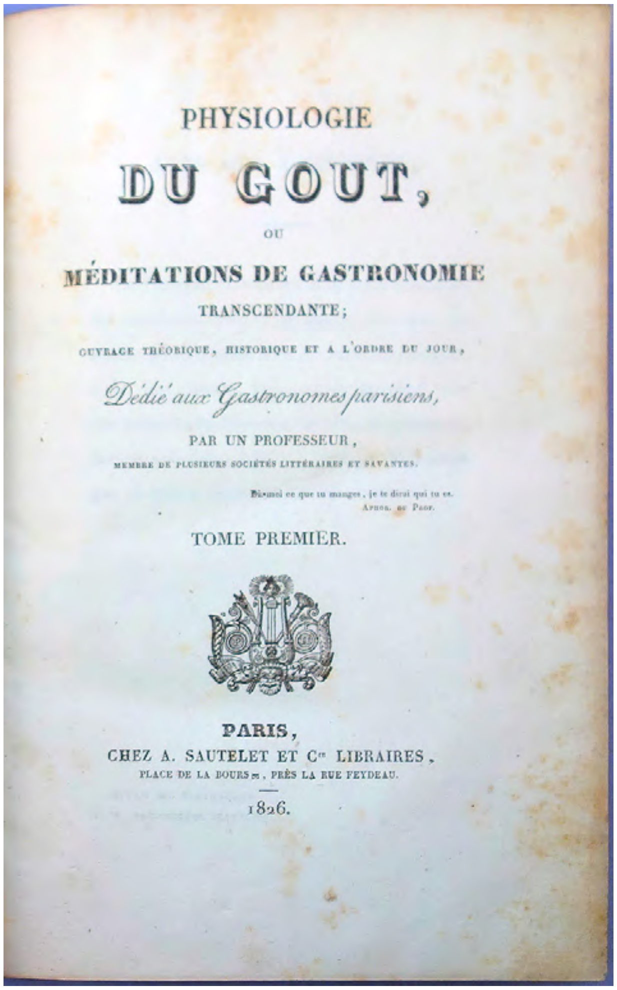

**First Edition.** Charles Bell was one of the foremost British anatomists of the 19th century. His anatomical researches resulted in several important milestones, and he played an important part in the discovery of the Bell-Magendie law describing the discrete functions of the sensory and motor nerves. Bell was trained in art as well as in medicine, and his twelve plates illustrating the structure of the brain are among the most beautiful in neuroanatomy. Plate I is important for its accurate portrayal of the cerebral gyri. The plates have been described as aquatints, but upon examination, most of the work appears to have been produced by stipple-engraving. Clarke & Dewhurst, *An Illustrated History of Brain Function,* p. 87. Gordon-Taylor, *Sir Charles Bell,* 4. Norman 168. 43650

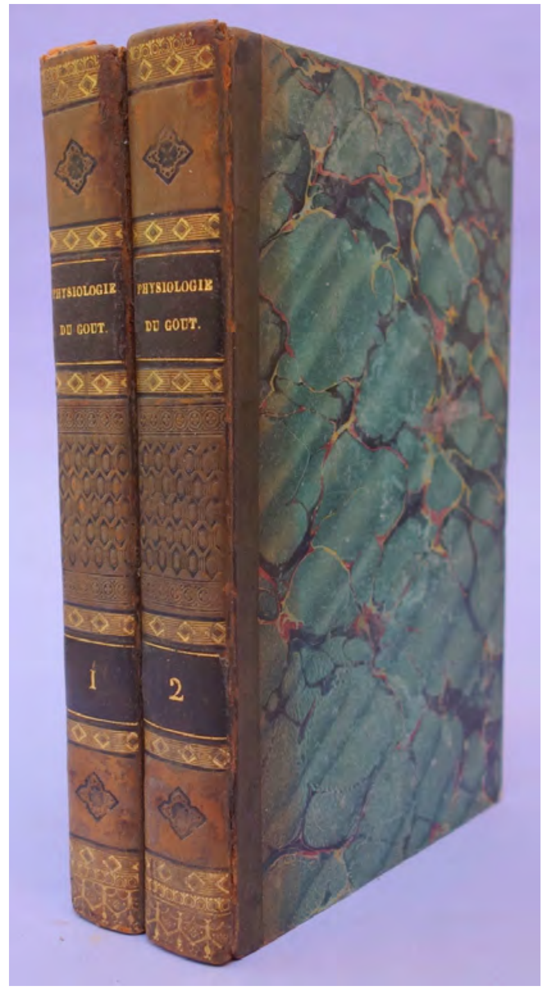


**4. Bidder, Friedrich Heinrich** (1810-94) and **Alfred Wilhelm Volkmann** (1800-1877). Die Selbständigkeit des sympathischen Nervensystems durch anatomische Untersuchungen nachgewiesen. [4], 88pp. 3 plates. Leipzig: Breitkopf and Härtel, 1842. 267 x 211 mm. Quarter morocco, marbled boards in period style. Some foxing and toning, but very good. $1250

**First Edition.** German physiologists Bidder and Volkmann performed important investigations of the sympathetic nervous system, one of the two main divisions of the autonomic nervous system responsible for regulating the body's unconscious actions. The two "showed the sympathetic nervous system to consist largely of small, medullated fibers originating from the sympathetic and spinal ganglia (Garrison-Morton.com 1318). In their investigations Bidder and Volkmann "introduced mathematical precision by inventing ways of measuring the caliber of nerve fibers, and popularized the numerical method in biological microscopy . . . [Their methods] added a new dimension to histological research, because not only was precision increased but in addition it was now possible for an investigator to test another's accuracy" (Clarke and Jacyna, *Nineteenth-Century Origins of Neuroscientific Concepts,* p. 360). 43725





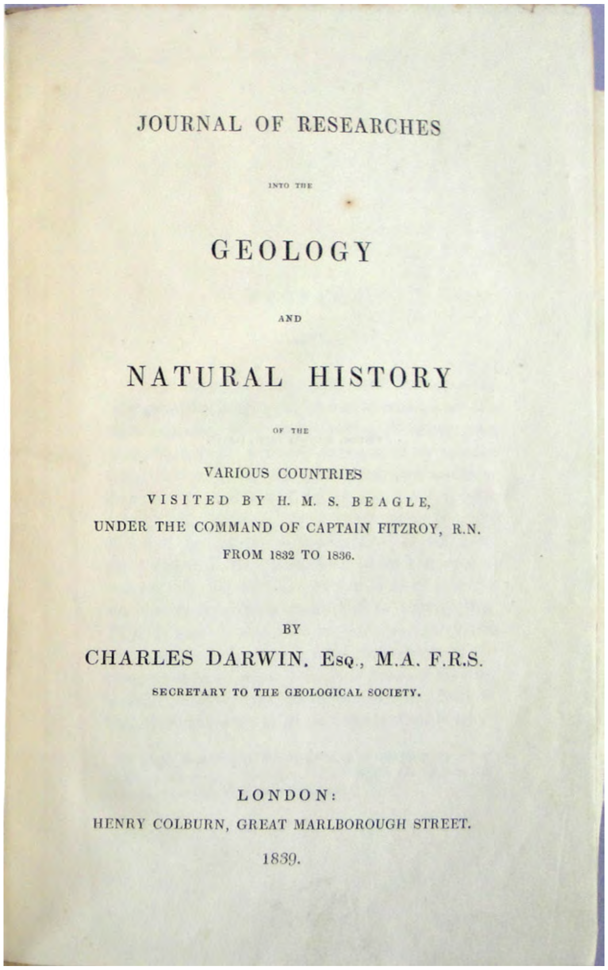

*"Tell Me What You Eat and I Will Tell You What You Are"*

**5. Brillat-Savarin, Jean Anthelme** (1755-1826). Physiologie du gout, ou méditations de gastronomie transcendante . . .2 vols., 8vo. [2], xiv, 390; 442pp. Paris: A. Sautelet et Cie., 1826. 206 x 126 mm. Quarter calf gilt, marbled boards ca. 1826, front hinge of Vol. I cracked, light edgewear. Occasional foxing but very good. $5000

**First Edition.** "*La physiologie du gout (*1826) by Brillat-Savarin has been in print ever since its first publication, and is much the most famous of all gastronomic essays. Brillat-Savarin was a lawyer from Belley in the French Alps, and a bachelor who spent most of his life in Paris eating at the best tables. His tastes were shaped by both rural and metropolitan traditions of eating, and further diversified by a brief period as an émigré which took him as far as the USA and shooting wild turkeys in New England. His book was many years in preparation and published in the last few weeks of his life. It opens with a series of aphorisms, the most quoted of which is 'Tell me what you eat: I will tell you what you are.' These are followed by the 148 'Gastronomic Meditations' in 30 chapters which form the bulk of the book. Brillat-Savarin sets out the physiological knowledge of the day, on the sense of taste, appetite, and the nutritional qualities of foodstuffs, but in a light and witty way enlivened by many anecdotes" (Mennell, *All Manners of Food: Eating and Taste in England and France from the Middle Ages to the Present,* p. 268). Vicaire, *Bibliographie gastronomique*, cols. 116-117. 43644

**6.** [**Caxton, William** (ca. 1422 – ca. 1491).] William Caxton shewing the first specimen of his printing to King Edward the Fourth at the Almonry, Westminster. Steel engraving by Frederick Bromley (1832-70) after the painting by Daniel Maclise (1806-70). N.p., 1858. 55.2 x 92.2 cm., archivally framed (frame measures 119.5 x 83.2 cm.). Lower margin with caption cropped from image, otherwise very good. $1250

**First Impression** of this large and striking 19th-century steel engraving after Maclise's famous painting celebrating the introduction of printing to England in 1476. The image shows England's first printer, William Caxton, displaying the first specimen of his printing at his Westminster press to Edward IV, his queen and their children. The image depicts all aspects of book production from typesetting to printing and binding, and in remarkably fine detail. 42122



JOURNAL OF RESEARCHES

INTO THE

GEOLOGY

AND

NATURAL HISTORY

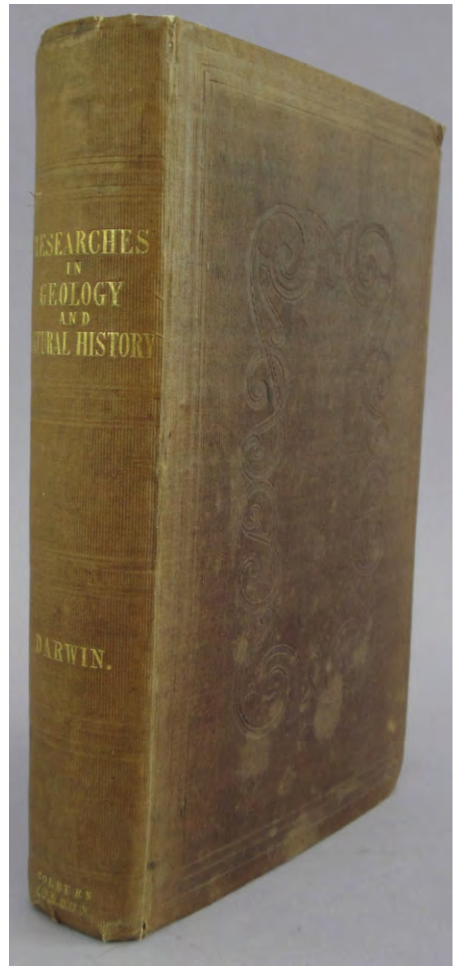
OF THE

VARIOUS COUNTRIES
VISITED BY H. M. S. BEAGLE,
UNDER THE COMMAND OF CAPTAIN FITZROY, R.N.
FROM 1832 TO 1836.

BY

CHARLES DARWIN, Esq., M.A. F.R.S.
SECRETARY TO THE GEOLOGICAL SOCIETY.

LONDON:
HENRY COLBURN, GREAT MARLBOROUGH STREET.
1839.




*Voyage of the Beagle—Darwin's First Published Book*

**7. Darwin, Charles** (1809-82). Journal of researches into the geology and natural history of the various countries visited by H. M. S. Beagle . . . [i-iv], [vii] viii-xiv, 615pp. plus pp. 609-629 addenda. 2 folding maps, 4 text wood-engravings. London: Henry Colburn, 1839. 235 x 146 mm. Original plum cloth (Freeman binding *b*), minor fading and spotting, spine skillfully and subtly repaired. Edges of first folding map a bit frayed, minor foxing, but fine otherwise. 19th century owner's name partly erased from front pastedown. $25,000

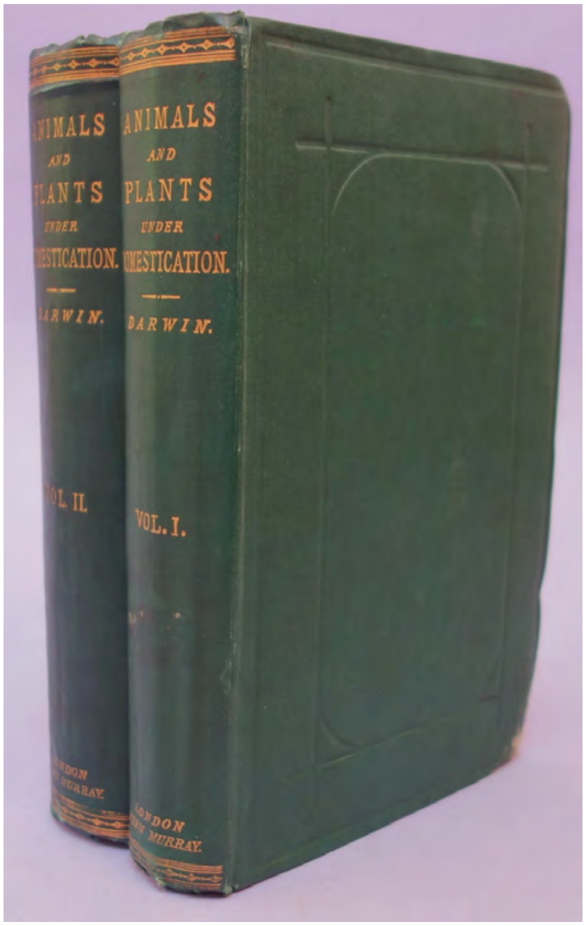
**First Separate Edition,** containing the original printed sheets and maps with a new title. Darwin's first published book, now universally known as *The Voyage of the Beagle,* "is undoubtedly the most often read and stands second only to *On the Origin of Species* as the most often printed. It is an important travel book in its own right and its relation to the background of his evolutionary ideas has often been stressed . . . The first issue forms, as is well known, the third volume of *The Narrative of the Voyages of H. M. Ships Adventure and Beagle*, edited by Captain Robert Fitzroy and published, in three volumes and an appendix to Volume II, in 1839 . . . On its first appearance in its own right, also in 1839, it was called *Journal of Researches into the Geology and Natural History* etc." (Freeman, pp. 31-32).

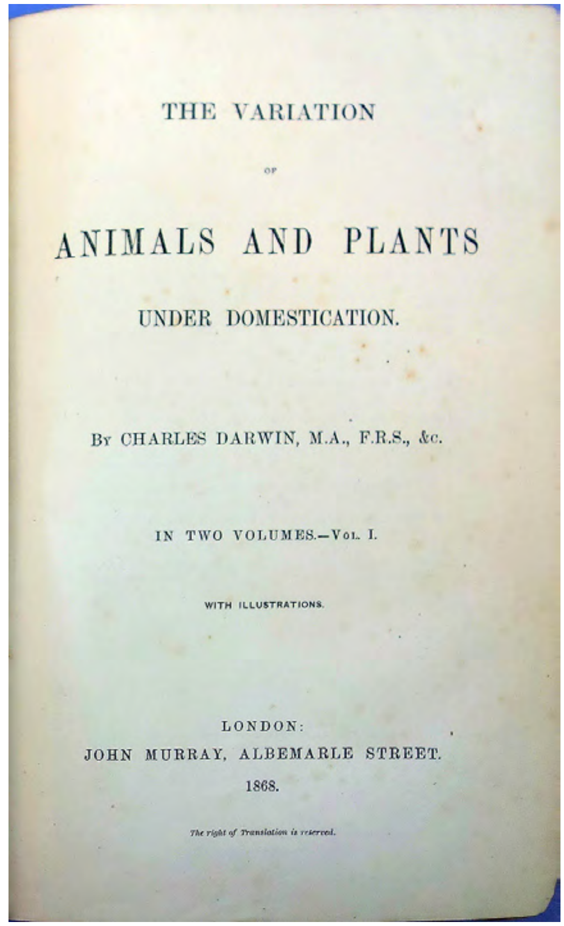
Freeman suggests that the two issues might have been released at the same time:

> It has usually been stated that Darwin's volume was reissued in its own covers later in the same year, because the demand for it was greater than that for the other two volumes of technical narrative. That the demand for it was greater than the rest was probably true, and that it must be considered technically the later issue is certainly correct, because pp. [i – iv] of the preliminaries are cancels and [v – vi], the original volume title, is discarded; the

> rest, [vii] – xiv, and the text sheets are those of the main work, bearing Vol. III on the first page of each signature. Nevertheless, it is also certain that **both were advertised in the same set of advertisements in August 1839** [emphasis ours] (Freeman, p. 34).

The one-volume issue is *much rarer on the market* than the version published as part of the *Narrative: American Book Prices Current* shows 113 auction records for the *Narrative* since 1975 versus only 22 records for the *Journal*. See Freeman for a detailed discussion of the work's publishing history and bibliographical features. Freeman, *The Works of Charles Darwin*, 11. 41456



THE VARIATION

OF

ANIMALS AND PLANTS

UNDER DOMESTICATION.

BY CHARLES DARWIN, M.A., F.R.S., &c.

IN TWO VOLUMES.—VOL. I.

WITH ILLUSTRATIONS.

LONDON:
JOHN MURRAY, ALBEMARLE STREET.
1868.

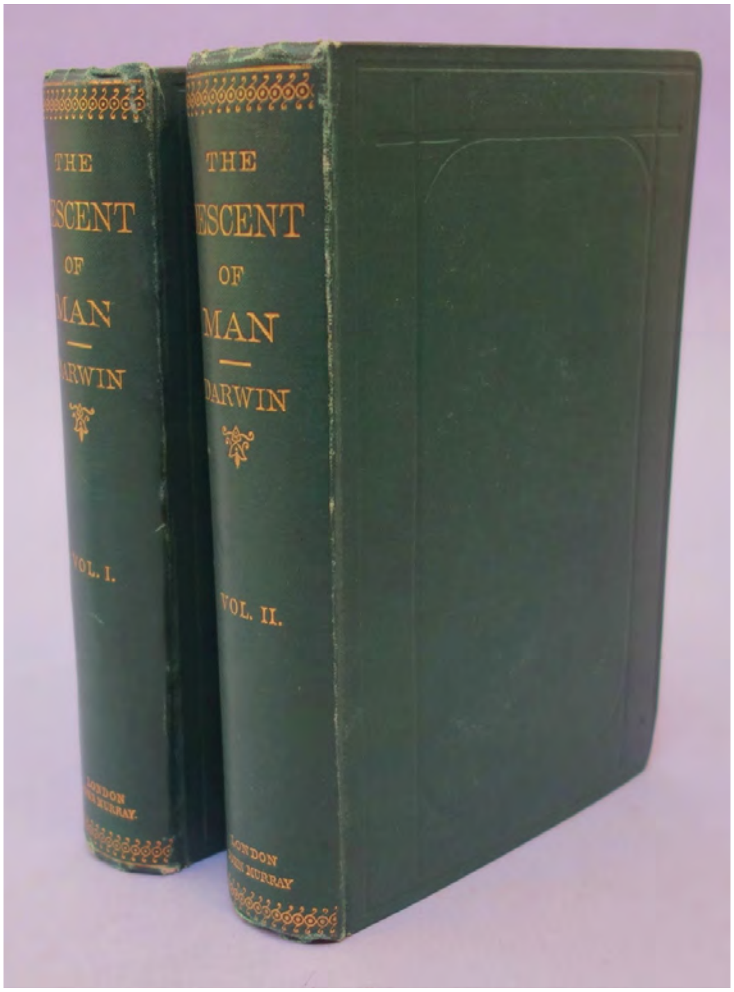
*The right of Translation is reserved.*

**8. Darwin, Charles** (1809-82). The variation of animals and plants under domestication. 2 vols. viii, 411 plus 32-page publisher's catalogue; viii, 486, [2, adverts.]pp. Text illustrations. London: John Murray, 1868. 222 x 142 mm. Original green cloth, gilt-lettered spines, bit of paper residue on corner of Vol. I front cover, corner of Vol. II front cover a bit creased. Occasional minor foxing but very good.

$2750

**First Edition**, second issue, of Darwin's longest work, representing the first two chapters of the projected "big book" on the origin of species of which the *Origin* was an abstract; this was the only section of the "big book" published during Darwin's lifetime. Along with a detailed discussion of the facts of artificial selection, the work contains Darwin's hypothesis of pangenesis, in which he tried to provide explanations of hereditary resemblance, inheritance of acquired characteristics, atavism, and regeneration; the theory served as "a point of departure for particulate theories in the later nineteenth century" (*Dictionary of Scientific Biography*).

The first issue of *Variation* has four lines of errata in the first volume and seven lines in the second. The second issue is distinguished by the single line of errata in Vol. i, p. vi; and by the two-line imprint shown on nearly all of the binding spines. Freeman 878. Norman 597. 43753




## *The Origin of Man*

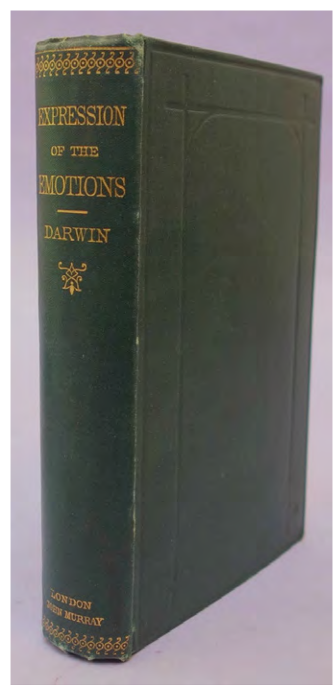
**9. Darwin, Charles** (1809-82). The descent of man, and selection in relation to sex. 2 vols., 8vo. viii, 423, [1], 16pp publisher's adverts.; viii [2], 475, [1]pp., 16 pp. publisher's adverts. Text wood-engravings. London: John Murray, 1871. 187 x 126 mm. (largely unopened). Original green cloth, gilt-lettered spines, inner hinges very slightly cracking, slight wear, corner of Vol. I back cover bumped, but a remarkably fine, unrestored copy. $10,000

**First Edition, First Issue,** distinguished by the presence of the "Postscript" leaf in Vol. II tipped in after p. viii, and "transmitted" appearing as the first word on p. 297 of Vol. I. Twelve years after the publication of the *Origin,* Darwin made good his promise to "throw light on the origin of man and his history" by publishing the present work, in which he compared man's physical and psychological traits to similar ones in apes and other animals, and showed how even man's mind and moral sense could have evolved through processes of natural selection. In discussing man's ancestry, Darwin did not claim that man was directly descended from apes as we know them today, but stated simply that the extinct ancestors of *Homo sapiens* would have to be classed among the primates. This statement was (and is) widely misinterpreted by the popular press, however, and caused a furor second only to that raised by the *Origin*. Darwin also added an essay on sexual selection, i.e. the preferential chances of mating that some individuals of one sex have over their rivals because of special characteristics, leading to the accentuation and transmission of those characteristics. He also famously speculated that humanity's ancestors would be found in Africa:

> In each great region of the world the living mammals are closely related to the extinct species of the same region. It is therefore probable that Africa was formerly inhabited by extinct apes closely allied to the gorilla and chimpanzee; and as these two species are now man's nearest allies, it is somewhat more probable that our early progenitors lived on the African continent than elsewhere (Vol. 1, p. 199).

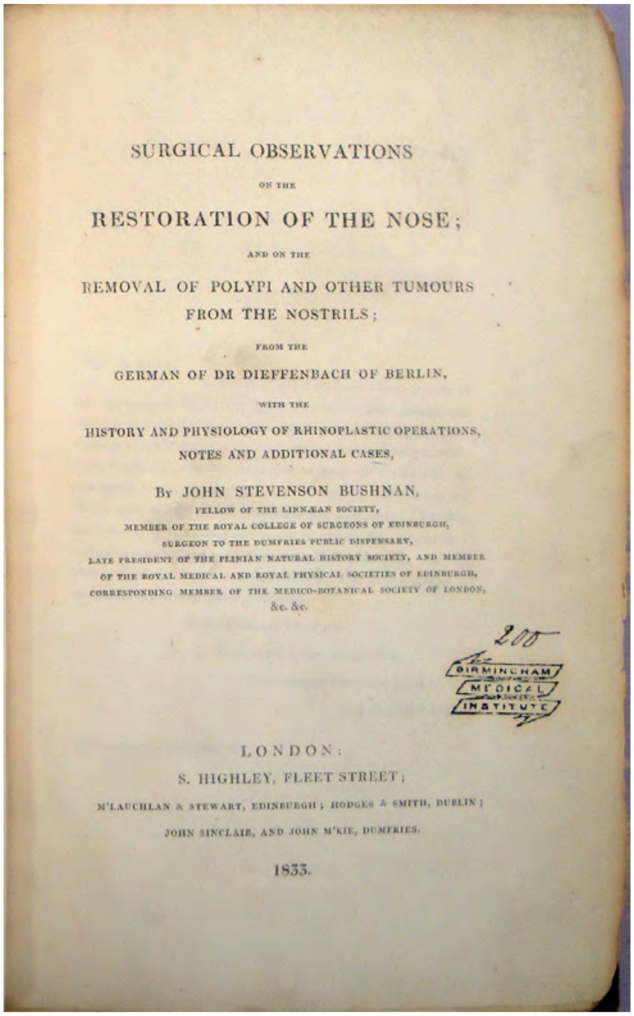
Freeman 937. Garrison-Morton.com 170. Norman 599. 43750


**10. Darwin, Charles** (1809-82). The expression of the emotions in man and animals. 8vo. vi, 374, 4 (adverts.) pp. 7 heliotype plates, wood-engraved text illustrations. London: John Murray, 1872. 189 x 125 mm. Original green cloth, gilt-lettered spine, a little worn, inner hinges cracked. Some foxing especially to first blank and title. Very good. $2500




**First Edition.** "With this book Darwin founded the study of ethology (animal behavior) and conveyance of information (communication theory) and made a major contribution to psychology" (DSB). Written as a rebuttal to the idea that the facial muscles of expression in humans were a special endowment, the work contains studies of facial and other types of expression (sounds, erection of hair, etc.) in man and mammals, and their correlation with various emotions such as grief, love, anger, fear and shame. The results of Darwin's investigations showed that in many cases expression is not learned but innate, and enabled Darwin to formulate three principles governing the expression of emotions—relief of sensation or desire, antithesis, and reflex action. *The Expression of the Emotions* was the only work by Darwin to be illustrated with photographs, and was one of the first books to feature heliotype plates.

This copy conforms to Freeman's first issue text points (see Freeman, p. 143). The plates are numbered in Roman numerals. Some copies of this work have plates numbered with Arabic numerals; Freeman speculated that the Arabic-numbered plates were earlier, but the Norman catalogue lists a presentation copy inscribed by Darwin that had Roman-numbered plates. This contradicts Freeman's suggestion, as it is more probable that Darwin would have presented copies from the earlier printing. Freeman 1141. Garrison-Morton.com 4975. Norman 600. 43752



SURGICAL OBSERVATIONS

ON THE

RESTORATION OF THE NOSE;

AND ON THE

REMOVAL OF POLYPI AND OTHER TUMOURS FROM THE NOSTRILS;

FROM THE

GERMAN OF DR DIEFFENBACH OF BERLIN.

WITH THE

HISTORY AND PHYSIOLOGY OF RHINOPLASTIC OPERATIONS, NOTES AND ADDITIONAL CASES,

By JOHN STEVENSON BUSHNAN,

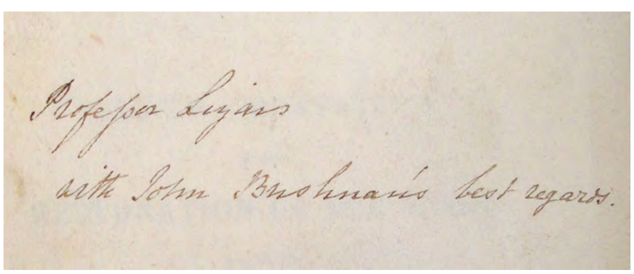
FELLOW OF THE LINNÆAN SOCIETY,
MEMBER OF THE ROYAL COLLEGE OF SURGEONS OF EDINBURGH,
SURGEON TO THE DUMFRIES PUBLIC DISPENSARY,
LATE PRESIDENT OF THE PLINIAN NATURAL HISTORY SOCIETY, AND MEMBER OF THE ROYAL MEDICAL AND ROYAL PHYSICAL SOCIETIES OF EDINBURGH,
CORRESPONDING MEMBER OF THE MEDICO-BOTANICAL SOCIETY OF LONDON,
&c. &c.

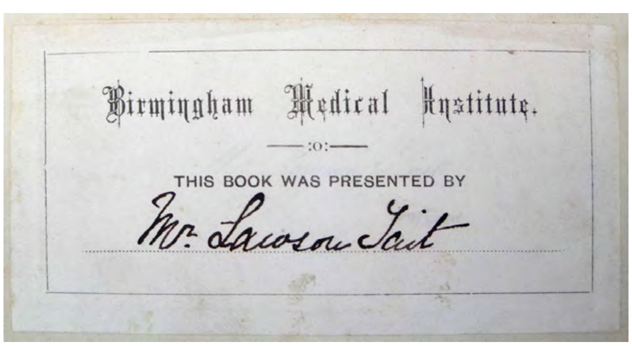
200

BIRMINGHAM MEDICAL INSTITUTE

LONDON:
S. HIGHLEY, FLEET STREET;
M'LAUCHLAN & STEWART, EDINBURGH; HODGES & SMITH, DUBLIN;
JOHN SINCLAIR, AND JOHN M'KIE, DUMFRIES.

1833.



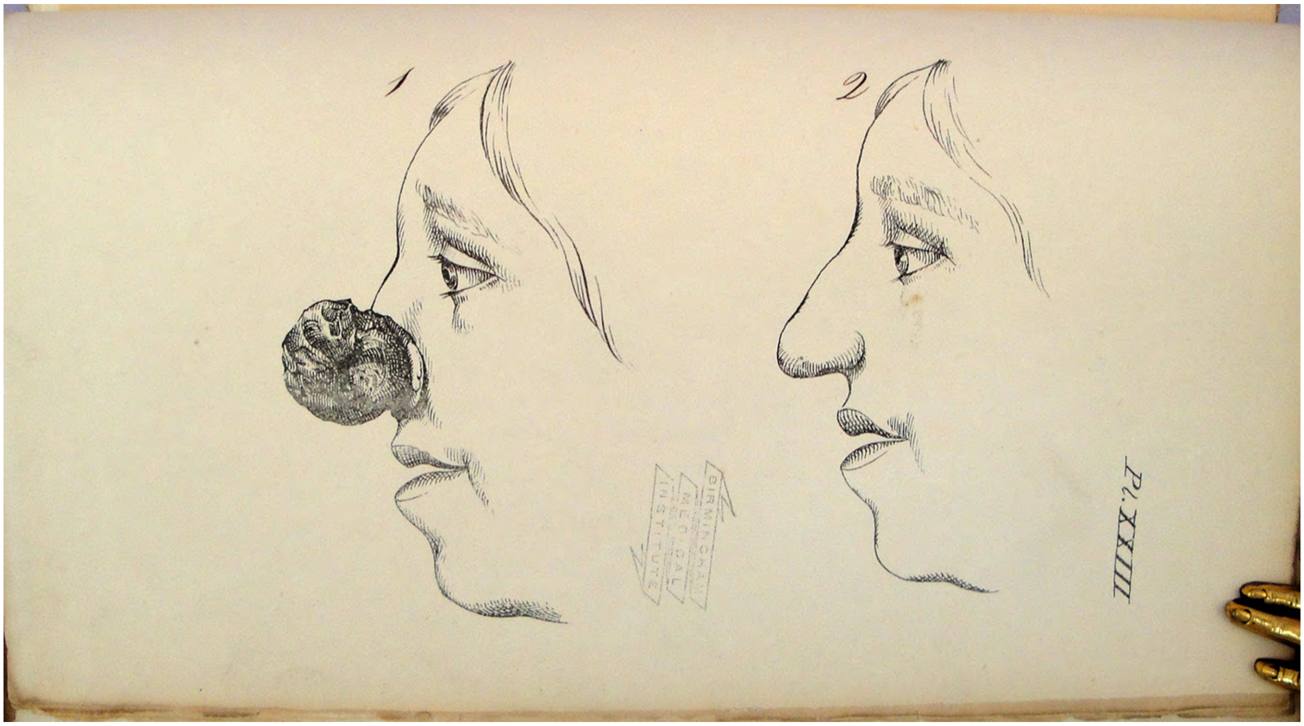




## *Probably the Greatest Association Copy—Inscribed to John Lizars and Later in the Library of Lawson Tait*

**11. Dieffenbach, Johann Friedrich** (1792-1847). Surgical observations on the restoration of the nose; and on the removal of polypi and other tumours from the nostrils . . . with the history of physiology of rhinoplastic operations, notes and additional cases by John Stevenson Bushnan (1808?-84). 8vo. viii, [2], 9-159, [3, including ads] pp. 26 plates. London: S. Highley, 1833. 228 x 143 mm. (uncut). Original cloth-backed boards, rebacked, corners a bit worn. Edges of leaves a bit dust-soiled, unobtrusive library stamp on title and plates, but a fine copy. *Presentation Copy, inscribed by Bushnan to John Lizars* (c. 1787-1860) on the half-title: "Professor Lizars with John Bushnan's best regards." Bookplate of the Birmingham Medical Institute, noting that this copy was the gift of Mr. [Robert] Lawson Tait (1845-99). $15,000

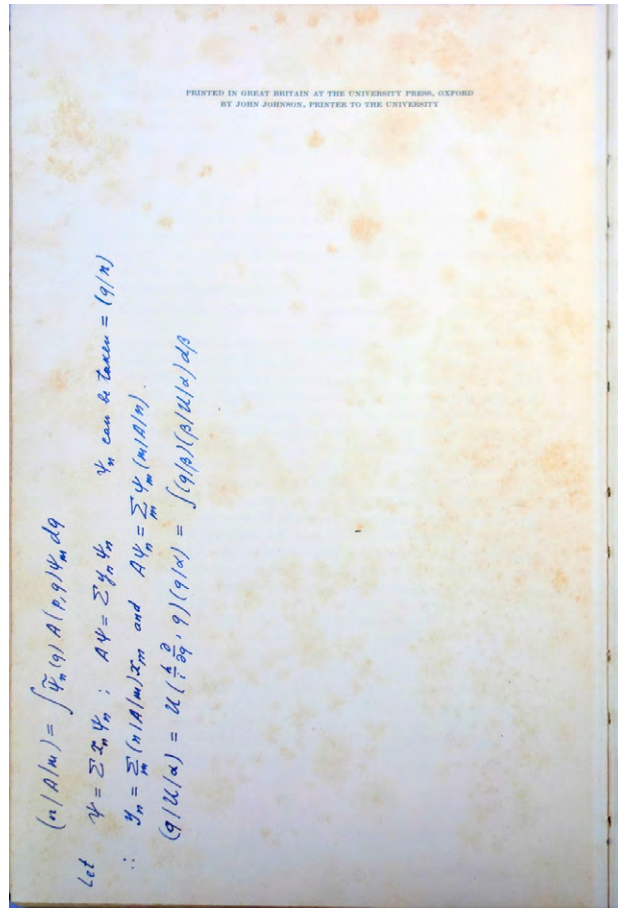
**First Edition in English** of the *rarest book in English on plastic surgery* after Carpue's *Account of Two Successful Operations for Restoring a Lost Nose* (1816). The above work is a translation, prepared by physician and medical writer John Stevenson Bushnan, of the section on rhinoplasty from Dieffenbach's *Chirurgische Erfahrunugen* (1829-34). Bushnan augmented Dieffenbach's text with annotations, accounts of his own cases and an important, well-documented history of rhinoplastic operations. Bushnan presented this copy to Scottish surgeon and anatomist John Lizars (see Garrison-Morton.com 6026), whose letter describing a rhinoplasty operation he had performed in 1831 is reprinted on p. 157; Lizars' case is illustrated in plate XXV. This copy later passed into the ownership of another Scottish surgeon, Lawson Tait, who is cited seven times in Garrison-Morton for his contributions to gynecological and plastic surgery.

Dieffenbach's clinical work in plastic surgery was "monumental in its variety, inventiveness and breadth of scope. . . . . Although Dieffenbach also used the Italian method of rhinoplasty, he preferred the Indian method because of the stronger quality of the forehead




skin. . . . [He also] realized that the various metal contrivances of Tagliacozzi and von Graefe for shaping the new nose were largely ineffectual, and he devised many subsequent procedures for trimming and shaping the nose, thus greatly improving the results attainable by the Indian method" (Gnudi & Webster, pp. 321-22). Dieffenbach pioneered many methods and principles of plastic surgery which "have not been improved upon and are still constantly employed" (Gnudi & Webster, p. 321).

This work is rare in any form, and this is the only inscribed copy of this work we have ever heard of in our fifty-one years of experience specializing in rare medical books. A greater double association copy of this work probably does not exist. Zeis 513. 42635

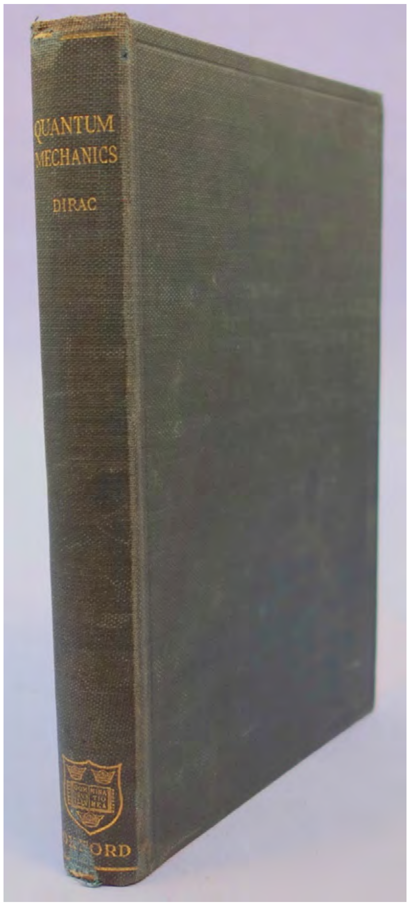




*From the Library of Boris Podolsky, Collaborator with Dirac*

**12. Dirac, Paul A. M.** (1902-84). The principles of quantum mechanics. x, 257, [1]pp. Oxford: Clarendon Press, 1930. 237 x 155 mm. Original cloth, a little shaken, spine rubbed and a bit faded, light wear at extremities and corners. Foxing and toning but very good. From the library of Russian-American physicist Boris Podolsky (1896-1966), with his signature on the title and occasional marginal notes in ink and pencil; formulae in Podolsky's hand on final blank. $6500

**First Edition** of Dirac's classic treatise on quantum mechanics, containing "the first complete exposition of the general formalism of quantum mechanics, presented in a logically consistent and axiomatic fashion" (Jammer, *Conceptual Development of Quantum Mechanics,* p. 366). "Except for Darwin's *Origin of Species*, no book since Newton's *Principia* explained so much of so wide a realm of nature. It is difficult to think of another physics text that conveys more effectively the power of a simple, logical presentation. Probably no other book has ever given its readers a greater appreciation of the aesthetic dimension of theoretical physics" (Schweber, *QED and the Men who Made It*, p. 573). "Present expositions of quantum mechanics largely rely on [Dirac's] masterpiece *The Principles of Quantum Mechanics"* (*Dictionary of Scientific Biography*).

This copy is from the library of Boris Podolsky, best known for his collaboration with Albert Einstein and Nathan Rosen on the famous "EPR" (Einstein-Podolsky-Rosen) paper ("Can quantum-mechanical description of physical reality be considered complete?," 1935) challenging the assumption that quantum mechanics could provide a complete description of physical reality. The EPR paper, which was written by Podolsky under Einstein's supervision, became "a centerpiece in the debate over the interpretation of quantum theory, a debate that continues today" (Thomas, Kelly Devine, "The Advent and Fallout of EPR." Institute for Advanced Study, Fall 2013. Web. Accessed 05 Jan. 2016).



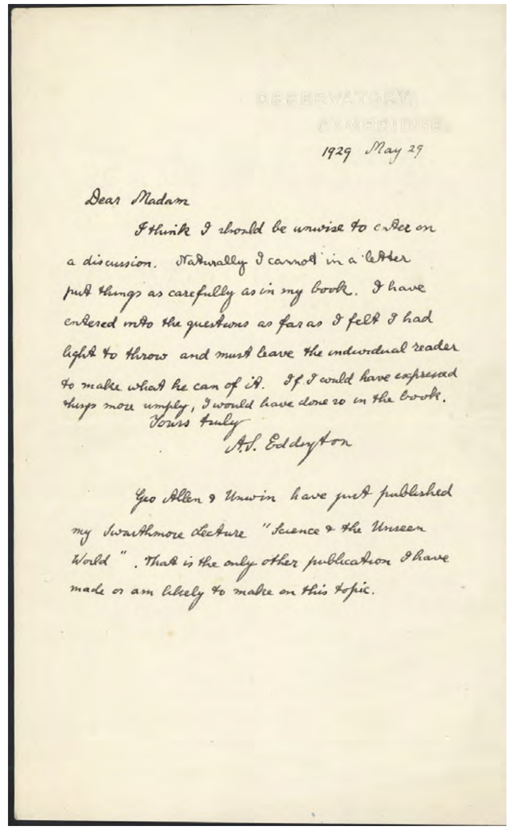

Born in Russia, Podolsky moved to the United States in 1913 and received a BS in Electrical Engineering and MS in mathematics from the University of Southern California. He received his PhD in Theoretical Physics from Caltech (under Paul Sophus Epstein) in 1928. In 1931, the year after Dirac published *The Principles of Quantum Mechanics*, Podolsky traveled to the Ukrainian Institute of Physics and Technology (Kharkov, USSR), collaborating with Vladimir Fock (1898-1974) (known eponymically for "Fock space", "Fock representation" and "Fock state"), and with Paul Dirac (who was there on a visit) and Lev Landau. Their work resulted in publication of four papers: "On quantum mechanics" (1932, with Dirac and Fock), "Zur Dirac'schen Quantenelektrodynamik" (1932, with Fock), "Interaction of the charges of Dirac's theory" (1932, with Fock), and "Derivation of Moller's formula from Dirac's theory" (1932, with Fock).

Dirac's biographer Helge Kragh described Podolsky's work in 1932 with Dirac and Fock in this way:

> While the physicists of the Copenhagen school reacted negatively to Dirac's theory, the Russian physicists found it interesting and promising. Vladimir Fock, Boris Podolsky, and K. Nikolsky developed aspects of the theory in several papers. For example Fock and Podolsky extended Dirac's one-dimensional treatment of two interacting electrons to the more realistic case of three dimensions. They obtained the expected result, a Coulomb interaction term with the correct sign.
>
> At that time, Dirac knew that his new theory of quantum electrodynamics was mathematically equivalent to that of Pauli and Heisenberg . . . One senses . . . [that] Dirac was not willing to admit that the mathematical equivalence implied a physical equivalence. He therefore continued to develop his approach, which half a year later resulted in a paper, co-authored by Fock and Podolsky, in the newly founded *Physikalische Zeitschrift der Sowietunion.* Dirac knew Fock and Podolsky from his travels to Russia, and Fock was an old acquaintance whom he had first met in the spring of 1927, during his stay in Göttingen . . . The Dirac-Fock-Podolsky theory germinated in discussions Dirac had with Fock and Podolsky in September 1932, when they all attended a conference on the theory of metals held in Leningrad. After the conference Dirac went to the Crimea, where he vacationed with Kapitza, and on his way back to Moscow he stopped in Kharkov to discuss his new quantum electrodynamics with Podolsky. Fock and Podolsky had recently proposed a new formalism for the quantization of the electromagnetic field which Dirac found more suitable for his purpose than the earlier formalism of Jordan and Pauli,. So he agreed to write a joint paper, which was complete in late October 1932. The three authors derived the fundamental equations of quantum electrodynamics in a relativistically covariant way and proved that the equations yielded the Maxwell equations as conditions on the q-number wave function. In earlier formulations, such as the Heisenberg-Pauli theory, the covariance was far from clear, a result that Dirac traced back to a certain lack of symmetry between space and time coordinates in these theories; in the earlier formulations each electron was supplied with a separate space coordinate, but all particles were given the same time parameter. In the Dirac-Fock-Podolsky paper a lucid proof of Lorentz invariance was obtained by making use of the idea of multiple times: In addition to the common time for the entire system of particles field (T), a separate field time (t) and separate times for each particle . . The representation used by Dirac, Fock, and Podolsky later proved to be useful in cases of interaction in general, and today it is known as the "interaction representation" or "interaction picture," sometimes called the"Dirac picture" (Kragh, *Dirac: A Scientific Biography*, p. 136-138).

