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



$\underline{\text{SOPHIA}} \sum \underline{\text{RARE BOOKS}}$

Flæsketorvet 68 *1711 København V * Denmark Tel: (+45)27628014 / Fax: (+45)69918469 www.sophiararebooks.com

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



First edition, extraordinarily rare inscribed offprint, of Hubble's landmark paper, 1929 Item # 20

The foundation work of physical chemistry

1. AVOGADRO, Amadeo. *Fisica de' Corpi Ponderabili ossia Trattato della Costituzione Generale de' Corpi del Cavaliere.* Turin: Stamperia Reale, 1837-1841.

\$26,500

\$40,000



First edition, and a very fine copy, of one of the great rarities of chemistry. This monumental work is the only large-scale publication of Avogadro (1776-1856), famous for his eponymous hypothesis (1811) that equal volumes of all gases at the same pressure and temperature contain the same number of molecules. Although his molecular hypothesis is widely considered to be Italy's great contribution to chemistry in the 19th century, his 1811 memoir was largely ignored for another half century, partly because it was published first in Italian (when Italy was at the periphery of scientific research) and subsequently only in minor French, German and

English scientific journals. Emil Offenbacher, the distinguished dealer who

specialized in chemistry, wrote (cat. 39, item 4, 1986) "a complete set [of the present work] is today of great rarity". ABPC/RBH list just four other copies between the Honeyman sale (1978) and the present copy.

Norman 89; Honeyman 168; Sparrow, Milestones of Science 16 [1811 memoir].



The first significant book on probability theory

2. BERNOULLI, Jacob. *Ars conjectandi, opus posthumum. Accedit Tractatus de seriebus infinitis, et Epistola Gallicè scripta De ludo pilae reticularis.* Basel: Impensis Thurnisiorum Fratum, 1713.



First edition, an exceptionally fine copy, rare in this condition. "Jakob 1 Bernoulli's posthumous treatise ... was the first significant book on probability theory: it set forth the fundamental principles of the calculus of probabilities and contained the first suggestion that the theory could extend beyond the

boundaries of mathematics to apply to civic, moral and economic affairs. The work is divided into four parts, the first a commentary on Huygens's *De ratiociniis in ludo aleae* (1657), the second a treatise on permutations (a term Bernoulli invented) and combinations, containing the Bernoulli numbers, and the third an application of the theory of combinations to various games of chance. The fourth and most important part contains Bernoulli's philosophical thoughts on probability: probability as a measurable

degree of certainty, necessity and chance, moral versus mathematical expectation, a priori and a posteriori probability, etc. It also contains his attempt to prove what is still called Bernoulli's Theorem: that if the number of trials is made large enough, then the probability that the result will lie between certain limits will be as great as desired" (Norman).



PMM 179; Dibner 110; Evans 8; Grolier/Horblit 12; Sparrow 21; Norman 216.

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One of the most significant promoters of the formal methods of higher analysis

3. BERNOULLI, Jacob. Opera. Geneva: Cramer & Philibert, 1744. First edition.

\$6,500

\$55,000

First edition, and a beautiful copy, very scarce on the market, of the collected works of Jakob I (Jacques) Bernoulli (1654-1705), "who greatly advanced algebra, the infinitesimal calculus, the calculus of variations, mechanics, the theory of



series, and the theory of probability [and] was one of the most significant promoters of the formal methods of higher analysis ... His *Opera* ... contains all his scientific writings except the *Neuerfundene* [1681] ... Supplementary material from his scientific diary is contained in the appendix to his *Opera*." (DSB). The editor. Gabriel Cramer (1704-1752),

was a Swiss mathematician who gave lessons at Geneva. He was the editor not only of Jakob Bernoulli's Opera (Geneva, 1744), but also those of his younger brother Johann (Geneva, 1742), and the author of *the Introduction a l'analyse des lignes courbes algébraques* (Geneva, 1750), a large volume containing the most complete exposition of algebraic curves existsing at that time, going far beyond Newton's Enumeratio." (Struik, *Source Book in Mathematics*, p.180). Jakob Bernoulli's

Opera are much scarcer than those of his brother Johann.



The birth of modern atomic physics

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



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

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Boolean algebra

5. BOOLE, George. *An Investigation of the Laws of Thought, on which are founded the Mathematical Theories of Logic and Probabilities.* London, and Cambridge: Walton and Maberly; Macmillan & Co., 1854.

\$30,000



First edition, the rare first issue, of Boole's principal work, in which he gave the first detailed presentation of Boolean algebra. "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. Boole's work led to the creation of set theory and probability theory in mathematics, to the philosophical work of Peirce Russell, Whitehead, and Wittgenstein, and to computer technology via the master's thesis of Claude Shannon, who recognized that the true/false values in Boole's two-valued logic were analogous to the open and closed states of electric circuits" (Hook & Norman, *Origins of Cyberspace*, 224).

Source 224 (1st issue, rebacked); Erwin Tomash B198 (2nd issue); Haskell Norman 266 (3rd issue).



The copy of Borelli's patron at the Tuscan court

6. BORELLI, Giovanni Alfonso. De vi percussionis liber. Bologna: Giacopo Monti, 1667.

\$15,000



First edition, an extraordinary association copy, of the first published book on the laws of percussion, and containing important hitherto unpublished material from the lectures of Galileo and Torricelli. This copy was a gift from Prince Leopold of Tuscany, Borelli's patron at the Tuscan court. Probably under the influence of Borelli, Leopold, together with his brother Grand Duke Ferdinand, founded the *Accademia del Cimento* where Borelli first presented much of the experimental work on which this text is based. "In this, Borelli's first book on mechanics, he quotes Galileo's youthful work on percussion, the fourth *Dialogo*, and lectures

by Torricelli. As well as the detailed discussion of impact, the book deals with the dynamics of falling bodies, vibration, gravity, fluid mechanics, magnetism, and pendular motion ... he gives the name resilience for the first time to a number of problems now classed under this name" (Roberts & Trent). This is "the earliest book on the laws of percussion, which undoubtedly influenced John Wallis who, in 1668, published his discovery of the laws governing the percussion of non-elastic bodies, and Christiaan Huygens, who deals with the percussion of elastic bodies in his treatise *De motu corporum ex percussion*, published in 1669' (Zeitlinger I, 174). Borelli regarded this work, together with his *De motionibus naturalibus* (1670), as necessary preparation for his masterpiece, *De motu animalium* (1680-81), on which he had worked since the early 1660s.



Early anatomy of the sense organs

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

\$45,000



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

describing only the Frankfurt edition of 1622, with the same number of plates but "reduced and certainly executed by another artist. Some of them are even reversed and show much inferior workmanship".

