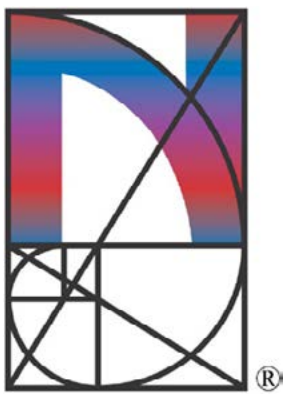
Catalogue 79:

Classics of Science & Technology

Featuring Electricity, Computing & Telecommunications



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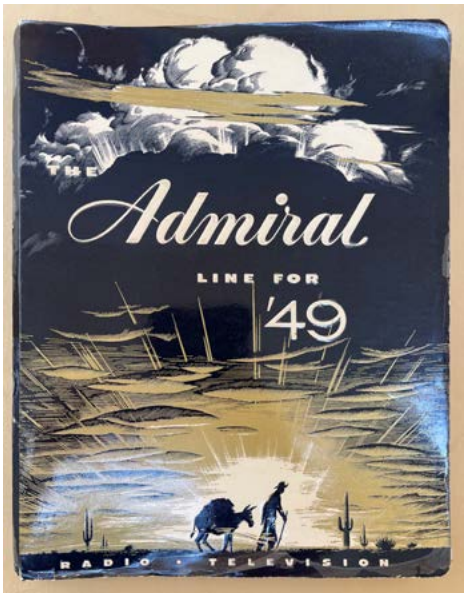
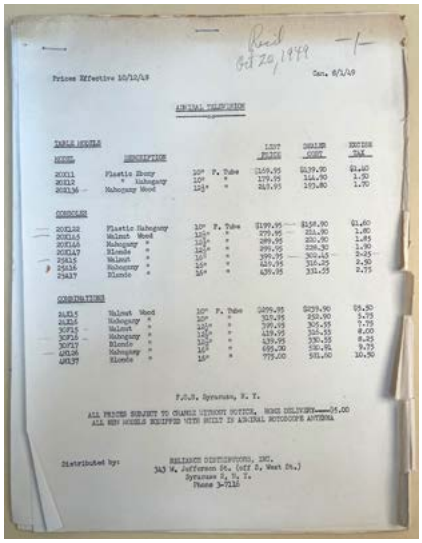


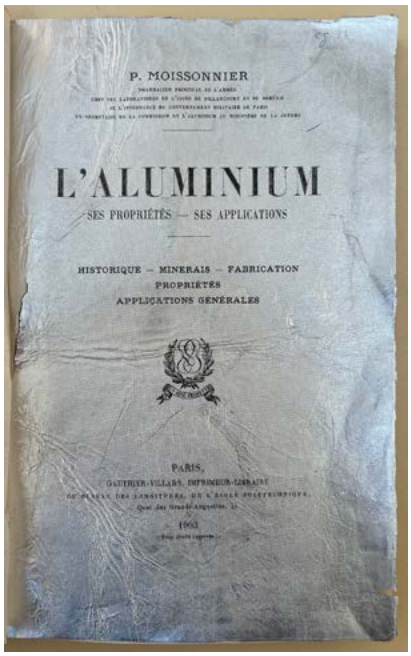
1. Admiral Corporation. Admiral line for '49. 58 unpaginated leaves, plus two 2-leaf brochures laid in. Chicago: Admiral Corporation, 1948-49. 283 x 218 mm. Original pictorial laminated soft cover folder, laminate peeling at edges, light wear. Some leaves with prices and product information written in pencil, other leaves with similar information on slips attached with clear tape. **With:**

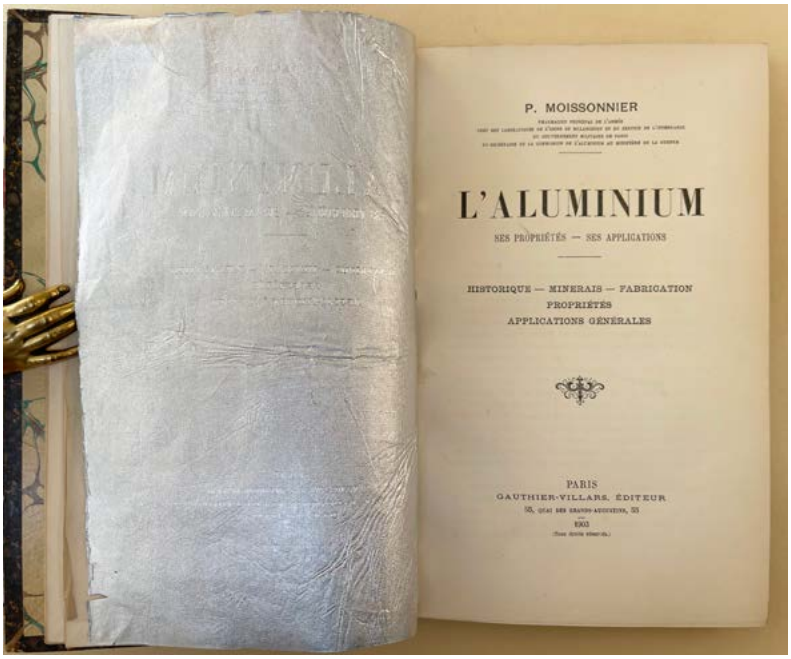


Reliance Distributors, Inc. Collection of documents including: Two mimeographed typescript price lists for Admiral products dated 15 September 1948 and 12 October 1949; two typed letters signed, dated 28 December 1948 and 22 February 1949, from Arthur M. Speers, Reliance Distributors' controller, to John A. Norton of Standard Supply; and a carbon copy of a sales receipt dated 14 June 1949. Together 18 leaves, stapled together. Some edges frayed. Together: $500

A remarkable and beautiful early television sales catalogue describing and illustrating 18 different 1948 and 1949 models, both tabletop and console, from the days of vacuum tubes and solid hardwood cabinets. The tabletop models, with 12.5-inch cathode-ray tubes, were priced between $169.95 and $249.95 in 1949 ($2178.76 - $3204.36 in 2023 dollars), while the most expensive console models, with 16-inch tubes, sold for $439.95 to $775.00 ($5640.16 - $9935.00 in 2023 dollars). Admiral Corporation, founded in 1934, was one of the most successful early consumer electronics manufacturers, producing radios, phonographs, televisions and major household appliances; they also manufactured various electronic devices for the U. S. government.

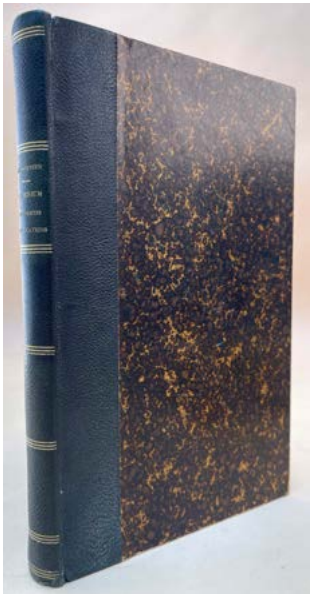
Included with our catalogue is a collection of documents from Reliance Distributors Inc., a dealer in Admiral products based in Syracuse, NY; the collection includes 1948 and 1949 price lists and two letters from Reliance Distributors' financial controller to a dissatisfied customer. 51497





With a Title Page Printed on Aluminum Foil

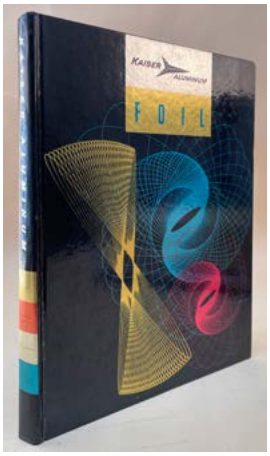
2. [Aluminum.] Moissonnier, Prosper. L'aluminium: Ses propriétés, ses applications. xviii, 237pp. Additional title printed on aluminum foil; text illustrations. Paris: Gauthier-Villars, 1903. 242 x 155 mm. Quarter morocco, marbled boards ca. 1903, slight edgewear. Small splits in the fragile aluminum-foil title-leaf (not affecting text), slight toning but very good. $2500



First Edition of one of the earliest surviving examples of aluminum foil, and the first example of printing on aluminum foil. Aluminum is the most abundant metallic element in the Earth's crust, but it was not isolated in its pure form until 1824—at that time aluminum was so difficult to refine that its price exceeded that of gold. The metal's price began to drop in 1856, when Henri Deville developed the first industrial method for its production, but it was not until thirty years later, when the Hall-Héroult process of producing aluminum by electrolysis was introduced, that it became cheap enough for mass production. Impressed by the metal's light weight and resistance to corrosion, the French War Ministry appointed a commission on aluminum and between 1887 and 1900 Prosper Moissonnier, chief pharmacist for the French army, carried out experiments on the commission's behalf to determine the metal's suitability for military use. His favorable conclusions were published here.

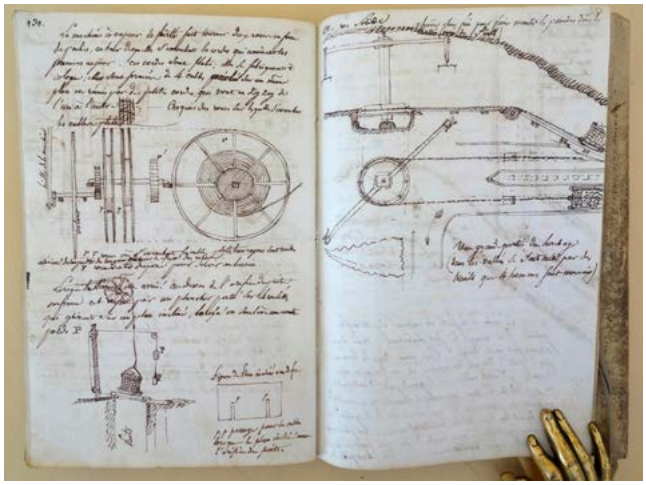
A remarkable feature of this book is the additional title-leaf printed on aluminum foil. Aluminum foil was first produced in 1903 by Alfred Gautschi, a Swiss scientist; the title-leaf in our book thus represents one of the very earliest uses of this now-ubiquitous product. 48383

3. [Aluminum.] Kaiser aluminum foil. [10], 234pp. Text illustrations; sheet of gold-toned embossed aluminum foil bound between pp. 198-199. Chicago: Kaiser Aluminum and Chemical Sales, 1958. 281 x 215 mm. Original laminated aluminum-foil binding, slight edgewear. Edges slightly toned but very good. Informational postcard laid in. $175



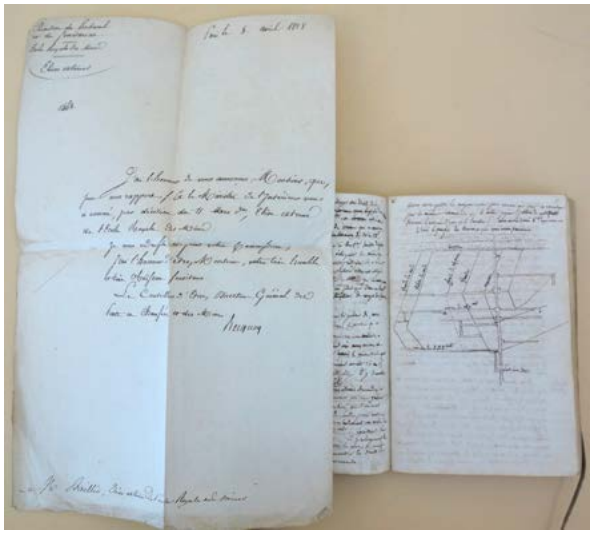
First Edition. In 1958 Kaiser Aluminum published this book on the production of aluminum foil bound in one continuous sheet of 0.00035-inch bright aluminum foil laminated to 140-pound Texoprint, a latex-impregnated paper. The foil side of the lamination was coated with nitrocellulose lacquer to ensure satisfactory adhesion of the inks, which were lithographed on the coated foil in five colors. The printed foil was then laminated with mylar film before it was applied as a bookbinding material. Kaiser Aluminum explained the steps involved in the production of the binding material in a note facing the title page, and indicated that they believed that this was the first book bound in one continuous sheet of laminated aluminum foil.

From the standpoint of printing history, the most significant chapter in the book is Chapter VIII, "Printing Aluminum Foil." A sheet of printed and embossed aluminum foil, tinted to resemble gold, was bound into each copy. 33953



Mining Engineering at the Beginning of the Industrial Revolution in France

4. [Baillio-Lamothe.] Manuscript notebook recording Baillio-Lamothe's field studies as an engineering student at the École des Mines (Paris). [2], 3-134, [18]pp., plus 5 loose sheets of notes, sketches, etc. in a pocket inside the back cover; *lacking the first leaf* [pp. 1-2]. Illustrated with numerous technical drawings of mining machinery, plans of mine layouts, etc. N.p., n.d. [1820]. 168 x 114 mm. Bound wallet-style in old vellum manuscript leaf, linen tie, some soiling. First and last leaves a bit soiled, but very good. Laid in is a letter to Baillio dated 8 April 1818, signed by Louis Becquey (1760-1849), Directeur-Général des Ponts et Chaussées et des Mines; the letter names Baillio-Lamothe an "élève externe" (external pupil) at the École. $3750



Remarkable document from the early days of the Industrial Revolution in France, recording field studies at several European coal mines undertaken by Baillio-Lamothe, an engineering student at Paris's École des Mines. Baillio-Lamothe's first name and history remain obscure, but he is known to have prepared at least one illustration for the *Annales des mines* (Vol. 13 [1826]).

The Industrial Revolution, which originated in Great Britain in the latter part of the 18th century, did not spread to France until the end of the Napoleonic Era in 1815. One of the major factors in this delay was the primitive state of French coal mining at that time. Technological innovations in manufacturing, such as steam-powered engines and mechanized looms, required coal for their production and use, but most of France's coal deposits were inconveniently located and expensive to mine; moreover, during Napoleon's reign France had prioritized war and conquest over the development of its domestic economic resources.

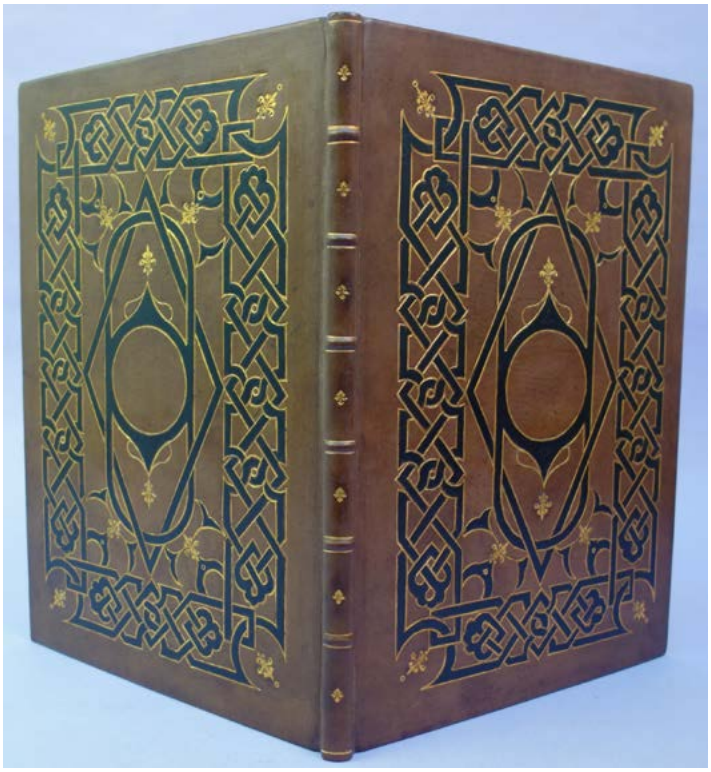
To improve France's coal-mining industry Louis Becquey, who became Directeur-Général des Ponts et Chaussées et des Mines in 1817, established a program at the École des Mines whereby engineering students like Baillio-Lamothe were sent to mining operations in France and other countries to learn mining techniques first hand. These students were required to keep detailed written accounts of what they learned during their travels, and journals such as the one we are offering "are now a part of the [École de Mines'] great heritage" (Hatchuel, p. 24).

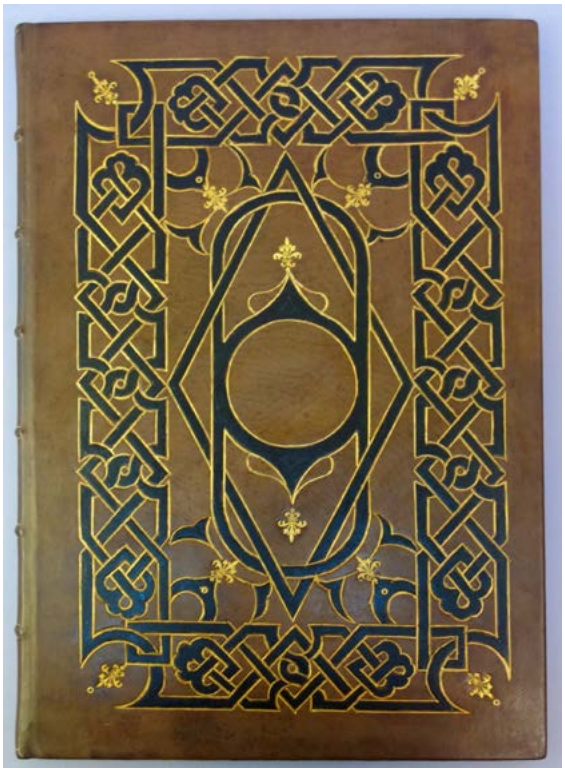
In April 1818 Baillio-Lamothe matriculated at the École as an "external student" (i.e., someone not from the École Polytechnique), as recorded in the letter from Becquey laid into Baillio's notebook. Two years later he spent the weeks between 28 June and 7 August 1820 traveling to coal mines in the north of France, Belgium, and Prussia. His journal contains detailed accounts of mining machinery and operations, many illustrated with precisely executed technical drawings; these include some remarkable sketches on pp. 130-131 of a steam engine ('machine à vapeur") Baillio had seen in operation at Fürth. The journal also records Baillio's encounters with fellow students Gabriel Lamé (1795-1870) and Émile Clapeyron (1799-1864), both noted mathematicians and engineers who made important contributions to these fields. Hatchuel, "École des Mines de Paris: A few lessons from a long history," in Subrahmanian, ed., *Engineering a Better Future,* pp. 21-32. 44857

One of the Greatest Renaissance Books on Machines

5. Besson, Jacques (d. 1569?). Theatrum instrumentorum et machinarum . . . cum Franc. Beroaldi figurarum declaratione demonstrativa. Edited by François Béroalde de Verville (1558-1612). Folio. 11 unnumbered leaves. Engraved architectural title-page border and 60 full-page engraved plates following the text, numbered 1-60. The plates are unsigned but were most probably drawn by Jacques Androuet du Cerceau (1510?-post 1584); plates 17, 35, 39 and 51 are copies of the original Androuet plates by René Boyvin (1525?-1580?), signed with his monogram. Superbly bound in full calf gilt, front and back covers tooled and painted with strapwork in the style of sixteenth-century French painted bindings, by Sean Richards. Small marginal tear in one plate repaired, but a fine copy. 365 x 253 mm. Lyons: Barth. Vincent, 1578. $12,500

Third(?) edition. Besson's lavishly illustrated *Theatrum instrumentorum et machinarum*, one of the first French works on machines and mechanical engineering, was originally published in an edition with no imprint (Orléans, 1569?) under the title *Instrumentorum et machinarum. . . liber primus*. This first edition was followed by three Lyons editions published in 1578, each augmented with explanatory notes by François Béroalde de Verville (author of the erotic classic *Moyen de parvenir*) and published by Barthélemy Vincent. Mortimer states that the present edition, distinguished by its Latin text, imprint date in Roman numerals, and four plates copied by Boyvin (see above), is probably the second Vincent edition; see Mortimer, *French 16th Century Books*, pp. 76-80 for further discussion.

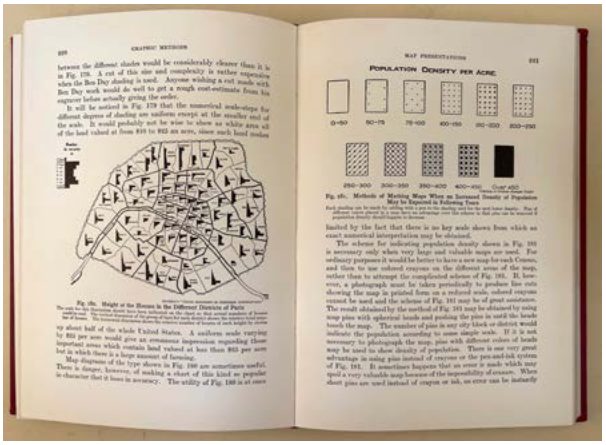


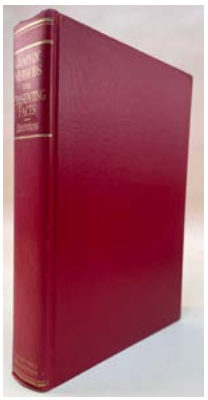


Besson's *Theatrum* illustrates an amazing variety of inventions, ranging from war machines to musical instruments to fire-fighting apparatus; the sixty full-page plates, reprinted from the first edition, were most probably designed by the Orléans architect Jacques Androuet du Cerceau. In the present edition, plates 17, 35, 39 and 51 were replaced with copies by René Boyvin (signed with his monogram), but the original plates remained in Vincent's possession and appeared variously in later editions. As a theoretical work the *Theatrum* was well received, going through several editions and translations and doing much to popularize mechanical engineering (in the tradition of Leonardo da Vinci) among the scientific dilettantes of France. Besson's designs could hardly have been practical for his era, however, as they made extensive use of both the screw and the worm-wheel, devices that could not yet be made with enough accuracy to function efficiently. Adams B-838. Mortimer, *French 16th Century Books,* 58. Norman 227. 43709

The First American Book on Information Graphics

6. Brinton, Willard C. (1880-1957). Graphic methods for presenting facts. xii, [2], 371pp. Text illustrations. New York & London: McGraw-Hill, 1914. 248 x 176 mm. Original cloth, gilt-lettered spine, very slight edgewear. Fine. $500





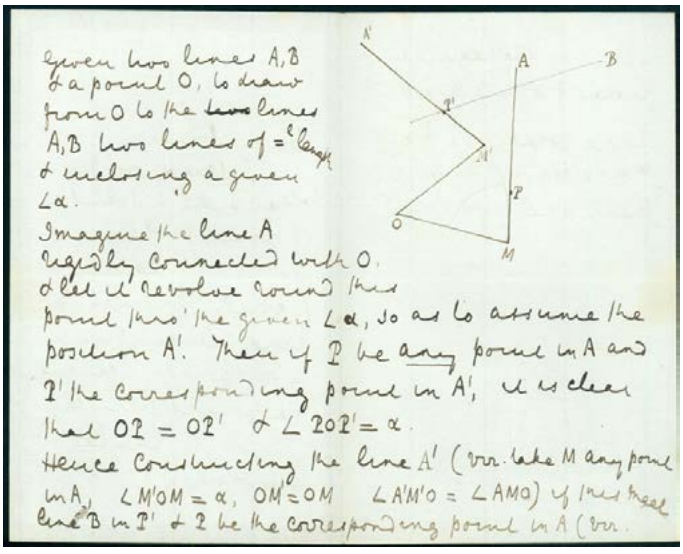
First Edition of the first book on information graphics published in the United States; rare in fine condition like this. Brinton, an engineer, was a pioneer in data visualization and one of the first to present its techniques to a general audience. Brinton described the purpose of his book in the preface:

In the preparation of this book there has been a been a constant effort to present the subject to suit the point of view of the business man, the social worker, and the legislator. Mathematics have been entirely eliminated. Technical terms are used practically not at all. Since the readers whom it is most desired to reach are those who have never had any statistical training, consistent effort has been made to keep the whole book on such a plane that it may be found readable and useful by anyone dealing with the complex facts of business or government . . . A definite effort has been made to produce a work which can serve as a hand book for anyone who may have occasional charts to prepare for reports, for magazine illustration, or for advertising (p. v).

Garrison-Morton.com 8121. 51512

Three Mathematical Autograph Letters, Signed, Plus a Four Page Autograph Mathematics Manuscript

7. Cayley, Arthur (1821-95). (1) Autograph letter signed ("A. C.") to **Archibald Smith** (1813-72), written in the margins of an autograph letter signed from Smith to Cayley. 1 page. London, 9 August 1863 [date of Smith's letter]. 280 x 226 mm.

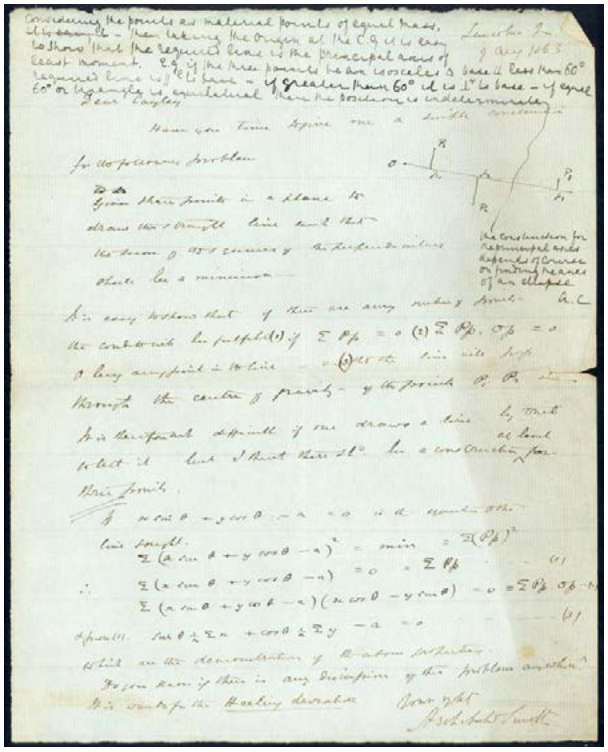


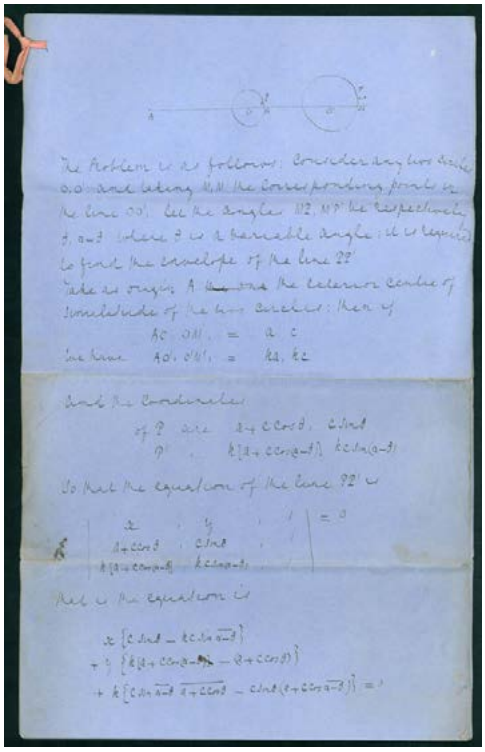
(2) Autograph letter signed to Smith. 3 – 1/2pp. Cambridge, 14 November 1866. 180 x 112 mm.

(3) Autograph letter signed to Smith. 3pp. Cambridge, 19 October 1868. 180 x 112 mm.

(4) Autograph manuscript (originally enclosed with Cayley's 19 Oct. 1868 letter). 4ff., tied with linen tape. 412 x 257 mm. N.p., n.d. [1868].

Together 4 items. Very minor marginal tears in nos. (1) and (4), otherwise very good. $8500





Exceptionally rare mathematical correspondence from Arthur Cayley, one of the founders of the British school of pure mathematics, consisting of three autograph letters, all containing mathematics; plus an extensive 4-page mathematical proof written on four extra-large legal sheets. These are the first mathematical letters or manuscripts by Cayley that we have seen on the market in over forty years.

Cayley was the author of over 900 papers covering nearly every aspect of modern mathematics; his greatest contributions were his development of the algebra of matrices, his work in non-Euclidean geometry and *n*-dimensional geometry, and his contributions to invariant theory. A large number of mathematical constructs bear his name, including Cayley's theorem (group theory), the Cayley-Hamilton theorem (linear algebra), Cayley's formula (graph theory) and the Cayley-Klein model (hyperbolic geometry). Cayley's correspondent was Archibald Smith, who in 1836 helped to found the *Cambridge Mathematical Journal,* the periodical in which Cayley published his first mathematical paper (see Crilly, p. 68). Smith also made significant contributions to the study of magnetism and the Earth's magnetic field.

Both Cayley and Smith were alumni of Trinity College, Cambridge and both subsequently entered Lincoln's Inn to study law, with Smith being called to the bar in 1841 and Cayley in 1849. Cayley remained in the legal profession until 1863, at which time he left the bar to take the newly established Sadleirean professorship of pure mathematics at Cambridge. It is evident from our letters that Smith and Cayley had a cordial relationship based on their shared love for mathematics; Smith apparently was in the habit of sending Cayley mathematical problems and requesting his help in solving them. Letter (1) contains both Smith's query and Cayley's response; in it Smith asked Cayley to give him

> a simple construction for the following problem. Given three points in a plane to draw the straight line such that the sum of the squares of the perpendiculars shall be a minimum.

Cayley responded by writing his solution in the margins of Smith's letter:

> Considering the points as material points of equal mass, then taking the origin at the C. G. it is easy to show that the required line is the principal axis of least moment. E.g. if the three points be an isosceles Δ base […] less than 60° required line is [parallel] to base—if greater than 60° it is [perpendicular] to base—if equal 60° or triangle is equilateral there the position is indeterminate. The construction for the principal axes depends of course on finding the axes of an elliptic. A. C.

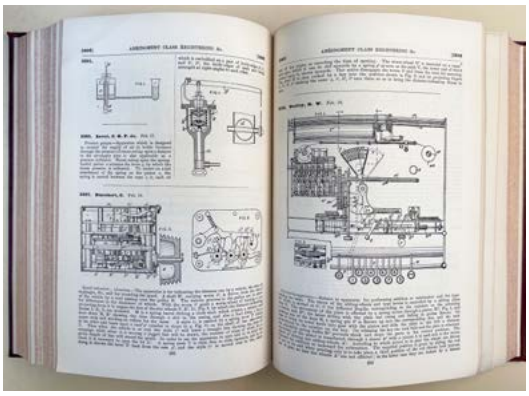
In letter (2), dated 1866, Cayley gave the solution to another of Smith's mathematical queries; "it comes out easily & prettily enough." Cayley stated the problem and solution as follows:

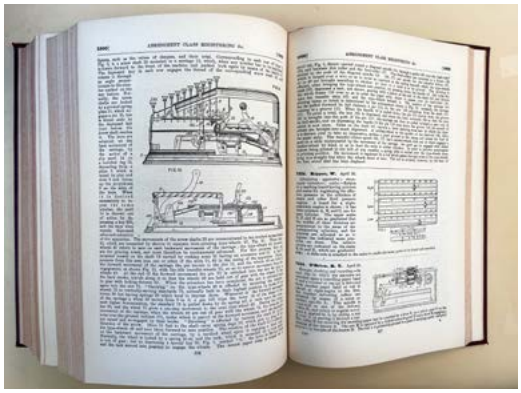
> Given two lines A, B & a point O, to draw from O to the lines A, B two lines of [equal] length & enclosing a given [angle] α. Imagine the line A rigidly connected with O and let it revolve round this point thro' the given [angle] α, so as to assume the position A'. Then if P be <u>any</u> point in A and P' the corresponding point in A', it is clear that OP = OP' & [angle] POP' = α . . .