In 1933, Podolsky returned to the USA with a fellowship from the Institute for Advanced Study. In a letter of recommendation to the founding director of the IAS, Einstein described Podolsky as "one of the most brilliant of the younger men who has worked and published with Dirac" (quoted in Thomas). In 1935 Podolsky accepted an appointment as professor of mathematical physics at the University of Cincinnati. In 1961 he moved to Xavier University, Cincinnati, where he worked until his death in 1966. 43737

## *Referring to "The Nature of the Physical World"*


OBSERVATORY, CAMBRIDGE.

1929 May 29

Dear Madam

I think I should be unwise to enter on a discussion. Naturally I cannot in a letter put things as carefully as in my book. I have entered into the questions as far as I felt I had light to throw and must leave the individual reader to make what he can of it. If I could have expressed things more simply, I would have done so in the book.

Yours truly

A.S. Eddington

Geo Allen & Unwin have just published my Swarthmore Lecture "Science & the Unseen World". That is the only other publication I have made or am likely to make on this topic.

**13. Eddington, Arthur Stanley** (1882-1944). Autograph letter signed to an unidentified correspondent ("Dear Madam"). Cambridge, May 29, 1929. 1 sheet, on Cambridge Observatory stationery. 178 x 110 mm. Fine. $450

From British astronomer and physicist A. S. Eddington, the first interpreter of Einstein's theory of relativity in English, whose 1919 expedition to observe the solar eclipse of May 29, 1919 provided one of the earliest confirmations of general relativity. During the 1920s and 1930s Eddington published a number of books on relativity intended for the non-scientist, which enjoyed great popularity with the public. In his letter, addressed to one of his readers, he alludes to two of these works:

> I think I should be unwise to enter on a discussion. Naturally I cannot in a letter put things as carefully as in my book. I have entered into the questions as far as I felt I had light to throw and must leave the individual reader to make what he can of it. If I could have expressed things more simply, I would have done so in the book.

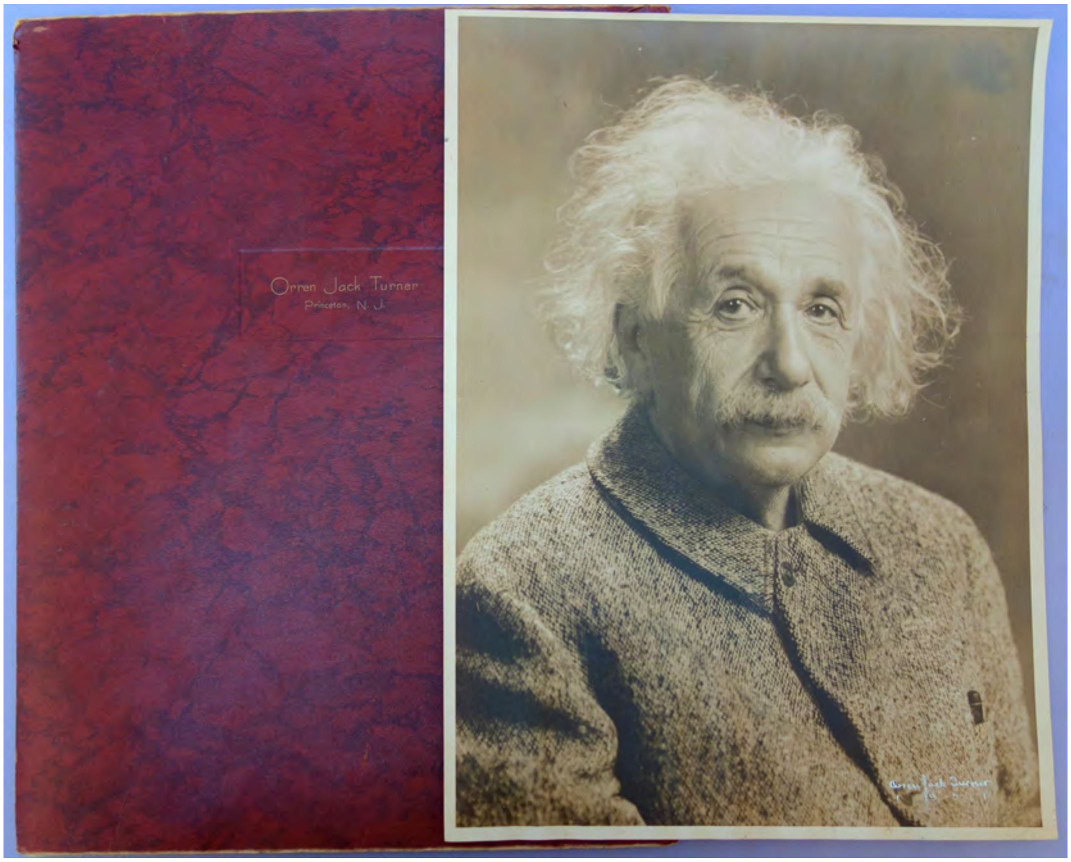
The book he refers to here is most probably his *Nature of the Physical World* (1928), based on his 1926-27 Gifford lectures. In a postscript he mentions another of his works: "Yes Allen & Unwin have just published my Swarthmore Lecture 'Science & the Unseen World' [1929]. That is the only other publication I have made or am likely to make on this topic." 43739

**14. Einstein, Albert** (1879-1955). Portrait photograph of Einstein by Orren Jack Turner. Princeton, N.J., 1951. 349 x 260 mm., in cardboard folder with photographer's name on the front. Signed and dated by the photographer in white ink in the lower right corner. Lower edges of photograph a little cockled, two or three almost invisible scratches but very good. $1000

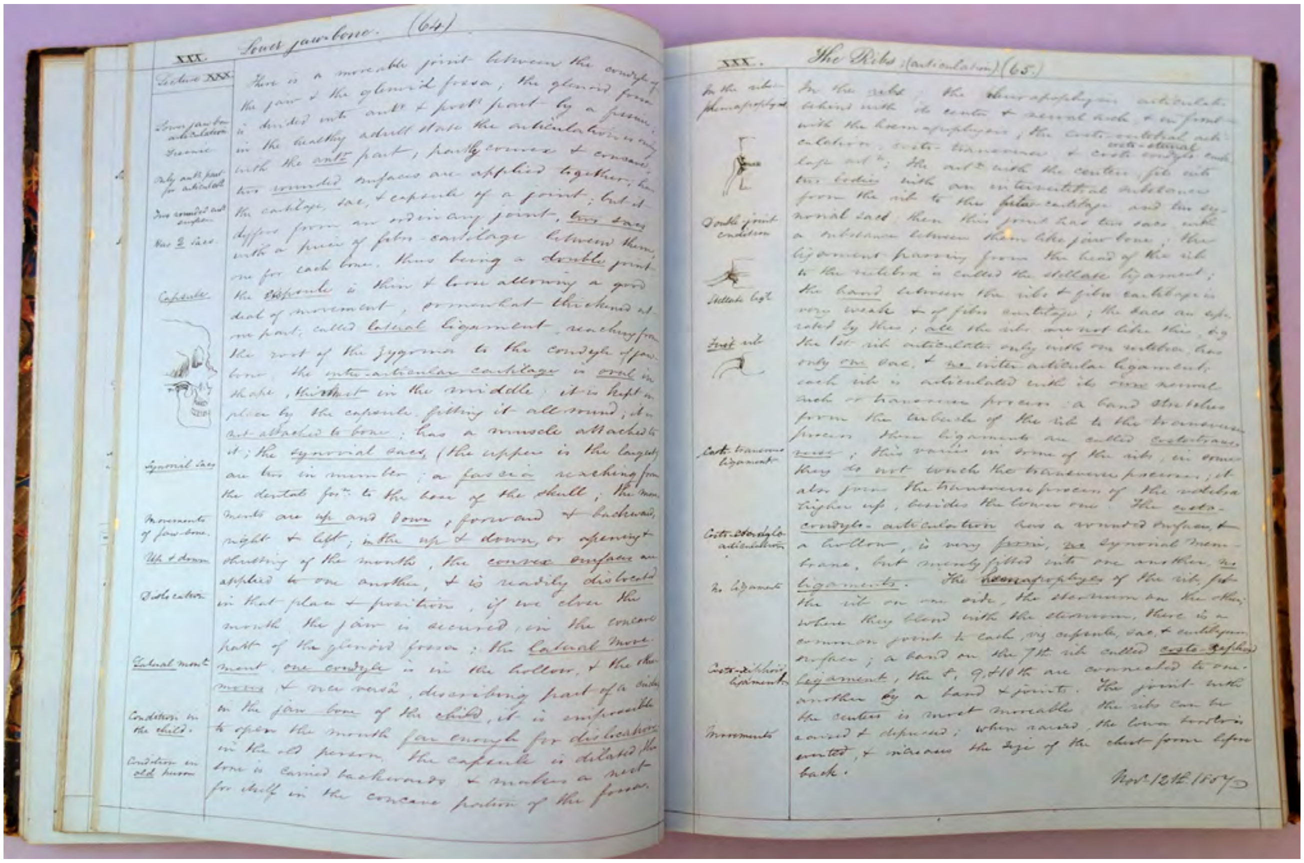
Evocative photographic portrait of Einstein near the end of his life, taken by Orren Jack Turner, an official photographer for Princeton University. 43743

**15. Einstein, Albert** (1879-1955). Collection of 32 black and white photographs of and relating to Einstein, including three by photographer Orren Jack Turner (signed with his embossed stamp, and with copyright notices in his hand). 1922-71. Various sizes, mostly 8 x 10 inches. Many with press IDs and captions. Lower edges of Turner photos a bit cockled, but very good. Complete listing available. $1750

The collection includes three photographic portraits of Einstein (dated 1922, 1937 and 1951) by Orren Jack Turner, an official photographer at Princeton University; these have Turner's embossed stamp in the lower margin and copyright notices in his hand. The earliest of these was taken during Einstein's first visit to the United States in 1921, when he lectured at Princeton. The remaining photographs are mostly press file photographs with text captions; several of them appear to have been printed at the time of Einstein's death. A complete list of the collection is available. 43760

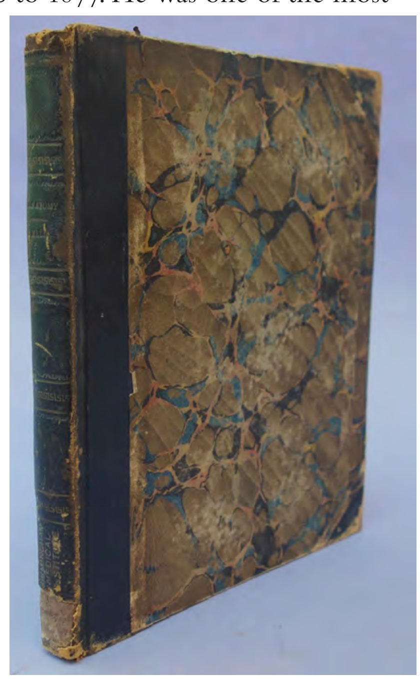



*Above: No. 14, Einstein portrait by Turner. Below: Some of the photos from No. 15*



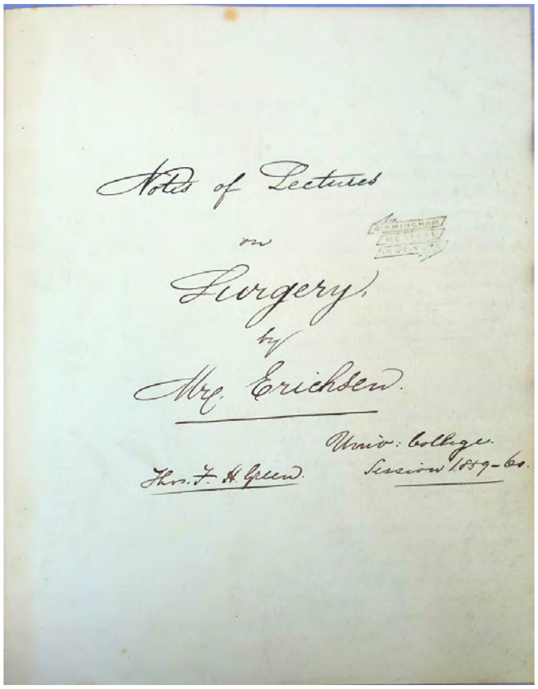

**16. Ellis, George Viner** (1812-1900). Lectures on anatomy by Professor Ellis University College London. Manuscript notes and drawings by Thomas Fould H. Green. 6-page index, 318 numbered pages and 4 unnumbered pages at the end. London, 1854-1858. 253 x 203 mm. Original half sheep, marbled boards, rubbed, lower spine chipped. Very good. Bookplate and stamp of the Birmingham Medical Institute. $1500

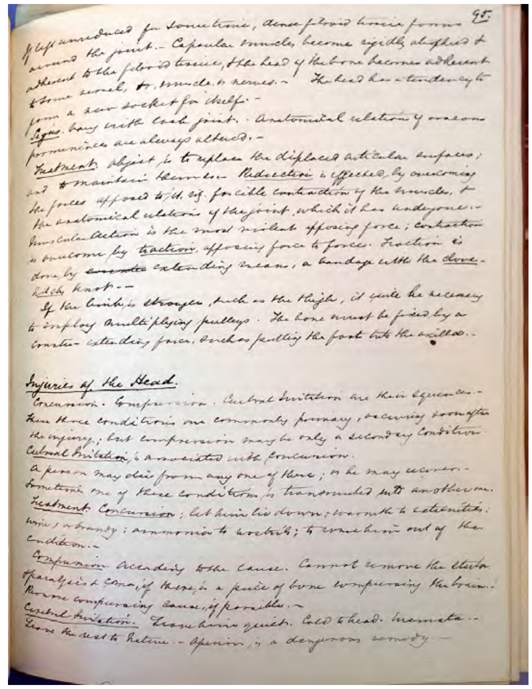
Ellis was professor of anatomy at University College, London from 1850 to 1877. He was one of the most prominent and respected anatomists of his time, and during his tenure University College became known as the pre-eminent center in England for the study of anatomy. Ellis is best known for his *Illustrations of Dissections in a Series of Original Coloured Plates* (1867), a large folio atlas of 58 chromolithographed plates remarkable for their accuracy, clarity and aesthetic value; they reflected the method of dissection that Ellis taught at University College. He also published *Demonstrations of Anatomy: Being a Guide to the Knowledge of the Human Body by Dissections* (1840), which became a standard textbook in England and the United States.



The present notebook contains a clear and neatly written record of Ellis's anatomy lectures given between October 1, 1854 and March 22, 1858. The lectures cover the anatomy of the skeleton, muscles and ligaments, arteries, sense organs, nervous system and genito-urinary system; several are illustrated with ink or pencil sketches. Although the notebook is unsigned, it is in the hand of Thomas F. H. Green, a medical student at University College who won certificates of honor in anatomy and pathological anatomy in 1858 (see the *Medical Times and Gazette* for August 7, 1858, page 152); we have compared the handwriting in this notebook to that in notebooks signed by Green.

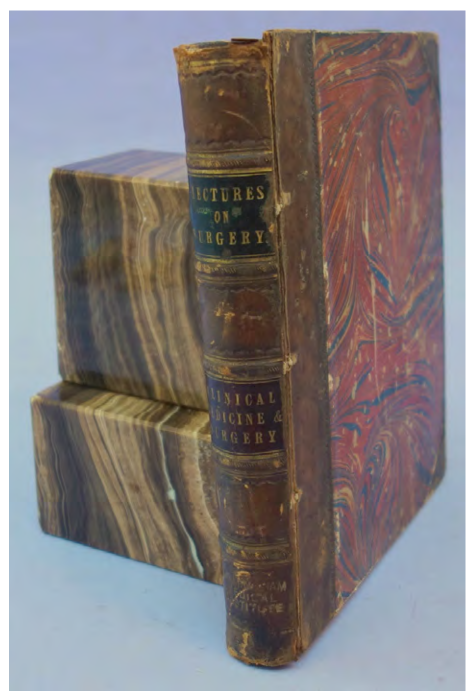
42784



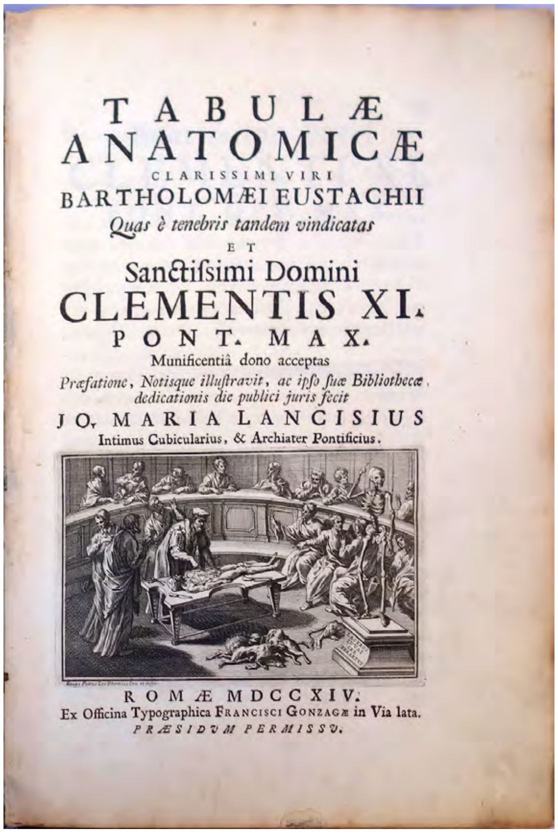



**17. Erichsen, John Eric** (1818-96). Notes of lectures on surgery by Mr. Erichsen. Univ. College. Session 1859-60. Manuscript notes in the hand of a student, Thomas F[ould] H. Green, who signed his name on the title-leaf. 145pp., mostly written on rectos with occasional notes on some versos. Also: Quain, Richard (1816-98) and Erichsen. Clinical lectures (surgical) by Mr. Quain and Mr. Erichsen. Univ. Coll. Hospital Oct. 1856 to [left incomplete]. Manuscript notes in Green's hand, signed by him at the foot of the title. [5], 15pp., written on rectos and versos. 221 x 185 mm. Both sets of notes contained in a single bound volume of approx. 206 leaves (412 pages), remaining pages blank. Half calf, marbled boards, front cover detached, light wear. Very good. Stamp and bookplate of the Birmingham Medical Institute. $1850

Erichsen was surgeon to University College Hospital and professor of surgery at University College; one of his students was Joseph Lister, who served as Erichsen's house surgeon at the Hospital in the early 1850s. Erichsen was the author of *The Science and Art of Surgery* (1853; Garrison-Morton.com 5602), the most popular textbook on the subject for many years; he also published *On Railway and Other Injuries of the Nervous System* (1866; Garrison-Morton.com 4538.1), the first book to discuss the injuries now known as whiplash. He enjoyed a worldwide reputation as a surgeon, and was an excellent lecturer and clinical teacher.



These manuscript notes were written by Thomas Fould H. Green; see previous entry for further information. Green's manuscript notebook contains both notes of Erichsen's surgical lectures (pp. 1-145) and the clinical lectures on surgery given by Erichsen and Richard Quain, special professor of clinical surgery at University College Hospital. Erichsen's surgical lectures cover the treatment of wounds—both by wound type and by the part of the body injured—as well as the treatment of fractures, asphyxia, gangrene, etc. The notes on Erichsen and Quain's clinical lectures, which Green apparently abandoned part way through the term, cover clubfoot, varicose veins, calculus, aneurysm, abscess, forearm amputation, cut throat, retention of urine and diseases of the breast. 42782



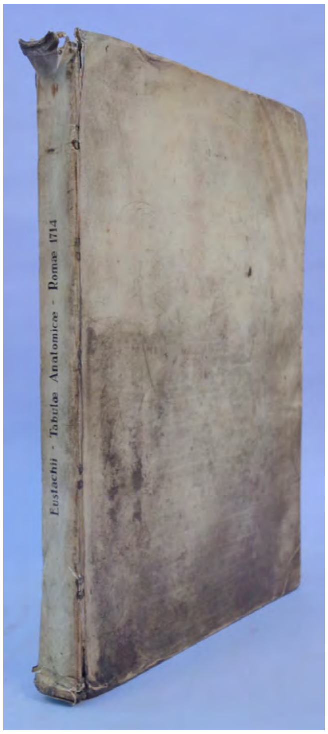


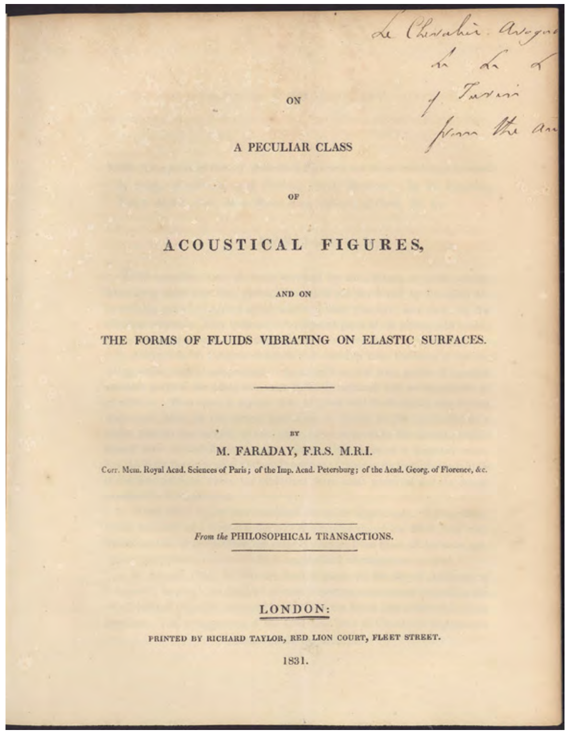
**18. Eustachi, Bartolomeo** (c. 1505-74). Tabulae anatomicae. . . . Edited by Giovanni Maria Lancisi (1654-1720). Folio. xliv, 115, [1], [14, index & errata]pp., another copy of errata leaf laid in. 47 engraved plates prepared by Giulio de'Musi under the direction of Eustachi and his assistant Pier Matteo Pini, engraved title vignette by Petrus Leo Gherrinus. Laid in is one of the 2 engraved graduated scales originally provided on a plate inserted after p. xliv; this plate not present in this copy. Rome: Francisco Gonzaga, 1714. 378 x 257 mm. Vellum ca. 1714, title inked on spine at a later date, splits at spine extremities, inner front hinge cracked. Minor foxing and toning, but very good. Extensive notes in Latin in an early hand on several leaves and on laid-in sheets. From the library of Herbert M. Evans (1882-1971) at the Denver Medical Society, with his bookplate. $9500

**First Edition.** Had Eustachi's full series of 47 anatomical copperplates been published at the time of their completion in 1552, Eustachi would have ranked with Vesalius as a founder of modern anatomy. As it happened, only the first eight were issued during Eustachi's lifetime (in his *Opuscula anatomica* [1564]), while the remaining 39 were lost for over a century after his death. Early in the 18th century Eustachi's copperplates were discovered in the Vatican Library and presented by Pope Clement XI to his physician, Giovanni Maria Lancisi, who published them with his own notes in 1714.

Eustachi, considered to have been "the most scientific anatomist of the High Renaissance" (Lilly), was the first to describe the adrenal gland, the abducens nerve, the thoracic duct and the valvulae venae (Eustachian valve) in the right ventricle of the heart. He was the first to accurately describe the uterus, as well as the first since classical times to give an account of the Eustachian tube. His plates are remarkable for their advanced anatomical knowledge, superior at times even to that in Vesalius's *Fabrica*; indeed, Eustachi was critical of the Vesalian illustrations, and corrected some of their errors.

Eustachi had prepared this series of plates to illustrate a projected book entitled De dissensionibus ac controversiis anatomicis, the text of which was lost after his death. The plates are strikingly modern, produced without the conventional 16th-century decorative accompaniments, and framed on three sides by numbered rules giving coordinates by which any part of the body could be precisely located on the plate; this device eliminated the need for identifying marks within the plate (the graduated scales were provided by the publisher for use as a location aid). The images are generic figures, composites of many anatomical observations, and are mathematically as well as representationally exact.





ON

A PECULIAR CLASS

OF

ACOUSTICAL FIGURES,

AND ON

THE FORMS OF FLUIDS VIBRATING ON ELASTIC SURFACES.

BY

M. FARADAY, F.R.S. M.R.I.

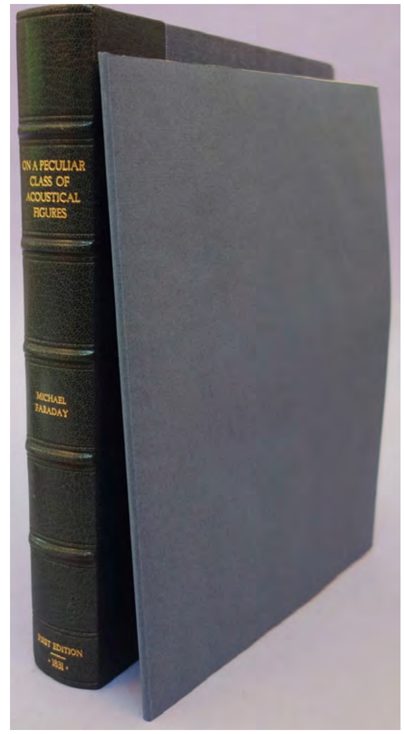
Corr. Mem. Royal Acad. Sciences of Paris; of the Imp. Acad. Petersburg; of the Acad. Georg. of Florence, &c.

*From the* PHILOSOPHICAL TRANSACTIONS.

LONDON:

PRINTED BY RICHARD TAYLOR, RED LION COURT, FLEET STREET.

1831.




*No. 18. Eustachi*

*No. 19. Faraday inscribed title and binding*

This copy is from the library of Herbert M. Evans, best known as the discoverer of vitamin E and human growth hormone. Choulant / Frank, pp. 200-202. Garrison-Morton.com 391. Lilly, *Notable Medical Books*, p. 41. Norman 740. Roberts & Tomlinson, *Fabric of the Body*, pp. 188-93. 43507

## *First Description of "Faraday Waves," Analogous to de Broglie Waves, Inscribed to Avogadro*

**19. Faraday, Michael** (1791-1867). On a peculiar class of acoustical figures, and on the forms of fluids vibrating on elastic surfaces [with Appendix: On the forms and states assumed by fluids in contact with vibrating elastic surfaces]. Offprint from *Philosophical Transactions* (1831). [2], 299-340pp. Text illustrations. 258 x 206 mm. Modern wrappers; preserved in quarter morocco slipcase. Very good. *Presentation Copy, Inscribed by Faraday to Count Amadeo Avogadro* (1776-1856) on the title: "Le Chevalier Avogadro of Turin from the author." Inscription cropped at fore-margin but still readable. $5000

**First Edition, Offprint Issue** of the first description of "Faraday waves"—nonlinear standing waves that appear on liquids enclosed by a vibrating surface—and "Faraday instability," which occurs when the vibration exceeds a certain limit. These phenomena are described in the appendix to Faraday's paper. The Faraday wave and its wavelength are analogous to the de Broglie wave with the de Broglie wavelength in quantum mechanics.

Faraday presented this copy to Italian chemist Amadeo Avogadro, the originator of Avogadro's law stating that equal volumes of gases under the same conditions of pressure and temperature will contain equal numbers of molecules. "Avogadro's number" ($6.022 \times 10^{23}$), the number of molecules in 1 mole of a substance, is named for him. Williams, *Michael Faraday,* pp. 179-81. Jeffreys 185. 43756 first

The Society of Arts

from the author

# EXPERIMENTAL RESEARCHES

IN

# ELECTRICITY.

BY

MICHAEL FARADAY, F.R.S. M.R.I.

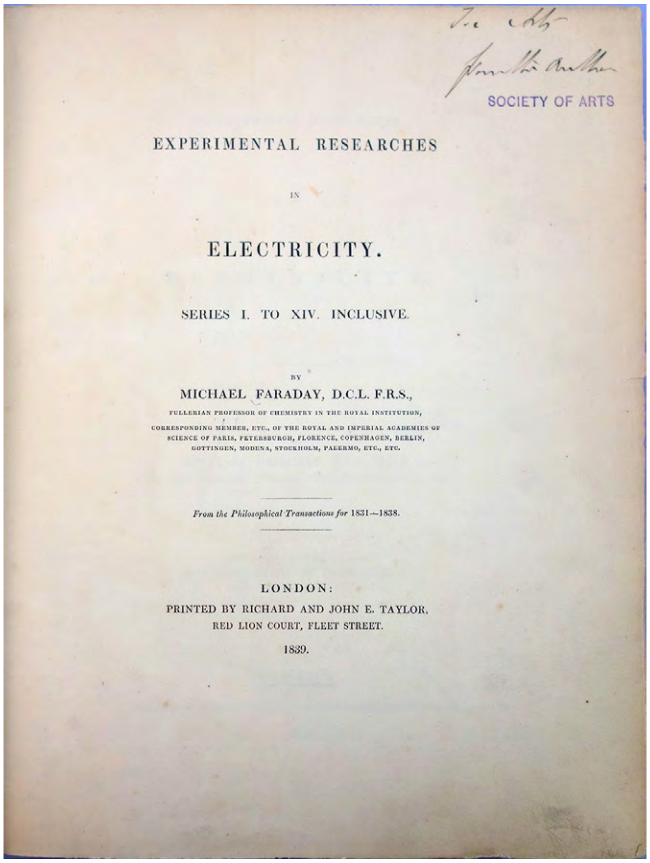
Corr. Mem. Royal Acad. of Sciences of Paris, St. Petersburgh, &c. &c.

*From the* PHILOSOPHICAL TRANSACTIONS.

LONDON:

PRINTED BY RICHARD TAYLOR, RED LION COURT, FLEET STREET.

1832.


SOCIETY OF ARTS

EXPERIMENTAL RESEARCHES

IN

ELECTRICITY.

SERIES I. TO XIV. INCLUSIVE.

BY

MICHAEL FARADAY, D.C.L. F.R.S.,

FULLERIAN PROFESSOR OF CHEMISTRY IN THE ROYAL INSTITUTION,

CORRESPONDING MEMBER, ETC., OF THE ROYAL AND IMPERIAL ACADEMIES OF SCIENCE OF PARIS, PETERSBURGH, FLORENCE, COPENHAGEN, BERLIN, GOTTINGEN, MODENA, STOCKHOLM, PALERMO, ETC., ETC.

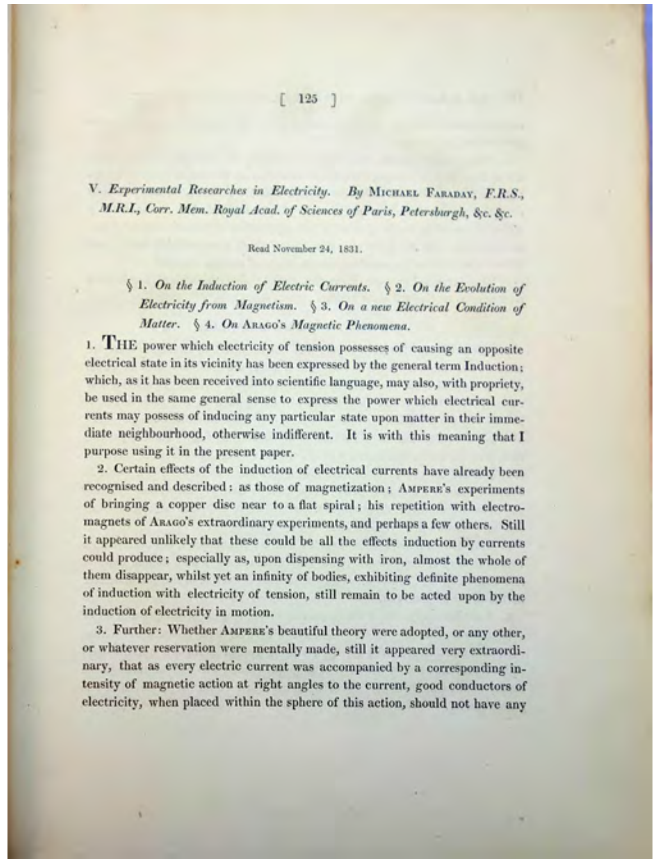
*From the Philosophical Transactions for* 1831—1838.

LONDON:

PRINTED BY RICHARD AND JOHN E. TAYLOR,

RED LION COURT, FLEET STREET.

1839.


[ 125 ]

V. *Experimental Researches in Electricity. By* MICHAEL FARADAY, *F.R.S., M.R.I., Corr. Mem. Royal Acad. of Sciences of Paris, Petersburgh, &c. &c.*

Read November 24, 1831.

§ 1. *On the Induction of Electric Currents.* § 2. *On the Evolution of Electricity from Magnetism.* § 3. *On a new Electrical Condition of Matter.* § 4. *On* ARAGO's *Magnetic Phenomena.*

1. THE power which electricity of tension possesses of causing an opposite electrical state in its vicinity has been expressed by the general term Induction; which, as it has been received into scientific language, may also, with propriety, be used in the same general sense to express the power which electrical currents may possess of inducing any particular state upon matter in their immediate neighbourhood, otherwise indifferent. It is with this meaning that I purpose using it in the present paper.

2. Certain effects of the induction of electrical currents have already been recognised and described: as those of magnetization; AMPERE's experiments of bringing a copper disc near to a flat spiral; his repetition with electro-magnets of ARAGO's extraordinary experiments, and perhaps a few others. Still it appeared unlikely that these could be all the effects induction by currents could produce; especially as, upon dispensing with iron, almost the whole of them disappear, whilst yet an infinity of bodies, exhibiting definite phenomena of induction with electricity of tension, still remain to be acted upon by the induction of electricity in motion.

3. Further: Whether AMPERE's beautiful theory were adopted, or any other, or whatever reservation were mentally made, still it appeared very extraordinary, that as every electric current was accompanied by a corresponding intensity of magnetic action at right angles to the current, good conductors of electricity, when placed within the sphere of this action, should not have any

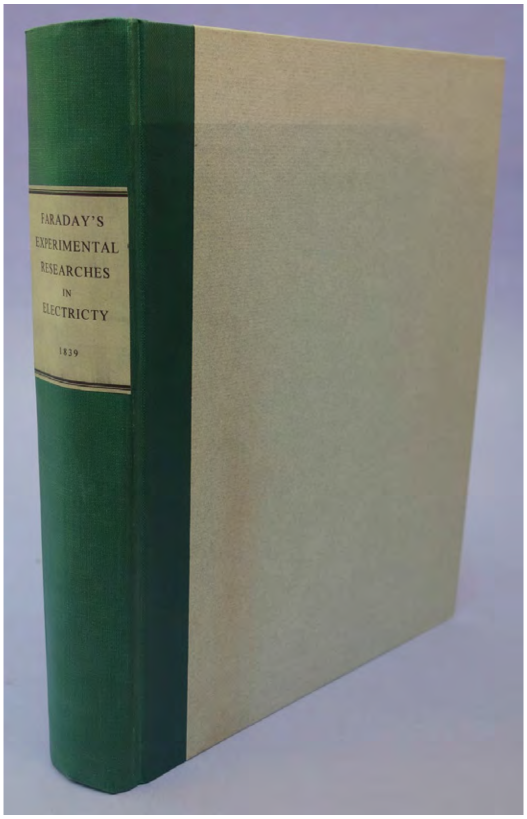
## *Inscribed Presentation Copies of Offprints of Faraday's Most Important Electrical Researches: Starting Point for Maxwell and Einstein*

**20. Faraday, Michael** (1791-1867). Experimental researches in electricity. 1st – 14th series, plus supplement to the 11th series and index. Offprints from Philosophical Transactions (1832-38). Variously paginated; each offprint with separate title not counted in pagination, plus general title dated 1839. 8 plates. 277 x 226 mm. 12 offprints total (both the 1st – 2nd series and the 12th – 13th series are published together as single offprints), bound together in modern quarter cloth, boards, paper spine label. Light toning, some edges dust-soiled and a tiny bit frayed, but very good. *Presentation Copies, Each One Inscribed by Faraday* on the title-leaf: "Society of Arts, from the Author." General title also inscribed by Faraday. Small stamp of the Society of Arts on the general title and one or two other places.

$60,000

**First Editions, Offprint Issues.** An extremely rare set of presentation offprints of Faraday's first fourteen papers on electricity, containing his most important contributions to electricity and magnetism. In 1831 Faraday embarked on what would be eight years of intensive research on electrical and magnetic phenomena, driven by his concept of "lines of force"; this represents "the starting point for the revolutionary theories of Clerk Maxwell and later of Einstein" (*Printing and the Mind of Man*). The groundbreaking results of Faraday's investigations during this period, culminating in his complete theory of electricity, are contained in the papers we are offering here.

The "First series" of the "Experimental researches," read in 1831 and published in 1832, is Faraday's single most important scientific paper: It reports his discovery of the means for generating electricity by electro-magnetic induction and his invention of the dynamo.




> Faraday became convinced that the relation of electricity to magnetism had to be extended, and that if a current could produce a magnetic field, a magnetic field also had to be able to produce a current . . . Faraday brooded over [this problem] for about ten years, and made numerous experiments, all negative . . . In the summer [of 1831], he built an iron ring on which he wrapped two coils of copper wire. He then noted that if he sent a current in one and connected the other to a galvanometer, the instrument would signal a current not in the stationary state, but only at the establishment or interruption of a current in the other coil. That was the clue he needed. By the end of September he had developed a clear understanding and experimental demonstration of electromagnetic induction. He had grasped the vital point that to generate a current, a conductor had to cut the lines of magnetic force . . . Once the nature of electromagnetic induction was understood, Faraday was able to explain Arago's observations and to invent an electromagnetic generator of currents—a primitive dynamo (Segrè, *Falling Bodies to Radio Waves*, pp. 143–44; see also 132–55).

Regarding Faraday's invention of the dynamo, his biographer L. Pearce Williams has this to say:

> . . . it was impossible to realize at the time the revolution in man's life that would be worked by future developments of this apparatus. . . . From this simple laboratory toy was to come the whole of the electric power industry and the benefits to everyone that have followed upon the ability to transport electricity to even the smallest village or farm. Faraday did realize that here was a possible source of cheap electric current, but he was too immersed in discovery to think of pursuing the practical aspects . . . The story is told that Sir Robert Peel, the Prime Minister, visited Faraday in the laboratory of the Royal Institution soon after the invention of the dynamo. Pointing to this odd machine, he inquired of what use it was. Faraday is said to have replied, "I know not, but I wager that one day your government will tax it" (Williams, *Michael Faraday*, pp. 195–96).

The "Second series" of the "Experimental researches," which deals with terrestrial electromagnetic induction and the force and direction of electromagnetic induction generally, is of almost equal importance to the "First series," as it represents the birth of the field concept. Through his experiments, Faraday had made the surprising discovery that the lines or curves of force generated by a magnet are independent of their source. Williams writes that

> this peculiar situation had great influence upon the course of Faraday's thought. In the same paper [i.e., the "Second series"] in which Faraday had noted the independence of the magnetic lines of force, he also introduced a new concept. This was the idea of the field of force generated in time and extending progressively through space. . . . For the next thirty years [Faraday] was to search for essentially two things: the way in which electric and magnetic forces were transmitted through space, and the relation between these forces and ponderable matter. It is no exaggeration to say that a fundamentally new way of looking at physical reality was introduced into science in this Second Series of the *Experimental Researches.* Hitherto all that had been really attended to was the effects of forces acting upon matter. Henceforth, the problem of the way in which the force was transmitted between particles of matter or even through empty space was to loom ever larger. Out of the successive answers given by Faraday, James Clerk Maxwell and Albert Einstein was to emerge modern field theory (pp. 204–6).

By the time Faraday completed his fourteenth series of electrical researches, he was ready to put forth a new and complete theory of electricity:

> The particles of matter were composed of forces arranged in complex patterns which gave them their individuality. These patterns could be distorted by placing the particles under strain. Electrical force set up such a strain. In electrostatics, the strain was imposed on molecules capable of sustaining large forces; when the line

> of particulate strain gave way, it did so with the snap of the electric spark . . . In electrochemistry, the force of the "breaking" strain was that of the chemical affinities of the elements of the chemical compound undergoing electrical decomposition . . . This buildup and breakdown of interparticulate strain, passing through the electrolyte, constituted the electrical "current." It was a transfer of energy which did not entail a transfer of matter . . . [Faraday's] theory was elegant, firmly based on experiment, and complete. It was also heretical, challenging almost all the fundamental concepts of orthodox electrical science (*Dictionary of Scientific Biography*).

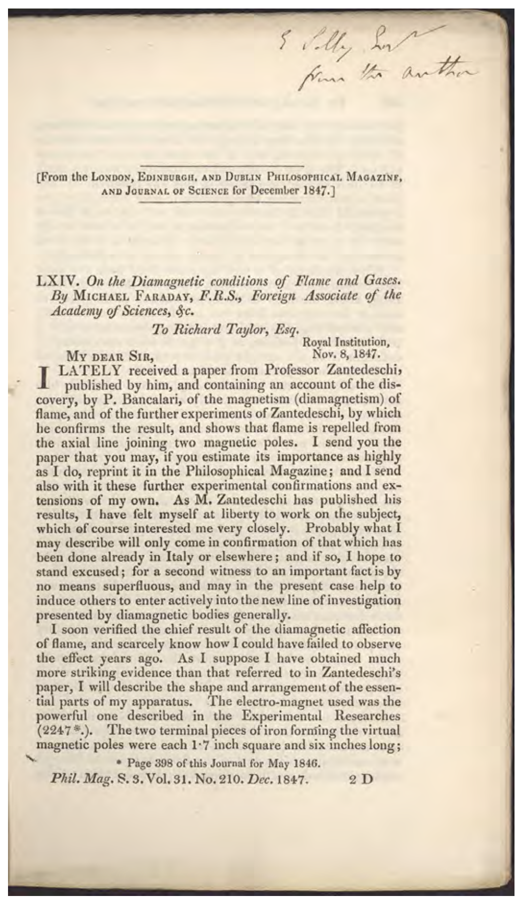
In 1839 Faraday's first fourteen papers were collected, reset in 8vo format, and published by R. J. & E. Taylor in a single volume titled *Experimental Researches in Electricity.* In that same year Faraday suffered a mental breakdown from which he never fully recovered; although he continued to pursue his electrical researches throughout the remainder of his career (publishing them as series 15 – 30 in the *Philosophical Transactions*), it was never with the same focus or intensity. The second volume of his collected *Experimental Researches*, containing series 15 through 18, appeared in 1844 and the final volume, containing series 19 through 29, was issued in 1855. Series 30 never appeared in book form.

A great promoter of science, Faraday inscribed this set of offprints to the Society of Arts, formally known as the Society for the Encouragement of Arts, Manufacture and Commerce. The mission of the Society was to "embolden enterprise, enlarge science, refine art, improve our manufacturers and extend our commerce." The organization is known today as the Royal Society of Arts (RSA).

The offprint of Faraday's first paper on electro-magnetic induction has been very difficult to find for the past 50 years. Two copies have appeared at auction; the last sold for sold for $47,500 in 2011. Jeffreys, *Michael Faraday, A List of his Lectures and Published Writings* (1960) 187, 191, 207, 215, 218, 220-21, 227, 234, 241, 273, 277, 279-80. See *Printing and the Mind of Man* 308 and Horblit 29 (both citing the book-form edition); also see Norman 760 for a set of later offprints inscribed by Faraday. 43746

**21. Faraday, Michael** (1791-1867). On the diamagnetic conditions of flame and gases. Offprint from *Philosophical Magazine* 31 (1847). 401-424pp. 224 x 144 mm. Original plain wrappers, spine repaired, minor chipping. Light dust-soiling but very good. *Presentation Copy, Inscribed by Faraday* to chemist Edward Solly (1819-86) on the first leaf: "E. Solly Esqr from the author." $1500

**First Edition, Offprint Issue.** "In the fall of 1847 [Faraday] had learned from Francesco Zantedeschi that flames were repelled by the poles of a strong magnet. Faraday explained this effect by a temperature-dependent (dia)magnetism of gases, and proved that all current gases except oxygen were diamagnetic with respect to the air by observing their motion after being freed in the air between the poles of an electromagnet" (Darrigol, *Electrodynamics from Ampère to Einstein*, p. 103). Faraday presented this copy to English chemist Edward Solly, one of his associates at the Royal Institution. Williams, *Michael Faraday*, pp. 396-99. Jeffreys 363. 43758


[From the LONDON, EDINBURGH, AND DUBLIN PHILOSOPHICAL MAGAZINE, AND JOURNAL OF SCIENCE for December 1847.]