The most beautiful book on the comparative anatomy of the ear and throat

8. CASSERI (or CASSERIO), Giulio Cesare. *De vocis auditisque organis historia anatomica.* Ferrara: Victorius Baldinus, 1601 (Part II: 1600).

\$25,000

First edition, a very fine copy. "Like [his teacher] Fabrici, Casserio attempted to explain human anatomy by reference to the lower animals, and his *De Vocis*, containing the first comparative studies of the vocal and auditory organs, represents



one of the sixteenth century's most ambitious and detailed investigations in comparative anatomy. The work is divided into two treatises--on the anatomy of the larynx and on that of the ear. In the first Casserio compared the human vocal apparatus to those of other mammals, birds, amphibians and insects. He recognized the larynx to be the principal organ of voice, gave the first precise description of the cricoid-thyroid muscles and accurately depicted the superior and inferior laryngeal nerves, which he correctly assumed to originate from cranial nerves. He also was the first to understand the complex sound-producing organs on the abdomen of the cicada. In the second treatise, Casserio provided the first detailed comparative account of the auditory ossicles, the first adequate description of the mammalian osseous labyrinth, and the first representation of the ear of the fish--this last all the more remarkable in that, up to this time, no one had believed that fishes possess a sense of hearing" (Norman).

Choulant-Frank p. 223; GM 286; Grolier Medicine 24; Heirs of Hippocrates 397; NLM/Krivatsy 2199; Norman 410.

Coined the phrase "circulation of the blood" - the basis for Harvey's De motu cordis

9. CESALPINO, Andrea. Peripateticarum Quaestionum Libri Quinque. Venice: Giunta, 1571.

\$140,000



First edition, very rare and an exceptionally fine copy in a contemporary binding. "Cesalpino preceded Harvey in the discovery of the concept of the circulation, and Harvey must have known of his ideas" (Garrison-Morton). "Cesalpino's most important medical studies concern the anatomy

and physiology of the movement of the blood. He gave a good description of the cardiac valves and of

the pulmonary vessels connected to the heart, as well as of the minor blood circulation; he also recognized that the heart is the center of the circulation of the blood and accepted the existence of the traditional synanastomoses of the arteries with the veins" (DSB). ABPC/RBH lists only three other copies in contemporary bindings sold at auction in the last 60 years: Norman copy, Christie's 1998, \$36,800 ("title page stained at edges and with removed stamp"); Swann, 2001, \$33,350 ("wormholes through front cover & blank outer margin of opening leaves, title page stamped"); Friedman copy, Sotheby's, 2001, \$110,000 ("repaired tear to title page, spine head repaired, C4,5 guarded ... the only copy to surface at Anglo-American auctions in the past century was that of Haskell F. Norman").

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GM 755; Lilly Library Notable Medical Books 45; Norman 430; Osler 901; Waller 1877.

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

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

\$28,500



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

other subjects, he describes his invention of a rhombic pantograph apparatus attached to telescope and drawing board, by which accurate drawings of distant objects could be made" (Whittaker, *Mapping and naming the moon*, p. 76).



Darwin's epochal voyage, inscribed by the Captain of the Beagle

11. DARWIN, Charles and Robert FITZROY. *Narrative of the Surveying Voyages of His Majesty's Ships Adventure and Beagle, between the Years 1826 and 1836, describing their Examination of the Southern Shores of South America, and the Beagle's Circumnavigation of the Globe.* London: Henry Colburn, 1839.

\$195,000



First edition, an extraordinary presentation copy inscribed by the Commander of the *Beagle* Robert FitzRoy, the man who chose Darwin to accompany him on the epochal voyage. "The five years of the voyage were the most important event in Darwin's intellectual life and in the history of biological science. Darwin sailed with no formal scientific training. He returned a hard-headed man of science, knowing the importance of evidence, almost convinced that species had not always been as they were since the creation but had undergone change ... The experiences of his five years in the *Beagle*, how he dealt with them, and what they led to, built up into a process of epoch-making importance in the history of thought" (DSB). The third volume comprises Darwin's own journal of his voyage in the *Beagle*, which is the first issue of his first published book. It is "is undoubtedly the most often read and stands second only to *On the Origin of Species* as the most often printed" (Freeman, 31). Only one other complete copy of the Narrative in its original binding and inscribed by FitzRoy has appeared at auction (Christie's, 2005, \$60,752). A copy inscribed by FitzRoy but lacking one of the plates sold for \$63,885 at Bonham's in 2013.

Norman 584.

Cogito, ergo, sum

12. DESCARTES, René. *Discours de la methode pour bien conduire sa raison, & chercher la verité dans les sciences. Plus la Dioptrique, les Meteores, et la Geometrie. Qui sont des essais de cete Methode.* Leiden: Jan Maire, 1637.

\$125,000



First edition, a fine, large copy in untouched contemporary vellum, of Descartes' first and most famous work. Following the *Discours*, now celebrated as one of the canonical texts of Western philosophy, are three 'Essais', the last of which,

La Géométrie, contains the birth of analytical or coordinate geometry, "of epoch-making importance" (Cajori, History of Mathematics, p. 174), designated by John Stuart Mill as "the greatest single step ever made in the progress of the exact sciences". It "rendered possible the later achievements of seventeenth-century mathematical physics" (Hall, *Nature and Nature's Laws* (1970), p. 91). The first of the Essais, La Dioptrique, contains Descartes' discovery of 'Snell's law' of refraction of light (earlier than Snell); the second, Les Météores, contains Descartes' explanation of the rainbow, based on the

optical theories developed in the first Essai. "It is no exaggeration to say that Descartes was the first of modern philosophers and one of the first modern scientists ... Not least may be remarked his discussion of Harvey's discovery of the circulation of blood, the first mention of it by a prominent foreign scholar" (PMM).



PMM 129; Grolier/Horblit 24; Dibner 81; Norman 621.

$\underline{SOPHIA} \sum \underline{RARE BOOKS}$

Presentation copy from Descartes to Kenelm Digby

13. DESCARTES, René. *Principia philosophiae*. [Bound with:] Specimina philosophiae: seu dissertatio de methodo ... dioptrice, et meteora. Amsterdam: Louis Elzevir, 1644.

