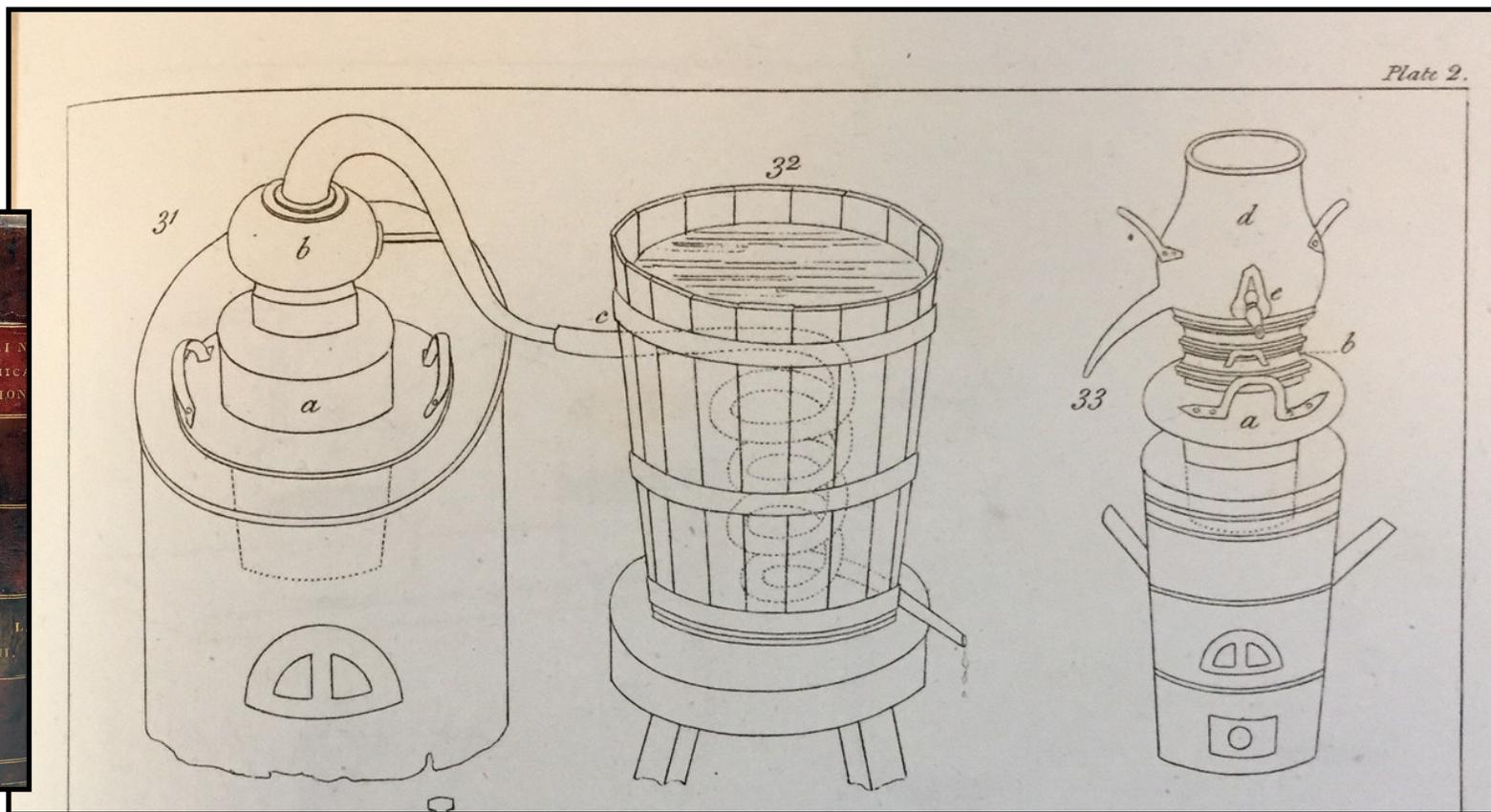
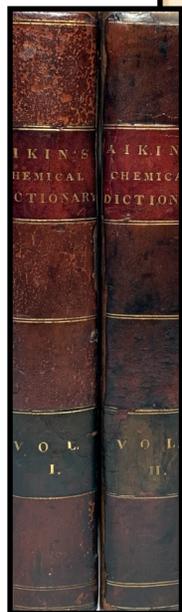


Rootenberg Rare Books & Manuscripts Presents:

A Short History of Science Catalogue





CHEMISTRY AND MINERALOGY EXPLAINED

1. AIKIN, Arthur & AIKIN, Charles Rochemont

A dictionary of chemistry and mineralogy, with an account of the processes employed in many of the most important Chemical Manufactures. To which are added a description of chemical apparatus, and various useful tables of weights and measures, chemical instruments, &c. &c. London: John and Arthur Arch and William Phillips, 1807. Two volumes 4to. vii, [i], 628; [iv], 580 pp. With 15 engraved plates. Full calf. Bookplates of High Legh Library and Arnold Thackray in each volume.