LXIV. *On the Diamagnetic conditions of Flame and Gases. By* MICHAEL FARADAY, *F.R.S., Foreign Associate of the Academy of Sciences, &c.*

*To Richard Taylor, Esq.*

Royal Institution, Nov. 8, 1847.

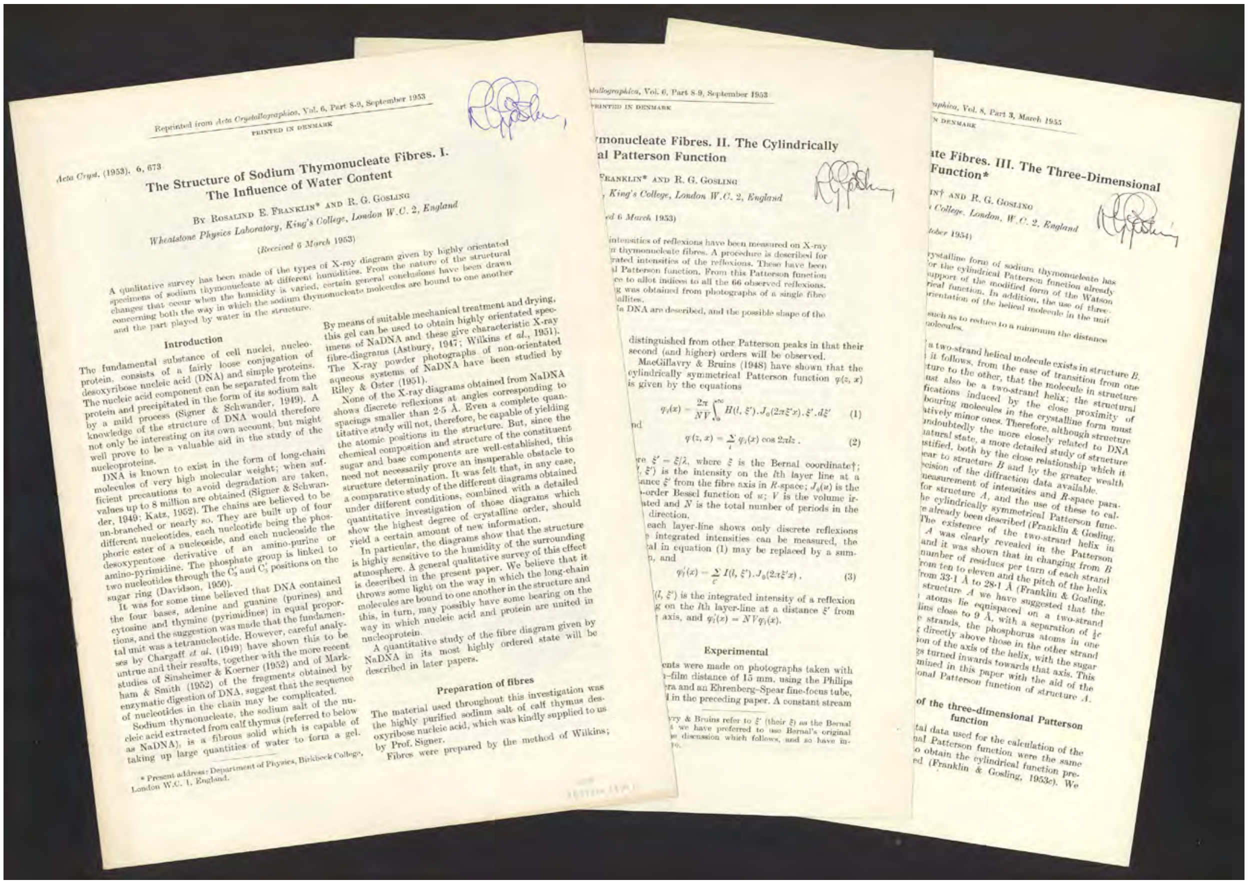
MY DEAR SIR,

I LATELY received a paper from Professor Zantedeschi, published by him, and containing an account of the discovery, by P. Bancalari, of the magnetism (diamagnetism) of flame, and of the further experiments of Zantedeschi, by which he confirms the result, and shows that flame is repelled from the axial line joining two magnetic poles. I send you the paper that you may, if you estimate its importance as highly as I do, reprint it in the Philosophical Magazine; and I send also with it these further experimental confirmations and extensions of my own. As M. Zantedeschi has published his results, I have felt myself at liberty to work on the subject, which of course interested me very closely. Probably what I may describe will only come in confirmation of that which has been done already in Italy or elsewhere; and if so, I hope to stand excused; for a second witness to an important fact is by no means superfluous, and may in the present case help to induce others to enter actively into the new line of investigation presented by diamagnetic bodies generally.

I soon verified the chief result of the diamagnetic affection of flame, and scarcely know how I could have failed to observe the effect years ago. As I suppose I have obtained much more striking evidence than that referred to in Zantedeschi's paper, I will describe the shape and arrangement of the essential parts of my apparatus. The electro-magnet used was the powerful one described in the Experimental Researches (2247*.). The two terminal pieces of iron forming the virtual magnetic poles were each 1·7 inch square and six inches long;

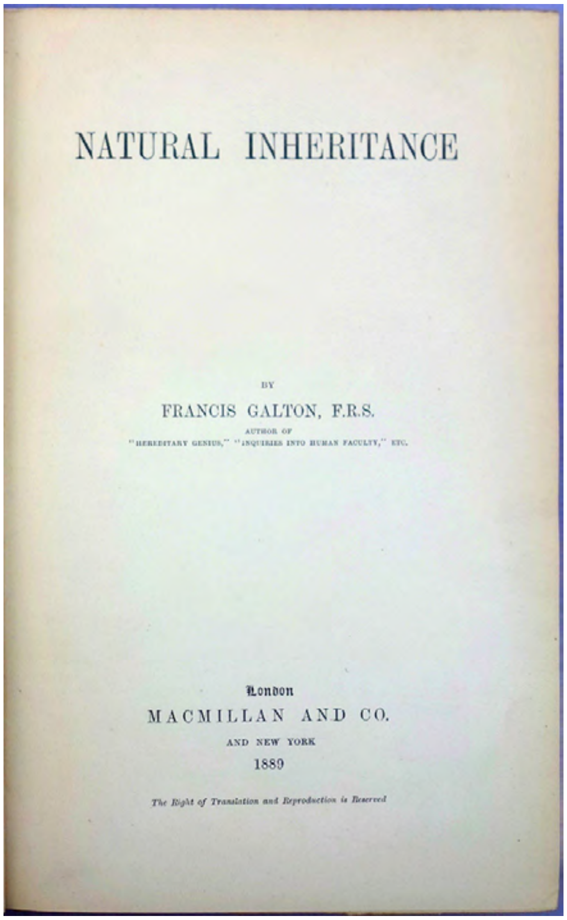
* Page 398 of this Journal for May 1846.

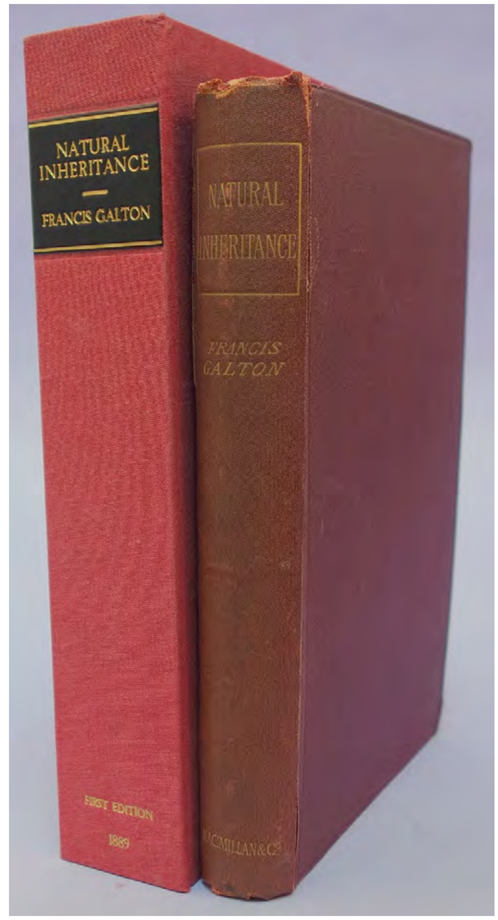
*Phil. Mag.* S. 3. Vol. 31. No. 210. *Dec.* 1847. 2 D



**22. Franklin, Rosalind** (1920-58) & **R. G. Gosling.** (1) The structure of sodium thymonucleate fibres. I. The influence of water content. Offprint from *Acta Crystallographica* 6 (1953). 673-677pp. (2) The structure of sodium thymonucleate fibres. II. The cylindrically symmetrical Patterson function. Offprint from *Acta Crystallographica* 6 (1953). 678-685pp. (3) The structure of sodium thymonucleate fibres. III. The three-dimensional Patterson function. Offprint from *Acta Crystallographica* 8 (1955). Together 3 offprints. 268 x 202 mm. Without wrappers as issued. Fine copies, each one signed by R. G. Gosling on the first page. $8000

**First Separate Editions.** In January 1951, after having learned X-ray crystallography techniques in Paris, Rosalind Franklin arrived at the MRC Biophysics Unit at King's College, London, to pursue research on the structure of DNA. The head of the MRC, John T. Randall, arranged for Gosling, a graduate student previously associated with Maurice Wilkins, to work with her. At the same time, James Watson and Francis Crick were pursuing their own DNA investigations at the Cavendish Laboratory at Cambridge, which culminated, in April 1953, in the publication of their famous double-helix model of DNA structure (based in part on information derived from one of Franklin's x-ray photographs). In March 1953, before they were aware of the Watson-Crick model, Franklin and Gosling submitted two papers on DNA structure for publication in Acta Crystallographica. "The first describes the observations on the types of X-ray diagram given by highly orientated specimens of sodium DNA at different humidities. Two forms of DNA fibres, named A and B, are described and the conditions are given for producing them. In this paper are reproduced the beautiful X-ray photographs which were used in the subsequent analysis of both forms. The accompanying paper describes quantitative measures on the X-ray pattern of the A form. . . ." (Klug, "Rosalind Franklin" [1968], p. 808). Two years later Franklin and Gosling submitted their final paper in the series, "contain[ing] an interpretation of the three-dimensional Patterson function of the A structure in which the orientation of the helical molecules in the unit cell of the crystal is analysed and a detailed picture of the arrangement of the phosphate groups is proposed." (Klug, p. 808). 37736



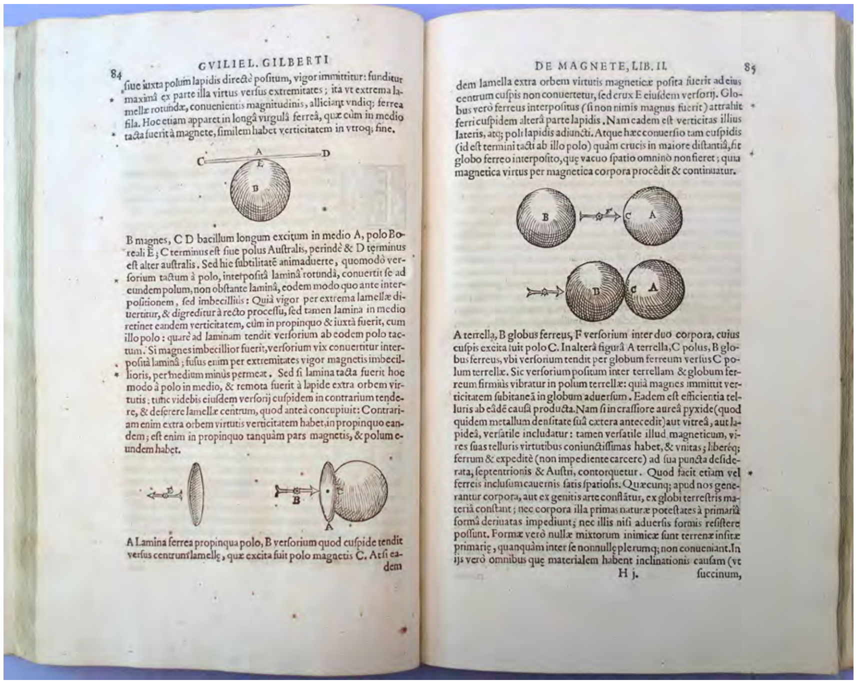




**23. Galton, Francis** (1822-1911). Natural inheritance. 8vo. ix, [5], 259pp., leaf of adverts. Text diagrams. London: Macmillan, 1889. 223 x 142 mm. Original maroon cloth, gilt-lettered spine, inner hinges cracking, spine a little faded and with small splits in upper portion; boxed. Very good copy.

$1000

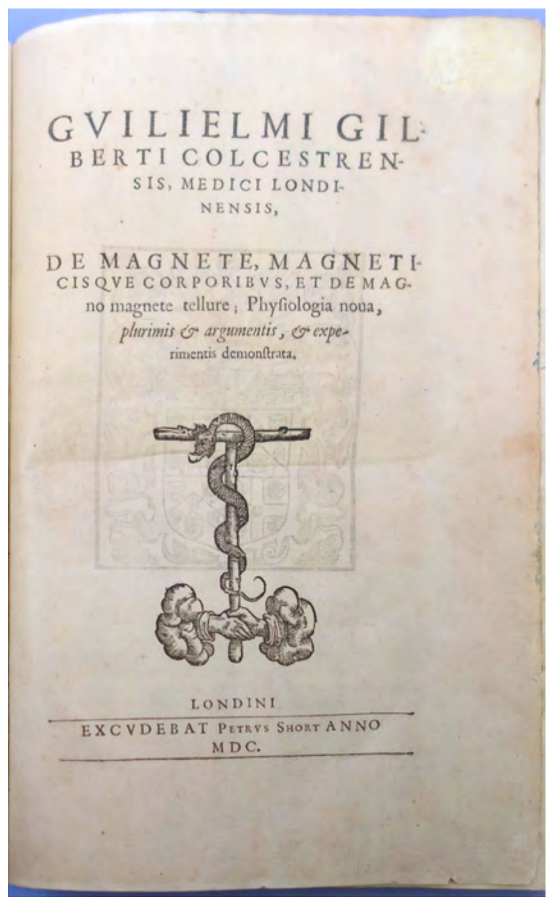
**First Edition** of Galton's greatest scientific work. Galton's two most significant contributions to statistics—correlation and regression to the mean—grew out of his analyses of anthropometric data. Galton came up with the concept of "regression to the mean" in the mid-1880s, while investigating the heritability of height in humans. In plotting the heights of children against their parents, Galton found that if a child's "mid-parent" (the average of the male and female parents' heights, with the mother's height adjusted upwards) was taller than the mean, the child would tend to be shorter than the mid-parent by a certain ratio, whereas the opposite was true if the mid-parent was shorter than the mean. With the assistance of mathematician J. H. Dickson, Galton came up with a full mathematical formulation of this concept, which is discussed in detail in *Natural Inheritance.*

"[Galton] came close to deducing several of the fundamental genetic truths arrived at by Mendel. His theory of particulate inheritance with its emphasis on quantitative variation in numbers of different genetic elements actually fitted the metric characters, like stature, he analyzed. . . . On theoretical grounds, Galton had edged close to developing a whole set of important genetic concepts that would emerge early in the twentieth century. But unlike Mendel, he did not know how to test his model and there were no physical structures within the cell on which he could hang his personal and latent [hereditary] elements so far as he knew" (Gillham, *Life of Sir Francis Galton,* pp. 258, 262). Forrest, *Francis Galton*, p. 312. Garrison-Morton.com 233. 43751




# One of the First Early Modern Works in Experimental Science

**24. Gilbert, William** (1544-1603). De magnete, magneticisque corporibus, et de magno magnete tellure. . . . Folio. [16], 240pp. Text woodcuts, folding woodcut plate. London: Peter Short, 1600. 296 x 194 mm. Recently bound in old vellum antiphonal leaf, cloth ties; preserved in a cloth drop-back box. Corner of leaf *2 repaired, minor stains on p. 46, light foxing, but very good. $18,500

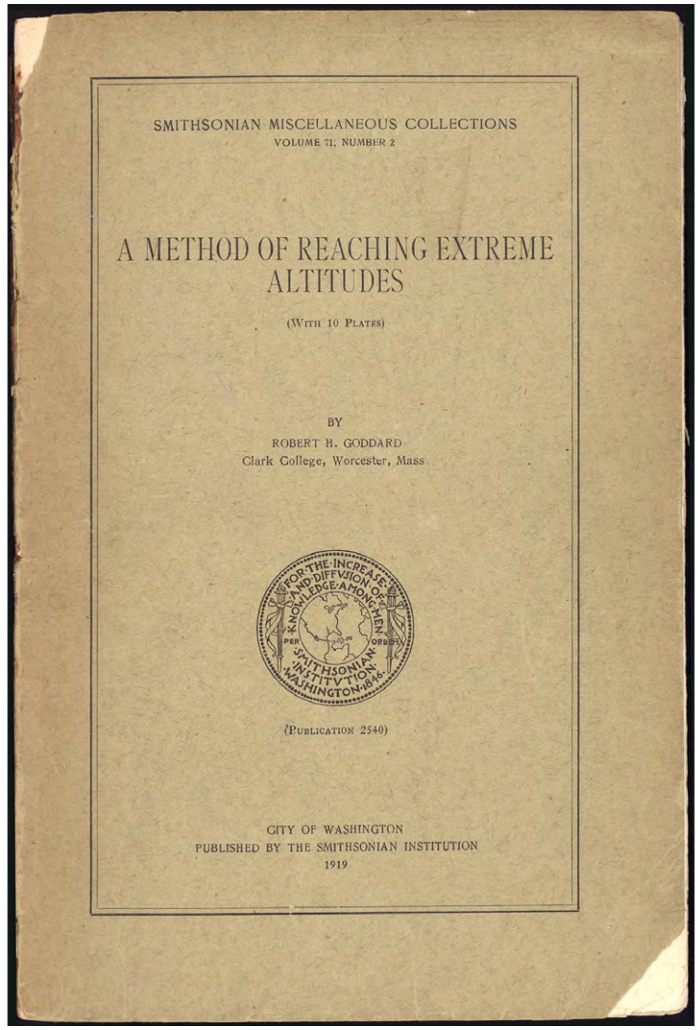

GVILIELMI GIL-
BERTI COLCESTREN-
SIS, MEDICI LONDI-
NENSIS,

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

LONDINI
EXCVDEBAT PETRVS SHORT ANNO
MDC.

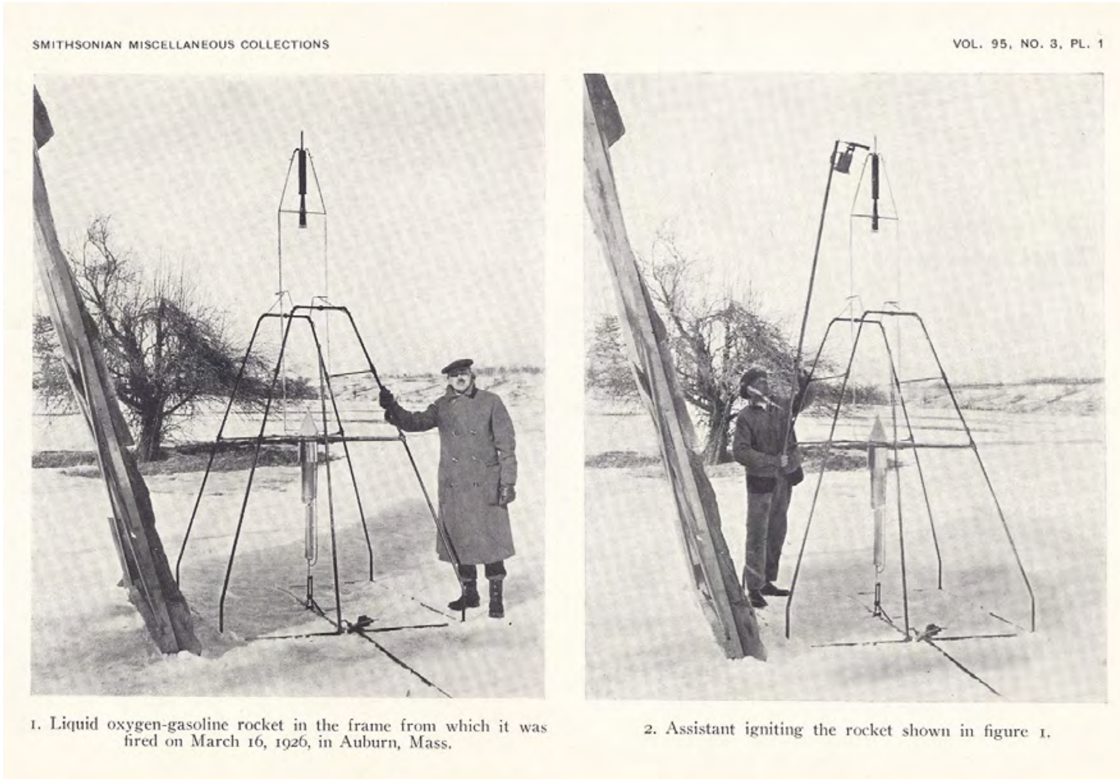
**First Edition.** "One of the earliest monographs devoted to a particular branch of terrestrial physics, and one of the first published reports of an extensive series of linked, reconfirmed experiments" (Heilbron, *Electricity in the 17th and 18th Centuries*, p. 169). Gilbert divided his work into six books, the first of which gave an outline of the history of magnetism and introduced his new hypothesis that the earth itself was a magnet. In chapter 2 of the second book, Gilbert distinguished the effects of electricity from those of magnetism, thus establishing electrical studies as a separate discipline; he also introduced the terms "electricity," "electric force," and "electric attraction," and described the first instrument (the versorium) for measuring electricity. In the remainder of his treatise, Gilbert discussed the five known movements associated with magnets—coition, direction, variation, declination and revolution—and discussed them in terms of the earth's magnetism, using data obtained from experiments with a small spherical magnet ("terella") which, he believed, duplicated the earth's magnetism in miniature. Heilbron, pp. 169-179. *Printing and the Mind of Man* 107. Horblit, *100 Books Famous in Science*, 41. Dibner, *Heralds of Science*, 54. Norman 905. S.T.C. 11883. 43653

**25. Goddard, Robert H.** (1882-1945). A method of reaching extreme altitudes. Smithsonian Miscellaneous Collections 71, no. 2. 8vo. [4], 69, [1]pp. 5 plate leaves with plates numbered 1-10. Washington, D.C.: Smithsonian Institution, 1919. 246 x 168 mm. Original tan printed wrappers, preserved in a folding cloth box. Wrappers chipped at spine and corners, front hinge partially split, otherwise a very good copy. From the library of Harrison D. Horblit (1912-88), author of the noted bibliography *One Hundred Books Famous in Science* (1964), with his bookplate on the inner flap of the folding box. $12,500

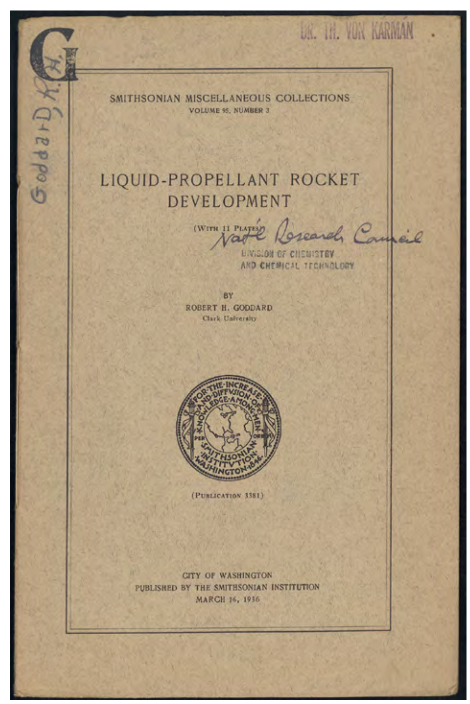



**First Edition of the earliest practical treatise on the development of rocketry for space flight.** "Like the Russian hero Konstantin Tsiolkovsky and the German pioneer Hermann Oberth, Goddard worked out the theory of rocket propulsion independently. . . . Having explored the mathematical practicality of rocketry since 1906 and the experimental workability of reaction engines in laboratory vacuum tests since 1912, Goddard began to accumulate ideas for probing beyond the Earth's stratosphere. His first two patents in 1914, for a liquid-fuel gun rocket and a multistage step rocket, let to some modest recognition and financial support from the Smithsonian Institution. . . . The publication in 1919 of his seminal paper 'A Method of Reaching Extreme Altitudes' gave Goddard distorted publicity because he had suggested that jet propulsion could be used to attain escape velocity and that this theory could be proved by crashing a flash-powder missile on the moon. Sensitive to criticism of his moon-rocket idea, he worked quietly and steadily toward the perfection of his rocket technology and techniques. . . . Among Goddard's successful innovations were fuel-injection systems, regenerative cooling of combustion chambers, gyroscopic stabilization and control, instrumented payloads and recovery systems, guidance vanes in the exhaust plume, gimbaled and clustered engines, and aluminum fuel and oxidizer pumps" (*Dictionary of Scientific Biography).*

The secretive Goddard published only two booklets on rocketry, of which this is the first. The remainder of his work was documented in patents. Goddard's booklet of 1919 was preceded by the theoretical writings of Tsiolkovsky published in Russian, 1903-1914, and by the theoretical paper by Esnault-Pelterie published in French in 1913. Goddard & Pendray, *The Papers of Robert H. Goddard,* I, 233-38. 43688

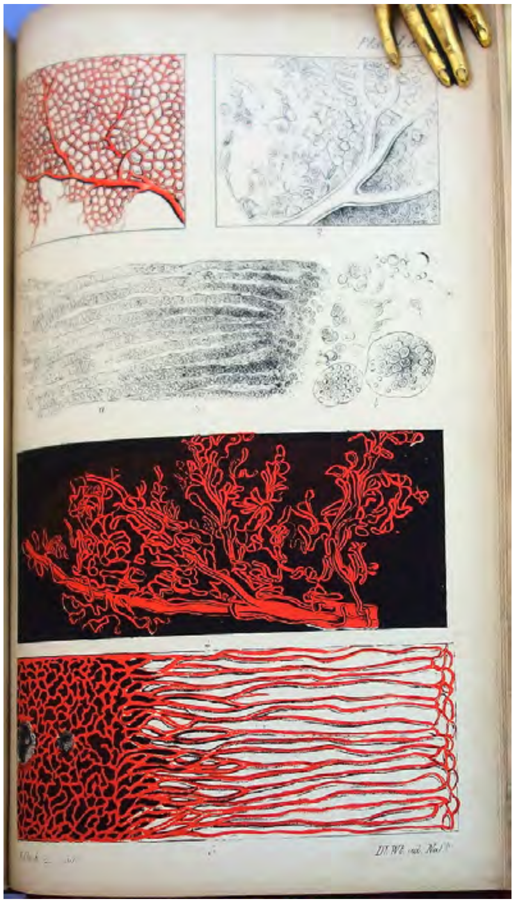


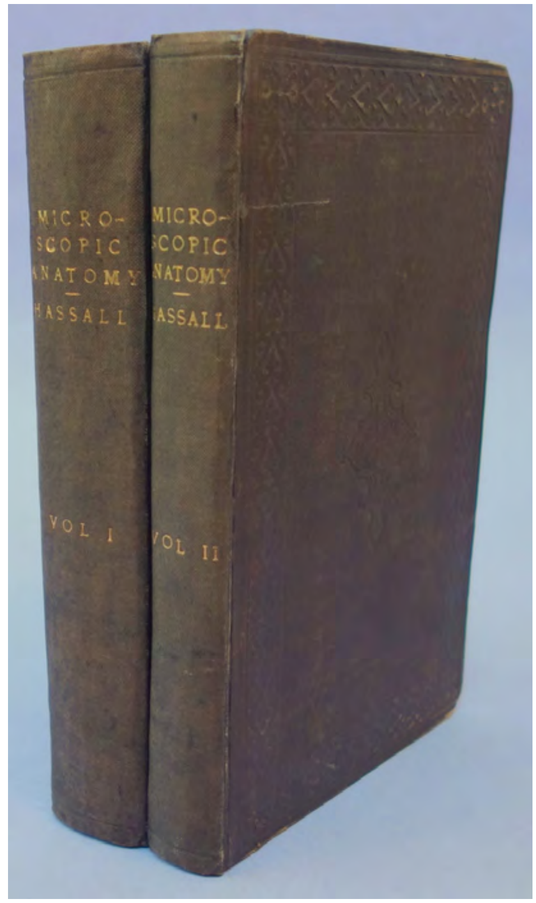

**26. Goddard, Robert H.** (1882-1945). Liquid-propellant rocket development. 10pp. 6 plate leaves. Washington, DC: Smithsonian Institution, 1936. 246 x 163 mm. Original printed wrappers; preserved in a cloth drop-back box. Fine copy. From the library of aviation and aerospace pioneer Theodore von Kármán (1881-1963), with his stamp and docketing on the front wrapper. Front wrapper inscribed "Nat'l Research Council," with stamp beneath reading "Division of Chemistry and Chemical Technology." $3750




**First Edition** of Goddard's second and last published paper on rocketry. "With an eye toward patentability of demonstrated systems and with the aid of no more than a handful of technicians, Goddard achieved a series of workable liquid-fuel flights starting in 1926. Through the patronage of Charles A. Lindbergh, the Daniel and Florence Guggenheim Foundation, and the Carnegie and Smithsonian institutions, the Goddards and their small staff were able to move near Roswell, New Mexico. There, during most of the 1930s, Goddard demonstrated, despite many failures in his systematic static and flight tests, progressively more sophisticated experimental boosters and payloads, reaching speeds of 700 miles per hour and altitudes above 8000 feet in several test flights" (*Dictionary of Scientific Biography*).

This copy is from the library of aeronautics pioneer Theodore von Kármán, who in addition to directing the Jet Propulsion Laboratory at Caltech was also the founder of the Aerojet Engineering Corporation, one of the industrial giants of the jet age. "At Caltech, Karman and his students laid the foundations for aerodynamic design leading to supersonic flight" (*Dictionary of Scientific Biography*). 43705

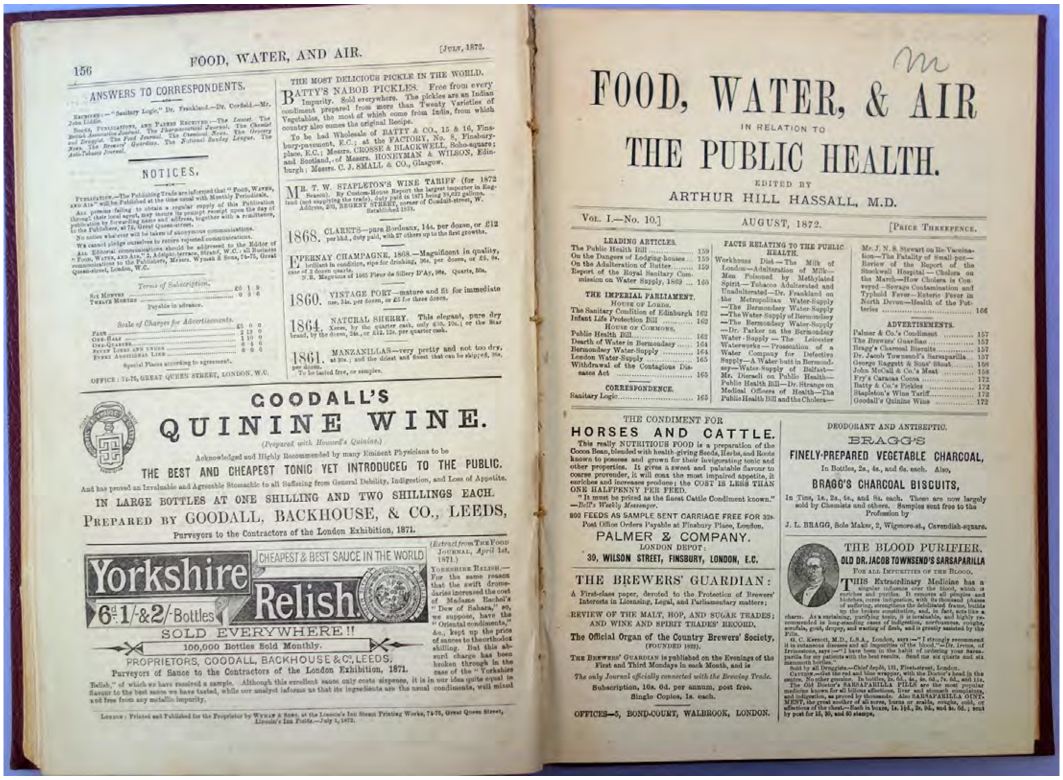





## *First English Textbook on Microscopical Anatomy*

**27. Hassall, Arthur Hill** (1817-94). The microscopic anatomy of the human body. 2 vols. (text and plates). [4, ads], xxiv, 570pp. (text); [16, ads], [4]pp. plus 66 plates numbered 1 – 69 (plates 8, 17 and 38 were never published) plus explanation leaves, some plates printed in color or hand-colored. London: Samuel Highley, 1849. 225 x 140 mm. Original cloth, skillfully rebacked in matching cloth, light edge-wear. Some dampstaining and soiling in plate margins, Plate 23 creased and with one corner lacking (not affecting image), light offsetting but on the whole very good. Small oval stamp of the Medical Library, Bath on verso of Vol. II title and 1 or 2 other places; "Bath Pathological Society" inscribed on front free endpapers of both volumes. $1500

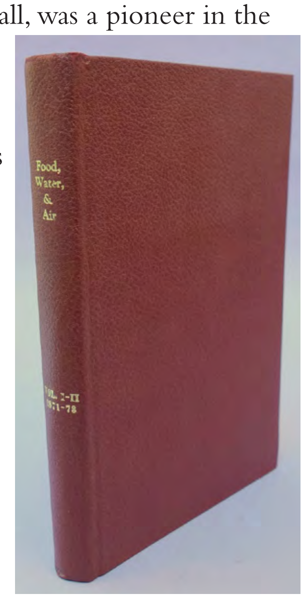
**First Edition.** "First English textbook on microscopical anatomy. [Hassall's] description of the concentric corpuscles of the thymus (p. 9) led to the term 'Hassall's corpuscles'" (Garrison-Morton.com 544). Hassall later applied his expertise with the microscope to the field of public health, where he was instrumental in the improvement of the London water supply and the passage of the first pure food and drug laws. 43722



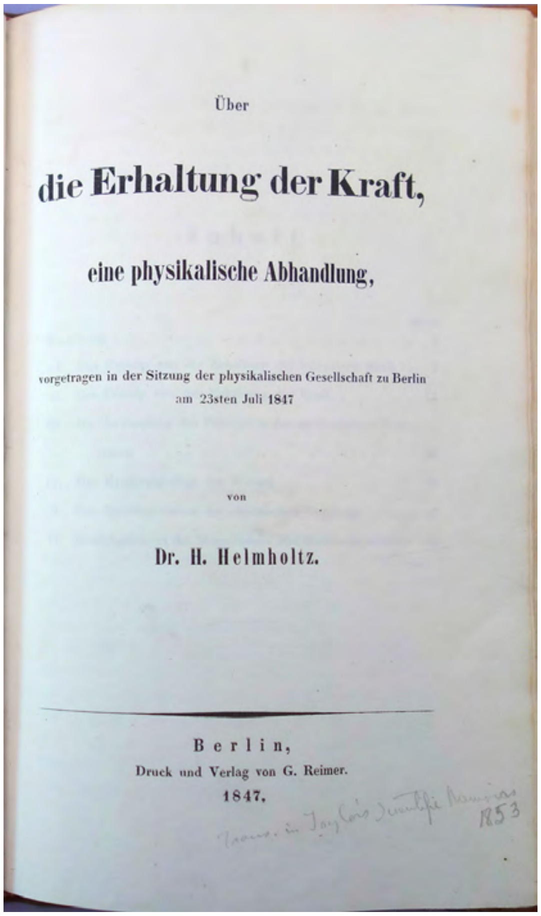

*The First Periodical Devoted to Food, Water and Air Quality*

**28. Hassall, Arthur Hill** (1817-94), *editor.* Food, water, and air. Vol. I, no. 1 – Vol. II, no. 26 (Nov. 1871 – Oct. 1873), plus Vol. III, no. 36 (Nov. 1874). *Lacking* Vol. II, nos. 18, 23 & 25 (April, September and November 1873). 200; 60, 73-112, 121-128, 137-144; 77-84pp.; lacking pp. 19-20 in Vol. I (most likely a page of advertisements). Volume title and index for Vol. I included (inserted in October 1873 issue). 273 x 187 mm. Modern red cloth. First leaf of Vol. I detached, minor foxing and toning, some signatures starting, one or two marginal tears, but overall good. Former owner's name ("Dr. A. M. Edwards") inscribed on first leaves of several issues. $2500

**First Edition** of the *extraordinarily rare first periodical* devoted to food, water and air quality, with only one copy (British Library) recorded in OCLC. Its founder and editor, Dr. Arthur Hill Hassall, was a pioneer in the detection of food adulteration, which had become a major problem in England in the first half of the nineteenth century. Hassall began campaigning against adulteration in 1850 with a series of articles published in the Lancet, in which he pioneered the use of both chemical and microscopic analysis to expose impurities in the foods, beverages and drugs consumed by the British public. Hassall's investigations led to the passage of the first Food and Drug Act in 1860, and his proposals for punishing food adulterers and appointing food inspectors were incorporated into the revised Food and Drug Act of 1872.



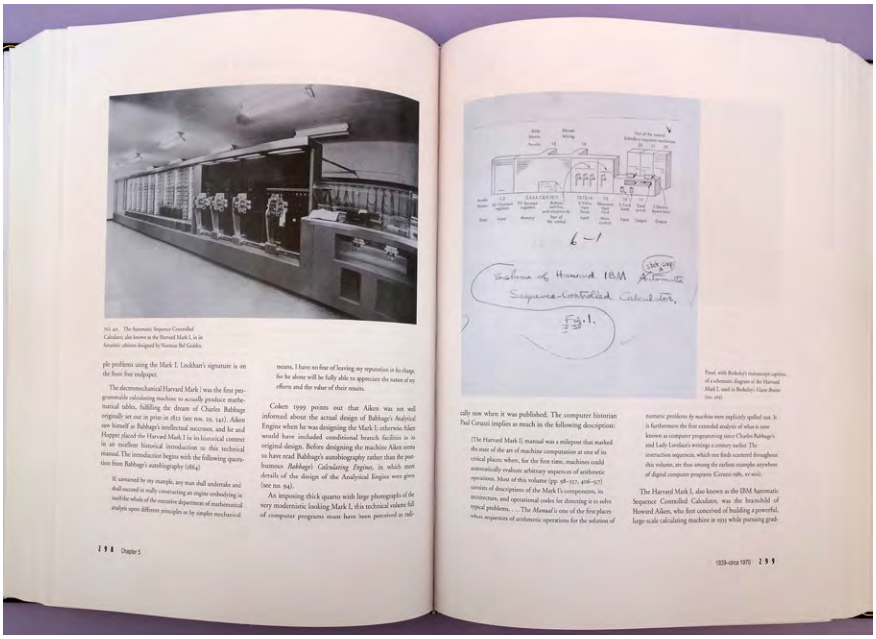

In November 1871 Hassall began publishing the monthly periodical *Food, Water, and Air,* which he claimed to be the first publication of its kind devoted to "the question of Purity of all articles of Food and Drink" (Vol. I, p. 1). Along with food adulteration, the periodical also contained articles on bacterial contamination, sewage treatment, vaccination, cholera and other matters of public health. *Food, Water, and Air* ceased publication in November 1874 due to "the pressure of increasing engagements," chief among them Hassall's appointment as President of the newly founded Society of Public Analysts.
43724

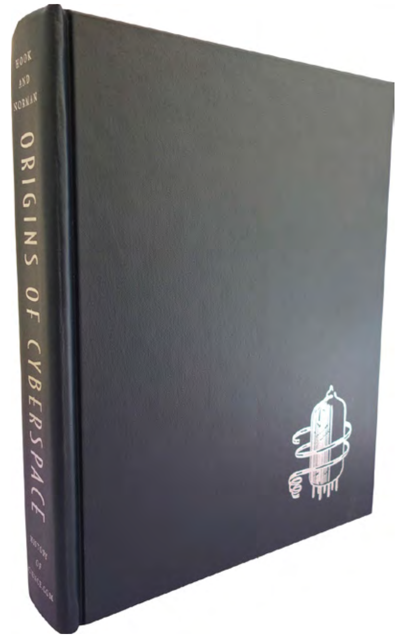



## *Conservation of Energy*

**29. Helmholtz, Hermann von** (1821-1894). Über die Erhaltung der Kraft, eine physikalische Abhandlung. . . . [4], 72pp. Berlin: G. Reimer, 1847. 214 x 133 mm. 19th century half calf, marbled boards, rebacked and corners repaired,endpapers renewed.Very good copy. 19th century engraved bookplate of Dr. Edmund Atkinson (1831-1901), professor of applied science at the Royal Military Academy, Sandhurst (Great Britain). $20,000

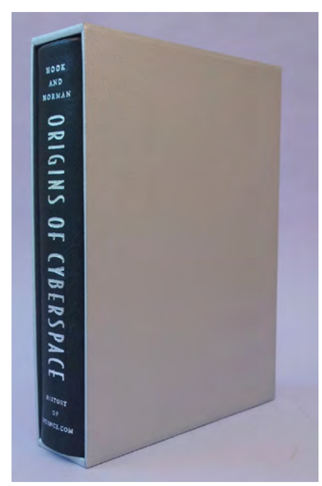
**First Edition.** On the basis of this short paper, written when he was only twenty-six, Helmholtz is ranked as one of the founders, along with James Joule and J. R. von Mayer, of the principle of conservation of energy. The paper sets forth the philosophical and physical basis of the energy conservation principle. Helmholtz maintained that the scientific world view was based on two abstractions, matter and force, and since the only possible relationship that can exist among the ultimate particles of matter is a spatial one, then ultimate forces must be moving forces radically directed.This can be inferred from the impossibility of producing work continually from nothing. Helmholtz analyzed different forms of energy and different types of force and motion, grouping them into two categories, active (kinetic) and tension (potential). He also gave mathematical expression to the energy of motion, providing an experimental measure for research on all forces, including those of muscle physiology and chemistry. Dibner, Heralds of Science, 159. Garrison-Morton.com 611. Horblit, *100 Books Famous in Science*, 48. Norman 1039. *Printing and the Mind of Man* 323. 43633





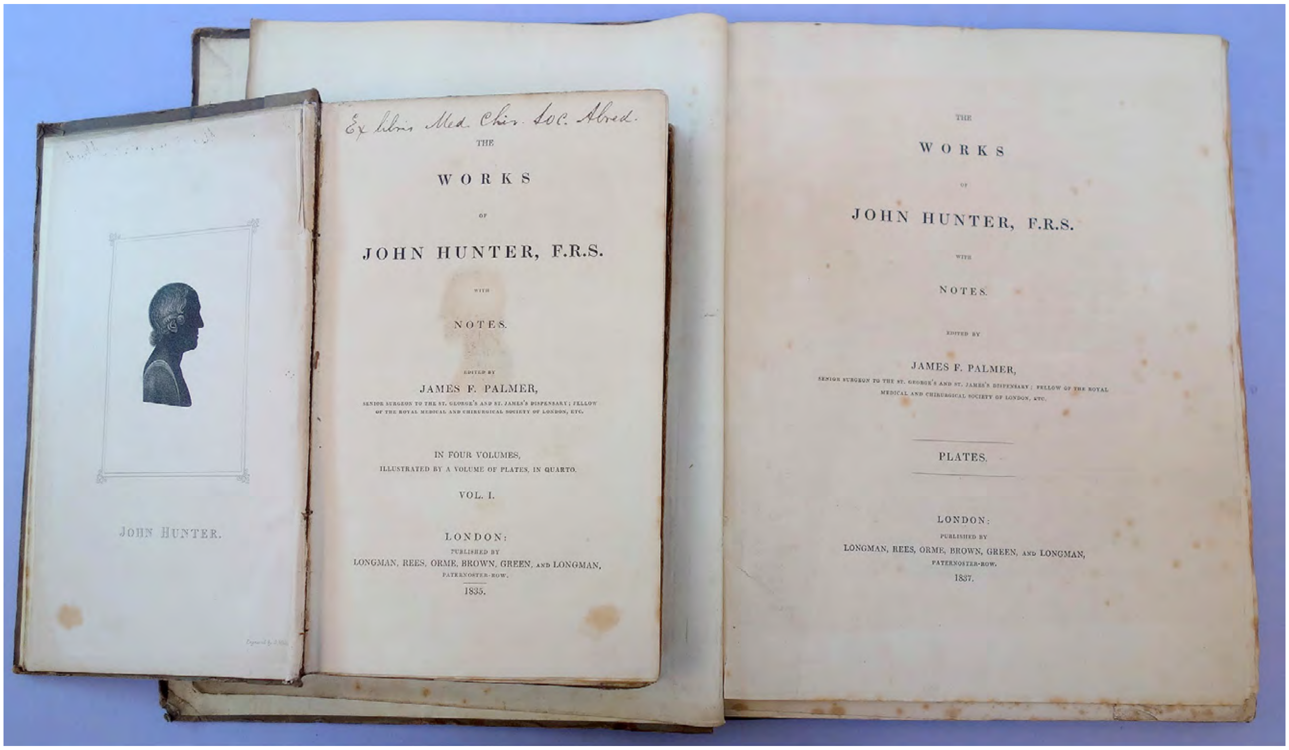

**30. Hook, Diana H. and Jeremy M. Norman.** Origins of cyberspace: A library on the history of computing, networking and telecommunications. With contributions by Michael R. Williams. x, 670pp. mostly printed in two columns. 8–1/2 x 11 inches. 284 illustrations. Printed in two colors throughout on Fortune Matte 80 pound acid-free paper. Bound in heavy cloth with silver stamping. ISBN 0-930405-85-4. Edition limited to 500 copies. Novato: Historyofscience.com, 2002. Also available in a deluxe numbered edition, bound in full leather, all edges gilt, in a cloth slipcase. $500 (regular)
$1500 (deluxe)


Since its publication in 2002, *Origins of Cyberspace* has become the standard bibliographical reference for classics in the history of computing, networking and telecommunications. It describes the Jeremy Norman library of technical reports, books, pamphlets, blueprints, typescripts, manuscripts, photographs, and ephemera on the history of computing and computer-related aspects of telecommunications, from the early seventeenth century to about 1969 and includes 1411 annotated entries.