\$65,000

\$125,000



First edition, a highly important presentation copy from Descartes to the English natural philosopher Kenelm Digby (1603-65), of Descartes' system of physics in which he developed his theory of vortices. "With the *Principles* we have what can be considered a canonical presentation of Descartes' views in physics" (*Cambridge*

Companion to Descartes, p. 292). It is here bound with

the first Latin edition of the *Discours de la Méthode* (1637); this edition includes the first appearance of the Cartesian catch-phrase: 'cogito, ergo sum.' Digby met Descartes on several occasions – in fact, according to Descartes' biographer Baillet (*Vie de M. Descartes*, 1691), we know that it was precisely in October 1644, during Descartes' stay in Paris, that he distributed newly-printed copies of his *Principia* to his friends, and that during Descartes's stay Digby had "de longues et fréquentes conférences avec M. Descartes au collège de Boncourt où ils s'étaient donné rendezvous". "Digby was one of the first (if not the first) to introduce Descartes to English readers" (MacDonald, *Kenelm Digby's Two Treatises*, p. 10). The Norman copy (Christie's, 1998, \$36800) - also inscribed only by the recipient - is the only other presentation copy of this work we know of having appeared on the market.



Norman 622/623.

Two rare works of pre-Vesalian anatomy

14. DRYANDER, Johannes; MUNDINUS. Anatomiae, hoc est, corporis humani dissectionis pars prior ... ; [with:] Anatomia Mundini, ad vetustissimorum, erundemque aliquot manu scriptorium, codicum fidem collate, iustoq(ue) fuo ordini restitute. Marburg: Eucharius Cervicornus, 1537; 1541.



A very attractive sammelband, from the library of Jean Blondelet, comprising two rare illustrated works of pre-Vesalian anatomy, in their original untouched vellum binding: the enlarged second edition of Dryander's *Anatomia capitis humani* (1536), the first significant analysis of the anatomy of the head (the first edition is a notorious rarity), united

with his edition of the *Anathomia* of Mundinus, known as the "restorer of anatomy" for his innovative dissection practice. The illustrations are, with those of Berengario, the

best that were published before Vesalius' *Fabrica* in 1543 (Lind, p. 297). This copy of the *Anatomiae* is remarkable for having the folding table, which is almost always lacking. The second work is the finest illustrated edition of the first book devoted to anatomy (and the first to incorporate new knowledge gained since antiquity). His illustrations, based on actual dissection, whether his own or others currently in circulation, make "Dryander's illustrated anatomical works ... an important milestone of anatomical illustration" (Persaud). It is particularly appropriate to find these two works bound together, because Dryander began his translation of Mundinus at the end of the *Anatomiae*, so the second work can be viewed as a continuation of the first.



SOPHIA \sum RARE BOOKS

Einstein's first original paper on unified field theory, author's offprint

15. EINSTEIN, Albert. *Einheitliche Feldtheorie von Gravitation und Elektrizität.* Berlin: Akademie der Wissenschaften, 1925.

\$14,500

First edition, extremely rare author's presentation offprint - not to be confused with the common trade offprint - and the copy of his son Hans Albert, of Einstein's first original paper on unified field theory, and the first to use the term "Unified Field Theory" in its title. In the opening paragraph of this paper, Einstein wrote: "After incessant search during



the last two years, I now believe I have found the true solution" (Pais, *Subtle is the Lord*, p. 343). The half-dozen papers Einstein had already written on unified field theory were reactions to the ideas of others, such as Eddington, Kaluza and Weyl; it was in this paper that Einstein put forward the first original approach of his own. Inspired by James Clerk Maxwell's success in finding a unified theory of electricity and magnetism, Einstein's work on unified field theory represents about a quarter of his entire research output and half his scientific production after 1920. Although he was ultimately unsuccessful, a similar vision was realized in the decades after his death in the construction of the 'standard model', a unified theory of electromagnetism with the weak and strong nuclear forces. No other copies of this author's presentation offprint in auction records (it was not in Einstein's own reference collection of offprints in the Richard Green Library).

& Boni 155; Weil 147.

'The source of all modern methods in mathematical physics'

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

\$32,000



First edition of the first mathematical study of heat diffusion, the first major mathematization of a branch of physics outside me- chanics. "This work marks an epoch in the history of both pure and applied mathematics. It is the source of all modern methods in mathematical physics ... The gem of Fourier's great book is 'Fourier series'" (Cajori, *A History of Mathematics*, p. 270). "In this groundbreaking study, arguing that previous theories of mechan- ics advanced by such outstanding scientists as Archimedes, Galileo, Newton and their successors did not explain the laws

of heat, Fourier set out to study the mathematical laws governing heat diffusion and proposed that an infinite mathematical series may be used to ana-lyse the conduction of heat in solids: this is now known as the 'Fourier Series'. His work paved the way for modern mathematical physics" (Introduction to the 2009 reprint by Cambridge University Press). "There is no doubt that today this book stands as one of the most daring, innovative, and influential works of the nineteenth century on mathematical physics" (González-Velasco, p. 428).

Dibner 154; Evans 37; Sparrow 68; *Landmark Writings in Western Mathematics* 26; Norman 824; *En Francais dans le Texte* 232.



$\underline{SOPHIA} \sum \underline{RARE} \ \underline{BOOKS}$

"The first recorded description of an operation for strangulated hernia" (GM)

17. FRANCO, Pierre. *Petit traité, contenant une des parties principales de chirurgie, laquelle les chirurgiens hernieres exercent, ainsi quil montre en la page suivante. Des VIII. especes des hernies & des accidens qui leurs suruiennent. De la pierre en la vessie. De la cure de cataracte. De ungula. Des bouches & leures fendues. De la maniere d'extirper une jambe ou bras. Des luppies, & des autres absces flegmatiques.* Lyon: Antoine Vincent, [1556].

\$75,000



First edition, in an untouched contemporary binding and with a fine provenance, of this exceptionally rare work that is absent from many major medical collections, which regard the expanded second edition of 1561 as the first. "Considered from the point of view of the performance of operations, Franco should be considered the premier surgeon of the

sixteenth century ... he invents operations that should remain in the practice of surgery; there is no surgeon who has given more discoveries

to surgery" (Nicaise, *Pierre Franco*, Introduction). "Franco was influential in bringing operative surgery back into the realm of regular surgical practice, recapturing it from the ignorant hands of charlatans and itinerant "cutters." His major interest was in hernia surgery, to which he introduced several important innovations including an operation preserving the testicle (which was usually removed), a less risky incision at the base of the scrotum and methods for the surgical release of strangulated hernia. Franco was also the first surgeon to address himself seriously to the removal of bladder stones; he gave an account of perineal lithotomy and was the earliest to describe and perform the suprapubic incision" (Norman, on the second edition of 1561). We know of no other copy having appeared in commerce.



& Garrison-Morton 3573; Waller 13221; Wellcome 2408; not in Norman.