First edition. According to the preface, the author's intention was to give a "faithful and sufficiently detailed description of all the important facts hitherto discovered in the sciences of chemistry and mineralogy, enlarging more particularly on those parts which are of particular interest to the manufacturer and practical chemist." Indeed, according to Duveen, the work "was published at an interesting period, and gives a very full account of the state of chemistry at the beginning of the 19th century." Included are descriptions of processes such as the smelting of copper, iron and tin, as well as the making of vitriol, salt, and other substances derived from the author's own experiments. Many of the great chemists throughout history are cited, especially with respect to the language they used to describe various material and procedures, including Bergman, Scheele, Black, Priestley, Kirwan, and many more.

Arthur Aikin (1773-1854) was an English chemist, mineralogist and scientific writer who studied under Joseph Priestley. He was one of the founders of the Geological Society of London in 1807. His brother Charles (1775-1847) was a physician and a member of the Royal College of Surgeons. Cole, 16; Duveen, *Bibliotheca Alchemica et Chemica*, p. 8; Ward & Carozzi, 35.

\$ 950.00

ASTRONAUTS AND CELEBRITIES

2. [ASTRONAUTS]

ONE GIANT LEAP. Honoring Astronauts who achieved significant "Firsts" in the field of Space Travel and Exploration. Santa Monica Airport: The Board of Directors of the Museum of Flying. Friday, September 20, 1996 at 7:30 pm. Original invitation and program for this black tie event. . 11.6 X 8.6" with 36 glossy pages containing letters and photographs throughout honoring astronauts who achieved significant "FIRSTS" in the field of space travel and exploration.

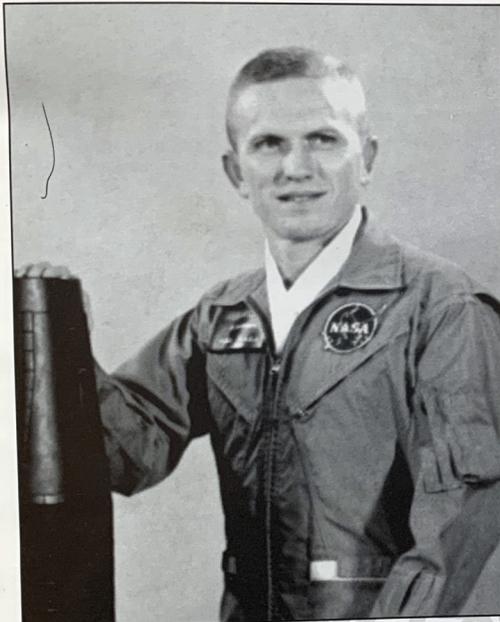
The booklet for a black-tie event held to honor living astronauts. The keynote speaker was Ray Bradbury, Phil Hartman was Master of Ceremonies, and celebrities Tom Hanks and John Travolta also participated. The astronauts being honored that night included Buzz Aldrin, Guy Bluford, Frank Borman, Wally Schirra, Alan Shepard, and Kathy Sullivan, all of whom signed their photographs in the program hereby offered.

As this was a private party, it is doubtful that many of these programs signed are available on the market. However, it was a wonderful opportunity to meet and thank each of the astronauts for helping us touch the stars.