"In my view the medal for bravery should be awarded to Hook and Norman for this first large-scale attempt at defining the important and most influential works on the history and development of computing by mechanical or electronic means . . . here we have a bibliography, that will, I predict, become the standard reference work" (Jolyon Hudson, in *Antiquarian Book Review* [Dec/Jan 2002]). 38301

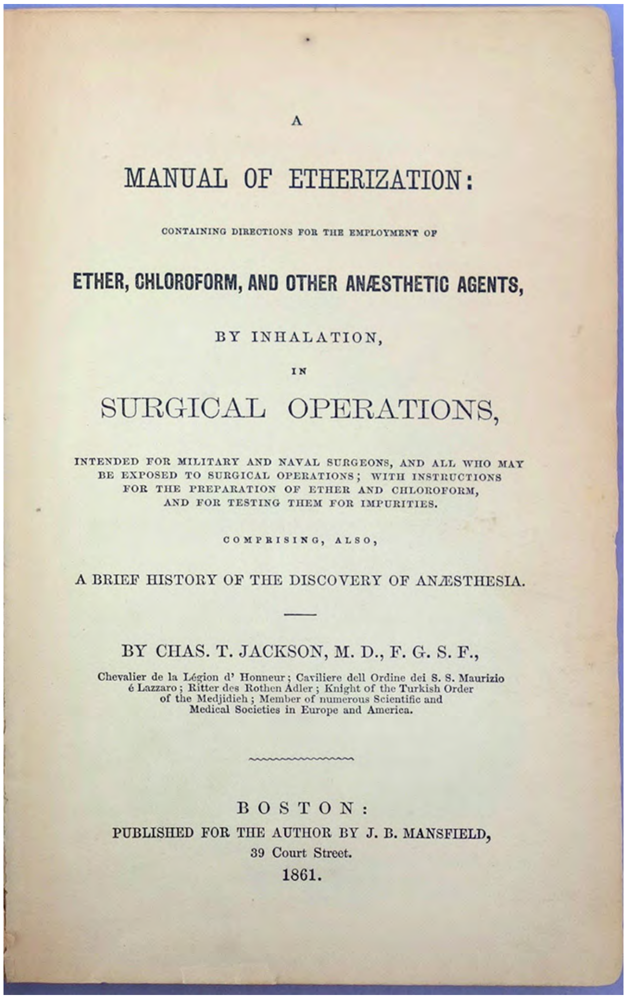
Besides the regular limited edition, we still have three copies in stock of the deluxe edition signed by the coauthors, the designer, and the binder, bound in full leather, all edges gilt, in a cloth slipcase. 38310




**31. Hunter, John** (1728-93). The works . . . with notes. Edited by James F. Palmer. 4 volumes plus atlas. Text: xxiv, 643; xvi, 488; xx, 638; xxi, xl, 506, 639-675 (index to first 3 vols.)pp. Frontispiece portrait and facsimile in Vol. I. Atlas: 27pp. plus engraved portrait and 61 plates numbered 1-26, 26*, 27-60. London: Longman . . . , 1835. 228 x 141 mm. (text); 296 x 231 mm. (atlas). Original boards, rebacked, new paper spine labels, light edgewear, inner front hinge of Vol. I cracking. Occasional foxing in text, a bit more foxing in atlas especially to the portrait of Hunter, Vol. I frontispiece starting, a few 19th century library markings inside front covers, but on the whole very good, with Vol. IV mostly unopened. "Ex libris Med. Chir. Soc. Abred." inscribed on title of Vol. I.

$2750


**First Collected Edition** of the complete works of John Hunter, including his four books (*The Teeth*; *Venereal Disease*; *Animal Oeconomy* and *The Blood, Inflammation and Gun-Shot Wounds*) and all of his published papers, illustrated "by the whole of the original engravings, to which several others have been added" (Vol. I, p. xi). Also included are a life of Hunter by Drewry Ottley and an index to the first three volumes (not present in all copies). Le Fanu, *John Hunter: A List of His Books,* p. 21. 43728


A

MANUAL OF ETHERIZATION:

CONTAINING DIRECTIONS FOR THE EMPLOYMENT OF

ETHER, CHLOROFORM, AND OTHER ANÆSTHETIC AGENTS,

BY INHALATION,

IN

SURGICAL OPERATIONS,

INTENDED FOR MILITARY AND NAVAL SURGEONS, AND ALL WHO MAY BE EXPOSED TO SURGICAL OPERATIONS; WITH INSTRUCTIONS FOR THE PREPARATION OF ETHER AND CHLOROFORM, AND FOR TESTING THEM FOR IMPURITIES.

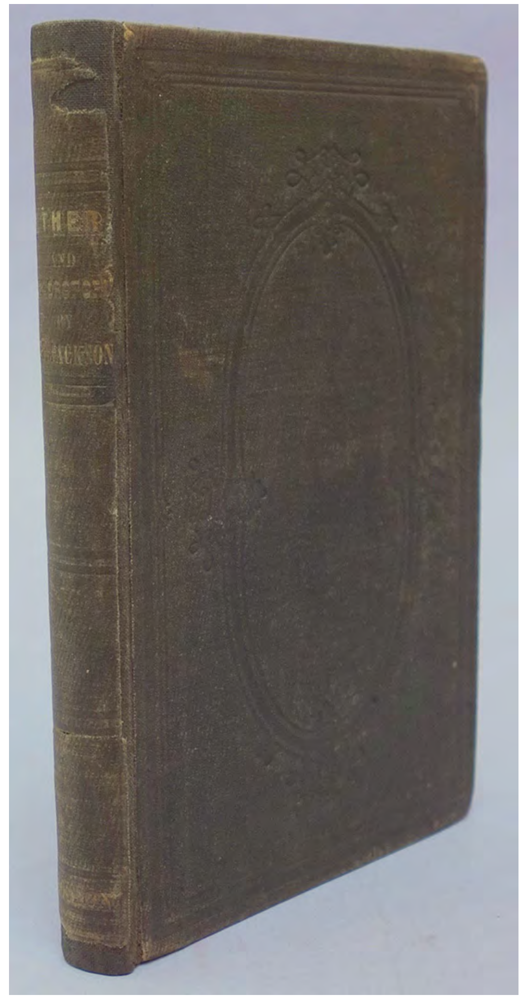
COMPRISING, ALSO,

A BRIEF HISTORY OF THE DISCOVERY OF ANÆSTHESIA.

BY CHAS. T. JACKSON, M. D., F. G. S. F.,

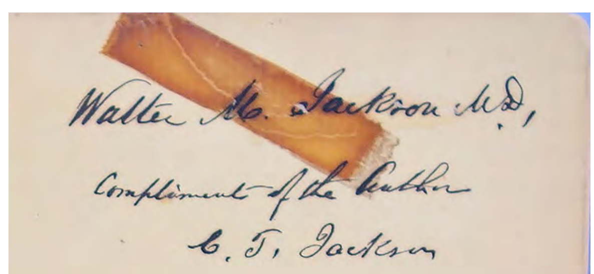
Chevalier de la Légion d' Honneur; Caviliere dell Ordine dei S. S. Maurizio é Lazzaro; Ritter des Rothen Adler; Knight of the Turkish Order of the Medjidieh; Member of numerous Scientific and Medical Societies in Europe and America.

BOSTON:
PUBLISHED FOR THE AUTHOR BY J. B. MANSFIELD,
39 Court Street.
1861.



**32. Jackson, Charles T.** (1805-80). A manual of etherization. . . . 12mo. 134, [4]pp. Text illustrations. Boston: For the author by J. B. Mansfield, 1861. 192 x 123 mm. Original cloth, rebacked retaining original spine. Title leaf detached, light toning, stain from clear tape on front free endpaper affecting author's inscription, but a good copy. *Author's Presentation Inscription* to Walter M. Jackson, M.D. on the front endpaper. $1250

**First Edition.** Jackson's only formal study of inhalation anesthesia, giving details on the use of chloroform, ether, etc., and with a history of the discovery of anesthesia, in which Jackson played so controversial a role (see Duncum, *Development of Inhalation Anesthesia*, chap. 3). The recipient of this copy may have been a relative. Fulton & Stanton V.3. Waller 5083. Osler 1440. 43721




*The Original Prototype of the World's First Stored Program Personal Computer*

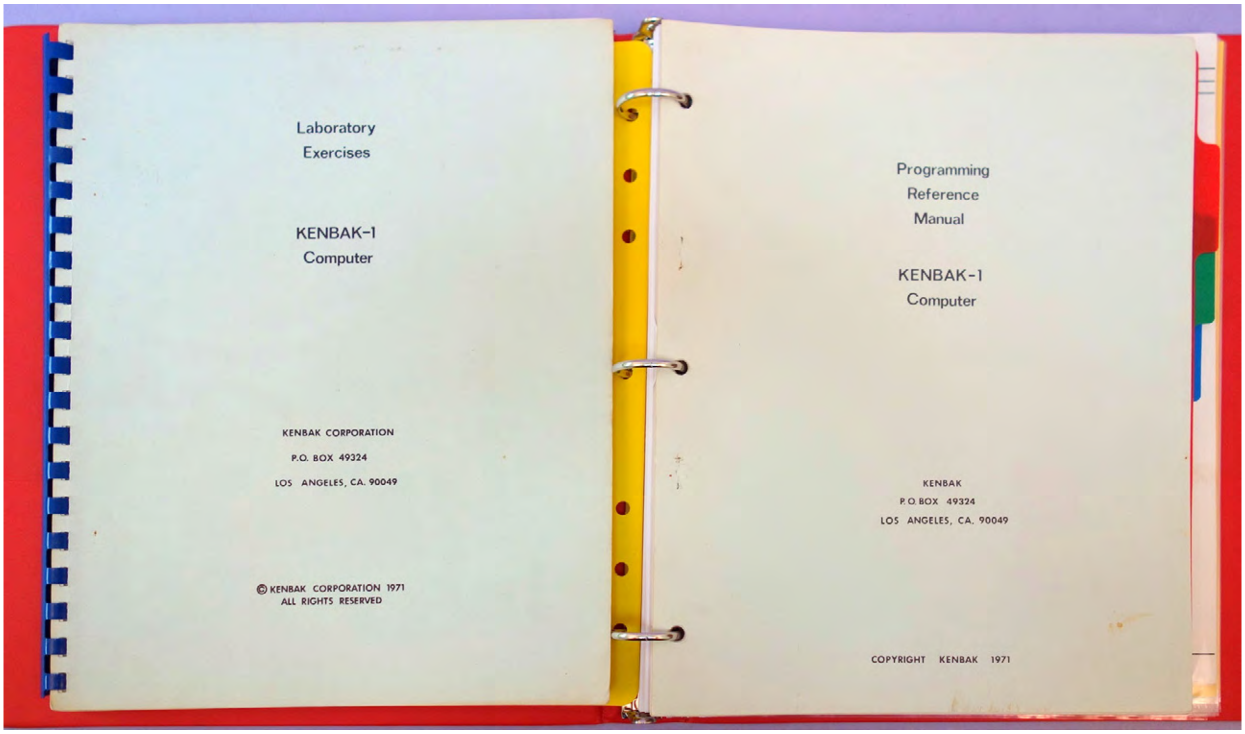
**33. KENBAK-1.** (1) Prototype Kenbak-1 computer built by its inventor, John Blankenbaker (b. 1929). Comprises motherboard with 132 integrated circuits, 2 power supplies, 2 MOS shift registers (1024 bits each) and cooling fan, in customized steel case with 3-prong power connector, the front panel with a toggle power switch, 12 incandescent lights, 15 pushbuttons and various lettering including the name "KENBAK-1." Approximately 490 x 292 x 110 mm. Preserved in a foam-padded protective instrument case. (2) Binder of documentation including *Programming Reference Manual KENBAK-1 Computer* (Los Angeles: KENBAK, 1971; iii, 24pp.); "Installation & maintenance" (photocopy; 8pp.); "Theory of operation" (photocopy; 9-42, 26pp.); original coding sheets, mimeographed purchase guides, reviews, stationery, etc. (3) Laboratory exercises KENBAK-1 computer. Variously paginated. Los Angeles: KENBAK, 1971. Original wrappers, spiral-bound. (4) Advertisement for the KENBAK-1 computer. In *Scientific American* 224, no. 3 (September 1971): 194. Whole number, in original printed wrappers. $65,000


The prototype of the KENBAK-1, the world's first commercially available stored-program personal computer, so deemed in 1987 by a panel of judges, including Apple co-founder Steve Wozniak, at the Computer Museum in Boston.

The stored program concept, in which both program and data are processed in an electronic memory, was the key concept in the design of the electronic computer as theorized by John von Neumann in the so-called von Neumann architecture. Because the Kenbak-1 was the first personal computer to apply this key concept in its design, it is an especially important landmark in the history of computing.

Only about 40 or 50 of these machines were ever built; of which perhaps ten remain extant. The KENBAK-1, invented by computer engineer John Blankenbaker, went on sale in 1971, five years before the Apple 1. This prototype model of the KENBAK-1 is the very one used in the first demonstration of a commercial personal computer, which took place in May 1971 at an Anaheim, California convention of high school mathematics teachers. This unit was still operational in July 2015.

> [The KENBAK-1] was created in 1971 by John Blankenbaker, working in his garage in Los Angeles. Initial sales commenced in September of 1971. It was intended to be educational and the professionals in the field were



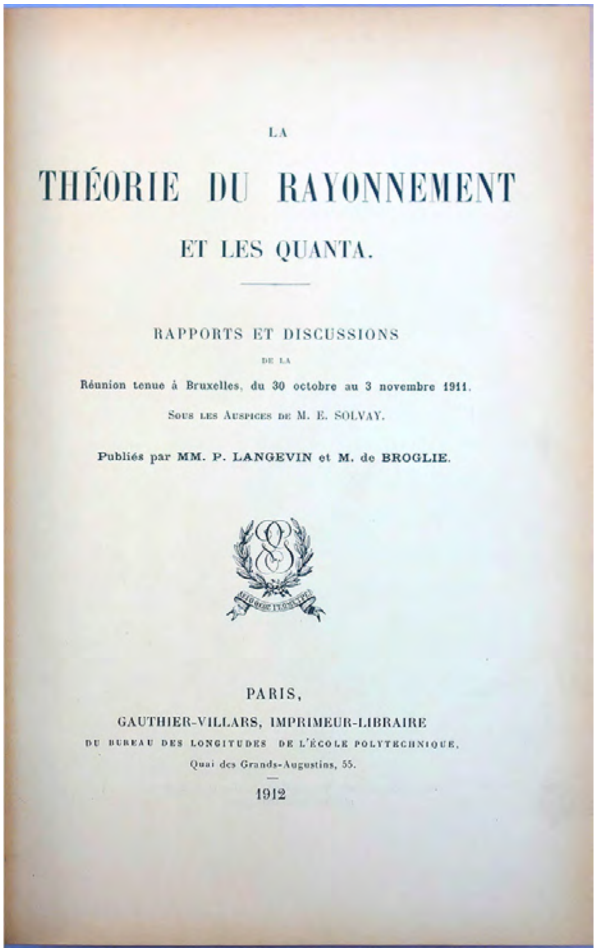

enthusiastic but it was a struggle to convince the non-professionals that they could buy a real computer at this price ($750), thus only some 40 devices were sold, mainly to schools.

The creator of Kenbak-1—John Blankenbaker, had a long experience in the field of computers. He started the design of a computing device as early as in the winter of 1949, when he was a 19 y.o. physics freshman at Oregon State College, inspirited by an article in a magazine. After graduation from the college in 1952, he worked at Hughes Aircraft Co. in the department for digital computers, designing the arithmetic unit for a business data processor. Some time in the late 1950s he began to think there could be simple computers which could be afforded by individuals.

As late as in the fall of 1970 he found himself unemployed and decided to investigate what might be done to make a computer for personal use. He wanted the computer to be low cost, educational, and able to give the user satisfaction with simple programs. The computer could be serial and slow which would reduce the cost yet create the environment that was desired. It should demonstrate as many programming concepts as was possible. Because of the small size, the native language of the unit would be the machine language. Above all, it had to be a stored program machine in the von Neumann sense. To keep the costs low, switches and lights were the input and output of the machine. (Some thought was given to punched card input, but it was never developed.)

By the spring of 1971, the logic printed circuit board had been built and the computer was assembled. Designed before microprocessors were available, the logic consisted of small and medium scale integrated circuits, mounted on one printed circuit board. MOS shift registers implemented the serial memory. Switches in the front keyed the input and lights displayed the output. The memory was two MOS shift registers, each of 1024 bits. The computer executed several hundred instructions per second (Dalakov).

As noted above, Blankenbaker demonstrated the KENBAK-1 in May 1971 using this prototype. In September 1971 the first advertisement for the machine appeared in the Scientific American, promising potential customers that "very quickly you, or your family or students, can write programs of fun and interest." Blankenbaker intended the computer to be used for educational purposes and so did not make any special effort to market it to hobbyists, an omission he later regretted. Between 40 and 50 commercial units, differing slightly from the prototype, were manufactured and sold between 1971 and 1973, when the company folded. According to Wikipedia, about 10 KENBAK-1 units are now known to exist worldwide. Dalakov, Georgi. "The KENBAK-1 of John Blankenbaker." History of Computers, Computing and Internet. N.p., n.d. Web. Accessed 06 Nov. 2015. Wilson, Bill. "The Man Who Made 'the World's First Personal Computer.'" BBC News. N.p., 6 Nov. 2015. Web. Accessed 09 Nov. 2015. 43693


LA

THÉORIE DU RAYONNEMENT

ET LES QUANTA.

RAPPORTS ET DISCUSSIONS

DE LA

Réunion tenue à Bruxelles, du 30 octobre au 3 novembre 1911.

Sous les Auspices de M. E. SOLVAY.

Publiés par MM. P. LANGEVIN et M. de BROGLIE.

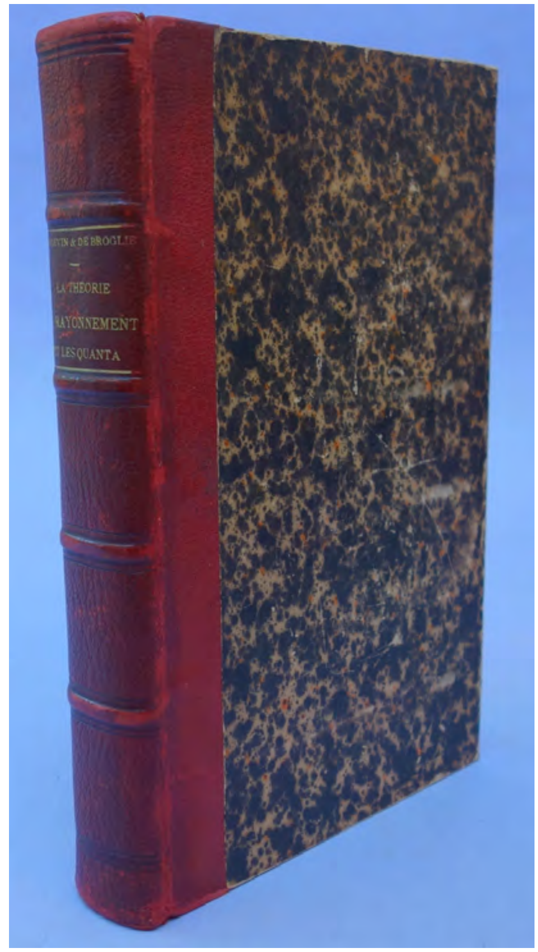
PARIS,

GAUTHIER-VILLARS, IMPRIMEUR-LIBRAIRE

DU BUREAU DES LONGITUDES DE L'ÉCOLE POLYTECHNIQUE,

Quai des Grands-Augustins, 55.

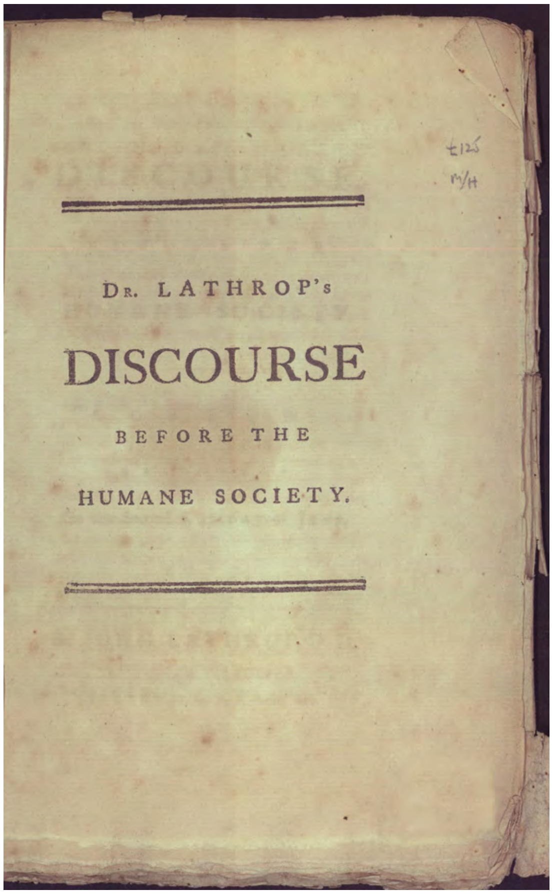
1912

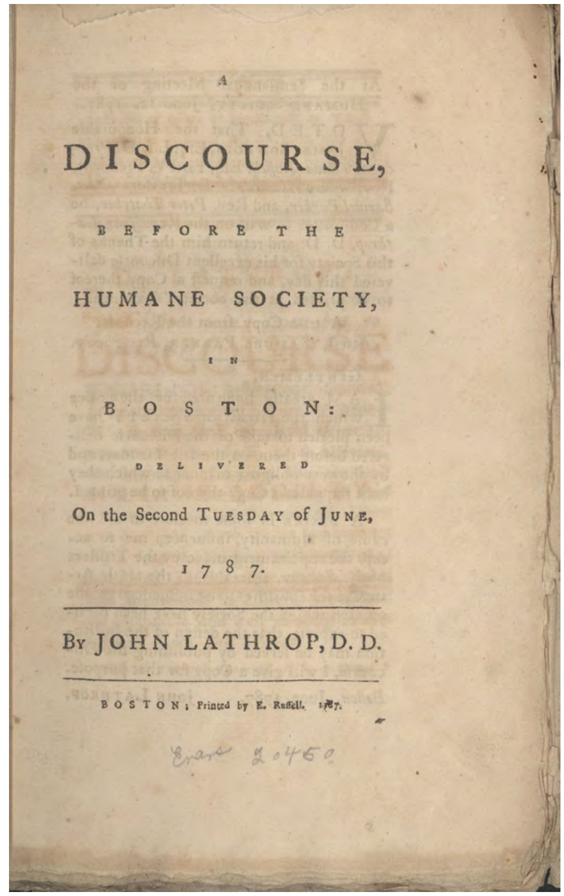



## *The First Solvay Conference*

**34. Langevin, Paul** (1872-1946) & **Maurice de Broglie** (1875-1960), *editors.* La théories du rayonnement et les quanta. Rapports et discussions. . . . 8vo. [8], 461, [3]pp. Paris: Gauthier-Villars, 1912. 240 x 152 mm. Quarter morocco ca. 1912, light wear and rubbing, inner front hinge cracked. Light toning but very good. Signature on flyleaf dated 1917 of American chemist Earl Frederick Farnau, Associate Professor of Chemistry at the University of Cincinnati. $750

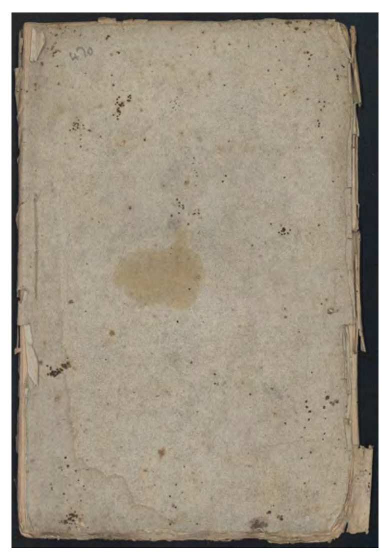
**First Edition** of the proceedings of the first international Solvay Conference on physics, devoted to radiation theory and the quanta. The purpose of the conference was twofold: "First, there was the need to examine whether classical theories (molecular-kinetic theory and electrodynamics) could, in some undiscovered ways, provide an explanation of the problem of black-body radiation and of the specific heat of polyatomic substances at low temperatures; secondly, to consider phenomena in which the theory of quanta could be successfully used" (Mehra, *The Solvay Conferences on Physics*, p. 14; see also pp. 13-72, containing summaries of all the papers delivered). Among the participants were Max Planck, who gave an exposition of the arguments that had led him to the discovery of the quantum of action; Heike Kamerlingh Onnes, who reported on the discovery of superconductivity of certain metals at extremely low temperatures; Arnold Sommerfeld, who discussed the production of x-rays by high speed electrons; and Albert Einstein, who summarized many aspects of the quantum concept, particularly in regard to his explanation of the anomalies of specific heats at low temperatures. 43738



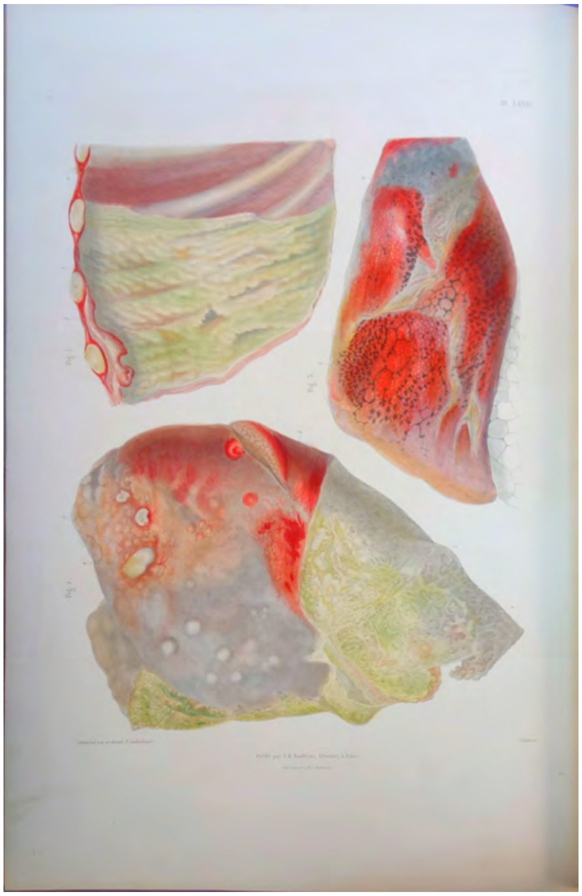

## *The First American Publication on Resuscitation*

**35. Lathrop, John** (1740-1816). A discourse before the Humane Society, . . . delivered on the second Tuesday of June, 1787. 8vo. 34, xiii [1]pp. Boston: E. Russell, 1787. 228 x 149 mm. (uncut). Original plain wrappers, portions of spine lacking, light soiling and spotting. Edges frayed, light overall toning, but a very good to fine copy with the scarce half-title. $1250



**First Edition** of the **First Separate Work on Resuscitation** published in the United States. OCLC does not list any earlier publications of the Humane Society of the Commonwealth of Massachusetts (founded 1785), the first society formed in this country for resuscitating victims of drowning and other accidents such as suffocation, strangulation and lighting strikes. The reports of this society provide the earliest documentation of the history of resuscitation in this country. Lathrop was one of the original trustees of the Humane Society; his name appears on p. ii and p. xi of the Appendix.

The Massachusetts society was one of many resuscitation organizations inspired by Amsterdam's pioneering Maatschappi tot Redding van Drenkelingen (founded 1767), the first organization devoted to the resuscitation of persons apparently dead from drowning and other accidental causes. The Massachusetts society was modeled directly after England's Royal Humane Society (est. 1774). A list of "Methods of Treatment to be used with Persons apparently dead from drowning, &c." appears on p. iv; these methods included warming the body, rubbing the skin with flannel and sprinkling it with spirits, blowing tobacco smoke up the rectum and gently moving the limbs. Austin, *Early American Medical Imprints 1668-1820*, 1125. 43732

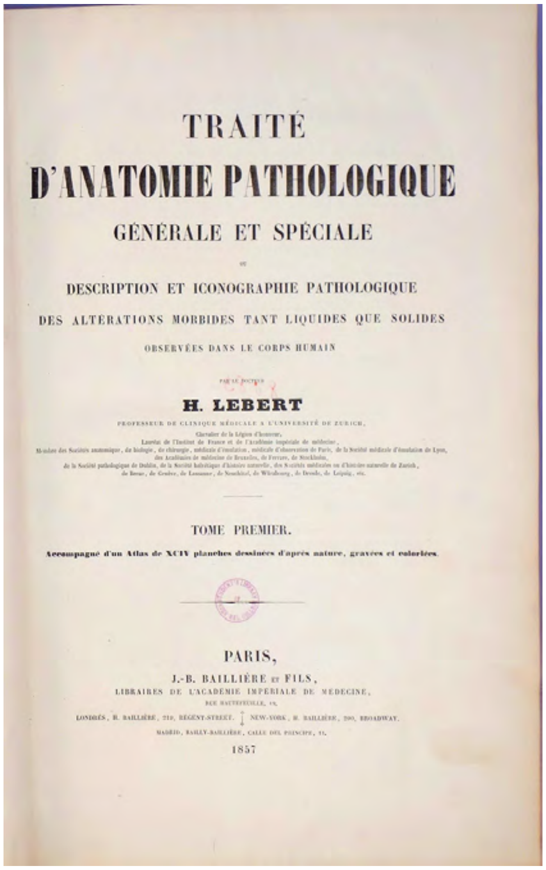


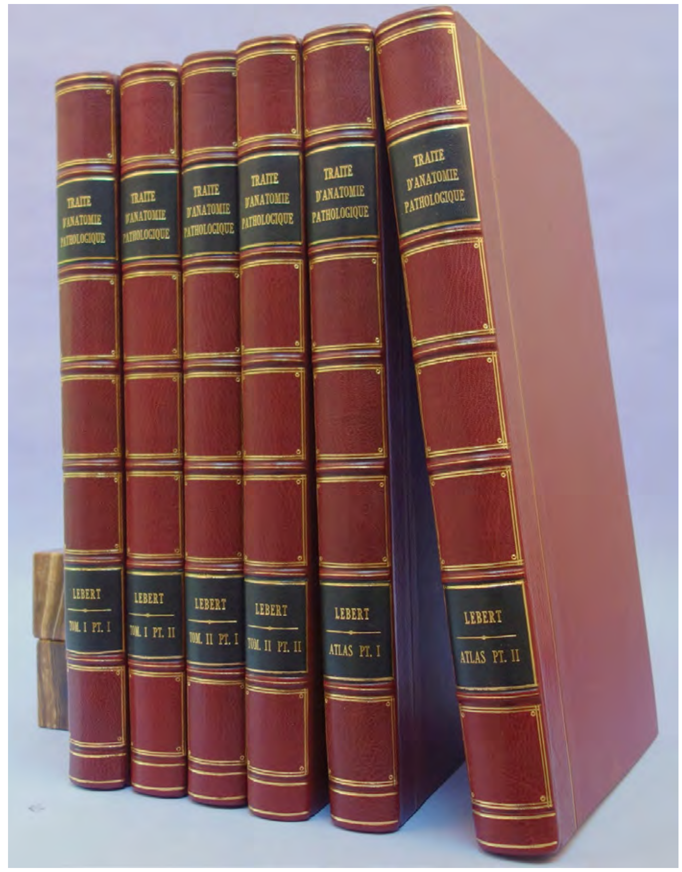
## *Magnificent Atlas of Pathology*

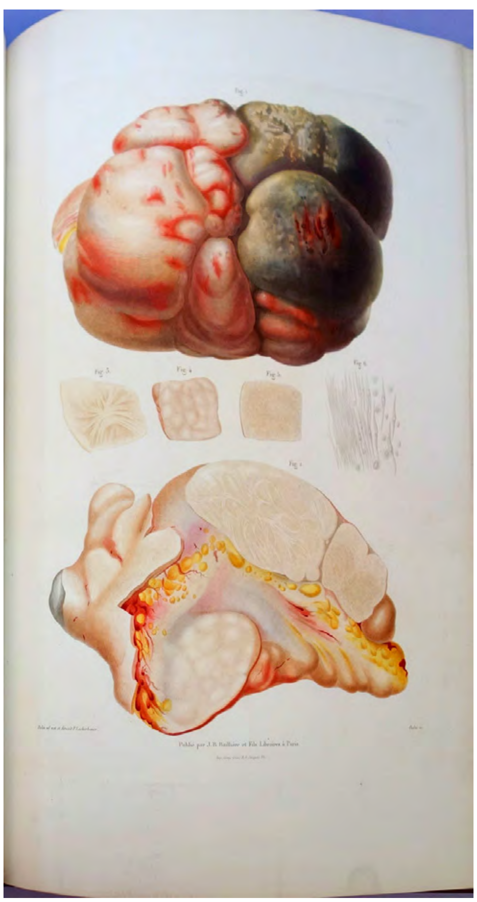
**36. Lebert, H[ermann]** (1813-78). Traité d'anatomie pathologique générale et spéciale. 3 vols. in 6, folio. Text: [4], ii, 760; [6], 733pp. Atlas: [2], 46pp., 94 mostly hand-colored copperplates numbered 1-94; [2], 44pp., 106 mostly hand-colored copperplates numbered 95-200. All plates drawn from nature by P. Lackerbauer and engraved by various artists. Paris: Baillière, 1857-61. 463 x 302 mm. Quarter morocco gilt, cloth boards in period style. Occasional minor finger-soiling to plates, one or two tiny marginal tears repaired, small round library stamp on versos of plates and on first leaves of volumes (together with a few other library markings), but overall a fine, clean set. The small library stamps never show through to the plate surfaces. $15,000

**Only Edition** of one of the greatest and most magnificent of all pathological atlases, and Lebert's greatest work. Lebert was among the first to use the microscope in pathological anatomy, thus paving the way for the development of cellular pathology, and his atlas includes several beautiful illustrations of microscopic structures in the human body. Lebert's atlas can be compared with the masterpiece of Cruveilhier (1829-42) in format and in the beauty and accuracy of its illustrations. However, while Cruveilhier covered only special pathology, Lebert set about to cover both general and special pathology, which may explain why Lebert's text is roughly twice the length of Cruveilhier's. Furthermore, Lebert's work was printed on paper of the highest quality, and copies such as the one we are offering remain in the finest clean and unfoxed condition, unlike copies of Cruveilhier's atlas which are frequently found with considerable foxing and/or browning. Lebert was also able to have his illustrations reproduced as superb copperplate engravings, nearly all of which are beautifully hand-colored; they are among the finest illustrations of macro- and micropathology ever published.

Lebert's *Traité d'anatomie pathologique* was originally published in fascicles between 1857 and 1861, each fascicle containing 30-40 pages of text and five plates. A prospectus for the work, issued when 28 of the fascicles had

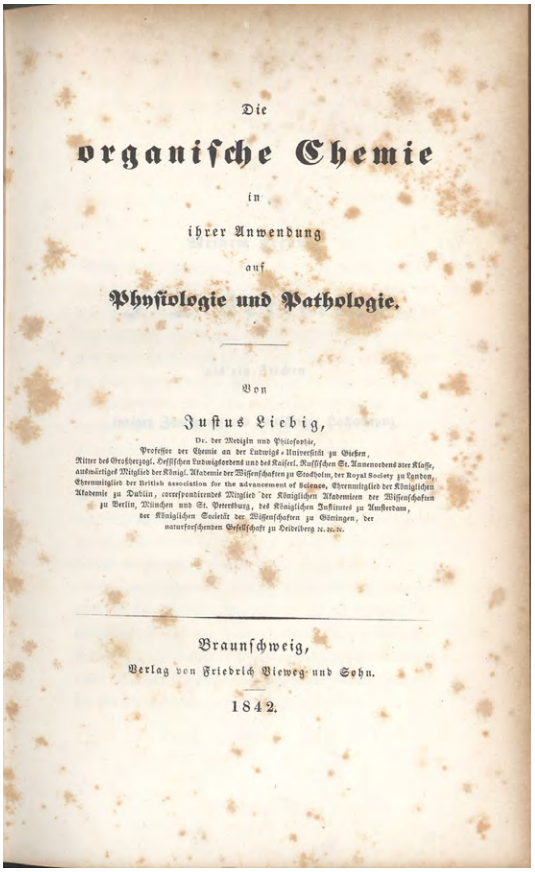

TRAITÉ
D'ANATOMIE PATHOLOGIQUE
GÉNÉRALE ET SPÉCIALE
OU
DESCRIPTION ET ICONOGRAPHIE PATHOLOGIQUE
DES ALTÉRATIONS MORBIDES TANT LIQUIDES QUE SOLIDES
OBSERVÉES DANS LE CORPS HUMAIN
PAR LE DOCTEUR
H. LEBERT
PROFESSEUR DE CLINIQUE MÉDICALE A L'UNIVERSITÉ DE ZURICH,
TOME PREMIER.
Accompagné d'un Atlas de XCIV planches dessinées d'après nature, gravées et coloriées.
PARIS,
J.-B. BAILLIÈRE ET FILS,
LIBRAIRES DE L'ACADÉMIE IMPÉRIALE DE MÉDECINE,
LONDRES, H. BAILLIÈRE, 219, REGENT-STREET. NEW-YORK, H. BAILLIÈRE, 290, BROADWAY.
MADRID, BAILLY-BAILLIÈRE, CALLE DEL PRINCIPE, 11.
1857

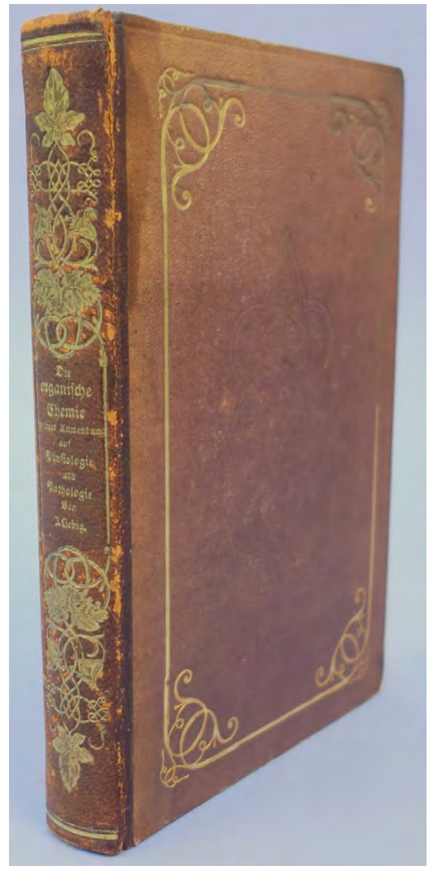


been published, states that the price of each fascicle was 15 francs and that the parts were issued every six weeks. Our copy includes both the first and second subscription lists, bound in Vols. I and II respectively. Most copies of this work are bound in either three or four volumes; ours is bound in six volumes, with the two text volumes divided into four.

Lebert, a native of Breslau (now Wroclaw, Poland), studied medicine and natural science in Berlin, Zurich, and in Paris, where his primary teachers were Guillaume Dupuytren and Pierre-Charles-Alexandre Louis. Much of his career was spent in Switzerland, at first in the town of Bex (canton of Vaud), and later in Zurich, where he held the post of professor of clinical medicine from 1853 to 1859. In 1859 Lebert was invited to succeed Friedrich Theodor Frerichs as professor of clinical medicine and director of the hospital at Breslau. In 1879 he returned to Bex where he spent the remainder of his life. Lebert was a noted 19th-century cancer researcher (see Wolff, *Science of Cancerous Disease,* numerous refs.), and one of the first to publish an atlas of pathological anatomy based on the cell theory (*Physiologie pathologique* [1845]; see Garrison-Morton.com 543.1). Garrison-Morton.com 2297.1. Goldschmid, *Entwicklung und Bibliographie der pathologisch-anatomischen Abbildung* (1925) 198-200, pl. 40-41, providing the only extensive description and modern reproduction of Lebert's work, and commenting that Lebert's illustrations of macro- and micropathology are equally excellent. Reynolds 2413. Not in Waller or Cushing. Not in Choulant/Frank. 43695



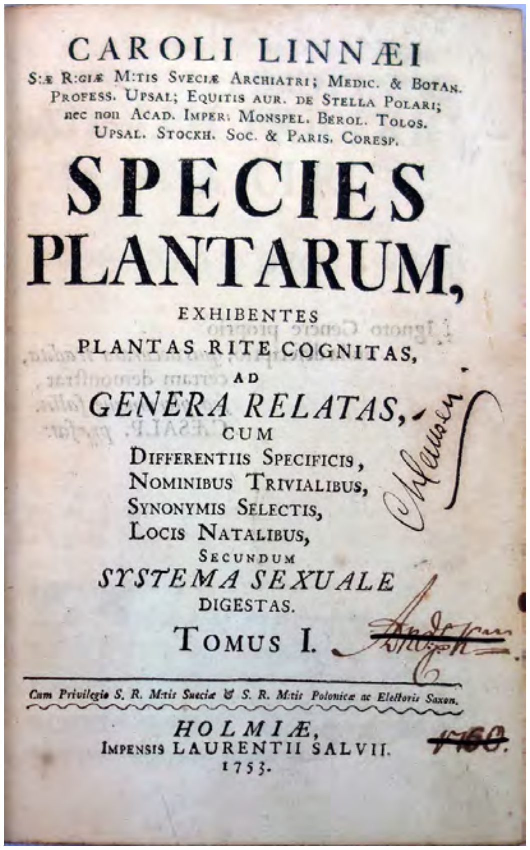
**37. Liebig, Justus von** (1803-73). Die organische Chemie in ihrer Anwendung auf Physiologie und Pathologie. xvi, [2], 342, [2, including errata]pp. Braunschweig: F.Vieweg, 1842. 215 x 136 mm. Half morocco gilt ca. 1842, gilt cloth boards, all edges gilt, light wear, back cover a bit faded. Foxing, heavy at times, errata corrected in ink, but a good copy. Ownership signature (illegible) on front free endpaper.