In letter (3), dated 1868, Cayley enclosed the four-page autograph manuscript listed above under no. (4), containing "a solution, such as I have been able to obtain, of your problem, but the solution is I am afraid in a form which will not be of any use to you. May I send the problem—of course in your name—to the Educational Times; it is very likely that you will so obtain a solution of it in a more practical form; and at any rate, the problem, quà problem is an excellent one." In the manuscript Cayley stated the problem as follows:

> Considering any two circles O, O' and taking M, M' the corresponding points in the line OO', let the angles MP, M'P' be respectively θ, α − θ where θ is a variable angle; it is required to find the envelope of the line PP'.

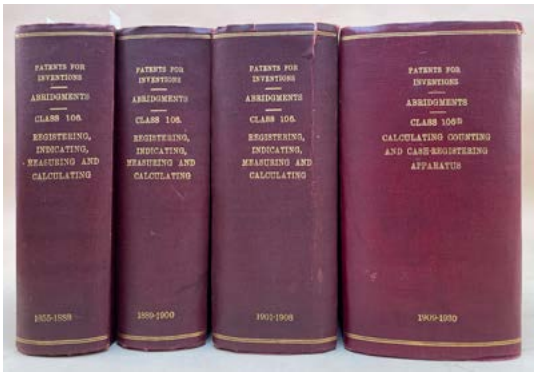
Cayley's solution covers four folio pages and includes several equations and two diagrams. Biggs *et al.*, *Graph Theory*, ch. 3. *Dictionary of Scientific Biography.* Crilly, *Arthur Cayley: Mathematician Laureate of the Victorian Age*, pp. 68, 120-121. Kline, *Mathematical Thought from Ancient to Modern Times*, pp. 804-9. Ewald, *From Kant to Hilbert*, p. 542. 42843





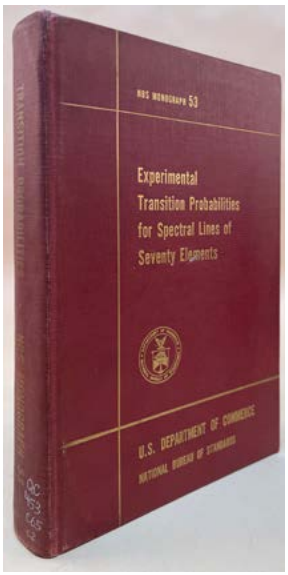
An Index to Mechanical Calculators from 1855 to 1930

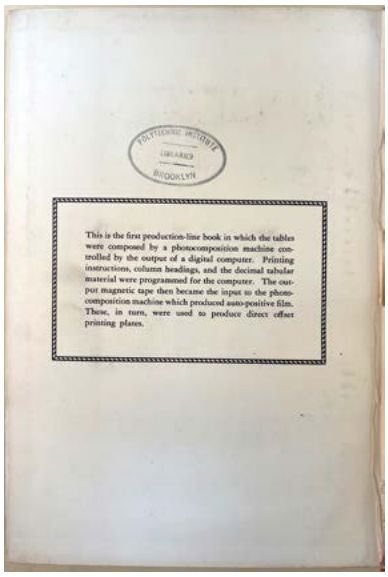
8. [**Calculating Machines.**] **Patent Office.** Patents for inventions. Abridgements of specifications. Class 106, registering, indicating, measuring, and calculating . . . 4 vols., each containing several parts, and diagrams of many machines. London: His Majesty's Stationery Office, 1905-30. Original cloth, light edgewear. Light toning but very good. $1250



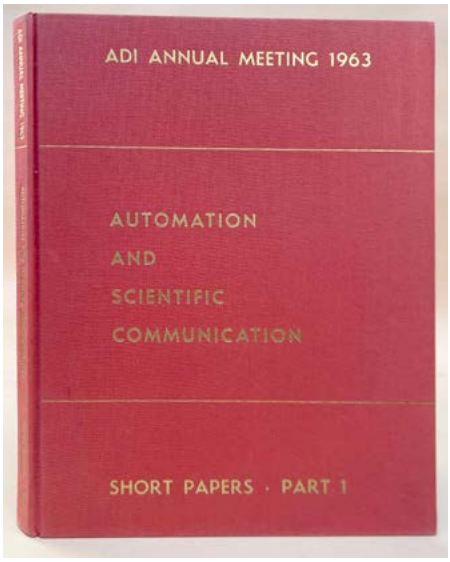
First Edition. These four thick volumes, containing between 5000 and 10,000 pages and illustrated with 1000 or more diagrams of machines, provide the only comprehensive index to all the mechanical calculating machines patented in Britain between 1855 and 1930, including many created by non-British inventors. Since most non-British inventors would have desired to patent their machines in England, these volumes represent a comprehensive index of the technology as it developed. The volumes testify to the enormous growth of the international mechanical calculating machine industry during this 75-year period—in 1855 only 25 patents for "calculating-apparatus" were granted, compared to the several hundred such patents approved in 1930. 51327

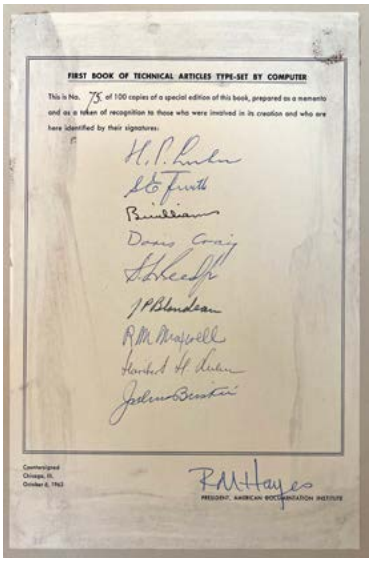
The First Books Typeset by a Computer-Controlled Typesetting Machine





9. [**Computer-Controlled Typesetting.**] **Corliss, Charles H.** and **William R. Bozman.** Experimental transition probabilities for spectral lines of seventy elements derived from the NBS tables of spectral-line intensities. NBS monograph 53. xviii, 562, [4] pp. Washington DC: U.S. Government Printing Office, 1962. 255 x 177 mm. Ex-library copy. Original cloth, library shelf-mark on spine, inner hinges split but holding. Minor finger-soiling, library stamps on end-papers and fore-edge, library pocket inside back cover. Good copy. **With:**





Luhn, Hans Peter (1896-1964), editor. Automation and scientific communication. Part 1 (only). [8], 128pp. Text illustrations. Washington DC: American Documentation Institute, 1963. 280 x 217 mm. Original gilt-stamped cloth. Fine. *No. 75 of 100 special-edition copies; printed label tipped to the front pastedown with autograph signatures of Luhn and a number of other participants in the edition's creation.*

The two: $950

First Editions of the First and Second Books Typeset by a Computer-Controlled Composition Machine. According to Corliss and Bozman's introduction to *Experimental Transition Probabilities,*

> [a]t the beginning of the preparation of this table it was realized that equipment was available which would permit essentially automatic preparation of the finished book. It was therefore decided to attempt to produce this publication by completely automatic methods. An electronic computer could be used for the computation, then the magnetic tape output from the computer could be used to operate an automatic phototypesetting machine which would produce film ready for making the printing plates (p. xvi).

The book's colophon (a highly unusual feature for a GPO publication) reads:

> This is the first production-line book in which the tables were composed by a photocomposition machine controlled by the output of a digital computer. Printing instructions, column headings, and the decimal tabular material were programmed for the computer. The output magnetic tape then became the input to the photocomposition machine which produced auto-positive film. These, in turn, were used to produce direct offset printing plates.

Luhn's *Automation and Scientific Communication,* published the following year, was most likely the second book typeset by a computer-controlled composition machine; the copy offered here is one of a special edition of

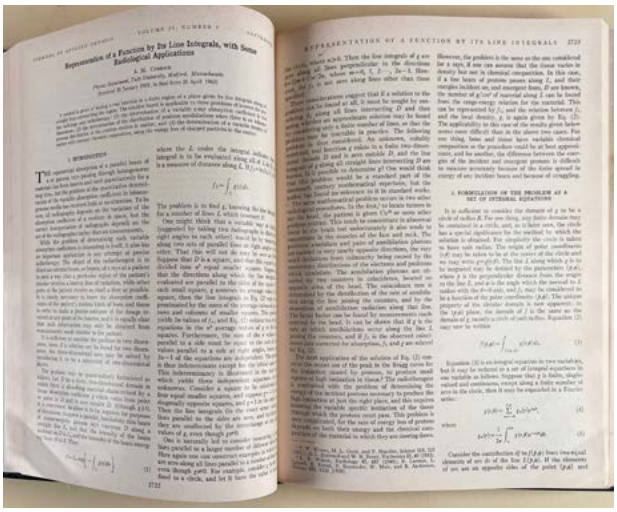
100 copies signed by the contributors. Luhn, the book's editor, was a computer scientist employed by IBM; he created the Luhn algorithm (used to validate identification numbers), KWIC (Key Words in Context) indexing, and SDI (Selective Dissemination of Information) services.

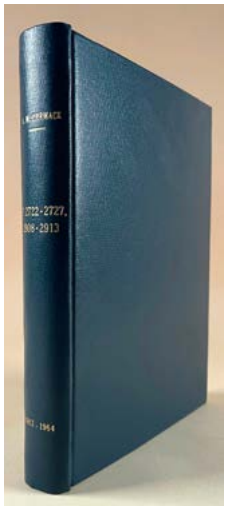
For the 26th annual meeting of the American Documentation Institute, held in Chicago from 6-11 October 1963, Luhn issued *Automation and Scientific Communication,* a collection of short papers presented at the meeting. On the verso of the title page a statement reads: "This 128 page book has been printed from type set automatically with the aid of electronic information processing equipment. It is believed that this is the first volume of technical articles ever produced in this manner." The work was published in two parts: Part 1 was mailed to participants prior to the meeting, and Part 2 was distributed at the meeting. Each part is complete in itself.

Ordinary copies of Part 1 were issued in paper wrappers. We are offering one of 100 copies of the special cloth-bound edition, each bearing a printed label signed by Luhn and eight other participants in the edition's creation, and countersigned by the president of the American Documentation Institute. 42595

Mathematical Theory behind the CT Scanner—Beginnings of Digital Image Processing

10. Cormack, Allan M. (1924-98). (1) Representation of a function by its line integrals, with some radiological applications. In *J. Applied Physics* 34 (1963): 2722-27. Whole number. 2535-2922pp. Text illustrations. (2) Representation of a function by its line integrals, with some radiological applications. II. In *J. Applied Physics* 35 (1964): 2908-13. Whole number. 2789-3102pp. Text illustrations. The two numbers bound together in library buckram. Light toning, otherwise very good. $1750

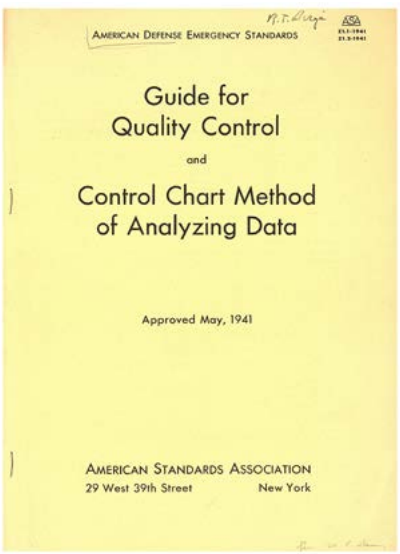

Representation of a Function by its Line Integrals, with Some Radiological Applications

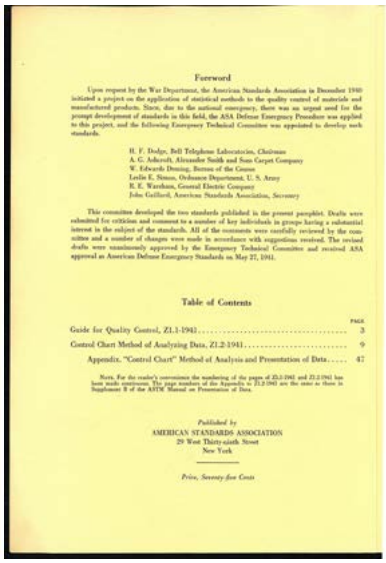

A. CORMACK

First Edition. Cormack's two-part paper, published in the early 1960s, is a foundation document of digital image processing: It set forth the mathematical theory of axial tomography, the method by which the varying X-ray absorption rates of tissues in the human body can be used to construct a detailed picture of the organs and soft tissues. For this achievement Cormack shared the 1979 Nobel Prize in physiology or medicine with Godfrey Hounsfield, who in 1973 invented the first practical computer-assisted tomography (CT) scanner. "This was the first time that researchers trained not in the medical sciences but in mathematics and engineering received the Nobel Prize in Medicine" (Grolier Medical Hundred, p. 365).

Cormack, who was educated as a physicist, first became interested in axial tomography in 1956 when, as the only nuclear physicist in Cape Town, S.A., he was asked to spend several hours each week supervising the use of radioactive isotopes at the Cape Town hospital. He became interested in determining values of attenuation coefficients for X-rays, realizing that these values could be displayed as a gray-scale image of internal anatomy. "Recognizing the problem as a mathematical one, [Cormack] produced a solution, using a desktop calculator, and was able to conduct experiments in which he reconstructed accurate cross sections of an irregularly shaped object. His reconstructions were, in essence, the first computed tomograms, but though he realized that his method could be used to produce cross-sectional X-ray images, no working machine designed for such a purpose was attempted, probably because of the limitations of the computers of the early 1960s" (Magill, *The Nobel Prize Winners: Physiology or Medicine*, III, 1325). Garrison-Morton.com 8149. Grolier Medical Hundred, 100(n). 39271

Inscribed by Deming to Birge





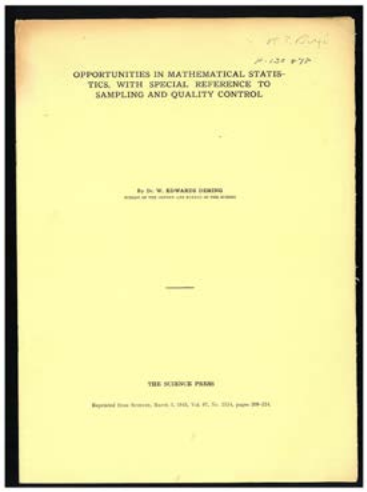
11. [**Deming, Walter E.** (1900-1993).] **American Standards Association.** Guide for quality control and control chart method of analyzing data. 14, [2], 47-66pp. New York: American Standards Association, 1941. Original yellow printed wrappers. 270 x 195 mm. *Presentation Copy,* inscribed "from W. E. Deming" at the foot of the front wrapper. From the library of American physicist Raymond T. Birge (1887-1980), the recipient of this copy, with his signature on the front wrapper. Very good. $950

First Edition. Walter E. Deming, an engineer, statistician and management consultant, is regarded as the father of the quality control movement in manufacturing. Deming was largely responsible for introducing statistical quality control to American industries after World War II; he also became enormously influential in postwar Japan, where his theories of management, widely adopted by Japanese industries, led to Japan's industrial rebirth and economic success in the latter half of the 20th century.

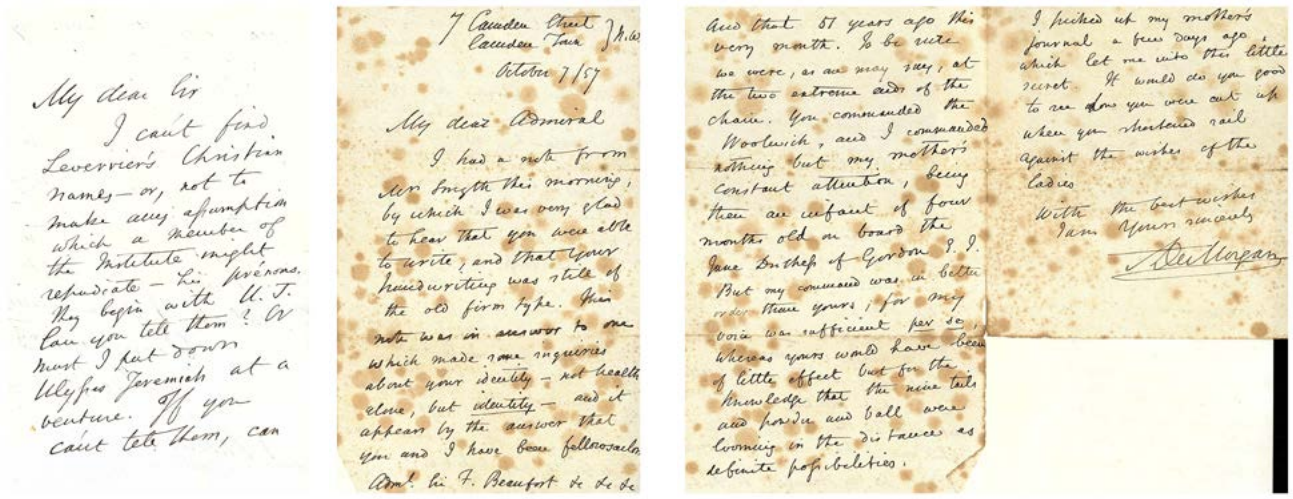
In the latter half of 1940, over a year before the United States' formal entry into World War II, the U.S. government began sending planes, tanks and other war matériel to aid the Allied forces in Europe. To support efficient production of these materials, the U.S. War Department asked the American Standards Association (now the American National Standards Institute) to create standards for applying statistical methods to the quality control of materials manufactured for the war effort. Deming was one of a six-member emergency committee appointed to develop these standards, which were published in the present pamphlet.

This copy is from the library of American physicist Raymond T. Birge, whose interest in statistics led to a collaboration with Deming on the classic paper "On the statistical theory of errors" (1934). 51301

12. Deming, Walter E. (1900-1993). Opportunities in mathematical statistics, with special reference to sampling and quality control. Offprint from *Science* 97 (1943). 5pp. 278 x 203 mm. Original printed wrappers, top margins a bit sunned, small gouge in back wrapper. Very good. From the library of American physicist Raymond T. Birge (1887-1980), with his signature on the front wrapper. $200



First Edition, Offprint Issue. One of Deming's early papers on quality control, from the library of Raymond T. Birge, co-author with Deming of the classic paper "On the statistical theory of errors" (1934). 51302



13. De Morgan, Augustus (1806-71). (1). Autograph letter signed to an unidentified correspondent. Camden Town, Jan. 27, 1848. 1 page plus integral blank. 180 x 114 mm. (2) Autograph letter signed to Admiral Sir Francis Beaufort (1774-1857). Camden Town, October 7, 1857. 2-1/2pp. 183 x 114 mm. Heavy foxing, blank portion of second leaf cut away. Together 2 letters, both mounted on single sheet. $750

Two dryly humorous letters from the mathematician Augustus de Morgan, known for formulating De Morgan's laws or De Morgan's theorem (rules in formal logic relating pairs of dual logical operators in a systematic manner expressed in terms of negation), and for introducing the term "mathematical induction" and making its idea rigorous. De Morgan was also the author of *Arithmetical Books from the Invention of Printing to the Present Time* (1847), which has been described as "the first significant work of scientific bibliography" (*Dictionary of Scientific Biography*).

De Morgan's 1848 letter reads as follows:

> I can't find Leverrier's Christian names—or, not to make any assumption which a member of the Institute might repudiate—his *prénoms*. They begin with U. J. Can you tell them? Or must I put down Ulysses Jeremiah at a venture. If you can't tell them, can you calculate them. They can hardly be as difficult as a planet.
>
> If you happen to know Hencke's, pray tell them to me: but I can't demand them of you as a right which I do Leverrier's.

"Leverrier" refers to Urbain Jean Joseph Leverrier (1811-77), the French astronomer whose mathematical calculations and astronomical observations of the perturbations of Uranus led directly to the discovery of Neptune. "Hencke" refers to German astronomer Karl Ludwig Hencke (1793-1866), discoverer of the asteroids 5 Astraea and 4 Vesta.

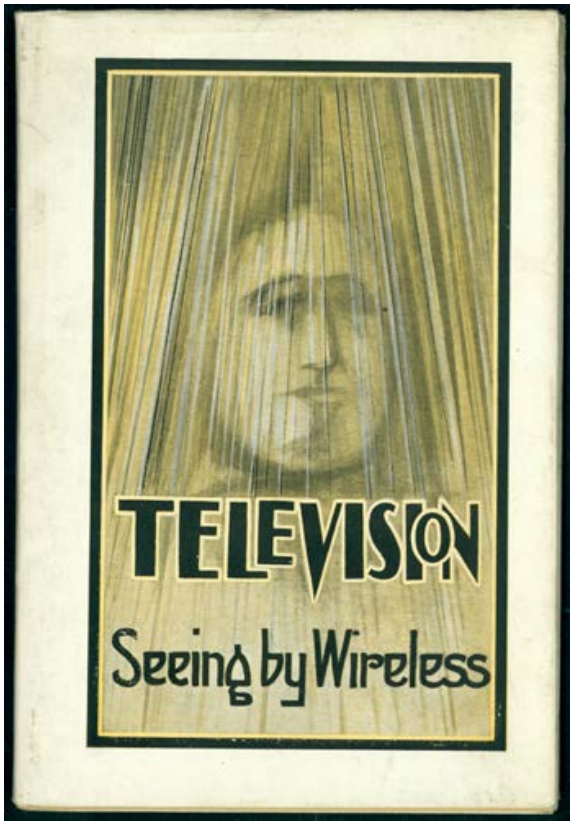
The 1857 letter reads:

> I had a note from Mr. Smyth this morning, by which I was very glad to hear that you were able to write, and that your handwriting was still of the old firm type. This note was in answer to one which made some inquiries about your identity—not health alone, but identity—and it appears that you and I have been fellow sailors, and that 51 years ago this very month. To be sure we were, as we may say, at the two extreme ends of the chain. You commanded the Woolwich, and I commanded nothing but my mother's constant attention, being then an infant of four months old on board the Jane Duchess of Gordon E. S. But my command was in better order than yours; for my voice was sufficient *per se,* whereas yours would have been of little effect but for the knowledge that the nine tails and powder and ball were looming in the distance as definite possibilities.
>
> I picked up my mother's journal a few days ago, which let me into this little secret. It would do you good to see how you were cut up when you shortened sail against the wishes of the ladies.

De Morgan was born in India and returned to England as an infant; his letter refers to this voyage. His correspondent, Admiral Sir Francis Beaufort, was a naval hydrographer who conducted important hydrographic surveys in South America and southern Anatolia; he served for 25 years as head of the Hydrographic Office of the British Admiralty, and invented the Beaufort scale for indicating wind force. 40154

The First English Language Book on Television

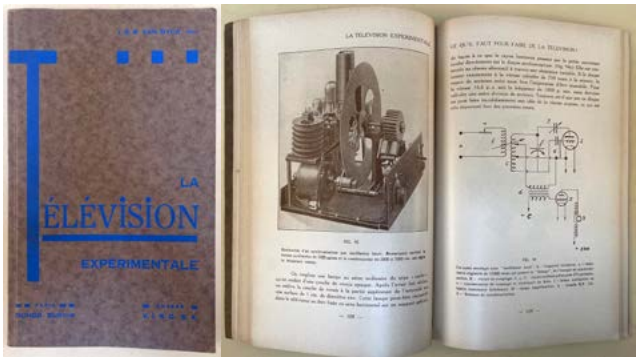
14. Dinsdale, Alfred. Television: Seeing by wireless. 8vo. 62pp. London: W. S. Caines for Sir Isaac Pitman & Sons, 1926. 186 x 125 mm. Original printed paper boards, pictorial dust-jacket. Very fine copy. $6500



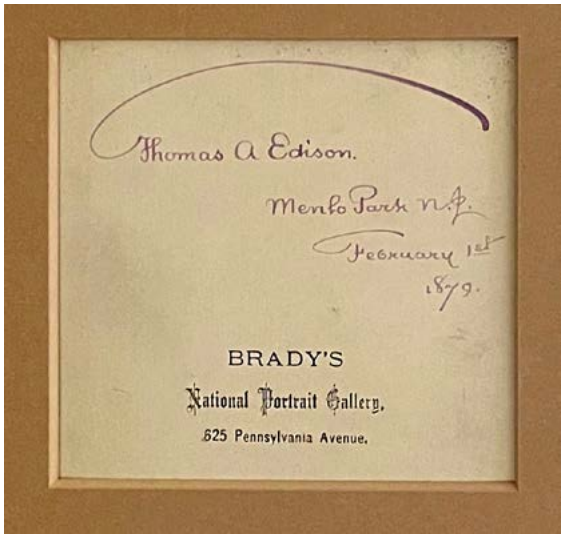
First Edition of the *first book in English on television.* Dinsdale discusses the technical challenges faced by early experimenters (Jan van Szczepanik, Boris Rosing, Denoys von Kihaly and others), but focuses primarily on the work of the Scottish engineer John Logie Baird (1888-1946), the first person to produce televised pictures of objects in motion. In February 1924 Baird produced the first television image in outline, and in April 1925 he transmitted the first pictures between two televisions. By the following October Baird had succeeded in transmitting images with gradations of light and shade, and on January 27, 1926, he successfully transmitted recognizable human faces between two rooms by television. Of Baird's early experiments, Dinsdale writes: "Baird's weird apparatus—old bicycle sprockets, biscuit tins, cardboard discs and bullseye lenses, all tied together with sealing wax and string—failed to impress those who were accustomed to the shining brass and exquisite mechanism of the instrument maker. The importance of the demonstration was, however, realized by the scientific world . . ." (p. 49). Although he did not succeed in producing a viable system of television, Baird paved the way for future technical developments. Television reached a state of technical feasibility in 1931, and the first high-definition broadcasting system was launched in London in 1936 by the BBC.

The copy we are offering is in nearly pristine condition, and is the finest copy we have seen in our four decades in business. The Richard Green copy, with a tape repair on the back panel of the dust-jacket and some minor rubbing, sold at Christies' on June 17, 2008 for $16,250.00. Shiers, *Early Television: A Bibliographic Guide to 1940,* 841. 40292

15. Dyck, Joseph Géréberne Regina van (1902-). La television expérimentale. Avec une préface de A. Henrotay. 191pp. Text illustrations. Paris: Dunod; Antwerp: V.I.R.O.S.A., 1932. 240 x 150 mm. Original printed wrappers. Ownership signature on page 9. Pages a little toned, otherwise very good to fine. $250



First Edition of an early Belgian work on television. 51047

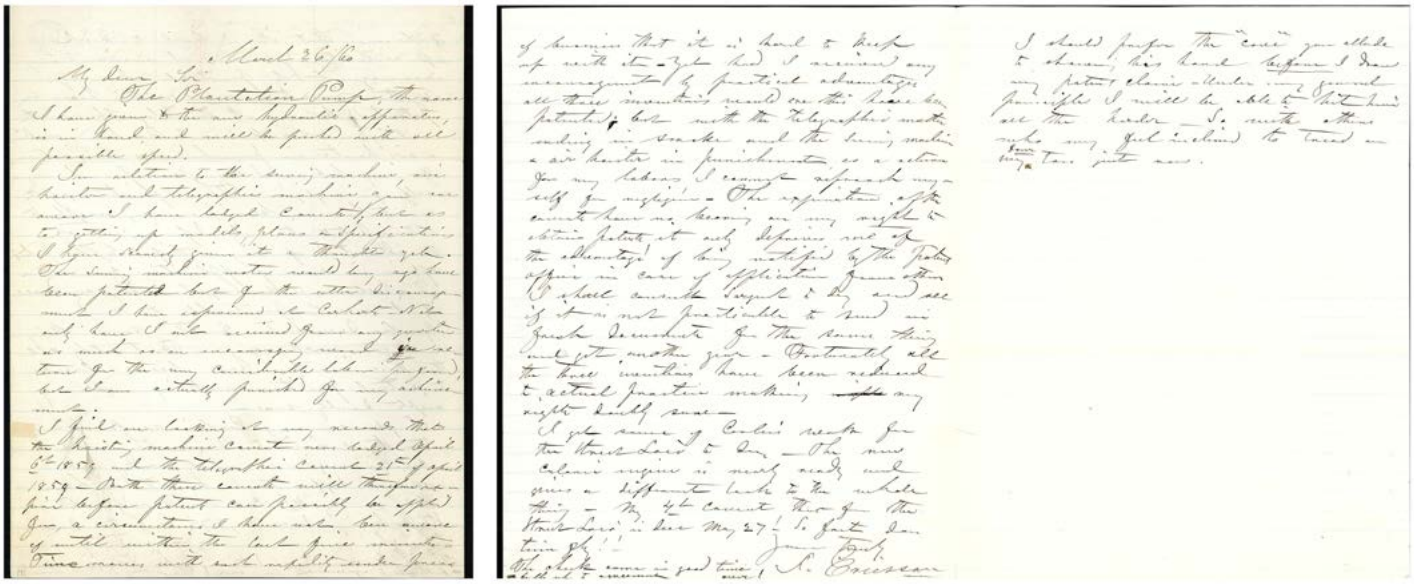


Mathew Brady's Famous Photograph of Edison and his Phonograph, Signed by Edison on the Verso

16. Edison, Thomas A. (1847-1931); **Mathew Brady** (ca. 1822/24 – 1896). Prof. T. A. Edison and his speaking phonograph, before National Academy of Science. Cabinet photograph (mounted and framed), *signed and dated by Edison on the verso*. Washington DC, April 1878. 135 x 101 mm. (image); 166 x 108 mm. (mount); 295 x 232 mm. (frame). Small stain on upper left corner of mount, but very good. Verso signed by Edison: "Thomas A. Edison. / Menlo Park N.J. / February 1st 1879." $8500

In November 1877 Edison, then 30 years old, announced his first major invention, the phonograph—the first machine capable of recording and reproducing sound. A remarkable aspect of this invention was that before Edison invented it no one had thought of recording sound.