\$ 2500.00

FRANK BORMAN

Frank Borman



Frank Borman commanded Apollo 8, which became the first manned spacecraft to orbit the Moon. In a memorable broadcast to the world from Apollo 8 on Christmas Eve of 1968, Borman and fellow astronauts James Lovell and William Anders read passages from the book of Genesis. The late Wernher von Braun stated, "Frank Borman was the right astronaut at the right time to command the critical Apollo 8 mission. More than any flight, Apollo 8's safe return to Earth after ten orbits of the Moon made possible the Apollo 11 lunar landing." Borman, who served on the review board which investigated the tragic Apollo 1 fire that killed astronauts Grissom, White and Chaffee, later headed the team that re-engineered the Apollo

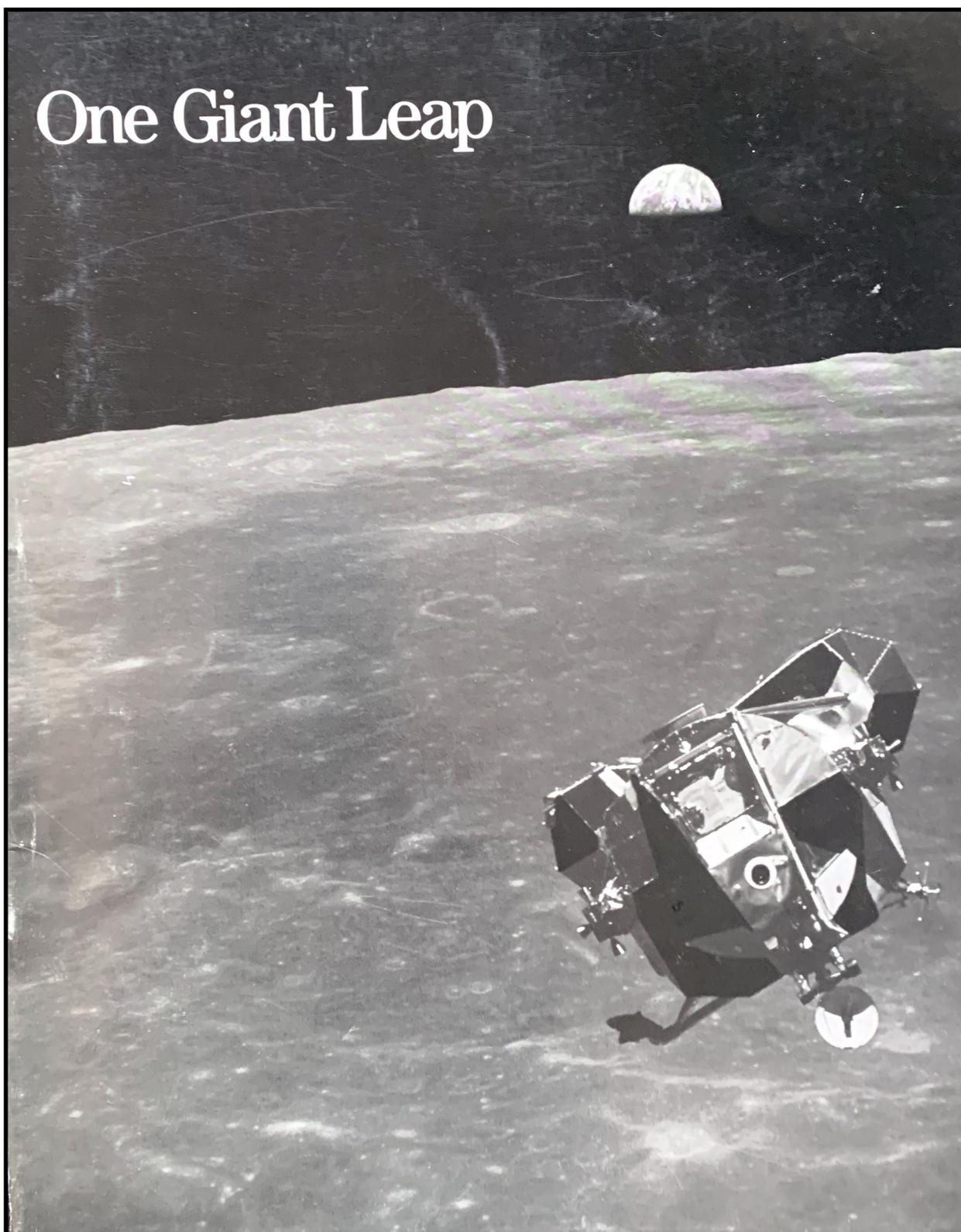
BUZZ ALDRIN

Buzz Aldrin



Dr. "Buzz" Aldrin, lunar module pilot of Apollo 11, was a member of the first crew to land on the moon. It was on July 20, 1969 that the lunar module Eagle touched down on the lunar surface and Neil Armstrong radioed, "Houston, Tranquility Base here. The Eagle has landed." Following his historic Apollo 11 mission, Aldrin was presented the Presidential Medal of Freedom. Apollo 11 was Aldrin's second space flight. In November 1966, he had served as pilot of Gemini 12. Aldrin spent just over 12 days in space and performed the first effective space walks. Aldrin graduated from the U.S. Military Academy in 1951. He later performed graduate work at MIT, earning a Ph.D. in Astronautics in 1963, specializing in manned space

