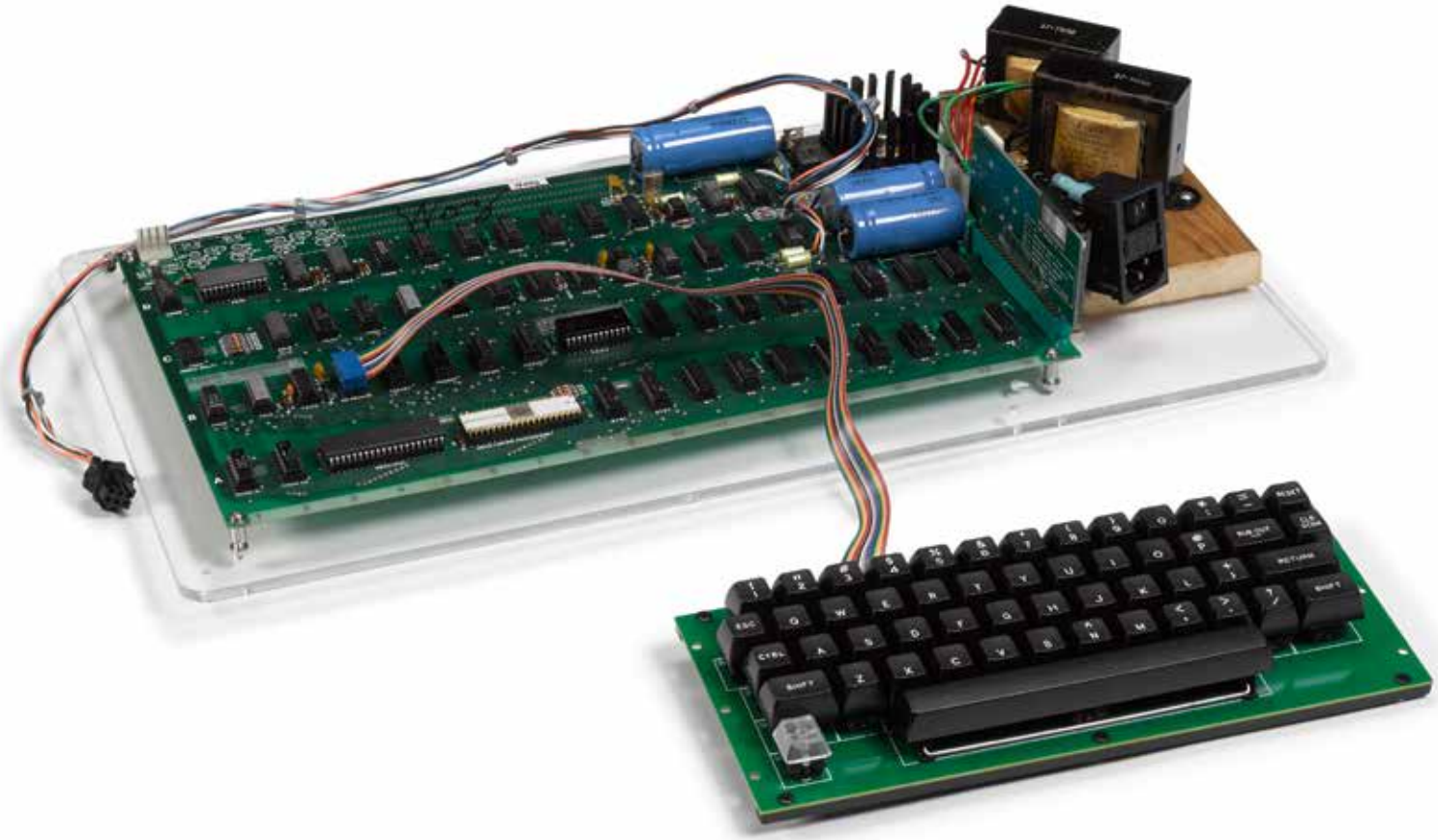
Bonhams

History of Science and Technology

New York I December 4, 2019



History of Science and Technology

New York | Wednesday December 4, 2019 at 1pm

BONHAMS

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New York, New York 10022
bonhams.com

PREVIEW

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10am-5pm
Tuesday, December 3,
10am-5pm
Wednesday, December 3,
10am-1pm

Sale Number: 25265
Lots 1 - 105

Catalog: $35

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Bidding by telephone will only be accepted on a lot with a lower estimate in excess of $1000.

Please contact client services with any bidding inquiries.

Please see pages 59 to 63 for bidder information including Conditions of Sale, after-sale collection and shipment.
All items listed on page 63 and/or noted as W next to the lot number will be transferred to off-site storage, if not removed by 4.30pm, Thursday 5 December 2019.

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ILLUSTRATIONS

Front cover: Lot 60
Inside front cover: Lot 59
Inside back cover: Lot 98
Back cover: Lot 17
Session page: Lot 1

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To bid live online and / or leave internet bids please go to www.bonhams.com/auctions/25265 and click on the Register to bid link at the top left of the page.

Forward

Welcome to our 2019 History of Science and Technology auction in which we include a broad selection of books and three-dimensional items that investigate myriad fields of science and technology spanning natural history to astrophysics; analog instruments to super computers; ballooning to advanced rocketry.

Aptly, we begin with a foundational work in the history of science: the first edition of Plato's Timaeus, printed in 1484 and providing the first recorded application of mathematical concepts to the order of the heavens. It's a highly important scientific work whose impact has never been properly understood.

There is a healthy section of books covering the history of computing beginning with material by Charles Babbage including many presentation copies and, most importantly, Ada Lovelace's translation of Sketch of the Analytical Engine Invented by Charles Babbage Esq. which includes Lovelace's celebrated explanatory notes – considered the most important paper in the history of digital computing. Other computing highlights include works by Norbert Weiner (including the rare paper that introduced the Weiner filter), Howard Aiken, Grace Hopper, Claude Shannon as well as Vincent Cerf & Robert Kahn's A Protocol for Packet Network Intercommunication, the work that provided the architecture of the internet.

Among the 19th century highlights is a first edition of Charles Darwin's On the Origin of Species by Means of Natural Selection, a handsome copy in original cloth. We transition into the 20th century by way of Freud (including a letter referring a patient to Jung), Edison, Tesla and Marconi. We continue with a selection of Einstein items including early offprints from the library of his son H.A. Einstein.

We always endeavor to bring to market some of the most significant computers, and this year is no exception. We have a working Apple-1, the company's initial product and a rarity on its own. This example has the distinction of having supplied power to a prototype Apple II during the development phase of the latter. We also have the next groundbreaking product developed by Apple--the ramifications of which are still felt today and which Steve Wozniak considers to have "changed our lives forever" – a prototype of the original Macintosh. Our example, one of the earliest extant, was produced before the 3 ½ inch disk drive was implemented. We conclude the section with rare Cray supercomputer material including a complete Cray-3 supercomputer processing octant.

The Air and Space section opens with items from modern ballooning pioneer Julian Nott including his flight log, a large archive of his work on high altitude balloon flight, and awards, gear and souvenirs from his greatest flights. After a number of intriguing lots of space photography – Apollo missions as well as Voyager mosaics of Mars – we offer a collection of contractor's models, the types of which are rarely seen at auction and surely made in extremely limited numbers.

This is just a sampling of the auction highlights. We encourage you to take a closer look in the following pages and stop by our preview if you are in the area. Please do not hesitate to contact me with questions.

Adam Stackhouse
Senior Specialist
Head of Sale

History of Science & Technology

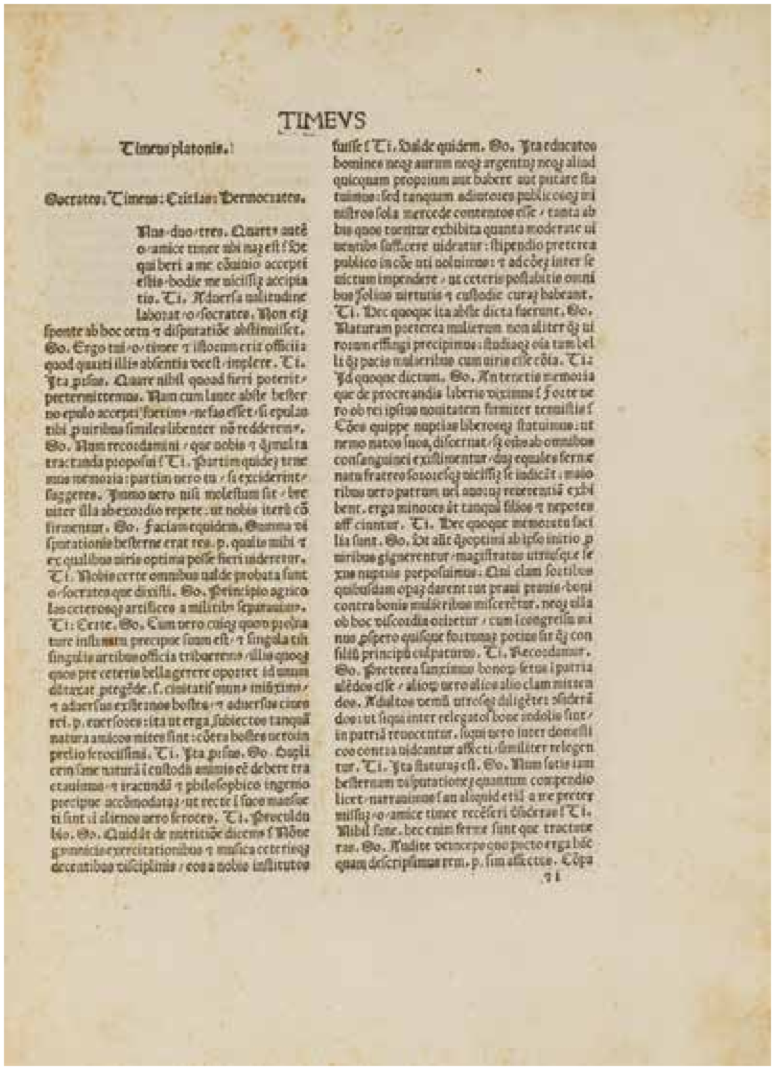
Lots 1-105

IN TIMEVM

Quemadmodum ex imaginis liniamentis sepe niuētis forme linamēta coniicim⁹, sic ex hoc imaginario celestis aie uultu, quē in speculari materia mundi cōspicim⁹, ueraȝ eius faciē p uiribus coniectamus. Dupla igitur ⁊ tripla ⁊ cetera interualla i prima numeroꝝ figura descripta, plato inueniri arbitratus i speris, ad aie partes ⁊ uires, unde in spas translata sunt, retulit. Putauit eīȝ quantum spatii a terra usque ad lunā extat, duplum a terra ad solem usqȝ ptendi. Quātumqȝ ab ipsa usqȝ ad solem, triplum ab eadem eē ad uenerem. Rursus quantum a terra ad uenereȝ, quater tantum ab eadem ad mercurium. Item quantuȝ ad mercurii stellā ab ipsa terra, nouies tantuȝ a terra ad marteȝ. Et quātū a terra ad martē, octies tantum a terra ad iouem. Quantumqȝ a terra est usque ad iouem, septies ⁊ uicies tantuȝ a terra usque ad saturni circuȝ. Hic inter cetera uides grauiores planetas iouē atqȝ saturnū utrinqȝ p sol. duos numeros designari. Et si alibi ex nonnulloꝝ pythagoricoꝝ opinione, alias interuallorum mensuras recensui, platonicas tn̄ pbabiliores existimo. Per hec autē forsan intelligi possunt, que in decimo de re. p. de speris obscurius inuoluuntur. Item p illa que ō numeroꝝ pportionumqȝ uirtute tractauimus coiectari possunt que in octauo de re. p. de celesti circuitu ⁊ numeris ⁊ pportionibus implicantur.

Quomodo repleantur duploꝝ triploꝝumqȝ numerorum interualla.

Plato postqȝ primā excogitauit figuraȝ septem limites continentem: in qua duple atqȝ triple rationes cōprehenduntur, deinceps alterā effingi iubet figuram adeo maiores numeros cōplectentem: ut ubi duple sexquitertiis sexquialterisqȝ replentur, he quoqȝ medie sexquioctauis sic impleantur: ut sexquitertiarum spatia tonum capiant. Describamus ergo figurā prime similem: sed senarium ponamus in apice: post queȝ longo spatio subdamus eius duplum. i. duodenarium: idqȝ spatiuȝ occupemus octonario simul ⁊ nonenario. Deinde similiter lōgo spatio uigīti quatuor post duodeciȝ describamus: ⁊ in hoc ipso spatio sexdecim decemqȝ ⁊ octo ponamus. Eodeȝ ordine inter uiginti quatuor ⁊ quadraginta octo, uelut media triginta duo ⁊ triginta sex inserentes. Hactenus duploꝝ latus absoluimus. Deinceps uero triploꝝ spatia cōsumemus, pcul a senario secernentes decem ⁊ octo senarii triplum: atque inter eos nouem ⁊ duodecim designemus. Similiter inter deceȝ ⁊ octo ⁊ quinquaginta quatuor eius triplum, uiginti septē ⁊ triginta sex collocemus. postremo a quinquaginta quatuor ad eius tripluȝ, cētū sexaginta duo. pgemina similiter media. s. octuaginta unū centūqȝ ⁊ octo pgrediamur. Et ergo ad primā figure huius duplam habitudinē reuertamur, cōsideremus inter sex ⁊ duodeciȝ medietates duas, octo. s. atque nouem. Et octonariū quidē inter sex ⁊ duodeciȝ rōne harmonica se habere. Naȝ ⁊ excedit senarium, tertia senarii portiōe, ⁊ exceditur a duodenario, portione similiter duodenarii tertia. Item ad senariuȝ sexquitertius ē. sed duodenarius ad ipsum ē sexqalter. Preterea differētia inter duodecim atqȝ octo quaternari⁹ ē. Differentia uero inter octo atqȝ sex, binarius. Sic igitur quatuor ad duo, sicut duodecim ad sex duplicem continent rōneȝ. In his uero que diximus artificium uersatur harmonicuȝ: cōparemus quoqȝ nouēȝ ⁊ ad sex p sexquialterā: ⁊ ad duodeciȝ p sexquitertiā qualitatē, ⁊ ad octo p sexquioctauā pprietatem: qua resonet tonus. Intelligem⁹ pfecto hac ipsa sexqoctaua duos sexquitertios colligari. i. octo ad sex, nouēqȝ ad duodecim. neqȝ deest medietas his numeris arithmetrica. Siquidē nouenari⁹ senariuȝ qdē excedit ternario, ⁊ a duodenario pariter ternario superatur. Similiter p rōnes easdeȝ in duplis sequētibus pcedem⁹, cōligātes duplas qdē p sexqtertias ⁊ sexquialteras. Itē sexquioctaua pportione sexquitertias geminas cōnectentes: Similiter ferme excepto tono per triplas discurrere licet. Qm̄ uero sexquitertie rōnes non solum ex duobus tonis fiunt, uerum etiam ex hemitonio: ⁊ hoc qdeȝ minore, cui deest ad plenum hemitonium particula quedā, iccirco plato inquit, in sexqtertiis portiunculā quādā


TIMEVS

Timeus platonis.

Socrates: Timeus: Critias: Hermocrates.

1

PLATO. 427?-347 B.C.

The Timaeus [and] Critias [From Plato's Opera]. Translated into Latin by Marsilius Ficinus, together with commentary. [Florence: Laurentius (Francisci) de Alopa, Venetus, for Francesco Berlinghieri and Philippus Valor, 1484]. *FIRST EDITION OF PLATO'S TIMAEUS.*

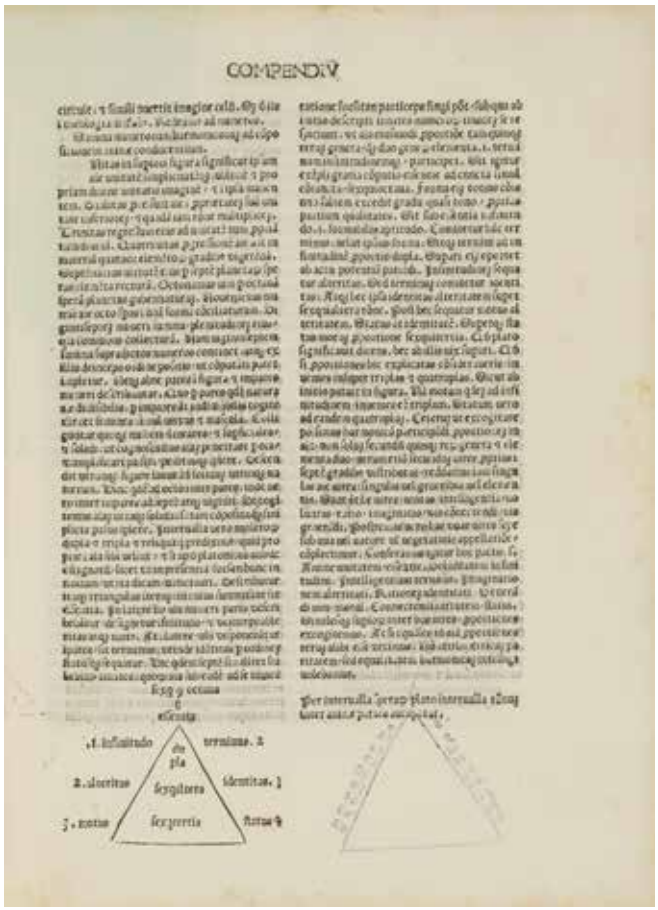
Folio (185 x 212 mm). 42 CONSECUTIVE LEAVES, comprising the complete parts III & IV from the First Printing of Plato's Opera, as printed in discrete parts at San Jacopo de Ripoli (see Kristeller), Collation: et^{8} cō^{4} rū^{6} [et]^{10} [con]^{8} [rum]^{6}. 46 lines and headlines, two printed and two manuscript diagrams, double column, initial spaces, neatly bound in stiff modern wrappers.

SAVING THE PHENOMENA, THE FIRST SCIENTIFIC COSMOLOGY, containing the first recorded scientific application of mathematics to the explanation of nature. Conceiving the cosmos to be a beautifully ordered mechanism operating according to natural law, the *Timaeus* is the first great statement of science. In positing geometry to be the ultimate explanatory instrument of natural order, Plato here effectively invents mathematical physics, and originates the challenge to early scientists to "save the phenomena."

Written almost 2500 years ago, the Timaeus provides the first explicit statement of the principle of physical causality: "all that becomes must needs become by the agency of some cause; for without a cause nothing can come to be" *(Timaeus, 28a, 28c)*. Drawing on the mathematical perspective of the Pythagoreans for the purpose of theoretically explaining the empirical world, Plato here brilliantly "saves the phenomena" of the seemingly irregular motions of the heavens and the apparently erratic flux of the elements. In addition to these two grand themes, the *Timaeus* also pursues specific scientific inquiries ranging from geophysics, metallurgy, and hydraulics to botany, physiology, and pathology. More than in any other dialogue, the *Timaeus* evidences Plato the scientist and mathematician vigorously at work -- positing that counter-revolving circles drive the motions of the heavens; that elemental transmutation is the work of a geometric atomism (involving the decomposition and recomposition of the surfaces of the five Platonic solids); and that the soul of the universe is to be considered a harmonic composition of natural process. The *Timaeus* integrally links mechanics and technicality with the thinking of science, and with the *Timaeus* one begins to perceive nature assuming the algorithmic regularity of a clockwork universe.

In the *Critias,* the companion dialogue, Critias relates the story of Atlantis first synoptically transmitted in the *Timaeus*, now elaborated in its entirety for the first time. Atlantis, a fabulously rich culture, technologically advanced and populous, loses connection with virtue and divinity, filled with a lust for possessions and power. Seeking to enslave all of the Mediterranean as far as Egypt, they are stopped by the virtuous Athenians. A cautionary myth, *Critias* is also an allegorical rendering of the physical principles articulated in the *Timaeus.*


TIMEVS


COMPENDIV

"Our elementary particles can be compared with the regular solids of Plato's Timaeus. They are Archetypes of the Ideas of matter."

-Werner Heisenberg

According to Paul Oskar Kristeller, Ficini's Opera of Plato was printed in parts beginning in February 1484 and finishing before September 1484 at the press of San Jacopo de Ripoli, significantly the first press known to employ women. *The Timaeus and Critias* were printed together as Part IV of Plato's *Opera*; and Ficino's own original statement on the Timaeus, Compendium in Timaeum as Part III. One can speculate that the discretely printed parts of the 1484 *Opera* may have been sold individually or collectively, as with Aldus's Aristotle of 1495-8, which might explain the high percentage of surviving copies which are defective.

The *Timaeus* is central to Plato's work and brings his philosophy into concrete focus: "the one place in Plato's work where all of the 'furniture' of Platonism – gods, souls, Ideas, space, properties, natural and artificial kinds – are seen related each to all within a single frame." (Mohr, pp xix-xx). The relationship of Plato's metaphysics to the changing sensible world is explicitly articulated to meaningful scientific purpose and effect, but it's ultimate concern is the human being and the relationship to the natural order -- a focus enabling us to think about human society and even the Republic in the most concrete and physical of ways. Although typically portrayed as a philosopher, Plato was in fact one of ancient Greece's most important patrons of mathematics: "Let no-one ignorant of geometry enter here" was the motto posted at the entrance to his Academy, and Euclid himself was said to have been his student.

A FOUNDATIONAL WORK IN THE HISTORY OF SCIENCE AND IDEAS, the *Timaeus* has had a profound influence on scientists from Aristotle to Kepler to Heisenberg, across thousands of years. In fact, Heisenberg's autobiography begins with him reading the *Timaeus* hiking in the alps, and the resulting intellectual awakening. "Our elementary particles can be compared with the regular solids of Plato's *Timaeus*. They are Archetypes of the Ideas of matter." The full complexity and power of the *Timaeus*, and its import in the history of science has yet to be fully or sufficiently understood. The 1484 Plato, in any form, is of the greatest rarity both at auction and in private hands.

References: BMC VI, 666; BSB-Ink. P-568; Goff P-771; GW M33912; HC 13062; PMM 27; See Bradie and Duncan, "Plato's Universe," *Evolution of the Concepts of Space and Time*, 1997; Cornford, *Plato's Cosmology: The Timaeus of Plato*, 1935; Hetherington, "Plato's place in the history of Greek astronomy: restoring both history and science to the history of science," *Journal of Astronomical History and Heritage*, 1999; Hulsit, "A Short History of Causation," abridged from From *Cause to Causation. A Peircean Perspective*, 2002; Knorr, "Plato and Eudoxus on the Planetary Motions," *J. Hist. Astronom.* 21, 1990; Kristeller, "The First Printed Edition of Plato's Works and the Date of Its Publication (1484)," *Studies in Renaissance Thought and Letters*, Rome, 1993 pp 138 ff.; Mohr, *God and Forms in Plato*, 2005.

$80,000 - 120,000


SECRETA
SECRETORVM
RAYMVNDI LVLLII
ET HERMETIS PHILOSOPHORVM IN LIBROS
TRES DIVISA.
COLONIAE.
Apud Gosuinum Cholinum.
Anno M. D. LXXXXII.

2


GEOMETRIA,
à
RENATO DES CARTES
Anno 1637 Gallicè edita; postea autem
Apud Ludovicum & Danielem Elzevirios,

3

4

2

LLULL, RAMON. C.1232-1315.

2 titles:
1. *Secreta secretorum ... cum opusculo d. Thomae Aquinatis, de esse & essentia mineralium....* Cologne: Gosuinum Cholinum, 1592.
8vo (148 x 95 mm). Early green vellum. Toned, lacks rear free endpaper, boards somewhat bowed.
Provenance: Joannes Caspari (ownership inscription to title); Edward Sanford Burgess (bookplate).
Adams L1711.
2. *Opusculum Raymundinum de auditu kabbalistico: sive as omnes scientias....* No place: 1601.
8vo (153 x 90 mm). Woodcut diagrams, illustration to title. Early 20th century green levant, spine lettered in gilt. 2 gatherings browned, contemporary marginalia.
Provenance: Leo S. Olschki (bookplate); Edward Sandford Burgess (bookplate).

Polymath Ramon Llull is considered a pioneer of computation theory.

$1,000 - 1,500

3

DESCARTES, RENÉ. 1596-1650.

Geometria á Renato Des Cartes Anno 1637 Gallicé edita.... Amsterdam: Elzevir, 1659-1661.
2 volumes. 8vo (194 x 153 mm). 520; [18], 420, [4] pp. With frontispiece portrait of Descartes in volume I, title printed in red and black and with woodcut printer's device, numerous diagrams in text. Contemporary limp vellum, manuscript title on spines, pastedowns lacking, light wear and warping to binding.
Provenance: Jacoby Lantfitt(?) (ownership signature to f.f.e.p. dated 1700); E.N. da C Andrade, Fellow of the Royal Society (bookplates in both volumes).

Second edition of Frans van Schooten's Latin translation of Descartes' seminal work. The *Géométrie* first appeared in French as an appendix to Descartes' *Discours de la Méthode* (1637). Van Schooten first saw the *Géométrie* at Leiden, as Descartes had come there to supervise the printing of the *Discours.* Van Schooten published the first Latin translation in 1649, adding his own extensive commentary. In the second edition the commentaries were enlarged and served as a basic reference for the generation of scholars who developed integral calculus. Isaac Newton, for one, used this edition in his studies, as his annotated copy in the library at Cambridge University can attest. PMM 129. Poggendorff I: 557.

$1,500 - 2,000

4

BROWNE, JOHN. 1642-1700.

A Compleat Treatise of the Muscles, as they appear in Humane Body, and Arise in Dissection.... London: Thomas Newcombe for the Author, 1681.
Small folio (317 x 197 mm). Engraved portrait frontispiece, 37 engraved plates. Contemporary calf. Upper joint cracked, spine ends chipped, marginal worming at lower inside corner through first several leaves.
Provenance: Hermann von Wechlinger Schulte [1876-1932], dean of Creighton University Medical School (bookplate).

FIRST EDITION. John Browne published the first description of cirrhosis of the liver six years before he brought out this anatomical atlas. An English surgeon, Browne was one of the first medical authors to publish in English. Cushing B762; Heirs of Hippocrates 642; Russell 101; Wellcome III, p 251; Wing B-5126.

$1,000 - 1,500

5

6

7

8

5

VIEUSSENS, RAYMOND DE. 1641-1715.

Neurographia universalis. Lyons: Jean Certe, 1716.
Folio. (335 x 221 mm). Half title, 30 plates (13 folding) including portrait frontispiece. Contemporary mottled calf, spine gilt in 7 compartments. Old repairs to joints, puncture marks through several leaves at inside margins, browning.

"*Editio Novissima*." Vieussens' masterpiece, still considered one of the most complete and accurate descriptions on the nervous system written in the 17th century. "The best illustrated neurological monograph of the seventeenth century ... He showed the spinal cord to be an independent structure, and his elucidation of the fine structure of the cerebellum (including the discovery of the dentate nuclei) surpassed all previous descriptions" (Norman 2152, on the 1684 edition). Garrison & Morton 1379; Norman 2152 (1684 ed.); Radcliffe 511; Waller 996.

$1,200 - 1,800

6

COWPER, WILLIAM. 1666-1709.

Myotomia Reformata: Or an Anatomical Treatise on the Muscles of the Human Body. Illustrated with Figures after the Life.... London: Robert Knaplock, William and John Innys, and Jacob Tonson, 1724.
Folio (480 x 338 mm). Engraved frontispiece, title printed in red and black, double-page engraved table, and 67 engraved plates (numbered 1-66, plate 13 in 2 states), engraved illustrations, diagrams, head- and tail-pieces and initials. Early 20th century half morocco and tan cloth by Ulrich Holzer of Boston. An uncut copy, marginal tears to several leaves with crude repairs, browning and chipping to page edges, wear and soiling to covers and spine.

FIRST FOLIO EDIION, remarkable not only for the quality of the large plates but for "the ingenious historiated initials wittily decorated with myotomical motifs" (Norman). First appearing in 1694 in an octavo edition with only 10 plates, it was brought into this richly illustrated folio form by Richard Mead (1673-1754) after Cowper's death, using plates by Michael Vender Gucht (1660-1725), some after drawings by Rubens and Raphael. Choulant-Frank, p 253; Garrison-Morton 392.1; *Heirs of Hippocrates* 723; Norman 530; Osler 2384; Russell 210; Wellcome II, p 401.

$1,500 - 2,500

7

AN EIGHTEENTH CENTURY SUNDIAL.

English, second quarter 18th century, bronze horizontal sundial displaying the Equation of Time, signed "*T. Heath Fecit*," 8 inches in diameter. Fixed gnomon, the circular plate engraved with roman chapter ring enclosing ring giving the annual variation between Mean Time and Solar Time, labeled "*Watch Faster / Watch Slower,*" further engraved with a calendar ring and central compass rose labeled with cardinal and intermediate points.

Thomas Heath, a London instrument maker, worked from 1720-1753 at the sign of Hercules and Globe in the Strand.

$2,000 - 3,000

8

KNORR, GEORG WOLFGANG. 1705-1761.

Les delices des yeux et de l'esprit, ou collection Generale des differentes especes de coquillages que la mer renferme. Nuremberg: 1760-1768.
3 volumes (of 6) in 1. 4to (250 x 203 mm). 3 hand-colored engraved extra title pages, 90 hand-colored engraved plates. 19th century green morocco gilt, marbled endpapers. Corners bumped, some fingermarks.

FIRST FRENCH EDITION of one of the most beautiful books dedicated to shells, illustrated with vividly hand-colored plates. Published in 6 parts between 1760 and 1773 (of which only the first 3 are present here), this work was among Knorr's contributions to making Nuremberg a center of publishing for works on natural history during the 18th century. Nissen ZBI 2235.