Gauss' second masterpiece

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

\$15,000



First edition, the very rare offprint, from the library of Haskell F. Norman, of the founding paper of modern differential geometry containing the seed for Riemann's work on non-Euclidean geometry. A "masterpiece of the mathematical literature" (Zeidler, p. 16). "... the crowning contribution of the period, and his last great breakthrough in a major new direction of mathematical research, was *Disquisitiones generales circa superficies curvas* (1828), which grew out of his geodesic meditations of three decades and was the seed of more than a century of work on differential geometry" (*DSB*). "A decisive influence on the entire course of development of differential geometry was exerted by the publication

of [the present] paper of Gauss... It was this paper, carefully polished and containing a wealth of new ideas, that gave this area of geometry more or less its present form and opened a large circle of new and important problems whose development

provided work for geometers for many decades" (Kolmogorov & Yushkevitch, p. 7). Gauss's *Disquisitiones* was, in particular, the basis for Riemann's famous 1854 Habilitationsschrift 'Uber die Hypothesen welche die Geometrie zu Grunde liegen'.

Norman 880 (this copy).



Harrison's claim to the longitude prize

19. [HARRISON, John and James SHORT]. A Narrative of the Proceedings relative to the Discovery of the Longitude at Sea; by Mr. John Harrison's Time-Keeper; Subsequent to those published in the Year 1763. London: Printed for the Author, and Sold by Mr. Sandby, 1765.

\$75,000



First edition of this extremely rare work in which Harrison defended the success of his chronometer H4, and staked his claim to be awarded the full "Longitude Prize" of £20,000. Harrison had been working on the problem of longitude for over three decades by the time he published this work, one of the most important of the pamphlets produced in the course of the longitude affair. H4 had first been properly tested in 1761, when Harrison's son William took it with him on a voyage to Jamaica in the ship Deptford for a sea-trial. Although the trial was a triumph that exceeded the demands of the Longitude Act, Harrison's claim to the Prize was not accepted, and he was forced to undertake another trial of H4 in 1764. Again accompanied by William, on this occasion H4 computed the longitude of Barbados within 9.8 geographical miles, exhibiting accuracy three times greater than that required by the Act. Despite this success, the board still refused to issue the award, in some part due to resistance from the Astronomer Royal Nevil Maskelyne, an advocate of the cheaper lunar distance method. Faced with another refusal, Harrison had the present appeal to the Board of Longitude printed. The self-published pamphlet was presumably printed in an extremely limited edition for private circulation to members of the Board. The National Maritime Museum did not have a copy of the pamphlet until 2003, when it acquired the papers of the 2nd Viscount Barrington,

a member of the 18th-century Board of Longitude. ABPC/RBH list only three copies in the past 40 years, including the Streeter copy (in a modern binding) (Christie's 16/17 April 2007, \$114,000).

Hubble's law and the expanding universe - inscribed presentation offprint

20. HUBBLE, Edwin. A Relation between Distance and Radial Velocity among Extra-Galactic Nebulae. [Washington, D.C.]: Carnegie Institution, 1929.

\$160,000



First edition, extraordinarily rare inscribed offprint, of Hubble's landmark paper, which "made as great a change in man's conception of the universe as the Copernican revolution 400 years before" (DSB). Even 'ordinary' copies of this offprint are very rare, but we have never seen nor heard of another inscribed copy. This paper "is generally regarded as marking the discovery of the expansion of the universe" (Biographical Encyclopedia of Astronomers). It established what would later become known as Hubble's Law: that galaxies recede from us in all directions and more distant ones recede more rapidly in proportion to their distance. "The repercussions were immense. The galaxies were not randomly dashing through the cosmos, but instead their speeds were mathematically related to their distances, and when scientists see such a relationship they search for a deeper significance. In this case, the significance was nothing less than the realization that at some point in history all the galaxies in the universe had been compacted into the same small region. This was the first observational evidence to hint at what we now call the Big Bang" (Singh, Big Bang). Hubble's "result has come to be regarded as the outstanding discovery in twentieth-century astronomy" (DSB).

Lagrange's masterpiece - laid the foundations of modern mechanics

21. LAGRANGE, Joseph Louis de. Méchanique analitique. Paris: Veuve Desaint, 1788

\$14,500



First edition of "perhaps the most beautiful mathematical treatise in existence. It contains the discovery of the general equations of motion, the first epochal contribution to theoretical dynamics after Newton's *Principia*" (Evans). "Lagrange's masterpiece, the *Méchanique Analitique* (Paris, 1788), laid the foundations of modern mechanics, and occupies a place in the history of the subject second only to that of Newton's *Principia*." "With the appearance of the *Méchanique Analitique* in 1788, Lagrange proposed to reduce the theory of mechanics and the art of solving problems in that field to general formulas, the mere development of which would yield all the equations necessary for the solution of every problem ... [it] united and presented from a single point of view the various principles of mechanics, demonstrated their connection and mutual dependence, and made it possible to judge their validity and scope" (DSB). "In the preface of the book La Grange proudly points to the complete absence of diagrams, so lucid is his presentation. He regarded mechanics (statics and dynamics) as a geometry of four dimensions and in this book set down the principle

of virtual velocities as applied to mechanics" (Dibner).

& Grolier/Horblit 61; Evans 10; Dibner 112; Sparrow 120; Norman 1257.

Lansbergen's astronomical tables - competition for Kepler's Tabulae Rudolphinae

22. LANSBERGEN, Philippus van. abulae motuum coelestium perpetuae; ex omnium temporum observationibus constructae, temporumque omnium observationibus consentientes. Item novae et genuinae motuum coelestium theoricae & Astronomicarum observationum thesaurus. Middelberg: Zacharias Roman [Colophon: Leiden: Willem Christiaens van der Boxe], 1788.

\$8,500



First edition, very rare, of Lansbergen's astronomical tables. Lansbergen was a staunch Copernican, and "complained with justification that the Church opposed the heliocentric hypothesis on theological grounds alone, without examining the evidence and the scientific arguments in its support" (Heninger, *The Cosmographical Glass*, p. 68). Lansbergen could not, however, accept Johannes Kepler's elliptical orbits, upon which Kepler had based his own Rudolphine Tables published five years earlier. Lansbergen attacked Kepler in his early works, and produced these rival tables which were founded on a more traditional epicyclic theory. Lansbergen's tables were simpler than Kepler's and were widely used by astronomers throughout the 1630s. The brilliant young English astronomer Jeremiah Horrocks bought a copy of Lansbergen's *Tabulae* in 1635 (when he was 16) and noted that Lansbergen had predicted a transit of Venus in 1639, whereas Kepler had predicted Venus would pass below the Sun. Horrocks recalculated Lansbergen's tables and found there would indeed be a transit of Venus, which he was the first to observe. ABPC/ RBH list only a single copy of Lansbergen's tables in the last fifty years.

The method of least squares

23. LEGENDRE, Adrien Marie. *Nouvelles méthodes pour la détermination des orbites des comètes.* Paris: Firmin Didot, 1805.