Edison's achievement made him instantly famous, and in the following year he was invited to demonstrate his invention before the National Academy of Sciences in Washington DC. While in Washington Edison and his machine were photographed at the studio of Mathew Brady, the celebrated Civil War photographer, resulting in this famous photograph. Edison's autograph signature on the verso of this copy is an early example of his famous "umbrella signature," with the characteristic flourish extending from the "T" across the entire signature. 51517

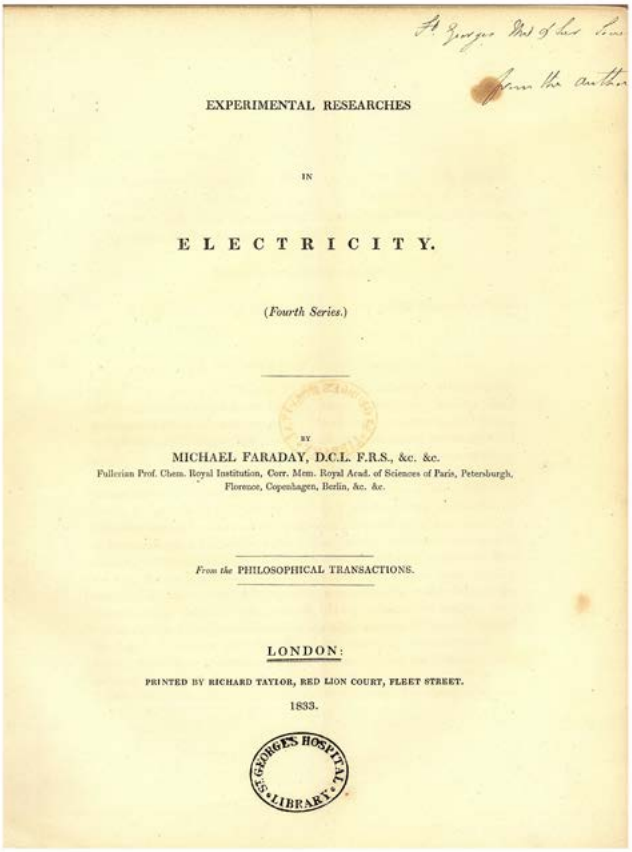


From the Designer of the Union Navy's Ironclad Warship, the "Monitor"

17. Ericsson, John (1803-89). Autograph letter signed, dated March 26, [18]60, to an unknown recipient. 2-1/2 pp., on lined paper embossed with a small steam locomotive and the letters "P. & P. in the upper left corner. 247 x 195 mm. Creased where folded, small tear mended, but fine overall.
$1500

A very fine, detailed letter from the prolifically inventive Swedish-born engineer John Ericsson, whose many accomplishments include the invention of a screw propeller for steamships, a rotary steam engine, the first English steam-driven fire engine, and his enormously popular "caloric" engine. This last, a hot-air engine designed to use heat more directly and efficiently than its steam-powered counterpart, was the first mass-produced heat-powered engine; in various incarnations, it satisfied the growing need for small and medium-sized sources of industrial power throughout the nineteenth century. Ericsson's most famous achievement, however, was his design for the Union Navy's ironclad warship *Monitor*; the *Monitor's* decisive victory over the Confederate ironclad *Merrimac* in March 1862 marked a turning point not only in the course of the Civil War, but in the history of warship design and construction. In later life Ericsson interested himself in alternative sources of power, particularly solar and tidal energy.

The present letter, written almost exactly two years before the *Monitor's* defeat of the *Merrimac*, discusses several of Ericsson's inventions—a hydraulic pump, a "swing machine," an air hoister and a telegraphic machine—as well as the difficulties Ericsson had encountered in obtaining the necessary support and encouragement to proceed with patenting these inventions. The last paragraph of the letter contains a reference to a "new" caloric engine, which was "nearly ready"; Ericsson continued to improve the caloric engine to the end of his life. Ericsson's imperious and combative temperament is apparent throughout the letter, particularly in the postscript, in which he states that "I should prefer the 'cove' you allude to showing his hand *before* I have my patent claim. Under my general principle I will be able to hit him all the harder—so with others who may feel inclined to tread on my & our toes just now." Strandh, *Hist. Machine*, pp. 136-39; 164. 16818



EXPERIMENTAL RESEARCHES

IN

ELECTRICITY.

(*Fourth Series.*)

BY

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

Fullerian Prof. Chem. Royal Institution, Corr. Mem. Royal Acad. of Sciences of Paris, Petersburgh, Florence, Copenhagen, Berlin, &c. &c.

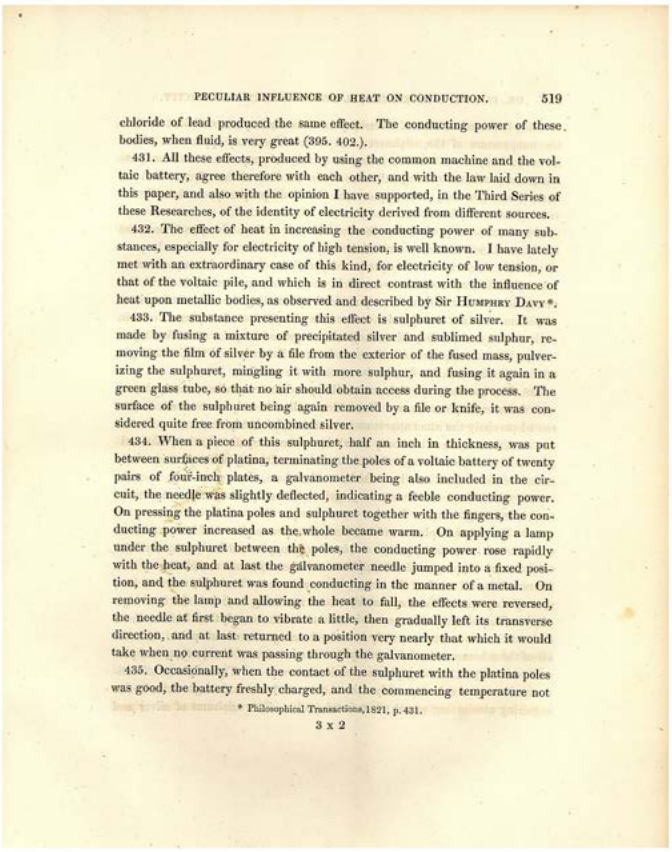
From the PHILOSOPHICAL TRANSACTIONS.

LONDON:

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

1833.

ST. GEORGE'S HOSPITAL LIBRARY



PECULIAR INFLUENCE OF HEAT ON CONDUCTION. 519

chloride of lead produced the same effect. The conducting power of these bodies, when fluid, is very great (395. 402.).

431. All these effects, produced by using the common machine and the voltaic battery, agree therefore with each other, and with the law laid down in this paper, and also with the opinion I have supported, in the Third Series of these Researches, of the identity of electricity derived from different sources.

432. The effect of heat in increasing the conducting power of many substances, especially for electricity of high tension, is well known. I have lately met with an extraordinary case of this kind, for electricity of low tension, or that of the voltaic pile, and which is in direct contrast with the influence of heat upon metallic bodies, as observed and described by Sir HUMPHRY DAVY *.

433. The substance presenting this effect is sulphuret of silver. It was made by fusing a mixture of precipitated silver and sublimed sulphur, removing the film of silver by a file from the exterior of the fused mass, pulverizing the sulphuret, mingling it with more sulphur, and fusing it again in a green glass tube, so that no air should obtain access during the process. The surface of the sulphuret being again removed by a file or knife, it was considered quite free from uncombined silver.

434. When a piece of this sulphuret, half an inch in thickness, was put between surfaces of platina, terminating the poles of a voltaic battery of twenty pairs of four-inch plates, a galvanometer being also included in the circuit, the needle was slightly deflected, indicating a feeble conducting power. On pressing the platina poles and sulphuret together with the fingers, the conducting power increased as the whole became warm. On applying a lamp under the sulphuret between the poles, the conducting power rose rapidly with the heat, and at last the galvanometer needle jumped into a fixed position, and the sulphuret was found conducting in the manner of a metal. On removing the lamp and allowing the heat to fall, the effects were reversed, the needle at first began to vibrate a little, then gradually left its transverse direction, and at last returned to a position very nearly that which it would take when no current was passing through the galvanometer.

435. Occasionally, when the contact of the sulphuret with the platina poles was good, the battery freshly charged, and the commencing temperature not

* Philosophical Transactions, 1821, p. 431.

Faraday Discovers the Semiconductor Effect

18. Faraday, Michael (1791-1867). Experimental researches in electricity (fourth series). 9. On a new law of electric conduction. 10. On conducting power generally. Offprint from *Philosophical Transactions* (1833). [2], 507-522pp. London: Printed by Richard Taylor, 1833. 280 x 215 mm. Modern wrappers. Vertically creased, occasional spotting, but very good. *Presentation Copy*, inscribed on the title in Faraday's hand: "St. Georges Med[ical] & Sur[gical] Society from the author." St. George's Hospital library stamps on the title and last page. $12,500

First Edition, Offprint Issue. In the section titled "On conducting power generally" Faraday presented the first documented observation of what we now call a semiconductor, i.e., a substance with an electrical conductivity value falling between conductors (such as copper) and insulators (such as glass). Contrary to metals, a semiconductor's electrical conductivity increases with increasing temperature, and its conductivity can be altered by various means. The enormous advances in electronics made in the 20th century would not have been possible without semiconductors.

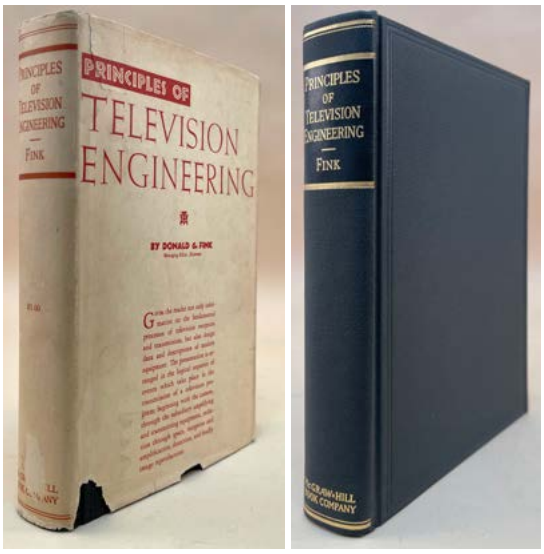
Faraday's groundbreaking observation appears on page 519:

> I have lately met with an extraordinary case . . . which is in direct contrast with the influence of heat upon metallic bodies . . . The substance presenting this effect is sulphuret of silver [silver sulfide] . . . When a piece of this sulphuret . . . was put between surfaces of platin[um], terminating the poles of a voltaic battery, a galvanometer being also included in the circuit, the needle was slightly deflected, indicating a feeble conducting power . . . On applying a lamp under the sulphuret between the poles, the conducting power rose rapidly with the heat, and at last . . . the sulphuret was found conducting in the manner of a metal.

Jeffreys, *Michael Faraday: A List of his Lectures and Published Writings*, 215. 51123

19. Fink, Donald G. (1911-96). Principles of television engineering. xii, 541pp. Text illustrations. New York & London: McGraw-Hill, 1940. 230 x 153 mm. Original cloth, dust-jacket (chipped, marginal tear, slight soiling). Minor finger-soiling but fine as far as copies of this book go. Ownership signature on the front free endpaper.

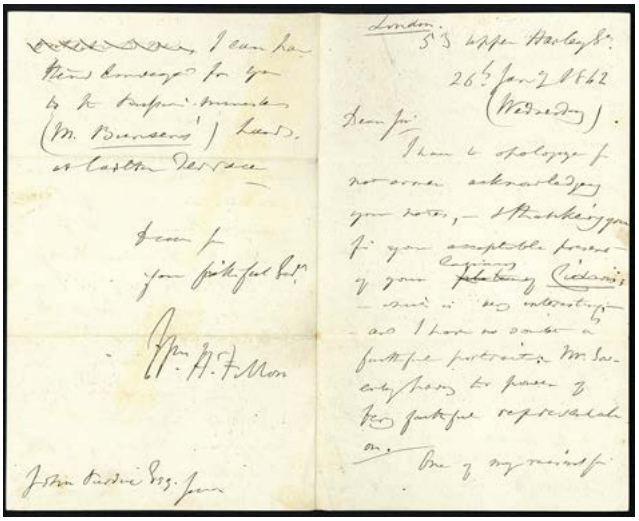
$275



First Edition. Fink, an American electrical engineer, was a pioneer in the development of television standards. His book "became a standard text for people working in television development" ("Donald Fink, 84, Pioneer in TV Technology." *The New York Times*, 6 May 1996). 51064

20. Fitton, William Henry (1780-1861). Autograph letter signed to John Jardine. 4pp. London, 53 Upper Harley Street, 26 January 1842. 183 x 116 mm. A few faint spots but fine otherwise.

$500

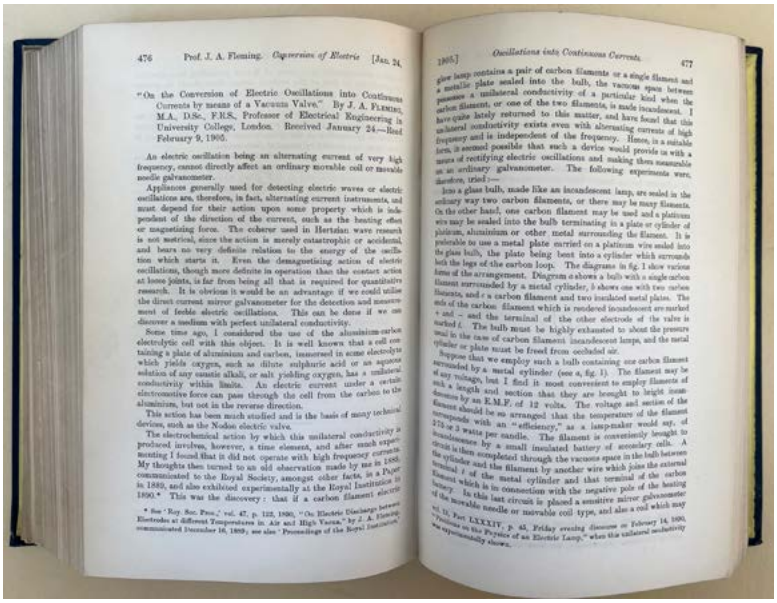


From the geologist William Henry Fitton, best known for his contributions to stratigraphy as embodied in his classic "On some of the strata between the chalk and the Oxford oolite (e.g., coralline) in the south-east of England" (*Trans. Geol. Soc.*, 1836). Fitton served as president of the Geological Society from 1827 to 1829, and contributed numerous essays and reviews on geological science to the *Edinburgh Review*. In the present letter Fitton discussed Jardine's present to him of an engraving of *Cidaris* (sea urchins) and mentioned a possible meeting with **Alexander von Humboldt** (1769-1859), the famous German naturalist and explorer, who was then in England:

> I have to apologize for not sooner acknowledging your notes, & thanking you for your acceptable present of your engraving of *Cidaris*, which is very interesting—and I have no doubt a faithful portrait: Mr. Sowerby having the power of very faithful representation.
>
> One of my reasons for delaying a reply to your second note (of the 20th) was the possibility that I might have seen the Baron von Humboldt, whom it is not unlikely that I may meet during his stay in England. But as I am not sure of this, I must answer your enquiry by saying that I fear that the K. of Prussia's time & hands are too much occupied with public affairs, to admit of his studying natural history;—nor should I know how to present an impression of your plate to him. But if you wish to put half a dozen copies, at the […] of Baron von Humboldt, or of Baron von Buch (who also resides at Berlin) & […] direct them to the former at the Prussian Embassy—Carlton Terrace, I can have no doubt that Mr. von Humboldt will receive them & take them to Berlin. Or if you wish have your copies left at the Geological Society, & the packet addressed, outside, I can have them conveyed for you to the Prussian minister's (M. Bunsen's) hands at Carlton Terrace.

Humboldt was a close friend of Prussia's King Frederick Wilhelm IV, whom he served as an advisor and diplomat; it is clear from Fitton's letter that Jardine was attempting to send a copy of his engraving to the King via Humboldt. "Mr. Sowerby" most likely refers to British naturalist, illustrator and conchologist George Brettingham Sowerby (1788-1854), author of several illustrated works on molluscs and a co-author of *The Mineral*

Conchology of Great Britain; the reference could also be to his brother, James de Carle Sowerby (1787-1871), who was also a scientific illustrator. The second paragraph of Fitton's letter mentions German geologist and paleontologist Christian Leopold von Buch (1774-1853), one of the foremost contributors to geology in the first half of the 19th century, best known for scientifically defining the Jurassic system. We have not been able to identify John Jardine, Fitton's correspondent; he may have been a relative of Scottish naturalist William Jardine (1800-1874), editor of *The Naturalist's Library* (1833-43). 42651



"On the Conversion of Electric Oscillations into Continuous Currents by means of a Vacuum Valve." By J. A. FLEMING, M.A., D.Sc., F.R.S., Professor of Electrical Engineering in University College, London. Received January 24,—Read February 9, 1905.

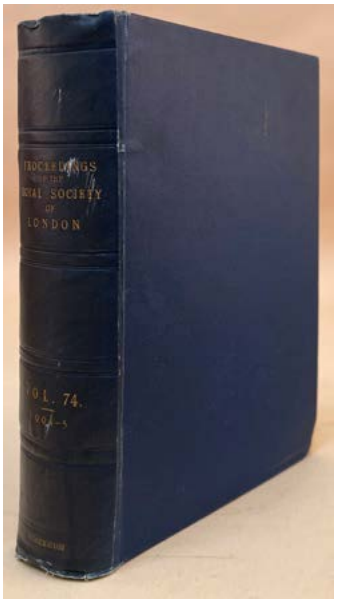
An electric oscillation being an alternating current of very high frequency, cannot directly affect an ordinary movable coil or movable needle galvanometer.

Appliances generally used for detecting electric waves or electric oscillations are, therefore, in fact, alternating current instruments, and must depend for their action upon some property which is independent of the direction of the current, such as the heating effect or magnetising force. The coherer used in Hertzian wave research is not metrical, since the action is merely catastrophic or accidental, and bears no very definite relation to the energy of the oscillation which starts it. Even the demagnetising action of electric oscillations, though more definite in operation than the contact action at loose joints, is far from being all that is required for quantitative research. It is obvious it would be an advantage if we could utilise the direct current mirror galvanometer for the detection and measurement of feeble electric oscillations. This can be done if we can discover a medium with perfect unilateral conductivity.

Some time ago, I considered the use of the aluminium-carbon electrolytic cell with this object. It is well known that a cell containing a plate of aluminium and carbon, immersed in some electrolyte which yields oxygen, such as dilute sulphuric acid or an aqueous solution of any caustic alkali, or salt yielding oxygen, has a unilateral conductivity within limits. An electric current under a certain electromotive force can pass through the cell from the carbon to the aluminium, but not in the reverse direction.

This action has been much studied and is the basis of many technical devices, such as the Nodon electric valve.

The electrochemical action by which this unilateral conductivity is produced involves, however, a time element, and after much experimenting I found that it did not operate with high frequency currents. My thoughts then turned to an old observation made by me in 1883, communicated to the Royal Society, amongst other facts, in a Paper in 1889, and also exhibited experimentally at the Royal Institution in 1890.* This was the discovery: that if a carbon filament electric

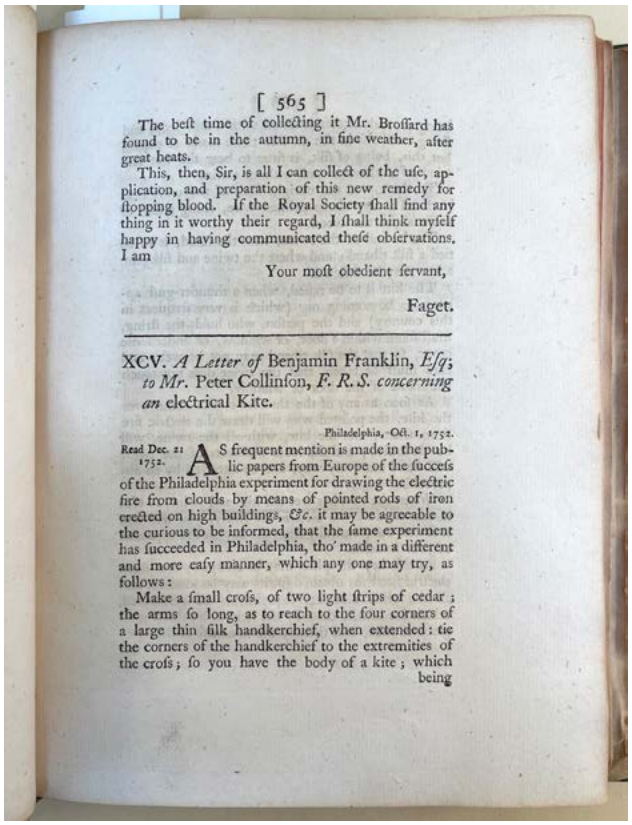


The Vacuum Tube—Beginning of Electronics

21. Fleming, John Ambrose (1849-1945). On the conversion of electric oscillations into continuous currents by means of a vacuum valve. In *Proc. Roy. Soc.* 74 (1905): 476-487. Whole volume, 8vo. [66, variously paginated], 580pp. Plates, text illustrations. Later library buckram, very minor rubbing and wear. Book-label and stamps of the Liverpool Athenaeum. $2750

First Edition, journal issue. Fleming's paper introduced the basic principle of the modern wireless valve. Fleming, an electrical engineer and physicist who had worked with Thomas Edison's company in London, invented the two-electrode vacuum-tube or diode, an event that marks the beginning of the electronics age. A precursor of the transistor, the vacuum tube was the first switch used in the earliest electronic computers. Using vacuum tubes as switches, the first general-purpose electronic computer, the ENIAC, was able to operate 10,000 times the speed of a human computer. By comparison, the Harvard Mark 1, which used electromechnical relays as switches, computed 100 times the speed of a human computer. Fleming's invention also paved the way for Lee DeForest and others to perfect the broadcasting of wireless signals.

Fleming had been aware since 1884 of the so-called "Edison effect" of "unilateral flow of particles from negative to positive electrode, and he repeated some of the experiments, with both direct and alternating currents, beginning in 1889 . . . [In 1904] he returned to his experiments on the Edison effect, with a view to producing a rectifier that would replace the inadequate detectors then used in radiotelegraphy. He named the resulting device a 'thermionic valve,' for which he obtained a patent in 1904 [i.e., 1905]. This was the first electron tube, the diode, ancestor of the triode and the other multielectrode tubes which have played such an important role in both telecommunications and scientific instrumentation" (*Dictionary of Scientific Biography*). *Printing and the Mind of Man* 396. 40296



[565]

The beſt time of collecting it Mr. Broſſard has found to be in the autumn, in fine weather, after great heats.

This, then, Sir, is all I can collect of the uſe, application, and preparation of this new remedy for ſtopping blood. If the Royal Society ſhall find any thing in it worthy their regard, I ſhall think myſelf happy in having communicated theſe obſervations. I am

Your moſt obedient ſervant,

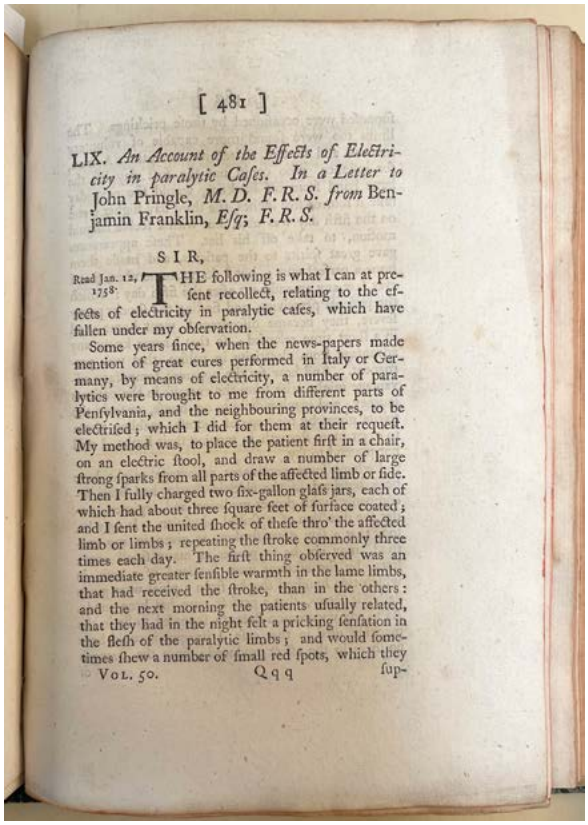
Faget.

XCV. *A Letter of* Benjamin Franklin, *Eſq; to Mr.* Peter Collinſon, *F. R. S. concerning an* electrical Kite.

Philadelphia, Oct. 1, 1752.

Read Dec. 21 1752. AS frequent mention is made in the public papers from Europe of the ſucceſs of the Philadelphia experiment for drawing the electric fire from clouds by means of pointed rods of iron erected on high buildings, *&c.* it may be agreeable to the curious to be informed, that the ſame experiment has ſucceeded in Philadelphia, tho' made in a different and more eaſy manner, which any one may try, as follows:

Make a ſmall croſs, of two light ſtrips of cedar; the arms ſo long, as to reach to the four corners of a large thin ſilk handkerchief, when extended: tie the corners of the handkerchief to the extremities of the croſs; ſo you have the body of a kite; which being



[481]

LIX. *An Account of the Effects of Electricity in paralytic Caſes. In a Letter to* John Pringle, *M. D. F. R. S. from* Benjamin Franklin, *Eſq; F. R. S.*

SIR,

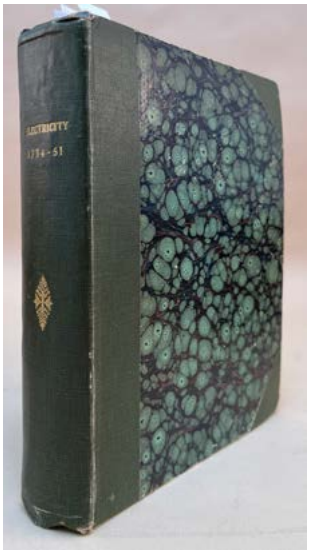
Read Jan. 12, 1758. THE following is what I can at preſent recollect, relating to the effects of electricity in paralytic caſes, which have fallen under my obſervation.

Some years ſince, when the news-papers made mention of great cures performed in Italy or Germany, by means of electricity, a number of paralytics were brought to me from different parts of Penſylvania, and the neighbouring provinces, to be electriſed; which I did for them at their requeſt. My method was, to place the patient firſt in a chair, on an electric ſtool, and draw a number of large ſtrong ſparks from all parts of the affected limb or ſide. Then I fully charged two ſix-gallon glaſs jars, each of which had about three ſquare feet of ſurface coated; and I ſent the united ſhock of theſe thro' the affected limb or limbs; repeating the ſtroke commonly three times each day. The firſt thing obſerved was an immediate greater ſenſible warmth in the lame limbs, that had received the ſtroke, than in the others: and the next morning the patients uſually related, that they had in the night felt a pricking ſenſation in the fleſh of the paralytic limbs; and would ſometimes ſhew a number of ſmall red ſpots, which they

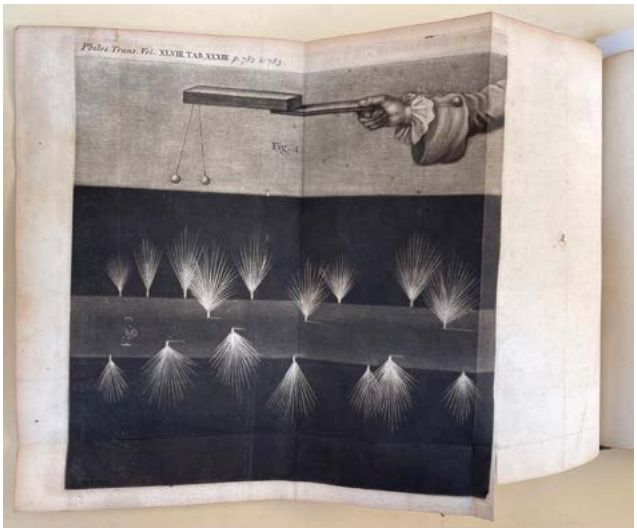
Franklin and his Fellow "Electricians"—Franklin's Famous "Kite" Paper, Together with 47 Other 18th-Century Papers on Electricity

22. Franklin, Benjamin (1706-90). A letter of Benjamin Franklin, Esq; to Mr. Peter Collinson, F.R.S. concerning an electrical kite. Extract from *Philosophical Transactions of the Royal Society* 47 (1752): 565-567. 232 x 173 mm. In a *Sammelband* of extracts from the *Philosophical Transactions* containing 48 papers on electricity by Franklin and others, published between 1734 and 1764; click here for complete listing. Later half cloth, marbled boards, light wear, lower corners a bit bent. Light foxing and toning, occasional marginal dampstaining, but very good. $17,500

A virtually impossible to duplicate collection of rare English-language papers on electricity from the key early decades from 1734 to 1764. It includes the first edition of four key papers by Benjamin Franklin, including the one on his famous kite experiment.

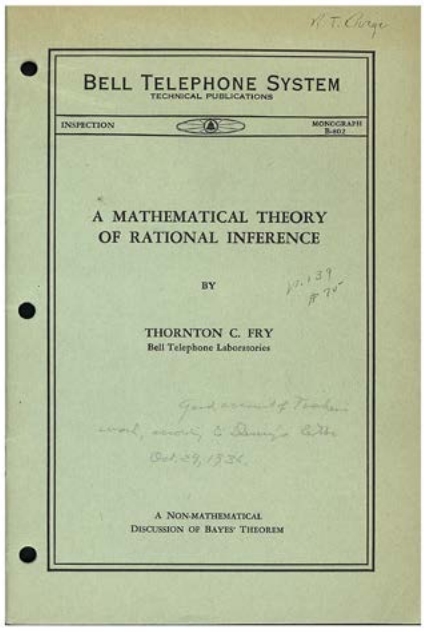


"Until the middle of the eighteenth century electricity was known only in its static form, and the most important instrument in use was the Leiden jar for concentrating electricity, discovered accidentally by Pieter van Musschenbroek . . . With this and other instruments Franklin conducted a series of experiments during the years 1746-57 . . . The most dramatic result of Franklin's researches was the proof that lightning is really an electrical phenomenon. Others had made such a suggestion before him—even Newton himself—but it was [Franklin] who provided the experimental proof. In 1752 he flew a kite in a thunderstorm and attached a key to its string. From this he collected electric charges in a Leiden jar and showed that atmospheric and frictional or man-made electricity are the same" (*Printing and the Mind of Man*, p. 119). Franklin's lightning experiments made his name famous throughout Europe, and "marked the coming of age of electrical science" (*Dictionary of Scientific Biography*).