$2,000 - 3,000

9

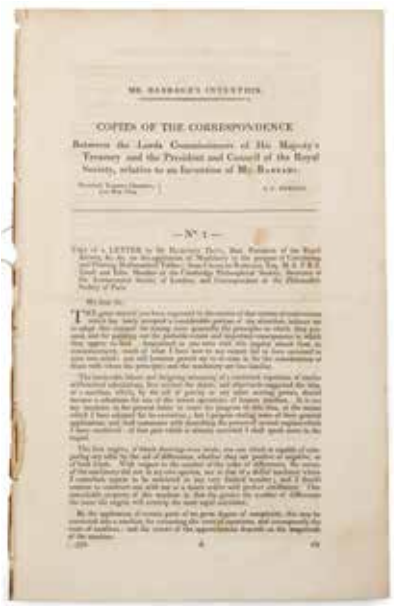
9

BABBAGE, CHARLES. 1791-1871.

Observations on the Analogy which Subsists between the Calculus of Functions and Other Branches of Analysis. London: W. Bulmer for Royal Society, 1817.
4to (292 x 235 mm). Contemporary (original?) string-bound blue wrappers, custom cloth slipcase and burgundy levant slipcase. Offprint from *Philosophical Transactions.*

PRESENTATION COPY, INSCRIBED BY THE AUTHOR, OF THIS RARE OFFPRINT. In full: *"Mr. Soret (?) with the Author's Compliments."* Babbage's major mathematical invention before he devoted his time to his differential and analytical engines. Years later, in his *Passages from the Life of a Philosopher,* Babbage said of his calculus of functions: "This was my earliest step, and is still one to which I would willingly recur if other demands on my time permitted. Many years ago I recorded, in a small MS. volume, the facts, and also extracts of letters from Herschel, Bromhead and Maule, in which I believe I have done justice to my friends if not to myself. It is very remarkable that the Analytical Engine adapts itself with singular facility to the development and numerical working out of this vast department of anaylsis." Hook & Norman *Origins of Cyberspace* 21 (journal edition).

$2,000 - 3,000


MR. BABBAGE'S INVENTION.

COPIES OF THE CORRESPONDENCE

—N° 1.—

10

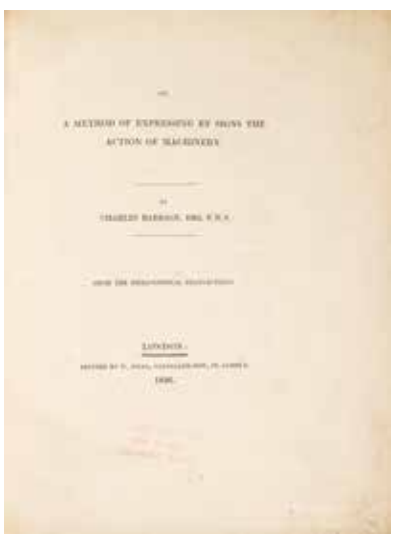
10

BABBAGE, CHARLES. 1791-1871.

Mr. Babbage's invention: Copies of the Correspondence between the Lord's Commissioners of his Majesty's treasury and the President and Council of the Royal Society, Relative to an Invention of Mr. Babbage. London: House of Commons, May 22, 1823.
Folio (330 x 207 mm). 8 pp including docketed title on verso of final leaf. Disbound, custom cloth folder and black levant-backed slipcase. Some light spots and faint dampstain to one corner.

FIRST OFFPRINT EDITION, paginated [1]-6. Reprints the letters that led to Babbage receiving funding to construct his Difference Engine. Hook & Norman *Origins of Cyberspace* 31.

$1,000 - 2,000


ON

A METHOD OF EXPRESSING BY SIGNS THE ACTION OF MACHINERY.

BY

CHARLES BABBAGE, ESQ. F.R.S. &c.

FROM THE PHILOSOPHICAL TRANSACTIONS

LONDON:

1826.

11

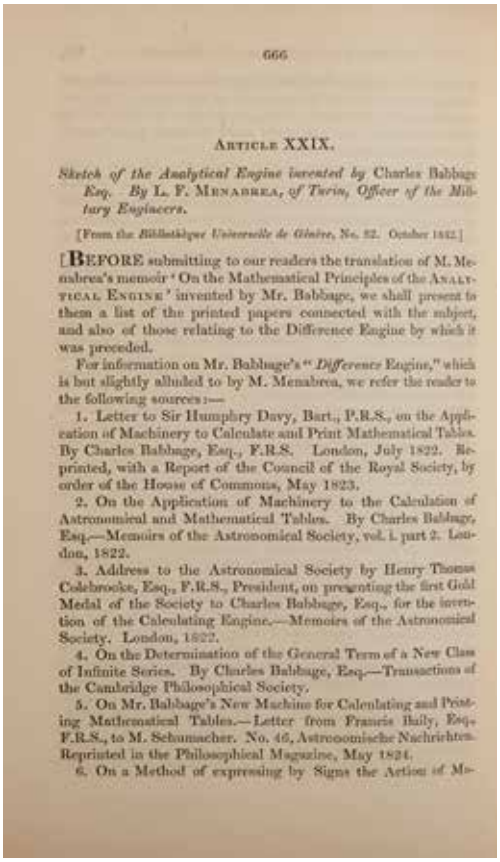
11

BABBAGE, CHARLES. 1791-1871.

On a Method of Expressing by Signs the Action of Machinery. London: W. Nicol, 1826.
4to (295 x 227 mm). 4 engraved plates, 1 of which is folding. Plain blue paper wrappers; custom blue levant-backed clamshell case. Folding plate linen-backed, light dampstain to lower fore-edge corner of mainly first 2 leaves, title-page toned, wrappers with some chips. *Provenance:* Detroit Public Library (stamp to title and final leaf).
WITH: *Philosophical Transactions of the Royal Society of London. For the Year MDCCCXXVI. Part III.* London: W. Nicol, 1826.
4to (292 x 230 mm). 19 engraved plates. Plain blue paper wrappers, custom cloth folder and blue morocco-backed slipcase. Uncut and unopened, wrappers with spine sunned and chipped, otherwise near fine.

FIRST EDITION OF BOTH THE RARE PRE-PUBLICATION OFFPRINT AND THE ORIGINAL JOURNAL APPEARANCE, the first publication in which he introduced his system of mechanical notation, an elaborate system of notational symbols used to identify parts of his machines and describe their interrelated motions. "The complicated relations which then arose amongst the various parts of the machinery would have baffled the most tenacious memory. I overcame that difficulty by improving and extending a language of signs, the Mechanical Notation, which in 1826 I had explained in a paper printed in the 'Phil. Trans.' By such means I succeeded in mastering trains of investigation so vast in extent that no length of years ever allotted to one individual could otherwise have enabled me to control. By the aid of the Mechanical Notation, the Analytical Engine became a reality: for it became susceptible of demonstration" (Babbage *Passages from the Life of a Philosopher* 114). Hook & Norman *Origins of Cyberspace* 37.

$1,500 - 2,500



666

ARTICLE XXIX.

Sketch of the Analytical Engine invented by Charles Babbage *Esq. By* L. F. MENABREA, *of Turin, Officer of the Military Engineers.*

[From the *Bibliothèque Universelle de Génève*, No. 82. October 1842.]

[BEFORE submitting to our readers the translation of M. Menabrea's memoir 'On the Mathematical Principles of the ANALYTICAL ENGINE' invented by Mr. Babbage, we shall present to them a list of the printed papers connected with the subject, and also of those relating to the Difference Engine by which it was preceded.

For information on Mr. Babbage's "*Difference* Engine," which is but slightly alluded to by M. Menabrea, we refer the reader to the following sources:—

1. Letter to Sir Humphry Davy, Bart., P.R.S., on the Application of Machinery to Calculate and Print Mathematical Tables. By Charles Babbage, Esq., F.R.S. London, July 1822. Reprinted, with a Report of the Council of the Royal Society, by order of the House of Commons, May 1823.

2. On the Application of Machinery to the Calculation of Astronomical and Mathematical Tables. By Charles Babbage, Esq.—Memoirs of the Astronomical Society, vol. i. part 2. London, 1822.

3. Address to the Astronomical Society by Henry Thomas Colebrooke, Esq., F.R.S., President, on presenting the first Gold Medal of the Society to Charles Babbage, Esq., for the invention of the Calculating Engine.—Memoirs of the Astronomical Society. London, 1822.

4. On the Determination of the General Term of a New Class of Infinite Series. By Charles Babbage, Esq.—Transactions of the Cambridge Philosophical Society.

5. On Mr. Babbage's New Machine for Calculating and Printing Mathematical Tables.—Letter from Francis Baily, Esq. F.R.S., to M. Schumacher. No. 46, Astronomische Nachrichten. Reprinted in the Philosophical Magazine, May 1824.

6. On a Method of expressing by Signs the Action of Ma-

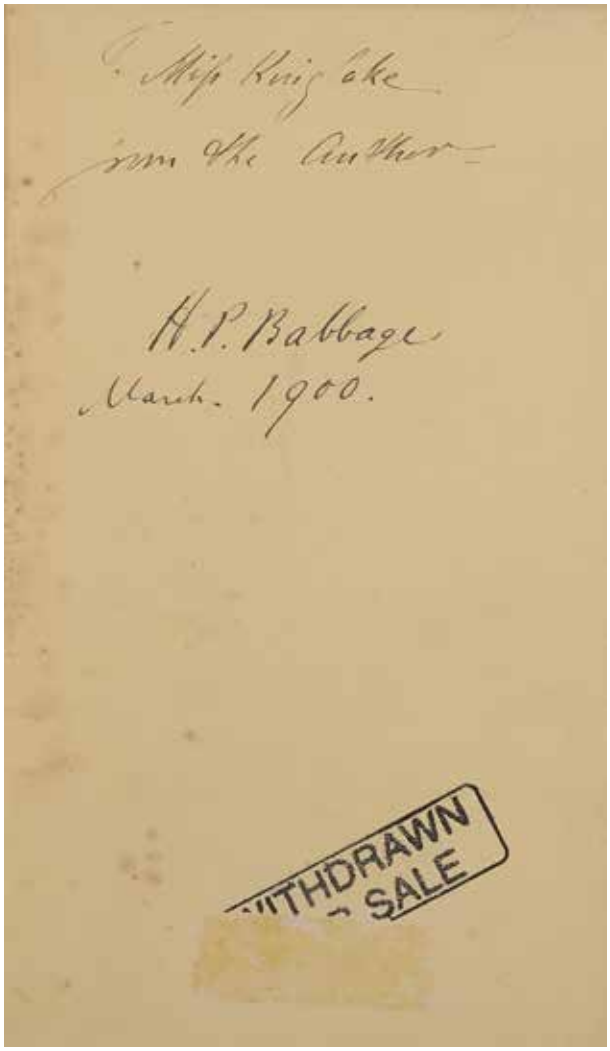
12

LOVELACE, AUGUSTA ADA, TRANSLATOR, & LUIGI FEDERICO MENABREA.

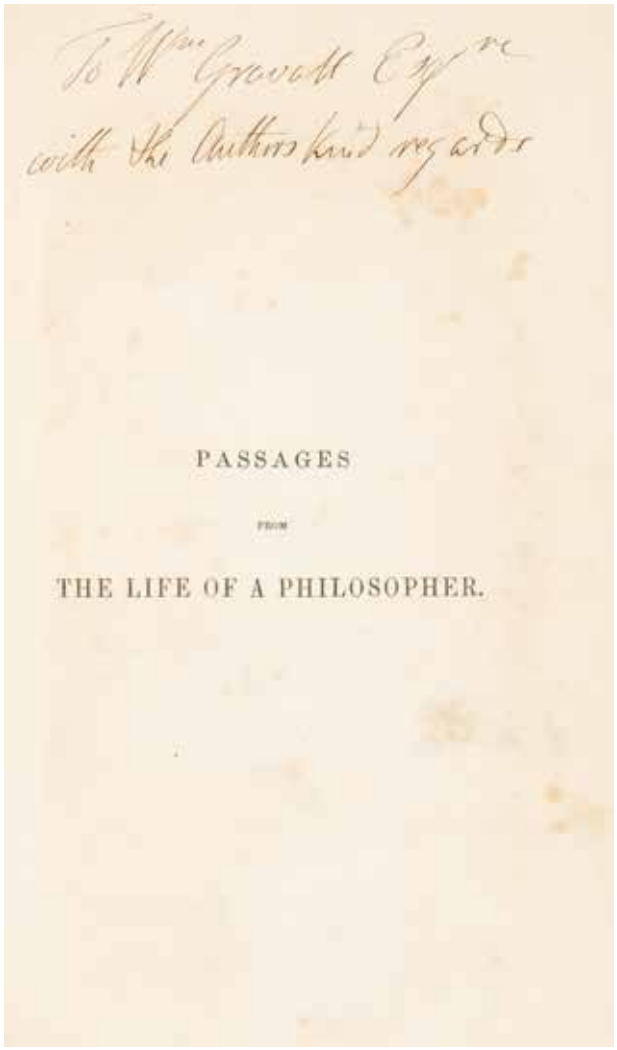
Sketch of the Analytical Engine Invented by Charles Babbage Esq. London: Richard and John E. Taylor, 1843.
8vo (216 x 135 mm). In: *Scientific Memoirs, Selected from the Transactions of Foreign Academies of Science and Learned Societies, and from Foreign Journals.* Volume III. Contemporary half calf over cloth, rebacked.
WITH: BABBAGE, CHARLES. 1791-1871. *Addition to the Memoir of M. Menabrea on the Analytical Engine.* [London: 1843.]
8vo (218 x 140 mm). Conjoined leaves, custom cloth case.

FIRST EDITION, JOURNAL ISSUE, OF THE MOST IMPORTANT EARLY PAPER IN THE HISTORY OF DIGITAL COMPUTING. "Countess Lovelace's notes ... stand as one of the first thorough studies of the nature and power of digital computers, written a hundred years before any working computer existed" (Ceruzzi, *The Reckoners* p 56).
"In the fall if 1841, after eight years of work, Babbage described his landmark Analytical Engine at a seminar in Turin. Although the Engine was never constructed, there is no doubt that in conception and design, it embodied all of the essential elements of what is recognized today as a general-purpose digital computer. L.F. Menabrea, an Italian military engineer who attended the seminar, reported the presentation the following year in an obscure Swiss serial, and Babbage urged Ada Lovelace to translate the report into English. In fact, Lovelace undertook a far larger task: adding to her translation a series of important explanatory 'Notes' substantially longer than Menabrea's article" (Grolier *Extraordinary Women* p 122).
The collaboration "between Byron's celebrity daughter and Babbage is one of the more unusual in the history of science ... Ada's translation of Menabrea's paper, with its lengthy explanatory notes, represents the most complete contemporary account in English of the intended design and operation of the first programmable digital computer. Babbage considered this paper a complete summary of the mathematical aspects of the machine, proving 'that the whole of the development and operations of Analysis are now capable of being executed by machinery.' As part of his contribution to the project, Babbage supplied Ada with algorithms for the solution of various problems. These he had had worked out years ago, except for one involving Bernouilli numbers, which was new. Ada illustrated these algorithms in her notes in the form of charts detailing the stepwise sequence of events as the hypothetical machine would progress through a string of instructions input from punched cards (Swade 2000, 165). These procedures, and the procedures published in the original edition of Menabrea's paper, were the first published examples of computer 'programs.'
"Ada also expanded upon Babbage's general views of the Analytical Engine as a symbol-manipulating device rather than a mere processor of numbers. She brought to the project a fine sense of style that resulted in the frequently quoted analogy, 'We may say most aptly that the Analytical Engine weaves algebraic patterns just as the Jacquard-loom weaves flowers and leaves.' She suggested that ... 'Many persons who are not conversant with mathematical studies, imagine that because the business of the engine is to give its results in numerical notation, the nature of its processes must consequently be arithmetical and numerical, rather than algebraical and analytical. This is an error. The engine can arrange and combine its numerical quantities exactly as if they were letters or any other general symbols; and in fact it might bring out its results in algebraical notation, were provisions made accordingly' (p 713)" (*OOC*).
Lady Lovelace signed these notes "A.A.L.," masking her class and gender in deference to the conventions of the time. Their authorship remained a mystery until Charles Weld credited them to "a lady of distinguished rank and talent" in his *History of the Royal Society*, 1848. He adds in a footnote: "I am authorized by Lord Lovelace to say, that the translator is Lady Lovelace." *Extraordinary Women in Science & Medicine* (Grolier Club 2013) 112; Hook & Norman *Origins of Cyberspace* 62; Van Sinderen 1980, 55.

$15,000 - 20,000



13



14

13

BABBAGE, CHARLES. 1791-1871.

The Exposition of 1851; or, Views of the Industry, the Science and the Government, of England. London: John Murray, 1851.
8vo (224 x 140 mm). Original green cloth stamped in gilt and blind, rebacked with pieces of the original spine. Light spots to endpapers, extremities lightly rubbed and sunned.
Provenance: Henry Prevost Babbage (Ownership signature and presentation label); Cheltenham Public Library (bookplates and "withdrawn" stamp).

PRESENTATION COPY, INSCRIBED BY BABBAGE; SECOND EDITION WITH APPENDIX ON "BABBAGE'S CALCULATING MACHINE." Inscription in full: *"To Miss Kniglake from the Author."* "Babbage had been proposed to head the Industrial Commission for the Great Exhibition of 1851, but was rejected because of his early radicalism and his conflicts with the government over the Difference Engine. Resentful over his treatment, Babbage decided to publish a book on the Exhibition to set before the public the ideas that he otherwise would have presented to the Exhibition's governing committees. Babbage's Difference Engine, although certainly one of the engineering marvels of the nineteenth century, was not included in the Exhibition" Hook & Norman *Origins of Cyberspace* 67.

$2,000 - 3,000

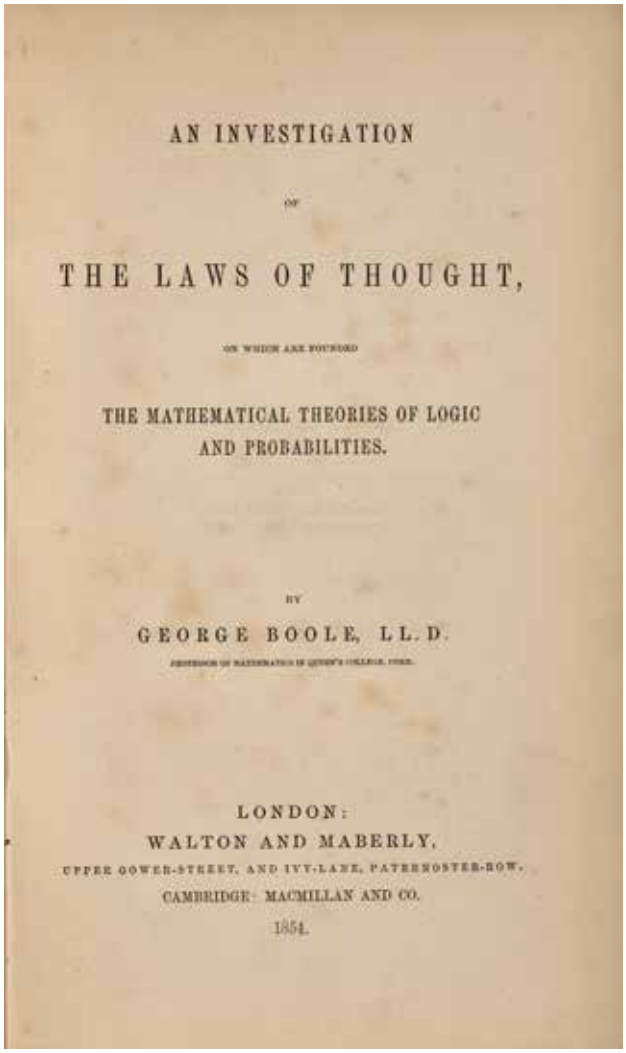
14

BABBAGE, CHARLES. 1791-1871.

Passages from the Life of a Philosopher. London: Longman, Green, Longman, Roberts & Green, 1864.
8vo (225 x 142 mm). Wood-engraved frontispiece, without publisher's catalog. Publisher's green cloth, spine gilt-lettered. Covers soiled, corners bumped, slight foxing to first few leaves.
Provenance: C.J. Peacock (bookplate); Sydney Melmore (bookplate).

FIRST EDITION, ASSOCIATION COPY, INSCRIBED BY BABBAGE ON THE HALF-TITLE: "To Wm. Gravatt, Esqre. with the author's kind regards." This was Babbage's final book, which details his two most important inventions, the difference engine and analytical engine. Gravatt and Babbage were advocates of the difference engine made by Swedish inventor Georg Scheutz, which Gravatt studied and demonstrated to British audiences, including at one point, Prince Albert. In Chapter 10 (pp 147-167), Babbage describes Gravatt's long efforts to have the difference engine exhibited at the International Exhibition of 1862, with the heading *"Its Exhibition in 1862 Entirely Due to Mr. Gravatt."* Hook *Origins of Cyberspace* 84; Hyman p 260; Van Sinderen 77.

$5,000 - 7,000


AN INVESTIGATION

OF

THE LAWS OF THOUGHT,

ON WHICH ARE FOUNDED

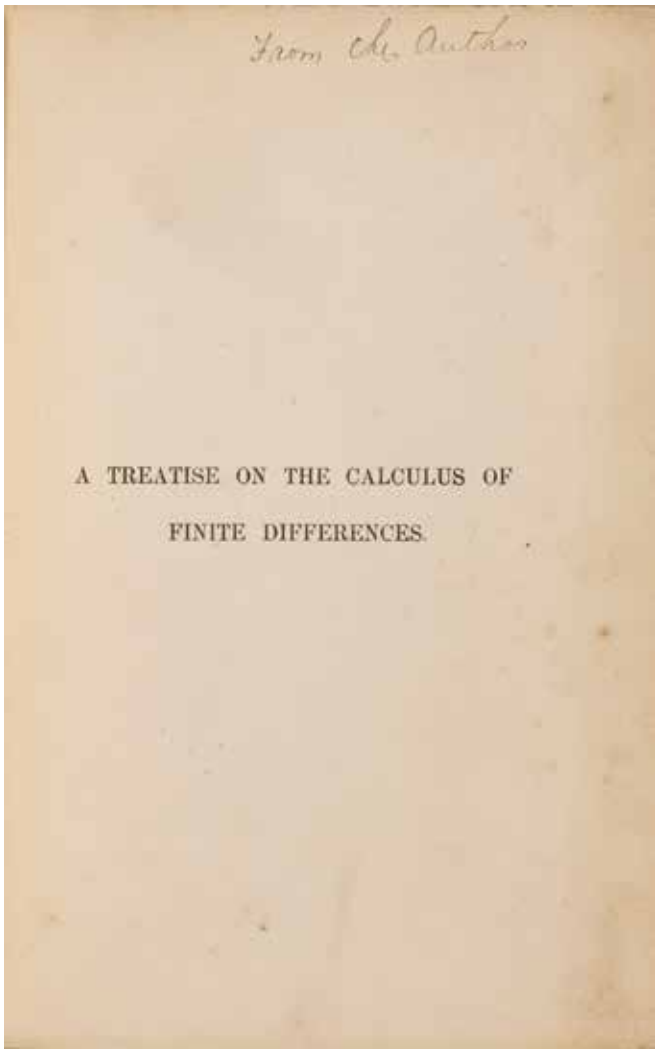
THE MATHEMATICAL THEORIES OF LOGIC AND PROBABILITIES.

BY

GEORGE BOOLE, LL.D.

LONDON:
WALTON AND MABERLY,
UPPER GOWER-STREET, AND IVY-LANE, PATERNOSTER-ROW.
CAMBRIDGE: MACMILLAN AND CO.
1854.

15


From the Author

A TREATISE ON THE CALCULUS OF FINITE DIFFERENCES.

16

15

BOOLE, GEORGE. 1815-1864.

An Investigation of The Laws of Thought on which are founded the Mathematical Theories of Logic and Probabilities. London/ Cambridge: Walton and Maberly/Macmillan & Co, 1854.
8vo. "Note" and Errata leaves bound after contents, L2 and Q8 cancelled as usual, 20 pp of (later) advertisements at rear. Publisher's cloth, rebacked with original spine laid-down, endpapers renewed.

FIRST EDITION OF AN IMPORTANT WORK IN THE HISTORY OF COMPUTING, the first full expression of a practical system of algebraic logic (i.e., "Boolean logic"), likely the second issue with errata bound after the last numbered prelim. "Boole invented the first practical system of logic in algebraic form, which enabled more advances in logic to be made in the decades of the nineteenth century than in the twenty-two centuries preceding" (Norman 266). In 1937, Claude Shannon would recognize that Boole's true/false values were analogous to the open and closed states of electric circuits, opening the door for binary computing. Norman 266. Hook & Norman *Origins of Cyberspace* 224.

$2,000 - 3,000

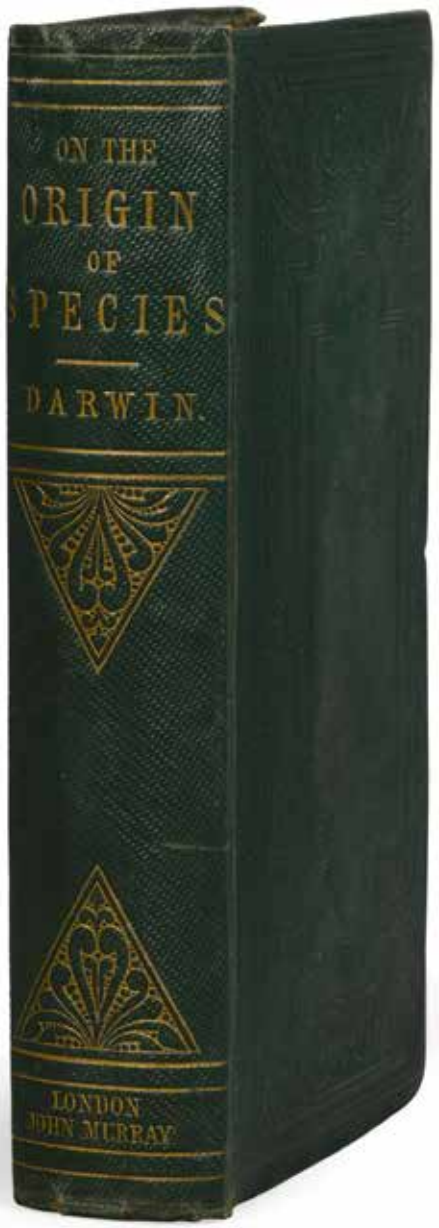
16

BOOLE, GEORGE. 1815-1864.

A Treatise on the Calculus of Finite Differences. Cambridge: Macmillan and Co, 1860.
8vo. 18 pp of advertisements, dated 1860. Publisher's cloth, wear to cloth at spine ends.
Provenance: Presentation copy, ink inscription "From the author" to half-title.
WITH: *A Treatise on Differential Equations.* Cambridge: Macmillan and Co, 1859. 8vo. 14 pp ads. Publisher's cloth, some staining.
Provenance: Alfred Barrett (inscription to title page, cancelled); C. Lloyd (ink signature).

FIRST EDITIONS, ONE A PRESENTATION COPY, of Boole's two major works on mathematics and differential equations. According to Stephen Wolfram, Boole's work was still an important reference when they compiled *Mathematica* in the 1990s, "notable especially for its nice examples of the factorization of linear difference operators" (*Idea Makers,* Wolfram, 2016). Important texts in the history of algorithmic analysis, these works embody and elaborate on Boole's most important discoveries in the field, they contain much original work and extend the content of Boole's earlier articles on the subject.

$1,000 - 1,500



17

DARWIN, CHARLES. 1809-1882.

On the Origin of Species By Means of Natural Selection. London: John Murray, 1859.

8vo (198 x 125 mm). Half-title verso with quotations from W. Whewell and Bacon only, folding lithographic diagram by William West after Darwin, 32-page publisher's catalogue at rear dated June 1859. Publisher's blind-stamped green cloth, spine gilt, brown coated endpapers, by Edmonds & Remnants with their ticket on the lower pastedown; modern cloth chemise and slipcase. Some spotting to title and early leaves, abrasion with small loss to front pastedown, rehinged.

Provenance: Thomas Cope, Huyton (bookplate); George Taylor (ownership signature); Alexander Glass (ownership signature, dated 4-15-62).