\$6,750



First edition, first issue of the invention of the method of least squares, "the automobile of modern statistical analysis" and the origin of "the most famous priority dispute in the history of statistics" (Stigler, *A History of Statistics*). "The great advances in mathematical astronomy made during the early years of the nineteenth century were due in no small part to the development of the method of least squares. The same method is the foundation for the calculus of errors of observation now occupying a place of great importance in the scientific study of social, economic, biological, and psychological problems. Gauss says in his work on the *Theory of Motions of the Heavenly Bodies* (1809) that he had made use of this principle since 1795 but that it was first published by Legendre. The first statement of the method appeared as an appendix entitled "Sur la méthode des moindres quarrés" in Legendre's *Nouvelles méthodes pour la détermination des orbites des comètes*, Paris 1805" (Wolberg, 'The Method of Least Squares,' in *Designing Quantitative Experiments*, 2010).

"A preliminary statement of Lower's views concerning the functions of the heart and lungs" (Fulton)

24. LOWER, Richard. *Diatribae Thomae Willisii Doc. Med. & Profess. Oxon...M.D.* London: At the house of John Martyn & James Allestry, at the sign of the Bell in St. Paul's churchyard, 1665.



First edition, extremely rare, and in an untouched contemporary binding, of pioneering Oxford physician and physiologist Richard Lower's first and rarest book. Ostensibly a strident defence of Thomas Willis's *Diatribae duae medico-philosophicae* (London, 1658-9), against the criticisms of Irish physician Edmund O'Meara published in his *Examen Diatribae Thomae Willisii de febribus* (1665), "Lower's book is, in fact, the repository of some of the most important ideas that fretted the minds

of his contemporaries. He defended Harveian circulatory physiology, and the role of the thoracic duct in nutrition; he substituted chemical principles for the four humours and constantly upheld the experimental method in medicine. When he wrote *Vindicatio* Richard Lower was the leading physiologist in Oxford. He had investigated the transfusion

of blood and other fluids; he had studied the difference between venous and arterial blood as well as aspects of respiration, nutrition, and body heat, all in terms of a chemico-mechanical philosophy which reached maturity in *Tractatus de Corde* (1669). Lower's *Vindicatio* is a rare book. Antoine Portal (1770-3), who reviewed O'Meara's *Examen*, was unable to obtain a copy of *Vindicatio*, and Fulton traced only eight copies. ABPC/RBH list no copy in the past fifty years.

Wing L3308. Not in Garrison-Morton or Wellcome.

\$28,500



The foundation of modern economics

25. [MALTHUS, Thomas Robert]. *An Essay on the Principle of Population, as it Affects the Future Improvement of Society. With Remarks on the Speculations of Mr. Godwin, M. Condorcet, and Other Writers.* London: J. Johnson, 1798.

\$225,000



First edition, rare, of this foundation work of modern economics, and the seed for Darwin's theory of natural selection. "Malthus' Essay was a crucial contribution to Darwin's thinking about natural selection when he returned in 1836 from the Beagle voyage. In July 1837 Darwin began his "Note book on Transmutation of Species," in which he wrote: "In October 1838, that is, fifteen months after I had begun my systematic enquiry, I happened to read for amusement "Malthus on Population," and being well prepared to appreciate the struggle for existence ... it at once struck me that under these circumstances favourable variations would tend to be preserved and unfavourable ones to be destroyed. The result would be the formation of a new species" (Life and Letters, I, 83). Later, in the Origin of Species, he wrote that the struggle for existence "is the doctrine of Malthus applied with manifold force to the whole animal and vegetable kingdoms; for in this case there can be no artificial increase of food, and no prudential restraint from marriage" (p. 63). "Without doubt the great watershed in the development of Darwin's evolutionary theory came with his reading of Malthus. Not only did Malthus provide a vital missing element, but it served to precipitate other, equally necessary, elements into their proper place in Darwin's thought. With but the one notable exception of 'divergence',

from 1838 onwards Darwin was able to work with a clear formulation of his theory of natural selection" (Vorzimmer, 'Darwin, Malthus, and the Theory of Natural Selection,' *Journal of the History of Ideas* 30 (1969), p. 542). AE/RBH list only nine copies in non-rebacked contemporary bindings in the last 40 years.

Norman 1431; PMM 251; Garrison-Morton 1693; Kress B 3693;

Less than a dozen copies known

26. MATTE LA FAVEUR, Sebastian. Pratique de chymie, divisée en quatre parties, par S. Matte La Faveur, distillateur & demonstrateur ordinaire de la chymie en la faculté de Medecine de Montpelier. Avec un avis sur les eaux minerales. Montpelier: Daniel Pech, 1671.

\$15,250



Extremely rare complete copy of this important work "less than a dozen copies are known to exist, most imperfect with missing leaves and fewer plates" (*The Roy G. Neville Historical Chemical Library*, vol. 2, p. 153 - describing their copy as "probably the finest example extant" – this copy collates as theirs and is similarly bound in contemporary unrestored calf). "Sold only by the author at his home in Montpellier, the *Pratique* contains clear directions on practical operations and the preparation of chemicals. Matte La Faveur (fl. 1671), distiller and demonstrator of chemistry at Montpellier, simultaneously gave a course at Paris until 1684, when he was succeeded by the famous chemist Nicolas Lemery. Undoubtedly, Lemery used this work when writing his celebrated *Cours de*

Chymie (1675),

and it is well known that he seldom acknowledged his sources. The *Pratique* forms a direct link between the *Traite de la Chymie* (1663) of Christophle Glaser and the *Cours* of Lemery. **Extremely rare**." (Neville).



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

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

\$15,000



First edition of Maxwell's presentation of his theory of electromagnetism, advancing ideas that would become essential for modern physics, including the landmark "hypothesis that light and electricity are the same in their ultimate nature" (Grolier/ Horblit). "This treatise did for electromagnetism what Newton's *Principia* had done for classical mechanics. It not only provided the mathematical tools for the investigation and representation of the whole electromagnetic theory, but it altered the very framework

of both theoretical and experimental physics. It was this work that finally displaced action-at-a-distance physics and substituted the physics of the field" (*Historical Encyclopedia of Natural and Mathematical Sciences*, p. 2539). "From a long view of the history of mankind — seen from, say, ten thousand years from now — there can be little doubt that the most significant event of the 19th century will be judged as Maxwell's discovery of the laws of electrodynamics" (R. P. Feynman, in *The Feynman Lectures on Physics* II (1964), p. 1-6). "[Maxwell] may well be judged the

greatest theoretical physicist of the 19th century ... Einstein's work on relativity was founded directly upon Maxwell's electromagnetic theory; it was this that led him to equate Faraday with Galileo and Maxwell with Newton" (PMM).

Grolier/Horblit 72; Norman 1666; PMM 355.