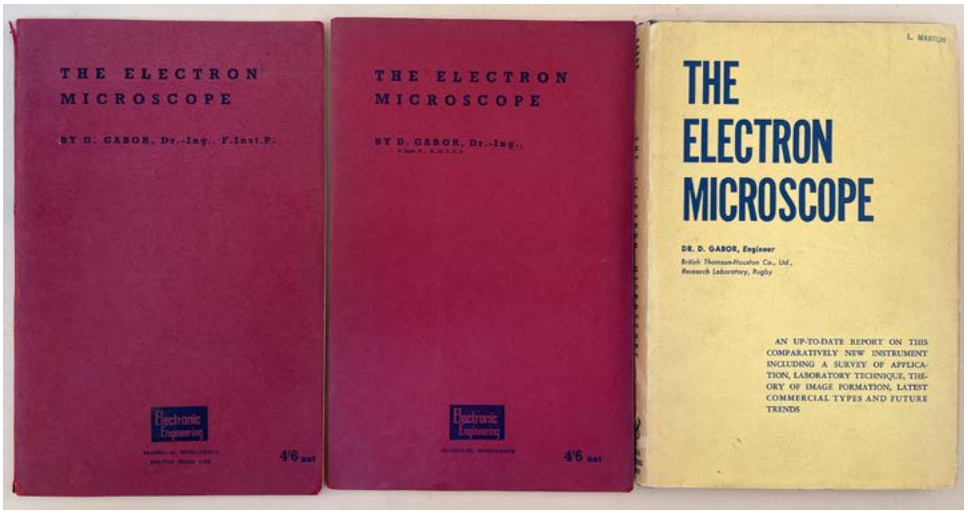
As is well known, Franklin communicated the results of his electricity experiments in a series of letters to the Royal Society in London. Our volume includes four additional Franklin papers, all of which first appeared in print in the Royal Society's *Philosophical Transactions*— "A letter from Mr. Franklin to Mr. Peter Collinson, F.R.S. concerning the effects of lightning" (1752); "Electrical experiments, made in pursuance of those by Mr. Canton" (1755); "Extract of a letter concerning electricity, from Mr. B. Franklin to Mons. Delibard" (1755); and "An account of the effects of electricity in paralytic cases" (1757). In addition, the volume contains 43 papers on electricity from the *Philosophical Transactions* by some of Franklin's most notable contemporary "electricians," including **Charles Du Fay**, **Stephen Gray**, **Granville Wheler**, **William Watson**, **Guillaume Mazeas**, **Jean Antoine Nollet**, **Benjamin Wilson**, **John Canton** and **Ebenezer Kinnersley**; click here for a complete listing. The papers, published between 1734 and 1764, provide a good representation of both the lead-in to Franklin's electrical investigations and the enormous scientific interest inspired by his results. 51404

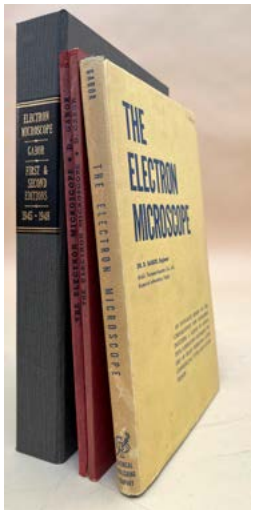
23. Fry, Thornton Carle (1892-1991). A mathematical theory of rational inference. *Bell Telephone System Technical Publications,* monograph B-802. Offprint from *Scripta Mathematica* 2 (1934). 17pp. 230 x 150 mm. Original blue printed wrappers, a bit sunned. Very good. From the library of Raymond T. Birge (1887-1980), with his signature and pencil note on the front wrapper and pencil annotations in the text. $750

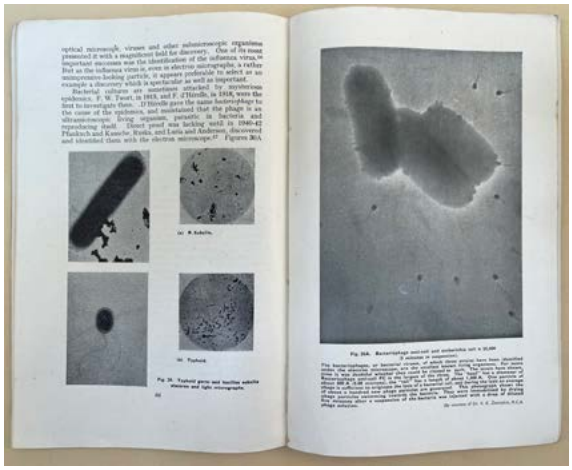


First Edition, Offprint Issue. A non-mathematical discussion of Bayes's theorem by Thornton Fry, the head of Bell Lab's division for industrial applications of mathematics and statistics. Bayes's theorem is one of the most widely applied theorems in computing.

This copy is from the library of American physicist Raymond T. Birge, chair of the Department of Physics at the University of California, Berkeley. Birge's interest in statistics led to a collaboration with Walter Edwards Deming, founder of the quality control movement, with whom he co-authored the classic paper "On the statistical theory of errors" (1934). Birge's pencil annotations appear on several pages of this copy, and on the front wrapper he wrote "Good account of [statistician R. A.] Fisher's work, according to Deming's letter Oct. 29, 1934." 51142







24. Gabor, Dennis (1900-1979). (1) The electron microscope. 104pp. Text illustrations. London: Hulton Press, 1945. 216 x 141 mm. Original printed wrappers, spine a bit worn and chipped. **With:**

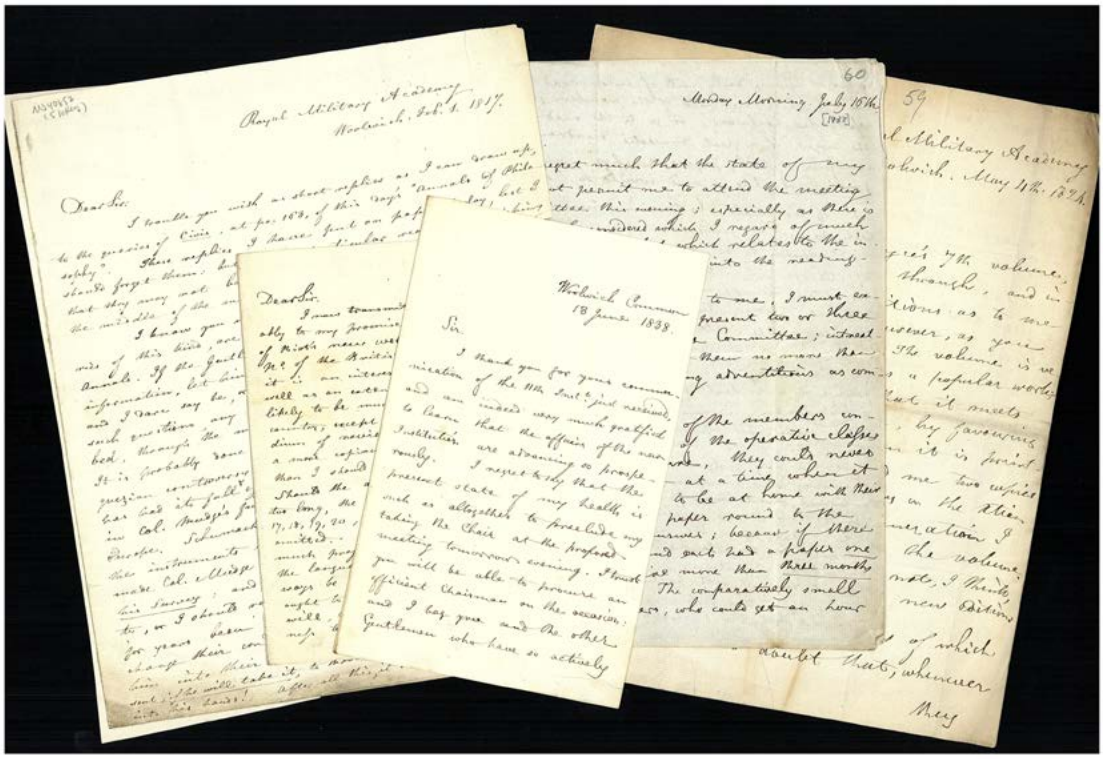
Gabor. The electron microscope. Second edition. 106, [2]pp. Text illustrations. London: Published from the offices of "Electronic Engineering," 1948. 216 x 141 mm. Original printed wrappers. **With:**

Gabor. The electron microscope. viii, 164pp. Text illustrations. Brooklyn, NY: Chemical Publishing Co., 1948. 204 x 136 mm. Original cloth, dust-jacket (slightly worn). Stamp of Ladislaus L. Marton (1901-79) on the dust-jacket and front free endpaper. Together 3 items; the first two boxed. Very good.

$950

First, second, and **first American** editions of Gabor's monograph on the electron microscope, intended "to be both an introduction to the electron microscope and a critical contribution to its theory" (Foreword). In the 1920s Gabor invented the cathode-ray oscilloscope, the basic technology behind the electron microscope, but made no effort at the time to develop the technology further. When Ernst Ruska and Max Knoll invented the first electron microscope in 1931, Gabor felt that he missed an important opportunity, and much of his subsequent scientific work was spent trying to make up for this lapse. In 1947, while searching for ways to improve the electron microscope, Gabor invented holography, for which he received the Nobel Prize for physics in 1971.

The first American edition contains a new foreword by Gabor, and an index not present in the second English edition. Our copy of this edition is from the library of physicist Ladislaus L. Marton, known for his pioneering work in electron microscopy and electron optics; he was also the author of *Early History of the Electron Microscope* (1968). Gabor cited several of Marton's papers in the bibliography to *The Electron Microscope*. 51069

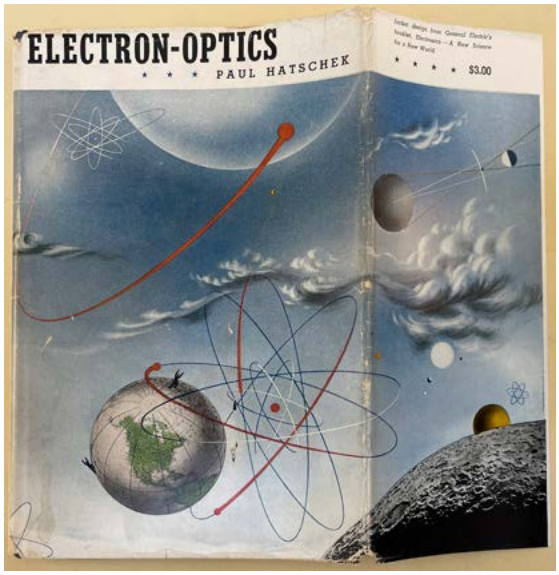


25. Gregory, Olinthus Gilbert (1774-1841). Five autograph letters signed, three to Robert Baldwin, of the publishing firm Baldwin, Cradock & Joy, and two to an unidentified officer of the Woolwich Institution for the Advancement of Literary, Scientific and Technical Knowledge. Woolwich, Sept. 28, 1816 – July 16, 1838. 11pp. total. Various sizes (the largest 251 x 203 mm.). One letter mounted with some fraying of the front edge (slightly affecting a few words), another with a small paper flaw, light soiling, but very good. $1250

From British mathematician and writer Olinthus Gregory, professor of mathematics at the Royal Military Academy at Woolwich, author of works on mathematics, astronomy, mechanics, etc., and editor of both the *Gentleman's Diary* and *Ladies' Diary.* Gregory played a role in the controversy surrounding the Trigonometrical Survey of Great Britain, later known as the Ordnance Survey. The survey, which had begun in 1791, was opposed for political reasons by Royal Society President Sir Joseph Banks, who in 1812 published in the *Philosophical Transactions* a memoir by Don José Rodriguez attacking the survey and its leader, Col. William Mudge. Gregory exposed Banks's machinations in a paper published in the *Philosophical Magazine,* which was later collected in *Dissertations and Letters, by Don Joseph Rodriguez, the Chevalier Delambre, Baron de Zach, Dr. Thomas Thomson, Dr. Olinthus Gregory, and Others . . . Tending Either to Impugn or to Defend the Trigonometrical Survey of England and Wales* (1815). Gregory's 1817 letter to Baldwin, one of the publishers of the *Annals of Philosophy*, discusses this controversy, noting that its effect had been to produce "a strong current in Col. Mudge's favour among all the men of science in Europe . . . the French Institute has made Col. Mudge a member, *expressly on account of his survey:* and immediately after this, the Royal Society, or I should rather say Sir Jos. Banks's party, who had for years been doing every thing to sink his reputation, change their conduct, flatter and fawn upon him, elect them into their councils . . ."

Gregory's remaining letters to Baldwin discuss literary matters, including his "account of Biot's new work [*Traité de physique* (1816)] for the next no. of the British review." His later letters, written to an unnamed official at Woolwich Institution for the Advancement of Literary, Scientific and Technical Knowledge, include a long discussion as to why the Institution's reading room should not provide daily newspapers for its largely working-class clientele. 40852

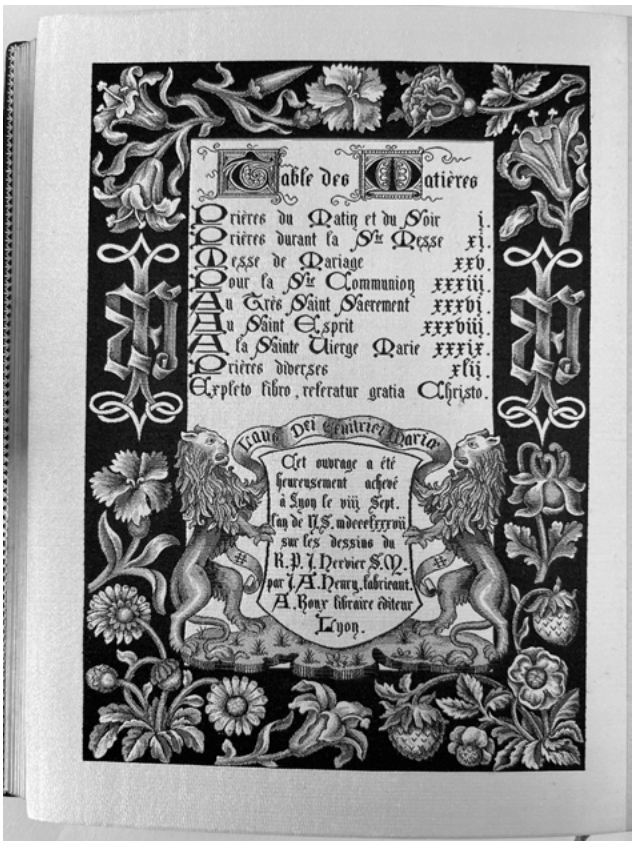
26. Hatschek, Paul (1888-1944)**.** Electron-optics. Translated by Arthur Palme. v, [1], 161pp. Text illustrations. Boston: American Photographic Publishing Company, 1944. 225 x 150 mm. Original cloth, pictorial dust-jacket (minor staining and chipping). Very good. From the library of Ladislaus L. Marton (1901-1979), with his ownership stamp on the front free endpaper. Laid in is a printed card from the publishing company requesting a review from the *Journal of Applied Physics*. $200



First Edition in English, translated from the 1937 German edition. Hatschek was a Czech engineer who made contributions to optical and film technology. Ladislaus L. Marton, the former owner of this copy, was a physicist best known for his pioneer work in electron physics, specifically in electron microscopy, electron optics, and electron interferences and scattering. 51066

27. Herschel, William (1738-1822). Stipple-engraved portrait by James Godby after Friedrich Rehberg (1758-1835). London: F. Rehberg, 1 November 1814. Archivally matted and framed; frame measures 430 x 317 mm. Insignificant scattered foxing but very good. $650

An excellent portrait of German-British astronomer William Herschel, commemorating his discovery in 1781 of the planet Uranus. According to the print's caption, "the background represents part of the constellation of Gemini, with a telescopic aspect of the Georgium Sidus [Uranus], as it was discovered by Dr. Herschel at Bath, the 13th of March 1781, in consequence of which, he was soon after introduced to the most gracious patronage of His Majesty, King George III." Herschel had named the new planet "Georgium sidus" [Georgian star] in honor of the king, but his choice found little favor outside of Britain. In 1782 German astronomer Johann Bode suggested the planet's present name, a Latinization of *Ouranos*, the Greek god of the sky. 41970

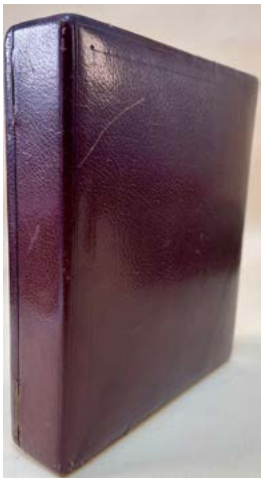


Is This the First Digital Book?

28. **[Jacquard Automated Loom.]** Livre de prières tissé d'après les enluminures des manuscrits du XIVe au XVIe siècle. 25 leaves woven in silk on the Jacquard automated loom by the firm of J. A. Henry after designs by R. P. J. Hervier, plus 3 leaves of plain silk, mounted on thin card. Lyon: A. Roux, 1886 [colophon dated 1887; our copy issued in 1889]. 170 x 135 mm. Full crushed morocco, elaborate inlaid "endpapers" in colored leather and gilt inside the front and back covers signed "Hauptmann-Petit" and "Maillard"; in a custom full morocco case lined in velvet and silk. Woven for Noé(?) Delaitre in 1889, as indicated on the page facing the half-title. Fine. $60,000

One of the true marvels of nineteenth-century technology in the service of the "Book Arts," which absolutely must be seen to be fully appreciated—a spectacular neo-Gothic Book of Prayers woven in silvery-grey and black silk thread by the Jacquard automated loom, which used a series of punched cards to produce elaborate woven patterns in cloth. Because the book was produced entirely from Jacquard cards, in which the punched holes or lack thereof are analogous to the digital logic of zeros and ones, this entirely woven book could be considered the first book produced by what we call a program, or the first digitally produced book. An estimated 50 or 60 copies were issued.

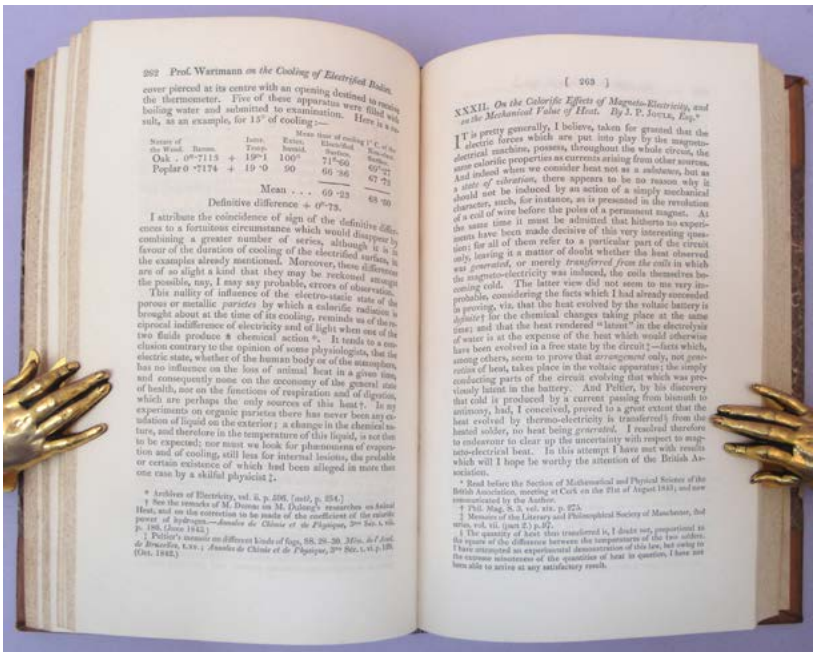
Inlaid leather and gilt front "endpaper"

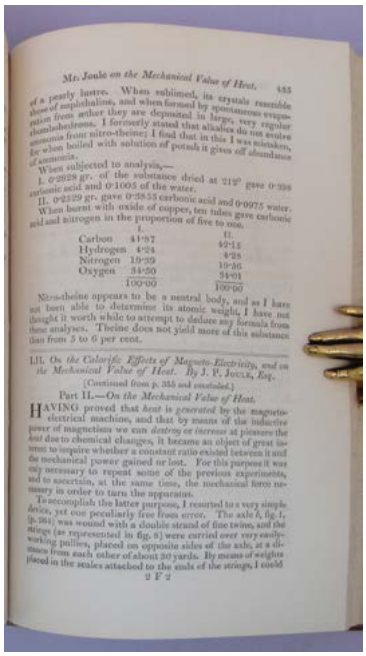


The technical virtuosity and degree of finesse achieved in this production represents a high point in the application of the Jacquard loom to the weaver's art. It is not known how many punched cards it took to produce the book, but estimates are between 200,000 and 500,000 cards to weave 400 woof threads per 2.5 cm. (approximately one square inch), demanding machine movements of not more than a tenth of a millimeter. Fine quality gray and black silk threads were used.

The prayer book's pages, which include elaborate borders, decorative initials, and three miniatures of the Virgin and Child, Crucifixion and Nativity, were all taken from Gruel and Engelmann's *Imitation de Jésus-Christ* (1874), which contains reproductions of a variety of illuminated manuscripts from the 14th to the 16th centuries. The original designs for the book are held by the Musée des Tissus et des Arts décoratifs de Lyon.

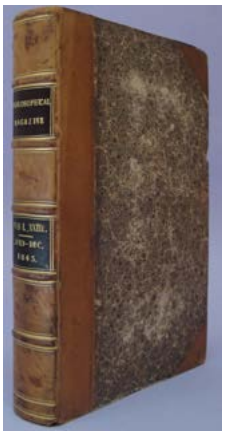
Matthew J. Westerby, in *The Woven Prayer Book: Cocoon to Codex* (2019), points out that the *Livre de prières* could be customized with an owner's name on the verso of the half-title. In our copy, the escutcheon in the designs on that leaf contains the letters ND, and beneath that the name Noe [?] Delaitre is woven in the banderole, with the date 1889, indicating most probably that the copy was woven and bound to order in 1889. In copies that were not customized those spaces were left blank. L. M. C. Randall, "A nineteenth-century 'medieval' prayerbook woven in Lyon," in M. Barasch and L. F. Sandler, eds., *Art the Ape of Nature: Studies in Honor of H. W. Janson* (1981), pp. 651-668. 44570





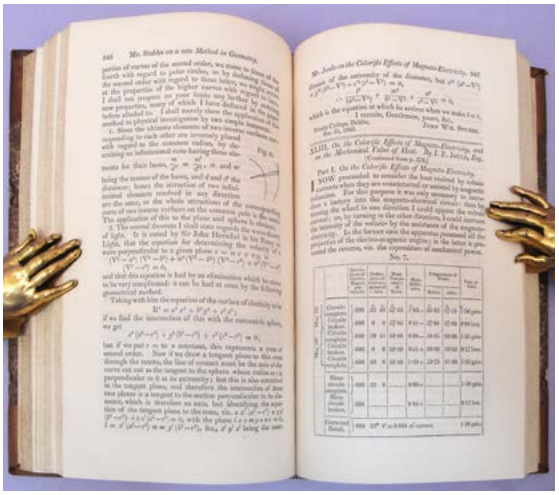
The Mechanical Equivalent of Heat

29. Joule, James Prescott (1818-1889). On the calorific effects of magneto-electricity, and on the mechanical value of heat. In: *London, Edinburgh and Dublin Philosophical Magazine and Journal of Science*, 3rd series, 23 (1843), pp. 263-276, 347-355, 435-455. Whole volume, 8vo. viii, 552pp. Engraved frontispiece, text illustrations. 215 x 133 mm. 19th century half calf, marbled boards, light rubbing, small dent in front cover's fore-edge. Minor foxing but very good. Binder's stamp on rear paste-down.

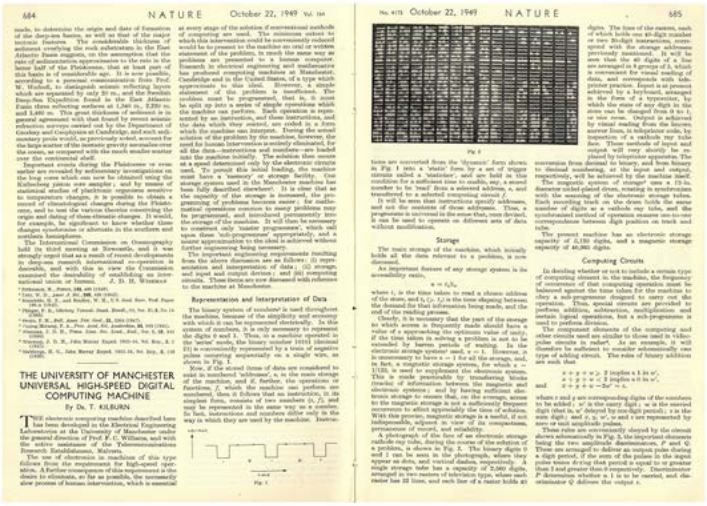


$10,000

First Edition, journal issue. "Experimental proof of the mechanical equivalent of heat for physical phenomena" (*Printing and the Mind of Man*, p. 196). Joule demonstrated that the conversion of heat into force, and vice versa, takes place at a fixed rate. This discovery led to two conclusions: First, that heat is a form of energy; and second, that within a given system, the sum total of energy is both constant and convertible. Joule's work, along with that of Mayer and Helmholtz, was fundamental to the establishment of the principle of the conservation of energy. Dibner, *Heralds of Science*, 158. Norman 1179. 40295



Kilburn Describes the Manchester Mark 1



30. Kilburn, Tom (1921-2001). The University of Manchester universal high-speed digital computing machine. In *Nature* 164 (1949): 684-687. Whole number. 677-720pp. 247 x 175 mm. Disbound from volume; without wrappers. Outer leaves a bit loose but very good. $950

First Edition, journal issue of Kilburn's paper describing the final version of the Manchester Mark 1, one of the earliest stored-program computers. Kilburn, one of the pioneers of computer science, collaborated with F. C. Williams on the prototype Manchester Baby—the world's first operable electronic stored-program computer—and on the Baby's successor, the Manchester Mark 1. Both machines were designed and built at Manchester University in the late 1940s; Alan Turing, who joined the university's Computing Machine Laboratory in September 1948, designed the Mark 1's base-32 encoding scheme.

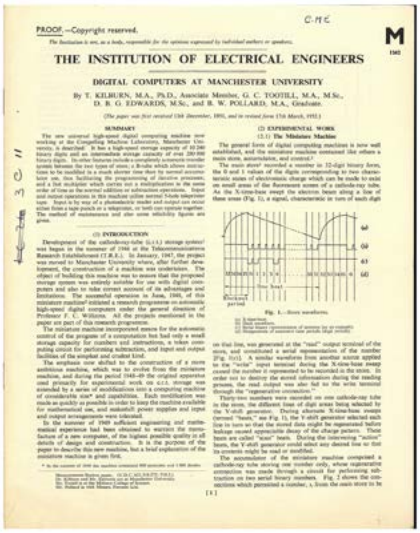
The first or "intermediary" version of the Mark 1 became operational in April 1949, and the "final specification" version went on line the following October. The machine incorporated important innovations such as index registers and the Williams-Kilburn CRT tube, the first random-access digital storage device. The Manchester Mark 1 served as the prototype for the Ferranti Mark 1, the first commercially available general-purpose stored program electronic computer. 51320

Kilburn Describes the Ferranti Mark 1

31. Kilburn, Tom (1921-2001). The new universal digital computing machine at the University of Manchester. In *Nature* 168 (1951): 95-96. Whole number. 89-128pp. 251 x 177 mm. Disbound from volume; without wrappers. Some outer leaves loose but very good. $950

First Edition, journal issue. Kilburn's description of the Ferranti Mark 1, the world's first commercially available electronic general-purpose stored program computer. The machine, based on the Manchester Mark 1, became operational in July 1951. 51319

Kilburn & Toothill on the Ferranti Mark 1


PROOF.—Copyright reserved.

THE INSTITUTION OF ELECTRICAL ENGINEERS

DIGITAL COMPUTERS AT MANCHESTER UNIVERSITY

32. Kilburn, Tom (1921-2001); **Geoff C. Toothill** (1922-2017); **D. B. G. Edwards; Brian W. Pollard.** Digital computers at Manchester University. 14pp. Text diagrams. London: Institution of Electrical Engineers, 1952. 278 x 216 mm. Without wrappers. Slight wear and toning, a few notations in pen but very good. $950

First Separate Edition. A description of the Ferranti Mark 1. Toothill was one of the designers of both the Manchester Baby and the Manchester Mark 1. Edwards worked on the Manchester Mark 1, and Pollard, an engineer at Ferranti Ltd., helped to build the Ferranti Mark 1. The paper was published in 1953 in *Symposium of Papers on Digital Computers.* This separate version of the paper, which resembles an offprint, is labeled "Proof.—Copyright reserved" in the upper left corner of the first page. *Origins of Cyberspace* 748. 51318


Friedrichs von Knauß,

Selbstschreibende

Wundermaschinen,

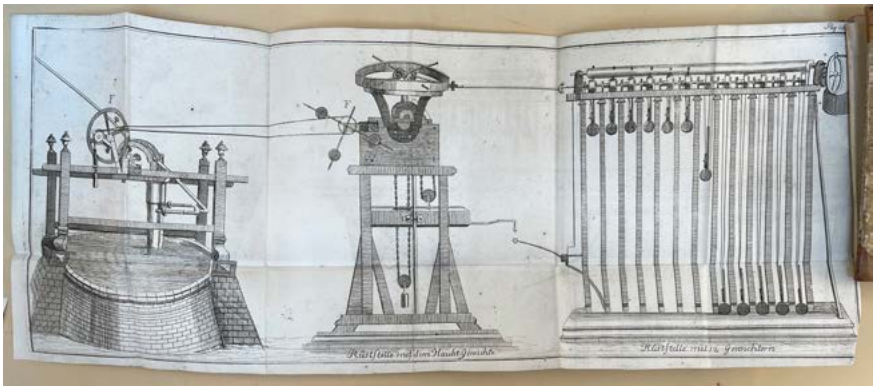
Kunst- und Meisterstücke;

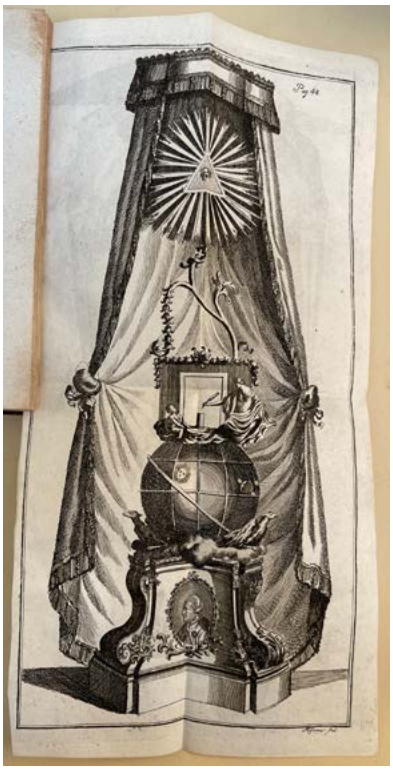
Franzens I. Josephs II.