FIRST EDITION, OF "THE MOST IMPORTANT SINGLE WORK IN SCIENCE" (DIBNER). Darwin not only drew "an entirely new picture of the workings of organic nature; he revolutionized our methods of thinking and our outlook on the natural order of things. The recognition that constant change is the order of the universe had been finally established and a vast step forward in the uniformity of nature had been taken" (*PMM* 344b). Thomas Cope (1827-1884) was a prosperous manufacturer of cigars and tobacco products in Liverpool in the mid-19th century. He was the first person in England to hire women to make cigars, and was the speaker of the Liverpool Parliamentary debating society. Dibner *Heralds* 199; Freeman 373 (binding variant b, advertisements variant 2, no priority); Garrison-Morton 220; Grolier *Science* 23b; Norman 593; PMM 344b;

$80,000 - 120,000

ON

THE ORIGIN OF SPECIES

BY MEANS OF NATURAL SELECTION,

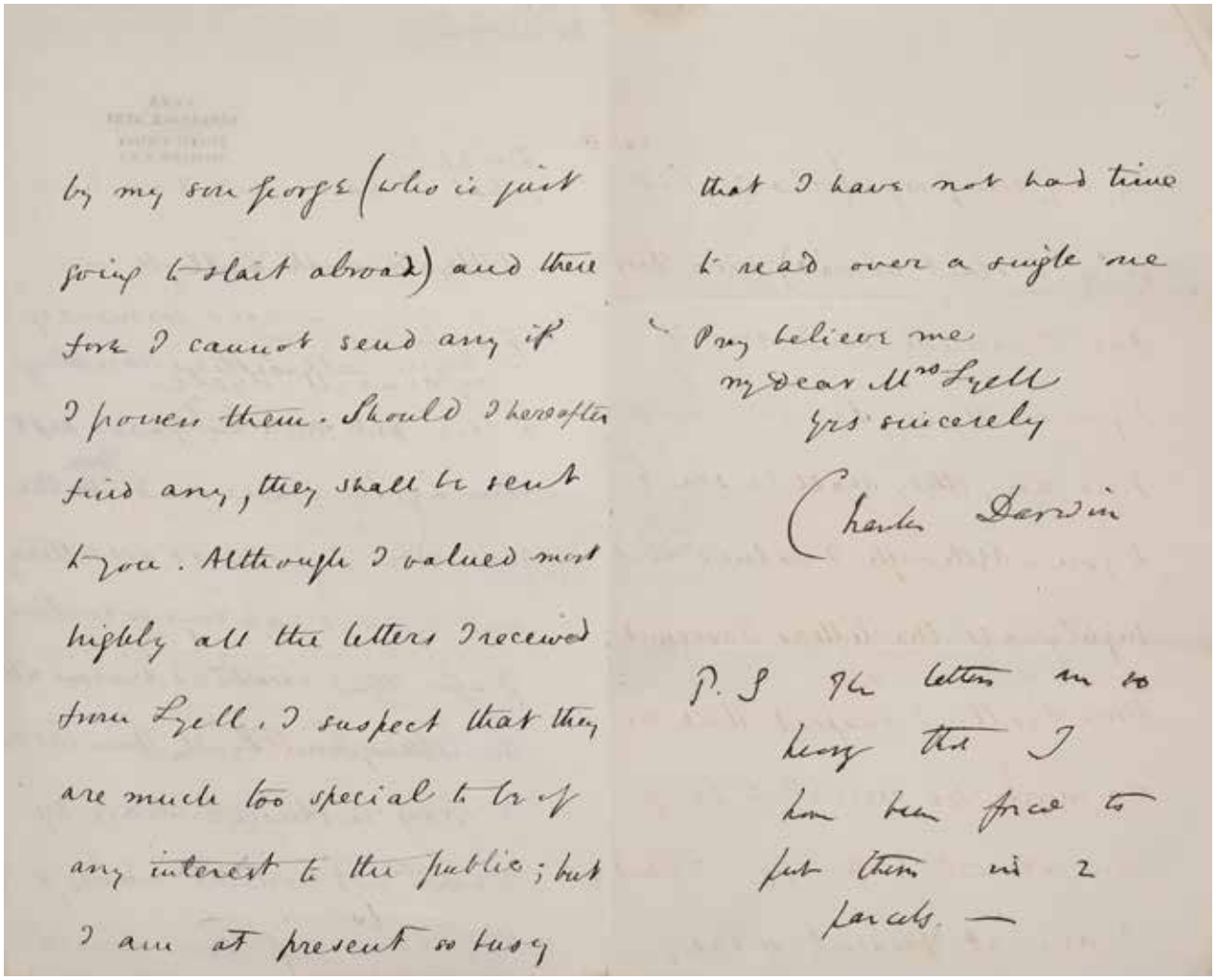
OR THE

PRESERVATION OF FAVOURED RACES IN THE STRUGGLE FOR LIFE.

By CHARLES DARWIN, M.A.,

FELLOW OF THE ROYAL, GEOLOGICAL, LINNÆAN, ETC., SOCIETIES;
AUTHOR OF 'JOURNAL OF RESEARCHES DURING H. M. S. BEAGLE'S VOYAGE ROUND THE WORLD.'

LONDON:
JOHN MURRAY, ALBEMARLE STREET.
1859.


by my son George (who is just going to start abroad) and therefore I cannot send any if I possess them. Should I hereafter find any, they shall be sent to you. Although I valued most highly all the letters I received from Lyell, I suspect that they are much too special to be of any interest to the public; but I am at present so busy that I have not had time to read over a single one

Pray believe me
my dear Mrs Lyell
yrs sincerely
Charles Darwin

P.S. The letters are so heavy that I have been forced to put them in 2 parcels.

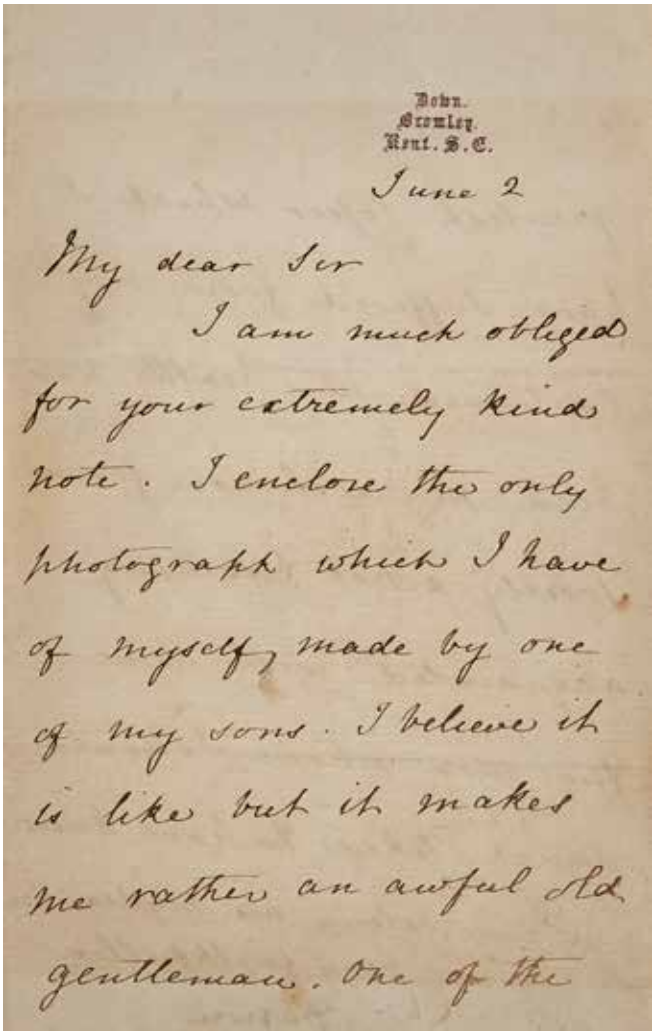
"Although I valued most highly all the letters I received from Lyell, I suspect that they are much too special to be of any interest to the public."

18

DARWIN, CHARLES. 1809-1882.
Letter Signed ("Charles Darwin"), with autograph postscript and emendations, to Mrs [Katherine Murray] Lyell, discussing 3 pp, on Down letterhead, December 26, [1875], folds, light soiling to margins.

A WONDERFUL LETTER DISCUSSING HIS CORRESPONDENCE WITH HIS FRIEND AND MENTOR CHARLES LYELL. Written to Katherine Murray Lyell, he begins, *"I used to formerly burn all letters excepting a few... From the year 1862, I preserved all letters, and wish I had done so earlier."* To assist with her projected biography of Lyell published in 1881 as *Life, Letters, and Journals of Sir Charles Lyell,* Darwin writes to her explaining their correspondence, and in an autograph post-script notes, *"The letters are so heavy that I have been forced to put them in 2 parcels."* Darwin, the great scientist, proves himself to be not much of a prognosticator when it comes to himself, surmising the letters *"are much too special to be of much interest to the public."*

$8,000 - 12,000


Down.
Bromley.
Kent. S.E.

June 2

My dear Sir

I am much obliged for your extremely kind note. I enclose the only photograph which I have of myself, made by one of my sons. I believe it is like but it makes me rather an awful old gentleman. One of the

19

20

19

DARWIN, CHARLES. 1809-1882.

Letter Signed ("Ch. Darwin"), with Autograph Postcript, 3 pp, 8vo (bifolium) on Down letterhead, Bromley, Kent, June 2, [late 1870s], first page toned.

DARWIN COMMENTS ON HIS PHOTOGRAPHIC PORTRAIT BY HIS SON AND ON HIS SECLUSION FROM SOCIETY. Darwin replies to an admirer referring to a Leonard Darwin photograph enclosed (not present here), his failing health and subsequent seclusion from society. He pens a postscript mentioning his collection of photographs. In part: *"I enclose the only photograph which I have of myself made by one of my sons. I believe it is like but it makes me rather an awful old gentleman."*

$1,500 - 2,500

20

THOMAS E. DEXTER'S PORTABLE MUSEUM OF NATURAL SUBSTANCES.

Mahogany cabinet, 465 x 360 x 380 mm, with recessed brass carrying handle and hinged doors at the front opening to six drawers of specimens of minerals, metals, animal specimens and man-made articles, two labels on the inner doors printed *"Patronised by Her Majesty. Portable Museum of Natural Substances Raw and Manufactured from the Mineral, Vegetable and Animal Kingdoms,"* and *"Illustrative of the Imports, Exports, Productions & Manufacturers of Great Britain and her Colonies compiled by Thomas E. Dexter, Royal Military Asylum, Chelsea."* Together with an accompanying book by Dexter: *Animal and Vegetable Substances Used in the Arts and Manufactures....* London: A.N. Myers, [1860].

An amazingly varied assemblage of product specimens from the height of the British Empire. Thomas Dexter describes the cabinet in his preference to *Animal and Vegetable Substances:* "The collection will be found invaluable in pointing out the extent and variety of our import and export trade, the source of our commercial greatness, and useful in every branch of that sound and practical education which has for its object the preparation of the Pupil to enact his part in the busy scene of life" (p iv).

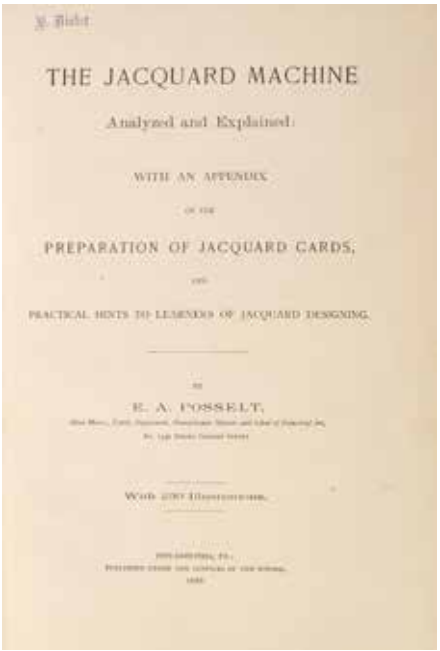
$2,000 - 3,000

21

21
JEVONS, WILLIAM STANLEY. 1835-1882.
On the Mechanical Performance of Logical Interference. London: for the Royal Society by Taylor and Francis, 1870.
4to (300 x 232 mm). Original printed wrappers, custom blue levant clamshell case. Creases to spine, excellent overall. In: *Philosophical Transactions of the Royal Society of London.* Volume 160, Part II.

FIRST EDITION of Jevons work describing his "logic piano," a cross between a logical abacus and a piano. It was the first machine able to solve problems at superhuman speed and earned him much acclaim after its exhibition at the Royal Society. His device is currently part of the Oxford University Museum of the History of Science. Hook & Norman *Origins of Cyberspace* 330.

$800 - 1,200


THE JACQUARD MACHINE

Analyzed and Explained:

WITH AN APPENDIX

PREPARATION OF JACQUARD CARDS,

PRACTICAL HINTS TO LEARNERS OF JACQUARD DESIGNING.

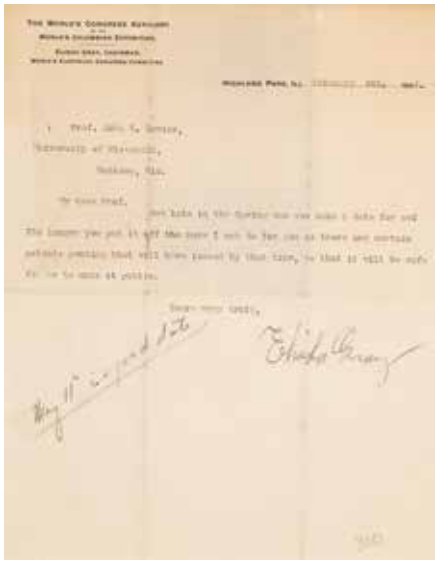
E. A. POSSELT,

22

22
POSSELT, EMMANUEL ANTHONY. 1858-1921.
The Jacquard Machine Analyzed and Explained: With an Appendix on the Preparation of Jacquard Cards, and Practical Hints to Learners of Jacquard Designing. Philadelphia: Pennsylvania Museum and School of Industrial Art, 1888.
4to (272 x 195 mm). Illustrated throughout, folding plate. Original pebbled brown cloth stamp in gilt. Toned, front hinge cracked after f.f.e.p., binding with extremities and head and tail of spine rubbed. *Provenance:* The Textile Institute, Manchester (stamp to f.f.e.p.); H. Nisbet (ownership signature to front pastedown, small stamp to title).

RARE FIRST EDITION OF THE MOST DETAILED BOOK ON THE JACQUARD LOOM. "This extensively illustrated work is the most detailed published account of the design and operation of the Jacquard loom, on which Jacquard himself appears to have never published any details" (OOC). The Jacquard loom was the first machine to use punched cards to control a sequence of operations, an important advance towards the development of computer programming. Babbage planned to use punched cards to store programs in his Analytical engine. Hook & Norman *Origins of Cyberspace* 355.

$3,000 - 5,000



23

23
GRAY, ELISHA. 1835-1901.
Typed Letter Signed ("Elisha Gray"), 1 p, 4to, Highland Park, IL, February 6, 1894, to Professor John E. Davies, University of Wisconsin, asking to set a date for a meeting, fold creases, light soiling. Matted.

THE "OTHER" INVENTOR OF THE TELEPHONE, Gray submitted an initial patent caveat for a telephone device on the same day that Alexander Graham Bell submitted his. Bell lobbied strenuously to win the patent dispute and was the first to produce a working model. In the end, the patent was awarded to Bell. Here Gray writes in his capacity as Chairman of the World's Electrical Congress Committee to to fellow committee member Davies, looking for a date for a meeting or presentation. He is understandably vague, saying "*... there are certain patents pending that will have issued by that time, so that it will be safe for me to make it public.*" This was some 18 years after the dispute with Bell, and Gray obviously had learned to be protective of his ideas.

$150 - 250

24

RÖNTGEN, WILHELM KONRAD. 1845-1923.

"Über eine neue Art von Strahlen. 5. Auflage." WITH: "Eine neue Art von Strahlen. II. Mittheilung." Offprints from: *Sitzungsberichten der Würzburger Physik-medic. Gesellschaft*, no 9, 132-41 & nos 1-2, 11-19. Würzburg: Stahl, 1896. Two parts bound together. 8vo. Half cloth and marbled boards, with original wrappers bound in. Darkening and minor staining to wrappers, commemorative postage stamp affixed to front wrapper of first part. With tipped-in pamphlet "Semi-Centennial of the First Written Report on the Discovery of the X-Ray by William Conrad Röntgen, December 28th, 1945." [New York]: Henry Schuman, 1945.
Provenance: Dr. Arno B. Luckhardt (bookplate).

RÖNTGEN'S FIRST COMMUNICATION OF THE DISCOVERY OF THE X-RAY. Part I is the 5th printing, bound with the first and only separate edition of his follow-up communication. The most important contribution to medical diagnosis in a century, and the key to modern physics, Röntgen's paper was in immediate demand; there were five separate printings in six issues in the space of two months. The follow up announcement, published a year later, introduces a scale for measuring X-ray intensity and an improved tube. Cushing R 193-94; Dibner 162; [Le Fanu] *Notable Medical Books* 239; Garrison-Morton 2683; Gernsheim 517-18; Horblit 90; Klickstein *Roentgen* pp 24-30 & entries III.2 & .10; Osler 1700; PMM 380; Waller 8078 & 8083.

$800 - 1,200


EINE NEUE ART
VON
STRAHLEN.
Von
Dr. Wilhelm Konrad Röntgen
WÜRZBURG.

24

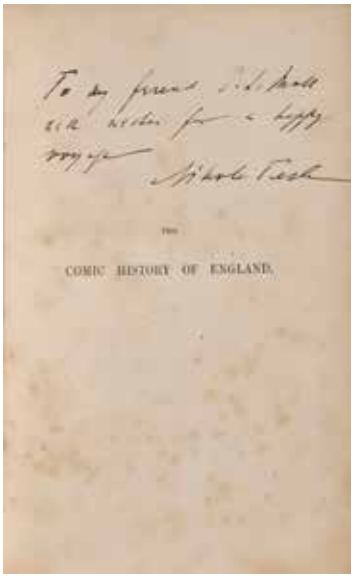
25

TESLA, NIKOLA. 1856-1943.

Autograph Presentation Signed ("Nikola Tesla") to *"To my friend J.L. Mott, With wishes for a happy voyage,"* on the half-title page of A'Beckett, *The Comic History of England,* London: Punch Office, 1864, Illustrations by John Leach, contemporary half-morocco over marbled paper boards, some wear, front hinge tender.

COPY INSCRIBED BY NICOLA TESLA to J.L. Mott of J.L. Mott Iron Works, originally of New York but who moved to Trenton in 1902. Interestingly, in 1917, artist Marcel Duchamp found an old urinal in a J.L. Mott showroom in New York, and signed it "R. Mutt" as a play on the name. A wonderful Tesla association in a rare format.

$5,000 - 8,000


COMIC HISTORY OF ENGLAND.

25

26

LUDGATE, PERCY. 1883-1922.

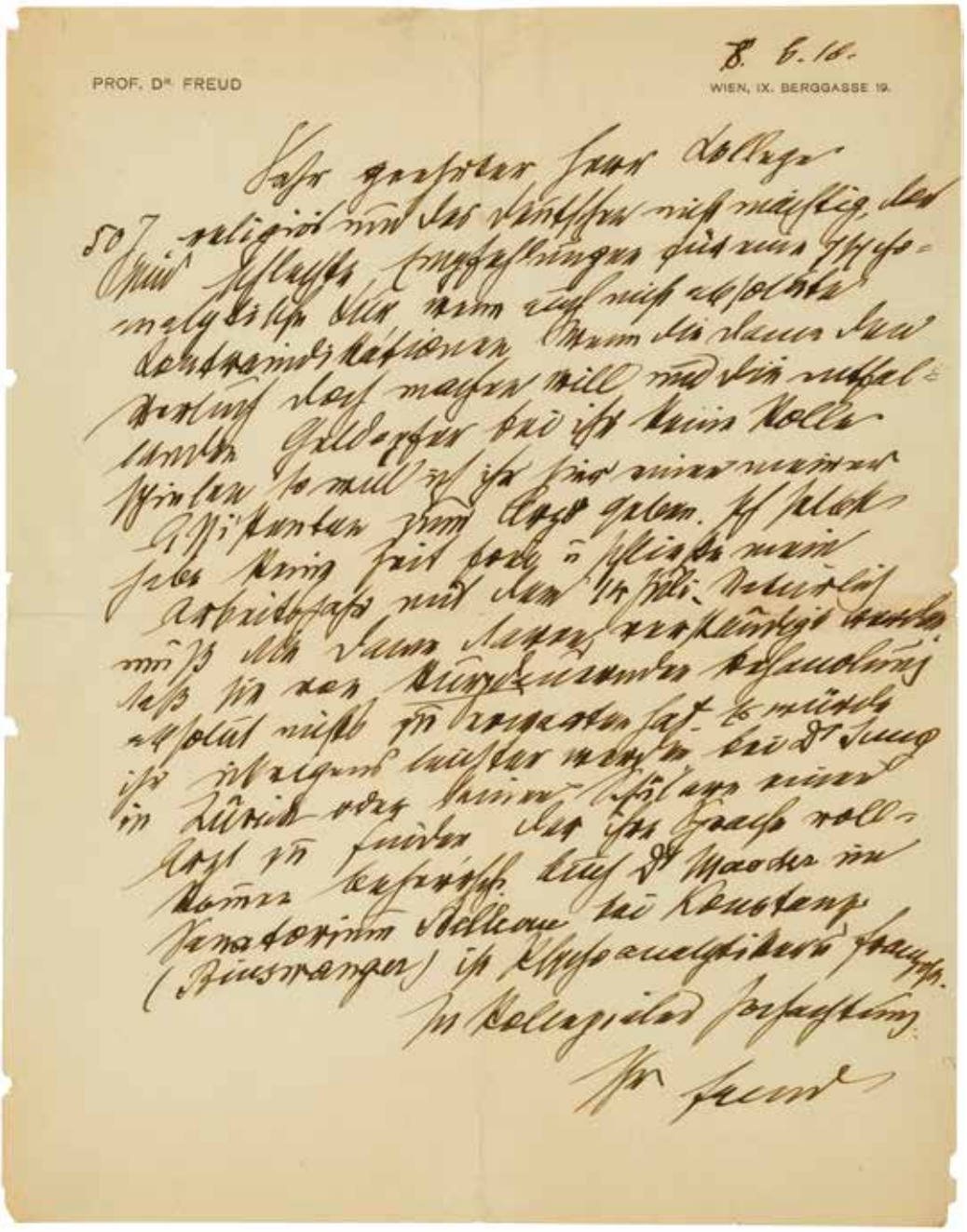
On a Proposed Analytical Machine. Dublin: The Royal Dublin Society, 1909.
8vo (280 x 184 mm). Original printed wrappers, custom folder. Unopened, front wrapper with tiny chips, spots and toning to extremities.
Offprint from: *The Scientific Proceedings of the Royal Dublin Society.* Volume XII (N.S.), Number 9.

FIRST APPEARANCE, offprint issue, of Ludgate's calculating machine, developed independently of Babbage's design and today considered closer to the modern computer than Babbage's. Portable and based on multiplication rather than addition, Ludgate's engine could also be programmed and was "the result of about six years' work, undertaken ... with the object of designing machinery capable of performing calculations, however, intricate or laborious, without the immediate guidance of the human intellect" (p 77). The machine was never built, and sadly, Ludgate's original drawings of it have been lost. Rarely encountered as a separate offprint. Randell *Origins of Digital Computers* (3d ed), pp 73-87 (reprinting this paper), 489. See Hook & Norman *Origins of Cyberspace* p 72.

$800 - 1,200


SCIENTIFIC PROCEEDINGS
OF THE
ROYAL DUBLIN SOCIETY

26



27

FREUD, SIGMUND. 1856-1939.

Autograph Letter Signed ("Freud") to a colleague referring his patient to Dr [Carl] Jung, 1 p, in German, on "Wien, IX, Bergstrasse 10" letterhead, June 8, 1910, skillful repairs to the folds, small chips to edges.

SIGMUND FREUD REFERS A PATIENT TO JUNG. Writing to a colleague, "*50 years old, religious, not fluent in German – those are bad recommendations for a psychoanalytic treatment, if not even absolute contra-indications.*" He continues to suggest contacting "*Dr Jung in Zurich, or one of his students who speaks her language fluently.*" Freud letters mentioning Jung are rare in the market.

$8,000 - 12,000

28

FREUD, SIGMUND. 1856-1939.

Original charcoal portrait of Freud by Henry Major (1889-1948), signed by Sigmund Freud ("Sigm Freud") and by Major ("Major"), 260 x 214 mm, [c.1929?] repair to left hand margin.

RARE, SIGNED HAND-DRAWN PORTRAIT OF FREUD. Henry Major was a caricaturist and portraitist who began his career in Vienna and London before moving to the United States. Illustration portraits signed by Freud are rare. See Norman F172 (for similar).

$6,000 - 9,000

28

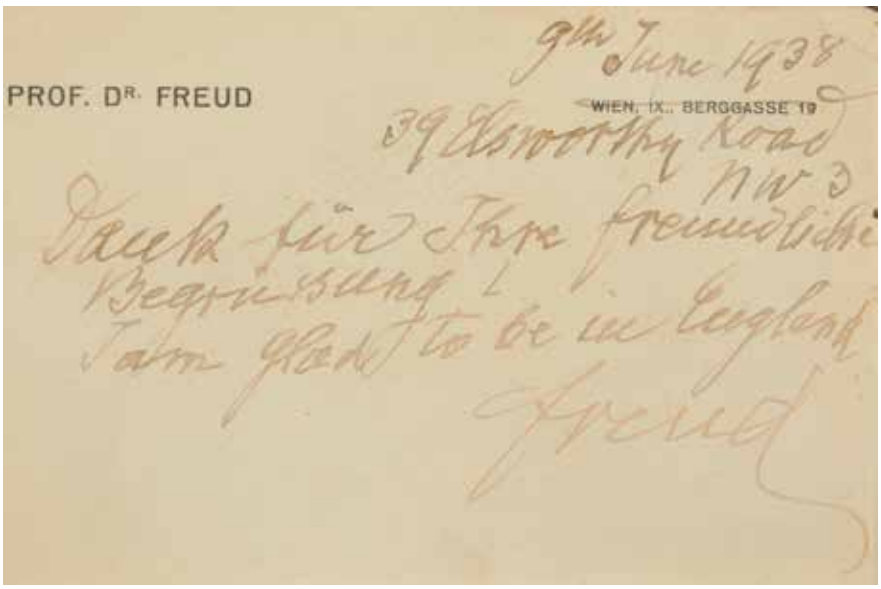
29

FREUD, SIGMUND. 1856-1939.

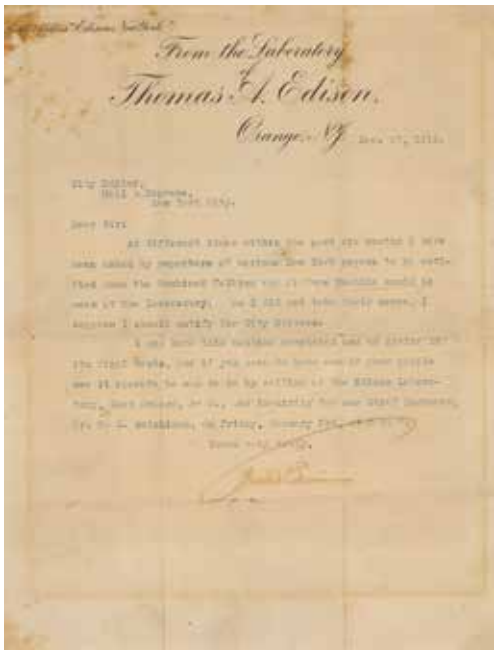
Autograph Note Signed ("Freud"), to Pierre Gildesgame, in response to a letter welcoming him to England, 1 p, approximately 84 x 125 mm, London, June 9, 1938, on a pre-printed notecard originally bearing his Vienna address, slightly faded, ink stains to edges at upper right. Matted and framed, with typed note from Gildesgame taped to reverse.

Shortly after Freud's arrival in England, Pierre Gildesgame, the Chairman of Maccabi Association London, wrote a letter welcoming the famous doctor to England. Freud responds here in German and English: "*Dank für Ihre freundliche Begrüßung ... I am glad to be in England*." The card is printed with his Vienna address, at Berggasse 19, but he has lined it out and replaced it with his first temporary address in London, 39 Elsworthy Road, in Hampstead. The date of the note is just three days after Freud's arrival in London, having left Vienna by the Orient express on June 4th, stayed one night in Paris at the home of Princess Marie Bonaparte, who helped to fund his relocation, and then continued on to London overnight. Freud was already suffering from cancer of the jaw at the time, and stayed in London until his death in September, 1939.

$1,000 - 1,500



29



30

31

32

30

EDISON, THOMAS ALVA. 1847-1931.

Typed Letter Signed ("Thos A Edison"), 1 p, 4to, Orange, NJ, December 27, 1912, to "City Editor," *Mail & Express*, inviting the newspaper to send someone to a demonstration of the "Combined Talking and Picture Machine," on Edison's letterhead, fold creases, adhesive residue on verso, browning to corners.

Edison writes to an anonymous editor, saying that he had been "*asked by reporters of various New York papers*" to let them know when the machine could be demonstrated, but that he "*did not take their names....*" As early as 1894, Edison collaborated with W.K.L. Dickson on the Kinetophone, which combined a phonograph with his Kinetoscope viewer. It wasn't until 1913 that a new version of the Kinetophone was introduced to the public, this time projecting the image onto a screen instead of having to be viewed through eye holes in the machine. He produced 19 sound motion pictures, but problems with the synchronization of sound and images during projection prevented the technology from catching on, and it was abandoned in 1915.

$1,500 - 2,000

31

EDISON, THOMAS ALVA. 1847-1931.

Check Signed ("Thos. A. Edison"), as President of the Edison Botanic Research Corporation, made out to W.H. Hand in the amount of $80.00, drawn on the Savings Investment & Trust Company of East Orange, NJ, date in blue ink stamp June 19, 1929. Countersigned by J. Miller, Treasurer. Perforated "Paid" stamp, ink processing stamps on verso, with some ink bleeding through to recto.

Edison Botanic Research Company was founded in 1927 as a collaboration between Edison, Henry Ford, and Harvey Firestone, to find a domestic source for organic rubber. The three friends each contributed $25,000 to build a botanical center in Fort Myers, Florida, to search for a plant that could produce natural latex in the case of a disruption of the supply from tropical regions, which had been a concern during World War I. Although Edison discovered that goldenrod was a viable alternative, the research was abandoned in favor of synthetic rubber by the outbreak of World War II;
WITH: Gray, Elisha. A T.L.S., 1p, 4to , Highland Park, IL, February 6th 1894, to a Professor Davies asking to set up a date for a meeting, matted.