The first separately published textbook of probability

28. [MONTMORT, Pierre Rémond de]. Essay d'Analyse sur les Jeux de Hazard. Paris: J. Quilau, 1708.



\$12,000

First edition, and a fine copy, of the first separately published textbook of probability. "In 1708 [Montmort] published his work on Chances, where with the courage of Columbus he revealed a new world to mathematicians" (Todhunter, *History of the Theory of Probability*, p. 78). "The *Essay* (1708) is the first published comprehensive text on probability theory, and it represents a considerable advance compared

with the treatises of Huygens (1657) and Pascal (1665). Montmort continues in a masterly way the

work of Pascal on combinatorics and its application to the solution of problems on games of chance. He also makes effective use of the methods of recursion and analysis to solve much more difficult problems than those discussed by Huygens. Finally, he uses the method of infinite series, as indicated by Bernoulli (1690)" (Hald, *A History of Probability and Statistics and their Applications before 1750*, p. 290). "Montmort's book on probability, *Essay d'analyse sur les jeux de hazard*, which came out in 1708, made his reputation among scientists" (DSB). Based on the problems set forth by Huygens in his *De Ratiociniis in Ludo Aleae* (1657) (published as an appendix to Frans van Schooten's *Exercitationum mathematicarum*), the *Essay* spawned Abraham de Moivre's two important works *De Mensura Sortis* (1711) and *Doctrine of Chances* (1718), as well as Jacob I Bernoulli's celebrated *Ars Conjectandi* (1713). ABPC/RBH list just two copies of this first edition.



SOPHIA \sum RARE BOOKS

Newton's lectures on algebra (and much else)

29. NEWTON, Isaac. Arithmetica Universalis; sive de Compositione et Resolutione Arithmetica Liber. Ciu accessit Helleiana Aequationum Radices Arithmetice Inveniendi Methodus ... Cambridge / London: Typis Academicus / Benjamin Tooke, 1707.



\$22,000

First edition of Newton's treatise on algebra, or 'universal arithmetic,' his "most often read and republished mathematical work" (Whiteside). "Included are 'Newton's identities' providing expressions for the sums of the

*i*th powers of the roots of any polynomial equation, for any integer i [pp. 251-2], plus a rule providing an upper bound for the positive roots of a polynomial, and a generalization, to imaginary roots, of René Descartes' Rule of Signs [pp. 242-5]" (Parkinson, p. 138). In the last section of the work, 'The linear construction of

equations' (pp. 279-326) (the term 'linear' in this context does not refer to straight lines but derives from Pappus), Newton deals with the problem of constructing cubics (thirddegree equations). The editor, William Whiston, included an appended tract by Halley on 'A new, accurate and easy method for finding the roots of any equations generally, without prior reduction' (pp. 327-343). Whiteside believes that the lectures printed in this work were composed 'over a period of but a few months' during the winter of 1683-4. The course of lectures stemmed from a project on which Newton had embarked in the autumn of 1669, the revision of Mercator's Latin translation of Gerard Kinckhuysen's Dutch textbook on algebra, Algebra ofte stel-konst (1661).



Second edition of Principia, first of the General Scholium

30. NEWTON, Sir Isaac. Philosophiae naturalis principia mathematica. Editio secunda auctior et emendatior. Cambridge: [Cornelius Crownfield at the University Press], 1713.



The important second edition of "the greatest work in the history of science" (PMM), a fine copy in an unrestored contemporary binding. The Principia elucidates the universal physical laws of gravitation and motion which lie behind phenomena described by Newton's predecessors Copernicus, Galileo and Kepler. "For the first time a single mathematical law could explain the motion of objects on earth as well as the phenomena of the heavens ... It was this grand conception that produced a general revolution in human thought, equaled perhaps only by that following Darwin's Origin of Species" (PMM). Published twenty-six years after the first, this second edition contains substantial additions, the chapters on the lunar theory and the theory of comets being much enlarged. But the most important addition is the Scholium generale, which appears here in print for the first time. "The General Scholium, added to the Principia in 1713, is probably Newton's most famous writing ... In this text, Newton not only challenges the natural philosophy of Descartes, counters criticism levelled against him by Leibniz and appeals for universal gravitation and an inductive method, but he embeds a subversive attack on the doctrine of the Trinity" (The Newton Project).

Babson 12; PMM 161 (for the first edition); Wallis 8.

SOPHIA \sum RARE BOOKS

\$36,000

Algebra for navigators, by the greatest Portuguese mathematician

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

\$52,000



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

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

"One of the most conspicuous landmarks in the progress of British geology" (DSB)

32. PLAYFAIR, John. *Illustrations of the Huttonian Theory of the Earth.* Edinburgh: [Neill & Co. for] Caddell and Davies; William Creech, 1802.

\$10,000



First edition, a beautiful copy in contemporary binding, very rare in such fine condition. "Playfair's exposition and development of James Hutton's Uniformitarian theory of the earth was largely responsible for the theory's acceptance. Playfair believed Hutton's theory to be a qualitative revolution in thought — the geologic equivalent

of Newton's *Principia* — but felt that its scientific principles were too much obscured by Hutton's difficult prose and preoccupation with natural theology. Divorcing Hutton's science from his religious

ideas, Playfair presented the essential elements of Uniformitarianism in a clear, elegant and readable manner, reinforcing them with many original observations and reflections of his own. He recognized the importance of unconformity (lack of continuity between strata in contact) as a manifestation of the geological cycle, a concept at the heart of Hutton's theory. He provided many descriptions of unconformities in England and Scotland, and made several important miscellaneous observations as well. Playfair also gave many terms their modern geological meaning, and introduced important new phrases, such as "geological cycle," into scientific literature" (Norman).

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& Grolier/Science 52b; Evans 66; Norman 1717; Parkinson, 241; PMM 247n.

SOPHIA **NARE BOOKS**

Turing machines anticipated

33. POST, Emil Leon. Finite Combinatory Processes: Formulation 1. [The Association for Symbolic Logic], 1936.

\$7,500



First edition, very rare offprint, of Post's formulation of the notions of computation and solvability by means of a theoretical machine very similar to the concept of a Turing machine proposed by Alan Turing in his famous paper 'On computable numbers.' Alonzo Church had, slightly earlier, identified effective calculability with general recursiveness and λ -definability ['An unsolvable problem in elementary number theory,' American Journal of Mathematics (1936)]. The formulations of Church, Post and Turing were later shown to be equivalent, but while Church's and Turing's identifications are now famous under the heading 'the Church-Turing thesis', Post's formulation is less well known. On the occasion of Post's death in 1954, W. V. Quine wrote: "Modern proof theory, and likewise the modern theory of machine computation, hinge on the concept of a recursive function. This important number-theoretic concept, a precise mathematical substitute for the vague idea of "effectiveness" or "computability," was discovered independently and in very disparate but equivalent forms by four mathematicians, and one of these was Post. Subsequent work by Post was instrumental to the further progress of the theory of recursive functions.