Marien Theresiens

The First Writing Automaton

33. Knauss, Friedrich von (1724-89). Selbstschreibende Wundermaschinen, auch mehr andere Kunst- und Meisterstücke; als so viele nunmehr aufgelöste Problemen under den drei glorwürdigstenb Regierungen Franzens I Josephs II bender römischen Kaiser; und Marien Theresiens kaiserl. königl. apostol. Majestät der Künste und Wissenschaften allergrössesten Beförderinn und Beschützerinn. [18], 170, [2]pp. Engraved frontispiece portrait and 11 folding engraved plates. Vienna: Privately printed for the author [by Theresia Schulz], 1780. 200 x 131 mm. Half calf ca. 1780, speckled boards, one corner bumped, light rubbing and edgewear. Very good to fine. $12,500

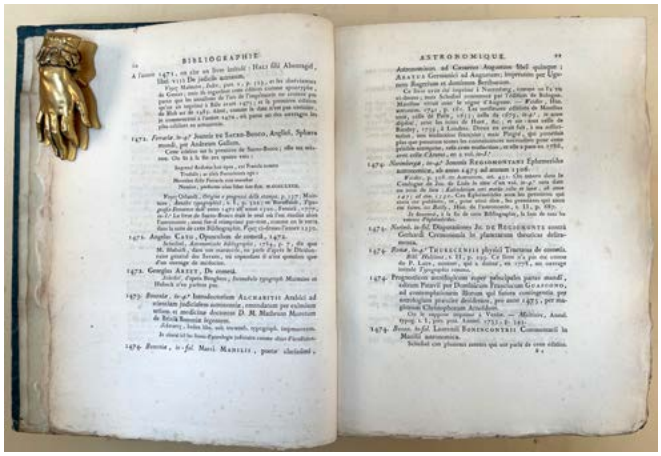




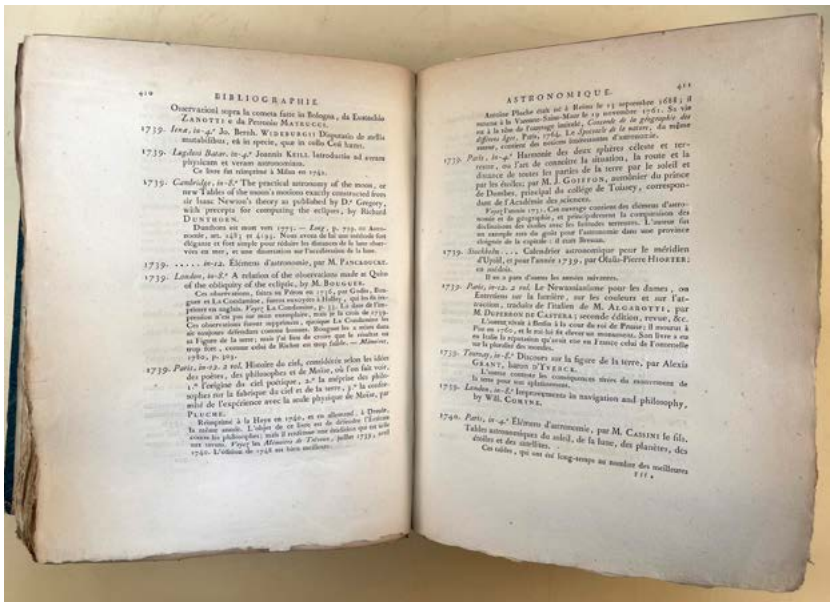
First and Only Edition. Knauss, a German watchmaker and inventor, is believed to have created the first writing automaton, anticipating Jacquet-Druoz by almost two decades. Knauss built at least five writing automata, all illustrated in the present work. The earlier examples of Knauss's writing automata were capable only of writing a single preprogrammed phrase, but his most advanced model was capable of writing "any phrase composed in advance, and it could also write to dictation by means of a hand-operated control on the letter keyboard" (Dalakov). "The principal mechanism constitutes a horizontal roll composed of pins, introduced into appropriate openings. When moving, the pins press on a keyboard containing keys, each key corresponding to a letter" (Dalakov). Knauss's "Miraculous writing machine," which he presented to Emperor Francis I, is still preserved in Vienna's Technisches Museum. Dalakov, Giorgi, "Friedrich von Knaus." *Computer Timeline*, www.computer-timeline.com/timeline/friedrich-von-knaus/. Accessed 14 June 2023. 51321

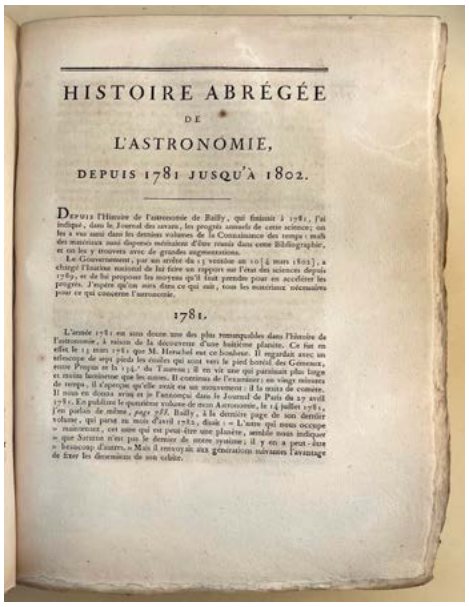
The First Major Historical Bibliography of a Science Other than Medicine

34. Lalande, Joseph Jérôme le François (1732-1807). Bibliographie astronomique; avec l'histoire de l'astronomie depuis 1781 jusqu'à 1802. 4to. [4], viii, 965pp. Paris: L'Imprimerie de la République, 1803. 271 x 211 mm. (uncut and partly unopened). Paste paper boards ca. 1803, handwritten paper spine label, some wear and rubbing, hinges cracked but holding. Uncut edges a bit frayed, light toning, small portions cut from lower right corner of title-leaf and last leaf (not affecting text). Very good. $1250



First Edition of the first major chronological bibliography of a science other than medicine, compiled by one of the foremost astronomers of the eighteenth century. In his preface Lalande acknowledged that he was dependent for the earliest literature on references in Johann Frideric Weidler's *Bibliographia astronomica* (1775) a pioneering work which he frequently cited. Weidler followed a chronological arrangement, and it is probable that Lalande found it convenient as well as useful to improve and build upon Weidler's work. Lalande's chronological order in his brief first section on books composed "before the discovery of printing"

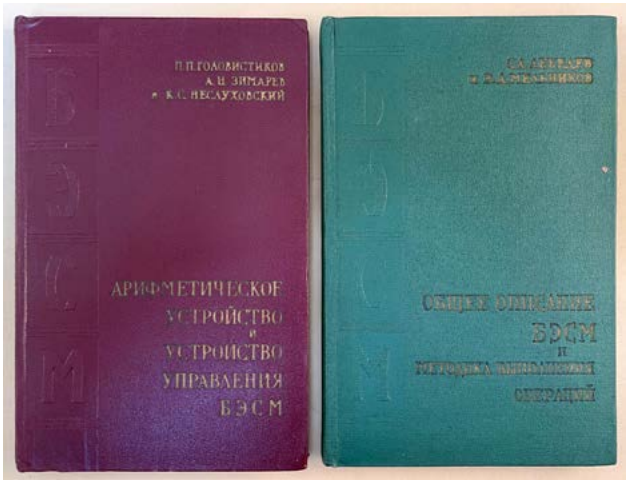




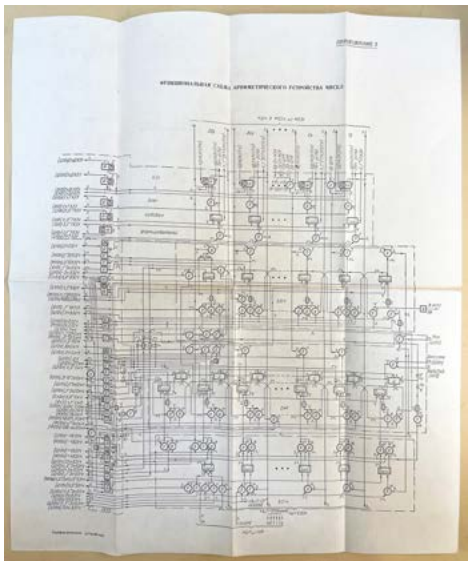
was somewhat shaky, with entries from the ancient world inexact and sometimes out of chronological sequence in the first three pages. But by around the time of Cassiodorus, which Lalande set a bit inaccurately at 530 CE, Lalande found himself on firmer chronological ground. Once he passed to printed books he assumed greater authority, and many of his thousands of entries indicate that he examined the actual edition himself, and commented on the contents, reflecting an extraordinary familiarity with a high percentage of the vast historical literature of astronomy. Pages 660-880 contain Lalande's history of astronomy from 1781 to 1802. 43201

Lebedev's Book on the BESM Computers

35. Lebedev, Sergey Alekseyvich (1902-74); V. A. Melnikov; P. P. Holovystykov; A. N. Zymarev; K. S. Neslukhovskyi. [In Cyrillic:] Elektronnaya tsifrovaya vychislitel'naya mashina BESM [BESM electronic digital computing machine]. Vol. 1: Obshcheye opisaniye BESM i metodika vypolneniya operatsiy [General description of BESM and method of performing operations]. Vol. 2: Arifmeticheskoye ustroystvo i ustroystvo upravleniya BESM [Arithmetic unit and BESM control device]. 208; 214pp. Folding diagram in Vol. 1; 3 loose folding diagrams in Vol. 2 held by paper strap tipped to the back pastedown. One of the diagrams is "Functional Diagram of the Arithmetic Unit of Orders." Another is "Functional Diagram of the Arithmetic



Unit of Numbers."Moscow: State Publishing House of Physical and Mathematical Literature, 1959-60. 197 x 120 mm. Ownership signature in Vol. 1, a few pencil underlinings. "Printed in USSR" stamped in both volumes. Very good. $500

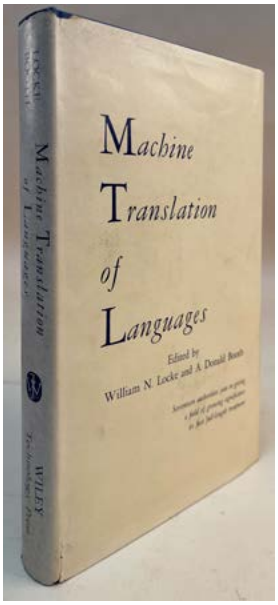


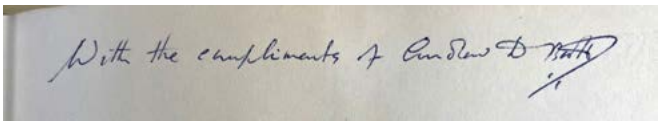
First Edition. The Soviet Union (USSR) began developing digital computers after World War II. BESM-1, the USSR's first large-scale general-purpose electronic digital computer, was designed and built by Soviet computer pioneer Sergey A. Lebedev; completed in 1952, the machine used around 5000 vacuum tubes and for a time was the fastest computer in Europe. Only one example of the BESM-1 was built, due to opposition from the USSR's Ministry of Machine and Instrument Building, which had developed its own less reliable machine.

The first volume of the present work, by Lebedev and Melnikov, gives a general description of BESM and its operations; the second, by Holovystykov, Zymarev and Neslukhoskyi, describes the machine's arithmetic unit and control device. 51209

The First Book on Machine Translation, Inscribed

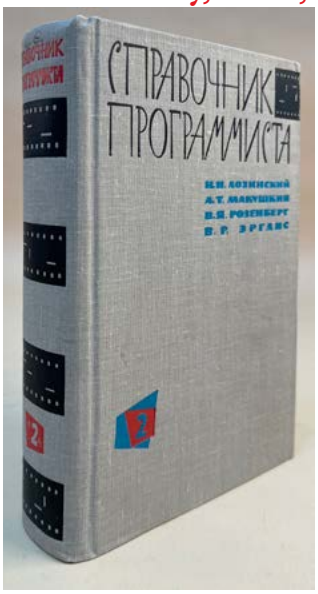
36. Locke, William N. (1909–) and **Andrew Donald Booth** (1918-2009), eds. Machine translation of languages. xii, 243, [1]pp. New York: John Wiley & Sons; London: Chapman & Hall, ©1955. 229 x 147 mm. Original blue cloth, buff printed dust-jacket (faint spotting, a few minor tears). Faint stain on front free endpaper, but very good. *Presentation Copy,* inscribed on the front free endpaper: "With the compliments of Andrew D. Booth." $750





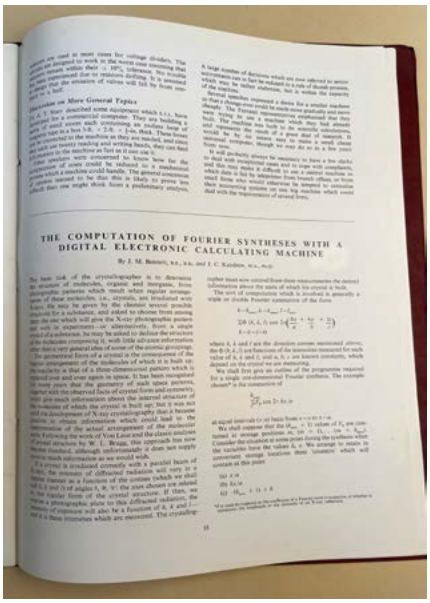
First Edition. The first book on the application of computers to language translation, co-edited by computer pioneer A. D. Booth, an important early contributor to the development of computer memory technology. The book's historical introduction, by Booth and Locke, represents the first history of machine translation. The book also contains a reprint of Weaver's twelve-page memorandum entitled "Translation," written on 15 July 1949 and circulated privately to about two hundred people; Weaver's memorandum "was the first suggestion that most had ever seen that language translation by computer techniques might be possible" (p. 15n). Also included is Erwin Reifler's paper, "The mechanical determination of meaning," in which he made the prescient claim that "all human pre-editorial work, which I had previously considered a *conditio sine qua non,* could be completely mechanized" (p. 137). Pages 227–36 contain an annotated bibliography of the subject, most of which consists of mimeographed articles. *Origins of Cyberspace* 497 (this copy). 39255

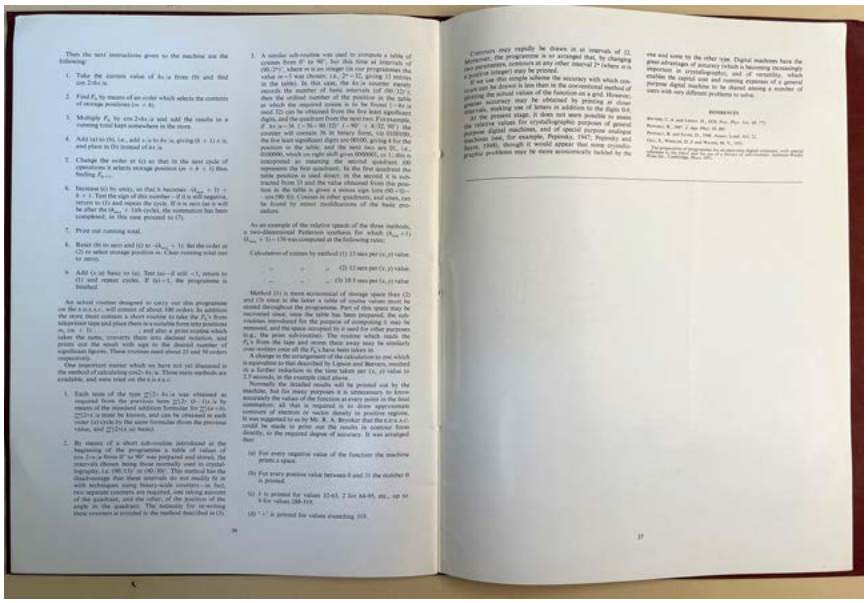
37. Lozinsky, N. N.; A. T. Makushkin; V. Y. Rozbiberg; V. R. Erglis. [In Cyrillic:] Spravochnik programmista. Tom vtoroy: Standartnyye programmy i sistemy ikh ispol'zovaniya [Programmer's handbook. Volume 2: Standard programs and systems for their use]. Vol. 2 *only.* 848pp. Leningrad: Izdatel'stvo "Sudostroyeniye," 1964. 200 x 125 mm. Original cloth stamped in black, blue and red, one corner slightly bent. Light toning but very good. Ownership signature on the title; "Printed in USSR" stamped at the foot of the title.



$450

First Edition. Contains some standard programs for the Soviet Union's BESM-2, Ural, Ural-2 and Minsk-1 digital computers, together with instructions for their use. The BESM-2, a successor to the USSR's first large-scale digital electronic computer, was manufactured between 1958 and 1962; the Ural series of mainframes was produced between 1956 and 1964; and the Minsk family of computers, developed in the Byelorussian SSR, was produced between 1959 and 1975. 51211


THE COMPUTATION OF FOURIER SYNTHESES WITH A DIGITAL ELECTRONIC CALCULATING MACHINE



Bennett & Kendrew's First Account of Their Use of the EDSAC to Find the Structure of Myoglobin; Also with Papers by Alan Turing and Maurice Wilkes

38. Manchester University. Manchester University computer. Inaugural conference. July [9-12] 1951. [Bolton: Tillotson's, 1951.] 40pp. Text illustrations. 282 x 215 mm. Original maroon printed stiff wrappers, title gilt-stamped on upper wrapper, bound with a maroon cord at the spine. Label removed from spine, light edgewear, but very good. From the library of the Institut für Praktische Mathematik, Technische Hochschule, Darmstadt, with library stamps on front wrapper and title-leaf.

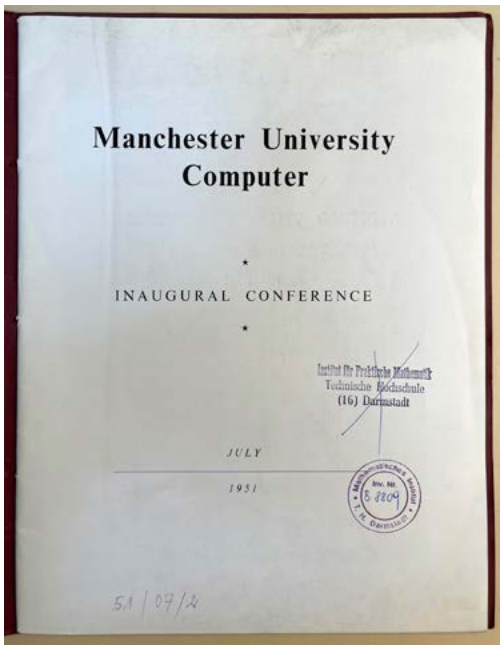
$7500

First Edition. *Rare* program from the Manchester University Computer Inaugural Conference, the second and certainly one of the most important of the early British computer conferences. Held to inaugurate the Ferranti Mark I computer, the conference featured papers by **Alan Turing** ("Local programming meth-

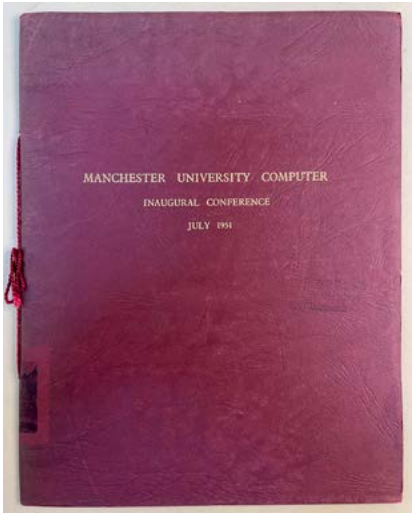
LOCAL PROGRAMMING METHODS AND CONVENTIONS

By A. M. Turing, F.R.S., Ph.D.

DISCUSSION CONTRIBUTIONS



ods and conventions"), **Maurice Wilkes** ("The best way to design an automatic calculating machine"), and, most significantly, **John Kendrew**, whose "The computation of Fourier syntheses with a digital electronic calculating machine" (co-written with John Bennett) describes his pioneering use of the Cambridge EDSAC to calculate structure factors of the protein molecule myoglobin. Kendrew and Bennett's Manchester paper, which preceded the expanded account published in the *Acta Crystallographica* (see Garrison-Morton.com 6910), thus represents the **first paper on the application of an electronic computer to computational biology**. Kendrew received the 1962 Nobel Prize in chemistry for calculating the structure of myoglobin at high resolution.



"The Manchester University Conference was held to inaugurate the Ferranti Mark I computer. The machine had been delivered to the University in February 1951 and by the time of the conference it was at the center of a flourishing computer laboratory. The Ferranti Mark I was the first commercially manufactured computer in Britain (and arguably in the world). To commemorate the event Ferranti underwrote the cost of the slim but elegant conference proceedings . . . The Mark I itself was described by F. C. Williams, and the corresponding paper in the proceedings, which is superbly illustrated, is the best single account of the Ferranti Mark I computer" (Williams and Campbell-Kelly, *The Early British Computer Conferences* [1989], xiii). *Origins of Cyberspace* 774 (this copy). 43247

The First Periodical Devoted to Computing

39. Mathematical tables and other aids to computation. Vols. 1–13 (1943-59). 8vo. Washington, D.C.: National Research Council. 250 x 172 mm. Original green printed wrappers, some wear and fading. Occasional library stamps. Very good set. $4500

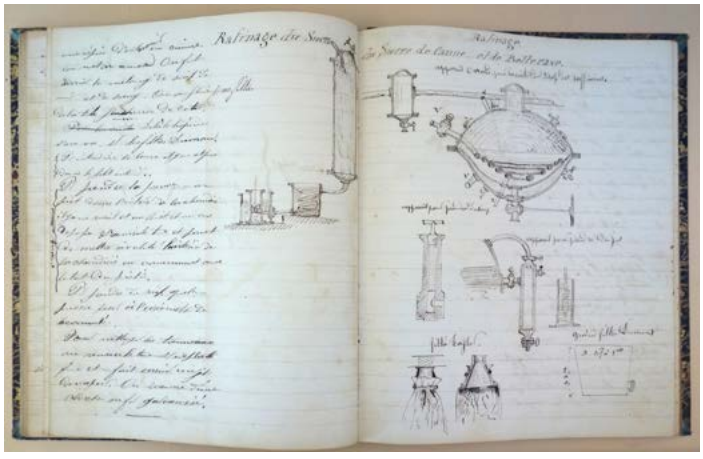
First Edition of the first thirteen volumes of the first journal devoted to computing. A quarterly journal published by the National Research Council's committee of the same name, *MTAC* was founded by the committee's chairman, Raymond C. Archibald, professor of mathematics at Brown University. The journal appeared under the above title until 1960, when, reflecting the obsolescence of mathematical tables caused by the development of electronic digital computers, the name was changed to *Mathematics of Computation*.

Making mathematical tables was the traditional area of concentration for human computers, and improving their accuracy while increasing the speed of their production had been a primary motivation for developing the first difference engines and later for developing the first programmable digital computers. In his introduction to the first number of *MTAC*, Archibald stated that one of the journal's goals was to "serve as a clearinghouse for information" concerning tools for computation, which "especially during the last decade . . . have been vastly multiplied" (Vol. 1, p. 1). In 1943, shortly after *MTAC* began publication, the Harvard Mark I and the Bell Labs Relay Interpolator (later called the Model II) became operational, but could not be described in print for reasons of wartime security. After World War II ended *MTAC* began reporting on these new developments in computing.

MTAC remains the primary periodical source of information on the electromechanical and electronic digital computers designed and built during the late 1940s and early 1950s, as well as on the scientific uses of punched-card machines, mechanical desk calculators, etc. Among the more notable papers published in the journal are A. D. Booth's "Development of A.P.E. (X.) C." (1954); Comrie's "Application of commercial calculating machines to scientific computing" (1946); Goldstine and Goldstine's "The Electric Numerical Integrator and Computer (ENIAC)" (1946), containing the first widely published description of that machine; Huskey's "Characteristics of the Institute for Numerical Analysis computer" (1950), describing the SWAC computer; Rajchman's "The Selectron—a tube for selective electrostatic storage" (1950); Alt's "A Bell Telephone Laboratories computing machine" (1948), describing Stibitz's Model V relay computer; and Lyndon's "The Zuse computer" (1947), containing the first widely distributed description of Zuse's Z4 machine.

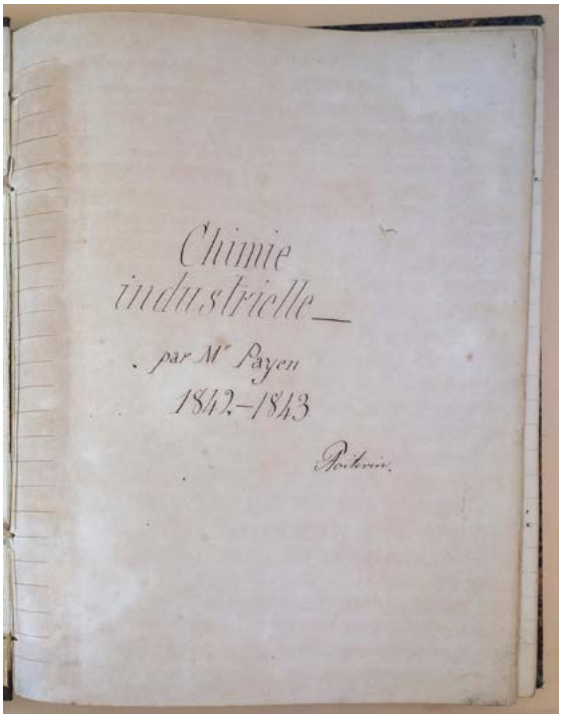
As it dealt with a highly specialized topic, *MTAC* was mailed to a very small readership. By its third year of publication, 1946, its subscription list was only 350 readers (Grier 2001, 44). After the first electronic computing organization, the Association for Computing Machinery, was formed in 1947, *MTAC* served as the periodical for that organization until the launch of the *Journal of the Association for Computing Machinery* in January 1954; this would have caused substantial growth in its subscription base. *Origins of Cyberspace* 777. 41161

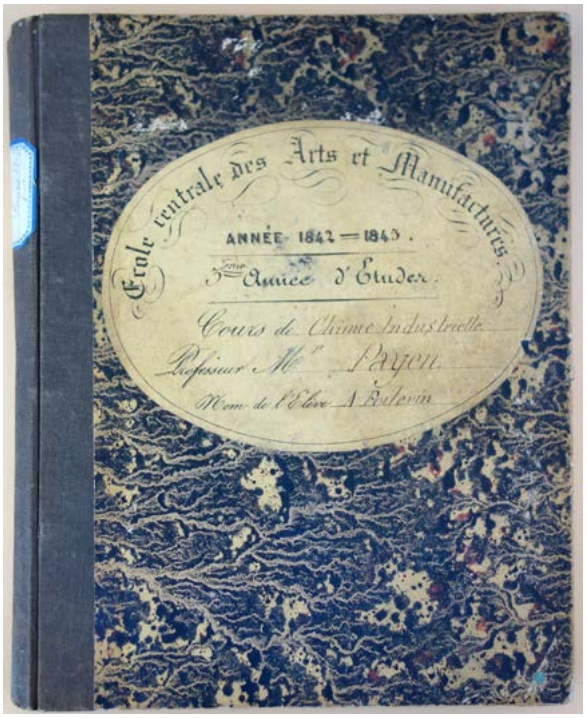
The Poitevin Archive of Industrial Chemistry



40. Poitevin, Alphonse (1819-82). Archive consisting of 24 autograph signed manuscript notebooks from Poitevin's student days at the École Centrale des Arts et Manufactures and 2 ledgers documenting Poitevin's business and other expenses in later years. Together 26 volumes, containing over 7000 pages total. 1841-43 and 1856-94. Notebooks measure 217 x 178 mm.; ledgers measure 350 x 227 mm. Original uniform quarter cloth, marbled boards, paper labels on front covers completed in manuscript by Poitevin (notebooks); original half suede, marbled boards (ledgers). Some wear and rubbing especially to ledger volumes, some dampstaining in ledger volumes, but overall very good. $15,000

Exceptional archive documenting the scientific education of photography pioneer Alphonse Poitevin, who was the first to successfully exploit the light-sensitive properties of dichromated gelatin; his work forms the foundation of photolithography, carbon printing and collotype printing. Poitevin's interest in photography began during his student years at the École Centrale des Arts et Manufactures, when he first began experi-



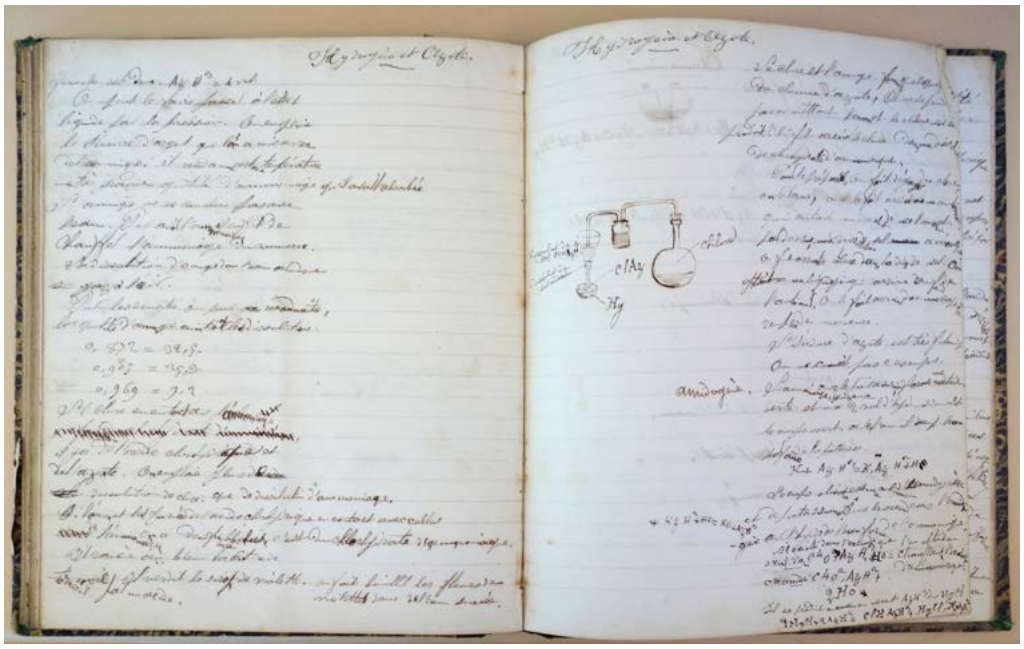


menting with Daguerre's newly introduced photographic process. Our archive of his student notebooks from that period, held privately until recently by Poitevin's descendents, provides unique access to this important formative stage in his scientific career.

> [Poitevin] took up the study of photography while still a student in the École Centrale, almost immediately after Daguerre's process was published in 1839. He recognized the one great defect of this method is that it gives but a single photograph. He tried to solve that problem by trying to make molds by electrically depositing copper upon the silver plate carrying the daguerrean image . . . In 1847 when working at the Easter Salt Works he continued his work on trying to make copies of daguerreotypes on silvered copper . . . Experience from this early work led him to his most important discovery, the photographic engraving technique, which happened in 1854.
>
> . . . In August 1855 he patented a helioplastic process, by which films of dichromated gelatin were exposed to light under a negative and then soaked in water, which resulted in a relief image from which a mold could be made. Mungo Ponton in Scotland had discovered in 1839 the effect of light on dichromates and William Henry Fox Talbot had in 1853 discovered that dichromated gelatin which had been exposed to light would allow greasy ink to adhere to it, although it repelled water. **Based upon these facts Poitevin invented his new photo-lithographic processes: carbon printing and collotype printing** [emphasis ours] . . . For the discovery of the permanent photographic printing process he was awarded the Duc de Luyne's Prize of 20,000 francs and the Marquis of Argentil's Prize of 12,000 francs as well as the order of Chevalier of the Légion d'Honneur (*Encyclopedia of Nineteenth-Century Photography,* pp. 1139-40).

During his time at the École Centrale, Poitevin studied under a number of distinguished professors including the following:

- Chemist and physicist **Henri-Victor Regnault** (1810-78), founder of the Société Française de Photographie and one of the first to use and promote photography on paper
- Industrial chemist **Anselme Payen** (1795-1871), the first to isolate cellulose, which rapidly led to the development of the wet collodion process in photography
- Chemist **Eugène Péligot** (1811-90), who isolated the first sample of pure uranium metal and also discovered potassium chlorochromate, a salt made from the photosensitive chemical potassium dichromate
- Physicist **Jean Claude Eugène Péclet** (1793-1857), for whom the Péclet number, used in fluid mechanics, is named



Our archive contains Poitevin's notebooks for the classes he took from these four men as well as for eighteen other courses. A complete list of the notebooks, arranged by academic year, follows:

1840-41

Géometrie analytique, M. Martelet

Géometrie descriptive, M. Olivier (2 vols.)

Méchanique, M. Belanger

Histoire naturelle, M. Edwards

Physique, M. Regnault

Chimie, M. Péligot (2 vols.)