$400 - 600

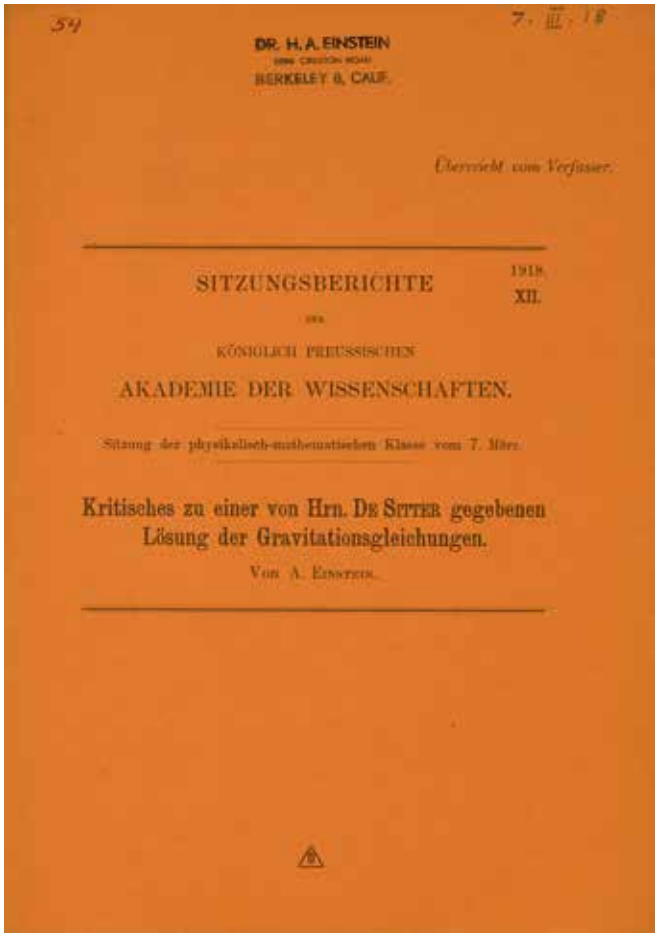
32

MARCONI, GUGLIELMO. 1874-1937.

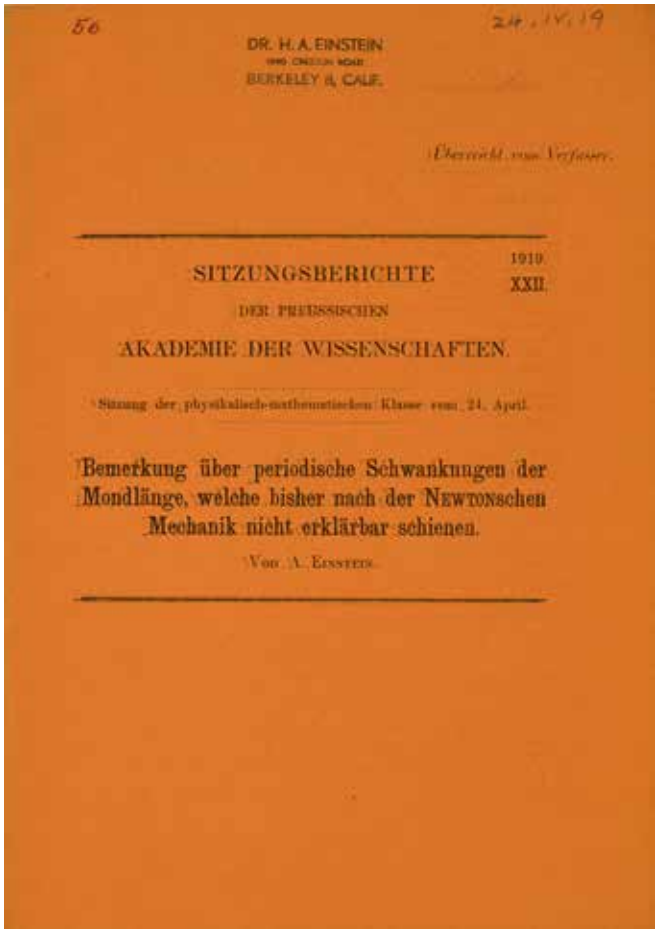
Photograph Signed ("Guglielmo Marconi"), 145 x 97 mm gelatin silver print laid down to a quarto sheet, London, July 2, 1926, inscribed on lower margin of mount "*Al Maestro Vincenzo Bellezza — Ammirando la sua Maestria — nel saper mantenere sempre alto all'estero il gran nome dell'Arte Musicale Italiana*," with photographer's imprint (Foulsham & Banfield, Ltd, London), slightly soiled, matted, under protective rigid plastic.

Vincenzo Bellezza (1888-1964) was an Italian conductor who performed through Europe, South America, and at New York's Metropolitan Opera from 1926 to 1935. The inscription praises Bellezza for upholding the reputation of Italian music in the world at large, a reference to the beginning of his tenure at the Met.

$1,000 - 1,500


54
7. III. 18
DR. H. A. EINSTEIN
BERKELEY 8, CALIF.
Überreicht vom Verfasser.
SITZUNGSBERICHTE
1918.
XII.
DER
KÖNIGLICH PREUSSISCHEN
AKADEMIE DER WISSENSCHAFTEN.
Sitzung der physikalisch-mathematischen Klasse vom 7. März.
Kritisches zu einer von Hrn. De Sitter gegebenen Lösung der Gravitationsgleichungen.
Von A. Einstein.

33


56
24. IV. 19
DR. H. A. EINSTEIN
BERKELEY 8, CALIF.
Überreicht vom Verfasser.
SITZUNGSBERICHTE
1919.
XXII.
DER PREUSSISCHEN
AKADEMIE DER WISSENSCHAFTEN.
Sitzung der physikalisch-mathematischen Klasse vom 24. April.
Bemerkung über periodische Schwankungen der Mondlänge, welche bisher nach der Newtonschen Mechanik nicht erklärbar schienen.
Von A. Einstein.

34

33
EINSTEIN, ALBERT. 1879-1955.
Kritisches zu einer von Hrn. De Sitter gegebenen Losung der Gravitationsgleichungen. [Offprint from]: Sitzungsberichte der Koniglich Preussischen Akademie der Wissenschaften, XII. Berlin, 1918. Berlin: Reichsdruckerei, 1918.
8vo (257 x 179 mm). Publisher's printed orange wrappers.
Provenance: H.A. Einstein (1904-1976, his stamp to upper wrapper, "54" in red ink and "7.III.18" in pencil to upper margin).

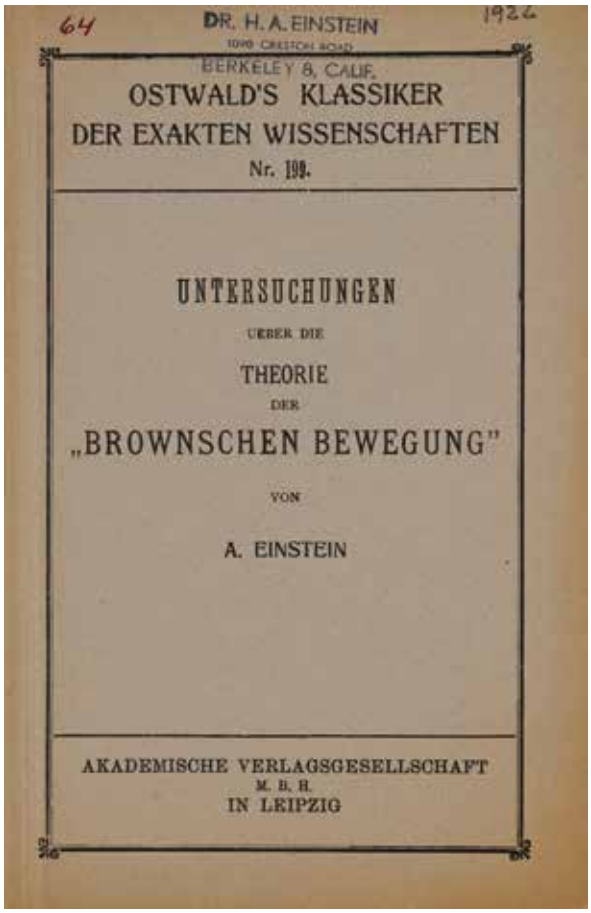
EINSTEIN DEFINES THE NATURE OF A SPACE-TIME SINGULARITY, AUTHOR'S PRESENTATION OFFPRINT ISSUE, HANS ALBERT EINSTEIN'S COPY. In this early paper on the cosmological implications of General Relativity, Einstein criticizes De Sitter's hypothesis about the structure of the cosmic gravitational field and provides the first proper definition of a space-time singularity. Despite Einstein's critique, the De Sitter model was the dominant cosmological model until the 1930s—at which time Einstein and de Sitter together proposed a "just right" cosmological model. The great cosmological debate between Einstein and De Sitter marks the beginning of the modern scientific understanding of the origins of the universe. Einstein's Author Presentation Offprints of this period (printed "Uberreicht vom Verfasser") are very rare and represent the true meaning of offprint as a separate printing of an article given to the author for collegial distribution, as opposed to the more common trade "offprints" of the works.

$5,000 - 7,000

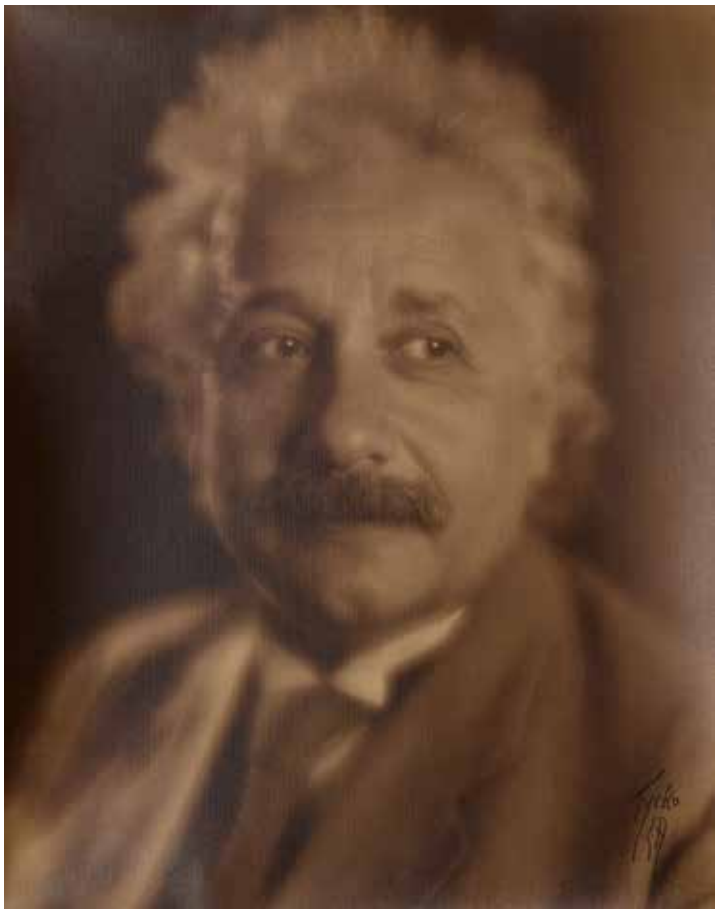
34
EINSTEIN, ALBERT. 1879-1955.
Bemerkung uber periodische Schwankungen der Mondlange, welche bisher nach der Newtonsche Mechanik nicht erklarbar schienen. [Offprint from:] Sitzungsberichte der Koniglich Preussischen Akademie der Wissenschaften XXI. XXII. XXIII, 1919. Berlin: Reichsdruckerei, 1919.
8vo (250 x 178 mm). Publisher's printed wrappers.
Provenance: H.A. Einstein (1904-1976, his stamp to upper wrapper, "56" in red ink and "24.IV.19" in pencil to upper margin).

EINSTEIN EXPLAINS THE FLUCTUATIONS IN THE MOON'S LONGITUDE. AUTHOR'S PRESENTATION OFFPRINT ISSUE, HANS ALBERT EINSTEIN'S COPY. In a year otherwise consumed by relativity, Einstein here explains the seeming wandering of the moon in the sky as due to a (periodic) change in the earth's own rotation. In Einstein's view the tides determined the earth's moment of inertia, and consequently the rate and angle of the earth's rotation. Using this model, he attempted to compute the effect of the tides on the earth's rotation—and thus the fluctuations in the moon's longitude—but the calculations derived were smaller than the perceived fluctuations in the moon's longitude. The cause of the error in his theoretical results was that Einstein had not used the proper astronomical method of time determination—an error which Einstein admitted in a later addendum to the article. A very unusual "fluctuation" for Einstein. Einstein's presentation offprints of this period (printed "Uberreicht vom Verfasser") are very rare.

$3,000 - 5,000


64
DR. H. A. EINSTEIN
1922
1000 GRESTON ROAD
BERKELEY 8, CALIF.
OSTWALD'S KLASSIKER
DER EXAKTEN WISSENSCHAFTEN
Nr. 199.
UNTERSUCHUNGEN
UEBER DIE
THEORIE
DER
„BROWNSCHEN BEWEGUNG"
VON
A. EINSTEIN
AKADEMISCHE VERLAGSGESELLSCHAFT
M. B. H.
IN LEIPZIG

35



36

35
EINSTEIN, ALBERT. 1879-1955.
Untersuchungen ueber die Theorie der "Brownschen Bewegung." Leipzig, Akademische Verlagsgesellschaft. 1922. 12mo (192 x 123 mm). Publisher's gray printed wrappers, small chip to lower corner rear wrapper.
Provenance: H.A. Einstein (1904-1976, his stamp to upper wrapper, "56" in red ink and "24.IV.19" in pencil to upper margin).

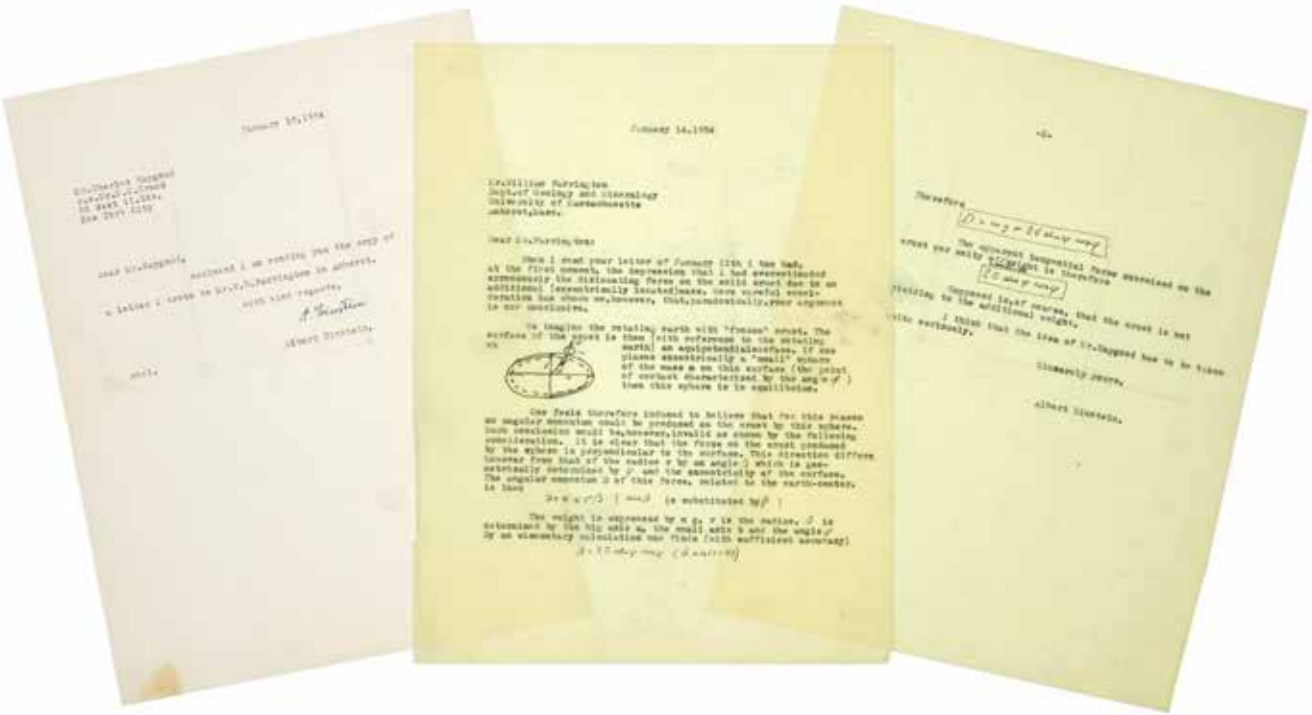
HANS ALBERT EINSTEIN'S COPY OF THE FIRST BOOK EDITION of Einstein's landmark papers on Brownian motion, compiling 5 important works originally published 1905-1908. Weil 129.

$1,500 - 2,500

36
[EINSTEIN, ALBERT. 1879-1955]; AND ELSA EINSTEIN.
1. TYCKO, AARON, photographer. 2 gelatin silver print portraits of Albert Einstein, 8 x 10 inches, signed ("Tycko / LA") at lower right corner. 2. ___. 2 gelatin silver print portraits of Albert Einstein by Tycko, 8 x 10 inches, unsigned.
3. ___. 3 gelatin silver portraits of Elsa Einstein, 8 x 10 inches, 2 of which are housed in Ambassador Hotel folder, all signed by the photographer at the lower left and lower right, both copies in folders inscribed by Elsa Einstein to Mr. and Mrs. Tycko, 1932 and 1933. WITH: 2 Autograph Letters Signed and 5 Typed Letters Signed ("Elsa Einstein" and "Elsa"), 7 pp, 4to and 8vo, Pasadena and Princeton, NJ, January 27, 1932 to May 15, 1934, to Aaron Tycko, the majority regarding the arrangement of portrait sessions and the ordering of prints, most with original transmittal envelopes, many autograph. With ticket stub and program to 1934 Einstein tribute concert at Carnegie Hall.

An intriguing archive of material relating to the popular portrait of Albert Einstein taken during his sojourn in Southern California during the winters of 1931-33. In the first letter in this archive, Elsa Einstein writes to portrait photographer Aaron Tycko, then in residence at the Ambassador Hotel downtown, agreeing to have Einstein sit for a portrait, preferably at their house in Pasadena, as otherwise it will be some time before they are near the hotel. Tycko must have come to Pasadena, because within weeks Elsa wrote him a short note complementing him on the quality of the portrait. The Tycko portrait became the Einstein's preferred image, and they reordered copies of it often. The two families also became friends, and the Tyckos were invited to a 1934 concert at Carnegie Hall celebrating the physicist.

$4,000 - 6,000



37

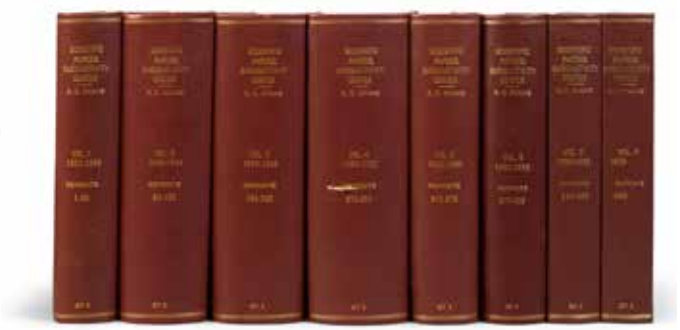
EINSTEIN, ALBERT. 1879-1955.

Carbon Copy of a Letter to William Farrington ANNOTATED AND DIAGRAMMED in ink and pencil by Einstein describing in mathematical detail the action of force on the earth's crust, 2 pp, rectos only, letter dated January 14, 1954, folds;
WITH: Typed Note Signed ("A. Einstein") to Charles Hapgood, 1 p, personal letterhead embossed with 112 Mercer St address, January, 16, 1954, centerfold.

ANNOTATED, AND HIGHLY SCIENTIFIC LETTER ON THE EARTH'S SHIFTING CRUST. Showing an application of his scientific mind outside of physics, Einstein wrote to geologist William Farrington at MIT describing in great scientific detail how the ideas put forth by Charles Hapgood about the shifting of the earth's crust are plausible. Here he forwards the Farrington letter to Hapgood, inserting in ink and pencil the scientific diagrams and equations in making his argument. In 1958, Hapgood published his *Earth's Shifting Crust,* which utilized as an introduction a foreword Einstein had provided for him in May of 1954, shortly after this exchange. It was not until the 1960's that the idea of continental drift took root at large in the scientific community, overriding the ideas which Hapgood put forth. A fascinating look at the breadth of Einstein's knowledge and mind, reinforcing his idea that "All religions, arts and sciences are branches of the same tree" (Einstein, "Moral Decay," 1937).

$12,000 - 18,000

38



39

38

ROBLEY D. EVANS AND THE MARKLE CYCLOTRON.

American physicist Robley D. Evans found his calling as a Caltech (California Institute of Technology) graduate student when he began to work with Los Angeles County Health Officer Frank Crandall to investigate the deleterious effect of radium-containing patent medicines that were being manufactured in the area. He went on to devote his life to researching the physiological effects of radiological substances, both positive and negative. He joined the faculty at the Massachusetts Institute of Technology in 1934 and was responsible for building the Markle Cyclotron, the first cyclotron in the world for biological and medical use. His book, *The Atomic Nucleus,* published in 1955, was a basic text for graduate students in in nuclear physics.

The present archive contains an overview of his life and career with material from his Hollywood High days through his time at Caltech and his professorship at MIT. Items include his heavily annotated copy of *the Atomic Nucleus* and related material, 4 cases of glass medical slides he had used in his research, a 16 mm film reel related to his work on an episode of the CBS Conquest hour on radiation poisoning, patent documents, congratulatory letters from colleagues such as Nobel laureate William A. Fowler as well as material on awards he had won.

Perhaps most interesting is the collection of photographs and 8 mm film documenting the construction of the Markle Cyclotron. The archive contains about 87 5 x 7 inch gelatin silver photographs and 4 reels of 8 mm film that show both the construction and the interior instrumentation.

$1,500 - 2,500

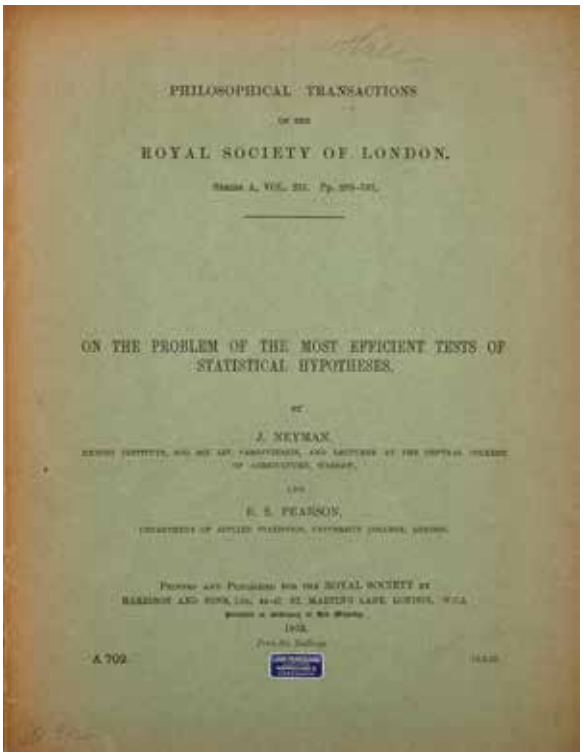
39

EVANS, ROBLEY DUNGLISON. 1907-1995.

Collection of 8 bound volumes of extracts and offprints, 1932-1980, various journals, including photocopies of some articles, library cloth. *Provenance:* Estate of Robley D. Evans.

Pioneer of nuclear medicine Robley D. Evans' own collection of his journal output.

$1,000 - 2,000



PHILOSOPHICAL TRANSACTIONS

OF THE

ROYAL SOCIETY OF LONDON.

ON THE PROBLEM OF THE MOST EFFICIENT TESTS OF STATISTICAL HYPOTHESES.

BY

J. NEYMAN,

AND

E. S. PEARSON,

A 702

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41

40

NEYMAN, JERZY & EGON S. PEARSON.

On the Problem of the Most Efficient Tests of Statistical Hypotheses. London: for the Royal Society by Harrison and Sons, 1933.
4to (304 x 232 mm). Original printed green wrappers. Partially sunned. Offprint from: *Philosophical Transactions of the Royal Society of London,* Series A, Volume 231.
Provenance: Anders Hjorth Hald (Ownership signature and Danish bookseller tag to front wrapper).

FIRST OFFPRINT EDITION OF THE PAPER THAT INTRODUCED THE NEYMAN-PEARSON LEMMA, the basis of hypothesis testing with applications in signal processing systems, digital communication systems, radar systems, as well as in economics to calculate the demand function of the consumer and even in particle physics to construct analysis-specific likelihood ratios.

$1,000 - 1,500

41

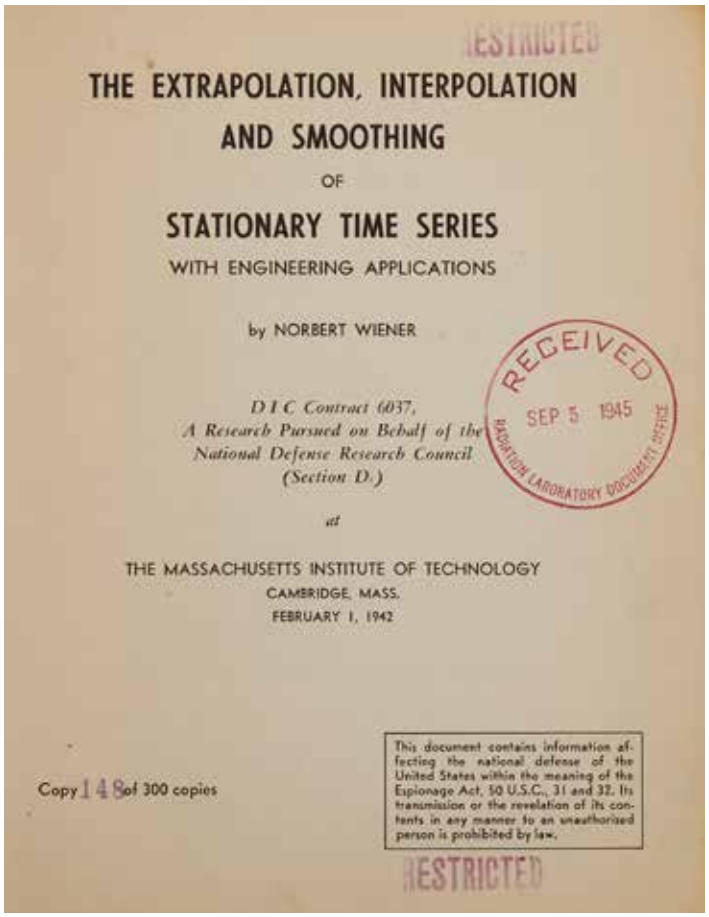
RICHTER, CHARLES FRANCIS. 1900-1985.

6 Autograph Manuscripts Signed ("Charles F. Richter"), approx. 762 pp recto and verso, 4to, Stanford and Pasadena, September 24, 1919 to March 27, 1934, being early journals kept by Richter during his university years and early career, all in period notebooks with cardstock or limp covers, wear to covers, some leaves fragile.

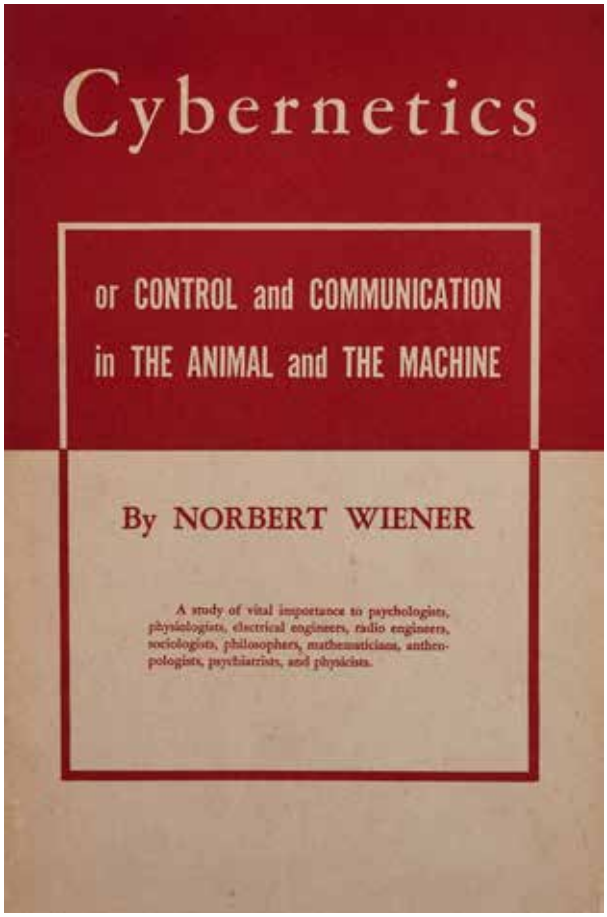
Charles Richter was a physicist and seismologist at Cal Tech who is best remembered as the creator of the Richter magnitude scale which was the first to quantify the size and power of earthquakes. He was an obsessive diarist throughout his life, and in these volumes dating from his early years, he carefully details his transition from university student to doctoral student to emerging scientist. His journals are filled with equations and experiment observations, but also contain much of the personal reflection that we expect from a young person's diary, wondering about the universe and his place in it, wondering if he will ever find love. The journals break down thus:

September 24 to December 5, 1919: provides detail about traveling from Los Angeles to Palo Alto, school life and work, family news.
December 6, 1919 to April 14, 1920: mentions thermodynamics, chess club, girls.
April 15, 1920 to May 19, 1922: writes extensively on western civilization, sexual ethics, and defines what his personal credo is.
May 19, 1922 to May 31, 1924: covers detached. Anticipates a romantic relationship; writes notes on form and content of poetry; solves advanced math problems.
May 31, 1924 to June 27, 1926: first 12 leaves have been excised. Discusses creative writing, fractional derivatives, provides a "summary of history."
August 4, 1928 to March 27, 1934: criticism of the writings of Dewey; notes on April 28, 1930 eclipse; analysis of "Humanism and America."
From May 19, 1922, writing on sexual ethics: *"... in any case where a woman's 'reputation' is involved, I shall use a condom. I shall always be prepared, in case the condom breaks and pregnancy results, to marry the girl at once, regardless of possible consequences. / Conditions at present are such that I expect soon to have sexual intercourse...."*

$5,000 - 10,000



42



43

THE WIENER FILTER

42

WIENER, NORBERT. 1894-1964.