"The first [work] to deal with obstetrics as a separate subject" (Norman)

34. RÖSSLIN, Eucharius. Der swangern Frawen und hebammen roszgarten. [Cologne: Arnt von Aich, 1518?].

\$75,000



An exceptionally fine copy, in an untouched contemporary binding, of one of three editions of this landmark work published at about the same time. This is the earliest printed textbook for midwives and one of the first printed books devoted to obstetrics, including engravings attributed to the Frankfurt artist Martin Kaldenbach, a pupil of Albrecht Dürer. Although copies of these editions occasionally appear on the market, they are almost always in poor condition, and usually rebound, as a result of extensive use

over the centuries. "Roesslin's obstetrical treatise, first published in German in 1513 under the title *Der swangern Frawen und hebammen roszgarten*, had

an enormous impact on contemporary obstetrical practice and remained influential for two hundred years, going through over one hundred editions before the close of the eighteenth century" (Norman). ABPC/RBH record no other copy sold at auction in the last 35 years, and when this copy was sold in 1985 Sotheby's noted that "All these early editions of 1513 are extremely rare; none is recorded as having been sold by auction in England or Germany with the exception of the Hellman-Gunn set sold in London at Bonham's in 1979, which included a rather poor copy of the present issue.

&GM 6138; not in Adams; this edition not in Norman.



"One of the great rarities of early zootomical literature" (Cole)

35. RUINI, Carlo. Dell' Anotomia e dell' infermita del cavallo. Bologna: Heirs of Giovanni Rossi, 1598.

\$95,000



First edition, the particularly rare first issue, with illustrations considered comparable to those in Vesalius' *Fabrica*. "The unusual rarity of the first edition [i.e., first issue] might be partially explained by the fact that a portion of the sheets of the first edition were reissued the following year by Gaspare Bindoni in Venice.

Copies of this second issue, which is also rare, contain a cancel title and a different dedication leaf, changing the dedication to Ceisar, Duke of Vendôme, natural son of Henri IV" (Norman). "His book is the first devoted to the anatomy of an animal, and is one of the finest achievements of the heroic age of Anatomy" (Singer, *The Evolution of Anatomy*, p. 153, with three plates reproduced). "At the hands of Ruini the subject of equine anatomy jumped at a single bound from the blackest ignorance to relative perfection, the degree of which it is difficult to exaggerate"

(Smith, *The Early History of Veterinary Literature and its British Development*, Vol. 1, p. 209). "As the author of the first book devoted exclusively to the structure of an animal other than man, Ruini ranks among the founders of both comparative anatomy and veterinary medicine" (Norman).



Bird 2111; Dibner 186; Durling 3991 (all the second issue); GM 285; Norman 1858.

'Few other works of the twentieth century have had a greater impact'

36. SHANNON, Claude Elwood. *A Mathematical Theory of Communication.* New York: American Telephone and Telegraph Company, 1948.

\$10,000



First edition, the rare offprint, of "the most famous work in the history of communication theory" (*Origins of Cyberspace*, 880). "Probably no single work in this century has more profoundly altered man's understanding of communication than C. E. Shannon's article, 'A mathematical theory of communication,' first published in 1948" (D. Slepian (ed.), *Key papers in the development of information theory, Institute of Electrical and Electronics Engineers*, Inc., New York, 1974).

"In 1948 Shannon published his most important paper, entitled 'A mathematical theory of communication'. This seminal work transformed the understanding of the process of electronic communication by providing it with a mathematics, a general set of theorems rather misleadingly called information theory. The information content of a message, as he defined it, has nothing to do with its inherent meaning, but simply with the number of binary digits that it takes to transmit it. Thus, information, hitherto thought of as a relatively vague and abstract idea, was analogous to physical energy and could be treated like a measurable physical quantity ... So wide were its repercussions that the theory was described as one of humanity's proudest and rarest creations, a general scientific theory that

could profoundly and rapidly alter humanity's view of the world. Few other works of the twentieth century have had a greater impact; he altered most profoundly all aspects of communication theory and practice" (*Biogr. Mems Fell. R. Soc. Vol. 5*, 2009).

"The first accurate anatomical illustrations of the fetus in utero" (Norman)

37. SMELLIE, William. *A Sett [sic] of Anatomical Tables, with Explanations, and an Abridgement, of the Practice of Midwifery, with a View to Illustrate a Treatise on that Subject, and a Collection of Cases.* London: [D. Wilson], 1754.

\$8,500

First edition, a very fine copy, of Smellie's great obstetrical atlas, "which is very rare and is said to have been issued in only 100 copies" (*Heirs of Hippocrates*). "The plates in this classic of obstetrical illustration are far superior to any that had appeared before. They give everywhere a masterly representation, true to nature, of the relations of the parts of



mother and child, and have perhaps contributed more to spreading correct ideas of labor than all the books that have ever been written on the subject" (Grolier Medicine). "When Smellie's *Theory and Practice of Midwifery* was published, Jan van Rymsdyk had already completed a series of 26 anatomical illustrations for use in Smellie's obstetrical lectures, and in an advertisement published at the end of the work, Smellie announced his intention to publish these drawings in an atlas to be paid for by subscription. The atlas was published two years later, with the number of plates increased to 39, 11 of which had been supplied by Pieter Camper, professor of medicine at Francker in the Netherlands. Smellie was the leading forceps practitioner in London, and several of the plates illustrate the use of this instrument in various presentations of the fetus. These engravings are the first accurate anatomical illustrations of the fetus in utero" (Norman).

& Grolier Medicine 43b; Norman 1955; Heirs of Hippocrates 522.

One of five known large and thick paper copies

38. TAGLIACOZZI, Gaspare. De curtorum chirurgia per insitionem, libri duo.. Venice: Gaspare Bindoni, 1597.

\$160,000



First edition, first issue, one of five known large and thick paper copies, of the first book devoted entirely to plastic surgery. Only two of these are in private hands: the present copy, in a contemporary binding, and the Norman copy, which is an exlibrary copy in modern binding (sold Christie's, 1998, \$29,900). "Tagliacozzi studied under Girolamo Cardano at Bologna and

later became professor of surgery and anatomy at

that institution. This work, "Concerning the surgery of the mutilated by grafting," is a classic in the history of plastic surgery and is especially noteworthy for its description of rhinoplasty. Rhinoplasty had been practiced in ancient India and, in the thirteenth century, by a family of itinerant Sicilian surgeons who kept the operation a family secret ... The immediate popularity of the work caused it to be pirated by another Venetian printer, and that is the edition mentioned by Osler" (*Heirs of Hippocrates*). Rhinoplasty was much in demand in the sixteenth century and later, both as a remedy for the grotesque deformity of 'saddle nose' caused by syphilis, and for injuries resulting from duels (the great astronomer Tycho Brahe had his nose sliced off in a duel, and was forced to wear a replacement reportedly made of silver and gold).