$850

**First Edition.** Liebig published the present work two years after his groundbreaking Die organische Chemie in ihrer Anwendung auf Agricultur und Physiologie (1840); these two treatises, on plant and animal chemistry respectively, mark the foundation of organic chemistry. "Indeed, modern views on the molecular structure and chemical constitution of organic compounds lead straight back to the 'twin constellation' represented by Liebig's two volumes" (*Printing and the Mind of Man*).

In the above work Liebig discussed the chemical processes of animal respiration and nutrition, introducing the modern concept of metabolism. Based upon his understanding of chemical reactions, Liebig supported Lavoisier's theory of animal heat, which stated that it was solely the product of the oxidation of ingested hydrogen and carbon to carbon dioxide and water. He also classified the organic foodstuffs according to function into proteins, carbohydrates and fats, and attempted to deduce the actual chemical transformations that these undergo within the body. Although marred by some speculative excesses, Liebig's work inspired even its detractors "to view the chemical phenomena of life differently than they had before, for Liebig had provided one of the first comprehensive pictures of the overall meaning of the ceaseless chemical exchanges which form an integral part of the vital processes . . . As with his agricultural chemistry, Liebig's physiological writings provided an impetus which outlasted the refutation of some of his specific theories" (*Dictionary of Scientific Biography*). Garrison-Morton.com 677. Norman 1351. *Printing and the Mind of Man* 310b. 43718

## *Introduction of Binomial Nomenclature*



CAROLI LINNÆI
S:Æ R:GIÆ M:TIS SVECIÆ ARCHIATRI; MEDIC. & BOTAN. PROFESS. UPSAL; EQUITIS AUR. DE STELLA POLARI; nec non ACAD. IMPER: MONSPEL. BEROL. TOLOS. UPSAL. STOCKH. SOC. & PARIS. CORESP.

SPECIES PLANTARUM,

EXHIBENTES PLANTAS RITE COGNITAS, AD GENERA RELATAS, CUM DIFFERENTIIS SPECIFICIS, NOMINIBUS TRIVIALIBUS, SYNONYMIS SELECTIS, LOCIS NATALIBUS, SECUNDUM SYSTEMA SEXUALE DIGESTAS.

TOMUS I.

Cum Privilegio S. R. M:tis Sueciæ & S. R. M:tis Polonicæ ac Electoris Saxon.

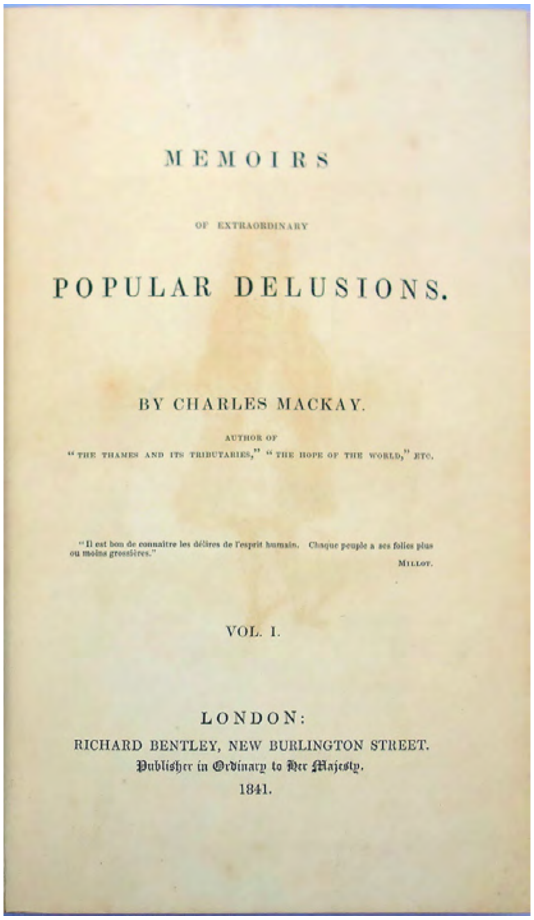
HOLMIÆ, IMPENSIS LAURENTII SALVII. 1753.


**38. Linnaeus, Carl** (1707-1778). Species plantarum . . . 2 vols., 8vo. [12], 560; [2], 561-1200, [32]pp. Leaves E6, F5 and R2 cancels. Stockholm: Laurentius Salvius, 1753. 194 x 120 mm. Quarter calf elaborately gilt, paste paper boards, vellum corners, in antique style. Light toning and foxing, a few ink spots, but a very good copy. Former owners' signatures (one dated 1760) on titles. Bookseller's label inside front cover of Vol. I. $7750

**First Edition**, second state, with the cancel leaves as listed above (copies without the cancel leaves are so rare as to be almost unobtainable). "The most important single work in the world's botanical literature" (Hunt), and the first full-dress appearance of Linnaeus's binomial system of nomenclature, his most important contribution to general biology.

Linnaeus was the first to work with species as a clearly defined concept, and to come up with a system of identification based on genus and species together. He briefly applied the system in his 1749 dissertation on plants eaten by animals before using it fully in his *Species plantarum,* the work he valued above all his others. Linnaeus's binomial system led to pictorial exactitude in description, and an enriched view of the genus as seen through the precisely articulated differences among its species. The thousands of binomial names Linnaeus coined for the *Species plantarum* are ultimately the best key to his intentions as a botanist, for the combined genus and species nomenclature, with its phrase-names describing the differences between species, reveals exactly how he saw plants. To him, a plant's scientific name expressed "a primary characteristic by means of which I can distinguish this species from all others of the same genus speedily, safely and pleasantly" (quoted in Hunt, vol. 2, p. lxx).

Because Linnaeus's printer used worn types and ordinary paper, some fading-out of print and browning or foxing can be expected in all copies. Corrections were made to a few leaves and cancels inserted shortly after publication began, so that most copies reflect this as well. *The Hunt Botanical Catalogue,* Vol. 2, part 2, no. 548. Soulsby, *Catalogue of the Works of Linnaeus,* 480a. 43659


MEMOIRS

OF EXTRAORDINARY

POPULAR DELUSIONS.

BY CHARLES MACKAY.

AUTHOR OF

"THE THAMES AND ITS TRIBUTARIES," "THE HOPE OF THE WORLD," ETC.

"Il est bon de connaître les délires de l'esprit humain. Chaque peuple a ses folies plus ou moins grossières."

MILLOT.

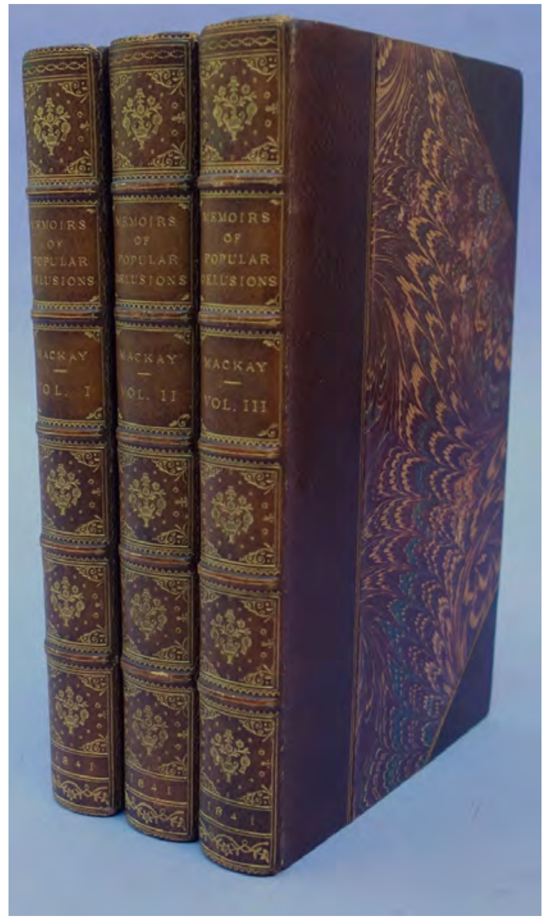
VOL. I.

LONDON:

RICHARD BENTLEY, NEW BURLINGTON STREET.

Publisher in Ordinary to Her Majesty.

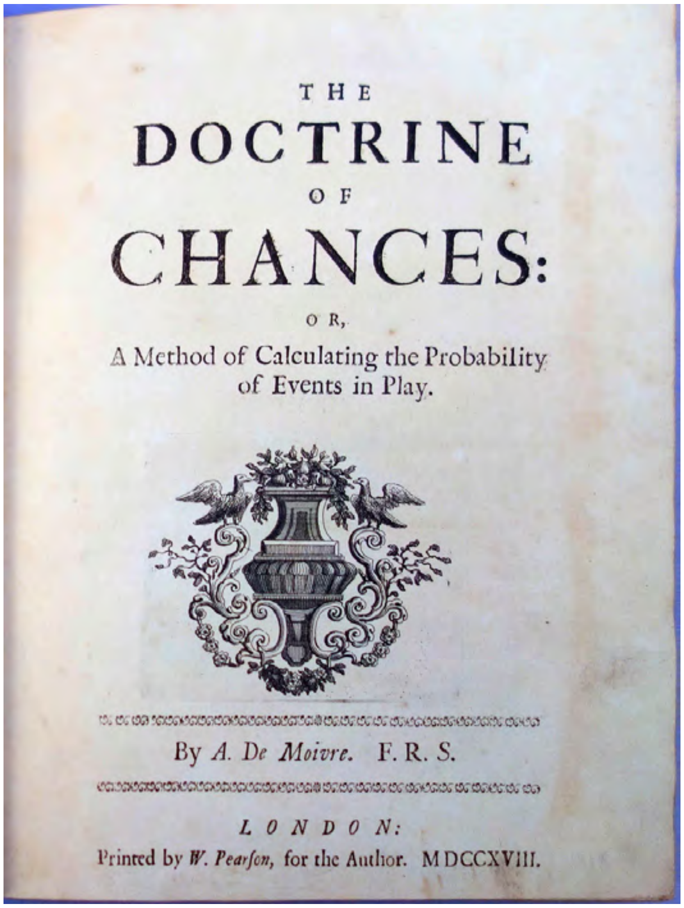
1841.

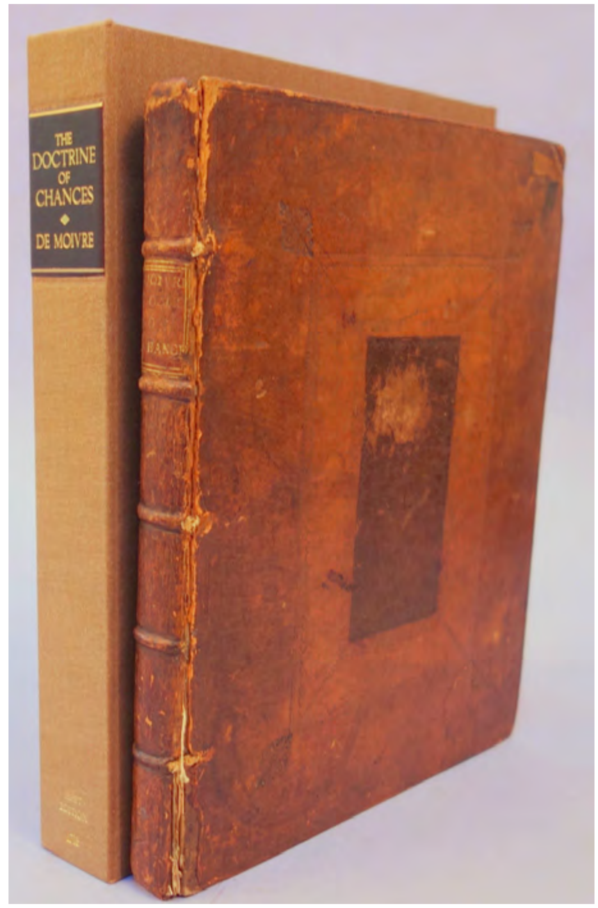



## *Classic Work on Crowd Psychology*

**39. Mackay, Charles** (1814-89). Memoirs of extraordinary popular delusions. 3 vols. [iii]-iv, [2], 400; [6], 506; [6] 404pp. 5 plates, including frontispieces to all volumes. London: Richard Bentley, 1841. 222 x 137 mm. Late $19^{th}$ century half morocco gilt, marbled boards, all edges gilt, spines a bit faded, hinges a little tender. Minor occasional foxing but very good set, without the half-title in vol. 1. $10,000

**First Edition** of this classic work on crowd psychology by the Scottish journalist Charles Mackay, still in print today under the title *Extraordinary Popular Delusions and the Madness of Crowds*. Among the "popular delusions" covered are three early instances of what we now call economic bubbles: The South Sea Company bubble of 1711-20, the Mississippi Company bubble of 1719-20, and the Dutch tulip mania of the early seventeenth century. Present-day financial writers such as Michael Lewis and Andrew Tobias have praised Mackay's accounts of these economic disasters, and Lewis included Mackay's financial mania chapters in his *The Real Price of Everything: Rediscovering the Six Classics of Economics* (2008). Other delusions debunked by Mackay include alchemy, fortune-telling, animal magnetism, prophecies, religious relics, the Crusades and witch hunting. 43755

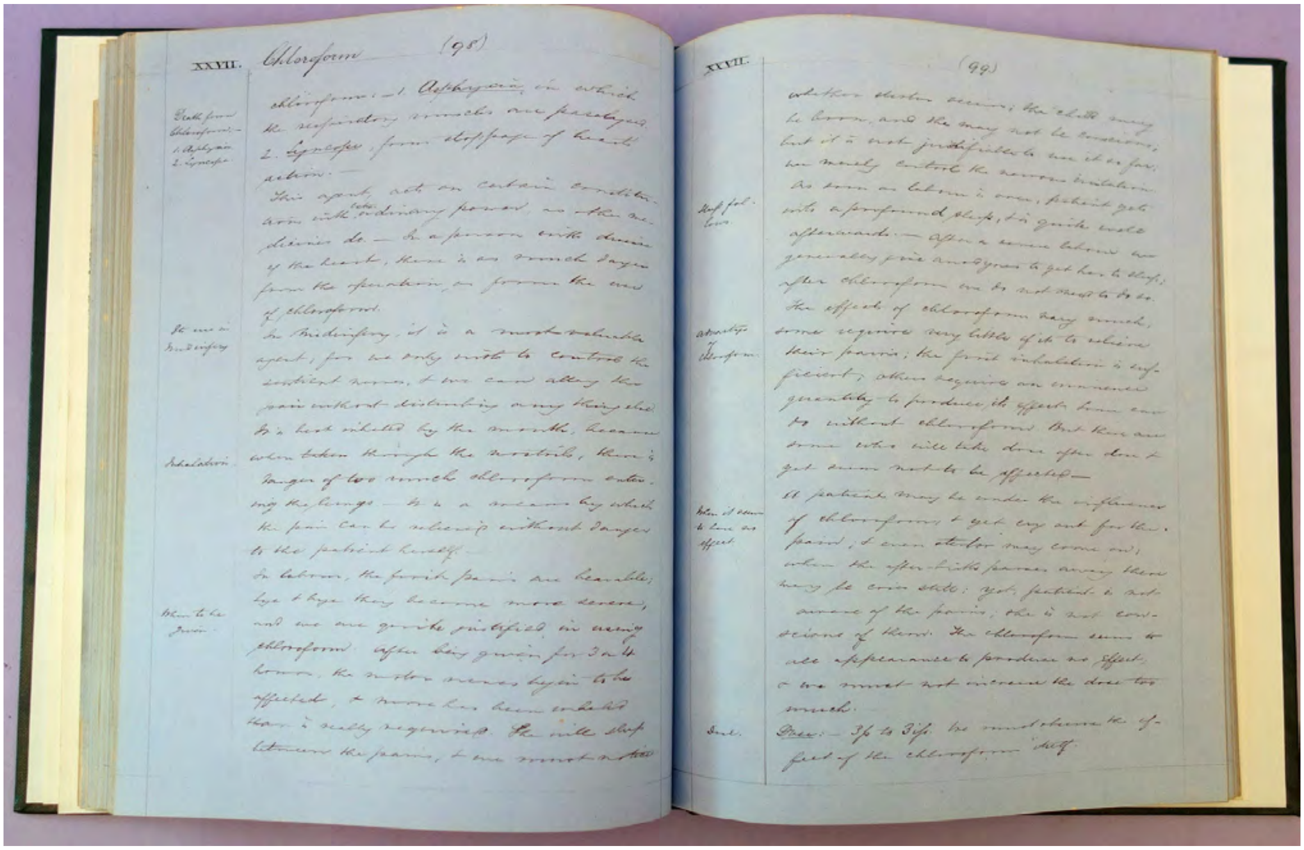




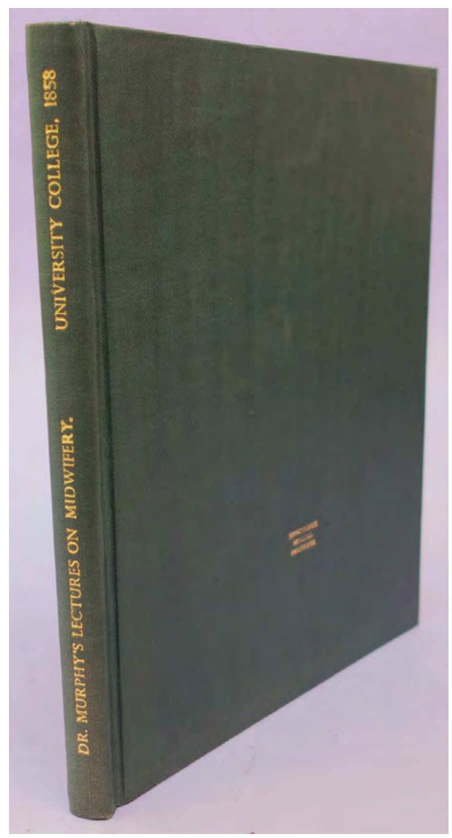

## *Moivre's First Book on Probability*

**40. Moivre, Abraham de** (1667-1754). The doctrine of chances: Or, a method of calculating the probability of events in play. 4to. [4], xiv, 175pp. London: W. Pearson for the author, 1718. 251 x 200 mm. Paneled calf ca. 1718, front hinge cracked and tender but holding, some wear at extremities and corners; boxed. Very good, clean unrestored copy with only occasional soiling. Engraved armorial bookplate of Charles Meynell on front pastedown. $9500

**First Edition** of Moivre's first book on probability, essentially a gambler's manual, "giving a systematic presentation of the arithmetic principles upon which are based the solution of problems concerning the advantage of players and the size of wager which may be laid in a wide variety of games of chance" (Walker, p. 12). Norman 1529. Stigler, *The History of Statistics*, pp. 70-88. Walker, *Studies in the History of Statistical Method*, pp, 12-13. 43749

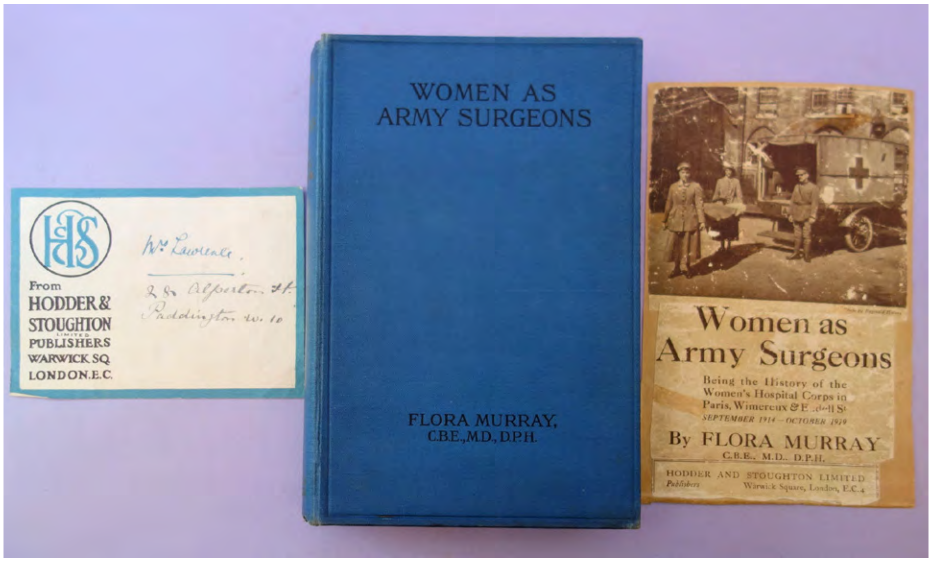


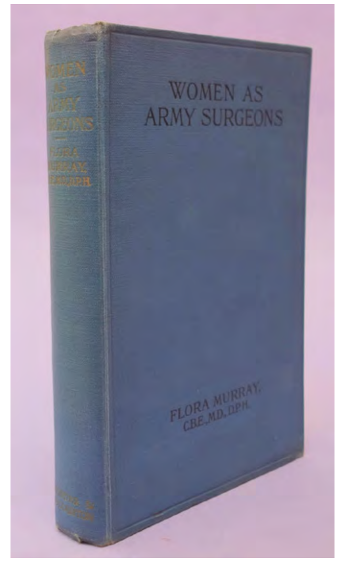
**41. Murphy, Edward William** (1802-87). Notes of lectures on midwifery by Dr. Murphy. Session 1858. Manuscript notebook written by Thomas F[ould] H. Green. Title-leaf, contents and 158 numbered pages. London, 1858. 253 x 206 mm. 20th-century library buckram. Very good. Bookplate and stamp of the Birmingham Medical Institute. $1500



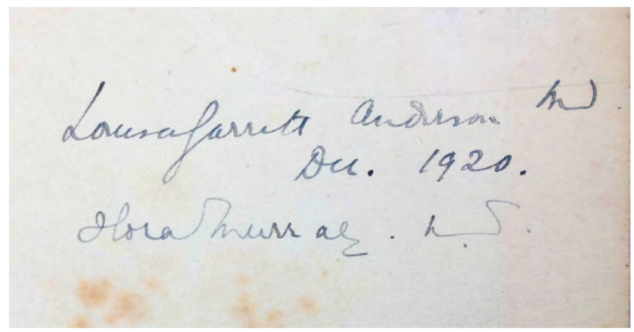

Murphy was professor of midwifery at University College, London, and the author of several works on obstetrics, including *Lectures on Natural and Difficult Parturition* (1845), *Chloroform in the Practice of Midwifery* (1848) and *Chloroform: Its Properties and Safety in Childbirth* (1855). He was an early adopter of the use of chloroform anesthesia in childbirth.

These notes of Murphy's 1858 lectures cover pregnancy, labor and birth, lactation, the diseases of pregnancy, spontaneous abortion and miscarriage, deformed pelvis, hemorrhage, ruptured or prolapsed uterus, etc. Pages 93 – 100 contain a discussion of chloroform anesthesia. The notes were written by Thomas F. H. Green, a medical student at University College who won certificates of honor in anatomy and pathological anatomy in 1858 (see the *Medical Times and Gazette* for August 7, 1858, page 152). 42783



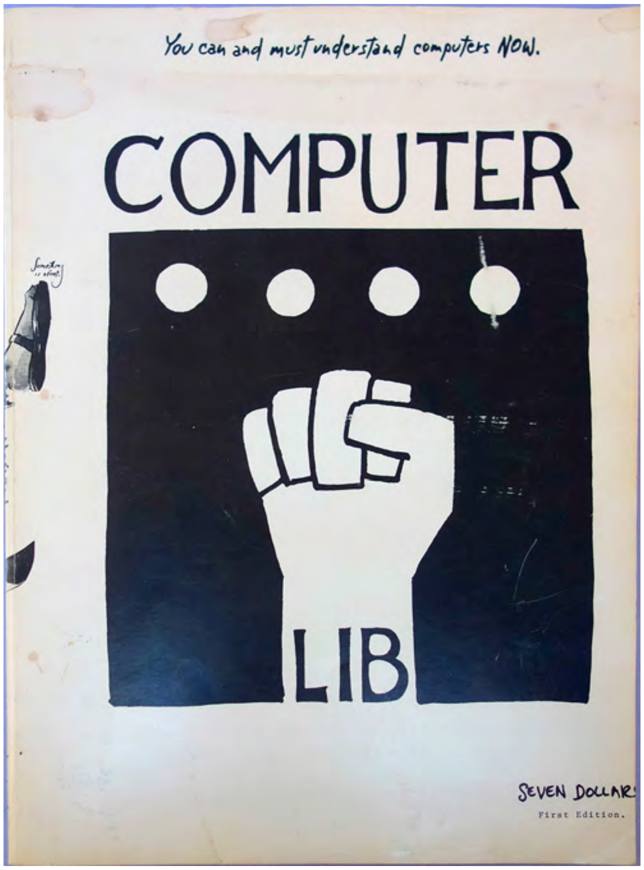

## *Pioneering Work on Women in Military Medicine, Signed by the Author and her Life Partner*

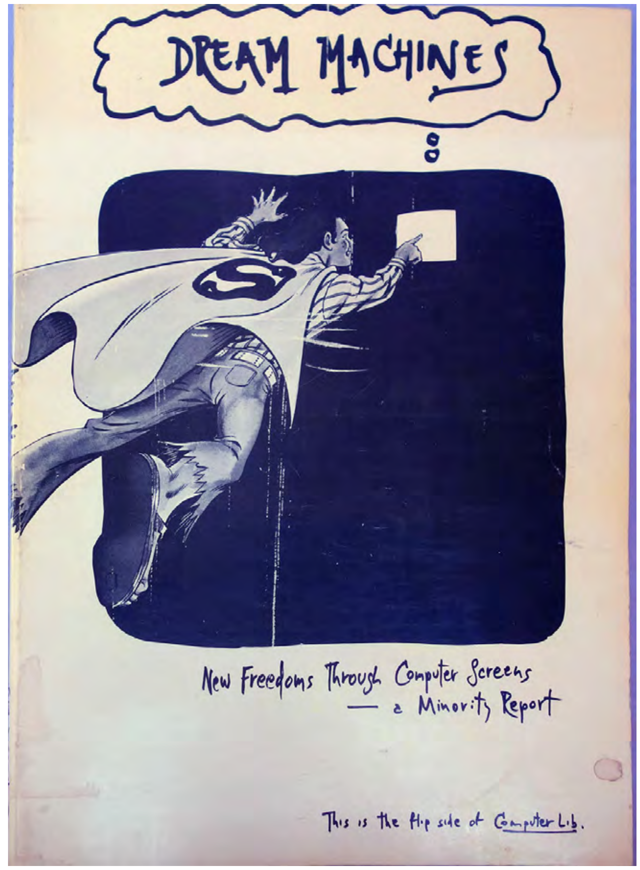



**42. Murray, Flora** (1869-1923). Women as Army surgeons: Being the history of the Women's Hospital Corps in Paris, Wimereux and Endell Street, September 1914 – October 1919. xvi, 263pp. Folding frontispiece and 11 plate leaves containing 22 plates. London: Hodder & Stoughton, [1920]. 214 x 138 mm. Original blue cloth, light edgewear, gilt-stamping on spine a bit faded, front hinge a bit loose. Endpapers foxed, light toning, but very good. *Signed on the flyleaf by Murray and her colleague and life partner, Dr. Louisa Garrett Anderson (*1873-1943), to whom the book is dedicated. Front panel of dust-jacket, mounted on card, laid in, together with publisher's label addressed to "Mrs. Lawrence," almost certainly the same Mrs. Lawrence mentioned on page 135 as one of the nursing sisters from French hospitals who remained with the WHC after 1919. Offprint of Murray's obituary from *The Lancet* tipped in.

$950

**First Edition.** Murray obtained her medical degree at the University of Durham in 1905, after training in London. In 1908 she became involved in the women's suffrage movement in Britain, joining the Women's Social and Political Union and, together with her companion Dr. Louisa Anderson (daughter of Elizabeth Garrett Anderson, the first woman to qualify as an M.D. in Britain), providing medical care to hunger-striking suffragists released from prison. She and Anderson also founded the pioneering Women's Hospital for Children in 1912. Shortly after the outbreak of World War I, Murray and Anderson became "the first women to break down the prejudice of the British War Office and, after successfully forming the Women's Hospital Corps (the motto of which was the WSPU's 'Deeds not Words'), and running a hospital in Claridge's Hotel in Paris, they were invited to organize a hospital at Wimereux near Boulogne. In February 1915 they were asked to take entire charge of the Endell Street Military Hospital in London . . . [which] treated 26,000 patients before it closed in 1919" (Crawford, *The Women's Suffrage Movement: A Reference Guide 1866-1928*, p. 13). Murray's *Women as Army Surgeons* gives a vivid account of the Women's Hospital Corps' wartime experiences; she dedicated the book to Anderson—"bold, cautious, true and my loving comrade." The two women are buried in adjacent graves near their home in Penn, Buckinghamshire; Anderson's tombstone reads, "We have been gloriously happy." 43662




## *Manifesto of the Microcomputer Revolution*

**43. Nelson, Theodor Holm** (1937- ). Computer lib / Dream machines. 127pp. (including inside front and back covers). Text illustrations. N.p., 1974. 357 x 255 mm. Original printed soft covers, a few light dampstains on cover. Very good. $750

**Scarce First Edition** of the bestselling underground manifesto of the microcomputer revolution, subtitled "You can and must understand computers NOW." Nelson, a pioneer of information technology, coined the terms "hypertext," "hypermedia" and "hyperlink" in 1965 and developed the first hypertext editing system (with Andries van Dam) in 1967. He issued his engagingly countercultural *Computer Lib* together with *Dream Machines: New Freedoms through Computer Screens—A Minority Report;* both works are crammed with simulated pull quotes, cartoons, sidebars etc. similar to the layout of a magazine, but in an amateurish large publication format. The back cover of *Computer Lib* serves as the front cover for *Dream Machines* and the division between the two books marked by the text for one rotated 180 degrees in relation to the other. Nelson's book was reissued by Microsoft Press in 1987. Rheingold, Howard. "Tools for Thought [chapter 1]." *Howard Rheingold's | Tools for Thought.* N.p., 2000. Web. Accessed 21 Jan. 2016. 43754

# Centenaire de Fresnel

## Liste des participants.

| | | | billet | | Ch H. | |
|---|---|---|---|---|---|---|
| 2 | H. A. Lorentz | 21 | 1 | H H | — — | |
| 3 | J. E. Verschaffelt | | 2 | | 2 | = Mme |
| | Ch. Lefébure | | 3 | | | |
| 4 | P. Langevin | | 4 | H | — | |
| 5 | O. W. Richardson | | 5 | | 1 | |
| 6 | A. Einstein | | 6 | | 1 | |
| 8 7 | Kramers | | 7 | | 1 | |
| 9 | C. T. R. Wilson | | 8 | | 1 | |
| N. Bohr 10 | N. Bohr | | 9 | | 1 | |
| R. H. Fowler 11 | R. H. Fowler | | 10 | | 1 | |
| 15 | A. H. Compton (with Mrs Compton, Mrs McCloskey + son) | 11 12 13 14 | | | 3 2 | 2 lits |
| 16 | W. Pauli jr. | | 15 | | 1 | |
| 17 | W. Heisenberg | | 16 | | 1 | |
| 18 | P. Debye | | 17 | | 1 | |
| 19 | L. Brillouin | | 18 suppl. | H | — | |
| 20 | Louis de Broglie | | 19 | H | — | |
| 21 | Th. de Donder | | 20 | | 1 | |
| 22 | C. E. Guye | | 21 Genève | 20 | — | |
| | | | 21 nombre | | | |
| 23 | W. L. Bragg | | 22 / 22 | | 1 | = Mr |
| 24 | M. Born | | 23 | | 2 | = Mr Mr |

## *Signed by Twelve Nobel Prize Winners, Including Einstein, Bohr and Heisenberg*

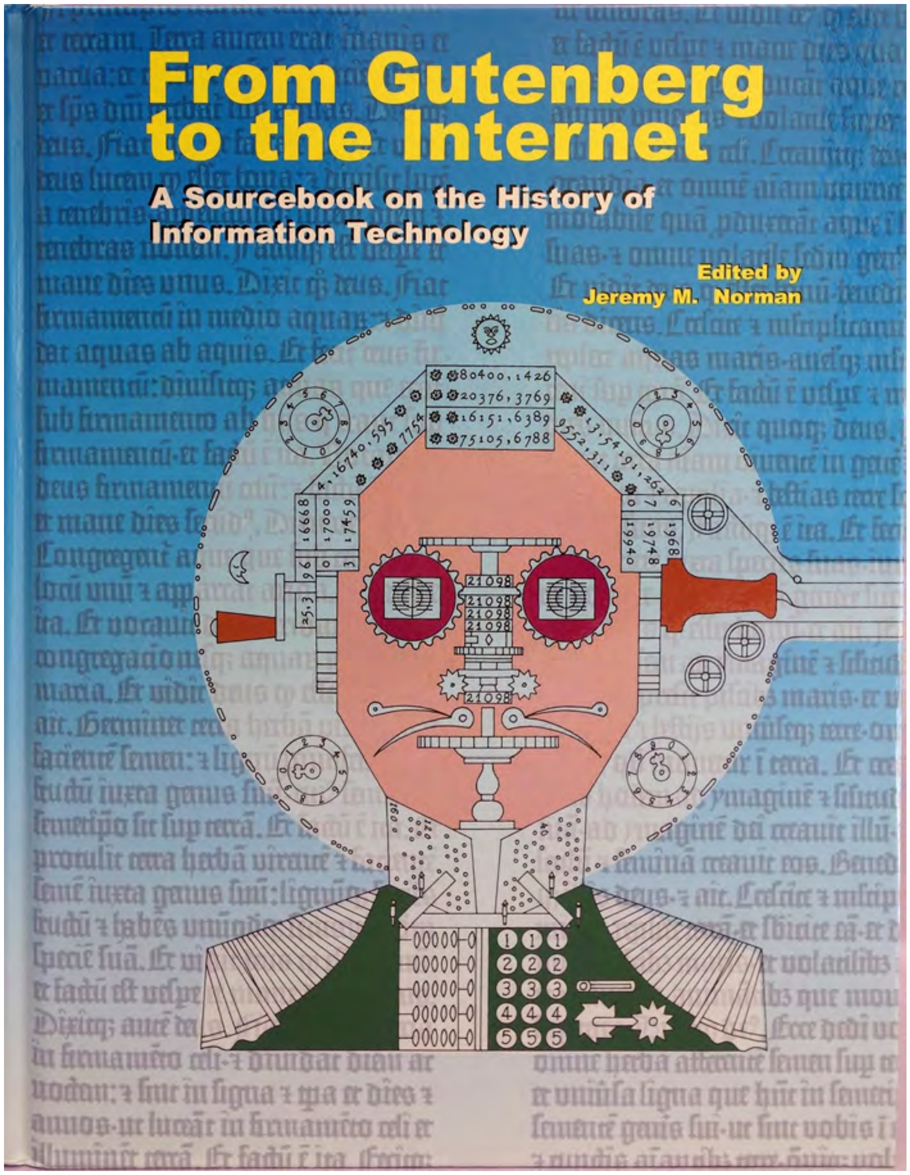
**44. [Nobel Laureates—Physics.]** Centenaire de Fresnel. Liste des participants. Single sheet of graph paper with 20 autograph signatures of scientists attending the Fresnel centenary, including Albert Einstein, Werner Heisenberg, Niels Bohr, Wolfgang Pauli and others as listed below. [Brussels, October 1927.] 275 x 211 mm. Creased horizontally, light toning but fine otherwise. $25,000

**Unique Sheet Containing 20 Signatures from the Golden Age of 20th Century Physics, Including 12 Nobel Prize Winners.** This list of autograph signatures, which has no parallel in the history of early quantum physics, was compiled during the fifth Solvay International Conference, where the world's most notable physicists met to discuss the new quantum mechanics developed by Werner Heisenberg, Max Born and Pascual Jordan in 1925–26 (it was at this meeting that Einstein made his famous remark that "God does not play dice"). All of the signers made highly significant contributions to the development of quantum theory and quantum mechanics in the first quarter of the 20th century. It would be virtually impossible to find another document like this from such an historic period in modern physics.

The fifth Solvay Conference was held in Brussels in October 1927. Part of the conference overlapped with the centenary celebration honoring French physicist Augustin Fresnel (1788–1827), which opened in Paris on October 27; since the dates of neither event could be changed, H. A. Lorentz, the organizer of the Solvay Conference, "suggested the compromise solution of a general invitation to attend the [Fresnel] celebrations. Those who wished to participate could travel to Paris on 27 October, returning to Brussels the next day, when sessions would be resumed in the afternoon. This was the solution that was indeed adopted" (Bacciagaluppi & Valentini, *Quantum Theory at the Crossroads: Reconsidering the 1927 Solvay Conference,* pp. 17–18). The present list was signed by 20 members of the Solvay Conference who wanted to attend the Fresnel centenary; the signatories are as follows:

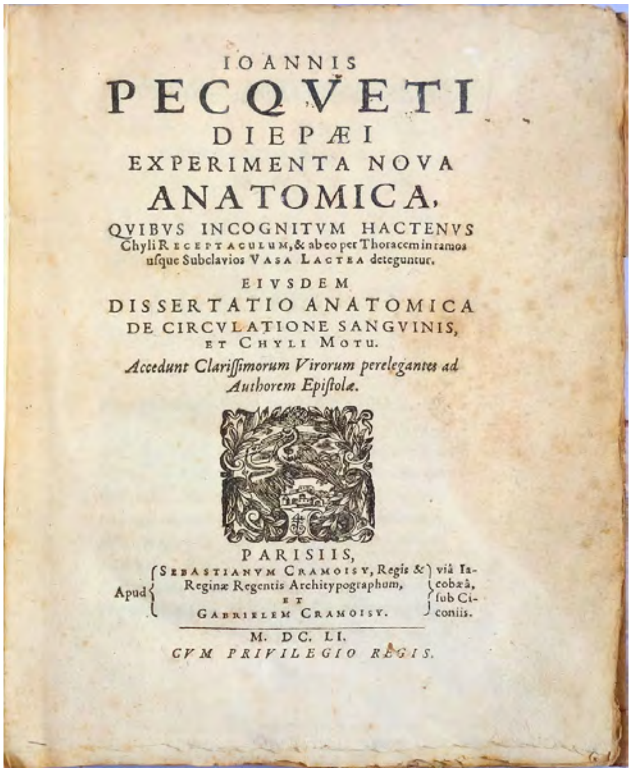
1. H. A. [Hendrik Antoon] Lorentz (1853–1928; Nobel laureate 1902 for explanation of the Zeeman effect)
2. J. E. [Jules Emile] Verschaffelt (1870–1955; Director, International Solvay Institutes)
3. Ch. [Charles] Lefèbure (Secretary of the Solvay Conference)
4. P. [Paul] Langevin (1872–1946; developed Langevin dynamics and the Langevin equation)
5. O. W. [Owen Willans] Richardson (1879–1959; Nobel Laureate 1928 for his work on thermionic emission)
6. A. [Albert] Einstein (1879–1955; Nobel Laureate 1921 for discovery of the photoelectric effect)
7. H. A. [Hendrik Anthony] Kramers (1894–1952; collaborated with Niels Bohr and participated in founding of quantum mechanics)
8. C. T. R. [Charles Thomson Rees] Wilson (1869–1959; Nobel Laureate 1927 for inventing the cloud chamber)
9. N. [Niels] Bohr (1885–1962; Nobel Laureate 1922 for his contributions to our understanding of atomic structure and quantum theory)
10. R. H. [Ralph Howard] Fowler (1889–1944; Paul Dirac's research supervisor at Cambridge and formulator of "zeroth law of thermodynamics")
11. A. H. [Arthur Holly] Compton (1892–1952; Nobel Laureate 1927 for discovery of the Compton effect)
12. W. [Wolfgang] Pauli (1900–1958; Nobel Laureate 1945 for his discovery of the exclusion principle)
13. W. [Werner] Heisenberg (1901–76; Nobel Laureate 1932 for creating quantum mechanics)
14. P. [Peter] Debye (1884–1966; Nobel Laureate in chemistry 1936 for his work on molecular structure)
15. L. [Léon] Brillouin (1889–1969; French physicist who made contributions to quantum mechanics and information theory)
16. L. [Louis] de Broglie (1892–1987; Nobel Laureate 1929 for his discovery of matter waves)
17. Th. [Théophile] de Donder (1872–1957; "father of thermodynamics of irreversible processes" and Einstein collaborator)
18. C. E. [Charles-Eugène] Guye (1866–1942; one of Einstein's teachers; helped confirm experimentally Einstein's special theory of relativity)
19. W. L. [William Lawrence] Bragg (1890–1971; Nobel Laureate 1915 for his work on X-ray analysis of crystal structure)
20. M. [Max] Born (1882–1970; Nobel Laureate 1954 for his fundamental researches in quantum mechanics)

Mehra, *The Solvay Conferences,* p. 181. 43744




**45. Norman, Jeremy M.**, *editor*. From Gutenberg to the Internet: A sourcebook on the history of information technology. xvi, 899pp. Illustrated. Novato: Norman Publishing, 2005. 8-1/2 x 11 inches. Pictorial boards, laminated. New copy. $89.50

Presents 63 original readings from the history of computing, networking and telecommunications, arranged thematically by chapters. Most of the readings record basic discoveries from the 1830s through the 1960s that laid the foundation of the world of digital information. With an illustrated historical introduction, timeline, and introductory notes. 38950




## *Discovery of the Thoracic Duct— Uncut Copy in the Original Boards*

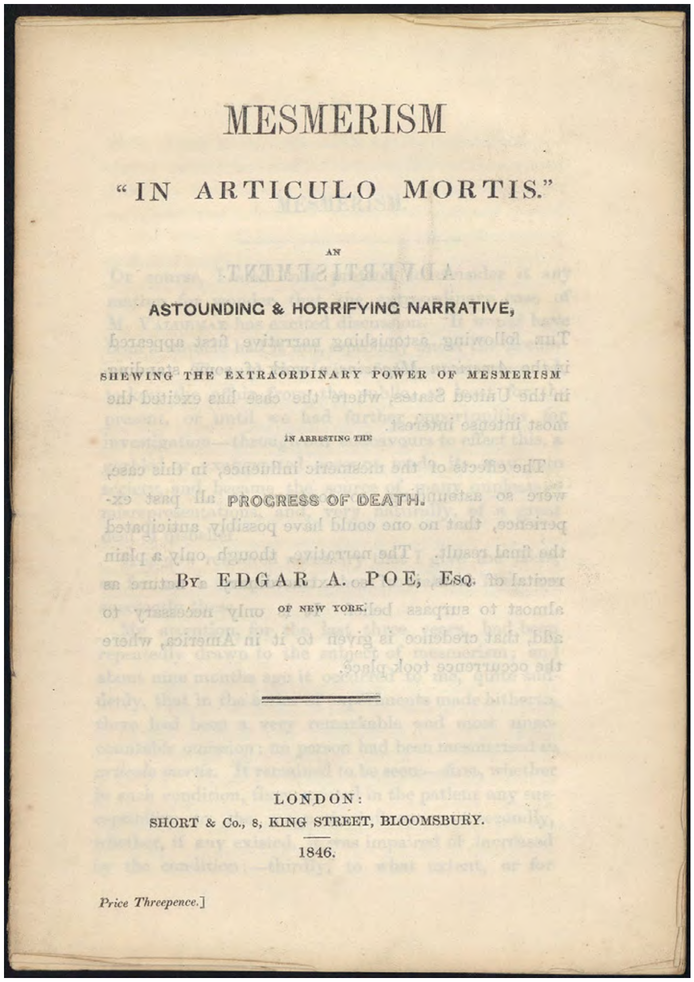
**46. Pecquet, Jean (**1622-1674). Experimenta nova anatomica, quibus incognitum hactenus chyli receptaculum, & ab eo per thoracem in ramos usque subclavios vasa lactea deteguntur. 4to. [12], 108pp. Text engravings, including full-page engraving on p. 21. Paris: Sebastian Cramoisy and Gabriel Cramoisy, 1651. 222 x 170 mm. (uncut). Limp boards ca. 1651, title in ink on spine, minor worm traces inside both covers, light wear and soiling, minor repairs to spine. Portion of front free endpaper torn away, evidence of stamp removal from lower margin of final leaf, minor foxing and staining, but a very good uncut copy. $18,500

**First Edition.** In his experiments with live dogs Pecquet discovered the thoracic duct and chyle reservoir (receptaculum chylii), which had been sought after since Aselli's discovery of the chyliferous vessels (lacteals) in dogs in 1627. Pecquet correctly described the termination of the chyliferous vessels (Aselli's "lacteal veins") in the chyle reservoir, refuting the erroneous notion that the vessels ended in the liver; he also described the junction of the thoracic duct at the union of the jugular and subclavical veins. Pecquet's discovery clarified for the first time the process of absorption in digestion. Garrison-Morton.com 1094. Norman 1676. Norman, *One Hundred Books Famous in Medicine*, 28A. 43485


**47. Podolsky, Boris** (1896–1966). Group of materials as listed below. $1750

The Russian-American physicist Boris Podolsky is best remembered for his collaboration with Albert Einstein and Nathan Rosen on the famous "EPR" (Einstein-Podolsky-Rosen) paper (1935) challenging the assumption that quantum mechanics could provide a complete description of physical reality. For more information see nos. 12 and 61.