The Extrapolation, Interpretation and Smoothing of Stationary Time Series with Engineering Applications. [Washington, D.C.: National Defense Research Council], 1942.

4to (227 x 177 mm). Original plain wrappers, custom cloth clamshell case. Restricted stamps to front wrapper and to title, some wear to spine.

Provenance: Massachusetts Institute of Technology Radiation Laboratory Document Room (stamp to front wrapper and to title), the lab at which the Wiener filter was developed; Christie's Origins of Cyberspace, February 23, 2005, lot 217.

FIRST EDITION, RESTRICTED ISSUE, number 148 of 300 copies. The Battle of Britain was raging when Wiener, then mathematics professor at MIT, petitioned chairman of the National Defense Research Committee (NDRC) Vannevar Bush to be of service to his country. Wiener was soon after awarded a grant. He hired graduate student Julian Bigelow and the two set about to construct a mathematical model that would predict the behavior of enemy pilots for use by Army antiaircraft fire control. Among the ideas formulated for this work was a filter for signal processing later called the Wiener filter, which reduced the amount of noise present in a signal by comparing it with an estimate of the desired noiseless signal. Although the ideas were not well received when the resulting paper was issued, Wiener revisited them after the war when he wrote his groudbreaking book *Cybernetics.* Claude Shannon, considered the "father of information theory," wrote in his landmark paper "the Mathematical Theory of Communications" that Wiener's monograph, "contains the first clear-cut formulation of communication theory as a statistical problem, the study of operations on time series." Excessively rare, we can find only this copy in Rare Book Hub. Hook & Norman *Origins of Cyberspace* 990.

$6,000 - 9,000

43

WIENER, NORBERT. 1894-1964.

Cybernetics or Control and Communication in the Animal and the Machine. New York & Paris: John Wiley & Sons, Hermann, 1948.

8vo. Original crimson cloth stamped in black and white, dust jacket. Some light spots to edges, jacket with spine toned, an excellent copy overall.

FIRST AMERICAN EDITION, SIGNED by Wiener and with original prospectus laid in. MIT professor of Mathematics Norbert Wiener's work was a groundbreaking set of predictions about the future of machine and man. He coined the term cybernetics based on the Greek verb *kybernan*, "to steer, navigate or govern." Hook & Norman *Origin of Cyberspace* 991.

$1,000 - 2,000

44

STIBITZ, GEORGE ROBERT. 1904-1995.

Relay Computers. Washington, D.C.: National Defense Research Council, February 1945.
4to (275 x 209 mm). Black cloth. Front wrapper, distribution list and introduction leaf in photocopy.
Provenance: Christie's *The Origins of Cyberspace,* February 23, 2005. Lot 188.

LIMITED, RESTRICTED EDITION, one of 137 examples used for presentation before the Applied Mathematics Panel of the National Defense Research Council. Bell Labs employee George Stibitz, in 1937, decided to use telephone relays to build one of the world's first digital computers. It performed simple mathematical calculations using Boolean algebra. The answer to the problem was displayed through flashlight bulbs. Hook & Norman *Origins of Cyberspace* 910.

$1,500 - 2,500

44

45

AIKEN, HOWARD H. & GRACE M. HOPPER.

The Automatic Sequence Controlled Calculator. New York: American Institute of Electrical Engineers, August-November, 1946.
3 parts. 4to (295 x 220 mm). Original pictorial wrappers, custom cloth slipcase. Some wear to spines. In: 3 Issues of *Electrical Engineering.* Volume 65, Numbers 8-9, 10 & 11.

FIRST EDITION of this 3-part article on the Harvard Mark I, IBM's Automatic Sequence Controlled Calculator, an electromechanical computer first used for the Manhattan Project on March 29, 1944 to run a John von Neumann program. In 1936, Howard Aiken, then still pursuing his doctorate, presented IBM his concept for the Mark I and company chairman Thomas Watson Sr. personally approved the project. Computing pioneer Grace Hopper was among the computer's original programmers. Hook & Norman *Origins of Cyberspace* 412.

$800 - 1,200

45

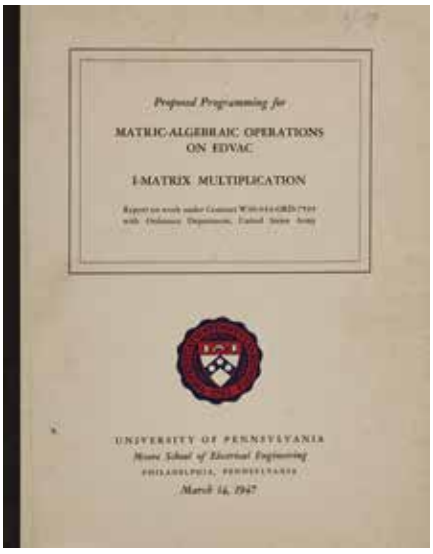
46

EDVAC.

PATTERSON, GEORGE W. *Proposed Programming for Matric-Algebraic Operations on EDVAC. I-Matrix Multiplication.* Philadelphia: University of Pennsylvania, Moore School of Engineering, March 14, 1947.
4to (279 x 215 mm). Original cloth-backed printed wrappers. Some faint spots, wrappers lightly soiled and creased.
Provenance: Andrew Donald Booth, co-designer of the APE(X) C series of computers (ownership signature to front wrapper).

FIRST EDITION OF ONE OF THE EARLIEST PUBLISHED PAPERS ON PROGRAMMING OF A STORED PROGRAM COMPUTER.
In 1946, Patterson joined the staff of the Moore School of Electrical Engineering of the University of Pennsylvania, where he designed the logic for EDVAC arithmetic circuits and coordinated the logic design for the entire machine. Hook & Norman *Origins of Cyberspace* 827.

$1,000 - 2,000



46

47

47
ENIAC & EDSAC.
3 titles:
1. BURKS, ARTHUR. *Electronic Computing Circuits of the ENIAC.* [New York]: Institute of Radio Engineers, August, 1947. 4to (279 x 215 mm). Binder holes punched in gutter margin. Offprint from: *Proceedings of the Institute of Radio Engineers.* Volume 35, Number 8. Hook & Norman *Origins of Cyberspace* 512.
2. WILKES, MAURICE & WILLIAM RENWICK. *An Ultrasonic Memory Unit for the EDSAC.* [Surrey]: Electronic Engineering, July, 1948. 4to (253 x 190 mm). Original printed wrappers. Offprint from *Electronic Engineering.*
SIGNED by WILKES on the front wrapper. Hook & Norman *Origins of Cyberspace* 1017.
3. ___. *The EDSAC - An Electronic Calculating Machine.* [London]: December, 1949. 4to (276 x 202 mm). Original self wrappers. Offprint from the *Journal of Scientific Instruments and of Physics in Industry,* Volume 26, number 12.
SIGNED by WIlkes on the front wrapper. Hook & Norman *Origins of Cyberspace* 1025.

A collection of papers for two of the earliest general purpose digital computers. Burks was a member of the team that designed the ENIAC. The second item discusses delay line memory, a sequential memory system that stores information by continuously circulating data through, in this case, mercury-filled tubes, until accessed or changed by the computer.

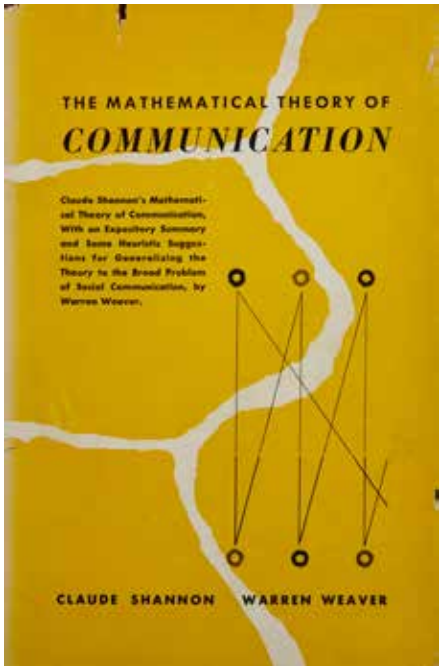
$1,000 - 2,000

48

48
WILLIAMS, FREDERIC C. AND TOM KILBURN.
A storage system for use with binary-digital computing machines. London: March 1949.
4to (278 x 216 mm). Original printed wrappers. Toned, front wrapper unevenly toned. Offprint from: *Proceedings of the Institution of Electrical Engineers,* Volume 96, Number 40.

RARE OFFPRINT EDITION OF THE FIRST PUBLISHED ACCOUNT OF THE FIRST TRULY HIGH SPEED RANDOM ACCESS MEMORY. Williams and Kilburn, both at Manchester University, developed this early random-access memory device that works by displaying a grid of dots on a cathode ray tube (Williams tube) creating a small static electricity charge at each dot, the location of which is read by a thin metal sheet in front of the display. The system was utilized in a number of early computers including the first commercially available computer, the Ferranti Mark 1, as well as IBM's first commercial scientific computer, the 701. Hook & Norman *Origins of Cyberspace* 1066.

$800 - 1,200



49

49
SHANNON, CLAUDE E. & WARREN WEAVER.
The Mathematical Theory of Communication. Urbana: University of Illinois, 1949.
8vo. Original burgundy cloth, dust jacket. Jacket with spine faded, some edgewear.
Provenance: Harvey Rorgen(?) (ownership signature to f.f.e.p.).

FIRST EDITION IN BOOK FORM, SIGNED & INSCRIBED by Shannon on the f.f.e.p. Considered "the magna carta of the information age" according to *Scientific American,* Shannon's work provided "a mathematical guide for the system's engineers [at Bell Labs], a blueprint for how to move data around with optimal efficiency" (Gertner p.128). Gertner. *The Idea Factory.* [NY: 2012.]; Hook and Norman *Origins of Cyberspace* 881.

$800 - 1,200

50

SHANNON, CLAUDE. 1916-2001.

Programming a Computer for Playing Chess. In: *The Philosophical Magazine: A Journal of Theoretical Experimental and Applied Physics.* London: Taylor & Francis, March 1950. Volume 41, Seventh Series, Number 314.
8vo (255 x 173 mm). Original wrappers. Wrappers partially toned and extremities and spine lightly rubbed.
Provenance: British Iron & Steel Research Association (stamp to front wrapper); Department of Scientific and Industrial Research (2 stamps, including "surplus" stamp, to front wrapper).

THE FIRST TECHNICAL PAPER ON CHESS PROGRAMMING. Hook & Norman *Origins of Cyberspace* 882.

$800 - 1,200

51

NEWELL, ALLEN & HERBERT A. SIMON.

The Logic Theory Machine. [September, 1956.]
4to (278 x 215 mm). Self wrappers, custom cloth folder and black morocco-backed slipcase. first and final leaves toned and with some tiny chips to extremities.
Offprint from the IRE Transactions on Information Theory IT-2.

FIRST EDITION of this work discussing what is considered the first artificial intelligence program. Newell and Simon had met while working for the RAND Corporation and began discussing the possibility of teaching machines to think. Their first project, the Logic Theorist, was a program that could prove mathematical theorems. They chose Bertrand Russell's and Alfred North Whitehead's *Principia Mathematica* as the focus and managed to get the program to solve 38 of the second chapter's 52 theorems - and the proof for theorem 2.85 was more elegant than that of Russell and Whitehead. The Logic Theorist was demonstrated at the Summer 1956 Dartmouth conference, the first conference on artificial intelligence, a name coined by John McCarthy specifically for the event. Hook & Norman *Origins of Cyberspace* 815.

$2,000 - 3,000

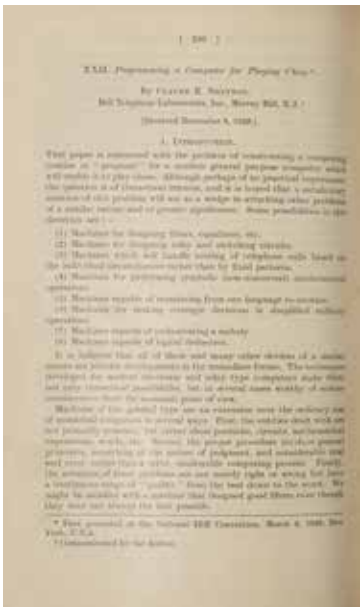
52

ROSENBLATT, FRANK. 1928-1971.

The Perceptron: A Probabilistic Model for Information. Lancaster, PA: American Psychological Association, November, 1958.
8vo (241 x 161 mm). Original printed wrappers. Spine sunned. In: *Psychological Review,* Volume 65, Number 6.
Provenance: M.R. Lowe (?) (ownership signature to front wrapper).

FIRST EDITION of Rosenblatt's algorithm, considered the first modern artificial neural network, it was tasked for image recognition. Originally implemented in software form for the IBM 704, it eventually found hardware implementation in the MARK 1 Perceptron. An early and important step on the road to artificial intelligence. Hook & Norman *Origins of Cyberspace* 870.

$800 - 1,200



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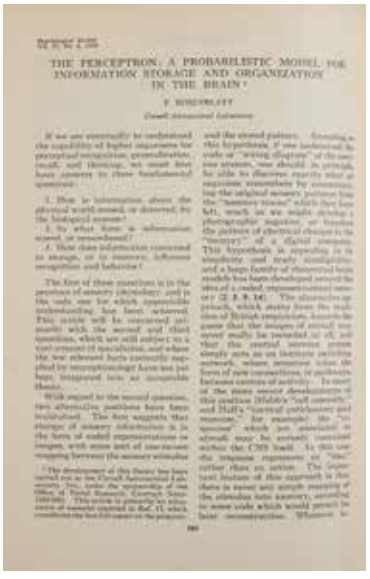
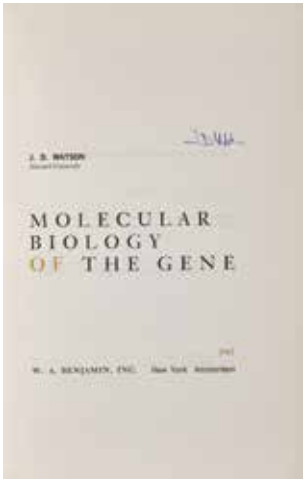
51



THE PERCEPTRON: A PROBABILISTIC MODEL FOR INFORMATION STORAGE AND ORGANIZATION IN THE BRAIN

52

53



54

55

56

53
HEISENBERG, WERNER. 1901-1976.
Autograph Letter Signed ("Werner Heisenberg") to the rector of Eötvös Loránd University Budapest, 2 pp, 294 x 208 mm, Badenweiler, March 20, 1964, folds, original autograph envelope, folds.

In the midst of the Cold War, Heisenberg thanks the rector of a Hungarian University where was given an honorary degree in 1964. Heisenberg had delivered a lecture on the development of the theory of elementary particles ("Entwicklung der Theorie der Elementarteilchen"), and notes that he looks forward to much more collaboration.

$1,000 - 1,500

54
WATSON, JAMES D. B.1928.
Molecular Biology of the Gene. New York: W.A. Benjamin, 1965.
8vo. Publisher's white cloth, entwined double helix decoration to upper cover, lettered in aqua and black, original printed dust jacket, light toning to margins.

FIRST EDITION, HARDCOVER ISSUE, SIGNED BY WATSON, THE AUTHOR'S FIRST BOOK.

$2,000 - 3,000

55
WATSON, JAMES D. B.1928.
Autograph Quotation with Diagram Signed ("J.D. Wa[tson]"), on single sheet of letter-sized white paper, undated.

DEPICTING THE DOUBLE-HELIX OF DNA AND SIGNED BY WATSON. Watson has both labeled the sketch, "*DNA*" and "*base pair either A-T or G-C*" and captioned it below, "*the average human chromosome has some 100 million base pairs along its single DNA molecule*." An attractive manuscript memorializing Watson and Crick's discovery of the double-helix structure of DNA.

$2,000 - 3,000

56
WATSON, JAMES D. B.1928. [AND FRANCIS CRICK. 1916-2004.]
The Double Helix: A Personal Account of the Discovery of the Structure of DNA. New York: Norton & Co., 1980.
8vo. Trade paperback edition from the "Norton Critical Editions" series. Thumbed, a few ink margin notes, calculations in pencil on rear blank.

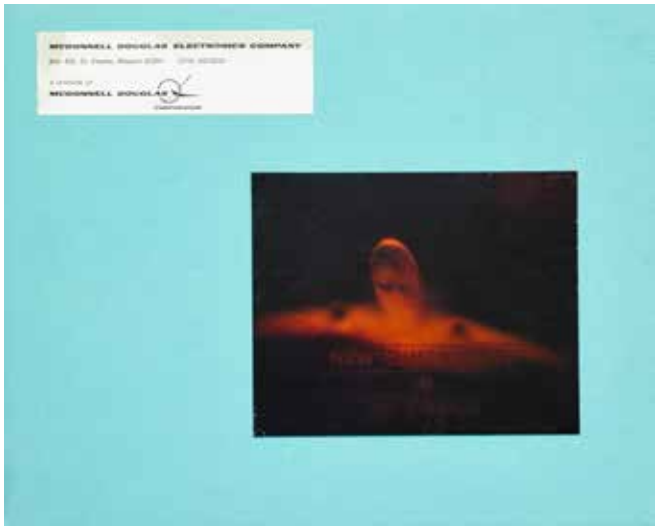
SIGNED by both Watson and Francis Crick on the title page.

$1,000 - 2,000

A Protocol for Packet Network Intercommunication

VINTON G. CERF AND ROBERT E. KAHN

57



58

THE BIRTH OF THE INTERNET

57

CERF, VINTON & ROBERT KAHN.

A Protocol for Packet Network Intercommunication. [New York]: IEEE Communications Society, May, 1974.
4to (280 x 217 mm). Original printed wrappers. Custom cloth folder, burgundy morocco slipcase. closed tear to back wrapper, staple holes to front wrapper, light wear to spine, still a bright copy. In: *IEEE Transactions on Communications.* Volume Com-22, Number 5.
Provenance: Polytechnic Institute of New York (stamps to front wrapper including "withdrawn" stamp).

FIRST EDITION OF CERF & KAHN'S WORK THAT PROVIDED THE ARCHITECTURE OF THE INTERNET. Kahn and Cerf set out in 1973 to connect various independent packet-switched networks. "The result was an Internet Protocol (IP) that specified how to put the packet's destination in its header and helped to determine how it would travel through networks to get there. Layered above it was a higher-level Transmission Control Protocol (TCP) that instructed how to put the packets back together in the right order, checked to see if any of them was missing and requested retransmissions of any information that had been lost. These became known as TCP/IP. Kahn and Cerf published them as a paper called 'A Protocol for Packet Network Intercommunication.' The internet was born" (Isaacson p 259). Hook & Norman *Origins of Cyberspace* 528. Isaacson *The Innovators* [2014].

$8,000 - 12,000

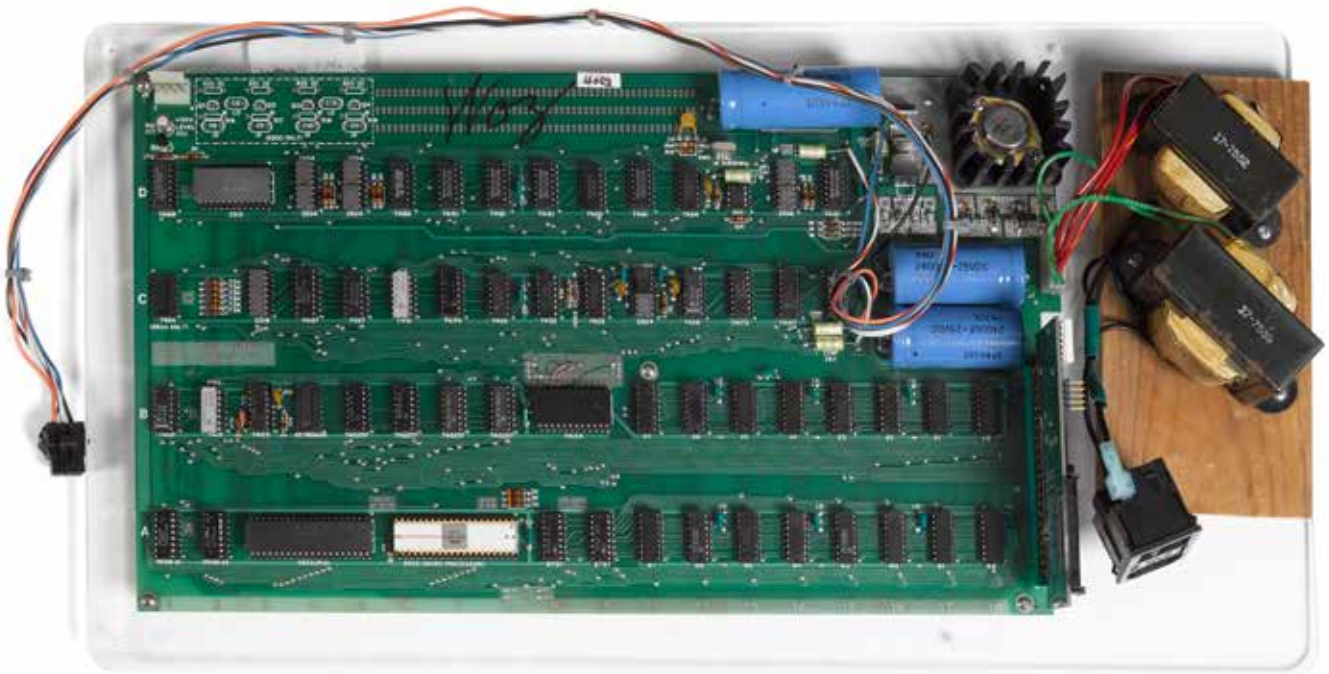
58 ¤

HOLOGRAMS.

[CHARNETSKI, CLARK. B.1942.] Set of 4 image-plane reflection holograms, by McDonnell Douglas Electronics Company, c.1970-74, on silver halide emulsion film, 125 x 100 mm each, mounted to colored mat board, 204 x 253 mm overall, with McDonnell Douglas labels on recto, and viewing instructions on verso. Subjects include a DC-10 jet, a figurine of a man pushing a boulder, a stick figurine on skis, and a group of marching band figurines with instruments. Slight handling wear.

The use of holography to capture 3-dimensional images on film evolved toward commercial applications in the late 1960s. Clark Charnetski, a physicist at Conductron Corporation in Ann Arbor, Michigan, produced these holograms for McDonnell Douglas, the majority shareholder in Conductron. The intention was to demonstrate how holograms could be used in brochures, advertisements and displays, with the goal of creating a viable commercial market for the technology.

$1,500 - 2,500



59

APPLE-1 COMPUTER SIGNED BY STEVE WOZNIAK, FITTED WITH AN APPLE II POWER CONNECTOR AND USED IN THE DEVELOPMENT STAGE.

Apple-1 motherboard, Signed ("Woz"), with label "Apple Computer 1 / Palo Alto. Ca. Copyright 1976," with rhombic "NTI" logo below, includes printed circuit board with four rows A-D, and columns 1-18, MOS Technologies 6502 microprocessor, labeled MCS 6502 1177; keyboard interface and connector; 8K bytes RAM in 16-pin 4K memory chips; 3 "Big Blue" Sprague capacitors; firmware in PROMS (A1, A2); low-profile sockets on all integrated circuits; heatsink; CFF1A card in expansion slot; 2 Triad transformers; custom clear acrylic case; overall approximately 15 x 9 x 2½ inches.
WITH:
1. Apple Computer Co. *Apple-1 Operation Manual.* [1976.] 12 pp including folding schematics. Original wrappers. First edition with 770 Welch Road Suite 154, Palo Alto address.
2. Apple Computer Co. *Apple-1 Cassette Interface.* [1976.] 4 pp. Original wrappers. With 770 Welch Road, Suite 154 address.
3. Apple Computer Inc. *Apple-I Operation Manual.* 1977. 14 pp including folding schematics. Stapled with front wrapper. 20863 Stevens Creek Blvd B 3-C, Cupertino address.
4. Apple Computer Inc. *Preliminary Apple BASIC User's Manual.* 14 pp. Stapled with front wrapper. 20863 Stevens Creek Blvd B 3-C, Cupertino address.
5. Apple Computer Company. *Advertisement for Apple-1.* With 770 Welch Road, Suite 154 address.
6. Apple Computer Inc. *Product Information.* March 1977. 4 pp. Self wrappers.
7. *Homebrew Computer Club Newsletter* Volume 2, Issue numbers 11-12, 13, 18. 1976-1977.
8. *The Michigan Apple-Gram*. Volume 1, Numbers 3, 4, 5, 6, 7. May-September, 1979. Publication of the Michigan Apple Computer Club.
* And with: Original cardboard box; Apple III monitor; Apple 1/Apple II replica keyboard; Panasonic RQ-2102 Portable Cassette Recorder; Cassette interface replica kit.
Computer operational as of September 2019.
Provenance: Elmer Baum, Apple Employee #34; Allen J. Baum; A Silicon Valley hardware engineer; #84 on the Apple-1 Registry.

ORIGINAL APPLE-1 IN WORKING CONDITION ORIGINALLY USED TO POWER AN APPLE II PROTOTYPE DURING THE DEVELOPMENT STAGE. SIGNED BY STEVE WOZNIAK ON THE BOARD.

The Apple-1 computer is the first pre-assembled personal computer to come to market, heralding the dawn of the personal computer revolution. Steve Wozniak, in his autobiography, recounts: "I didn't realize it at the time, but that day, Sunday, June 29, 1975, was pivotal. It was the first time in history anyone had typed a character on a keyboard and seen it show up on their own computer's screen right in front of them" (p 166).

The story of its production and sale has become one of the most potent legends in 20th century history. "People who saw my computer could take one look at it and see the future. And it was a one-way door. Once you went through it, you could never go back" (Wozniak p 168).

Wozniak and Steve Jobs demonstrated the breakthrough design at the Homebrew Computer Club in Palo Alto. The next day, the ever enterprising Jobs obtained an order from Byte Shop owner Paul Terrell for 50 assembled boards to be delivered in 30 days at $500 apiece. Jobs scrambled to come up with the $15,000 of parts needed and enlisted friends and family in the assembly process. Approximately 200 units were eventually made, although only approximately 74 surviving authentic Apple-1's are listed in the Apple 1 Registry as of January 2019. Although the first Byte Shop order sold extremely well (at a retail price of $666.66), there were at least some remainders from the additional 150 and also many Apple-1s were eventually traded in for Apple IIs.

The present example is from the second batch of boards printed by NTI soon after the first. Despite being printed in greater numbers, the NTI boards are less likely encountered on the market than the first batch. Apple-1 expert Corey Cohen has postulated that more NTI boards were traded to Apple for the Apple II and later ordered destroyed by Steve Jobs. This particular board is fitted with an Apple II power connector. According to a statement by former Apple employee Allen Baum, it was used to test Apple II boards before the production power supplies, famously designed by Rod Holt, were ready. Also, the bridge rectifier diodes are doubled - likely to accommodate the higher current draw of the Apple II. An amazing artifact from the gestational period before Apple's transition from a Silicon Valley startup to a microcomputer powerhouse with sales growing from $775,000 in September 1977 to $118,000,000 three years later.

Wozniak, Steve & Gina Smith. *iWoz.* NY: 2006; Isaacson, Walter. *Steve Jobs.* NY: 2011.

$200,000 - 300,000

"I'm one of those people who think that Thomas Edison and the light bulb changed the world a lot more than Karl Marx ever did"

-Steve Jobs quoted in Levy's *Insanely Great*

60 W

APPLE MACINTOSH PROTOTYPE.

Prototype of the Macintosh Personal Computer, with 5-1/4 inch "Twiggy" disk drive, Cupertino, CA, 1983, electronic components contained in pre-production plastic molded housing, 330 x 245 x 250 mm (excluding keyboard and mouse); with various disks. Slight yellowing of plastic components, otherwise fine.
Provenance: Issued to Encore Systems and used in the early development of *MacWrite.* Owned by the company's former CEO and President since the 1980s; Exhibited (and operated) at the Mac@30 Anniversary Celebration held on January 25, 2014 at the Flint Center in Cupertino, CA.

THE EARLIEST MACINTOSH—THE MACHINE THAT "HAS CHANGED OUR LIVES FOREVER" (Wozniak). Extremely rare working example of the earliest Macintosh prototype, with a functioning 5 ¼ inch Apple proprietary twiggy drive, one of only two known machines that survived after the move to the Sony 3 ½ inch drive.

The Macintosh began as a personal project of Jef Raskin, who envisioned a Swiss army knife of a computer: a low-cost, easy-to-use, high volume appliance named for his favorite apple. Already by 1981, utilizing the 16/32-bit Motorola 68000 microprocessor used in the Lisa, they had the design for a machine 60% faster and much less expensive than the Lisa. It was this design that caught the attention of Steve Jobs who, after being removed from the Lisa project, was looking for something new to capture his attention.

Once Jobs took interest in the project, it wasn't long before Raskin was forced out. Jobs "immediately saw that Burrell's machine could become the future of Apple" (Hertzfeld p 121). Jobs took over the project in January of 1981 and more than changed the direction, he wanted to build a "friendly" computer —the personal computer as a tool for personal empowerment. He engendered a non-conformist attitude in his team and a shared vision of a product that was "insanely great." It was an approach that utilized years later when Jobs returned to save Apple with the iMac, iPod, iPhone and iPad. "The best products, he [Jobs] believed, were 'whole widgets' that were designed end-to-end, with the software closely tailored to the hardware and vice versa. This is what would distinguish the Macintosh, which had an operating system that worked only on its own hardware, from the environment of Microsoft was creating in which its operating system could be used on hardware made by many different companies" (Isaacson p 137).