1841-42

Chimie industrielle, M. Payen

Chimie analytique, M. Dumas

Géologie, M. Burat

Mécanique appliquée, M. Belanger

Physique industrielle, M. Péclet

Métallurgie du fer [metallurgy of iron], M. Ferry

Construction des machines, M. Walter

Constructions, M. Mary

1842-43

Exploitation des mines, M. Burat

Machines-outils [machine tools], M. Walter de St. Ange

Métallurgie de la fonte [metallurgy of cast iron]

Physique appliquée, M. Péclet

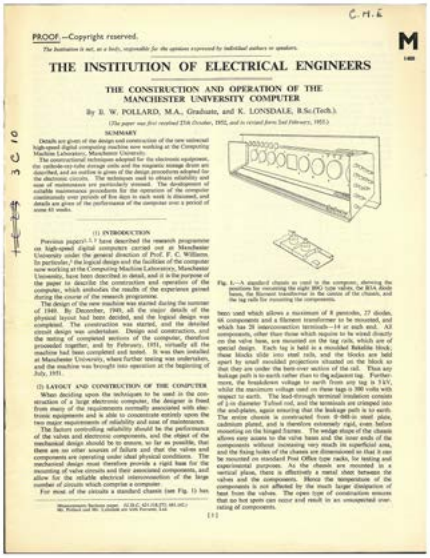
Hydraulique, M. Belanger

Chimie industrielle, M. Payen

Machines à vapeur [steam engines], M. Thomas

Travaux publiques [public works], M. Mary

The archive also includes two ledger volumes documenting Poitevin's income and expenses beginning in 1856, when he resigned from the Eastern Salt Works to form his own photolithographic printing company. The business failed and Poitevin was forced to sell his patent rights to French lithographer Alfred-Léon Lemercier. Poitevin later worked as an industrial chemist for several French firms while pursuing his researches into photographic printing processes; some of the expenses related to these investigations may be recorded in the ledgers. The ledger entries continue until the mid-1890s, over a decade after Poitevin's death; it is likely that Poitevin's family continued to use the ledgers to document their finances. 44568


PROOF.—Copyright reserved.

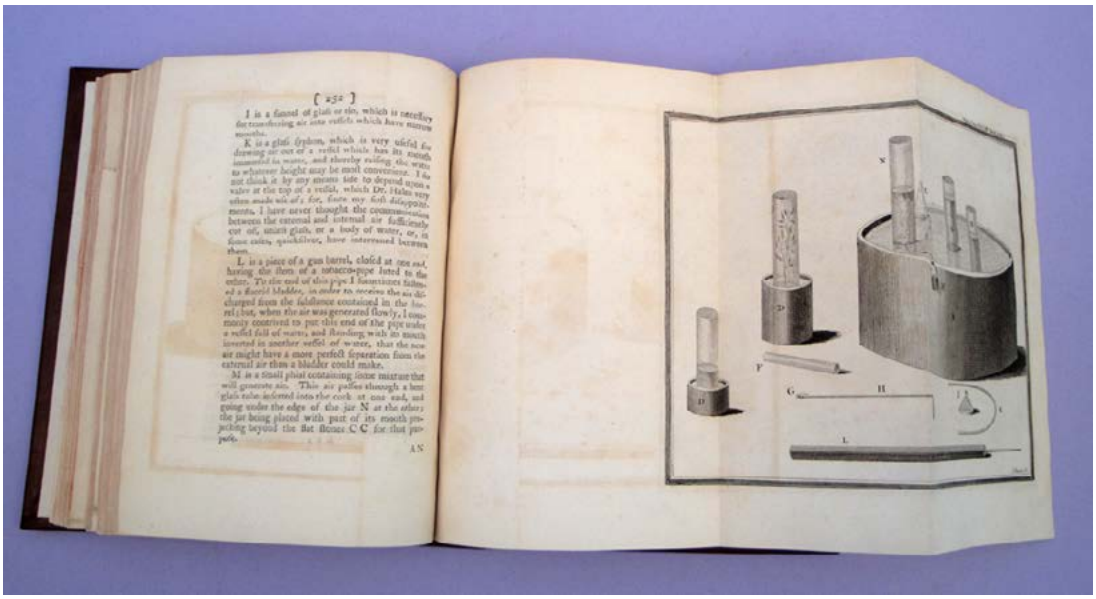
THE INSTITUTION OF ELECTRICAL ENGINEERS

THE CONSTRUCTION AND OPERATION OF THE MANCHESTER UNIVERSITY COMPUTER

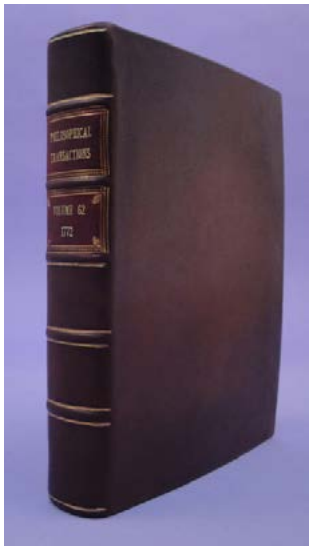
By F. W. POLLARD, M.A., Graduate, and K. LONSDALE, B.Sc.(Tech.).

41. Pollard, Brian W. and **Keith Lonsdale.** The construction and operation of the Manchester University computer. 12pp. Text diagrams. London: Institution of Electrical Engineers, 1953. 277 x 215 mm. Without wrappers as issued. A few annotations in pen. Near fine. $750

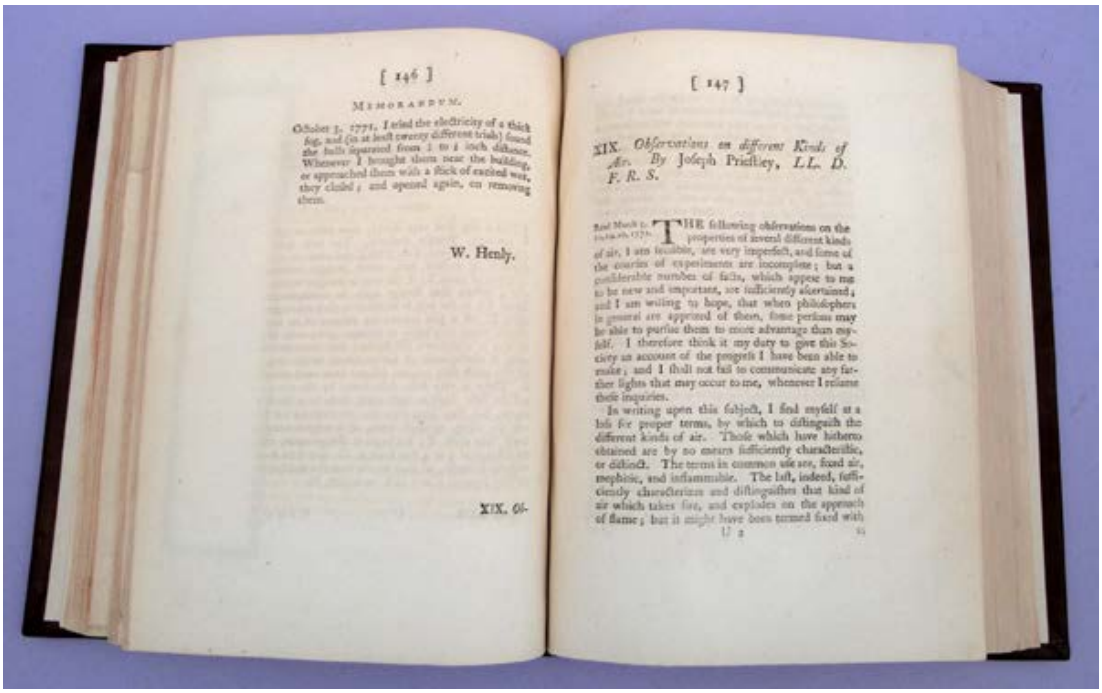
First Separate Edition. A description of the design and construction of the Ferranti Mark I. Pollard and Lonsdale were engineers at Ferranti Limited, the Manchester electronics firm that manufactured the machine. Their paper was published in 1953 in *Symposium of Papers on Digital Computers.* This separate version of the paper, which resembles an offprint, is labeled "Proof.—Copyright reserved" in the upper left corner of the first page. *Origins of Cyberspace* 838. 51317



42. Priestley, Joseph (1733-1804). Observations on different kinds of air. In: *Philosophical Transactions* 62 (1772): 147-264, 1 folding copperplate. Whole volume. xiv, 494, [2, including errata]pp. 12 (of 14) folding copperplates, *lacking Plates III and IV** (not affecting the Priestley paper). London: Davis, 1772. 222 x 171 mm. Full antique calf, gilt, in period style. Small, almost invisible library blind-stamp on first and last leaves. Light foxing and toning, a few small tears in plates repaired, occasional offsetting from plates, but very good. $3000



First Edition. The first of Priestley's remarkable papers on pneumatic chemistry. "In this essay Priestley showed that in air collected after the processes of combustion, respiration or putrefaction, one-fifth of the volume disappeared. He had also observed that mint grew vigorously in air tainted by animal respiration and that evidently plants reversed the process of polluting the air as respiration did. In this paper he also announced two new gases that he had obtained— nitrous oxide and carbonic oxide; these won him the Royal Society's Copley medal" (Dibner, *Heralds of Science,* 40). Priestley's hundreds of experiments on different types of "air," car-


[146]

MEMORANDUM.

October 1, 1771. I tried the electricity of a thick fog, and (in at least twenty different trials) found the balls separated from 1 to 2 inch diftance. Whenever I brought them near the building, or approached them with a ftick of excited wax, they clofed; and opened again, on removing them.

W. Henly.

XIX. 66

[147]

XIX. *Obfervations on different Kinds of Air.* By Joſeph Prieſtley, *LL. D. F. R. S.*

Read March 1, 1775.

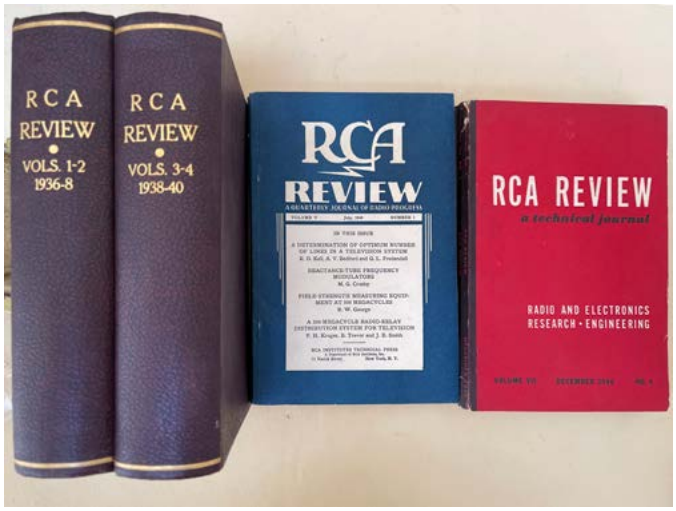
THE following obſervations on the properties of ſeveral different kinds of air, I am ſenſible, are very imperfect, and ſome of the courſes of experiments are incomplete; but a conſiderable number of facts, which appear to me to be new and important, are ſufficiently aſcertained; and I am willing to hope, that when philoſophers in general are apprized of them, ſome perſons may be able to purſue them to more advantage than myſelf. I therefore think it my duty to give this Society an account of the progreſs I have been able to make; and I ſhall not fail to communicate any farther lights that may occur to me, whenever I reſume theſe inquiries.

In writing upon this ſubject, I find myſelf at a loſs for proper terms, by which to diſtinguiſh the different kinds of air. Thoſe which have hitherto obtained are by no means ſufficiently characteriſtic, or diſtinct. The terms in common uſe are, fixed air, phlogiſtic, and inflammable. The laſt, indeed, ſufficiently characterizes and diſtinguiſhes that kind of air which takes fire, and explodes on the approach of flame; but it might have been termed fixed with

U 2

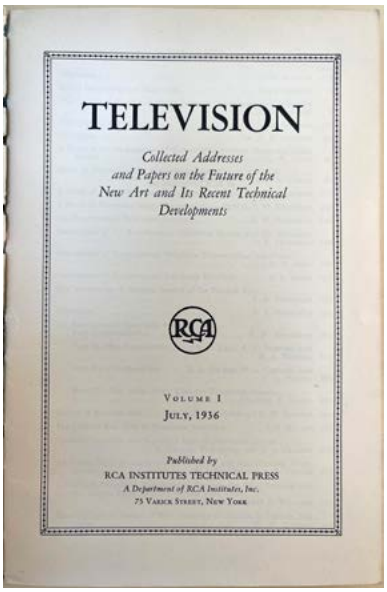
ried out over several years, led to the identification of numerous gases, including ammonia, nitrogen dioxide and (most importantly) oxygen, which Priestley obtained in 1774 by heating mercuric oxide. Priestley's experiments with gases led Cavendish and Watt to discover the compound nature of water, and it was this revelation, coupled with Priestley's isolation of oxygen, that formed the experimental basis of Lavoisier's new oxidation chemistry. *Printing and the Mind of Man* 217. 42148

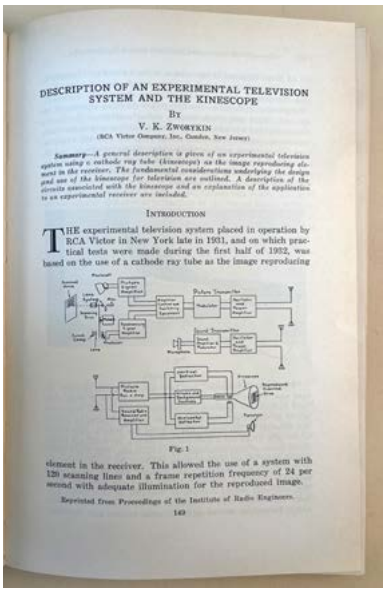
43. RCA [Radio Corporation of America]. RCA review: A quarterly journal of radio progress. Volumes 1 – 14. New York: RCA Institutes Technical Press, 1936-55. 222 x 147 mm. (Vols 1 – 4); 230 x 154 mm. (Vols 5 – 6). 227 x 152 mm. (Vols. 7 – 14). Vols. 1 – 2 and 3 – 4 bound in two publisher's cloth volumes; Vols. 5 - 14 in original printed wrappers. Minor chipping and wear, but very good. From the library of American physicist Charles B. Bazzoni (1866-1970), with his signature on the front wrapper of Vol. 5, issue 2 and printed subscription materials addressed to him laid in. $500

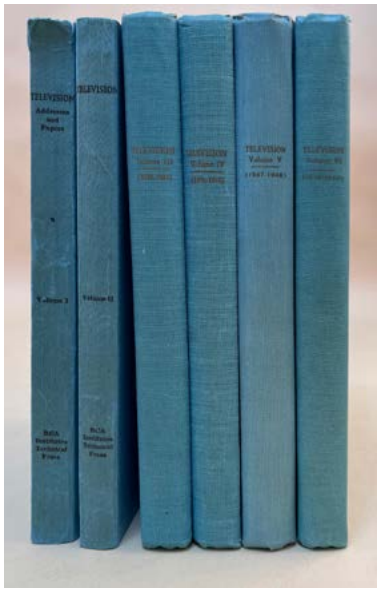


First Edition. The first fourteen volumes of this proprietary technical journal, recording progress in radio, television and electronics in papers written by RCA's engineers and executives. After Vol. 6 (July 1941 – April 1942), the journal was suspended for four years due to World War II, resuming publication in March 1946. The postwar volumes contain several papers on color television technology, which RCA played a major role in developing in the United States. Each postwar issue after March 1946 also includes a bibliography of all the technical papers published or presented by RCA authors in journals or technical meetings.

The present set is from the library of Charles B. Bazzoni, professor of physics at the University of Pennsylvania and later chief geophysicist for the Sun Oil Company; he also published several books. 51085





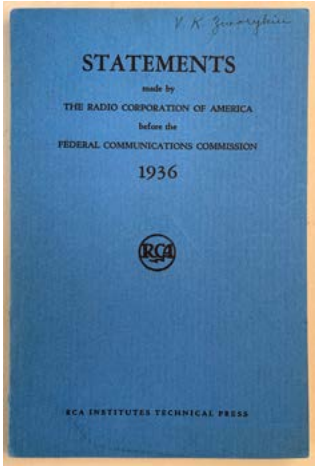


44. RCA [Radio Corporation of America]. Television: Collected addresses and papers on the future of the new art and its recent technical developments. 6 volumes. New York: RCA Institutes Technical Press, 1936-1950. Vols. 1 and 2 in original blue printed wrappers; Vols 3-6 in original cloth. 230 x 150 mm. (Vols. 1-2); 220 x 145 mm. (Vols. 3-6). Spines and edges faded, head of spine in Vol. 1 beginning to separate from the text block, first leaf of Vol. 1 starting, light toning. Very good. $750

First Edition. RCA was a leading pioneer of commercial television. The company began developing TV technology in 1929 at the urging of Vladimir Zworykin, one the founders of modern television, who had patented a prototype television system a few years earlier. Despite the system's technical limitations, Zworykin was able to convince RCA's president, David Sarnoff, that a commercial version could be produced in a short time for $100,000—an overly optimistic claim, as RCA ended up investing nearly ten years and several million dollars in the project. RCA began regular television broadcasting from its NBC studios in New York on 30 April 1939.

The first volume in the present series was issued in July 1936, almost three years before RCA's historic first TV broadcast; the sixth (and apparently final) volume came out in 1950. The first three volumes include eight papers written or co-authored by Zworykin. A bibliography of technical papers on television by RCA authors is appended to Vol. 6. 51100

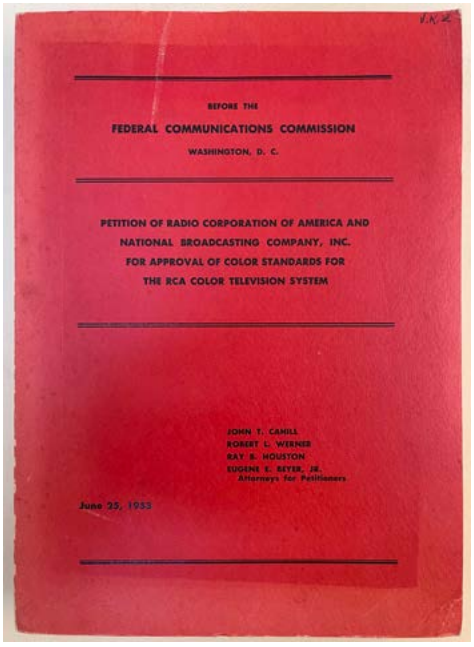
Signed by Vladimir Zworykin



45. RCA [Radio Corporation of America]. Statements made by officials of the Radio Corporation of American during hearings held by the Federal Communications Commission June 15th and October 5th, 1936. New York: RCA Institutes Technical Press, 1936. [4], 196pp. Charts, diagrams. 230 x 150 mm. Blue printed wrappers, slightly faded, tiny chip in upper spine. Very good. From the library of television pioneer **Vladimir K. Zworykin** (1888-1982), with his signature on the front wrapper. $750

First Edition. Includes a chapter on television by Charles B. Jolliffe (1894-1970), head of RCA's Frequency Bureau, summarizing RCA's progress in television research and development to 1936. 51062

Color TV—Zworykin's Copy


BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D. C.

PETITION OF RADIO CORPORATION OF AMERICA AND
NATIONAL BROADCASTING COMPANY, INC.
FOR APPROVAL OF COLOR STANDARDS FOR
THE RCA COLOR TELEVISION SYSTEM

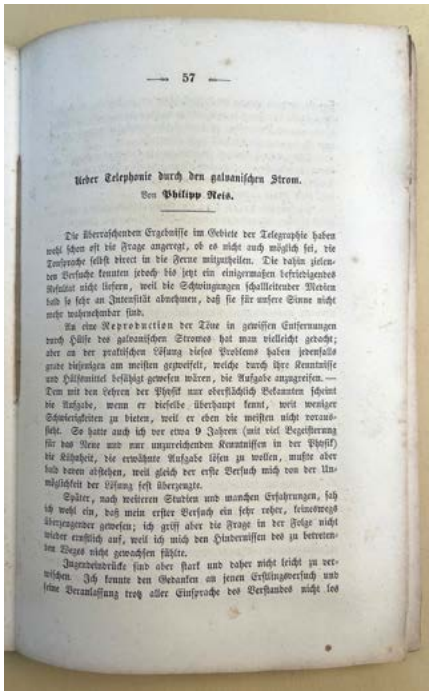
JOHN T. CAHILL
ROBERT L. WERNER
RAY B. HOUSTON
EUGENE K. BEYER, JR.
Attorneys for Petitioners

June 25, 1953

46. RCA [Radio Corporation of America]. Before the Federal Communications Commission Washington, D. C.: Petition of Radio Corporation of America and National Broadcasting Company, Inc. for approval of color standards for the RCA color television system. Washington, D.C.: RCA and NBC, 1953. 697pp. 255 x 180 mm. Original red soft covers, margins a bit faded. Very good. Laid in is an 11-page reproduced typescript press release on RCA letterhead, dated 25 June 1953, titled "RCA and NBC petition FCC to adopt standards permitting commercial broadcasting of compatible color television." From the library of television pioneer Vladimir K. Zworykin (1888-1982), with his initials written in his hand on the front wrapper and the first page of the press release. $950

First Edition. All-electronic color television, based on the dot-sequential color technology developed by RCA, was introduced in the United States in 1953 after being approved by the FCC. From the library of television pioneer Vladimir K. Zworykin (1888-1982), with his initials written in his hand on the front wrapper and the first page of the press release. Zworykin played a key role in the development of RCA's color television system. 51074

Reis Invents the First Functioning Telephone


— 57 —

Ueber Telephonie durch den galvanischen Strom.
Von Philipp Reis.

Die überraschenden Ergebnisse im Gebiete der Telegraphie haben wohl schon oft die Frage angeregt, ob es nicht auch möglich sei, die Tonsprache selbst direct in die Ferne mitzutheilen. Die dahin zielenden Versuche kennten jedoch bis jetzt ein einigermaßen befriedigendes Resultat nicht liefern, weil die Schwingungen schallleitender Medien bald so sehr an Intensität abnehmen, daß sie für unsere Sinne nicht mehr wahrnehmbar sind.

Als eine Reproduction der Töne in gewissen Entfernungen durch Hülfe des galvanischen Stromes hat man vielleicht gedacht; aber an der praktischen Lösung dieses Problems haben jedenfalls gute physikalische Kenntnisse gezweifelt, welche durch ihre Kenntnisse und Hülfsmittel befähigt gewesen wären, die Aufgabe anzugreifen. — Dem mit den Lehren der Physik nur oberflächlich Bekannten scheint die Aufgabe, wenn er dieselbe überhaupt kennt, weit weniger Schwierigkeiten zu bieten, weil er eben die meisten nicht voraussieht. So hatte auch ich vor etwa 9 Jahren (mit viel Begeisterung für das Neue und nur unzureichenden Kenntnissen in der Physik) die Lösbarkeit, die erwähnte Aufgabe lösen zu wollen, mußte aber bald davon abstehen, weil gleich der erste Versuch mich von der Unmöglichkeit der Lösung fest überzeugte.

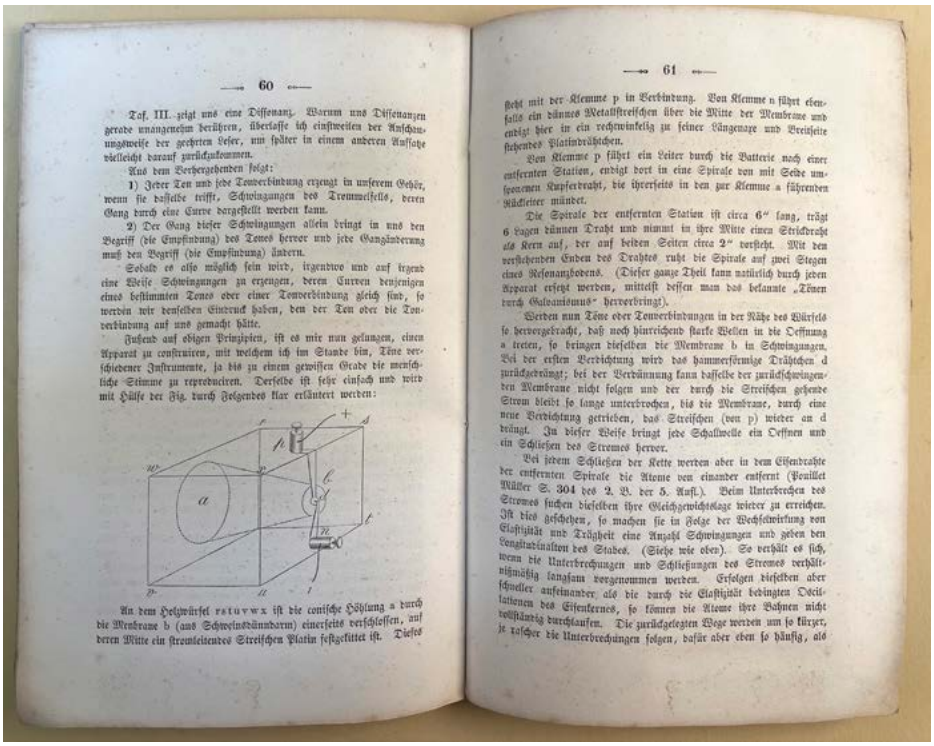
Später, nach weiteren Studien und manchen Erfahrungen, sah ich wohl ein, daß mein erster Versuch ein sehr roher, keineswegs überzeugender gewesen; ich griff aber die Frage in der Folge nicht wieder ernstlich auf, weil ich mich den Hindernissen des zu betretenden Weges nicht gewachsen fühlte.

Augenblicke sind aber stark und daher nicht leicht zu verwischen. Ich kannte den Gedanken an jenen Erstlingsversuch und seine Veranlassung trotz aller Einsprache des Verstandes nicht los

47. Reis, Johann Philipp (1834-74). Ueber Telephonie durch den galvanischen Strom. In *Jahres-Bericht des physikalischen Vereins zu Frankfurt am Main für das Rechnungsjahr 1860-1861* (1861): 57-64. Text illustrations; 3 folding plates (nos. I-III). Whole number. 80pp. 5 folding plates/charts. 221 x 142 mm. Without wrappers. First and last leaves lightly foxed, corners a bit frayed, but very good. Boxed. $5000

First Edition. Reis, a German schoolteacher and physicist, began experimenting with the electrical transmission of sound in the late 1850s, and by 1861 had designed several transmitters and receivers which had partial, but real success in transmitting intelligible speech. Some authors, including Reis's biographer, Silvanus P. Thompson, consider Reis to be the true inventor of the telephone.

Between 1858 and 1863 Reis constructed three different models of his telephone, the third and best known of which was demonstrated in scientific societies throughout Europe and America. One of those who saw the machine was Alexander Graham Bell, who was shown Reis's telephone at the Smithsonian Institution in March 1875, and who might have seen an earlier model demonstrated in Edinburgh as early as 1862 (Bell's own telephone, constructed on different principles, was patented in 1876). Unlike Bell, Reis had no interest in profiting from his telephone, freely giving out information about it to anyone who asked, and selling models of it at a reasonable price. It is very likely that Reis would have continued his work in telephony, had he not died shortly after his fortieth birthday.



— 60 —

Taf. III. zeigt uns eine Dissonanz. Warum uns Dissonanzen gerade unangenehm berühren, überlasse ich einstweilen der Anschauungsweise der geehrten Leser, um später in einem anderen Aufsatze vielleicht darauf zurückzukommen.

Aus dem Vorhergehenden folgt:

1) Jeder Ton und jede Tonverbindung erregt in unserem Gehör, wenn sie dasselbe trifft, Schwingungen des Trennungsfells, deren Gang durch eine Curve dargestellt werden kann.

2) Der Gang dieser Schwingungen allein bringt in uns den Begriff (die Empfindung) des Tones hervor und jede Gangänderung muß den Begriff (die Empfindung) ändern.

Sobald es also möglich sein wird, irgendwo und auf irgend eine Weise Schwingungen zu erregen, deren Curven denjenigen eines bestimmten Tones oder einer Tonverbindung gleich sind, so werden wir denselben Eindruck haben, den der Ton oder die Tonverbindung auf uns gemacht hätte.

Fußend auf obigen Principien, ist es mir nun gelungen, einen Apparat zu construiren, mit welchem ich im Stande bin, Töne verschiedener Instrumente, ja bis zu einem gewissen Grade die menschliche Stimme zu reproduciren. Derselbe ist sehr einfach und wird mit Hülfe der Fig. durch Folgendes klar erläutert werden:

An dem Holzwürfel rstuvwx ist die conische Höhlung a durch die Membrane b (aus Schweinsdünndarm) einerseits verschlossen, auf deren Mitte ein stromleitendes Streifchen Platin festgekittet ist. Dieses

— 61 —

steht mit der Klemme p in Verbindung. Von Klemme n führt ebenfalls ein dünnes Metallstreifchen über die Mitte der Membrane und endigt hier in ein rechtwinkelig zu seiner Längenaxe und Breitseite stehendes Platindrähtchen.

Von Klemme p führt ein Leiter durch die Batterie nach einer entfernten Station, endigt dort in eine Spirale von mit Seide umsponnenem Kupferdraht, die ihrerseits in den zur Klemme n führenden Rückleiter mündet.

Die Spirale der entfernten Station ist circa 6" lang, trägt 6 Lagen dünnen Draht und nimmt in ihre Mitte einen Stricknadel als Kern auf, der auf beiden Seiten circa 2" vorsteht. Mit den vorstehenden Enden des Drahtes ruht die Spirale auf zwei Stegen eines Resonanzbodens. (Dieser ganze Theil kann natürlich durch jeden Apparat ersetzt werden, mittelst dessen man das bekannte „Tönen durch Galvanismus" hervorbringt).

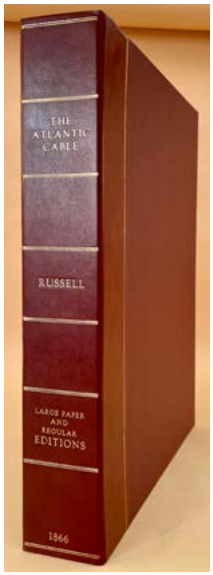
Werden nun Töne oder Tonverbindungen in der Nähe des Würfels so hervorgebracht, daß noch hinreichend starke Wellen in die Oeffnung a treten, so bringen dieselben die Membrane b in Schwingungen. Bei der ersten Verdichtung wird das hammerförmige Drähtchen d zurückgedrängt; bei der Verdünnung kann dasselbe der zurückschwingenden Membrane nicht folgen und der durch die Streifchen gehende Strom bleibt so lange unterbrochen, bis die Membrane, durch eine neue Verdichtung getrieben, das Streifchen (von p) wieder an d drängt. In dieser Weise bringt jede Schallwelle ein Oeffnen und ein Schließen des Stromes hervor.