1. Podolsky's Russian passport, with stamps dated 1913.
2. Podolsky's Certificate of Naturalization (U.S.), dated May 14, 1918.
3. Podolsky's B.S. diploma from the University of Southern California, dated June 6, 1918.
4. Podolsky's Honorable Discharge from the U.S. Army, dated Feb. 3, 1919.
5. Podolsky's American passport dated May 22, 1933.
6. Podolsky's Social Security card, in envelope.
7. File copy (a photomechanical reproduction made at the time) of Podolsky's letter to Einstein of July 25, 1935, enclosing a copy (also present here in photomechanical reproduction) of Podolsky's letter of July 6 to the *Physical Review* responding to Edwin Kemble's criticism of the EPR paper. 3ff. total.
8. Telegram to Podolsky from the U.S. Army Signal Corps notifying Podolsky of his appointment as physicist. 3 sheets. Dec. 6, 1940.
9. Power loss in iron at low magnetic densities. Carbon typescript. 6ff., last leaf torn with some loss. Contact sheet with two images of Podolsky included. N.d.
10. The dispersion by hydrogen-like atoms in undulatory mechanics. Offprint from Proc. National Academy of Sciences 14 (1928). 253-258pp. Original printed wrappers. Written while Podolsky was at Cal Tech.
11. An interpretation of $e^2/mc^2$ and h/mc. Offprint from *Physical Review* 46 (1934). 734-738pp. Original printed wrappers. Signed by Podolsky on the front wrapper.
12. —. Another copy, identified as "Desk copy" on front wrapper.
13. On interactions of electromagnetic fields. [1936?]. Typescript with autograph corrections. 4ff. (incomplete).
14. On Eddington's treatment of Dirac's equation. Offprint from *Physical Review* 53 (1938). 591-594pp. Original printed wrappers. Podolsky's name and address in typescript on front wrapper.
15. What is science? Carbon typescript. 8ff. Dated "9 Oct. 47" in pencil on first leaf.
16. Modern alchemy. Typescript (13ff.) plus carbon copy (13ff.) and what appears to be a previous draft of pp. 3-7 with manuscript corrections. Dated "9 Oct. 47" in pencil on first leaf. 31ff. total.
17. Professor Boris Podolsky (biographical sketch). April 15, 1964. Several versions clipped together, including photocopied typescript and original typescript. 7 sheets total.
18. Rosen, Nathan. Typed letter signed to Podolsky. Haifa, July 21, 1965. With carbon typescript of Polly Podolsky's reply (informing Rosen of Podolsky's ill health) and four more typed letters signed from Rosen to Polly dated 10/7/65 – 8/31/67, with enclosures. 10ff. total.
19. Publications of Boris Podolsky. Photocopied typescript. 1966 or after. 3ff.
20. The United States of America honors the memory of Boris J. Podolsky . . . Printed certificate with autopen signature of Lyndon Johnson, in envelope postmarked Dec. 23, 1966.



MESMERISM

"IN ARTICULO MORTIS."

AN

ASTOUNDING & HORRIFYING NARRATIVE,

SHEWING THE EXTRAORDINARY POWER OF MESMERISM

IN ARRESTING THE

PROGRESS OF DEATH.

BY EDGAR A. POE, ESQ.

OF NEW YORK.

LONDON:

SHORT & Co., 8, KING STREET, BLOOMSBURY.

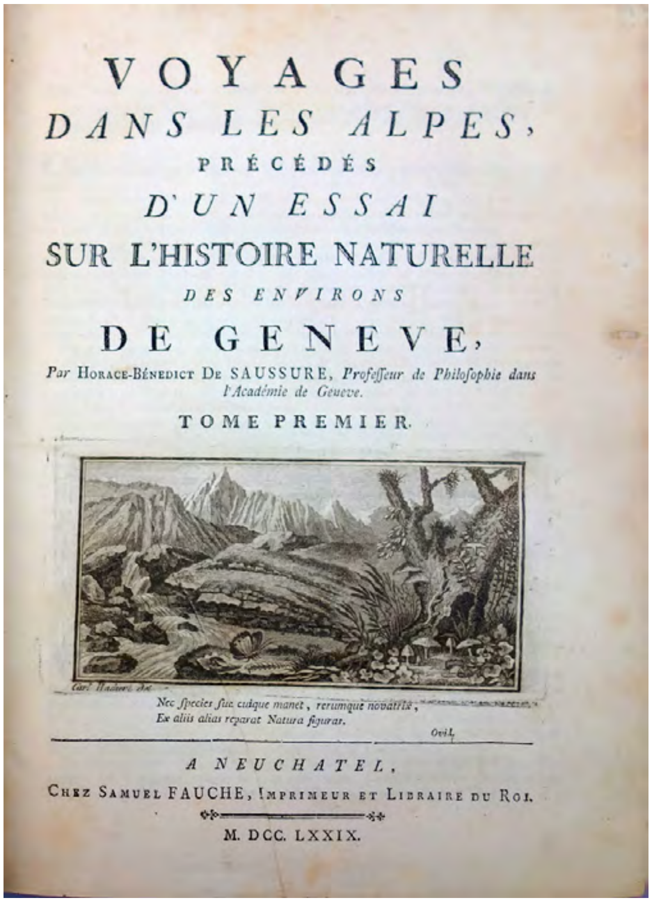
1846.

*Price Threepence.*]

## *"I Am Dead!"*

**48. Poe, Edgar Allan** (1809-49). Mesmerism "in articulo mortis." An astounding & horrifying narrative, shewing the extraordinary power of mesmerism in arresting the progress of death. 16pp. London: Short & Co., 1846. 213 x 138 mm. Without wrappers as issued; preserved in a cloth folding case. Light toning but a fine copy. Bookplate of American book collector Edward Hubert Litchfield (1879-1949). $7500

**First Separate Edition** of Poe's gruesome short story on the occult "powers" of mesmerism, originally published under the title "The facts in the case of M. Valdemar" in The American Whig Review of December 1845. "Poe plays with the idea that a dying person may be so imbued with magnetic fluid by a mesmerist that he can remain, although dead, in a kind of suspended death for months, until released by the mesmerist—at which point his body immediately turns into a pile of stinking, putrid slime. Taking it to be factual, people seriously debated whether such a horrifying use of mesmerism was possible, and condemned it on the assumption that it was" (Waterfield, *Hidden Depths: The Story of Hypnosis,* p. 146). "Mesmerism 'in articulo mortis'" was the last of three mesmeric tales Poe wrote in 1844 and 1845; although these works "were essentially literary, it is also significant that these works were written in the style of scientific texts . . . Although Poe's intentions remain somewhat ambiguous, leading some critics to suggest that he may have actually attempted to perpetrate a literary hoax, it is important to acknowledge that these works were published and received as legitimate contributions to the field of science, and thus they offer insight into the assumptions and expectations of the scientific community" (Enns, p. 65). Enns, "Mesmerism and the electric age: From Poe to Edison," in Willis & Wynne, eds., *Victorian Literary Mesmerism,* pp. 61-82. Heartman & Canny, *A Bibliography of the First Printings of the Writings of Edgar Allan Poe,* p. 111. 43625



VOYAGES
DANS LES ALPES,
PRÉCÉDÉS
D'UN ESSAI
SUR L'HISTOIRE NATURELLE
DES ENVIRONS
DE GENEVE,

Par Horace-Bénedict De SAUSSURE, *Profeſſeur de Philoſophie dans l'Académie de Geneve.*

TOME PREMIER.

*Nec ſpecies ſua cuique manet, rerumque novatrix,*
*Ex aliis alias reparat Natura figuras.* Ovid.

A NEUCHATEL,
Chez Samuel FAUCHE, Imprimeur et Libraire du Roi.
M. DCC. LXXIX.

*AVIS ſur les deux Editions originales des Voyages de Mr. de* Saussure, *Profeſſeur en Philoſophie dans l'Académie de Geneve, chez le Sieur* Fauche, *Imprimeur & Libraire du Roi, à Neuchâtel en Suiſſe.*

Ces Editions ſont accompagnées de Planches, & pr. l'in-4°. de magnifiques Vignettes en taille-douce; gravées ſous les yeux de l'Auteur qui a préſidé lui-même à ces Editions, imprimées avec le plus grand ſoin ſur du très-beau papier en 3 vol. in-4°, & 6 vol. in-8°. Chaque vol. in-4°. coutera 12 liv. de France en feuilles; le prem. vol. eſt actuellement hors de preſſe & l'in-8°. 3 livres de France en feuilles; l'un & l'autre avec Planches.

Il n'eſt pas beſoin de chercher à prévenir le Public, en faveur de l'ouvrage qu'on annonce. La matiere qui en fait le principal objet, eſt une des plus intéreſſantes que préſente l'Hiſtoire Naturelle, & l'on doit tout attendre des talens de l'Auteur, qui s'eſt déja rendu célebre dans la Carriere des Sciences, qui dépendent de la Phyſique & de l'Hiſtoire Naturelle. Mais ce qui fait la principale recommandation de cet ouvrage, c'eſt qu'il eſt le fruit d'un nombre de voyages, & de travaux continués pendant près de vingt ans, dans le but unique d'étudier l'Hiſtoire Naturelle de la Théorie de la Terre.

On ne trouvera donc point ici de ces hypotheſes conçues dans le fond d'un cabinet, produites par la ſeule force de l'imagination, & appuyées uniquement ſur des relations choiſies & raſſemblées dans le deſſein de les étayer. Les idées que préſente Mr. de Saussure, ne ſont que les réſultats d'obſervations faites par lui-même avec le plus grand ſoin, & répétées en différens pays.

Le Lecteur ſera d'autant plus diſpoſé à adopter ces réſultats avec confiance, qu'il trouvera dans cet ouvrage les détails des obſervations mêmes, dont ils ſont les conſéquences, qu'il ſuivra la marche des idées de l'Auteur, qu'il verra comment il a été acheminé, à faire un choix entre les hypotheſes connues, & quelquefois à les rejetter toutes, pour en prendre de plus conformes aux phénomenes.

La premiere partie qui ſert en quelque maniere d'introduction aux ſuivantes, contient une deſcription exacte de tout ce que les environs de Geneve & les montagnes voiſines, préſentent d'intéreſſant pour l'Hiſtoire Naturelle, & ſur-tout pour la Géographie Phiſique. L'Auteur a joint à cette deſcription un grand nombre d'expériences Chymiques, deſtinées à déterminer la nature des différentes ſubſtances minérales, qui ſe trouvent dans les environs de Geneve.

On lira avec plus d'intérêt encore la relation des voyages de l'Auteur ſur les hautes Alpes. D'après cette relation les Naturaliſtes pourront ſe former des idées plus juſtes, qu'on ne la fait juſqu'à ce jour, de la ſtructure de cette grande chaîne de Montagnes, & les objets variés & intéreſſans qu'elles renferment: on y trouvera non-ſeulement les obſervations du Barometre & du Thermometre, mais encore un grand nombre d'autres recherches relatives à la Phyſique générale.

A la ſuite de ſes voyages, on verra les réſultats généraux des obſervations les plus exactes, qui ayent été faites ſur la ſtructure de notre globe. Ces réſultats ſont les conſéquences immédiates des obſervations des Auteurs qui ont précédés M. de Saussure, & de celles qu'il a faites lui-même, tant ſur les Alpes que ſur les Montagnes de l'Italie, de la Sicile, de l'Auvergne, des Voſges, de l'Angleterre, &c. Ces mêmes réſultats ſervent de baſe aux conjectures qu'il propoſe ſur la Théorie de la Terre.

On trouvera enfin dans cet ouvrage, le modele d'un agenda deſtiné à diriger l'attention des Voyageurs, même de ceux qui ne ſont point Naturaliſtes, ſur des objets dont la connoiſſance peut répandre le plus de jour ſur cette même Théorie.

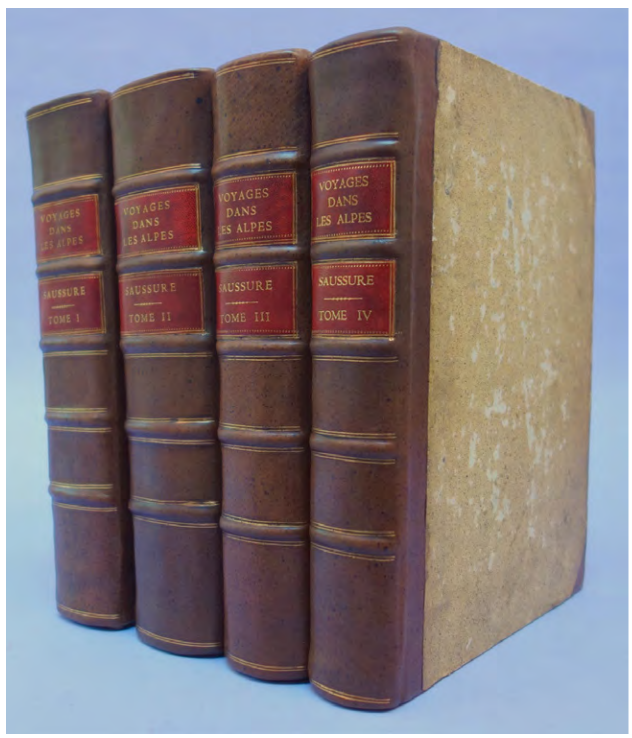
## *With an Unrecorded Prospectus*

**49. Saussure, Horace-Bénédict de** (1740-99). Voyages dans les Alpes. 4 vols., 4to. [6], xxxvi, 540, [2]; [4], xvi, 641, [1]; [4], xx, 532, [2]; [6], 594, [2]pp. 21 engraved plates, 2 maps, 2 folding tables in Vol. 2, engraved vignettes. Vol. 1 has prospectus leaf, "Avis sur les deux editions originales des Voyages de Mr. de Saussure," bound after the title; this leaf is printed on thin paper slightly smaller than the text block. Neuchatel: Samuel Fauche, 1779 (Vol. 1); Geneva: Barde, Manget et Cie., 1786 (Vol. 2); Neuchatel: Louis Fauche-Borel, 1796 (Vols. 3-4). 253 x 193 mm. 19th century boards rebacked and recornered in calf in period style, light rubbing. Light toning but very good. Gift inscription in Vol. I dated June 1935 by a descendant of the Saussure family. $7500

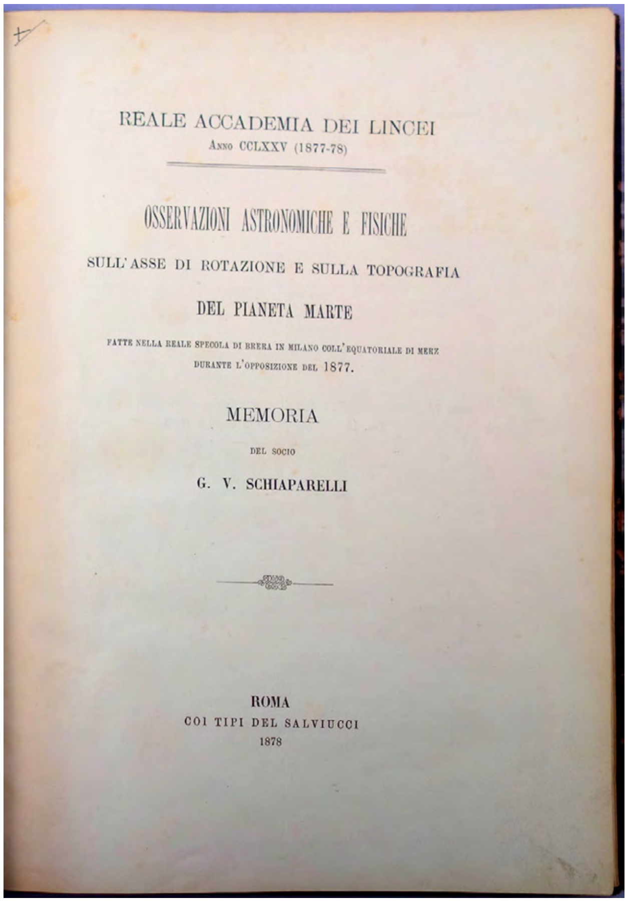
**Rare First Edition** of the complete quarto four-volume set of *Voyages dans les Alpes,* even more remarkable for containing the **unrecorded and possibly only extant copy** of publisher Samuel Fauche's prospectus for the work. It is clear from the prospectus that Fauche intended to publish the entire *Voyages,* announcing in the first paragraph that the work would appear in both quarto and octavo editions, "imprimées avec le plus grand soin sur du très-beau papier en 3 vol. in-4°, & 6 vol. in-8°," with the quarto volumes costing 12 livres each (unbound) and the octavo volumes 3 livres each. Fauche ended up publishing only the first volume of the *Voyages*; Vol. II, which did not appear until 1786, was published in Geneva by Barde, Manget et Cie. and the third and fourth volumes, issued a decade later, were published in Neuchatel by Louis Fauche-Borel, likely a relative of Samuel Fauche.

Saussure has been called the father of alpinism. He was the second person to climb Mont Blanc (a year after Balmat and Paccard's initial ascent), and he spent the years between 1774 and 1787 performing extensive geological, topological and meteorological investigations of the Alpine region, which he saw as holding the key to


a true theory of the earth. His *Voyages dans les Alpes* was of great importance to the development of geology, providing important evidence for James Hutton's uniformitarian theory of the earth and introducing a number of useful instruments designed by Saussure, including the hair hygrometer for measuring humidity and the first successful solar oven. The work was also instrumental in popularizing the term "geology," which began replacing "geognosy" in the 1770s.



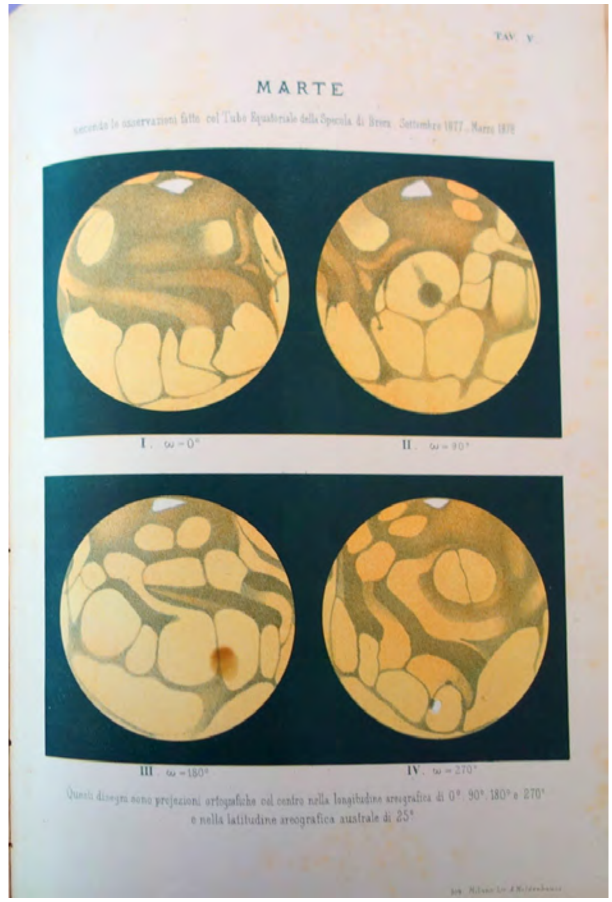

"As Saussure originally conceived of the structure of the Alps, the primitive and central chain of the mountains consists of vertical strata, while the marginal or secondary mountains adjacent to the primitive mountains consist of steeply inclined beds. These progressively approach the horizontal as they reach the margins of the chain . . . After some thirteen years of accurate observations and thinking, and particularly after having studied the St. Gotthard area, Saussure concluded that the dislocation, distortion, and even overturning of the alpine rocks had been caused by processes of horizontal compression, as well as by uplifting by internal explosions. He thus came close to an accurate understanding of the structure of the Alps" (*Dictionary of Scientific Biography*). 43706


REALE ACCADEMIA DEI LINCEI
Anno CCLXXV (1877-78)

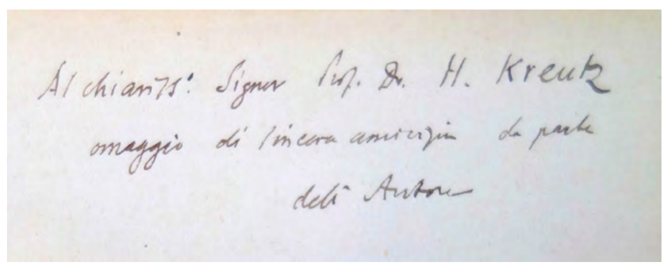
OSSERVAZIONI ASTRONOMICHE E FISICHE
SULL'ASSE DI ROTAZIONE E SULLA TOPOGRAFIA
DEL PIANETA MARTE
FATTE NELLA REALE SPECOLA DI BRERA IN MILANO COLL'EQUATORIALE DI MERZ
DURANTE L'OPPOSIZIONE DEL 1877.

MEMORIA
DEL SOCIO
G. V. SCHIAPARELLI

ROMA
COI TIPI DEL SALVIUCCI
1878

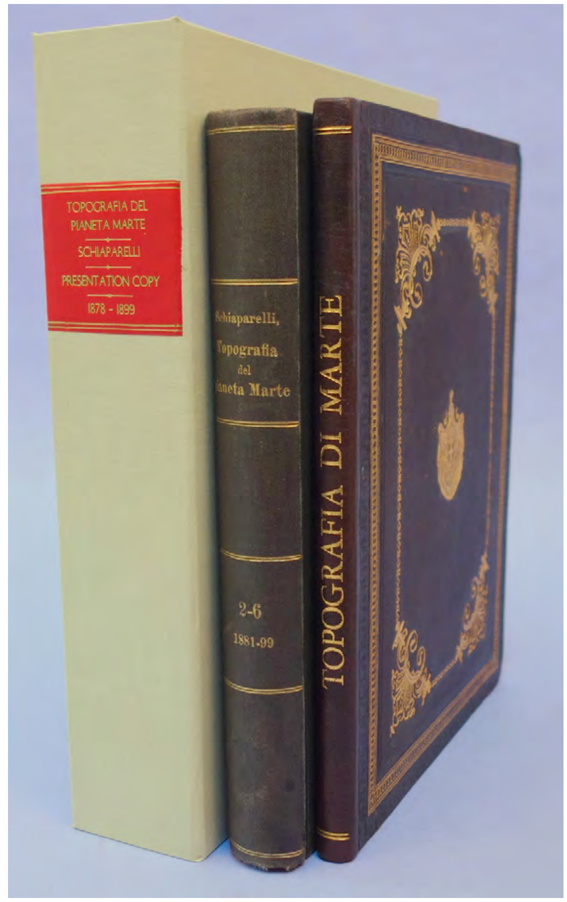



## *The "Canals" of Mars, Inscribed to Astronomer Heinrich Kreutz*



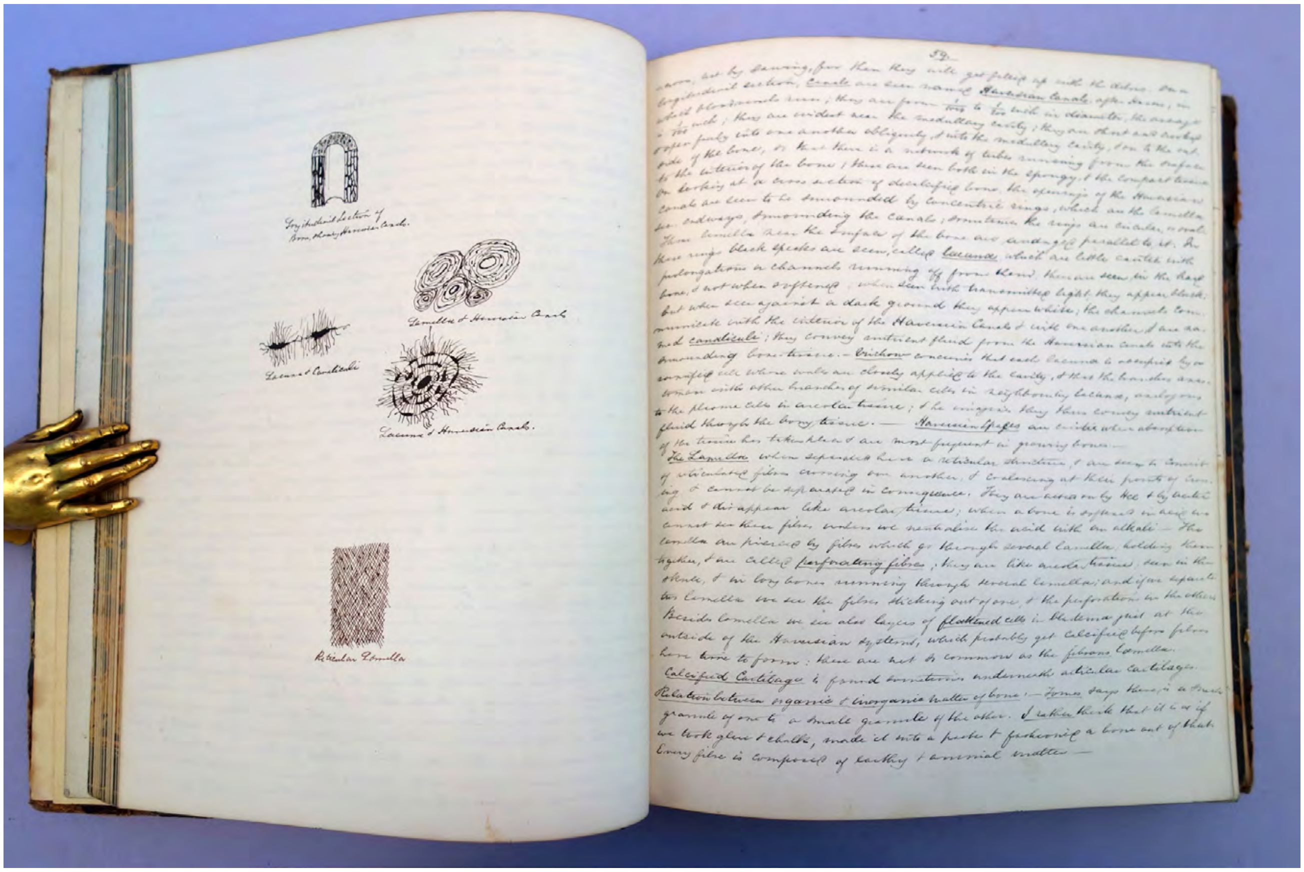
**50. Schiaparelli, Giovanni Virginio** (1835–1910). Osservazioni astronomiche e fisiche sull'asse di rotaztione e sulla topografia del pianeta Marte . . . 6 parts in 2 volumes. Part 1: 136pp., 5 plates; Part 2: 109, [3]pp., 6 plates; Part 3: 95, [1] pp., 3 plates; Part 4: 60pp., 3 plates; Part 5: 50pp., 4 plates; Part 6: 114pp., 5 plates. Rome: Coi Tipi del Salviucci, 1878-99. 286 x 207 mm. (Part 1); 284 x 215 mm. (Parts 2 – 6). Part 1 elaborately bound in morocco gilt ca. 1878, gilt arms on front cover probably those of Heinrich Kreutz (see below), all edges gilt, rebacked, very light edgewear; Parts 2 – 6 bound together in 19th century half cloth, marbled boards, slight wear; the two volumes preserved in a cloth drop-back box. Some of the plates a bit foxed, but overall fine. *Schiaparelli's Presentation Inscription* in Part 1 to astronomer Heinrich Kreutz (1854-1907): "Al chiarrissimo Signor Prof. Dr. H. Kreutz omaggio di sincera amicizia da parte dell'Autore." Bookplate in each volume of historian of rocketry and space travel Frederick I. Ordway III (1927-2014). $7500

**First Editions.** In 1877 Schiaparelli, director of Milan's Brera Observatory, began his study of the planet Mars, using a high-quality Merz refracting telescope. Over the next 13 years he continued his observations of the planet's topography and features: He was the first to name the Martian "seas" (dark areas) and "continents" (light areas), and he used Secchi's term "canali" (channels) to describe what he took to be a network of lines




crisscrossing the planet (these lines are actually optical illusions caused by the human brain's tendency to impose patterns on visual data). Although Schiaparelli believed these lines to be natural features, the term "canali," mistranslated into English as "canals," gave rise to a great deal of popular speculation about the possibility of intelligent life on Mars. Interest in the Martian "canals" was further fueled when American astronomer Percival Lowell published his *Mars* in 1895; Lowell believed that the canals had been built by intelligent Martians to carry water from the planet's polar ice caps to its equatorial regions. Lowell's ideas were largely rejected by astronomers but caught the imagination of the public, becoming a staple of science fiction in the first half of the twentieth century and inspiring such works as H. G. Wells' *War of the Worlds*. It was not until the Mariner flights to Mars in the late 1960s that the notion of canals on Mars was finally put to rest. However, recent evidence collected by the robotic Mars Rover has revived the possibility of organic life existing on Mars.

Schiaparelli presented this copy of the first part of his Osservazioni to German astronomer Heinrich Kreutz, best known for his studies of the orbits of several sungrazing comets—now known as the "Kreutz sungrazers"—which revealed that these comets were fragments of a much larger comet that had disintegrated several centuries previously. Schiaparelli had also performed important studies of comets prior to embarking on his Mars project; it was he who originated the hypothesis (since confirmed) that meteor showers are debris from comets that become visible when they cross the earth's orbit. *Dictionary of Scientific Biography*. Dunbar, Brian. "The 'Canali' and the First Martians." *NASA.* NASA, 03 Nov. 2003. Web. Accessed 23 Nov. 2015. 43703

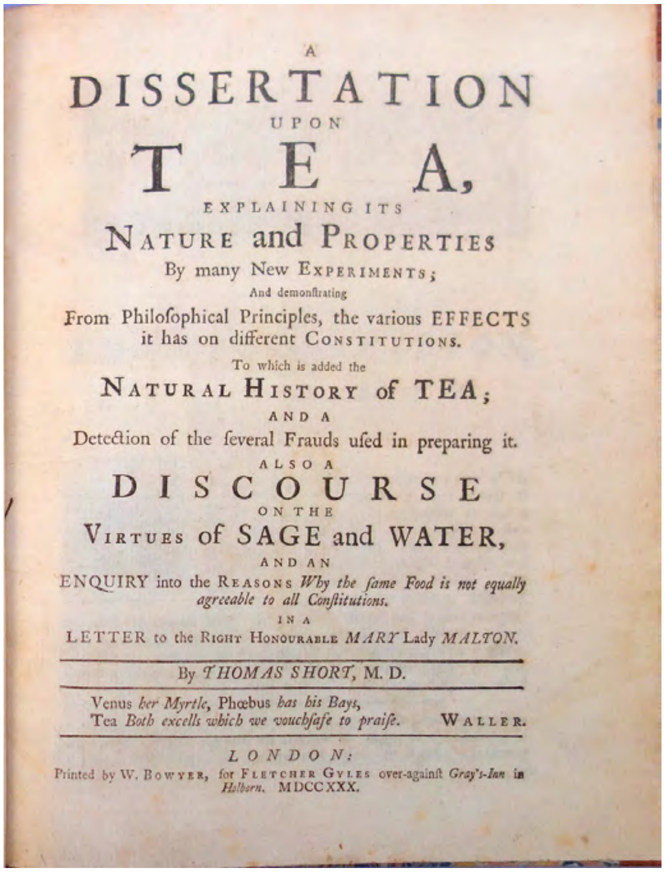


**51. Sharpey, William** (1802-80). Notes of lectures on "physiology," given at Univ. College . . . session 1859-60. Manuscript notes and drawings in the hand of a student, Thomas F. H. Green. 4 unnumbered leaves, 361 numbered pages, approximately 100 blank pages at the end. [London,] 1859-60. 227 x 189 mm. 19th century half leather, marbled boards, rebacked in cloth, light wear, original plain gray wrappers bound in. Very good. Small stamp of the Birmingham Medical Institute on 2 or 3 leaves.

**$1500**

Sharpey was appointed professor of anatomy and physiology at University College in 1836; he was the first to teach a complete course of physiology and minute anatomy at an English medical school. He was the author of two classic papers on cilia and ciliary motion (see Garrison-Morton.com 600 and 603) and discovered the "fibers of Sharpey" in bone tissue (see Garrison-Morton.com 545); he also edited the fifth through eighth editions of Jones Quain's *Elements of Anatomy.* Through his pupils Sharpey was the founder of the British school of physiology; his students included Michael Foster, first professor of physiology at Cambridge University, and John Burdon-Sanderson, the first to occupy the Waynflete Chair of Physiology at Oxford.

These lecture notes, written by medical student Thomas F. H. Green (see no. 16 for more information), cover the blood, tissues of the body, vascular system, digestive system, respiration, brain and nervous system, organs of special senses and reproduction. The notes are written on rectos only; several versos contain neatly executed drawings in ink or pencil, many illustrating aspects of microanatomy. 42836

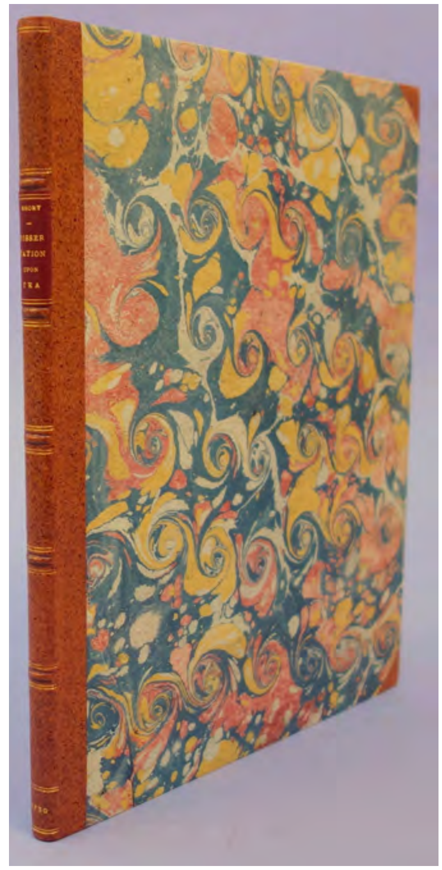


A
DISSERTATION
UPON
TEA,
EXPLAINING ITS
NATURE and PROPERTIES
By many New EXPERIMENTS;
And demonſtrating
From Philoſophical Principles, the various EFFECTS
it has on different CONSTITUTIONS.
To which is added the
NATURAL HISTORY of TEA;
AND A
Detection of the ſeveral Frauds uſed in preparing it.
ALSO A
DISCOURSE
ON THE
VIRTUES of SAGE and WATER,
AND AN
ENQUIRY into the REASONS *Why the ſame Food is not equally agreeable to all Conſtitutions.*
IN A
LETTER to the RIGHT HONOURABLE *MARY* Lady *MALTON.*

By *THOMAS SHORT,* M. D.

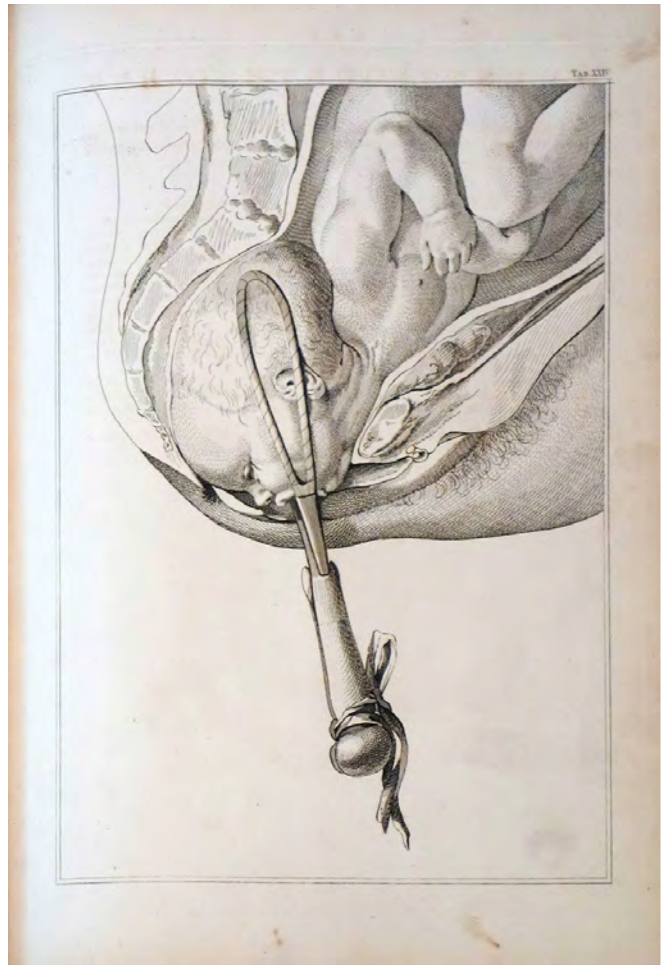
Venus *her Myrtle,* Phœbus *has his Bays,*
Tea *Both excells which we vouchſafe to praiſe.* WALLER.

*LONDON:*
Printed by W. BOWYER, for FLETCHER GYLES over-againſt *Gray's-Inn* in *Holborn.* MDCCXXX.



**52. Short, Thomas** (ca. 1690 – 1772). A dissertation upon tea, explaining its nature and properties by many new experiments . . . 4to. [4], 119pp. London: W. Bowyer, 1730. 233 x 187 mm. Half calf, marbled boards in period style. A few early marginal notes (cropped) and markings, otherwise very good. $1250

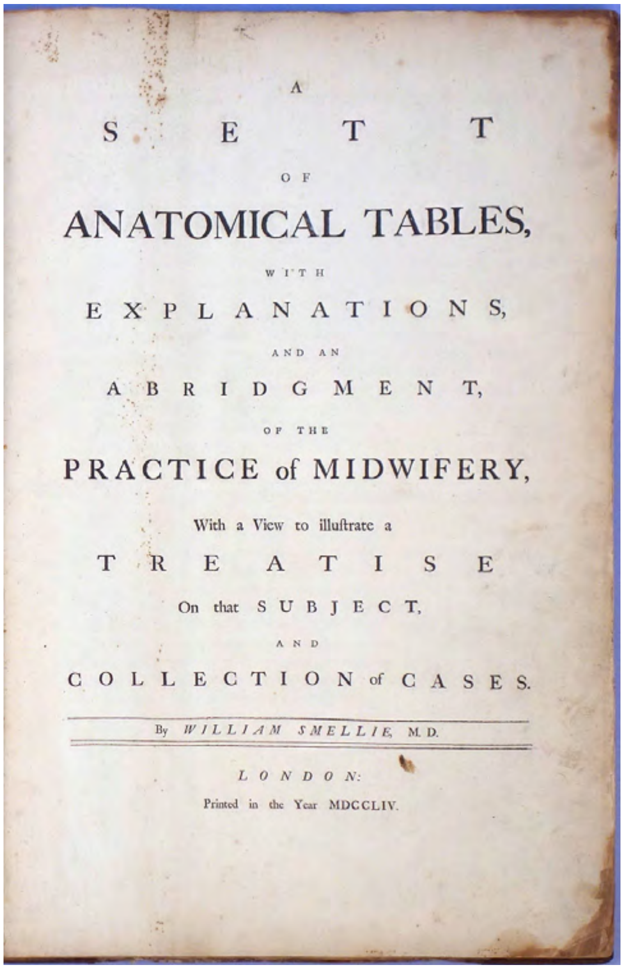
**First Edition.** Scottish physician Thomas Short, best known as the author of the first monograph in English on obesity (see Garrison-Morton.com 7061), wrote the present work on tea ostensibly to correct some of the more wild-eyed claims about its effects, whether beneficial or harmful. "His own account is structured upon a combination of bookish natural history and firsthand chemical and medicinal experimentation. Short's basic argument is that tea's 'astringent' quality tautens bodily tissue, while the water in which it is infused quickens the blood and augments circulation . . . Short ultimately enumerates such an overwhelming succession of benefits that his opening protestations of objectivity seem at risk of insincerity. Tea can dispel headaches, vertigo, drowsiness, ocular infections, pleurisy and pneumatic disorders, hangovers, constipation, edema, colds and catarrhs. It is even 'an antidote against chronick Fear or Grief' . . . Tea generates an increase in corporate tax revenues; it stimulates ancillary enterprises that variously supply items of tea equipage or sites for tea consumption; it inculcates a culture of sobriety that unmistakably promotes 'Business, Conversation and Intelligence'" (Ellis, Coulton and Mauger, *Empire of Tea: The Asian Leaf that Conquered the World*). 43723



## *First Accurate Illustrations of the Fetus in Utero*

**53. Smellie, William** (1697-1763). A sett[!] of anatomical tables, with explanations, and an abridgement of the practice of midwifery, with a view to illustrate a treatise on that subject, and collection of cases. Folio. 22 leaves, unsigned and unpaginated. 39 engraved plates by Charles Grignion after drawings by Jan van Rymsdyk, Pieter Camper (1722–89) and Smellie himself. London: [D. Wilson], printed in the year 1754. 547 x 362 mm. 18th century marbled boards, worn, rebacked and recornered in calf, free endpapers creased. Minor toning, spotting and offsetting, old repairs to free endpapers, a few insignificant marginal tears, but very good. Ownership inscription "Wm. Bond the gift of Mr. Hales 1817" on front free endpaper. $7500

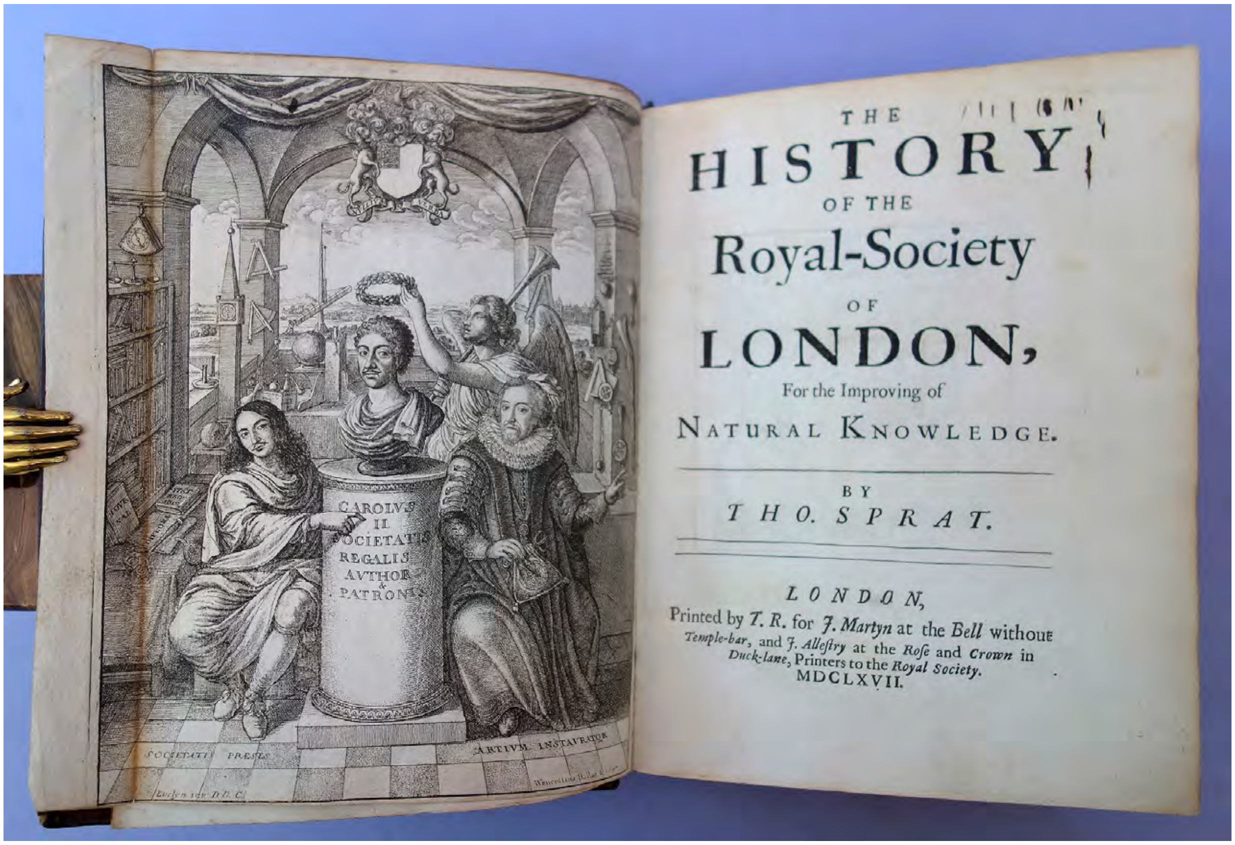
**First Edition** of Smellie's magnificent obstetrical atlas, illustrated with life-size anatomical plates containing the first accurate anatomical illustrations of the fetus in utero. In the preface to his *Treatise on the Theory and Practice of Midwifery* (1752), Smellie announced his original intention to "insert in this Compendium, plates of the most useful instruments appertaining to the art of midwifery; but as large drawings could not be properly bound in a book of so small a size, I have resolved to publish them in folio, with that set of prints which I am now preparing, according to the proposals specified in the advertisement at the end of this volume." This advertisement announced the imminent publication of "twenty-six plates, of about 18 inches by 12," engraved from the drawings made by Jan van Rymsdyk "for the use of those who attend [Smellie's obstetrical] lectures." Two years later the *Sett of Anatomical Tables* was published with the number of plates increased to thirty-nine, eleven of which had been contributed by Pieter Camper, one of Smellie's former pupils. The remaining two plates, nos. 37 and 39, are presumed to have been drawn by Smellie himself. The atlas was sold by subscription, unbound




in sheets, for £2. 6s—a very high price for the time. Some sources state that the first edition consisted of only eighty to one hundred copies, but the edition was most probably larger than this.