Still, Jobs recognized the importance of third-party software developers. After all, it was the third-party spreadsheet program *Visicalc,* created first only for the Apple II, that drove many to adopt the personal computer—beginning with the Apple II. The team created a manual for software developers, *Inside Macintosh,* and issued prototype Macintoshes to important developers like Randy Wigginton, Apple employee #6 who left in September 1981, but agreed to work on *MacWrite* as a semi-independent developer. *MacWrite* and *MacPaint* were the two major pieces of software

"There are occasionally short windows in time when incredibly important things get invented that shape the lives of humans for hundreds of years. These events are impossible to anticipate, and the inventors, the participants, are often working not for reasons of money, but for the personal satisfaction of making something great. The development of the Macintosh computer was one of these events, and it has changed our lives forever. Every computer today is basically a Macintosh, a very different type of computer from those that preceded it."

-Steve Wozniak from the forward of *Revolution in the Valley.*

bundled with the original Macintosh. Both incorporated the WYSIWIG (what you see is what you get) approach pioneered at Xerox Parc. The Macintosh would also take the GUI (graphical user interface) that Steve Jobs and the Lisa developers had borrowed from Xerox PARC and make it accessible to the masses. They realized that they had to show software developers how to work with this new playground, but unlike with the Apple II where each piece of software could have its own key commands, they wanted to maintain a consistent user experience.

Among the last-minute major changes to the Macintosh was the disk drive. The original plan was to use the new 5 ¼-inch "Twiggy" drive that was built to greatly expand the capacity of standard floppy disks. It soon became apparent with the release of the Lisa, which featured 2 of these drives along with a hard drive, that they were very unreliable and that it would be unfeasible to rely on a single "Twiggy" drive. The team scrambled, under the direction of Jobs, to develop their own 3.5-inch drive with Japanese company Alps based on the latest Sony drive, but realized, excepting Jobs, that they would never make it in time for the projected ship date. The team had to secretly work with Sony until Jobs was ready to acknowledge this—at one point having to hide a Sony employee in the closet to maintain the secret. The finished Macintosh used the new disk format which featured the same data rate as the Twiggy, was more robust than a 5 ¼ inch floppy and small enough to fit into a shirt pocket. Reportedly, Jobs had all of the existing twiggy prototypes destroyed.

The new Macintosh was launched during Superbowl XVIII with what is considered by many to be the greatest commercial of all time, "1984" by Ridley Scott. "The ad cast Macintosh as a warrior for the latter cause—a cool, rebellious, and heroic company that was the only thing standing in the way of the big evil corporation's plan for world domination and total mind control" (Isaacson p 162). Although originally sales were sluggish, the Macintosh's all-in-one, friendly design at a reasonable price eventually won out, and the "insanely great" philosophy of Steve Jobs that it embodied informs the devices that today have been inextricably woven into the fabric of daily life. Hertzfield *Revolution in the Valley* [Sebastopol, 2005]; Isaacson *Steve Jobs* NY: [2011]; Levy. *Insanely Great* [NY: 1995].

$120,000 - 180,000

61

PROTOTYPE OF APPLE VIDEO PAD 2.

Apple INC. [Palo Alto: Developed 1994-5.] Prototype design model of the Video Pad 2, with hinged flip-top, 180 x 232 mm, height 33 mm. Made of heavy duty plastic with mock memory card slot, power socket and phone line input socket, silver-papered screen, flip top with space for a video screen and two speakers either side. In its original black leather carrying case, impressed with Newton light bulb logo.
Provenance: Purchased in Palo Alto from an Apple Engineer in 1999.

A UNIQUE PROTOTYPE DESIGN FOR THE APPLE VIDEO PAD 2, the only surviving concept prototype for the Video Pad PDA. Three designs were put forward by Apple as Video Pad 1,2 and 3, developed in the period of 1993 to 1995 under CEO John Scully. Video Pads 1 and 3 were the only examples shown to the public. They were made from a conceptual design sketch drawn by John Scully and pictured in the May 1995 issue of *Macworld.* The prototypes were described as a "mocked-up videophone married to a PDA ... Designs like this purposely ignore present-day constraints such as cost and component availability ... Sometimes Apple's designers respond to a hot-button issue from someone from the top." The Video Pad was a move forward from the Newton Message Pad, which Scully also pushed into production, 1993-1997. Steve Jobs cancelled the Newton soon after his return in 1997.
This concept of Video Pad was, in effect, the first attempt by Apple to move into the phone market and was a natural development from the Newton Message Pad. It was a precursor to video telephony, the iPad and the iPhone products the company would release 10 years later to great success.
The Video Pad was a product well before its time - requiring technologies that were not yet mature enough to offer the desired functionality. It came at a time when Apple was looking for new devices and concepts to move on from the Steve Jobs-era, and in the 1990s the mobile phone and PDA were the way to go. It is unclear from an examination of the prototype if the unit was to operate on the cellular network or strictly over a phone line, but it is an easy assumption that Apple would be targeting the growing mobile market.
The Atlantic.com June 2017, Technology section, includes an article by Adrienne Lafrance discussing the Apple Videophone-PDA developments in some depth.

$12,000 - 18,000

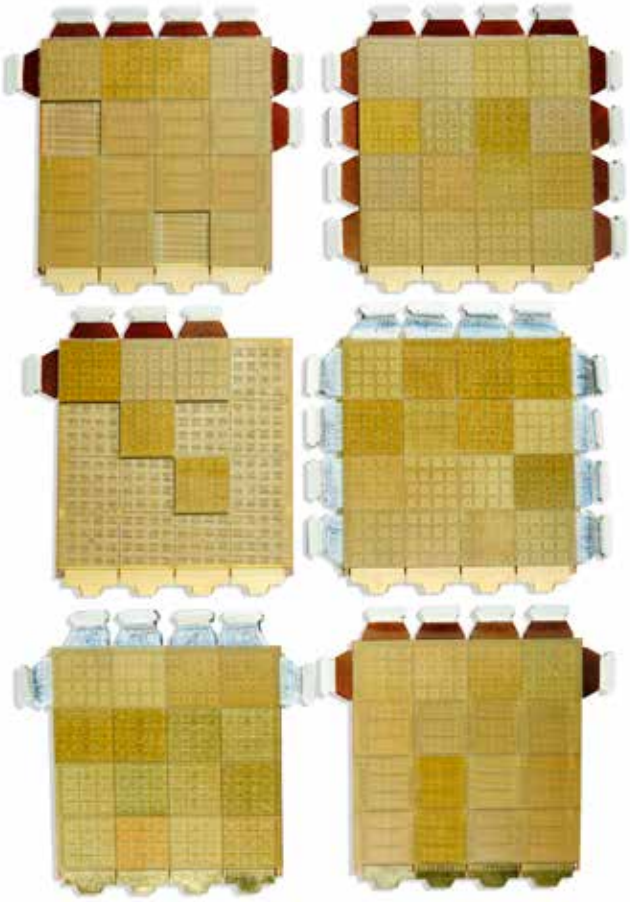
62 W

HEATHKIT HERO 2000 ROBOT.

Robot with optional arm, remote keyboard and charging unit, Heathkit, c.1986.

The Hero 2000 was an educational robot offered in both kit and assembled forms. It was based around an Intel 8088 16-bit microprocessor with 11 slave Z-80 processors. It had onboard speech synthesis, sensors, and the ability to expand. The original price for an assembled unit with this configuration was $4499.95.

$1,000 - 2,000



63 W

CRAY SUPERCOMPUTERS.

Collection of 16 Supercomputer Modules & Components including:
Cray-1: Logic module; memory module; rackmount hardware.
Cray X-MP: memory module; logic module.
Cray-2: Logic module; memory module; capacitor bay with lucite stand; power module with lucite stand.
Cray Y-MP: Processor module.
Cray-3: 6 modules, each in plastic case.

In 1976 Seymour Cray gave a rare speech at the National Center for Atmospheric Research (NCAR) in Boulder, Colorado. When he offered to answer questions afterwards, the programmers in the audience fell silent. The head of the NCAR computing division asked the programmers why they didn't raise a hand and one programmer replied: *"How do you talk to God?"* (Murray pp 3-4).

Cray joined Engineering Research Associates (ERA) in 1951 after graduating from the University of Minnesota with a B.Sc. in Electrical Engineering and a M.Sc. in applied mathematics. He quickly became respected among the engineers and was assigned the difficult task of designing a control system for what would be the EA 1103, which went on to become the first commercially successful scientific computer.
Cray eventually became dissatisfied with ERA after they had been bought first by Remington Rand and then by the Sperry Corporation. He, along with William Norris, one of ERA's founders, left to form Control Data Corporation (CDC). There he was responsible for the design of the CDC 1604, initial work on the 3000 series, the CDC 6600—generally considered to be the first successful supercomputer—and the CDC 7600.
In 1972 Cray left CDC to form Cray Research with a sizeable investment from CDC. At Cray Research he designed a supercomputer 5 times faster than the CDC 7600. The Cray 1 was the first supercomputer to successfully implement the vector processor design and was one of the most successful supercomputers in history, selling over 100 units at a cost of almost $8 million. It wasn't only Seymour Cray who was designing Cray Research's supercomputers. Taiwanese computer engineer Steve Chen later joined the company and worked as principal designer of the X-MP and Y-MP multi-processor supercomputers—2 successful systems that maintained the success of the Cray-1, although were designs derived from the Cray-1, whereas Cray preferred to begin his designs "from clean sheet of paper."
Seymour Cray's follow-up, the Cray-2, which used a unique Fluorinert cooling system that immersed the modules in the liquid, was not as successful as the Cray-1 nor the X-MP, selling only 27 units at a range of $12 to $17 million each. Even before the Cray-2 was complete, Seymour Cray had already moved on to designing the Cray-3. It would again use Flourinert to cool the modules, but also use gallium arsenide semiconductors, a material that had not previously been used in this context and which allowed for greatly increased speed. Cray even had to invest in a semiconductor startup, GigaBit Logic, as there were no current suppliers. Cray further developed the novel 3D integrated circuit packaging he had used for the Cray-2 to greatly decrease the pathways. Each module, measuring 121 x 107 x 7 mm, was composed of 9 printed circuit boards containing 69 electrical layers. Unfortunately, Cray never sold a single unit, although one was loaned to NCAR. Cary went on to design further systems before he died in a 1996 automobile accident, although none of them were brought to market.
Murray. *The Supermen.* NY: [1997].

$20,000 - 30,000

64

CRAY 3 SUPERCOMPUTER.

complete processing “octant,” early 1990s, consisting of a 10-module processor “brick” and a 32-module memory “brick,” each with brass bus bars at base for mounting to power bars in Fluorinert-filled cooling tank; the other a “brick” of 10 modules. Both with attached looms of two-conductor blue and white wires fitted with plastic connectors. The larger block mounted to a later wooden base. Size approximately 335 x 200 x 200 mm (excluding base), and 250 x 120 x 170 mm.

The Cray 3 was the first offering of the Cray Computer Corporation, Seymour Cray’s spin-off from Cray Research, Inc., the company that he created in 1972 after he left Control Data Corporation. The Cray 3 was the first supercomputer to use gallium arsenide integrated circuits for all of its logic circuitry and was the fastest computer of its time. The changing political climate at the end of the cold war drastically shrank the supercomputer market and much of the market turned to massively parallel designs. Cray ended up loaning a Cray 3 to the National Center for Atmospheric Research (NCAR) and another government order the company received was cancelled.

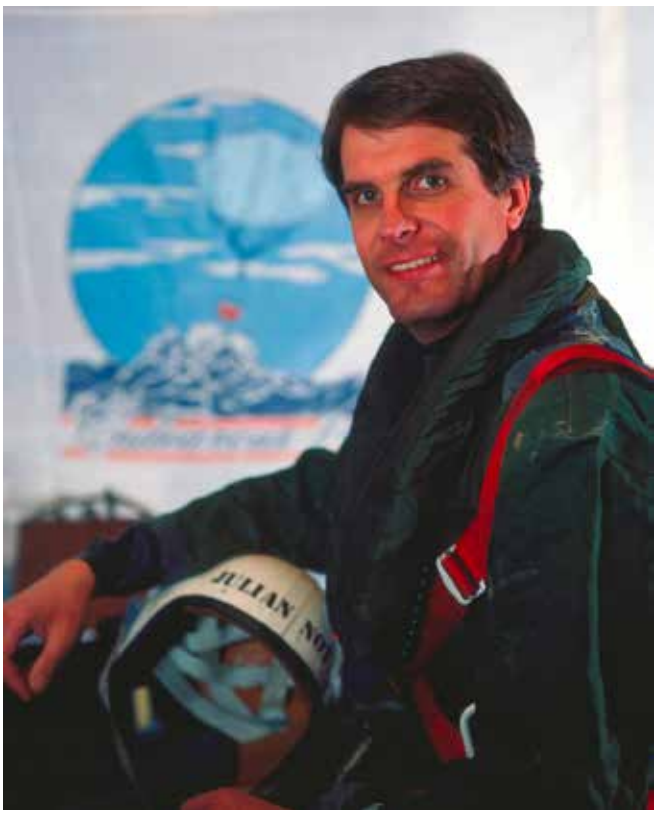
From the original Cray 3 brochure: “The Cray-3 logic and memory circuitry is packaged in up to 336 removable modules, each containing up to 1,024 GaAs integrated circuit die. Total integrated circuit population in a 16-processor Cray-3 is over 142,000 die, of which 36,864 are for common memory. The packaging results in a GaAs gate density of approximately 96,000 gates per cubic inch. The modules are three-dimensional structures measuring 121 mm by 107 mm by 7 mm. Nine printed circuit boards make up the [core of the] module sandwich and contain a total of 69 electrical layers. Circuit connections are made in all three dimensions within the module. X-y traces are as small as 0.048 mm. Z-axis connections are made with approximately 14,000 gold-plates, beryllium-copper twist-pin jumpers per module. The logic signal jumpers, which make up the bulk of the z-axis connections, are only 0.122 mm in diameter.”

The two bricks together represent the smallest Cray 3 module compliment that a customer could purchase and is likely the only complete one in existence. It comes from an employee of Cray Computer Corporation.

$8,000 - 12,000

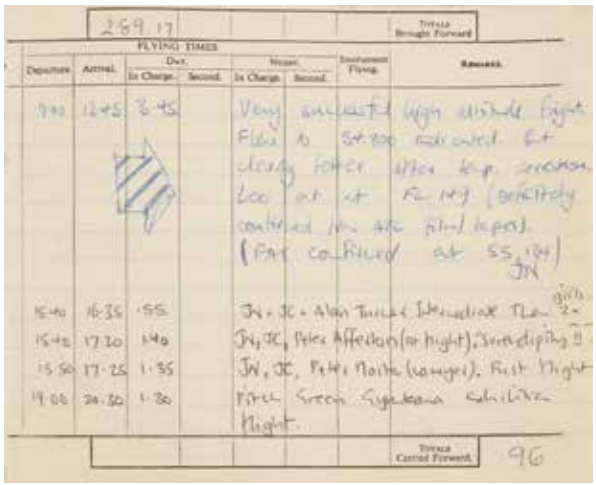
Julian Nott (1944-2019)

Lots 65-73



Modern ballooning pioneer Julian Nott (1944-2019) achieved many firsts during his years in the air. He designed and constructed the first hot air balloon with a pressurized cabin, which he flew to a world record altitude of 55,130 feet on October 31, 1980. He was the first balloonist to cross the Sahara Desert, to cross Australia, to cross the Alps, to cross the English Channel in a solar balloon, the first, and only, to be elected to the Society of Experimental Test Pilots. One of his many interesting projects, the Nazca Prehistoric Balloon, included designing, building and piloting a balloon utilizing only the methods and materials available to Pre-Inca Peruvians. At the time of his death, he was experimenting with his design for a balloon that used cryogenic helium.

We are pleased to offer the following 9 lots from Mr. Nott's estate which provide an overview of some his onsiderable achievements.



65

66

65
JULIAN NOTT'S PERSONAL FLIGHT BOOK.
Original flight log entitled *Personal Flying Log Book,* original blue cloth, 145 x 175 mm, partially printed and completed in manuscript, June 23, 1969 through October 29, 1989, 117 completed leaves, evenly toned, binding with general wear.

An amazing record of Julian Nott's ballooning exploits. The book begins with his very first flight as a passenger during the Queen's Parade in a balloon captained by Giles Bulmer. Nott was said to be impressed enough with this flight that he went on to obtain his balloon pilot's license the following year. The record includes each of Nott's subsequent flights, many with some commentary about the trip. All of his celebrated flights from the period are included as well as the test flights leading up to those flights. The commentary provides wonderful insights. From May 22, 1972: *"First flight in full high altitude rig to attempt a world altitude record. Reached 20,000 feet (QNH). Approximately 25 miles covered."* After a few flights he finally breaks the altitude record at 36,200 feet and then works to eventually bring the number to 55,130 feet on October 31, 1980: *"Very successful high altitude flight. Flew to 54,800 indicated. But clearly better after [?] correction. Leo out at Fl.149 (Definitely confirmed [?] ATC film/tapes). FAI confirmed at 55,134."*

$4,000 - 6,000

66
HIGH ALTITUDE BALLOON FLIGHT.
Extensive archive of material related to Julian Nott's work toward high altitude balloon flight.
Lot includes:
1. 7 of his working notebooks, some dated, approximately 1977-1984, used extensively.
2. Folder labeled "Dener Cabin" and featuring 5 sets of printed plans depicting a design for a high altitude pressurized cabin and 4 pages of manuscript notes with drawings, 1980.
3. Folder labeled "Hangar First Version / Bruce Blake / The One That Failed," and featuring a number of drawings, plans and notes for a fabric pressurized hangar, 1984.
4. 2 folders labeled "1984 Envelope—Trans Australia" and "Trans-Australia Flight Data," the first including notes, plans and drawings toward development of the envelope of the Wilson Endeavor in which he flew across Australia; and the second folder containing printed flight data, 1984.
5. 3 printed plans, one of which is a duplicate, each folded, being designs for Nott's first pressurized hot air balloon capsule which he used for his Daffodil II flight across India in which he broke the ballooning altitude record, 1973.
6. Group of 20 294 x 400 mm drawings, being designs for various aspects of a balloon, some labeled Daffodil II, 1979. Possibly an update of the 1974 balloon.
7. Folder labeled "Heat Ballance of Pumpkin Balloon," including copies of notes as well as annotated computer printouts.
8. Group of 5 drawings on tracing paper, 410 x 295 mm, depicting a pressurized cabin holding two people and a pumpkin balloon, no date.
9. Folder titled "1985/86—Attempts to design large AP envelope. / 1984 Pumpkin Construction," containing mainly notes, but with some plans and drawings toward the construction of a pumpkin balloon, 1984-1986.
10. 2 folders labeled "Historic India / Aug. Travel," and India Historic," the first containing notes and some drawings, the second containing mainly notes and correspondence, 1973-1974. Nott works toward his first pressurized hot air balloon cabin and the flight of his Daffodil II across India.

An amazing archive that provides a detailed picture of the effort and expertise required for Nott's considerable high altitude achievements. His reasoning for pursuing high altitude is best summed by Nott himself in a November 18, 1986 article in the New York Times: *"As you can see at this moment," he said, gesturing toward the hilly New Jersey landscape below him, "we have very little idea where we'll be able to land. That's a challenge of hot-air ballooning that one doesn't have in long-distance gas (helium-filled) balloons. In gas balloons you simply go up high and float until you get where you're going. Down here, there are steep hills and forests all around us and very few potential landing spots. The sun is setting. We have propane fuel enough to keep the balloon aloft for only another 50 minutes. We'll get down safely, of course, but the sport is in figuring out how. Accuracy in Plotting Course. By contrast, one can chart the destination of a long-distance balloon flight very accurately,"* Mr. Nott continued, *"because the speeds and directions of winds at high altitude can be forecast with some precision. Just two months ago, three Dutch balloonists flew from Newfoundland back to the Netherlands, and they plotted their course across the Atlantic so perfectly that they managed to land within a 20-minutes' drive of their homes."*

$4,000 - 6,000

67

68

67
1972 WORLD ALTITUDE RECORD FLIGHT MAP.
Printed map, approximately 860 x 700, constructed from separate map pieces with numerous annotations, with signs of heavy use.

Nott first took the World Altitude Record for a balloon flight in 1972 reaching 35,971 feet for which he was awarded the Royal Aero Club's 1972 silver medal—his first major prize. The map plots a broad area although he took off from Credenhill and landed a short distance away in Llandinabo, but flying for 3 hours, 25 minutes. An important memento of one of Nott's early ballooning achievements.

$1,000 - 1,500

68
ROYAL AERO CLUB AWARDS.
Three 40 mm diameter award medals in gold, sterling silver and bronze, each in original presentation box.

The Royal Aero Club is the national governing and coordinating body of air sport and recreational flying. Julian Nott was the first balloonist to ever win the club's prestigious gold medal, which he won for setting a world altitude record for class AX-10 hot air balloons of 45,836 feet, breaking his previous record of 35,971 feet for which he was awarded the club's 1972 silver medal. He went on to win the bronze medal in 1976 for his world altitude record for a class AX-7 balloon of over 37,000 feet.

Also included in the lot is a large group of correspondence and ephemera regarding the awards as well as a request to have the Prince of Wales participate in a balloon flight, a letter from Prince Philip regarding the 1972 award ceremony, and numerous photographs of Nott showing his ballooning rig to Prince Andrew as well as Nott receiving the awards.

WITH: Intrepid Sea-Air-Space Award presented at the first annual ceremony. Includes a program signed by co-honorees Alan Bean and Martin Bowen.
AND WITH: The Explorers Club medallion, with matching tie tack and pin.

$1,000 - 2,000

69

70

69
PROJECT NAZCA ARCHIVE.
Group of material related to the historic balloon flights at Nazca, Peru.
Lot includes:
1. Fabric used for November 1975 Nazca balloon.
2. 2 large pieces of fabric used for December 2002 Nazca balloon.
3. Wooden hook used to tighten the lines on the Nazca 2002 gondola.
4. 2 letters from Jim Woodman regarding the 1975 flight and the subsequent book covering the adventure.
5. 3 copies of Jim Woodman's *Nazca: The Flight of the Condor I,* one of which with Julian Nott's notes.
6. 2 Project Nazca, 1975 patches.
7. Assorted clippings and ephemera.

Project Nazca arose to explore the possibilities of early flight surrounding the mysterious desert lines drawings—vast pre-Incan geometric symbols and drawings etched into the earth. The original 1975 flight was sponsored by the International Explorers Society. Jim Woodman and Julian Nott proceeded to build and successfully fly a balloon using only methods and materials that would have been available to the ancient people of the land. Nott would go on to repeat the flight in 2002 for a Japanese television network.

$1,000 - 1,500

70
TROPHEES MONTGOLFIER AT ANNONAY.
Silver and Bronze trophy, approximately 250 mm tall, 1983[-84], inscribed ("Joseph et Etienne Montgolfier") on the base and ("Annonay 4 Juin 1783 / Trophee 1983 / Famille de Montgolfier Dedit") on the obelisk, crafted by Blanshet, depicting a balloon attached to an obelisk. Lot also includes 2 folders which include the original flight plan and original research for the flight as well as ephemera related to the race at Annonay.

Julian Nott was awarded the Trophees Montgolfier during the bicentennial celebration of first manned balloon flight by the Montgolfier Brothers at Annonay. The object of the contest was to precisely pilot a balloon a specified distance to Annonay. The lot includes the trophy, a small brass award plaque, a signed program for the awards ceremony held in June 1984, 8 team patches for Nott and teammate Max Steuer, a Montgolfier bicentennial pin and a copy of the contest rules. The two included folders are labeled "Flight File" and Annonay General Vol II." The first was apparently carried aboard Nott's balloon and includes information such as distress signals, flight safety messages, plotting charts, technical notes and instructions. The second folder includes information about weather, maps, a diagram of the balloon and details and correspondence for the manufacturing of custom parts. They provide a detailed view of the project.

$1,500 - 2,500

71

72

73

71

TWO FLIGHT SUITS.

Flight suits for 2 of Julian Nott's notable flights:
1. Flight Coverall, Mason & Hall, size 42L, orange nylon, with "Project Nazca / Peru 1975 I.E.S." patch, balloon pilot's wings patch and "Julian Nott" written on manufacturer's tag. The original flight suit for 1975 Nazca Project with Jim Woodman.
2. Flight Coverall, Lille of Telford, size 42, red polyester/cotton blend, with "J&B Scotch Whisky Balloon Team" patch and "Julian Nott" written inside the collar. The original flight suit for Nott's 1983 award winning flight during the Montgolfier Bicentennial race to Annonay.

$1,000 - 2,000

72

CORRESPONDENCE.

Extensive Collection of Letters, Signed Photographs and Ephemera presented to Julian Nott.
Including:
1. ARMSTRONG, NEIL. Typed Letter Signed ("Neil"), 4to, Lebanon, Ohio, May 18, 1997, accompanied by a photograph of Armstrong and Nott together.
2. A piece of cloth from the Century of Progress, the balloon flown by Jean Felix Piccard in 1933 investigating cosmic rays. Presented with a letter from Maureen M. Lynch at Valhalla Aerostation.
3. Flown plastic from STS 51, with note by Nott about its origins.
4. A series of 6 Letters Signed from Jeana Yeager, 1984-1989.
5. A series of 12 Letters Signed from Roxbee Cox, Baron Kings Norton, 1982-1997, accompanied by several pieces of ephemera from their correspondence and friendship.
6. A series of 3 Letters Signed from Malcolm Forbes, 1974-1975 and 5 from Steve Forbes. Accompanied by material related to the elder Forbes's Friendship trip.
Lot also includes a number of further items.

$1,000 - 2,000

73

STRATEX: ALAN EUSTACE.

Collection of material related to the StratEx project, including:
1. Flight Suit, blue Nomex fiber, size 48 regular, manufactured by Flight Suits, with StratEx / Eustace 2014 patch, NASA patch and Nott's name patch.
2. Flight Jacket, black nylon with orange interior, size 2XL, manufactured by Alpha Industries, with StratEx / Eustace 2014 patch, printed StatEx logo, and printed logos for United Parcel Technologies, ILC Dover and Paragon Space Development Corporation, signed by most of the team on the interior lining.
* Lot also includes StratEx golf shirt, patches, medallions, an inscribed book and magazine from Alan Eustace, and a group of signed postcards from Eustace.

Nott was senior balloon consultant for the StratEx project from 2011-2014, Google executive Alan Eustace's team that helped him set the world altitude record for a skydive, jumping from a helium balloon 135,890 feet near the top of the stratosphere, falling 820 mph, 25% faster than the speed of sound.

$1,000 - 1,500

PROPERTY OF VARIOUS OWNERS

74 W

DOUGLAS DC-7C SEVEN SEAS.
CONTRACTOR'S CUTAWAY MODEL, 8 x 24 inches, Douglas, [mid-1950s], with cutaway displaying standard and first class passenger areas as well as restrooms.

Douglas DC-7 was, in 1953, the first commercial airplane to fly a regular non-stop transatlantic flight. The DC-7C Seven Seas was an update on that plane and had the capacity to fly non-stop transatlantic flights.

$500 - 700

74

75 W

BOEING 737 CUTAWAY MODEL.
Contractor's model, 53 x 42 x 50 inches, [mid-1960s], with cutaway windows, on metal tripod stand.
The 737 was at first posited as a shorter, low-cost entry into the commercial jet market, but with its variant models over the years has grown (literally and figuratively) to become the best selling commercial jet historically. The present model features cutaway windows that display the cabin and the cockpit.

$2,000 - 3,000

75

76 W

LOCKHEED L-2000 MODEL.
Contractor's model, approximately 51 x 31 inches, on metal stand, [1966 or earlier].
The L-2000 was Lockheed's entry into the U.S. government-funded competition to provide the first supersonic transport (SST). Lockheed's design was abandoned when Boeing's 2707 won the contract in 1966.

$2,000 - 3,000

76

77

77 W

SOVIET SOYUZ SERVICE MODULE.

Contractor's model, approximately 54 x 29.00 inches, [1960s], with cutaway window on body, warning label affixed to body, on wooden base with casters.

Unusual variation on what is likely a Soyuz service module. Early Soviet models, especially of this size, are rarely seen on the market.

$4,000 - 6,000

78 W

DOUGLAS SPACE STATION CABIN MODEL.

Contractor's model, approximately 38 x 16 inches, labeled on wooden base "Douglas Space Cabin Simulator," mid-1960s, with cutaway window showing interior.

Interesting model, most likely produced for the U.S. Air Force Manned Orbiting Laboratory project. The project was to be a single-use laboratory with which crews would be launched on 40-day missions and return to Earth on a Gemini B spacecraft. The program was cancelled in 1969.

$2,000 - 3,000

79 W

SPACE STATION CENTRIFUGE.

Functioning contractor's model, approximately 60 x 39 inches, [1960s], engraved metal plaque reading "Centrifuge Section / Large Orbital Research Laboratory," being an electrically powered model, in operational condition.

This concept for a rotating environment laboratory that would induce artificial gravity on a space station features two revolving wheels, one clockwise, the other counter, each with four pods. One pod has a cutaway window that shows a single figure within. Likely a Douglas Aircraft concept, inspired by the von Braun wheel and proposed to NASA for their never flown Manned Orbiting Laboratory project.

$2,000 - 3,000

78

79

80

80 W

APOLLO COMMAND SERVICE MODULE.

Contractor's model, approximately 16 x 38 inches, [1960s], with removable command module.
Early North American Aviation model of the CSM showing minimal detail although demonstrating well the modular concept with the removable command module. Rarely seen.