Bei jedem Schließen der Kette werden aber in dem Eisendrahte der entfernten Spirale die Atome von einander entfernt (Pouillet Müller S. 304 des 2. B. der 5. Aufl.). Beim Unterbrechen des Stromes suchen dieselben ihre Gleichgewichtslage wieder zu erreichen. Ist dies geschehen, so machen sie in Folge der Wechselwirkung von Elastizität und Trägheit eine Anzahl Schwingungen und geben den Longitudinalton des Stabes. (Siehe wie oben). So verhält es sich, wenn die Unterbrechungen und Schließungen des Stromes verhältnißmäßig langsam vorgenommen werden. Erfolgen dieselben aber schneller aufeinander, als die durch die Elastizität bedingten Oscillationen des Eisenkernes, so können die Atome ihre Bahnen nicht vollständig durchlaufen. Die zurückgelegten Wege werden um so kürzer, je rascher die Unterbrechungen folgen, dafür aber eben so häufig, als

Reis announced his invention in a lecture delivered before the Physical Society of Frankfurt on October 26, 1861, and published his first printed account of the device in the Society's annual *Jahresbericht* for 1860-61. The membership list printed on pp. 3-5 of this issue shows the Society numbering around 100 members, and it is reasonable to assume that the edition of the 1860-61 *Jahresbericht* was correspondingly small. Catania, Basilio, "The 'Telephon' of Philipp Reis," 8 Nov. 2004, www.chezbasilio.org/reis.htm. Thompson, *Philipp Reis: Inventor of the Telephone* (1883). 38692

Russell's Splendid Book on the Atlantic Cable, in both Regular Paper and the Rare Large-Paper Versions

48. Russell, William Howard (1820–1907). The Atlantic telegraph. v, 117pp. plus 4pp. advertisements. Chromolithographed title and 25 tinted plates by Robert Dudley. London: Day & Son, [ca. 1866]. 299 x 208 mm. Original green cloth, elaborately gilt-stamped on front cover and spine, paper onlay on front cover representing a cross-section of the Atlantic cable; uncredited but possibly by Leighton Son & Hodge. Small splits in the upper hinge, slight edgewear. Minor foxing to the plates, but fine otherwise. Bookplate of Alfred Edward Sulzer. **With:**



Russell. The Atlantic telegraph. v, 117pp. plus 4pp. advertisements. Chromolithographed title and 25 tinted plates by Robert Dudley, enhanced with hand coloring and laid down on larger sheets. London: Day & Son, [ca. 1866]. 421 x 292 mm. Original maroon cloth, with the elaborately decorated upper cover of the regular-paper version inlaid into the upper cover. Some foxing, especially to the plates, but fine otherwise. From the library of Samuel Gurney (1816-82), the first chairman of the London and Provincial District Telegraph Company, with typed slip detail-

ing the book's provenance on the front pastedown; bookplate of Gurney's great-nephew Samuel Gurney, dated 1934, beneath. Together 2 items, preserved in a custom quarter morocco drop-back box.

The two: $9500

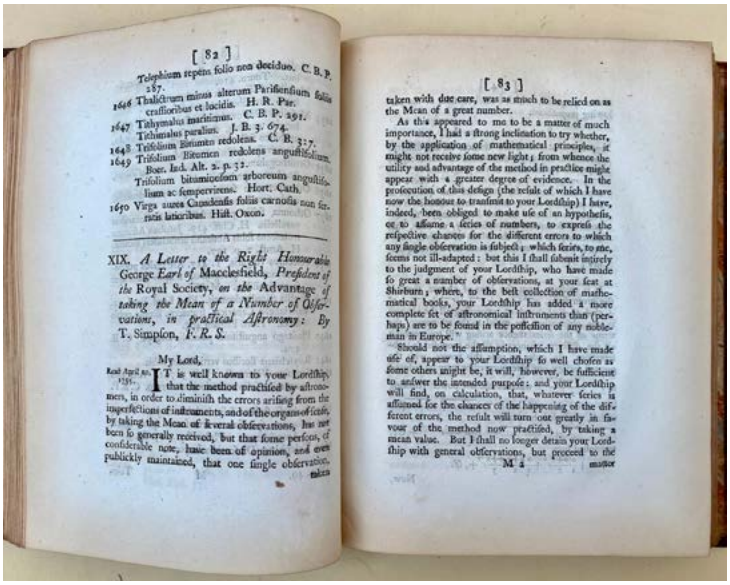
First Editions of the two versions of this lavish and beautifully illustrated Victorian "gift book" commemorating the successful laying of Cyrus Field's Atlantic cable in 1866. This landmark in the history of telecommunications was one of the greatest technological and engineering achievements of the 19th century. The illustrations are by the London artist Robert Dudley, who accompanied Russell on the voyage. The elaborate gilt-stamped binding, probably by Leighton Son & Hodge, was the most elaborate edition binding on a work concerning science or technology published in Victorian England. Russell's book on laying the Atlantic Cable may be unique among works on science or technology in that it was issued both as a deluxe illustrated book in regular format with tinted lithographed illustrations, and on large paper with the plates hand-colored, and in original publisher's cloth bindings. The copies we are offering are in as fine condition as it is possible to find for these books.

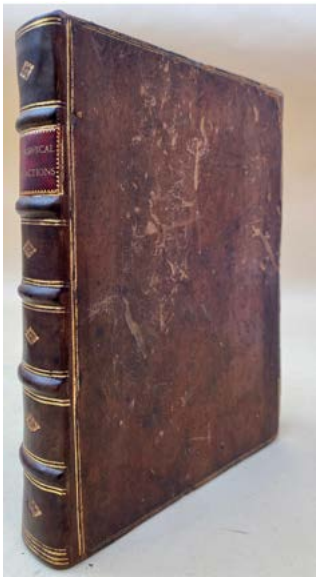
Comparing the regular edition's plates to the large-paper edition's hand-colored versions

The large-paper (L) and regular-paper (R) editions of Russell's "Atlantic Telegraph," in their specially made box

The book was written by William Howard Russell, a famous war correspondent with the London *Times*; Russell was the only journalist allowed to travel with Field's Atlantic cable expedition. Russell's work contains an early history of the Atlantic cable project, describing its inception in the mind of Cyrus Field in the mid-1850s; the first Atlantic cable of 1858, which failed only a few weeks after its completion; Field's second attempt of 1865, which ended with the loss of the cable after two-thirds of it had been laid; and the eventual triumph of Field's Atlantic cable venture in 1866, which established telegraph communication between America and Europe on a permanent basis. Several of Dudley's plates show the *Great Eastern,* then the largest steamship in the world, which Field engaged to lay the second and third Atlantic cables; other plates illustrate the laying of the first Atlantic cable, the geographic sites of the cable's endpoints, recovery of lost cables, etc.

The typed note on the front pastedown of the large-paper version reads: "This book belonged to my great uncle Samuel Gurney of Carlshalton, and was left by his widow to Henry Gurney, his nephew. After Henry's death, 1936, it was given to me by Henry's sister Hariette Louise Gurney." Dibner, *The Atlantic Cable* (1959). *Origins of Cyberspace* 189 (regular paper version). 45471



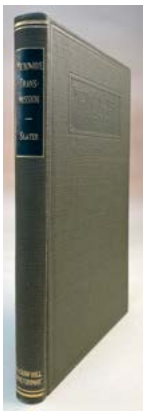


Classic of Statistics and Data Processing

49. Simpson, Thomas (1710-61). On the advantage of taking the mean of a number of observations, in practical astronomy. In: *Philosophical Transactions* 49 (1755): 82-93. Whole volume. [16], 444pp. Folding plates, text illustrations. London: L. Davis & C. Reymers, 1756. 218 x 171 mm. Calf ca. 1755, rebacked, corners repaired, some scuffing and wear. Moderate toning but very good. $2500

First Edition. Simpson's paper is considered a milestone in statistical inference, as well as the earliest formal treatment of any data-processing practice. Simpson was the first to attempt to prove mathematically that the mean result of several observations is nearer to the truth than any single observation (the law of large numbers). A key feature of his paper was that Simpson chose to focus "not on the observations themselves . . . but on the errors made in the observations, on the differences between the recorded observations and the actual position of the body being observed . . . [This] was the critical step that was to open the door to an applicable quantification of uncertainty" (Stigler, *History of Statistics*, pp. 90-91; see also pp. 88-94). "Simpson was the first to characterize the errors in observations as independent events, taking positive and negative values with equal probabilities, and the first to provide a mathematical expression for the probability that the error in the mean result will lie between assigned limits" (Todhunter, *History of Probability*, p. 309). 35289

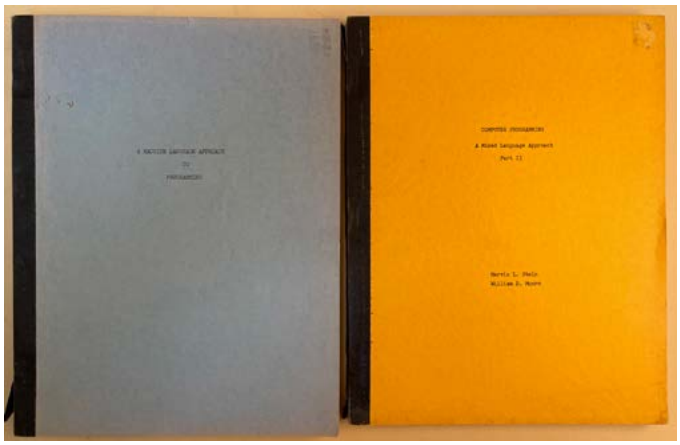
The First Book on Microwave Transmission



50. Slater, John C. (1900-1976). Microwave transmission. x, 309pp. Text diagrams. New York & London: McGraw-Hill, 1942. 229 x 153 mm. Original cloth, slight edgewear. Fine. $750

First Edition of the first book on microwave transmission. Slater, one of the first American physicists to contribute to quantum theory, "did more than any other person to provide the understanding requisite to progress in the microwave field" (Morse, p. 305). Microwave communication was first used on a large scale during World War II; up until the 1980s microwave relay systems were used to carry telephone and television signals, and in recent times there has been an explosive growth in the use of microwaves by wireless networks and other new telecommunication technologies. Morse, "John Clarke Slater 1900-1976," *National Academy of Sciences Biographical Memoir* (1982). 51102

51. Stein, Martin L. (1924-2015) and **William Delmar Munro** (1916-93). Computer programming: A mixed language approach. Mimeographed typescript. 2 volumes. [Vol. 1 title: A mixed language approach to programming]. 301; 218pp. N.p., 1963. 275 x 210 mm. Original stiff wrappers, cloth backstrips, minor splits in backstrips, one or two small marginal tears. Very good. Bookplate of Raymond Kassler tipped to the inside of both front wrappers. $850

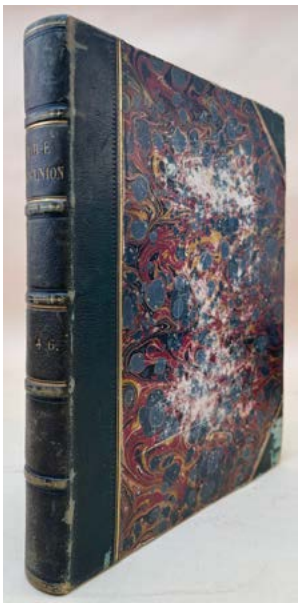


Rare Preprint Edition, with only one copy of Vol. 1 recorded in OCLC. This preprint edition was issued a year before the publication of Stein and Munro's *Computer Programming: A Mixed-Language Approach* (1964), their textbook on programming using FORTRAN and the FORTRAN Symbolic Assembly Program. "[The book] was well reviewed in its time and in 2017, more than five decades after its publication, it was still in print in its third edition. It was written with the intention to provide instruction in assembly language programming to both professional programmers and highly technical laypersons" (Wikipedia). Stein, described as the "father of computer science" at the University of Minnesota, taught the university's first courses on high-speed computation and played a fundamental role in the development of its computer science department. 51267

The First Paper Photographs Seen by a Wide Audience

52. Talbot, William Henry Fox (1800-1877). Le chateau de Chambord, near Blois, in France. Original calotype print. In *The Art Union Monthly Journal* 8 (1846), the June issue, opposite p. 143. Whole volume. [2], 338, [2]pp. 17 plates (1 folding). London: Palmer & Clayton. 290 x 231 mm. 19th century half morocco, marbled boards, some rubbing and wear. Calotype faded as always, minor foxing and offsetting in the text, but very good. $4500

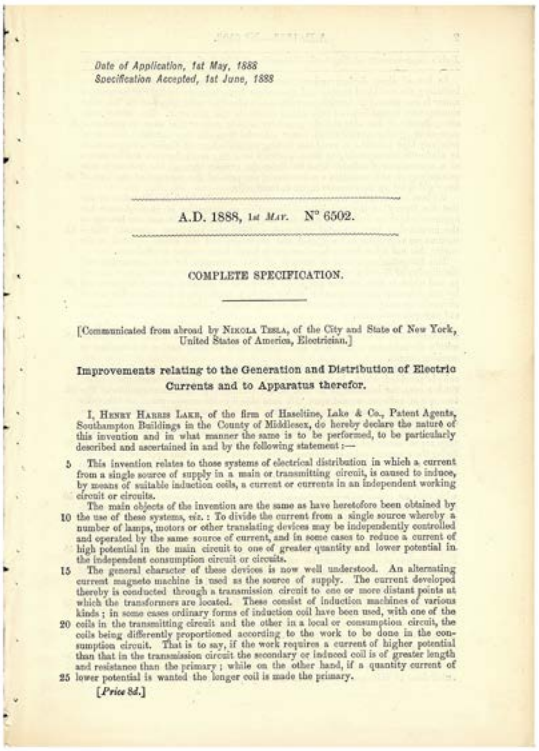
First Edition. In 1840 Fox Talbot invented the calotype process of photography, a process combining the concepts of the paper negative and the latent image; it is the ancestor of film-based photography. The calotype had several advantages over the daguerreotype, not the least of which was the ability to produce



any number of images from a single negative. In 1844 Fox Talbot published *The Pencil of Nature,* the first photographically illustrated book to be commercially published; this work was issued in only a small edition, and is now extremely rare and extremely expensive. Two years later, wishing to show that paper photography was the equal of established graphic media such as lithography and engraving, Fox Talbot entered into an agreement with Samuel Carter Hall, editor of the *Art Union Monthly Journal*, to include one of his original calotypes in every copy of the June 1846 issue.

To make the approximately 6000 calotypes needed for the *Art Union* issue, Fox Talbot's assistant and printer, Nicolaas Henneman, used every negative he could find in the shop. More than half of the images published in *The Pencil of Nature* also turn up in copies of the *Art Union*. However, Henneman's print staff was not capable of such mass production: The paper was not properly exposed, nor well fixed or washed, and prints were sometimes badly pasted onto the magazine leaves (though not in the copy we are offering). These factors caused the images to fade almost as soon as they were created, resulting in poor publicity for Talbot. Nevertheless, Vol. 8 of the *Art Union Monthly Journal* was the first periodical to be illustrated with a mounted paper photograph, and the photographs it included were the first paper photographs seen by a wide audience.

The photograph in this volume is one of the largest possible to obtain; it measures 160 x 205 mm. Gernsheim, *Incunabula of Photography,* no. 620. Goldschmidt and Naef, *The Truthful Lens,* p. 15. 43512



Date of Application, 1st May, 1888
Specification Accepted, 1st June, 1888

A.D. 1888, 1st MAY. N° 6502.

COMPLETE SPECIFICATION.

[Communicated from abroad by NIKOLA TESLA, of the City and State of New York, United States of America, Electrician.]

Improvements relating to the Generation and Distribution of Electric Currents and to Apparatus therefor.

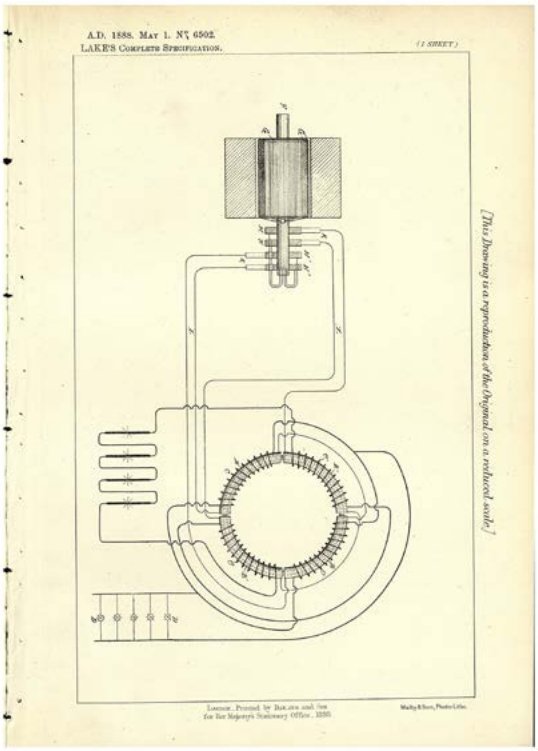
I, HENRY HARRIS LAKE, of the firm of Haseltine, Lake & Co., Patent Agents, Southampton Buildings in the County of Middlesex, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to those systems of electrical distribution in which a current from a single source of supply in a main or transmitting circuit, is caused to induce, by means of suitable induction coils, a current or currents in an independent working circuit or circuits.

The main objects of the invention are the same as have heretofore been obtained by the use of those systems, viz.: To divide the current from a single source whereby a number of lamps, motors or other translating devices may be independently controlled and operated by the same source of current, and in some cases to reduce a current of high potential in the main circuit to one of greater quantity and lower potential in the independent consumption circuit or circuits.

The general character of these devices is now well understood. An alternating current magneto machine is used as the source of supply. The current developed thereby is conducted through a transmission circuit to one or more distant points at which the transformers are located. These consist of induction machines of various kinds; in some cases ordinary forms of induction coil have been used, with one of the coils in the transmitting circuit and the other in a local or consumption circuit, the coils being differently proportioned according to the work to be done in the consumption circuit. That is to say, if the work requires a current of higher potential than that in the transmission circuit the secondary or induced coil is of greater length and resistance than the primary; while on the other hand, if a quantity current of lower potential is wanted the longer coil is made the primary.

[*Price 8d.*]



A.D. 1888. MAY 1. N° 6502.
LAKE'S COMPLETE SPECIFICATION.
(1 SHEET.)

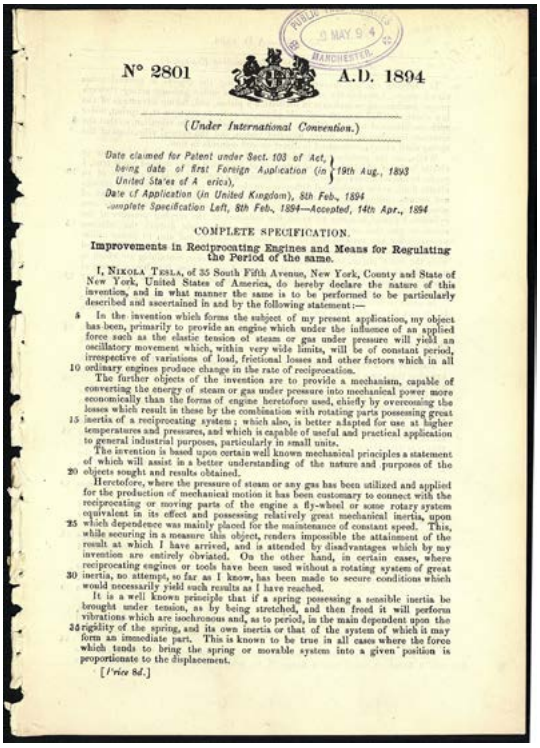
[*This Drawing is a reproduction of the Original on a reduced scale.*]

The First Viable Electric Motor to Run on Alternating Current

53. Tesla, Nikola (1856-1943) and **Henry Harris Lake.** A.D 1888, 1st May. [Patent] no. 6502. Complete specification . . . Improvements relating to the generation and distribution of electric currents and to apparatus therefore. Communicated from abroad by Nikola Tesla, of the city and state of New York, United States of America, electrician. 4pp. 1 plate. London: Darling & Son for His Majesty's Stationery Office, 1888. 260 x 185 mm. Disbound. Stitch-holes down the left margin, light toning. Very good. $7500

First Edition of the British patent for Tesla's alternating-current polyphase induction motor, which helped usher in the modern age of electricity. This was arguably Tesla's most important patent. The U.S. patent for Tesla's "electro-magnetic motor" was granted on 1 May 1888, and the British patent—applied for on 1 May 1888—was granted on 1 June.

At the time of its introduction Tesla's motor was the only commercially viable electric motor to run on alternating current (AC), the type of electricity favored by Tesla's financial backer, George Westinghouse. Electric motors prior to Tesla's had been designed to run on direct current (DC), the form of electricity favored by Thomas Edison, but AC had a distinct advantage over DC in that it could be transmitted through power lines efficiently at high voltage over longer distances than was possible with DC. The "war of the currents" between the two competing systems extended into the early 1890s, but Tesla and Westinghouse eventually won the day: "Although Edison continued to espouse direct current, Tesla's system triumphed to make possible the first large-scale harnessing of Niagara Falls and to provide the basis for the whole modern electric-power industry" (*Dictionary of Scientific Biography*). V. Smil, "May 1888: Tesla Files His Patents for the Electric Motor." IEEE Spectrum, 29 July 2021, spectrum.ieee.org/may-1888-tesla-files-his-patents-for-electric-motor. 51498



N° 2801 A.D. 1894

(Under International Convention.)

Date claimed for Patent under Sect. 103 of Act, being date of first Foreign Application (in United States of America), 19th Aug., 1893

Date of Application (in United Kingdom), 8th Feb., 1894

Complete Specification Left, 8th Feb., 1894—Accepted, 14th Apr., 1894

COMPLETE SPECIFICATION.

Improvements in Reciprocating Engines and Means for Regulating the Period of the same.

I, NIKOLA TESLA, of 35 South Fifth Avenue, New York, County and State of New York, United States of America, do hereby declare the nature of this invention, and in what manner the same is to be performed to be particularly described and ascertained in and by the following statement:—

In the invention which forms the subject of my present application, my object has been, primarily to provide an engine which under the influence of an applied force such as the elastic tension of steam or gas under pressure will yield an oscillatory movement which, within very wide limits, will be of constant period, irrespective of variations of load, frictional losses and other factors which in all ordinary engines produce change in the rate of reciprocation.

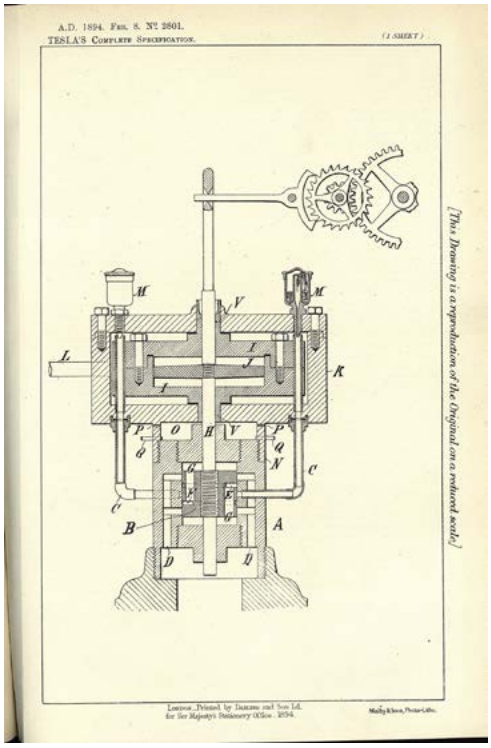
The further objects of the invention are to provide a mechanism, capable of converting the energy of steam or gas under pressure into mechanical power more economically than the forms of engine heretofore used, chiefly by overcoming the losses which result in these by the combination with rotating parts possessing great inertia of a reciprocating system; which also, is better adapted for use at higher temperatures and pressures, and which is capable of useful and practical application to general industrial purposes, particularly in small units.

The invention is based upon certain well known mechanical principles a statement of which will assist in a better understanding of the nature and purposes of the objects sought and results obtained.

Heretofore, where the pressure of steam or any gas has been utilized and applied for the production of mechanical motion it has been customary to connect with the reciprocating or moving parts of the engine a fly-wheel or some rotary system equivalent in its effect and possessing relatively great mechanical inertia, upon which dependence was mainly placed for the maintenance of constant speed. This, while securing in a measure this object, renders impossible the attainment of the result at which I have arrived, and is attended by disadvantages which by my invention are entirely obviated. On the other hand, in certain cases, where reciprocating engines or tools have been used without a rotating system of great inertia, no attempt, so far as I know, has been made to secure conditions which would necessarily yield such results as I have reached.

It is a well known principle that if a spring possessing a sensible inertia be brought under tension, as by being stretched, and then freed it will perform vibrations which are isochronous and, as to period, in the main dependent upon the rigidity of the spring, and its own inertia or that of the system of which it may form an immediate part. This is known to be true in all cases where the force which tends to bring the spring or movable system into a given position is proportionate to the displacement.

[Price 8d.]

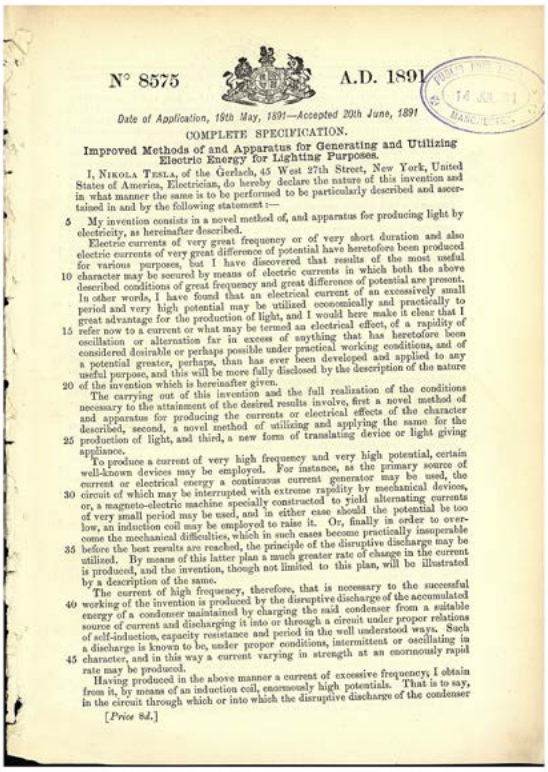


The Tesla Oscillator—His "Earthquake Machine"

54. Tesla, Nikola (1856-1943). [Patent] No. 2801. A.D. 1894. Complete specification. Improvements in reciprocating engines and means for regulating the period of the same. 4pp. Plate. London: Darling & Son, Ltd. for HMSO, 1894. 257 x 183 mm. Disbound. Stitch-holes in the left margin, left margin a bit ragged. Light soiling, but very good. Library stamps (one embossed) on the first page.
$3750

First Edition of the British patent for Tesla's electro-mechanical oscillator, for which he had received a U.S. patent on 19 August 1893; the British patent was granted on 14 April 1894.

Tesla's oscillator was a steam-powered reciprocating electricity generator, developed as a possible replacement for the inefficient reciprocating steam engines then used to power generators. Tesla predicted that his oscillator would provide "a means at hand of producing twice as much electricity from coal as we can produce at the present time" (quoted in Carlson, *Tesla: The Inventor of the Electrical Age*, p. 183), but it was rendered superfluous by the development of highly efficient steam turbines. Tesla claimed that the vibrations produced by his oscillator were strong enough to destroy buildings and even cause earthquakes, earning the device the nickname of "Tesla's earthquake machine." 51500



N° 8575 A.D. 1891

Date of Application, 19th May, 1891—Accepted 20th June, 1891

COMPLETE SPECIFICATION.

Improved Methods of and Apparatus for Generating and Utilizing Electric Energy for Lighting Purposes.

I, NIKOLA TESLA, of the Gerlach, 45 West 27th Street, New York, United States of America, Electrician, do hereby declare the nature of this invention and in what manner the same is to be performed to be particularly described and ascertained in and by the following statement :—

My invention consists in a novel method of, and apparatus for producing light by electricity, as hereinafter described.

Electric currents of very great frequency or of very short duration and also electric currents of very great difference of potential have heretofore been produced for various purposes, but I have discovered that results of the most useful character may be secured by means of electric currents in which both the above described conditions of great frequency and great difference of potential are present. In other words, I have found that an electrical current of an excessively small period and very high potential may be utilized economically and practically to great advantage for the production of light, and I would here make it clear that I refer now to a current or what may be termed an electrical effect, of a rapidity of oscillation or alternation far in excess of anything that has heretofore been considered desirable or perhaps possible under practical working conditions, and of a potential greater, perhaps, than has ever been developed and applied to any useful purpose, and this will be more fully disclosed by the description of the nature of the invention which is hereinafter given.

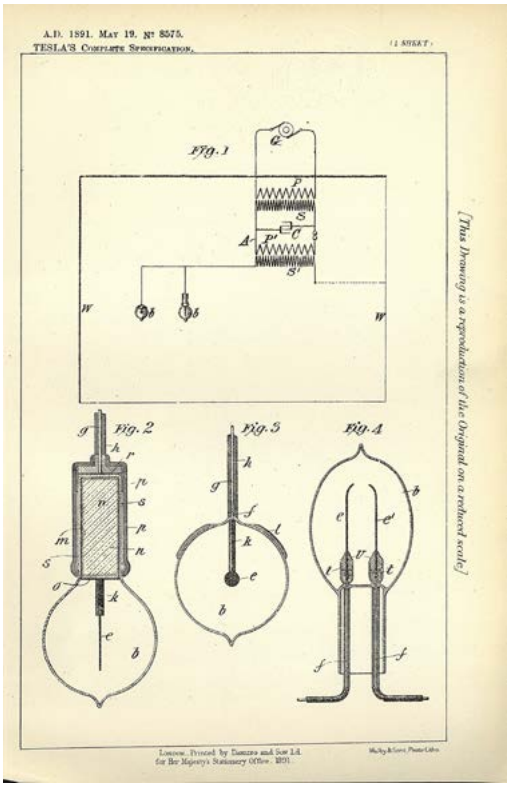
The carrying out of this invention and the full realization of the conditions necessary to the attainment of the desired results involve, first a novel method of and apparatus for producing the currents or electrical effects of the character described, second, a novel method of utilizing and applying the same for the production of light, and third, a new form of translating device or light giving appliance.

To produce a current of very high frequency and very high potential, certain well-known devices may be employed. For instance, as the primary source of current or electrical energy a continuous current generator may be used, the circuit of which may be interrupted with extreme rapidity by mechanical devices, or, a magneto-electric machine specially constructed to yield alternating currents of very small period may be used, and in either case should the potential be too low, an induction coil may be employed to raise it. Or, finally in order to overcome the mechanical difficulties, which in such cases become practically insuperable before the best results are reached, the principle of the disruptive discharge may be utilized. By means of this latter plan a much greater rate of change in the current is produced, and the invention, though not limited to this plan, will be illustrated by a description of the same.

The current of high frequency, therefore, that is necessary to the successful working of the invention is produced by the disruptive discharge of the accumulated energy of a condenser maintained by charging the said condenser from a suitable source of current and discharging it into or through a circuit under proper relations of self-induction, capacity resistance and period in the well understood ways. Such a discharge is known to be, under proper conditions, intermittent or oscillating in character, and in this way a current varying in strength at an enormously rapid rate may be produced.

Having produced in the above manner a current of excessive frequency, I obtain from it, by means of an induction coil, enormously high potentials. That is to say, in the circuit through which or into which the disruptive discharge of the condenser

[Price 8d.]