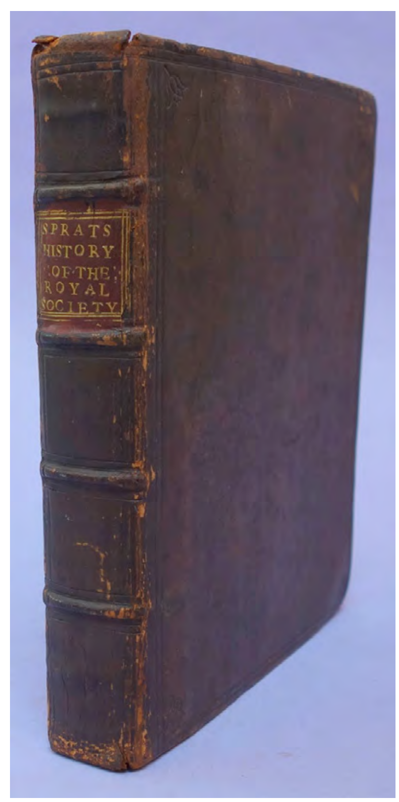
The life-size drawings Rymsdyk made for Smellie, now part of the Hunterian Collection at the University of Glasgow, were "far superior in accuracy to any that had appeared previously, surpassed only by those he made soon after for William Hunter's obstetrical atlas, not published until twenty years later" (Hagelin). The drawings by Camper, now preserved in the Library of the Royal College of Physicians at Edinburgh, are mainly diagrammatic, and it is possible that "Smellie instructed [Camper] to include only such detail as was necessary to his immediate purpose . . . [which] was mainly to indicate the position of the fetus in the uterus, and the application of the forceps to the head" (Thornton, p. 17). Smellie was the leading forceps practitioner in London, and the forceps that he devised—a short, straight instrument with the blades covered in leather—held the field for many years in the face of numerous modifications.

Smellie was a pioneer of modern obstetrics, and one of the great teachers of midwifery. Among his pupils were William Hunter and the physician-author Tobias Smollett, who edited Smellie's works for publication. "His contribution to our knowledge of the mechanism of labor is of fundamental importance. His additions to our knowledge of contracted pelves were also noteworthy. He not only gave directions for measuring the pelvis but was the first to measure the diagonal conjugate diameter and this today remains the most important pelvimetric maneuver we possess" (Thoms, pp. 124–25). Garrison-Morton.com 6154.1. Hagelin, *Rare and Important Medical Books,* pp. 118–19. Norman 1955. Thoms, *Classical Contributions to Obstetrics and Gynecology*, pp. 124–29. Thornton, *Jan van Rymsdyk*, pp. 10–21. 43656



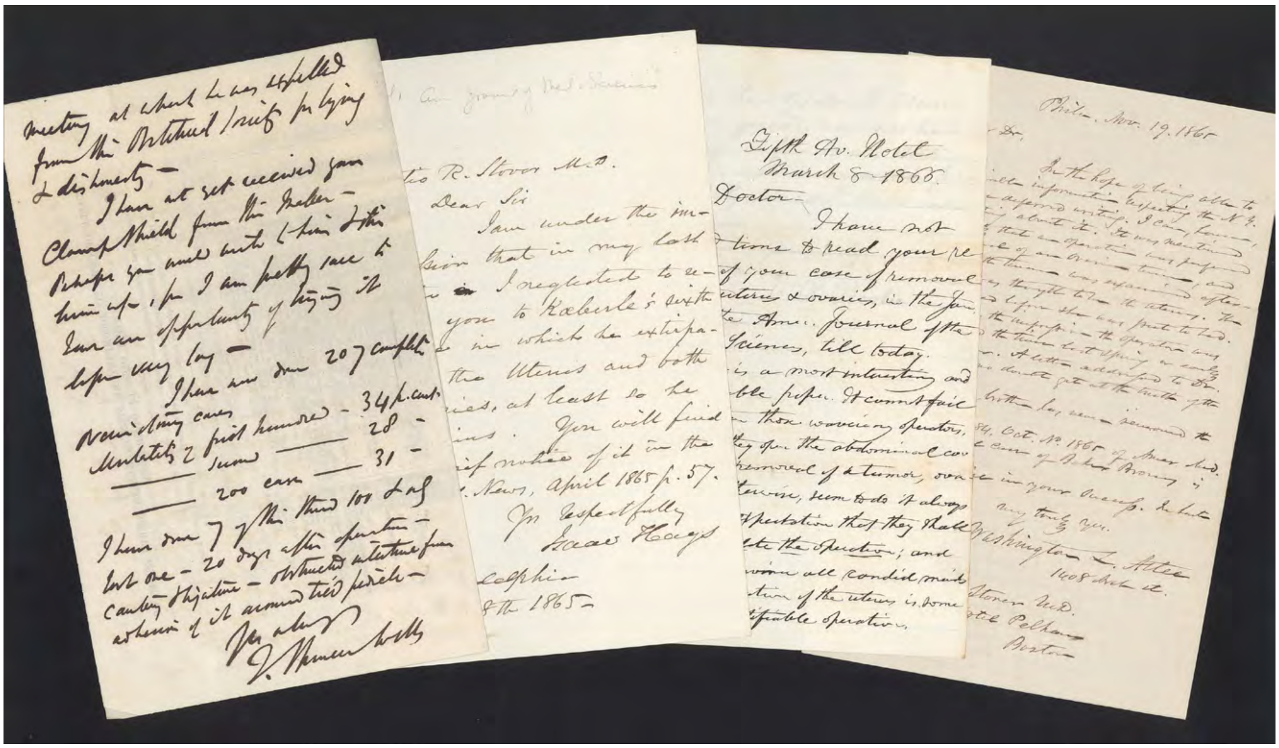

*Manifesto of the Royal Society With the Very Rare Frontispiece*

**54. Sprat, Thomas** (1635-1713). The history of the Royal-Society of London, for the improving of natural knowledge. 4to. [16], 438, [2, including errata]pp. Engraved arms of the Royal Society on the verso of the license leaf, etched frontispiece by Wenceslas Hollar (1607-67) after John Evelyn (1620-76) or possibly Mary Evelyn, 2 engraved folding plates. 207 x 157 mm. London: T. R. for J. Martyn, and J. Allestry, 1667. Blind-tooled calf ca. 1667, light wear to hinges and edges, head of spine worn. Occasional minor soiling and staining, but a fine, completely unrestored copy. Signature of Martin Bowes (1670-1726) of Bury St. Edmonds, Suffolk on front pastedown, also brief shorthand note and shelfmark; some minor ink underlining in text. $7500




**First Edition,** second state of p. 85 without the repeated "of" on lines 6–7. A fine and completely unrestored copy of the first history of the Royal Society, published only five years after the Society received its Royal Charter. Sprat, a clergyman, was one of the original founders of the Royal Society; "[his] exposition of the conception and beginning of the Royal Society remains the only one which tells us, in any detail, not only what the founders were doing, but even more important, what they thought they were doing" (Purver, *The Royal Society: Concept and Creation,* p. 9).

Sprat divided his work into three parts, the first of which discussed the state of natural philosophy of the "ancients" and compared that with the "moderns." The second part gave examples of the kind of scientific work that members of the Royal Society were doing. Influenced by Bacon, who appears in the frontispiece, Sprat focused on the utilitarian products of science, and nearly all the papers he chose for reproduction in the *History* deal with technological or commercial problems, and the virtuoso singled out by Sprat was Sir Christopher Wren—inventor, architect and technologist. Sprat's third part contains "A Defense and Recommendation of Experimental Knowledge in General." The work contains two contributions by Robert Hooke: "A method for making a history of the weather" (pp. 173-182, with plate); and "An account of a dog dissected" (p. 232). The pictorial frontispiece by John Evelyn (or possibly his wife, Mary), which is not found in most copies, depicts a bust of Charles II being crowned by Fame with a laurel wreath, flanked on either side by Francis Bacon and William, Viscount Brouncker, the Society's first President. Michael Hunter, *Science and Society in Restoration England*, pp. 194-197. Keynes, *Evelyn*, 178; Hooke, 28. Norman 1989. Wing S-5032. 43699



## *Important Letters on Abdominal Hysterectomy and Ovariotomy*

**55. Storer, Horatio R.** (1830-1922). Collection of 8 autograph letters signed to Storer from 8 different physicians, October 8, 1865-November 19, 1878. Various sizes. 16pp. in all, plus postmarked cover to one letter, and a small sepia-toned photograph of a portrait of Benjamin Waterhouse (very faded, chipped and creased). Creased where folded, otherwise fine. $3750

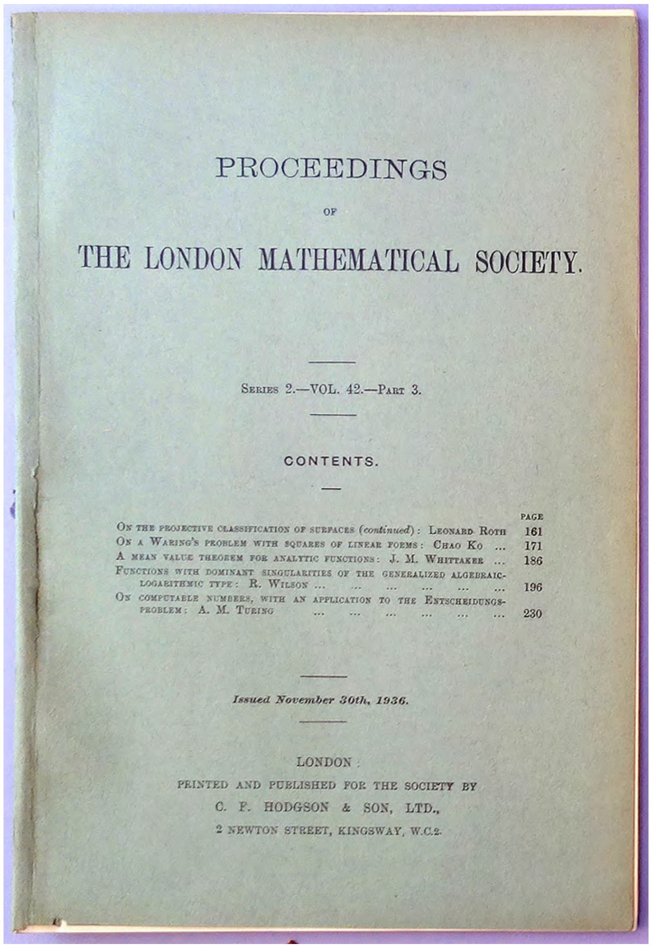
A fascinating collection of letters written to one of the foremost American gynecologists of the nineteenth century, mostly pertaining to his successful operation for abdominal hysterectomy—the fourth such operation performed in the United States. The *Dictionary of American Biography* cites Storer as the establisher of the specialty of gynecology, "not hitherto recognized as a distinct branch of medicine," and he was a founder of the Journal of the Gynaecological Society of Boston, the first journal devoted exclusively to the diseases of women. He published many books on gynecological and related topics, including several on abortion, to which he was opposed. His major surgical achievements were the operation for abdominal hysterectomy and the performance, in 1868, of the world's first cesarean-hysterectomy.

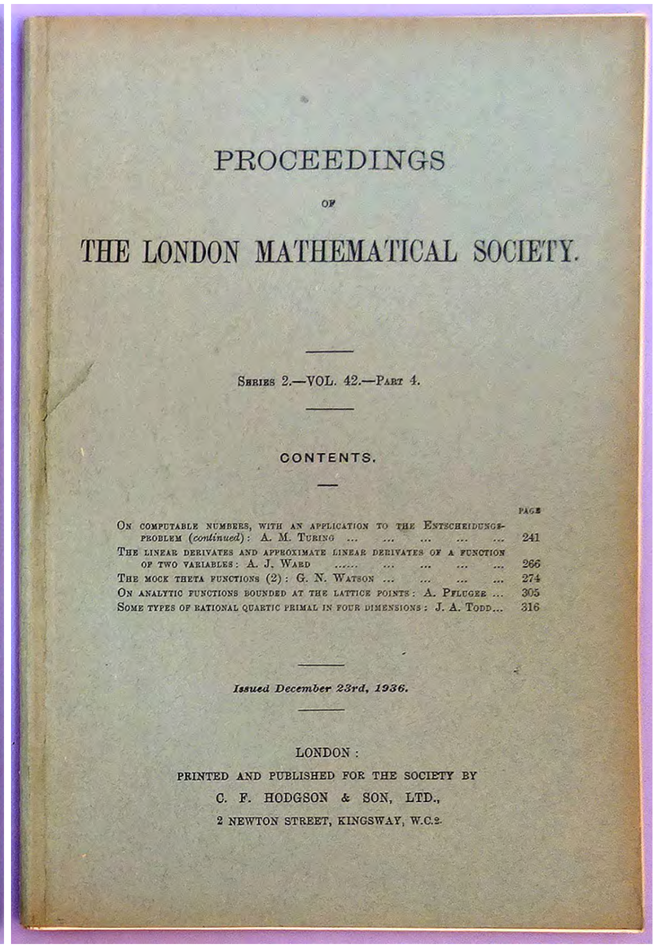
Storer's correspondents included some of the most distinguished names in American and English surgery:

T. Spencer Wells (1818-97), whom Ricci (p. 477) called "the greatest ovariotomist of the preantiseptic age" (see G-M 6056); Edmund Randolph Peaslee (1817-78), author of *Ovarian Tumors; Their Pathology, Diagnosis and Treatment, Especially by Ovariotomy*, 1872) and performer of the second double ovariotomy in America (1850); Washington Atlee (1808-78), who operated successfully on vesico-vaginal fistula (1860; see Garrison-Morton.com 6047), and who together with his brother John performed the first abdominal myomectomy (1844); Willard Parker (1800-1884), the first American to operate for appendicitis (1867; see Garrison-Morton.com 3564); Isaac Hays (1796-1879), longtime editor of the *American Journal of the Medical Sciences*; and Henry Austin Martin (1824-84), who was the first to write on the use of adhesive plaster in surgery.

In 1866 Storer published his account of the "Successful Removal of the Uterus and Both Ovaries by Abdominal Section" in the January number of the *American Journal of the Medical Sciences.* No fewer than five of the eight letters in this collection refer to Storer's operation, the report of which he must have circulated prior to its publication in the journal, as three of these five letters were written in late 1865. Isaac Hays, the editor of the journal that published Storer's paper, wrote to him on October 8 to refer him to Koeberlé's performance of the first successful extirpation of the uterus and ovaries (1863; see Garrison-Morton.com 6052). Washington Atlee, in his letter of November 19, discussed an unconfirmed report of a hysterectomy performed by Dr. Land, noted that his own brother John had never removed a uterus, and referred Storer to the account of Baker Brown's fatal case in the October 1865 number of the *American Journal of the Medical Sciences*. Willard Parker, in his letter of November 29, stated that he had never performed abdominal hysterectomy but had once removed a prolapsed uterus through the vulva. The more important of the remaining two letters referring to Storer's operation was that of E. R. Peaslee, written on March 8, 1866; it praised Storer's report as "a most interesting and a very able paper" and one that "must convince all candid minds that extirpation of the uterus is sometimes a justifiable operation."

Of the three letters that do not mention Storer's operation, the most valuable by far is that of Spencer Wells, who wrote to Storer on April 17, 1867 to discuss his own unsatisfactory experience with use of cautery in ovariotomy, and to report his current success rate after the completion of over 200 ovariotomies. Wells wrote his letter on the blank verso of a printed "Table of Cases to Accompany Mr. Spencer Wells's Fourth Series of Fifty Cases of Ovariotomy," which provides the pertinent data for fifty cases of completed ovariotomy performed between December 1865 and March 1867. Wells reported on 500 such cases between 1856 and 1872, with an overall mortality rate of 25%. In his letter, written when he had completed 207 operations, he gave the mortality rates for the first and second hundred (34% and 28% respectively), as well as the overall rate (31%) and his success rate with the seven operations completed since. Ricci, *Development of Gynaecological Surgery and Instruments*, pp. 447 (Peaslee); 469; 563 (Storer); 477-82 (Wells). Rutkow, *History of Surgery in the U.S.*, GY20 (Atlee); GSp142 (Martin); GYp42-45 (Peaslee). Speert, *Obstetrics & Gynecology in America*, pp. 180-81 (Storer); 129 (Peaslee). 29315



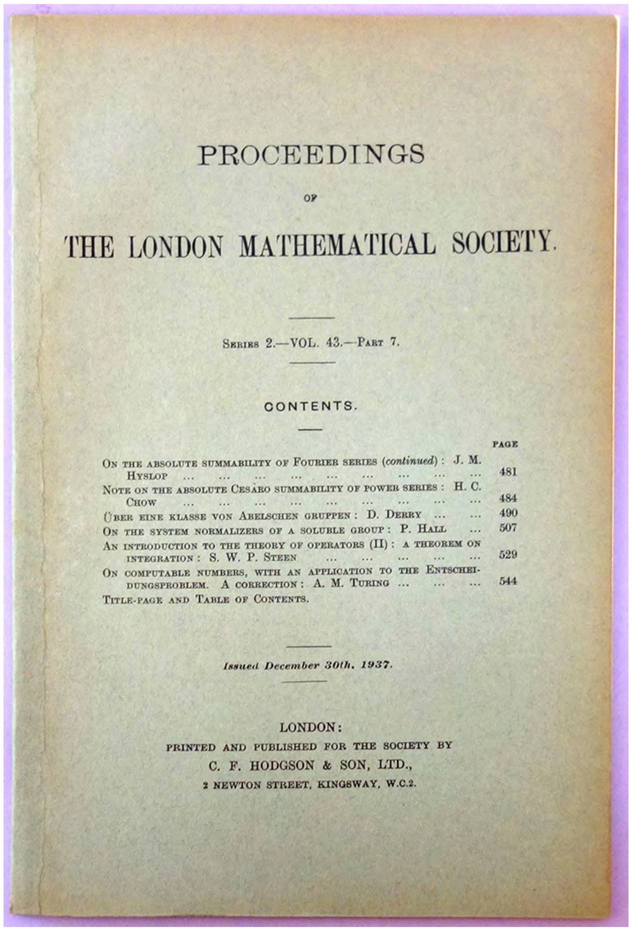



## *The Most Famous Theoretical Paper in the History of Computing*

**56. Turing, Alan Mathison** (1912–54). (1) On computable numbers, with an application to the *Entscheidungsproblem*. In *Proceedings of the London Mathematical Society,* 2d series, 42, pt. 3 (November 30, 1936): 230–40; pt. 4 (December 23, 1936): 241–65. (2) On computable numbers, with an application to the *Entscheidungsproblem*. A correction. In *Proceedings of the London Mathematical Society*, 2d series, 43 (1937): 544–46. Together three journal numbers. 259 x 175 mm. Original printed wrappers, very skillfully rebacked, small chip in back wrapper of third number; preserved in a cloth drop-back box. Very good to fine set. $60,000

**First Edition in the original wrappers, with Turing's "Correction" published the following year.** Turing's theoretical paper "On computable numbers" is undoubtedly the most famous theoretical paper in the history of computing. It is a mathematical description of what Turing called a universal machine—an imaginary computing device designed to replicate the mathematical "states of mind" and symbol-manipulating abilities of a human computer. Turing conceived of the universal machine as a means of answering the last of the three questions about mathematics posed by David Hilbert in 1928: (1) is mathematics *complete*; (2) is mathematics *consistent*; and (3) is mathematics *decidable*.

Hilbert's final question, known as the *Entscheidungsproblem*, concerns whether there exists a definite method—or, in the suggestive words of Turing's teacher Max Newman, a "mechanical process"—that can be applied to any mathematical assertion, and which is guaranteed to produce a correct decision as to whether that assertion is true. The Czech logician Kurt Gödel had already shown that arithmetic (and by extension mathematics) was incomplete. Turing showed, by means of his universal machine, that mathematics was also undecidable.


PROCEEDINGS

OF

THE LONDON MATHEMATICAL SOCIETY.

Series 2.—VOL. 43.—Part 7.

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To demonstrate this, Turing came up with the concept of "computable numbers," which are numbers defined by some definite rule, and thus calculable on the universal machine. These computable numbers "would include every number that could be arrived at through arithmetical operations, finding roots of equations, and using mathematical functions like sines and logarithms—every number that could possibly arise in computational mathematics." Turing then showed that these computable numbers could give rise to uncomputable ones—ones that could not be calculated using a definite rule—and that therefore there could be no "mechanical process" for solving all mathematical questions, since an uncomputable number was an example of an unsolvable problem. Turing's idea of a "universal machine" was given the name "Turing machine" by Alonzo Church.

Turing's concept of the "universal machine" was adapted to theories of brain function by McCulloch and Pitts, whose ideas in turn exerted a considerable influence on von Neumann's *First Draft of a Report on the EDVAC*, a theoretical description of the stored-program machine that was read by all the designers of first-generation computers. In showing that a universal machine was possible, Turing's paper was highly influential in the theory of computation, and it remained a powerful expression of the virtually unlimited adaptability of electronic computers.

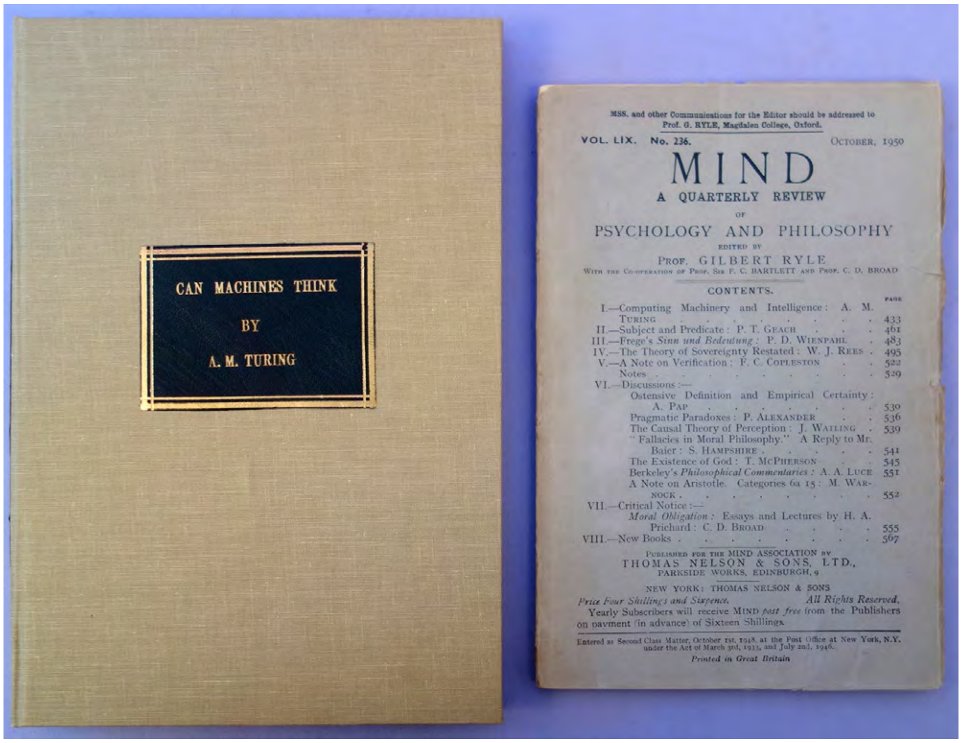
While the bound journal volume containing these papers remains common, the three parts of Turing's paper have become difficult to find in the original printed wrappers. *From Gutenberg to the Internet*, reading 7.1. *Origins of Cyberspace* 394. Randell, *The Origins of Digital Computers: Selected Papers*, 519. 43745

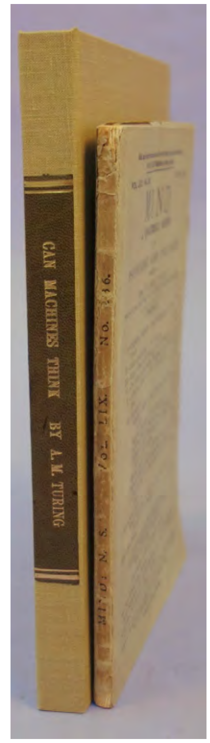
## *The Turing Test*

**57. Turing, Alan Mathison** (1912-54). Computing machinery and intelligence. In: *Mind* 59 (1950), pp. 433-60. Whole number. [2], 433-576pp. General title and table of contents for Vol. 59 laid in (8pp.). 214 x 137 mm. Original printed wrappers, spine repaired, light marginal wear & chipping, light vertical crease, ink markings beginning on p. 555, but a very good copy. Boxed. $3750

First Edition. Starting with the famous statement, "I propose to consider the question, 'Can machines think?' Turing introduces his restatement of the problem by creating a theoretical situation, which he calls the "Imitation Game," in which parties "X" and "Y" engage in a conversation by teletype. Human X cannot know whether Y is a machine or a person. If X believes that Y is responding like a person after a specified period of time, and Y turns out to be a machine, then that machine may be defined as having the capacity to "think." Turing believed that every human thought expressable in language could be mimicked by a universal machine, or computer, if it was suitably programmed.

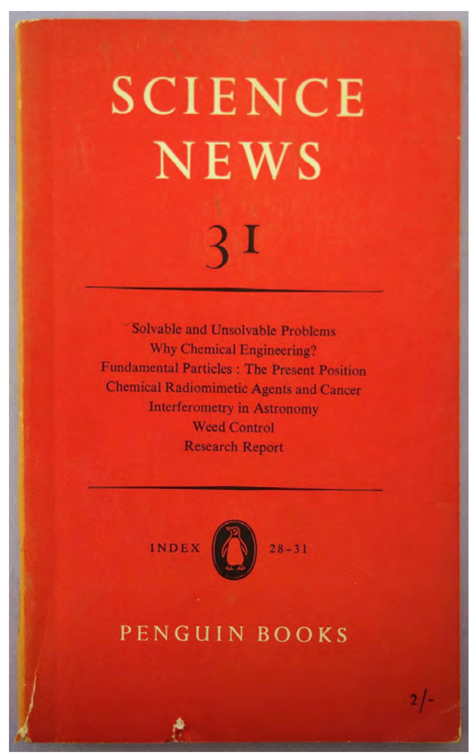
Concerning the future of artificial intelligence Turing wrote, " I believe that in about fifty years' time it will be possible to programme computers with a storage capacity of about $10^9$, to make them play the imitation game so well that an average interrogator will not have more than 70 per cent chance of making the right identification after five minutes of questioning. The original question, 'Can machines think?' I believe to be too meaningless to deserve discussion. Nevertheless I believe that at the end of the century the use of words and gen-




eral educated opinion will have altered so much that one will be able to speak of machines thinking without expecting to be contradicted. I believe further that no useful purpose is served by concealing these beliefs. The popular view that scientists proceed inexorably with well-established fact to well-established fact, never being influenced by any unproved conjecture is quite mistaken. Provided it is made clear which are proved facts and which are conjectures, no harm can result. Conjectures are of great importance since they suggest useful lines of research." (p. 442). (Pratt, *Thinking Machines,* p. 190; see also pp. 177-234). Lee, *Computer Pioneers*, pp. 670-78. *Origins of Cyberspace* 936. 43748

**58. Turing, Alan Mathison** (1912-54). Solvable and unsolvable problems. In *Science News* 31 (1954): 7-23. Whole number. 137pp. 8 plate leaves. 182 x 113 mm. Original printed soft covers, spine faded, small tears in lower front cover. Browned due to acidic paper but good otherwise. $500




**First Edition** of this important paper, published a few months before Turing's death by poisoning after eating an apple laced with cyanide. "Turing presents his ideas on computability from an unusual perspective and puts them in a distinctive light. The essay is playful, yet serious; strange, yet familiar; informal, yet proves rigorously the unsolvability of a decision problem" (Sieg, p. 332). Sieg, W., "Normal forms for puzzles: A variant of Turing's thesis," in Cooper and Van Leeuwen, eds., *Alan Turing: His Work and Impact*, pp. 332-339). Hodges, *Alan Turing*, pp. 494-495. 43761

VENARVM ET ITEM ARTERIARVM OMNIVM INTEGRA DELINEATIO, IN HOC POTISSIMVM PARATA, UT IN CONSPICUO ESSET, QUAENAM VENAE CUM arterijs porrigantur, & quae absq; arteriarum consortio per corpus repant, ac rursus cuiusmodi arterias Natura contingibus uenis destituerit.

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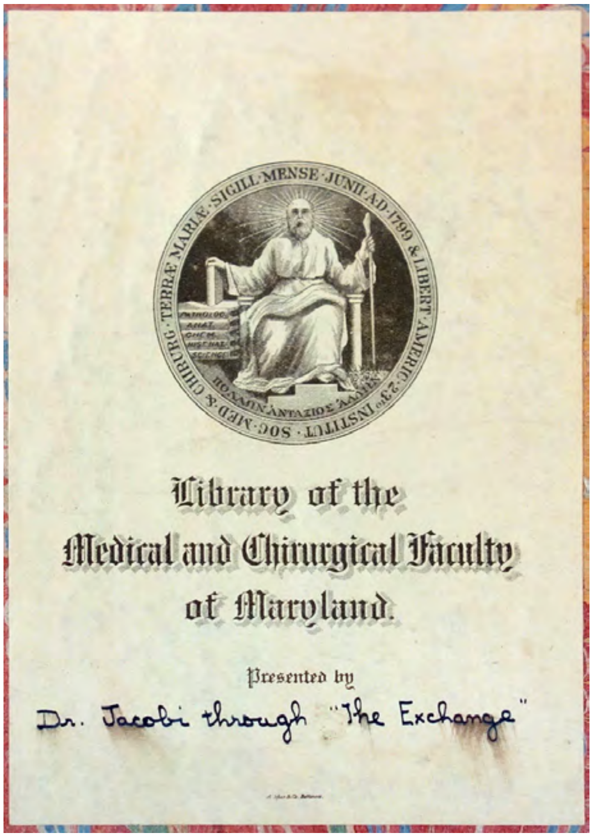
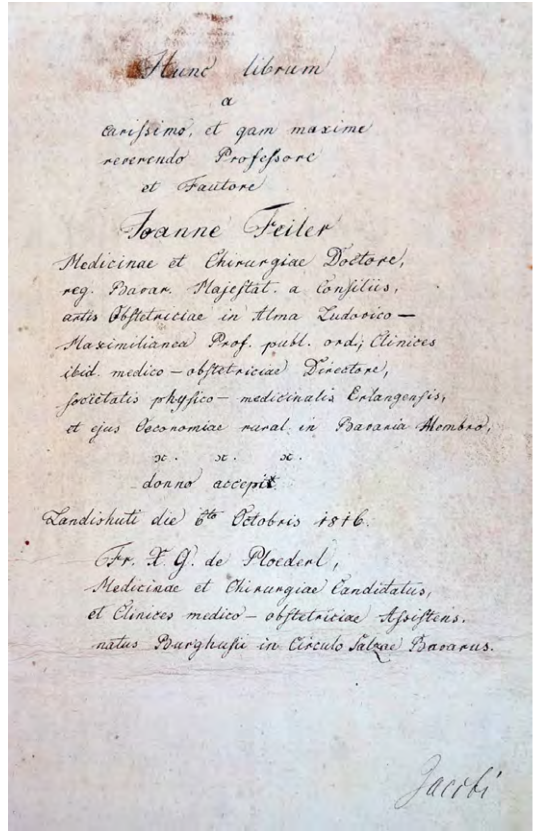
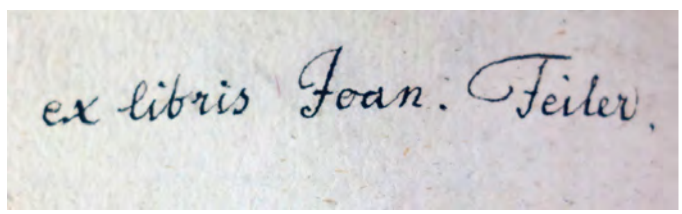


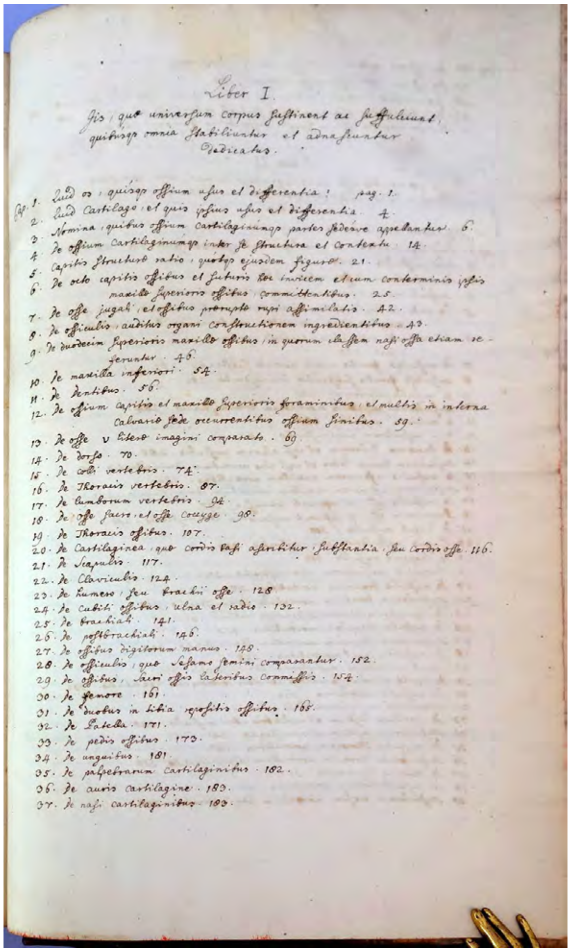

Abraham Jacobi's Copy of the 1555 Fabrica




**59.** **Vesalius, Andreas** (1514-64). De humani corporis fabrica libri septem. Folio. [12], 824, [48]pp. Five-page manuscript index in the hand of Bavarian obstetrician Johann Feiler (1786-1822), a former owner of this copy, bound in the back. Woodcut title, portrait, 2 woodcut folding plates, text woodcuts. Basel: Oporinus, 1555. 407 x 260 mm. 18th century calf, rebacked preserving original gilt spine and leather label, edges and corners repaired. Light toning, title a bit soiled and with small marginal lacuna, tears in first folding plate repaired at an early date, but a fine, clean copy with large margins. Long Latin inscription dated October 6, 1816 and signed "Jacobi" on the front flyleaf, noting that this copy was a gift from Feiler to "Fr. X. G. de Ploederl"; i.e. Franz Xavier Georg Plöderl (fl. early 19th cent.), author of a treatise on hysterectomy (*De hysterotomia*, 1820). Faint stamp on title and another leaf of pioneering American pediatrician Abraham Jacobi (1830-1919); bookplate of the Medical and Chirurgical Faculty of Maryland noting Jacobi's gift of this copy. $125,000

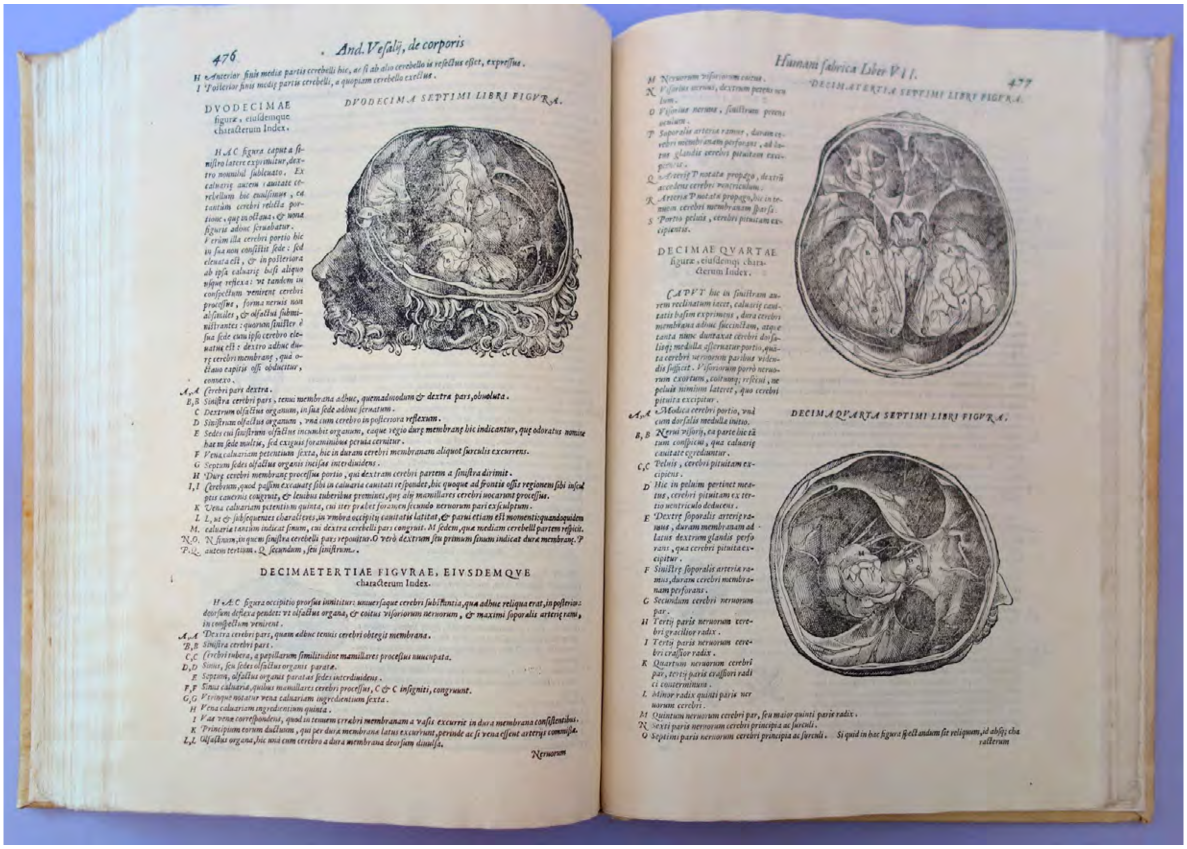
Second edition of the founding work of modern anatomy, containing the most beautiful and famous illustrations in the history of medicine, attributed to Jan van Calcar of the school of Titian. The 1555 edition was printed on heavier paper with larger type "with only 49 instead of 57 lines to the page, thus necessitating the recutting of all the small initial letters so that they would now fit seven lines of the new type. Indeed, an entirely new wood-block was cut for the frontispiece . . .

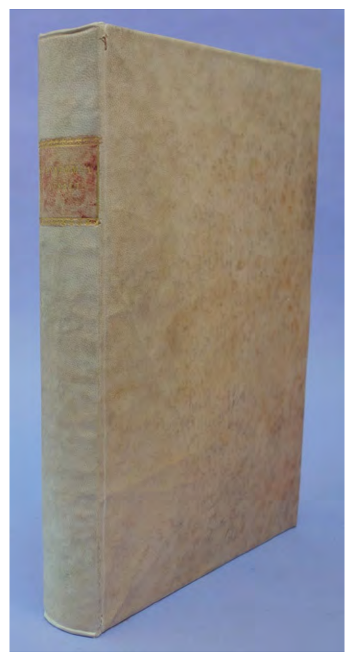
"Vesalius made some definite improvements in the text which have been cited by Garrison, such as concern the ethnic aspects of craniology, but more particularly in connection with his physiological observations in the last




chapter, *viz.*, (i) the effect of nerve section [p. 810, lines 22-34], (ii) persistence of life after splenectomy [p. 820, lines 26-31], (iii) collapse of the lungs on puncture of the chest [p. 821, lines 25-31], (iv) aphonia from section of the laryngeal nerve [p. 823, lines 25-31], (v) prolongation of life by artificial intratracheal inflation of collapsed lungs [p. 824, lines 8-14]" (Cushing, pp. 90-92).

This copy includes an 18th-century manuscript index to the work by Bavarian obstetrician Johann Feiler, which clearly indicates that Feiler had both read the *Fabrica* and regarded it as an important reference. Feiler later gave this copy to Franz X. G. Plöderl, who was most likely Feiler's student. Afterwards this copy was owned by American pediatrician Abraham Jacobi, who opened the first children's clinic in the U.S. at Mount Sinai Hospital in New York. Garrison-Morton.com 377. Cushing, *Bio-Bibliography of Andreas Vesalius, VI.A.-3*. For Feiler see Hirsch, *Biographisches Lexikon herforragender Aerzte vor 1880*. 43495

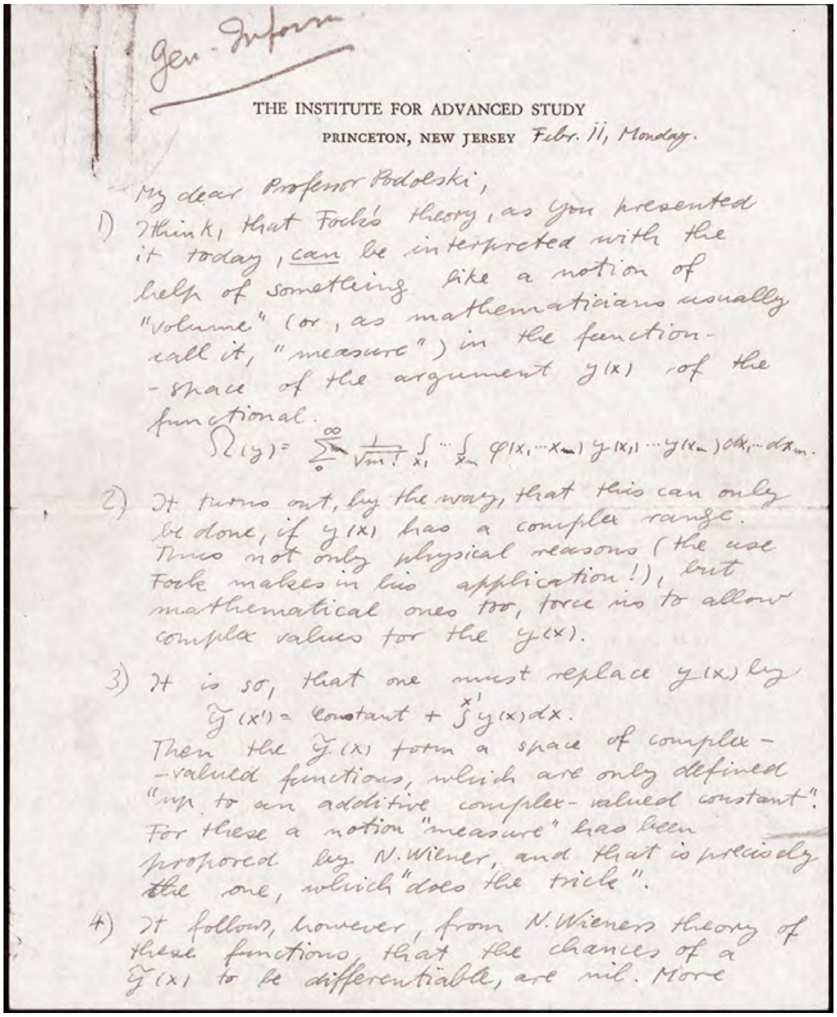


**60. Vesalius, Andreas** (1514-64). Anatomia: Addita nunc postremo etiam antiquorum anatome. Folio. [8, including engraved title by Francisco Valegio], 510, [46], [20]pp. Woodcut text illustrations by Joannes Criegher after the original Vesalian woodcuts. The last 20 pages consist of a separately titled appendix: Universa antiquorum anatome tam ossium, quam partium & externarum, & internarum ex Rufo Ephesio medico antiquissimo: Tribus tabellis explicate per Fabium Paulinum . . . Venice: apud Joan. Anton. et Iacobum de Franciscis, [1604]. 318 x 216 mm. Modern vellum. Margins of first and last signatures repaired, title a bit soiled, half-title (Cushing's *1) bound after engraved title (Cushing's *2), signature Xx bound after Yy. Upper margin of title inscribed "Inclita Nationis Polona Patavii Sumptibus," faint ownership inscription dated 1677 on verso title, partly effaced inscription ("Sumptibus nationis emptus") on dedication leaf. Very good.