$4,000 - 6,000

81

81

APOLLO 8.

Apollo 8 Onboard All Mags. 16 mm film reel, [NASA, 1968]. Color print film, on grey metal reel, 268 mm diameter, in canister with applied label indicating the length (715 feet). Some dust and spotting to canister, otherwise fine.

The Apollo 8 onboard camera captured views of Earth from orbit, the lunar surface, and the crew — Frank Borman, James Lovell, and William Anders — inside the Command and Service Module.

$1,000 - 2,000

82

82 W

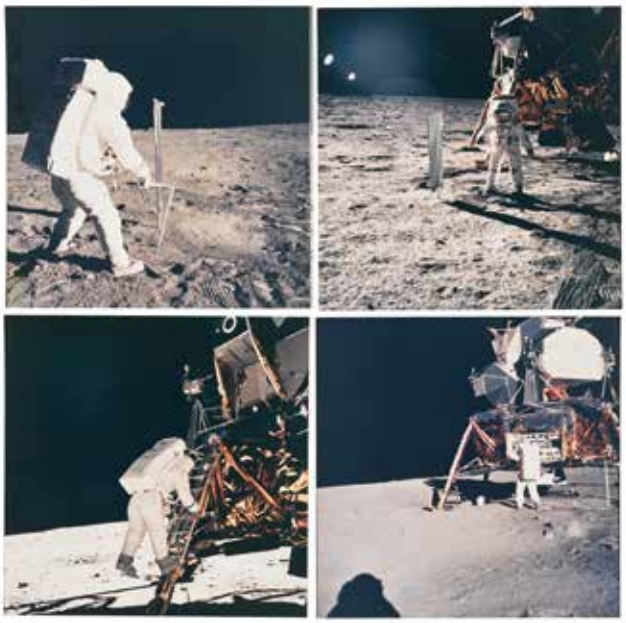
LUNAR GLOBE.

Visual-Relief Lunar Globe. Chicago: Denoyer-Geppert, May, 1969. 16-inch lunar globe, 1:8,533,150 scale, 21¾" tall on stand. Printed paper gores showing the lunar surface in raised relief; surmounted by a metal finial; the half-circular brass meridian fork holding a rotating calibrated meridian; and with conforming flat band moveable calibrated mylar scale between the North and South Poles; raised on a faux-wood grained domed round metal base.
Provenance: Jet Propulsion Laboratory scientist Dr. Conway W. Snyder.

FIRST EDITION. "In 1969, to commemorate the Apollo 10 mission, Denoyer Geppert designed a special lunar globe that the astronauts of the mission presented to President Nixon. Contracted by NASA, Denoyer Geppert created the first complete Moon globe, using the Apollo 10 film footage and photographs of the far side of the moon. 200 first edition globes of this type were produced, the first of which went to President Nixon and four others to special members of Congress" (American Globe Preservation Society, AMGS Newsletter, March 2012, p 4).

$4,000 - 6,000

83



84

85

83
APOLLO 11.
Apollo 11 Mission Film, Mags K, G, H, B, D, E, F. 16 mm film reel, [NASA, 1969]. Color print film, on gray metal reel, 305 mm diameter, in canister with applied label indicating the length (830 feet). Some scuffs and tape residue to canister, minor corrosion on reel.

This 16 mm print includes some of the most iconic motion picture images captured during Apollo 11's historic flight to the Moon, including parts of the moonwalk, the ascent from the Lunar surface, activities inside the Lunar Module and Command and Service Module, and panoramic views of the Lunar surface.

$2,000 - 3,000

84
APOLLO 11.
Group of 10 official photos of the moon landing, NASA [1969], color photographic prints, 203 x 203 mm (8 x 8 inches) each, depicting lunar surface operations by Armstrong and Aldrin, without captions or text, the film stock watermarked "*A KODAK PAPER*." Slight hazing to emulsion, otherwise fine.
Provenance: Delmer M. Ackels, employee at NASA/NOAA Alaska Gilmore Creek Tracking Satellite Station.

The historic first lunar landing mission in July 1969, captured in photographs taken by the astronauts. These prints were made available to NASA employees after the mission. Accompanied by three notarized letters of provenance.

$1,000 - 1,500

85
APOLLO PROGRAM RED NUMBER PHOTOGRAPHS.
Collection of 8 x 10 inch "red number" color photographs of Apollo 11, Apollo 12 and Apollo 15 projects, as follows:

1. Apollo 11: 4 photo prints.
2. Apollo 12: 27 photo prints.
3. Apollo 15: 17 photo prints.
Provenance: Jet Propulsion Laboratory scientist Dr. Conway W. Snyder.

Predominantly lunar EVA shots. All with stamped red numbers at upper left corners.

$1,000 - 2,000

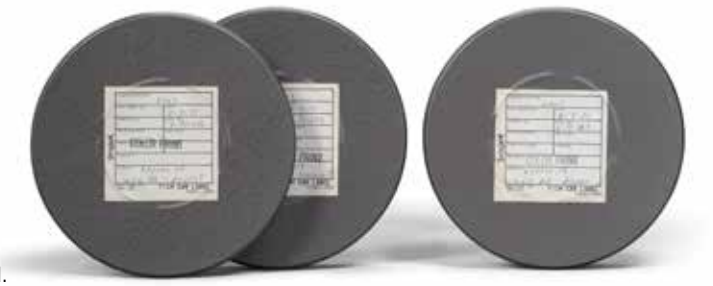
86

APOLLO 15 FILM GROUP.

Collection of 70mm and 16mm film positives.
Including:
1. 7 individually wrapped 70mm rolls, each with original printed label. Includes magazines: LL, MM, OO, PP, RR, SS & WW.
2. 70mm spool containing magazines KK, TT, NN.
3. 3 16mm color reels, each in metal cannister with original NASA-MSC label. Includes: “Mag BB Ascent,” “Mag EE Lunar Surface” and “Mag AA Descent.”
Provenance: Jet Propulsion Laboratory scientist Dr. Conway W. Snyder.

Apollo 15 was the 4th manned mission that landed on the moon. It was the first to use the Lunar Roving Vehicle. The above positives include both the 70mm Hasselblad positives in color and black and white where applicable and include footage of all three EVAs on the lunar surface as well as footage of Lunar orbit and the Transearth coast. The 16mm film is all color footage of the ascent and descent of the Apollo spacecraft as well footage of the lunar surface.

$3,000 - 5,000



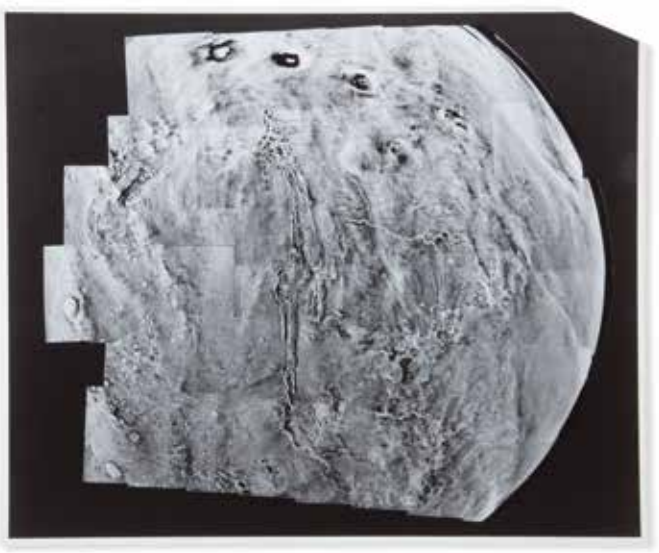
86

87

MOSAIC IMAGES OF MARS.

51 large format silver gelatin photographs, most mosaic images of the surface of Mars, 13 1/4 x 19 1/2 to 20 x 24 images, with large format color print, 14 x 18 inches, of the surface of Mars, a few with corners clipped, some penciled annotations on the verso, generally good condition.
Provenance: Jet Propulsion Laboratory scientist Dr. Conway W. Snyder. Dr. Snyder served as Project Scientist on Viking Mars and was considered the most knowledgeable person on the red planet.

$2,000 - 3,000



87

88 W

MARINER 9 MARS GLOBE.

Visual-Relief Mariner-9 Mars Globe. Chicago: Denoyer-Geppert, 1973.
16-inch diameter globe, 1:16,700,000 scale, loosely set on original wooden stand.
Provenance: Jet Propulsion Laboratory scientist Dr. Conway W. Snyder, Project Scientist on Viking Mars.

FIRST EDITION. Mariner 9, launched on May 30, 1971, was the first space vehicle to orbit another planet. Among its many tasks was to photograph 70% of the Mars surface, but it ended up exceeding its target capturing 85%, greatly expanding knowledge of the red planet. The present globe was created using the 7329 images that the space probe had transmitted to Earth.

$2,000 - 3,000

88

89

89

MARS-MARINER 9.

Mosaic of 4 photographs of the Martian surface, gelatin silver prints, depicting Olympus Mons, laid down to a black mat board, approximately 260 x 210 mm. Framed and glazed.

Photographed from *Mariner 9*, January 1973.

$800 - 1,200

90

90

MERCURY-MARINER 10.

Mosaic of 10 photographs of the surface of Mercury. Gelatin silver prints, approximately 370 x 220 mm collectively, hinged to black mat board, watermarked *THIS PAPER MANUFACTURED BY KODAK* on verso. Framed and glazed.

Shot from *Mariner 10*, March, 1974.

$1,500 - 2,500

91

91

VIKING PROJECT SLIDE COLLECTION.

3 metal slide containers, NASA, Langley Research Center, Hampton, Virginia, 1970s, labeled: “Early Langley Viking Master Set A-P”; “Langley/Early Viking Master Set Q-S / Some Early Duplicates”; “Miscellaneous Langley Slides—Some Probably Duplicates,” each case with inventory sheet inside lid.
Provenance: Jet Propulsion Laboratory scientist Dr. Conway W. Snyder, who served as Project Manager on Viking Mars.

Presentation slides detailing various aspects of the Viking program to send space probes to Mars. The program provided much of data on the planet in the 1990s and 2000s.

$2,000 - 3,000

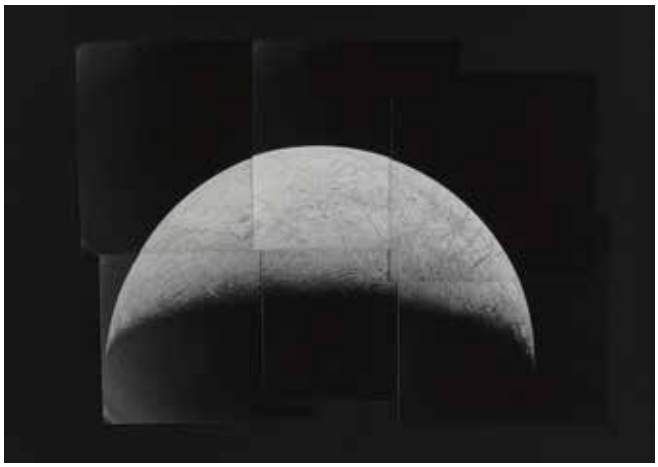
92

JUPITER-EUROPA VOYAGER 2.

Mosaic of 6 photographs of Jupiter's moon, Europa. Gelatin silver prints, approximately 190 x 270 mm collectively, hinged to black mat board, watermarked *THIS PAPER MANUFACTURED BY KODAK* on verso. Framed and glazed.

Photographed by *Europa Voyager 2*, June 1979.

$1,000 - 2,000



92

93 W

SATURN ROCKET CONCEPT MODEL.

Contractor's model, approximately 52 x 18 inches, [mid-to-late 1950s], plaque on wooden base reading: "Saturn / C-I Configuration."

Unusual concept model likely from the early days of development. It bears little resemblance the Saturn rockets that followed and is possibly an early model to test the booster stage as the upper stage appears too narrow to carry a payload.

$1,200 - 1,800

94 W

THOR BALLISTIC MISSILE.

Contractor's model, approximately 52 inches tall, [1950s], label absent from base.

Thor, named after the Norse god of thunder, was the first operational U.S. Air Force ballistic missile. They had a maximum range of 1,500 miles and maximum speed of 11,020 mph. A rare early model.

$800 - 1,200

93

94

95

96

95 W

ATLAS ROCKET.

Electric contractor's model, approximately 30 x 22 x 80 inches, [1960s], transparent and wired to illuminate each section, on wooden base and with remote control box.
Unusual showpiece model with separately lit sections and a center area with variable speed rotating lights. The Atlas rockets were the largest and most powerful of their time, hence its naming after a titan from Greek mythology. The series was most notably used in Project Mercury.

$3,000 - 5,000

96 W

ATLAS ROCKET.

Contractor's model, approximately 118 x 28 inches, [1960s], Air Force and American Flag labels to exterior.
Unidentified Atlas family rocket with what appear to be conceptual retractable fins.
Please note: due to size constraints, this piece will be only available to preview in Los Angeles. Contact the department for further information.

$2,000 - 3,000

97

98

99

97 W

GROUP OF 3 DELTA ROCKET MODELS.

3 contractor models, tallest approximately 24 inches tall, [early 1960s], manufactured by Douglas.
The Delta B was an expendable launch system responsible for sending both the Syncom-1 and the Syncom-2, the first geosynchronus satellite. The remaining two rockets are Delta D, or Thrust Augmented Delta, which are notable for having sent up the first geostationary communications satellite, Syncom-3.

$2,500 - 4,000

98 W

DOUGLAS THORAD.

Contractor's model, approximately 139 x 43 inches, circa mid-1960s, NASA decal on the body, engraved brass label on the base reading: "Douglas Thorad / Thor Space Vehicle," being a concept for a Thor family rocket, with 3 variants on the base surrounding the main rocket, on casters.

Impressive concept model for this expendable launch system derived from the Thor and Delta rockets.
Please note: Due to size constraints, this piece will only be available to preview in Los Angeles. Contact the department for further information.

$4,000 - 6,000

99 W

DELTA J.

Contractor's model, approximately 22 tall, [mid-1960s], with engraved metal plaque on base reading: "Douglas / Improved Delta." The Delta J, very similar to the Delta G, was a unique rocket that launched the Explorer 38 into orbit, and the first satellite to study radioastronomy.

$800 - 1,200

100

101

100 W

DELTA M ROCKET.

Contractor's model, approximately 19 inches tall, McDonnell Douglas, [late 1960s], label on wooden base reads: "McDonnell Douglas / DSV-3L / Long Tank Delta."
The Delta L, M and N are all closely related long tank Thor rockets all with 3 Castor 2 boosters. The Delta M was the most flown of the group with 12 successful launches from 1968-1971.

$800 - 1,200

101 W

AIR-TO-AIR MISSILE.

Contractor's model, approximately 16 x 13 x 24 inches, [1970s?], on metal stand, painted green, gray and black with "United States" and U.S. Air Force logo labels.
Unidentified U.S. Air Force missile with a distinctive split air inlet duct.

$1,000 - 2,000

102 W

ROCKETS.

Group of 5 contractor's models, approximately 35 to 41 inches tall, [late 1950s-1960s].
1. Nike Zeus, label on base reading: "*U.S. Army / Nike-Zeus / Anti-Missile Missile.*"
2. Delta D.
3. Delta M.
4. Unidentified missile possibly in the Nike Zeus family.
5. Unidentified rocket.

$1,500 - 2,500

102

103 W

ROCKETS.

Group of 6 models, 18 to 24 inches.
1. US Navy Polaris, Aerojet, [1960s].
2. Apollo Command Service Module, North American Rockwell Corporation, [mid-to-late 1960s].
3. Delta D, Douglas, [1960s].
4. Delta B, Douglas, [1960s].
5. Unidentified pair of rockets, machined aluminum attached to a single base.
6. R-7 Semyorka, [1960s?].

$1,500 - 2,500

104 W

ROCKETS.

Group of 4 contractor's models, approximately 52 to 46 inches tall, Douglas, [1960s].
1. Delta D, with engraved label on base reading: "Douglass / Thrust Augmented Delta."
2. Delta D, a slight variant on the previous, without label.
3. Thor Delta.
4. Thor Agena, with metal Douglas emblem and engraved label reading "Agena" on base.

$1,500 - 2,500

105 W

DOUGLAS HOOVERCRAFT MODEL.

Contractor's model, approximately 10 x 38 x 16 inches, [c.1967], "Douglas," "VRC," and "Maritime Administration / Department of Commerce" labels to fin and body.
Early concept model for a hovercraft likely funded by MARAD as evidenced by the label on the body and apparently prepared pre-McDonnell Douglas. There is no evidence this ever made it out of the concept phase, the main issue likely being that the U.S. military struggled to find a use for them.

$1,000 - 2,000

103

105

104

Bonhams

AUCTIONEERS SINCE 1793

Conflicts of the 20th Century

Online | December 2 - 12, 2019

PREVIEW
December 1 - 4
and by appointment

INQUIRIES
+1 (917) 206 1640
tom.lamb@bonhams.com
bonhams.com/books

FROM THE COLLECTION OF DR. EDWARD B. DOLL

A GREEN SAFETY PLUG AND A RED ARMING PLUG FROM "LITTLE BOY," L-11, ABOARD THE *ENOLA GAY*, AUGUST 7, 1945
$50,000 - 80,000

Bonhams

AUCTIONEERS SINCE 1793

Music Memorabilia

Los Angeles | December 10, 2019

PREVIEW
December 5 - 9

INQUIRIES
+1 (415) 503 3205
giles.moon@bonhams.com
bonhams.com/entertainment

AN EARLY IKE AND TINA TURNER REVUE CONCERT POSTER, 1960
$1,000 - 1,500

Bonhams

AUCTIONEERS SINCE 1793

Fine Instruments of Science and Technology

Montpelier Street, London | 30 September 2020

CLOSING DATE FOR ENTRIES
19 August 2020

ENQUIRIES
Jon Baddeley
+44 (0) 20 7393 3872
jon.baddeley@bonhams.com

bonhams.com/scientific

A CULPEPER-TYPE COMPOUND MONOCULAR MICROSCOPE ENGLISH, CIRCA 1740
£6,000 - 10,000 *

AN EDMUND CULPEPER COMPOUND MONOCULAR MICROSCOPE ENGLISH, CIRCA 1730
£10,000 - 15,000 *

* For details of the charges payable in addition to the final hammer price, please visit bonhams.com/buyersguide

Conditions of sale

The following Conditions of Sale, as amended by any published or posted notices or verbal announcements during the sale, constitute the entire terms and conditions on which property listed in the catalog shall be offered for sale or sold by Bonhams & Butterfields Auctioneers Corp. and any consignor of such property for whom Bonhams acts as agent. By participating in this sale, you agree to be bound by these terms and conditions.

If live online bidding is available for the subject auction, additional terms and conditions of sale relating to online bidding will apply; see www.bonhams.com/WebTerms for the supplemental terms. As used herein, "Bonhams," "we" and "us" refer to Bonhams & Butterfields Auctioneers Corp.

1. As used herein, the term "bid price" means the price at which a lot is successfully knocked down to the buyer. The term "purchase price" means the aggregate of (a) the bid price, (b) a PREMIUM retained by us and payable by the buyer (the "buyer's premium"), EQUAL TO 27.5% OF THE FIRST $3,000 OF THE BID PRICE, 25% OF THE AMOUNT OF THE BID PRICE ABOVE $3,000 UP TO AND INCLUDING $400,000, 20% OF THE AMOUNT OF THE BID PRICE ABOVE $400,000 UP TO AND INCLUDING $4,000,000, AND 13.9% OF THE AMOUNT OF THE BID PRICE OVER $4,000,000, and (c) unless the buyer is exempt by law from the payment thereof, any Alabama, Arizona, California, Colorado, Connecticut, Florida, Georgia, Hawaii, Idaho, Illinois, Iowa, Indiana, Kentucky, Louisiana, Maine, Massachusetts, Michigan, Minnesota, Nevada, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Rhode Island, Texas, Utah, Virginia, Washington, D.C., Washington , Wisconsin, Wyoming or other state or local sales tax (or compensating use tax) and other applicable taxes. With regard to New York sales tax, please refer to the "Sales and Use Tax" section of these Conditions of Sale.

2. In order to bid at the sale, prospective bidders must submit to Bonhams a completed bidder registration form (appearing at the end of this catalog) and any other requested information or references. New bidders and bidders who have not recently updated their registration information must pre-register to bid at least two business days before the sale. Individuals will be required to provide government-issued proof of identity and proof of address. Entity clients will be required to provide documentation including confirmation of entity registration showing the registered name, confirmation of registered address, documentary proof of officers and beneficial owners, proof of authority to transact on behalf of the entity and government-issued proof of identity for the individual who is transacting on the entity's behalf.

We may also request a financial reference and /or deposit from bidders before approving the bidder registration. In the event a deposit is submitted and you are not the successful bidder, your deposit will be returned to you. If you are the successful bidder, any such deposit will be credited to offset the appropriate portion of the purchase price.

We reserve the right to request further information, including regarding the source of funds, in order to complete bidder identification and registration procedures (including completing any anti-money laundering and/or anti-terrorism financing checks we may require) to our satisfaction. If our bidder identification and registration procedures are not satisfied, we may, in our sole discretion, decline to register any bidder or reject any bid or cancel any sale to such bidder.

Every bidder shall be deemed to act as a principal unless prior to the commencement of the sale there is a written acceptance by Bonhams of a bidder registration form completed and signed by the principal which clearly states that the authorized bidding agent is acting on behalf of the named principal. Absent such written acceptance by Bonhams, any person placing a bid as agent on behalf of another (whether or not such person has disclosed that fact or the identity of the principal) may be jointly and severally liable with the principal under any contract resulting from the acceptance of a bid. Every bidder shall be responsible for any use of its assigned paddle or bidding account, regardless of the circumstances.

3. You represent and warrant that: (i) you have provided us with true and correct copies of valid identification and proof of residence and, if applicable, financial and/or corporate documents; (ii) neither you, your principal (if applicable, and subject to Bonhams' prior written acceptance pursuant to paragraph 2 above), nor any individual or entity with a beneficial or ownership interest in either or in the purchase transaction is on the Specially Designated Nationals List maintained by the Office of Foreign Assets Control of the U.S. Department of the Treasury nor subject to any other sanctions or embargo program or regulation in effect in the United States, European Union, England and Wales, or other applicable jurisdictions; (iii) if you are acting as an agent for a principal, you have conducted appropriate due diligence into such principal, and agree that Bonhams shall be entitled to rely upon such due diligence, you will retain adequate records evidencing such due diligence for a period of five (5) years following the consummation of the sale, and will make these records available for inspection upon Bonhams' request; (vi) neither the purchase transaction (including your bidding activity) nor the purchase funds are connected with nor derive from any criminal activity, and they are not designed to nor have they or shall they, violate the banking, anti-money laundering, or currency transfer laws or other regulations (including without limitation, import-export laws) of any country or jurisdiction, or further any other unlawful purpose, including without limitation collusion, anti-competitive activity, tax evasion or tax fraud.

You acknowledge and agree that we may rely upon the accuracy and completeness of the foregoing warranties.

4. On the fall of the auctioneer's hammer, the highest bidder shall have purchased the offered lot in accordance and subject to compliance with all of the conditions set forth herein and (a) assumes full risk and responsibility therefor, (b) if requested will sign a confirmation of purchase, and (c) will pay the purchase price in full or such part as we may require for all lots purchased. No lot may be transferred.

Unless otherwise agreed, payment in good, cleared funds is due and payable within five (5) business days following the auction sale. Whenever the buyer pays only a part of the total purchase price for one or more lots purchased, we may apply such payments, in our sole discretion, to the lot or lots we choose. Payment will not be deemed made in full until we have received good, cleared funds for all amounts due. Title in any purchased property will not pass until full and final payment has been received by Bonhams. Accounts must be settled in full before property is released to the buyer. In the event property is released earlier, such release will not affect the passing of title or the buyer's obligation to timely remit full payment.

We reserve the right to refuse to accept payment from a source other than the registered bidder or buyer of record. Once an invoice is issued, we cannot change the buyer's name on an invoice.

Payment for purchases must be made in the currency in which the sale is conducted and may be made in or by (a) cash, up to the amount of US $5,000 (whether by single or multiple related payments), or the equivalent in the currency in which the sale is conducted, (b) cashier's check or money order, (c) personal check with approved credit drawn on a U.S. bank, (d) wire transfer or other immediate bank transfer, or (e) Visa, MasterCard, American Express or Discover credit, charge or debit card, provided that the registered bidder or buyer's name is printed on the card. A processing fee will be assessed on any returned checks.

To the fullest extent permitted by applicable law, the buyer grants us a security interest in the property, and we may retain as collateral security for the buyer's obligations to us, any property and all monies held or received by us for the account of the buyer, in our possession. We also retain all rights of a secured party under the California Commercial Code, and you agree that we may file financing statements without your signature. If the foregoing conditions or any other applicable conditions herein are not complied with, in addition to all other remedies available to us and the consignor by law, we may at our election: (a) hold the buyer liable for the full purchase price and any late charges, collection costs, attorneys' fees and costs, expenses and incidental damages incurred by us or the consignor arising out of the buyer's breach; (b) cancel the sale, retaining as liquidated damages all payments made by the buyer; and/or (c) cancel the sale and/or resell the purchased property, at public auction and/or by private sale, and in such event the buyer shall be liable for the payment of all consequential damages, including any deficiencies or monetary losses, and all costs and expenses of such sale or sales, our commissions at our standard rates, all other charges due hereunder, all late charges, collection costs, attorneys' fees and costs, expenses and incidental damages. In addition, where two or more amounts are owed in respect of different transactions by the buyer to us, to Bonhams 1793 Limited and/or to any of our other affiliates, subsidiaries or parent companies worldwide within the Bonhams Group, we reserve the right to apply any monies paid in respect of a transaction to discharge any amount owed by the buyer. If all fees, commissions, premiums, bid prices and other sums due to us from the buyer are not paid promptly as provided in these Conditions of Sale, we reserve the right to impose a finance charge equal to 1.5% per month (or, if lower, the maximum nonusurious rate of interest permitted by applicable law), on all amounts due to us beginning on the 31st day following the sale until payment is received, in addition to other remedies available to us by law.

5. We reserve the right to withdraw any property and to divide and combine lots at any time before such property's auction. Unless otherwise announced by the auctioneer at the time of sale, all bids are per lot as numbered in the catalog and no lots shall be divided or combined for sale.

6. We reserve the right to reject a bid from any bidder, to split any bidding increment, and to advance the bidding in any manner the auctioneer may decide. In the event of any dispute between bidders, or in the event the auctioneer doubts the validity of any bid, the auctioneer shall have sole and final discretion either to determine the successful bidder, re-open the bidding, or to cancel the sale and re-offer and resell the article in dispute. If any dispute arises after the sale, our sales records shall be conclusive in all respects.

We further reserve the right to cancel the sale of any property if (i) you are in breach of your representations and warranties as set forth in paragraph 3 above; (ii) we, in our sole discretion, determine that such transaction might be unlawful or might subject Bonhams or the consignor to any liability to any third party; or (iii) there are any other grounds for cancellation under these Conditions of Sale.

7. If we are prevented by fire, theft or any other reason whatsoever from delivering any property to the buyer or a sale otherwise cannot be completed, our liability shall be limited to the sum actually paid therefor by the buyer and shall in no event include any compensatory, incidental or consequential damages.

8. All lots in the catalog are offered subject to a reserve unless otherwise indicated in the catalog. The reserve is the confidential minimum bid price at which such lot will be sold and it does not to exceed the low estimate value for the lot. If a lot is offered subject to a reserve, we may implement such reserve by bidding on behalf of the consignor, whether by opening bidding or continuing bidding in response to other bidders until reaching the reserve. If we have an interest in an offered lot and the proceeds therefrom other than our commissions, we may bid up to the reserve to protect such interest. If the auctioneer determines that any opening or subsequent bid is below the reserve for a lot, (s)he may reject such opening bid and withdraw the item from sale. CONSIGNORS ARE NOT ALLOWED TO BID ON THEIR OWN ITEMS.

9. Other than as provided in the Limited Right of Rescission with respect to identification of authorship, all property is sold "AS IS" and any statements contained in the catalog or in any advertisement, bill of sale, announcement, condition report, invoice or elsewhere as to period, culture, source, origin, media, measurements, size, quality, rarity, provenance, importance, exhibition and literature of historical relevance, merchantability, fitness for a particular purpose, or physical condition ARE QUALIFIED STATEMENTS OF OPINION AND NOT REPRESENTATIONS, WARRANTIES, OR ASSUMPTION OF LIABILITY. Neither Bonhams nor the consignor shall be responsible for any error or omission in the catalog description of any property. No employee or agent of Bonhams is authorized to make on our behalf or on that of the consignor any representation or warranty, oral or written, with respect to any property.

10. All purchased property shall be removed from the premises at which the sale is conducted by the date(s) and time(s) set forth in the "Buyer's Guide" portion of this catalog. If not so removed, daily storage fees will be payable to us by the buyer as set forth therein. We reserve the right to transfer property not so removed to an offsite warehouse at the buyer's risk and expense, as set forth in more detail in the "Buyer's Guide." Packing and handling of purchased lots are the responsibility of the buyer and at the buyer's entire risk, as are the identification, application for, and cost(s) of obtaining of any necessary export, import, restricted material (e.g. endangered species) or other permit for such lots.

For an additional fee, Bonhams may provide packing and shipping services for certain items as noted in the "Buyer's Guide" section of the catalog.

11. The copyright in the text of the catalog and the photographs, digital images and illustrations of lots in the catalog belong to Bonhams or our licensors. You will not reproduce or permit anyone else to reproduce such text, photographs, digital images or illustrations without our prior written consent. Bonhams and the consignor make no representation or warranty as to whether the buyer acquires any copyrights on the purchase of an item of Property.