Cushing T16; Durling 4310; GM 5734; Heirs of Hippocrates 379; Norman 2048 (large and thick paper copy); Wellcome 6210



SOPHIA **NARE BOOKS**

'One of the most important direct sources of Leonardo's mathematical knowledge'

39. VALLA, Giorgio. *De expetendis, et fugiendis rebus opus*. [Colophon:] Venice: Aldus Manutius for Giovanni Pietro Valla, December 1501.

\$58,500



First and only edition of the first great humanistic Renaissance encyclopedia, an extraordinarily rich collection of translations from classical authors, and "une des plus belles productions des presses Aldines" (Graesse). Previously sold (this copy): Christie's London, 3 May 1995, lot 33, £10,125 (\$16,072); Christie's Rome, 16 June 1999, lot 14, Lit 91,700,000 (\$49,709). "For the next forty years at least, *De Rebus Expetendis* remained almost the only printed source of reference for the works of Apollonius, Archimedes, the Eutocius commentaries, and Hero. It was used extensively by Leonardo [da Vinci] and Copernicus" (Rose, *The Italian Renaissance of Mathematics*, p. 48). Leonardo owned a copy of *De Expetendis*, translated sections from

it into Italian, and used it in his work on geometric proportions. *De Expetendis* was "one of the most important direct sources of Leonardo's mathematical knowledge" (Kelley & Popkin, *The Shapes of Knowledge from the Renaissance to the Enlightenment*, p. 45, n. 55). Copernicus, who studied the book in Padua, learned from it of the heliocentric ideas of Aristarchus; he also "made heavy use of the mathematical excerpts translated by Valla from such Greek authors as Archimedes, Autolycus and Ptolemy. Moreover, Copernicus used a star-catalogue printed by Valla which differs significantly from that of Ptolemy" (Rose, pp. 123-4).



The 'venesection letter': one of Vesalius' rarest works

40. VESALIUS, Andreas. *Epistola docens venam axillarem dextri cubiti in dolore laterali secandam: & melancholium soc-cum ex venae portae ramis ...* Basel: [R. Winter], 1539.

\$150,000

First edition, extremely rare, of Vesalius's 'venesection letter.' This is a fine copy, complete with the final leaf (the Cushing and Waller copies both lack it). "Vesalius' letter advocated the new 'classical' method of letting blood near the site of the affliction, a method arousing great controversy among the medical community as it was directly opposed to the



traditional 'revulsive' bleeding taught by the Arabic authorities. Although the classical method was derived from a more accurate reading of Hippocrates and Galen ... the importance of Vesalius' defense of it lies in the authority he gave to his own knowledge of the structure of the venous system an important step in his movement away from traditional anatomical concepts" (Norman). "In this letter we perceive the first steps in the slow and gradual loosening of traditional bonds whence eventually emerged the principle that the validity of a hypothesis rests solely upon facts established by observation ... Out of the venous valves ... which in the consciousness of Harvey was to provide the key to unlocking the door to the circulation" (Saunders & O'Malley). ABPC/RBH list only the Norman copy (in a modern binding) since 1929.

Cushing IV-1; NLM/Durling 4586; Osler 583; Waller 9898; Wellcome 6569; Norman 2136.

The "most accurate neuroanatomical work produced before microscopic staining techniques" (GM)

41. VICQ D'AZYR, Félix. Traité d'anatomie et de physiologie, avec des planches coloriées représentant au naturel les divers organes de l'homme et des animaux ... Tome premier [all published]. Paris: François Ambroise Didot l'aîné, 1786.

\$55,000



First edition, uncut in a contemporary binding, and very rare when complete, of the "most accurate neuroanatomical work produced before the advent of microscopic staining techniques" (GM). "Vicq d'Azyr, the eminent French anatomist and neurologist, has been called the greatest comparative anatomist of the eighteenth century. A highly successful physician, he numbered Marie Antoinette among his patients. Vicq d'Azyr's descriptions of the gross morphology of the brain were among the most accurate of his day and he identified many of the cerebral convolutions as well as various internal structures of the brain for the first time. Although Vicq d'Azyr intended his *Traité d'anatomie et de physiologie* (Paris, 1786-9) to be a multi-volume set, only one volume was published. It contained all of his important neuroanatomical studies and was one of the finest works on the subject to appear before the advent of microscopy. The atlas' sixty-nine plates included thirty-four hand-colored aquatints with individual outline plates drawn and engraved by Alexandre Briceau (fl. 1765), the noted Paris engraver, from gross dissections of human brains which had been fixed in alcohol, such fixatives as formalin and other

chemicals not yet being used" (*Heirs of Hippocrates*). The Haskell F. Norman copy, in a modern binding, made \$23,000 (Christie's, 1998).

The birth of molecular biology

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

\$17,000



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

Science, 200. Garrison-Morton 256.3; Judson, *Eighth Day of Creation*, pp. 145-56.

One of the greatest rarities of modern mathematics

43. WHITEHEAD, Alfred North & RUSSELL, Bertrand. *Principia mathematica*. Cambridge: at the University Press, 1910-12-13.

\$140,000



First edition of all three volumes of this monumental work. Complete sets of the first edition are very rare on the market. Probably named after Isaac Newton's great work, Principia Mathematica was Whitehead and Russell's detailed account of their 'logicist' thesis that mathematics could be derived solely from logical concepts and by logical methods...[It] has had an influence, direct and indirect, of near Newtonian proportions upon the spheres of its chief influence: mathematical logic, set theory, the foundations of mathematics, linguistic analysis and analytical philosophy" (Grattan-Guinness, p. 89). "Whether they know it or not, all modern logicians are the heirs of Whitehead and Russell" (Palgrave, p. 20). "After the failure of Frege's Grundgesetze, due to Russell's paradox, it was the Principia Mathematica of Whitehead and Russell which first successfully developed mathematics within a logical framework" (ibid., p. 21). The first volume of Principia Mathematica was published in December 1910 in an edition of 750 copies, priced 25 shillings; volumes II and III had a print run of only 500 copies, and were priced at 30 shillings and 21 shillings, respectively. A fourth volume, dealing with applications to geometry, was written by Whitehead alone, but was not published.

& Landmark Writings in Western Mathematics 16; The Collection of the Garden Ltd. 219; Norman 1868.



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