$15,000

Fifth edition of the *Fabrica*. The typography of this edition closely follows that of the fourth edition, issued in 1568 by the Venetian printer Francesco Senense, father of Giovanni Antonio and Jacopo de Franceschi. This fifth edition also reprints the reduced-size woodblocks prepared by Joannes Criegher for the fourth edition. "The sons of Francesco Senense must have come into possession of Criegher's carefully engraved wood-blocks and when in 1604 their father's edition of 1568 presumably became sold out, they decided to issue another in precisely the same format . . . Fabricius of Acquapendente was by now professor of anatomy at Padua, and it was in all likelihood the student text he recommended. Additions to the book were a title-page handsomely engraved on copper and an additional series of anatomical tables with a new title-page and privilege giving the date of publication which was absent on the frontispiece" (Cushing, p. 93). Cushing, *A Bio-bibliography of Andreas Vesalius*, VI.A-5. 43649


Gen.-Inform.

THE INSTITUTE FOR ADVANCED STUDY
PRINCETON, NEW JERSEY Febr. 11, Monday.

My dear Professor Podolski,

1) I think, that Fock's theory, as you presented it today, can be interpreted with the help of something like a notion of "volume" (or, as mathematicians usually call it, "measure") in the function-space of the argument $y(x)$ of the functional.

$$\Omega(y) = \sum_{0}^{\infty} \frac{1}{\sqrt{m!}} \int_{x_1} \cdots \int_{x_m} \varphi(x_1, \cdots x_m)\, y(x_1) \cdots y(x_m)\, dx_1 \cdots dx_m .$$

2) It turns out, by the way, that this can only be done, if $y(x)$ has a complex range. Thus not only physical reasons (the use Fock makes in his application!), but mathematical ones too, force us to allow complex values for the $y(x)$.

3) It is so, that one must replace $y(x)$ by

$$\tilde{y}(x') = \text{Constant} + \int^{x'} y(x)\,dx .$$

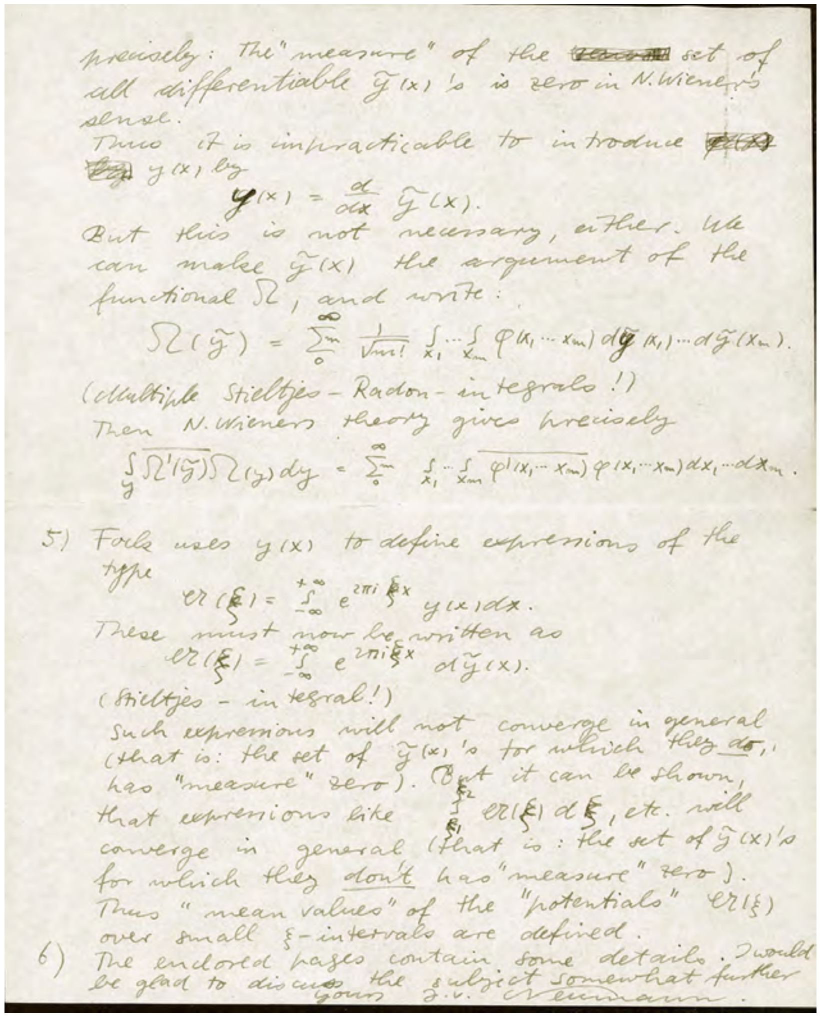
Then the $\tilde{y}(x)$ form a space of complex-valued functions, which are only defined "up to an additive complex-valued constant". For these a notion "measure" has been proposed by N. Wiener, and that is precisely the one, which "does the trick".

4) It follows, however, from N. Wieners theory of these functions, that the chances of a $\tilde{y}(x)$ to be differentiable, are nil. More

## *Autograph Letter and 6-Page Working Manuscript on the Mathematical Formulation of Quantum Mechanics*

**61. Von Neumann, John** (1903-57). Autograph letter signed, 2 pages, to Russian-American physicist Boris Podolsky (1896-1966), with accompanying 6-page working mathematical manuscript, on stationery of the Institute for Advanced Study. Princeton, "Febr. 11, Monday" [Feb. 11, 1935]. 8pp. total on 4 sheets. 172 x 141 mm. (letter); 255 x 204 mm. (manuscript). Light rust stain from paper clip, otherwise fine, written in von Neumann's small, legible hand. $50,000

**Extraordinarily Rare Autograph Letter** and 6-page manuscript in English, concerning the mathematical formulation of quantum mechanics, by John von Neumann. Both the letter and manuscript show von Neumann's method of working out a mathematical problem or concept: As his train of thought progressed, he neatly crossed out certain words, phrases and equations and replaced them with corrected versions. Autograph material by von Neumann is of the greatest rarity on the market: Rare Book Hub, which tracks auction records and catalogue sales back to the 19th century, does not record any sales of such materials. This is the first autograph letter and the only autograph manuscript by von Neumann that we have seen or heard of on the market in 51 years.



precisely: The "measure" of the set of all differentiable $\tilde{y}(x)$'s is zero in N. Wiener's sense.
Thus it is impracticable to introduce $y(x)$ by

$$y(x) = \frac{d}{dx}\tilde{y}(x).$$

But this is not necessary, either. We can make $\tilde{y}(x)$ the argument of the functional $\Omega$, and write:

$$\Omega(\tilde{y}) = \sum_{0}^{\infty}{}_{m} \frac{1}{\sqrt{m!}} \int_{x_1}\cdots\int_{x_m} \varphi(x_1\cdots x_m)\, d\tilde{y}(x_1)\cdots d\tilde{y}(x_m).$$

(Multiple Stieltjes–Radon–integrals!)
Then N. Wieners theory gives precisely

$$\int_{y} \overline{\Omega'(\tilde{y})}\,\Omega(y)\,dy = \sum_{0}^{\infty}{}_{m} \int_{x_1}\cdots\int_{x_m} \overline{\varphi'(x_1\cdots x_m)}\,\varphi(x_1\cdots x_m)\,dx_1\cdots dx_m.$$

5) Fock uses $y(x)$ to define expressions of the type

$$\mathfrak{U}(\xi) = \int_{-\infty}^{+\infty} e^{2\pi i \xi x}\, y(x)\,dx.$$

These must now be written as

$$\mathfrak{U}(\xi) = \int_{-\infty}^{+\infty} e^{2\pi i \xi x}\, d\tilde{y}(x).$$

(Stieltjes – integral!)
Such expressions will not converge in general (that is: the set of $\tilde{y}(x)$'s for which they do, has "measure" zero). But it can be shown, that expressions like $\int_{\xi_1}^{\xi_2} \mathfrak{U}(\xi)\,d\xi$, etc. will converge in general (that is: the set of $\tilde{y}(x)$'s for which they don't has "measure" zero). Thus "mean values" of the "potentials" $\mathfrak{U}(\xi)$ over small $\xi$-intervals are defined.
6) The enclosed pages contain some details. I would be glad to discuss the subject somewhat further.
Yours J.v. Neumann.

During his relatively short life (he died of cancer at age 53), von Neumann made great contributions to mathematics, physics, economics and computing. His work in computing was probably as significant, though slightly less well known, than that of Alan Turing. Like Turing, von Neumann died in his prime; had both lived normal lifespans it is likely that the early history of computing, as well as other sciences in which they worked, would have been very significantly different.

In physics von Neumann derived the key formulas of quantum statistics (1927), established the mathematical framework for quantum mechanics (Dirac-von Neumann axioms) in his *Mathematische Grundlagen der Quantenmechanik* (1932); translated as *Mathematical Foundations of Quantum Mechanics* (1956), introduced quantum logics, and developed the von Neumann entropy. Von Neumann was also one of the five original members of Princeton's Institute for Advanced Study, and a key member of the Manhattan Project.

Von Neumann's abilities as a lightning calculator were legendary, as recorded by several of his contemporaries, including his collaborator Herman Goldstine. He could perform complex mathematical calculations in his head with amazing speed, and was frequently asked to solve equations that had stumped other outstanding mathematicians. This he would sometimes do while standing in a corner at a party for a few minutes. He was also known for his ability to recite entire novels from memory, and for his "inexhaustible supply of dirty jokes"! The physicist Eugene Wigner, with whom von Neumann collaborated, compared von Neumann's mind to "a perfect instrument whose gears were machined to mesh accurately to a thousandth of an inch." Of von Neumann's remarkable intellect, physicist Hans Bethe once said, "I have sometimes wondered whether a brain like von Neumann's does not indicate a species superior to that of man" (quoted in Blair, p. 90).

During the late 1920s and 1930s von Neumann devoted considerable creative energy to the mathematical formulation of quantum mechanics, building upon the work of Dirac:

> Although Schrödinger himself after a year proved the equivalence of his wave-mechanics and Heisenberg's matrix mechanics, the reconciliation of the two approaches and their modern abstraction as motions in Hilbert space is generally attributed to Paul Dirac, who wrote a lucid account in his 1930 classic *The Principles of Quantum Mechanics.* He is the third, and possibly most important, pillar of that field (he soon was the only one to have discovered a relativistic generalization of the theory). In his above-mentioned account, he introduced the bra–ket notation, together with an abstract formulation in terms of the Hilbert space used in functional analysis; he showed that Schrödinger's and Heisenberg's approaches were two different representations of the same theory, and found a third, most general one, which represented the dynamics of the system. His work was particularly fruitful in all kinds of generalizations of the field.
>
> The first complete mathematical formulation of this approach, known as the Dirac–von Neumann axioms, is generally credited to John von Neumann's 1932 book *Mathematical Foundations of Quantum Mechanics,* although Hermann Weyl had already referred to Hilbert spaces (which he called *unitary spaces*) in his 1927 classic paper and book. It was developed in parallel with a new approach to the mathematical spectral theory based on linear operators rather than the quadratic forms that were David Hilbert's approach a generation earlier. Though theories of quantum mechanics continue to evolve to this day, there is a basic framework for the mathematical formulation of quantum mechanics which underlies most approaches and can be traced back to the mathematical work of John von Neumann. In other words, discussions about *interpretation* of the theory, and extensions to it, are now mostly conducted on the basis of shared assumptions about the mathematical foundations (Wikipedia, "Mathematical formulation of quantum mechanics").

Von Neumann wrote the present autograph letter and its accompanying manuscript to the Russian-American physicist Boris Podolsky, best known for his collaboration with Albert Einstein and Nathan Rosen on the famous "EPR" (Einstein-Podolsky-Rosen) paper (1935) challenging the assumption that quantum mechanics could provide a complete description of physical reality. Born in Russia, Podolsky moved to the United States in 1913 and received a BS in Electrical Engineering and MS in mathematics from the University of Southern California. He received his Ph.D. in Theoretical Physics from Caltech (under Paul Sophus Epstein) in 1928. Podolsky joined the Institute for Advanced Study in September 1934, shortly after returning from the Ukrainian Institute of Physics and Technology where he had worked with Paul Dirac (1902-84) and the eminent Russian theoretical physicist Vladimir Fock (1898-1974) on problems in quantum electrodynamics. This experience resulted in papers that he co-authored with Dirac and Fock: "On quantum mechanics" (1932, with Dirac and Fock), "Zur Dirac'schen Quantenelektrodynamik" (1932, with Fock), "Interaction of the charges of Dirac's theory" (1932, with Fock), and "Derivation of Moller's formula from Dirac's theory" (1932, with Fock). Podolsky's paper with Dirac was of special significance, as explained by Dirac's biographer:

> While the physicists of the Copenhagen school reacted negatively to Dirac's theory, the Russian physicists found it interesting and promising. Vladimir Fock, Boris Podolsky, and K. Nikolsky developed aspects of the theory in several papers. For example Fock and Podolsky extended Dirac's one-dimensional treatment of two interacting electrons to the more realistic case of three dimensions. They obtained the expected result, a Coulomb interaction term with the correct sign.
>
> At that time, Dirac knew that his new theory of quantum electrodynamics was mathematically equivalent to that of Pauli and Heisenberg . . . One senses . . . [that] Dirac was not willing to admit that the mathematical equivalence implied a physical equivalence. He therefore continued to develop his approach, which half a year later resulted in a paper, co-authored by Fock and Podolsky, in the newly founded *Physikalische Zeitschrift der Sowietunion*. Dirac knew Fock and Podolsky from his travels to Russia, and Fock was an old acquaintance whom he had first met in the spring of 1927, during his stay in Göttingen . . . The Dirac-Fock-Podolsky theory germinated in discussions Dirac had with Fock and Podolsky in September 1932, when they all attended a conference on the theory of metals held in Leningrad. After the conference Dirac went to the Crimea, where he vacationed with Kapitza, and on his way back to Moscow he stopped in Kharkov to discuss his new quantum electrody-

namics with Podolsky. Fock and Podolsky had recently proposed a new formalism for the quantization of the electromagnetic field which Dirac found more suitable for his purpose than the earlier formalism of Jordan and Pauli, so he agreed to write a joint paper, which was complete in late October 1932. The three authors derived the fundamental equations of quantum electrodynamics in a relativistically covariant way and proved that the equations yielded the Maxwell equations as conditions on the q-number wave function. In earlier formulations, such as the Heisenberg-Pauli theory, the covariance was far from clear, a result that Dirac traced back to a certain lack of symmetry between space and time coordinates in these theories; in the earlier formulations each electron was supplied with a separate space coordinate, but all particles were given the same time parameter. In the Dirac-Fock-Podolsky paper a lucid proof of Lorentz invariance was obtained by making use of the idea of multiple times: In addition to the common time for the entire system of particles field (T), a separate field time (t) and separate times for each particle . . . The representation used by Dirac, Fock, and Podolsky later proved to be useful in cases of interaction in general, and today it is known as the "interaction representation" or "interaction picture," sometimes called the "Dirac picture" (Kragh, *Dirac: A Scientific Biography* [1990], pp. 136-38).

Recognizing the significance of Podolsky's work, Einstein wrote a letter of recommendation to the founding director of the IAS, describing Podolsky as "one of the most brilliant of the younger men who has worked and published with Dirac" (quoted in Thomas).

On February 11, 1935 (so we can infer from von Neumann's letter), Podolsky gave a presentation at the IAS during which he discussed "Fock's theory"—most likely Fock's invention in 1931-32 of what is now called "Fock-space representation," the first and best known of the formalisms known as second quantizations that are used in quantum field theory to describe and analyze many-body systems. Later that day, in response to Podolsky's presentation, von Neumann composed the present letter and accompanying manuscript in which he discussed the normalization of second-quantized fields; i.e. the use of a constant or function in a probability equation to ensure that the sum of all probabilities equals one. Von Neumann spells out mathematically how this is to be done:

1. I think, that Fock's theory, as you presented it today, can be interpreted with the help of something like a notion of "volume" (or, as mathematicians usually call it, "measure") in the function-space of the argument $y(x)$ of the functional . . .

$$\Omega(y) = \sum_{0}^{\infty} m \frac{1}{\sqrt{m!}} \int_{x_1} \dots \int_{x_m} \varphi(x_1 \dots x_m)\, y(x_1) \dots y(x_m)\, dx_1 \dots dx_m$$

2. It turns out, by the way, that this can only be done, if $y(x)$ has a complex range. Thus not only physical reasons (the use Fock makes in his application!), but mathematical ones too, force us to allow complex values for the $y(x)$.

3. It is so, that one must replace $y(x)$ by

$$\tilde{y}(x^1) = constant + \int^{x^1} y(x)dx$$

   Then the $\ddot{y}(x)$ form a space of complex-valued functions, which are only defined "up to an additive complex-valued constant." For these a notion "measure" has been proposed by N. Wiener, and that is precisely the one, which "does the trick."

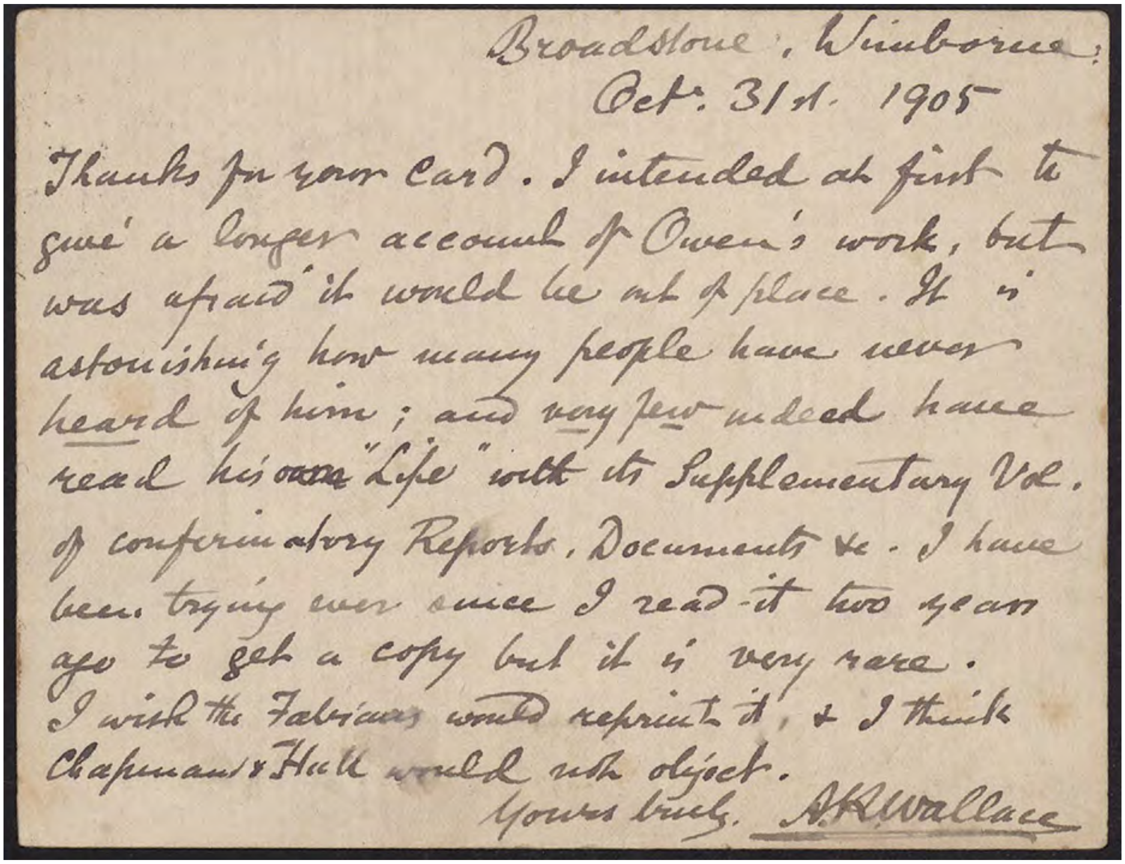
4. It follows, however, from N. Wiener's theory of these functions, that the chances of a $\ddot{y}(x)$ to be differentiable, are nil. More precisely: The "measure" of the set of all differentiable $\ddot{y}(x)$'s is zero in N. Wiener's sense . . .

"N. Wiener" refers to Norbert Wiener (1894-1964), the brilliant American mathematician, known for his famous work *Cybernetics* (1948). In the early 1920s Wiener made fundamental contributions to the mathematical study of measures, known as measure theory (the concepts of "Wiener space" and "Wiener process" grew out of this work), and in the early 1930s Wiener helped to make probability theory a "respectable mathematical discipline" by introducing "large infusions of measure theory" (Adams and Guillemin, *Measure Theory and Probability,* p. ix). Wiener and von Neumann were friends who often spent time together; they most probably first met at Göttingen when Wiener was studying there during the years 1924 – 26.

In both the letter and accompanying manuscript von Neumann mentions the "Stieltjes-Radon integral," which is used in probability and stochastic processes. This integral was named for the mathematicians Thomas Joannes Stieltjes (1856-94) and Johann Radon (1887-1956).

At the end of his letter von Neumann refers Podolsky to "the enclosed [6] pages [which] contain some details" and offers to "discuss the subject somewhat further." We do not know whether Podolsky took von Neumann up on his offer, but any collaboration between the two would have been cut short by Podolsky's leaving the IAS on June 30, 1935 to take a post as professor of mathematical physics at the University of Cincinnati. Podolsky left the IAS under a cloud: Prior to the EPR paper's publication he had leaked an advance report of its contents to the New York *Times*, which published an article on May 4, 1935 headed "Einstein Attacks Quantum Theory." This indiscretion so upset Einstein that he gave a statement to the *Times* saying that the report "was given to you without my authority. It is my invariable practice to discuss scientific matters only in the appropriate forum and I deprecate advance publication of any announcement in regard to such matters in the secular press" (quoted in Thomas). Einstein never spoke to Podolsky again.

Letters by von Neumann are exceptionally rare. The only letter by him that we can recall trading during our 51 years of experience was a typed letter from von Neumann presenting a copy of his *Theory of Games and Economic Behavior* to Warren Weaver. Rédei and Stölltnzer, in their *John von Neumann and the Foundations of Quantum Physics*, include a section of "Unpublished Correspondence" by von Neumann (pp. 225-29) selected from his archive at the Library of Congress. None of the four letters, which they deem of special significance, includes any mathematics. Blair, "Passing of a great mind," *Life* (February 25, 1957): 89-104. Heims, *John von Neumann and Norbert Wiener* (1980). Thomas, Kelly Devine, "The Advent and Fallout of EPR." Institute for Advanced Study, Fall 2013. Web. Accessed 05 Jan. 2016. Wigner, *Historical and Biographical Reflections and Syntheses* (2002), p. 129. Rédel and Stöltzner, editors, *John von Neumann and the Foundations of Quantum Physics* (2001). Personal communications from John Clauser. 43736



Broadstone, Wimborne:
Oct. 31st. 1905

Thanks for your card. I intended at first to give a longer account of Owen's work, but was afraid it would be out of place. It is astonishing how many people have never heard of him; and very few indeed have read his own "Life" with its Supplementary Vol. of confirmatory Reports, Documents &c. I have been trying ever since I read it two years ago to get a copy but it is very rare. I wish the Fabians would reprint it, & I think Chapman & Hall would not object.

Yours truly. A R Wallace

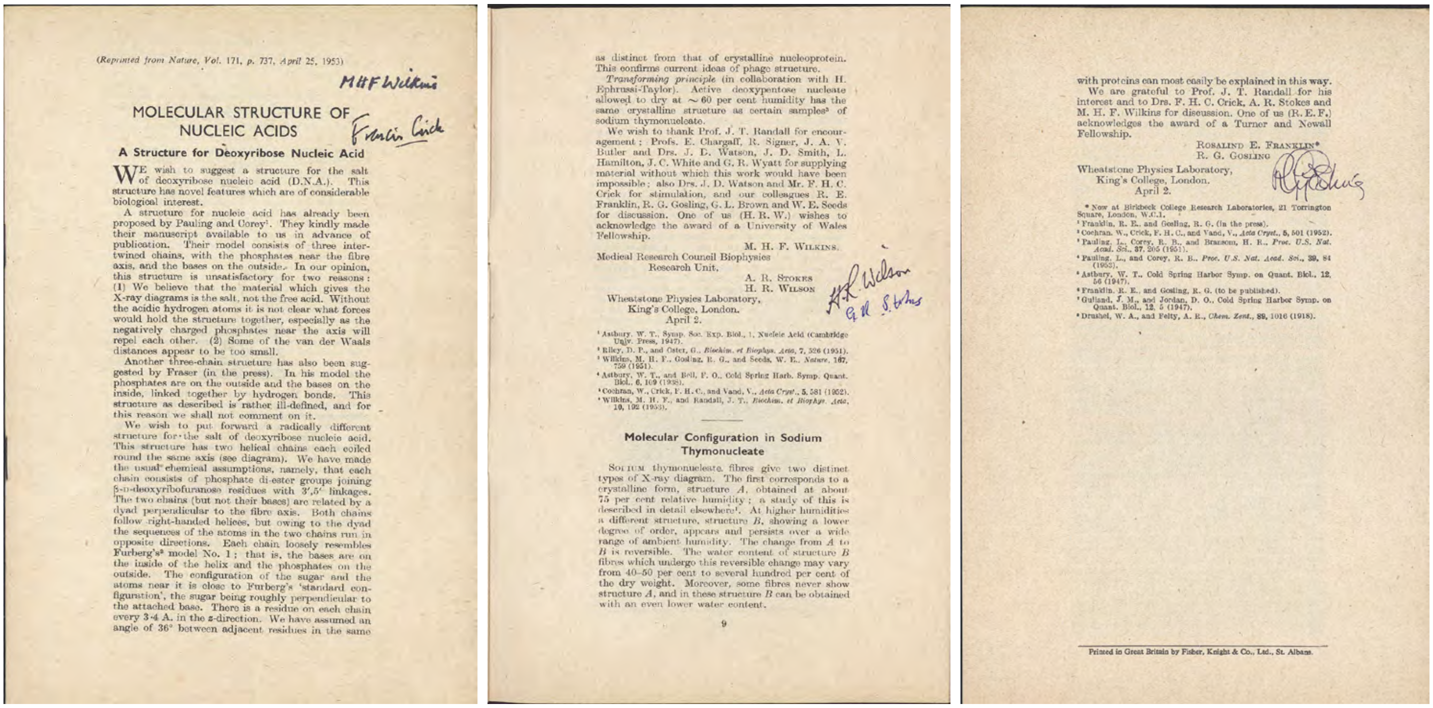
**62. Wallace, Alfred Russel** (1823-1913). Autograph postcard signed to Edward Deacon Girdlestone (1829-92). Broadstone, Wimborne, Oct. 31, 1905. 90 x 115 mm. Faint foxing but fine otherwise.

$1500

From Alfred Russel Wallace, co-creator with Darwin of the theory of evolution by natural selection, to socialist clergyman and author Edward Deacon Girdlestone, discussing Wallace's recently published *My Life* (1905):

> Thanks for your card. I intended at first to give a longer account of Owen's work, but was afraid it would be out of place. It is astonishing how many people have never heard of him; and very few indeed have read his own "Life" with its Supplementary Vol. of confirmatory Reports, Documents &c. I have been trying ever since I read it two years ago to get a copy but it is very rare. I wish the Fabians would reprint it, & I think Chapman & Hall would not object. Yours truly, A. R. Wallace.

Wallace is referring here to British industrialist and social reformer Robert Owen (1771-1858), one of the founders of utopian socialism, whom Wallace discussed at length in *My Life*. In his note to Girdlestone Wallace mentions Owen's *Life of Robert Owen Written by Himself* (1857-58), the second volume of which is subtitled "A supplementary appendix to the first volume . . . containing series of reports, addresses, memorials, and other documents referred to in that volume, 1808-1820" (no further volumes were published). "Fabians" refers to the Fabian Society, the influential British socialist organization (est. 1884) that founded Britain's Labour Party and the London School of Economics. Wallace became a socialist in 1875, supporting land reform and other progressive causes; he also emulated Owen in embracing spiritualism in his later years. 43741

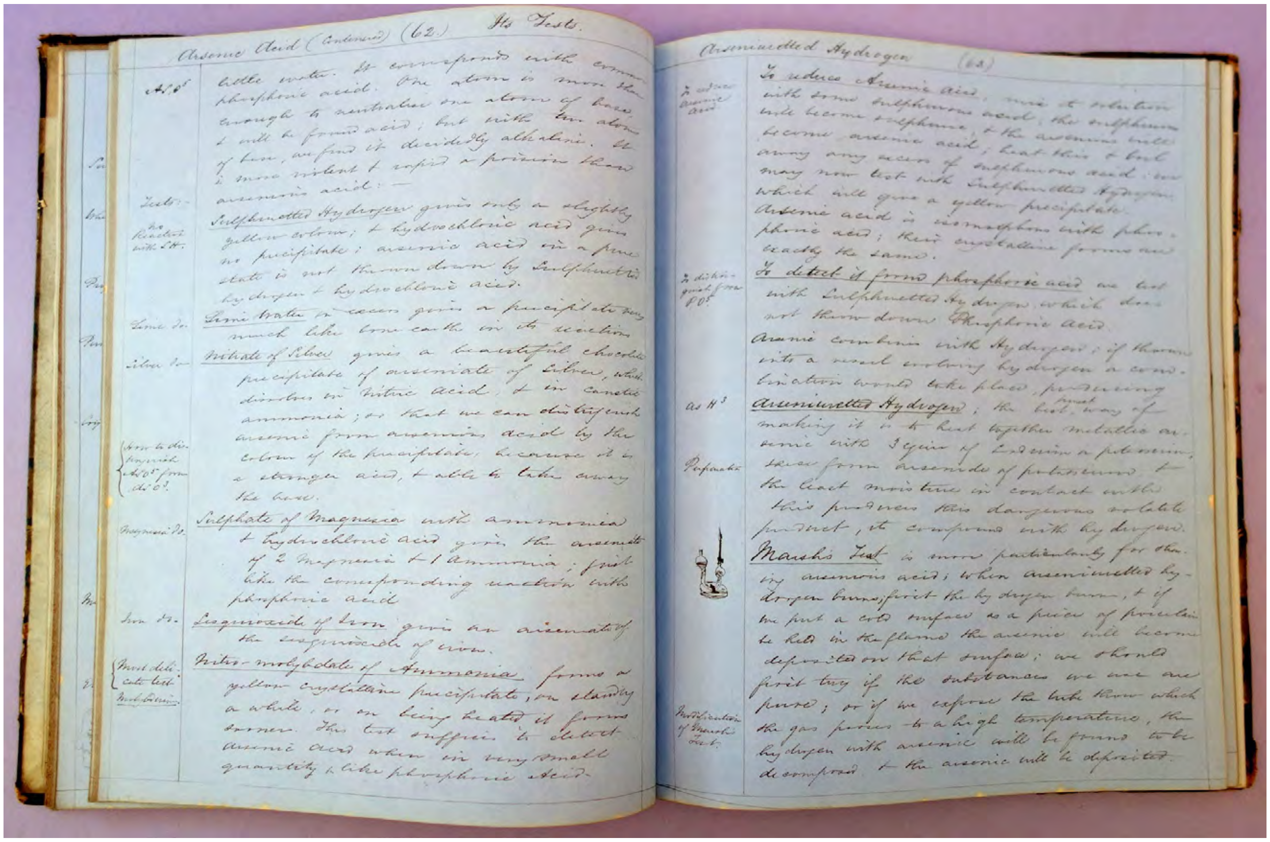


*The Double Helix—The "Three-Paper" Offprint, Signed by Five of its Authors*

**63. Watson, James D.** (1928- ) & **Francis H. C. Crick** (1916-2004). Molecular structure of nucleic acids. A structure for deoxyribose nucleic acid. With: Wilkins, Maurice (1916-2004); Stokes, A. R.; & Wilson, H. R. Molecular structure of deoxypentose nucleic acids. With: Franklin, Rosalind (1920-58) and Gosling, R. G. Molecular configuration in sodium thymonucleate. Together three papers in a single offprint from *Nature* 171, no. 4356 (April 25, 1953). 8vo. 13, [1]pp. 211 x 141 mm. Without wrappers as issued. *Signed by Francis Crick and Maurice Wilkins on the first page, by H. R. Wilson and A. R. Stokes on p. 9, and by R. G. Gosling on the last page.* Very good condition. $45,000

**First Editions, Offprint Issue.** Watson and Crick's discovery of the double-helical structure of DNA is the most important medical and biological discovery of the twentieth century. Their paper first appeared in the scientific journal *Nature,* grouped, under the general title "The molecular structure of nucleic acids," with two other seminal papers on DNA: "Molecular structure of deoxypentose nucleic acids," by Maurice Wilkins, A. R. Stokes and H. R. Wilson; and Rosalind Franklin and Raymond Gosling's "Molecular configuration in sodium thymonucleate," which contains Franklin's famous x-ray photograph of DNA. The journal publication of the three papers was followed by this "three-paper" offprint for distribution by the various authors. In 1962, Watson, Crick and Wilkins shared the Nobel Prize in Physiology or Medicine. Because Franklin had died in 1958 she could not share in the Nobel Prize.

As much as the general educated public appreciates the discovery of the double helix today, when the papers were published in 1953 they were only understood and appreciated by the few workers in the field. Thus, Rosalind Franklin was never asked to sign a copy of this offprint, and none exist with her signature. This copy is signed by all the remaining participants except Watson. Grolier, *100 Books Famous in Medicine,* 99. Judson, *Eighth Day of Creation*, pp. 145-56. Dibner, *Heralds of Science*, 200. 43757

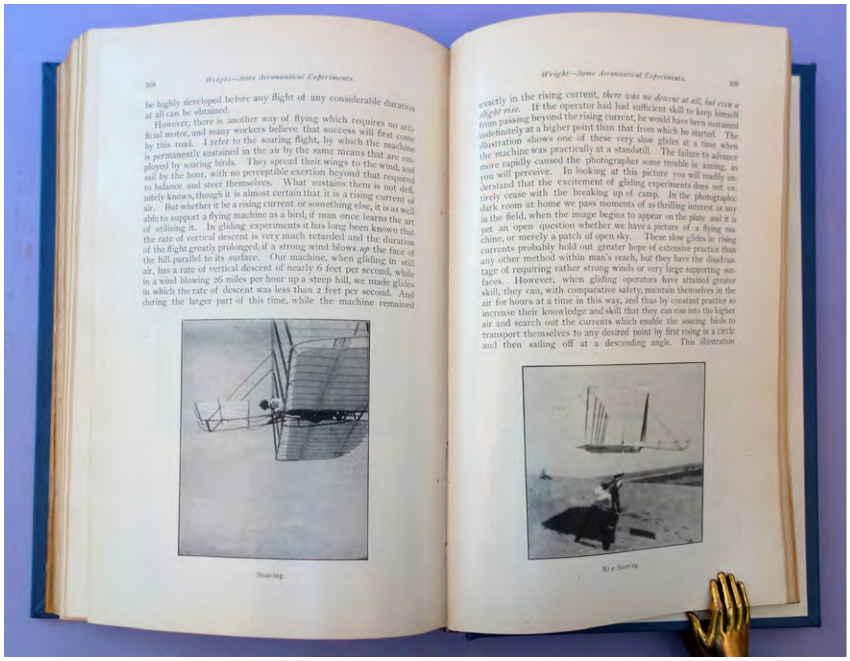


**64. Williamson, Alexander William** (1824-1904). Lectures on by Professor Williamson University College London. Manuscript lecture notes and drawings in the hand of a student, Thomas F[ould] H. Green. 140pp. London, 1857. 253 x 203 mm. Original half sheep, marbled boards, spine worn and chipped, light edgewear. Very good. Bookplate and stamp of the Birmingham Medical Institute.

$1250

Williamson studied chemistry at the University of Giessen under Justus Liebig, the founder of organic chemistry. Williamson was chair of general chemistry and professor of analytical and practical chemistry at University College, London, and is best known for developing what is now called the Williamson ether synthesis, an organic reaction that forms an ether from an organohalide and an alcohol. The Williamson ether synthesis helped to prove the chemical structure of ethers.

These notes of Williamson's lectures cover topics such as the properties of certain metals and metalloids such as antimony, bismuth, tin, silver, gold, copper and lead, as well as compounds made from these substances. Pages 129-140 are devoted to organic chemistry, defined as "the chemistry of compound radicals . . . derived from animal or vegetable matter"; as Liebig's student, Williamson would have played a role in disseminating his teacher's views and discoveries to his British students. The notes were written by Thomas Fould H. Green, a medical student at University College who won certificates of honor in anatomy and pathological anatomy in 1858 (see the *Medical Times and Gazette* for August 7, 1858, page 152). 42785

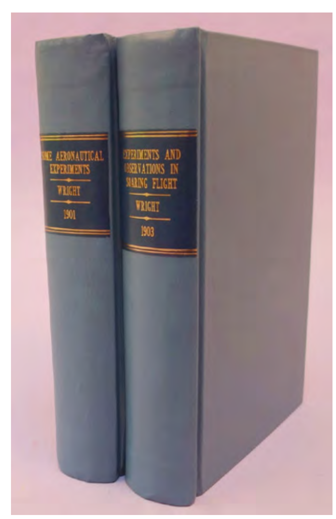


## *Invention of the Airplane*

**65. Wright, Wilbur** (1867-1912). (1) Some aeronautical experiments. In *Journal of the Western Society of Engineers* 6 (1901): 489-510. (2) Experiments and observations in soaring flight. In *Journal of the Western Society of Engineers* 8 (1903): 400-417. Together two journal volumes. 222 x 145 mm. Modern cloth. Library stamps on title pages; stamp of the Massachusetts Institute of Technology on lower edge of 1903 volume., but otherwise very good clean copies. $7500

**First Editions**, journal issues. The first paper, "Some aeronautical experiments," was the Wright brothers' first publication on aeronautics, and the work that first made their experiments with motorless gliders known to the world. The paper describes the brothers' progress over three seasons of glider flight, during which they mastered the art of flight control and solved the problem of wing warp drag by the addition of a vertical rear rudder. Wright presented this paper to the Western Society of Engineers at the urging of Octave Chanute, who was to a large degree responsible for encouraging the Wright brothers' early work; the paper is prefaced by some remarks by Chanute discussing the possibility of motorized flight using a new lightweight steam or gas engine.

Wright's second paper, "Experiments and observations in soaring flight," includes the first account of his and Orville's attempts with motorized gliders. The brothers made their first powered flight (852 feet in 59 seconds) on 17 December 1903, six months after this report was read before the Western Society of Engineers. Of the work described in their second paper Wilbur later testified in 1912: "This was the first time in the history of the world that lateral balance had been achieved by adjusting wing tips to respectively different angles of incidence on the right and left sides. It was also the first time that a vertical vane had been used in combination with wing tips, adjustable to respectively different angles of incidence, in balancing and steering an aeroplane . . . We were the first to functionally employ a movable vertical tail in a flying aeroplane. We were the first to employ wings adjustable to respectively different angles of incidence in a flying aeroplane. We were the first to use the two in combination in a flying aeroplane" (quoted in Freudenthal, *Flight into History: The Wright Brothers and the Air Age,* p. 60). These were the key discoveries made by the Wrights. When they applied for a patent on their work it was on their system of control and stability in a glider. Their key patent did not concern motorized airplanes. Dibner, *Heralds of Science*, 185. Gibbs-Smith, *The Invention of the Aeroplane 1799-1909,* pp. 37-40; 46-47. 43690



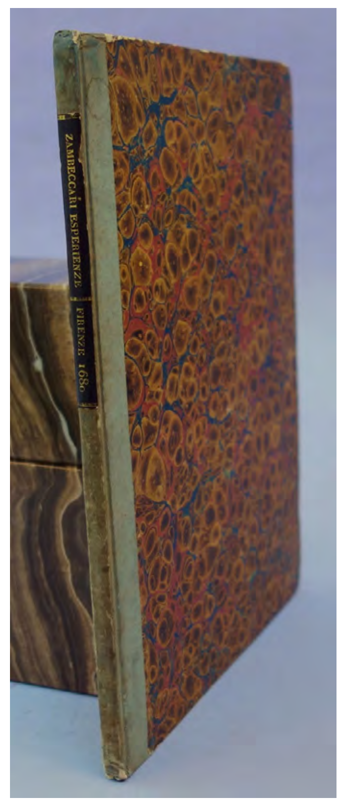
## *Proof that the Spleen is Not Essential to Life*


ESPERIENZE
DEL DOTTOR GIVSEPPE
ZAMBECCARI
Intorno
A DIVERSE VISCERE
tagliate a diversi Animali viventi,
*E da lui scritte, e dedicate*
All'Illustrissimo Signore
FRANCESCO REDI.
IN FIRENZE MDCLXXX.
Per Francesco Onofri. *Con licenza de' Superiori.*

**66. Zambeccari, Giuseppe** (1655-1728). Esperienze . . . intorno a diverse viscere tagliate a diversi animali viventi . . . dedicate all'illustrissimo Signore Francesco Redi. 4to. 30, [2]pp. Florence: Francesco Onofri, 1680. 250 x 182 mm. 19th-century marbled boards, paper spine with printed label, spine a bit soiled, light wear. Minimal spotting, staining on last few leaves but very good. Bookplate. $9500

**First Edition.** One of the earliest works on experimental surgery, containing proof that the spleen is not essential to life. The *Esperienze* was the only book published by Zambeccari during his lifetime, and it has always been a rarity in commerce.

Zambeccari, the son of a government official, studied medicine at Pisa, where one of his professors was the anatomist Lorenzo Bellini. After graduating in 1679, Zambeccari moved to Florence where he continued his medical studies under Francesco Redi. In 1680, with Redi's encouragement, Zambeccari performed the series of physiological experiments for which he is now known; these consisted of removing various organs from live dogs and other animals in order to gain a better understanding of the organs' functions.




> One of the first series of experiments dealt with the removal of the spleen; several of the animals operated upon survived, and a few months later they were killed and carefully examined in order to discover what anatomical, pathological, and physiological changes had been caused by the removal of the organ. . . . Turning to the study of other organs, Zambeccari performed unilateral nephrectomies and discovered that the animal apparently was not incommoded by the operation. In other experiments he tied the common bile duct and thus demonstrated that bile is not formed in the gall bladder, as was often the common belief. Encouraged by the results of his experiments, he not only removed the bile duct but also fragments of hepatic tissue, and even entire lobes of the liver, always finding that a good percentage of the animals survived the operation. Zambeccari performed a resection of the cecum and finally went so far as to remove the pancreas and to ligate the mesenteric veins. He also studied the eyes and noted that pricking the cornea of various animals rapidly leads to the reconstitution of the aqueous humor (*Dictionary of Scientific Biography).*

Garrison-Morton.com 3761. "Zambeccari, Giuseppe," The Galileo Project (internet resource). 43724