12. Bonhams may, in our discretion, as a courtesy and free of charge, execute bids on your behalf if so instructed by you, provided that neither Bonhams nor our employees or agents will be liable for any error or default (whether human or otherwise) in doing so or for failing to do so. Without limiting the foregoing, Bonhams (including our agents and employees) shall not be responsible for any problem relating to telephone, online, or other bids submitted remotely through any means, including without limitation, any telecommunications or internet fault or failure, or breakdown or problems with any devices or online platforms, including third-party online platforms, regardless of whether such issue arises with our, your, or such third-party's technology, equipment, or connection. By participating at auction by telephone or online, bidders expressly consent to the recording of their bidding sessions and related communications with Bonhams and our employees and agents, and acknowledge their acceptance of these Conditions of Sale as well as any additional terms and conditions applicable to any such bidding platform or technology.

13. These Conditions of Sale shall bind the successors and assigns of all bidders and buyers and inure to the benefit of our successors and assigns. No waiver, amendment or modification of the terms hereof (other than posted notices or oral announcements during the sale) shall bind us unless specifically stated in writing and signed by us. No act or omission of Bonhams, its employees or agents, nor any failure thereof to exercise any remedy hereunder, shall operate or be deemed to operate as a waiver of Bonhams' rights under these Conditions of Sale. If any part of these Conditions of Sale is for any reason invalid or unenforceable, the rest shall remain valid and enforceable.

14. These Conditions of Sale and the buyer's and our respective rights and obligations hereunder shall be governed by and construed and enforced in accordance with the laws of the State of California. Any dispute, controversy or claim arising out of or relating to this agreement, or the breach, termination or validity thereof, brought by or against Bonhams (but not including claims brought against the consignor by the buyer of lots consigned hereunder) shall be resolved by the procedures set forth below.

15. You accept and agree that Bonhams will hold and process your personal information and may share and use it as required by law and as described in, and in line with Bonhams' Privacy Policy, available at website at www.bonhams.com/legals/. If you desire access, update, or restriction to the use of your personal information, please email data.protection@bonhams.com.

SALES AND USE TAX

New York sales tax is charged on the hammer price, buyer's premium and any other applicable charges on any property collected or delivered in New York State, regardless of the state or country in which the buyer resides or does business. Buyers who make direct arrangements for collection by a shipper who is considered a "private" or "contract" carrier by the New York Department of Taxation and Finance will be charged New York sales tax, regardless of the destination of the property. Property collected for delivery to a destination outside of New York by a shipper who is considered a "common carrier" by the New York Department of Taxation and Finance (e.g. United States Postal Service, United Parcel Service, and FedEx) is not subject to New York sales tax, but if it is delivered into any state in which Bonhams is registered or otherwise conducts business sufficient to establish a nexus, Bonhams may be required by law to collect and remit the appropriate sales tax in effect in such state. Property collected for delivery outside of the United States by a freight-forwarder who is registered with the Transportation Security Administration ("TSA") is not subject to New York sales tax.

MEDIATION AND ARBITRATION PROCEDURES

(a) Within 30 days of written notice that there is a dispute, the parties or their authorized and empowered representatives shall meet by telephone and/or in person to mediate their differences. If the parties agree, a mutually acceptable mediator shall be selected and the parties will equally share such mediator's fees. The mediator shall be a retired judge or an attorney familiar with commercial law and trained in or qualified by experience in handling mediations. Any communications made during the mediation process shall not be admissible in any subsequent arbitration, mediation or judicial proceeding. All proceedings and any resolutions thereof shall be confidential, and the terms governing arbitration set forth in paragraph (c) below shall govern.

(b) If mediation does not resolve all disputes between the parties, or in any event no longer than 60 days after receipt of the written notice of dispute referred to above, the parties shall submit the dispute for binding arbitration before a single neutral arbitrator. Such arbitrator shall be a retired judge or an attorney familiar with commercial law and trained in or qualified by experience in handling arbitrations. Such arbitrator shall make all appropriate disclosures required by law. The arbitrator shall be drawn from a panel of a national arbitration service agreed to by the parties, and shall be selected as follows: (i) If the national arbitration service has specific rules or procedures, those rules or procedures shall be followed; (ii) If the national arbitration service does not have rules or procedures for the selection of an arbitrator, the arbitrator shall be an individual jointly agreed to by the parties. If the parties cannot agree on a national arbitration service, the arbitration shall be conducted by the American Arbitration Association, and the arbitrator shall be selected in accordance with the Rules of the American Arbitration Association. The arbitrator's award shall be in writing and shall set forth findings of fact and legal conclusions.

(c) Unless otherwise agreed to by the parties or provided by the published rules of the national arbitration service:

(i) the arbitration shall occur within 60 days following the selection of the arbitrator;

(ii) the arbitration shall be conducted in the designated location, as follows: (A) in any case in which the subject auction by Bonhams took place or was scheduled to take place in the State of New York or Connecticut or the Commonwealth of Massachusetts, the arbitration shall take place in New York City, New York; (B) in all other cases, the arbitration shall take place in the city of San Francisco, California; and

(iii) discovery and the procedure for the arbitration shall be as follows:

(A) All arbitration proceedings shall be confidential;

(B) The parties shall submit written briefs to the arbitrator no later than 15 days before the arbitration commences;

(C) Discovery, if any, shall be limited as follows: (I) Requests for no more than 10 categories of documents, to be provided to the requesting party within 14 days of written request therefor; (II) No more than two (2) depositions per party, provided however, the deposition(s) are to be completed within one (1) day; (III) Compliance with the above shall be enforced by the arbitrator in accordance with California law;

(D) Each party shall have no longer than eight (8) hours to present its position. The entire hearing before the arbitrator shall not take longer than three (3) consecutive days;

(E) The award shall be made in writing no more than 30 days following the end of the proceeding. Judgment upon the award rendered by the arbitrator may be entered by any court having jurisdiction thereof.

To the fullest extent permitted by law, and except as required by applicable arbitration rules, each party shall bear its own attorneys' fees and costs in connection with the proceedings and shall share equally the fees and expenses of the arbitrator.

LIMITED RIGHT OF RESCISSION

If within one (1) year from the date of sale, the original buyer (a) gives written notice to us alleging that the identification of Authorship (as defined below) of such lot as set forth in the **BOLD TYPE** heading of the catalog description of such lot (as amended by any saleroom notices or verbal announcements during the sale) is not substantially correct based on a fair reading of the catalog (including the terms of any glossary contained therein), and (b) within 10 days after such notice returns the lot to us in the same condition as at the time of sale, and (c) establishes the allegation in the notice to our satisfaction (including by providing one or more written opinions by recognized experts in the field, as we may reasonably require), then the sale of such lot will be rescinded and, unless we have already paid to the consignor monies owed him in connection with the sale, the original purchase price will be refunded.

If, prior to receiving such notice from the original buyer alleging such defect, we have paid the consignor monies owed him in connection with the sale, we shall pay the original buyer the amount of our commissions, any other sale proceeds to which we are entitled and applicable taxes received from the buyer on the sale and make demand on the consignor to pay the balance of the original purchase price to the original buyer. Should the consignor fail to pay such amount promptly, we may disclose the identity of the consignor and assign to the original buyer our rights against the consignor with respect to the lot the sale of which is sought to be rescinded. Upon such disclosure and assignment, any liability of Bonhams as consignor's agent with respect to said lot shall automatically terminate.

The foregoing limited right of rescission is available to the original buyer only and may not be assigned to or relied

Conditions of sale - continued

upon by any subsequent transferee of the property sold. The buyer hereby accepts the benefit of the consignor's warranty of title and other representations and warranties made by the consignor for the buyer's benefit. Nothing in this section shall be construed as an admission by us of any representation of fact, express or implied, obligation or responsibility with respect to any lot. THE BUYER'S SOLE AND EXCLUSIVE REMEDY AGAINST BONHAMS FOR ANY REASON WHATSOEVER IS THE LIMITED RIGHT OF RESCISSION DESCRIBED IN THIS SECTION.

"Authorship" means only the identity of the creator, the period, culture and source or origin of the lot, as the case may be, as set forth in the **BOLD TYPE** heading of the print catalog entry. The right of rescission does not extend to: (a) works of art executed before 1870 (unless these works are determined to be counterfeits created since 1870), as this is a matter of current scholarly opinion which can change; (b) titles, descriptions, or other identification of offered lots, which information normally appears in lower case type below the **BOLD TYPE** heading identifying the Authorship; (c) Authorship of any lot where it was specifically mentioned that there exists a conflict of specialist or scholarly opinion regarding the Authorship of the lot at the time of sale; (d) Authorship of any lot which as of the date of sale was in accordance with the then generally-accepted opinion of scholars and specialists regarding the same; or (e) the identification of periods or dates of creation in catalog descriptions which may be proven inaccurate by means of scientific processes that are not generally accepted for use until after publication of the catalog in which the property is offered or that were unreasonably expensive or impractical to use at the time of such publication.

LIMITATION OF LIABILITY

EXCEPT AS EXPRESSLY PROVIDED ABOVE, ALL PROPERTY IS SOLD "AS IS." NEITHER BONHAMS NOR THE CONSIGNOR MAKES ANY REPRESENTATION

OR WARRANTY, EXPRESS OR IMPLIED, AS TO THE MERCHANTABILITY, FITNESS OR CONDITION OF THE PROPERTY OR AS TO THE CORRECTNESS OF DESCRIPTION, GENUINENESS, ATTRIBUTION, PROVENANCE OR PERIOD OF THE PROPERTY OR AS TO WHETHER THE BUYER ACQUIRES ANY COPYRIGHTS OR OTHER INTELLECTUAL PROPERTY RIGHTS IN LOTS SOLD OR AS TO WHETHER A WORK OF ART IS SUBJECT TO THE ARTIST'S MORAL RIGHTS OR OTHER RESIDUAL RIGHTS OF THE ARTIST. THE BUYER EXPRESSLY ACKNOWLEDGES AND AGREES THAT IN NO EVENT SHALL BONHAMS BE LIABLE FOR ANY DAMAGES INCLUDING, WITHOUT LIMITATION, ANY COMPENSATORY, INCIDENTAL OR CONSEQUENTIAL DAMAGES. IN NO EVENT SHALL THE AGGREGATE LIABILITY OF BONHAMS AND ITS CONSIGNOR TO A PURCHASER EXCEED THE PURCHASE PRICE ACTUALLY PAID FOR A DISPUTED ITEM OF PROPERTY.

Seller's guide

SELLING AT AUCTION

Bonhams can help you every step of the way when you are ready to sell art, antiques and collectible items at auction. Our regional offices and representatives throughout the US are available to service all of your needs. Should you have any further questions, please visit our website at **www.bonhams.com/us** for more information or call our Client Services Department at +1 (212) 644 9001.

AUCTION ESTIMATES

The first step in the auction process is to determine the auction value of your property. Bonhams' world-renowned specialists will evaluate your special items at no charge and in complete confidence. You can obtain an auction estimate in many ways:

- Attend one of our Auction Evaluation Events held regularly at our galleries and in other major metropolitan areas. The updated schedule for Bonhams Auction Evaluation Events is available at **www.bonhams.com/us.**
- Call our Client Services Department to schedule a private appointment at one of our galleries. If you have a large collection, our specialists can travel, by appointment, to evaluate your property on site.
- Send clear photographs to us of each individual item, including item dimensions and other pertinent information with each picture. Photos should be sent to Bonhams' address in envelopes marked as "photo auction estimate". Alternatively, you can submit your request using our online form at **www.bonhams.com/us**. Digital images may be attached to the form. Please limit your images to no more than five (5) per item.

CONSIGNING YOUR PROPERTY

After you receive an estimate, you may consign your property to us for sale in the next appropriate auction. Our staff assists you throughout the process, arranging transportation of your items to our galleries (at the consignor's expense), providing a detailed inventory of your consignment, and reporting the prices realized for each lot. We provide secure storage for your property in our warehouses and all items are insured throughout the auction process. You will receive payment for your property approximately 35 days after completion of sale.

Sales commissions vary with the potential auction value of the property and the particular auction in which the property is offered. Please call us for commission rates.

PROFESSIONAL APPRAISAL SERVICES

Bonhams' specialists conduct insurance and fair market value appraisals for private collectors, corporations, museums, fiduciaries and government entities on a daily basis. Insurance appraisals, used for insurance purposes, reflect the cost of replacing property in today's retail market. Fair market value appraisals are used for estate, tax and family division purposes and reflect prices paid by a willing buyer to a willing seller.

When we conduct a private appraisal, our specialists will prepare a thorough inventory listing of all your appraised property by category. Valuations, complete descriptions and locations of items are included in the documentation.

Appraisal fees vary according to the nature of the collection, the amount of work involved, the travel distance, and whether the property is subsequently consigned for auction.

Our appraisers are available to help you anywhere and at any time. Please call our Client Services Department to schedule an appraisal.

ESTATE SERVICES

Since 1865, Bonhams has been serving the needs of fiduciaries – lawyers, trust officers, accountants and executors – in the disposition of large and small estates. Our services are specially designed to aid in the efficient appraisal and disposition of fine art, antiques, jewelry, and collectibles. We offer a full range of estate services, ranging from flexible financial terms to tailored accounting for heirs and their agents to world-class marketing and sales support.

For more information or to obtain a detailed Trust and Estates package, please visit our website at **www.bonhams.com/us** or contact our Client Services Department.

Buyer's guide

BIDDING & BUYING AT AUCTION
Whether you are an experienced bidder or an enthusiastic novice, auctions provide a stimulating atmosphere unlike any other. Bonhams previews and sales are free and open to the public. As you will find in these directions, bidding and buying at auction is easy and exciting. Should you have any further questions, please visit our website at **www.bonhams.com** or call our Client Services Department at +1 (212) 644 9001.

Catalogs
Before each auction we publish illustrated catalogs. Our catalogs provide descriptions and estimated values for each "lot." A lot may refer to a single item or to a group of items auctioned together. The catalogs also include the dates and the times for the previews and auctions. We offer our catalogs by subscription or by single copy. For information on subscribing to our catalogs, you may refer to the subscription form in this catalog, call our Client Services Department, or visit our website at
www.bonhams.com/us.

Previews
Auction previews are your chance to inspect each lot prior to the auction. We encourage you to look closely and examine each object on which you may want to bid so that you will know as much as possible about it. Except as expressly set forth in the Conditions of Sale, items are sold "as is" and with all faults; illustrations in our catalogs, website and other materials are provided for identification only. At the previews, our staff is always available to answer your questions and guide you through the auction process. Condition reports may be available upon request.

Estimates
Bonhams catalogs include low and high value estimates for each lot, exclusive of the buyer's premium and tax. The estimates are provided as an approximate guide to current market value based primarily on previous auction results for comparable pieces, and should not be interpreted as a representation or prediction of actual selling prices. They are determined well in advance of a sale and are subject to revision. Please contact us should you have any questions about value estimates.

Reserves
Unless indicated by the ¤ symbol next to the lot number, which denotes no reserve, all lots in the catalog are subject to a reserve. The reserve is the minimum auction price that the consignor is willing to accept for a lot. This amount is confidential and does not exceed the low estimate value.

Auction House's Interest in Property Offered at Auction
On occasion, Bonhams may offer property in which it has an ownership interest in whole or in part or otherwise has an economic interest. Such property, if any, is identified in the catalog with a ▲ symbol next to the lot number(s).

Bonhams may also offer property for a consignor that has been guaranteed a minimum price for its property by Bonhams or jointly by Bonhams and a third party. Bonhams and any third parties providing a guarantee may benefit financially if the guaranteed property is sold successfully and may incur a financial loss if its sale is not successful. Such property, if any, is identified in the catalog with a ○ symbol next to the lot number(s).

Bidding at Auction
At Bonhams, you can bid in many ways: in person, via absentee bid, over the phone, or via Bonhams' live online bidding facility. Absentee bids can be submitted in person, online, via fax or via email.

Valid Bonhams client accounts are required to participate in bidding activity. You can obtain registration information online, at the reception desk or by calling our Client Services Department.

By bidding at auction, whether in person or by agent, by absentee bid, telephone, online or other means, the buyer or bidder agrees to be bound by the Conditions of Sale.

Lots are auctioned in consecutive numerical order as they appear in the catalog. Bidding normally begins below the low estimate. The auctioneer will accept bids from interested parties present in the saleroom, from telephone bidders, and from absentee bidders who have left written bids in advance of the sale. The auctioneer may also execute bids on behalf of the consignor by placing responsive or consecutive bids for a lot up to the amount of the reserve, but never above it.

We assume no responsibility for failure to execute bids for any reason whatsoever.

In Person
If you are planning to bid at auction for the first time, you will need to register at the reception desk in order to receive a numbered bid card. To place a bid, hold up your card so that the auctioneer can clearly see it. Decide on the maximum auction price that you wish to pay, exclusive of buyer's premium and tax, and continue bidding until your bid prevails or you reach your limit. If you are the successful bidder on a lot, the auctioneer will acknowledge your paddle number and bid amount.

Absentee Bids
As a service to those wishing to place bids, we may at our discretion accept bids without charge in advance of auction online or in writing on bidding forms available from us. "Buy" bids will not be accepted; all bids must state the highest bid price the bidder is willing to pay. Our auction staff will try to bid just as you would, with the goal of obtaining the item at the lowest bid price possible. In the event identical bids are submitted, the earliest bid submitted will take precedence. Absentee bids shall be executed in competition with other absentee bids, any applicable reserve, and bids from other auction participants. A friend or agent may place bids on your behalf, provided that we have received your written authorization prior to the sale. Absentee bid forms are available in our catalogs, online at **www.bonhams.com/us**, at offsite auction locations, and at our San Francisco, Los Angeles and New York galleries.

By Telephone
Under special circumstances, we can arrange for you to bid by telephone. To arrange for a telephone bid, please contact our Client Services Department a minimum of 24 hours prior to the sale.

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We offer live online bidding for most auctions and accept absentee bids online for all our auctions.
Please visit **www.bonhams.com/us** for details.

Bid Increments
Bonhams generally uses the following increment multiples as bidding progresses:

$50-200	by $10s
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The auctioneer may split or reject any bid at any time at his or her discretion as outlined in the Conditions of Sale.

Currency Converter
Solely for the convenience of bidders, a currency converter may be provided at Bonhams' auctions. The rates quoted for conversion of other currencies to U.S. Dollars are indications only and should not be relied upon by a bidder, and neither Bonhams nor its agents shall be responsible for any errors or omissions in the operation or accuracy of the currency converter.

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A buyer's premium is added to the winning bid price of each individual lot purchased, at the rates set forth in the Conditions of Sale. The winning bid price plus the premium constitute the purchase price for the lot. Applicable sales taxes are computed based on this figure, and the total becomes your final purchase price.
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All sales are final and subject to the Conditions of Sale found in our catalogs, on our website, and available at the reception desk.

Payment
All buyers are asked to pay and pick up by 3pm on the business day following the auction. Payment may be made to Bonhams by cash, checks drawn on a U.S. bank, money order, wire transfer, or by Visa, MasterCard, American Express or Discover credit or charge card or debit card. All items must be paid for within 5 business days of the sale. Please note that payment by personal or business check may result in property not being released until purchase funds clear our bank. For payments sent by mail, please remit to Cashier Department, 220 San Bruno Avenue, San Francisco, CA 94103.

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Residents of states listed in Paragraph 1 of the Conditions of Sale must pay applicable sales tax. Other state or local taxes (or compensation use taxes) may apply. Sales tax will be automatically added to the invoice unless a valid resale number has been furnished or the property is shipped via common carrier to destinations outside the states listed in the Conditions of Sale. If you wish to use your resale license please contact Cashiers for our form.

Shipping & Removal
Bonhams can accommodate shipping for certain items. Please contact our Cashiers Department for more information or to obtain a quote. Carriers are not permitted to deliver to PO boxes.

International buyers are responsible for all import/export customs duties and taxes. An invoice stating the actual purchase price will accompany all international purchases.

Collection of Purchases
Please arrange for the packing and transport of your purchases prior to collection at our office. If you are sending a third party shipper, please request a release form from us and return it to +1 (212) 644 9009 prior to your scheduled pickup. To schedule collection of purchases, please call +1 (212) 644 9001.

Handling and Storage Charges
Please note that our office has requirement for freight elevator usage. Please contact us to schedule an elevator appointment for pickup of any large or awkward items. On Thursday 5 December oversized lots (noted as W next to the lot number and/or listed on page 63) will be sent to Door to Door Services where transfer and full value protection fees will be immediately applicable. Storage charges will begin accruing for any lots not collected within 5 business days of the date of auction. All other sold lot will be retained in Bonhams Gallery until Wednesday 18 December. Collection of lots will be by appointment only. Please call +1 (212) 644 9001 at least 24 hours in advance to make an appointment.

Storage charges of $5 per lot, per day will begin accruing for any lots not collected within 14 calendar days of the auction. Bonhams Reserve the right to remove uncollected sold lots to the warehouse of our choice at the buyer's risk and expense. Further transfer, handling, storage and full value protection fees will apply if move to a warehouse of our choice.

Auction Results
All you need is a touch-tone telephone and the lot number. Auction results are usually available on the next business day following the sale or online at **www.bonhams.com/us.**

Important notice to buyers

COLLECTION & STORAGE AFTER SALE

Please note that all oversized lots listed below and marked with a W in the catalogue will be removed to the warehouse of Door to Door Services herein referred to as Door To Door on Thursday 5 December. Lots not so listed will remain at Bonhams.

W LOTS WILL BE AVAILABLE FOR COLLECTION FROM DOOR TO DOOR BEGINNING AT 9AM ET ON FRIDAY 6 DECEMBER.

Address
Door To Door Services
50 Tannery Rd #8A
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Lots will be available for collection 24hrs following transfer to Door to Door every business day from 9am to 5pm ET.

Collections appointments must be booked 24 hours in advance (subject to full payment of all outstanding amounts due to Bonhams and Door To Door) by contacting Door To Door at 1-908-707-0077 ext 2070

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Please note: For sold lots removed to Door To Door there will be transfer and Full value protection charges but no storage charge due for lots collected by Wednesday 11 December. For sold lots that remain at Bonhams, there will be no storage charge for lots collected within 14 days of the sale date.

The per-lot charges levied by Door To Door Services are as follows (plus any applicable sales tax):

FURNITURE/LARGE OBJECTS
Transfer $75
Daily storage..... $10
Insurance (on Hammer + Premium + tax) 0.3%

SMALL OBJECTS
Transfer $37.50
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Please contact Michael Van Dyke at Door To Door
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For more information and estimates on domestic and International shipping Please contact Michael Van Dyke at Door To Door
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All amounts due to Bonhams and all charges due to Door To Door Services must be paid by the time of collection of the property from their warehouse.

TO MAKE PAYMENT IN ADVANCE
Telephone +1 (908) 707 0077 ext 2070 to ascertain the amount due, payable by cash, check, or credit card.

PAYMENT AT TIME OF COLLECTION
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Lots will only be released from Door To Door's warehouse upon production of the "Collection Slip" obtained from the Cashier's office at Bonhams.

The removal and/or storage by Door To Door of any lots will be subject to their standard Conditions of Business, copies of which are available at Bonhams.

PLEASE NOTE
Door To Door does not accept liability for damage or loss, due to negligence or otherwise, exceeding the sale price of such goods, or at their option the cost of repairing or replacing the damaged or missing goods.

Door To Door reserves a lien over all goods in their possession for payment of storage and all other charges due them.

Oversized lots

20, 60, 62, 63, 74, 75, 76, 77, 78, 79, 80, 82, 88, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105.

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Auction Registration Form

(Attendee / Absentee / Online / Telephone Bidding)
Please circle your bidding method above.

Bonhams

Paddle number (for office use only)

General Notice: This sale will be conducted in accordance with Bonhams Conditions of Sale, and your bidding and buying at the sale will be governed by such terms and conditions. Please read the Conditions of Sale in conjunction with the Buyer's Guide relating to this sale and other published notices and terms relating to bidding.
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Notice to Absentee Bidders: In the table below, please provide details of the lots on which you wish to place bids at least 24 hours prior to the sale. Bids will be rounded down to the nearest increment. Please refer to the Buyer's Guide in the catalog for further information relating to instructions to Bonhams to execute absentee bids on your behalf. Bonhams will endeavor to execute bids on your behalf but will not be liable for any errors or non-executed bids.

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If successful
I will collect the purchases myself ☐
Please contact me with a shipping quote (if applicable) ☐
I will arrange a third party to collect my purchase(s) ☐

Please email or fax the completed Registration Form and requested information to:
Bonhams Client Services Department
580 Madison Avenue
New York, New York 10022
Tel +1 (212) 644 9001
Fax +1 (212) 644 9009
bids.us@bonhams.com

Sale title:	History of Science	Sale date:	December 4, 2019
Sale no.	25265	Sale venue:	New York

General Bid Increments:

$10 - 200 .....by 10s	$10,000 - 20,000 .....by 1,000s
$200 - 500 .....by 20 / 50 / 80s	$20,000 - 50,000 .....by 2,000 / 5,000 / 8,000s
$500 - 1,000 .....by 50s	$50,000 - 100,000 .....by 5,000s
$1,000 - 2,000 .....by 100s	$100,000 - 200,000 .....by 10,000s
$2,000 - 5,000 .....by 200 / 500 / 800s	above $200,000 .....at the auctioneer's discretion
$5,000 - 10,000 .....by 500s	The auctioneer has discretion to split any bid at any time.

Customer Number	Title
First Name	Last Name
Company name (to be invoiced if applicable)	
Address	
City	County / State
Post / Zip code	Country
Telephone mobile	Telephone daytime
Telephone evening	Fax

Telephone bidders: indicate primary and secondary contact numbers by writing ① or ② next to the telephone number.

E-mail (in capitals) _____

By providing your email address above, you authorize Bonhams to send you marketing materials and news concerning Bonhams and partner organizations. Bonhams does not sell or trade email addresses.

I am registering to bid as a private client ☐ | I am registering to bid as a trade client ☐

Resale: please enter your resale license number here _____ We may contact you for additional information.

SHIPPING

Shipping Address (if different than above):

Address: _____ Country: _____

City: _____ Post/ZIP code: _____

Please note that all telephone calls are recorded.

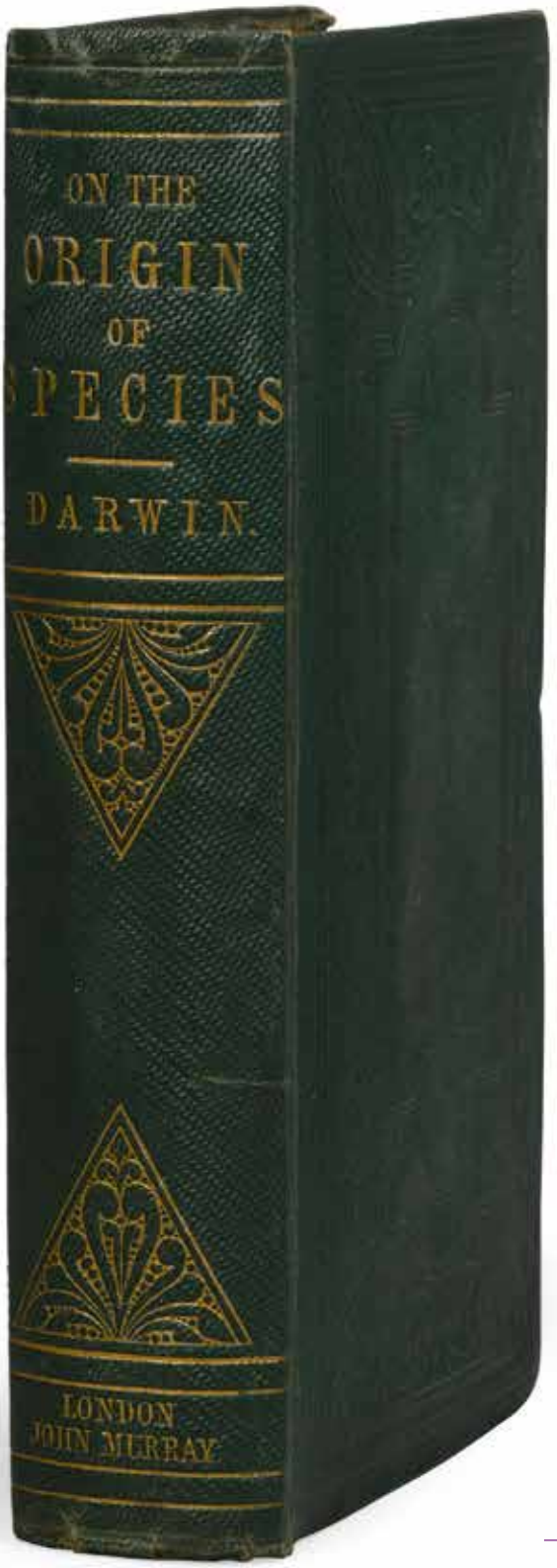
Type of bid (A-Absentee, T-Telephone)	Lot no.	Brief description (In the event of any discrepancy, lot number and not lot description will govern.) If you are bidding online there is no need to complete this section.	MAX bid in US$ (excluding premium and applicable tax) Emergency bid for telephone bidders only*

You instruct us to execute each absentee bid up to the corresponding bid amount indicated above.

* Emergency Bid: A maximum bid (exclusive of Buyer's Premium and tax) to be executed by Bonhams only if we are unable to contact you by telephone or should the connection be lost during bidding.

BY SIGNING THIS FORM YOU AGREE THAT YOU HAVE READ AND UNDERSTAND OUR CONDITIONS OF SALE AND SHALL BE LEGALLY BOUND BY THEM, AND YOU AGREE TO PAY THE BUYER'S PREMIUM, ANY APPLICABLE TAXES, AND ANY OTHER CHARGES MENTIONED IN THE BUYER'S GUIDE OR CONDITIONS OF SALE. THIS AFFECTS YOUR LEGAL RIGHTS.

Your signature:	Date:



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