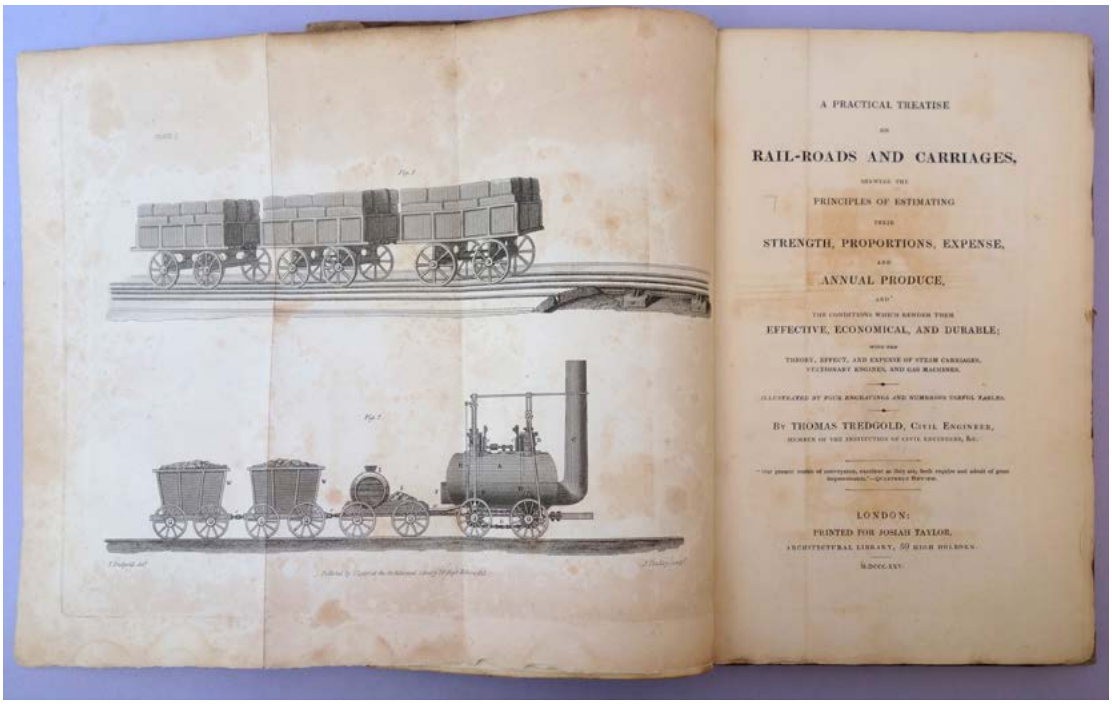
The First Patent Granted for the Tesla Coil

55. Tesla, Nikola (1856-1943). [Patent] No. 8575 . . . Date of application, 19th May, 1891—Accepted 20th June, 1891. Complete specification. Improved methods of and apparatus for generating and utilizing electric energy for lighting purposes. 5pp. Plate. London: Darling & Son for His Majesty's Stationery Office, 1891. 260 x 184 mm. Disbound; stitching holes in left margin, left margin a bit ragged. Light toning but very good. Library stamps (one embossed) on the first page.

$7500

First Edition of the British patent for the Tesla coil, granted on 20 June 1891, **three days prior** to the U.S. patent for this device. Tesla applied for the U.S. patent on 25 April 1891 but did not receive it until 23 June.

The Tesla coil is an electrical resonant transformer circuit that produces high-voltage, low-current, high-frequency alternating-current electricity. Although Tesla patented many similar circuits during this period, the present patent represents the first to contain all the elements of the Tesla coil: High-voltage primary transformer, capacitor, spark gap, and air core "oscillation transformer." Tesla used his coil to conduct innovative experiments in electrical lighting, high-frequency AC phenomena and wireless transmission of electricity. In the first part of the 20th century Tesla coils found a commercial application in wireless telegraphy and electrotherapy; today their dramatic and colorful electrical discharges provide entertainment at science museums and special effects for movies and television. 51501



A PRACTICAL TREATISE

ON

RAIL-ROADS AND CARRIAGES,

SHEWING THE

PRINCIPLES OF ESTIMATING

THEIR

STRENGTH, PROPORTIONS, EXPENSE,

AND

ANNUAL PRODUCE,

AND

THE CONDITIONS WHICH RENDER THEM

EFFECTIVE, ECONOMICAL, AND DURABLE;

WITH THE

THEORY, EFFECT, AND EXPENSE OF STEAM CARRIAGES,

STATIONARY ENGINES, AND GAS MACHINES.

ILLUSTRATED BY FOUR ENGRAVINGS AND NUMEROUS USEFUL TABLES.

By THOMAS TREDGOLD, Civil Engineer,

MEMBER OF THE INSTITUTION OF CIVIL ENGINEERS, &c.

"The present modes of conveyance, excellent as they are, both require and admit of great improvement."—Quarterly Review.

LONDON:

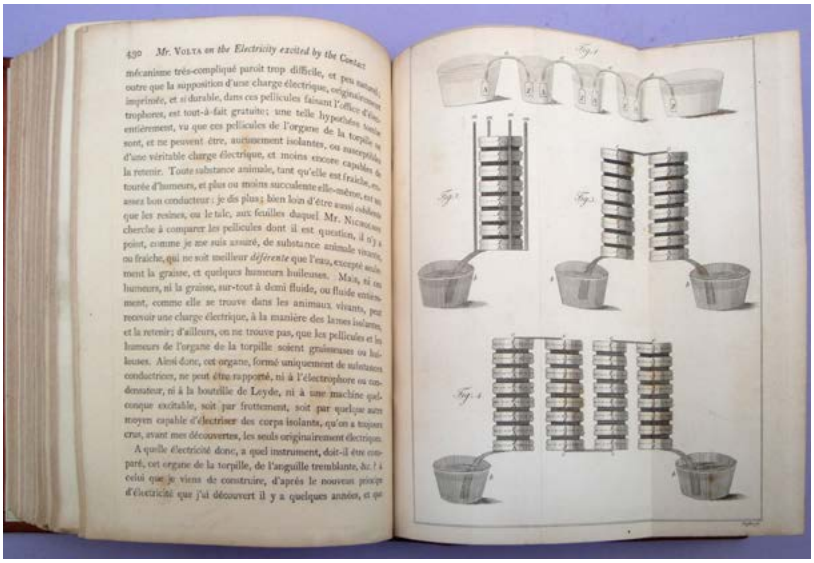
PRINTED FOR JOSIAH TAYLOR,

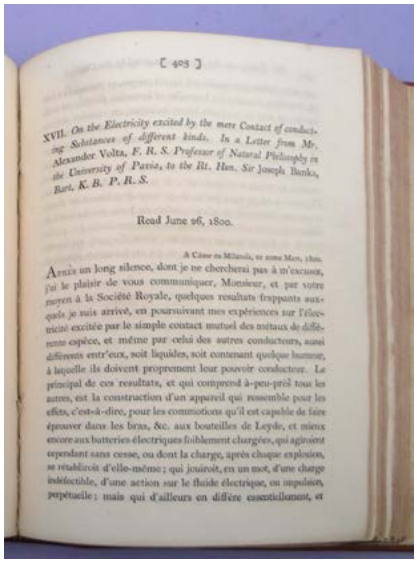
ARCHITECTURAL LIBRARY, 59 HIGH HOLBORN.

M.DCCC.XXV.

56. Tredgold, Thomas (1788-1829). A practical treatise on rail-roads and carriages, shewing the principles of estimating their strength, proportions, expense, and annual produce . . . xi, [1, errata], 184pp. Undated 16-page publisher's catalogue bound in front. 4 engraved plates, including folding frontispiece. London: Josiah Taylor, 1825. 228 x 142 mm. (uncut). Original boards, rebacked in cloth, corners repaired, 19th century bookseller's label on front cover. Minor foxing and dust-soiling, some offsetting from plates, library stamps, shelf-mark and small circular bookplate on front pastedown and first page of publisher's catalogue, but very good. $1500

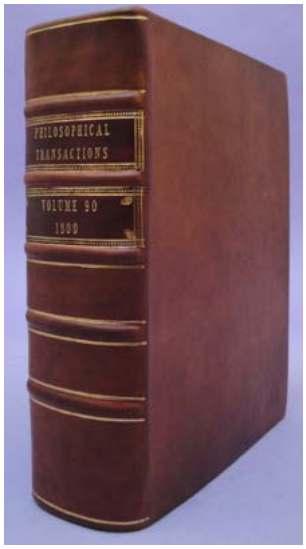
First Edition. Along with Nicholas Wood's *Practical Treatise on Rail-Roads* (1825), Tredgold's book represents the first comprehensive work on railway engineering. "In the above, the structural features of roadbed, rails, engines and rolling stock are analyzed, and the evolution of railroads from man-powered and animal-powered to steam-powered locomotion is given. Clear and detailed engravings illustrate Stephenson's pre-Rocket engines, and others with primitive transmission of power from engine to rail" (Dibner, *Heralds of Science,* no. 182). A conservative in railway matters, Tredgold believed it was "extremely improbable" that trains carrying passengers would travel faster than ten miles per hour. Norman 2092. 43462





Invention of the Electric Battery
Discovery of the Infra-Red Rays

57. Volta, Alessandro (1747-1827). On the electricity excited by the mere contact of conducting substances of different kinds. In: *Philosophical Transactions* 90, part 2 (1800), pp. 403-31. Folding plate (famous illustration of voltaic pile). **With:**

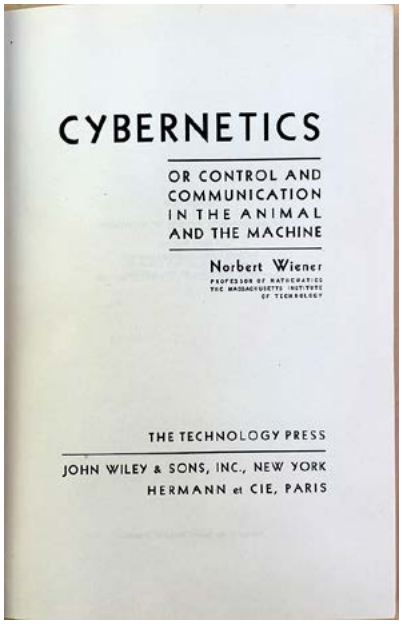


Herschel, Frederick William (1738-1822). Investigation of the powers of the prismatic colours to heat and illuminate objects. Experiments on the refrangibility of the invisible rays of the sun. Experiments on the solar, and on the terrestrial rays that occasion heat. In: *ibid.*, pp. 255-326; 437-538. 12 folding plates. Whole volume, 4to. vi, 238, 26, [4], 239-436, [4], 437-732, [8]pp. 33 plates. London: W. Bulmer for Peter Elmsly, 1800. 218 x 164 mm. Full antique calf, gilt in period style. Light foxing, offsetting and toning, title leaf repaired, margins trimmed causing the loss of several plate numbers but not otherwise affecting the images or text. Very small, almost invisible library blind-stamps on title and last leaves. Very good copy. $9500

First Editions, journal issues. Volta's epochal paper, written in French, describes the voltaic pile, the first electric battery. In his paper, addressed to Sir Joseph Banks at the Royal Society, Volta described two types of battery (the pile and the "crown of cups" filled with salty or alkaline water and connected by bimetallic arcs), and, in a rebuttal to the Galvanists, represented his apparatus as being fundamentally the same as the natural electricity-producing organs of the torpedo fish. By providing a source of continuous, controllable electric current, Volta's battery revolutionized the theory and practice of electricity. The voltaic pile made possible the experiments leading to the decomposition of water, electro-deposition of metal, and creation of the electro-magnet, initiating the electrical age. *Printing and the Mind of Man* 255. Horblit, *100 Books Famous in Science*, 37b. Dibner, *Heralds of Science* 60.

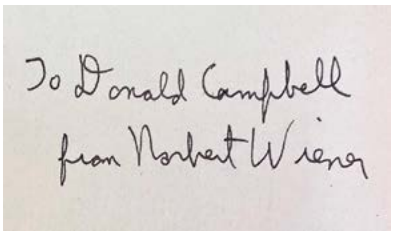
This volume of the *Philosophical Transations* also contains William Herschel's three papers announcing his discovery of infra-red rays. Herschel "made some delicate experiments at one end of the spectrum with a thermometer and discovered that when sunlight was refracted by a prism, invisible heat-rays fell outside the visible spectrum, being less refracted than red light. He had, in fact, discovered the infra-red rays" (*Printing and the Mind of Man* 254). 42151

Inscribed to Philosopher and Social Scientist Donald Campbell



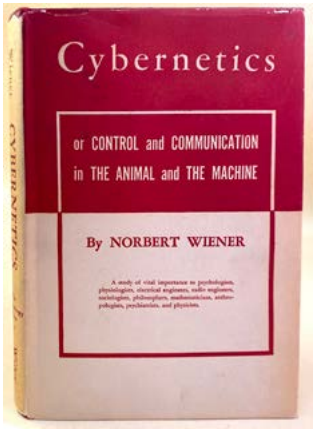
58. Wiener, Norbert (1894-1964). Cybernetics or control and communication in the animal and the machine. 8vo. [2], 194pp. New York: John Wiley & Sons; Paris: Hermann et Cie., 1948. 229 x 152 mm. Original red cloth, red and gray printed dust-jacket (a little chipped). Fine. Inscribed by Wiener to Donald Campbell (1916-96) on the front free endpaper: "To Donald Campbell from Norbert Wiener."

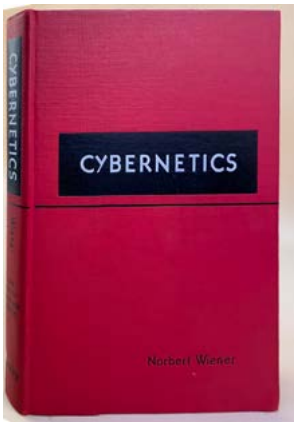
$6500



First American Edition, following shortly after the French edition that appeared in English the same year. We have never seen or heard of a presentation copy of the French edition. Wiener presented this copy to Donald T. Campbell, the highly influential psychologist, social scientist and information philosopher whose investigations of creative thought led him to come up with the concept of "Blind Variation and Selective Retention" (BVSR), a fundamental principle of cybernetics:

> Blind variation and selective retention (BVSR) is a phrase introduced by Donald T. Campbell to describe the most fundamental principle underlying cultural evolution. In cybernetics, it is seen as a principle for describing change in evolutionary systems in general, not just in biological organisms. For example, it can also be applied to scientific discovery, memetic evolution [i.e., the evolution of cultural memes] or genetic programming. As such, it forms a foundation for what has later been called Universal Darwinism (Wikipedia).



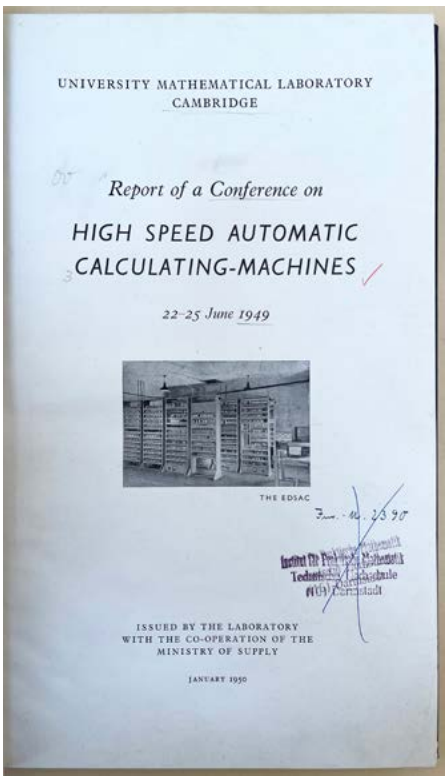


Cybernetics was the first conventionally published book (as opposed to technical report) to include a serious discussion of electronic digital computing. Computer-related words beginning with the "cyber-" prefix, including "cyberspace," originate from Wiener's book. Wiener, independently of Claude Shannon, conceived of communications engineering as a brand of statistical physics and applied this viewpoint to the concept of information; writing as a mathematician rather than an engineer, his discussion was theoretical rather than specific. The work influenced a generation of scientists working in a wide range of disciplines, including information theory, computer learning, and artificial intelligence.

Wiley had the first edition of Wiener's book typeset and printed by letterpress in France by the French publishers Hermann et Cie, probably because the French firm was a specialist in mathematical publications. The first edition was thus issued in Paris. The first American edition was printed offset from the French sheets and issued by John Wiley in New York, also in 1948. Because the typesetting was done in Europe, Wiener likely did not have the opportunity to read proofs carefully, as the first edition contained many typographical errors which were repeated in the American edition. These remained uncorrected through the various printings of the American edition until a second edition was published by John Wiley and MIT Press in 1961.

Regarding the notable paucity of books inscribed by Wiener, my colleague Arthur Freeman emailed me this story in October 2012: "Norbert, whom I grew up nearby (he visited our converted barn in Belmont, Mass., constantly to play frantic theoretical blackboard math with my father, an economist/statistician at MIT, which my mother, herself a bit better at pure math, would have to explain to him later), was a notorious cheapskate.

His wife once persuaded him to invite some colleagues out for a beer at the Oxford Grill in Harvard Square, which he did, and after a fifteen-minute sipping session, he got up to go, and solemnly collected one dime each from each of his guests. So when *Cybernetics* appeared on the shelves of the Harvard Coop Bookstore, my father was surprised and flattered that Norbert wanted him to have an inscribed copy, and together they went to Coop, where Norbert duly picked one out, wrote in it, and carried it to the check-out counter—where he ceremoniously handed it over to my father to pay for. This was a great topic of family folklore." *Origins of Cyberspace* 992. 43511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Report of a Conference on

HIGH SPEED AUTOMATIC CALCULATING-MACHINES

22-25 June 1949

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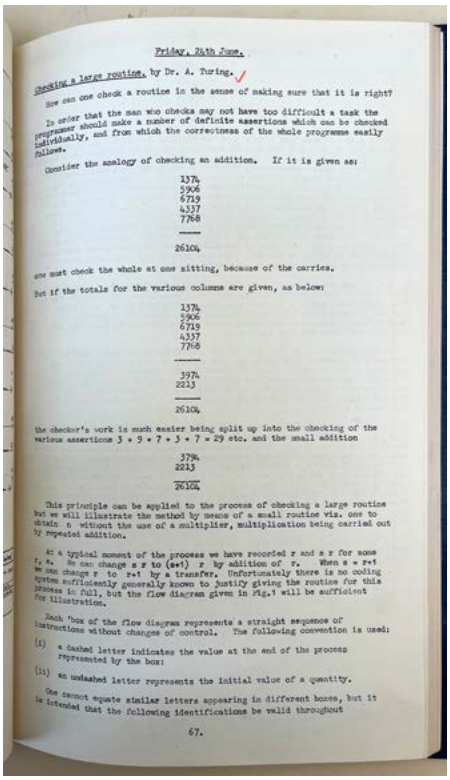
JANUARY 1950


Friday, 24th June.

Checking a large routine, by Dr. A. Turing.

How can one check a routine in the sense of making sure that it is right?

In order that the man who checks may not have too difficult a task the programmer should make a number of definite assertions which can be checked individually, and from which the correctness of the whole programme easily follows.

Consider the analogy of checking an addition. If it is given as:

1374
5906
6719
4337
7768
26104

one must check the whole at one sitting, because of the carries.

But if the totals for the various columns are given, as below:

1374
5906
6719
4337
7768
3974
2213
26104

the checker's work is much easier being split up into the checking of the various assertions $3 + 9 + 7 + 3 + 7 = 29$ etc. and the small addition

3794
2213
26104

This principle can be applied to the process of checking a large routine but we will illustrate the method by means of a small routine viz. one to obtain n without the use of a multiplier, multiplication being carried out by repeated addition.

At a typical moment of the process we have recorded r and s r for some r, s. We can change s r to $(s+1)$ r by addition of r. When $s = r+1$ we can change r to $r+1$ by a transfer. Unfortunately there is no coding system sufficiently generally known to justify giving the routine for this process in full, but the flow diagram given in Fig.1 will be sufficient for illustration.

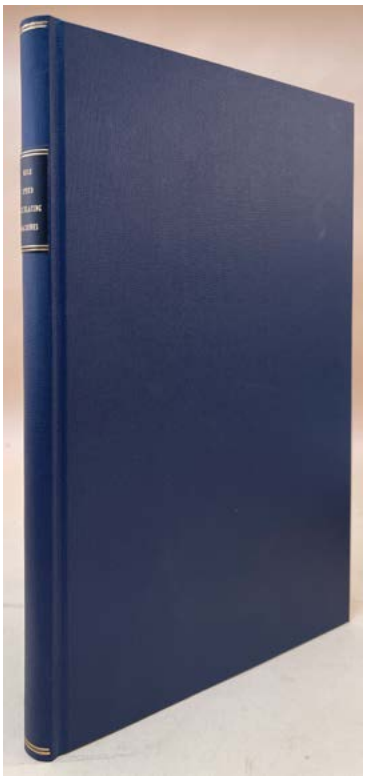
Each box of the flow diagram represents a straight sequence of instructions without changes of control. The following convention is used:

(i) a dashed letter indicates the value at the end of the process represented by the box:

(ii) an undashed letter represents the initial value of a quantity.

One cannot equate similar letters appearing in different boxes, but it is intended that the following identifications be valid throughout

67.

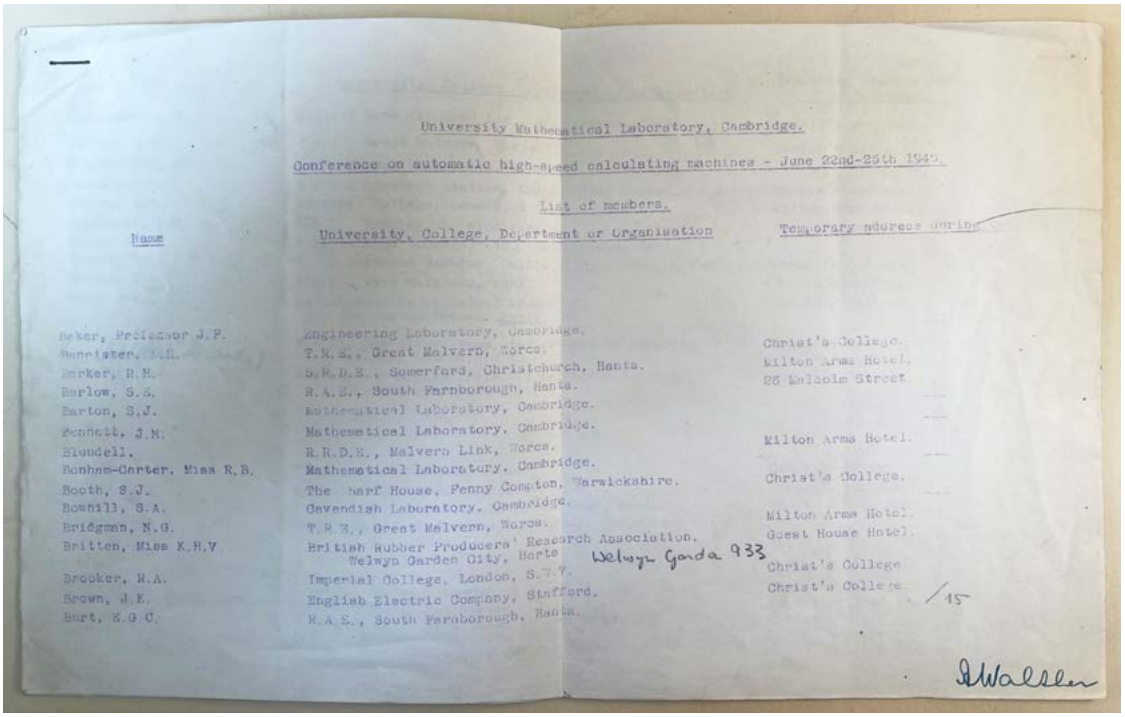


Walther's Copy of the First English Computer Conference—The First Conference in which a Stored-Program Computer was Demonstrated

59. [**Wilkes, Maurice Vincent** (1913-2010).] (1) Report of a conference on high speed calculating-machines, 22-25 June 1949. [6], 141pp., irregularly numbered. 33 inserted illustrations / diagrams. Cambridge: University Mathematical Laboratory, January 1950. 325 x 200 mm. Cloth. Stamp of the Institut für Praktische Mathematik in Darmstadt on the title. From the library of computer pioneer Alwin Walther (1898-1967) who worked at that institution. Laid in is an eight-page dittoed typescript list headed "University Mathematical Laboratory, Cambridge. Conference on automatic high-speed calculating machines – June 22nd-25th 1949. List of members," signed by Walther on the first page. $6500

First Edition. The report of the first computer conference held in England at which Alan Turing presented a software paper entitled "Checking a large routine" published on pp. 67-68 of this report. Turing included an early flow diagram and a chart illustrating his program.

This was the first computer conference in which a stored-program computer actually operated, and it was attended by a virtual who's who of all the early electronic computing pioneers in England. According to Walther's list of attendees, no one from the United States or France attended.



University Mathematical Laboratory, Cambridge.

Conference on automatic high-speed calculating machines - June 22nd-25th 1949.

List of members.

Name	University, College, Department or Organisation	Temporary address during
Baker, Professor J.F.	Engineering Laboratory, Cambridge.	Christ's College.
Bannister, H.M.	T.R.E., Great Malvern, Worcs.	Milton Arms Hotel.
Barker, R.H.	S.R.D.E., Somerford, Christchurch, Hants.	26 Malcolm Street.
Barlow, S.S.	R.A.E., South Farnborough, Hants.	
Barton, S.J.	Mathematical Laboratory, Cambridge.	
Bennett, J.M.	Mathematical Laboratory, Cambridge.	
Blundell,	R.R.D.E., Malvern Link, Worcs.	Milton Arms Hotel.
Bonham-Carter, Miss R.B.	Mathematical Laboratory, Cambridge.	
Booth, S.J.	The Dwarf House, Penny Compton, Warwickshire.	Christ's College.
Bowhill, S.A.	Cavendish Laboratory, Cambridge.	
Bridgman, N.G.	T.R.E., Great Malvern, Worcs.	Milton Arms Hotel.
Britten, Miss K.H.V	British Rubber Producers' Research Association. Welwyn Garden City, Herts. Welwyn Garden 933	Guest House Hotel.
Brooker, R.A.	Imperial College, London, S.W.7.	Christ's College
Brown, J.K.	English Electric Company, Stafford.	Christ's College
Burt, E.G.C.	R.A.E., South Farnborough, Hants.	

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AWalther

This copy is from the library of Alwin Walther, one of the pioneers of mechanical and early electronic computing technology in Germany, who attended the conference. Laid into this copy is Walther's copy of the list of conference members, indicating where each was staying during the conference. These sheets Walther undoubtedly received when he attended the conference. It is signed and annotated by him; with notations as to where certain attendees were staying. Walther's name appears on the second to last page of the list.

The conference was organized by Wilkes. Twenty-eight papers were presented at the conference, The texts of most of the papers, as well as of the discussions that followed, are reproduced in the report. The conference was attended by 139 people, according to Walther's addition on his ditto'd sheets. A bibliography of nearly 200 works on electronic computers appears on pages 134-41. This bibliography was relatively complete for the sparse literature available at the time.

The EDSAC, which had become fully operational just a few weeks previously, was the star of the Cambridge conference. Immediately after the opening address (delivered by Douglas R. Hartree), Wilkes presented a paper on the EDSAC written by himself and his colleague William Renwick (pp. 9-11), which was followed by a demonstration of the machine (pp. 12-16):

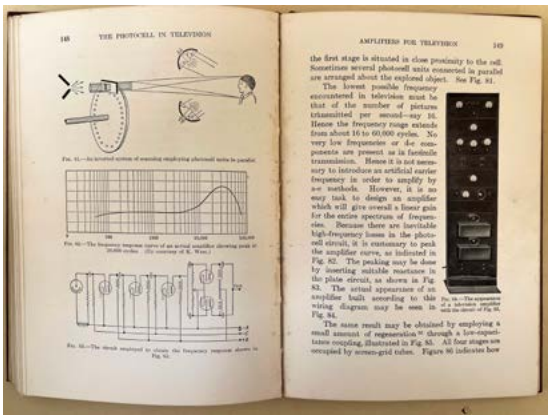
"For the demonstration two short programs were run: the first, written by Wilkes, printed a table of squares; the second, written by David Wheeler, printed out prime numbers. David Wheeler . . . also gave a paper later in the conference on organizing the program library for EDSAC [pp. 36-40]; this paper is interesting because it shows an early stage in the evolution of the EDSAC programming system that was later to be described in the classic textbook *The Preparation of Programs for an Electronic Digital Computer*" (Williams and Campbell-Kelly, *The Early British Computer Conferences*, p. xiii). *Origins of Cyberspace* 1019. 43281

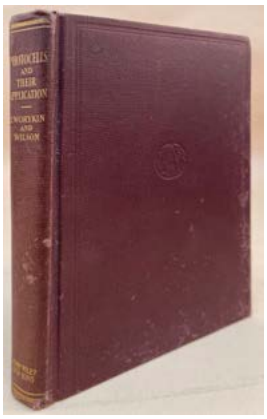
60. Wright, Joseph, of Derby (1734-97). A philosopher giving a lecture on the orrery. From the original picture painted by Mr Joseph Wright. In the collection of the Right Honourable the Earl of Ferrers. Mezzotint, with engraving, by William Pether after Wright; framed. N.p., 20 May 1768. 480 x 585 mm. Minor repair in the center of the lower margin at the imprint, but very good. $6000

Clayton state IV. This copy is from the collection of the Honorable Christopher Lennox-Boyd (1941-2012; Judy Egerton, author of the authoritative *Wright of Derby* (1990), used Lennox-Boyd's collection as a source for her book's bibliography of states of Wright's prints.

Wright's famous painting, depicting a lecturer demonstrating a mechanical model of the solar system to a small audience, broke with tradition in making science its focus rather than religion or classical mythology. Wright, an artist associated with the British Enlightenment, has been called the first professional painter to express the spirit of the Industrial Revolution. 46500

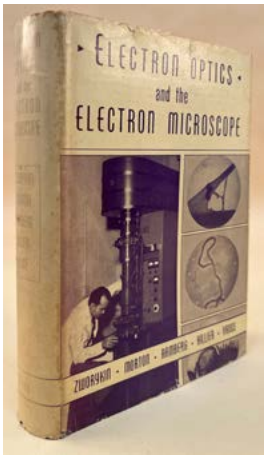
61. Zworykin, Vladimir K. (1888-1982) and **E. D. Wilson.** Photocells and their application. xi, 209pp. Text illustrations. New York: John Wiley & Sons; London: Chapman & Hall, 1930. 195 x 134 mm. Original cloth, spine a bit faded, minor edgewear and scuffing. Ownership signature and notes on endpapers. Very good. $375

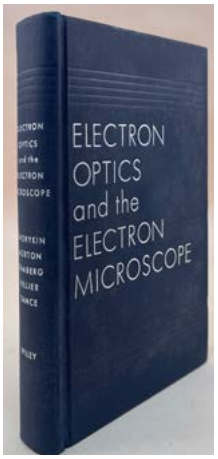




First Edition. Zworykin, one of the pioneers of modern television, obtained his Ph.D. in 1926 from the University of Pittsburgh with a thesis on the improvement of photoelectric cells. Also known as "electric eyes," photoelectric cells are devices that convert light energy into electrical energy; they are used as switches, light detectors, light meters and power sources. Zworykin spent several years at Westinghouse Labs in Pittsburgh working on various applications of photoelectric cells—including their possible use in television and image transmission—before leaving Westinghouse in 1930 to take charge of television development at RCA. 51044

62. Zworykin, Vladimir K. (1888-1982); **James Hillier** (1915-2007) *et al.* Electron optics and the electron microscope. xi, 766pp. Text illustrations. New York: John Wiley & Sons, 1945. 213 x 143 mm. Original cloth, dust-jacket (spine faded, slight wear and spotting). Minor spotting but very good. $375





First Edition. Zworykin, Hillier and their associates at RCA Laboratories developed the first commercial high-resolution electron microscope in North America. 51067