One Giant Leap



FROM THE LIBRARY OF AMERICAN ASTRONOMER ASAPH HALL—WHO DISCOVERED 2 MOONS

3. ASTRONOMY COLLECTION

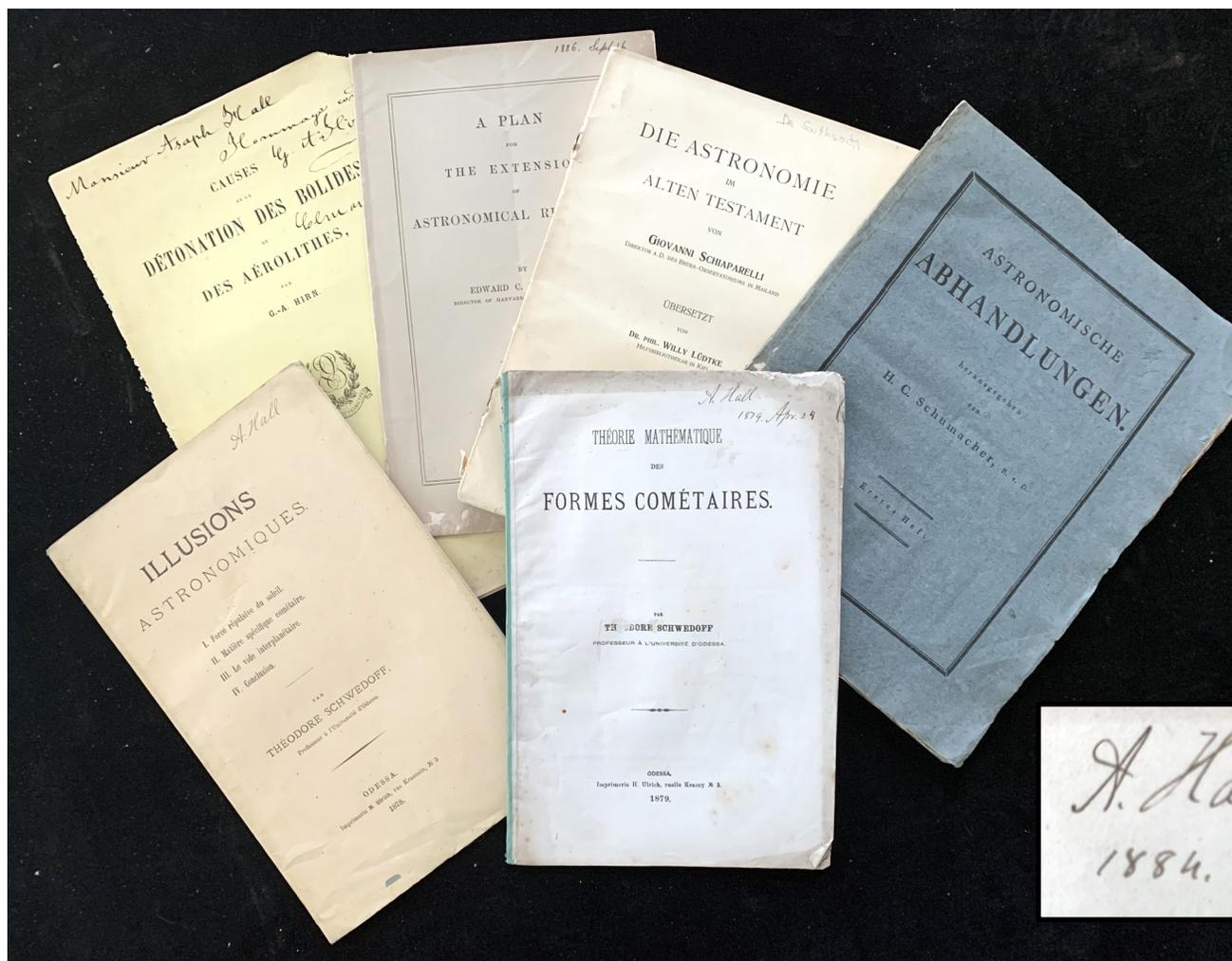
Sixty-one (61) original offprints and monographs. 1823-1944, though most are 1870-1895.

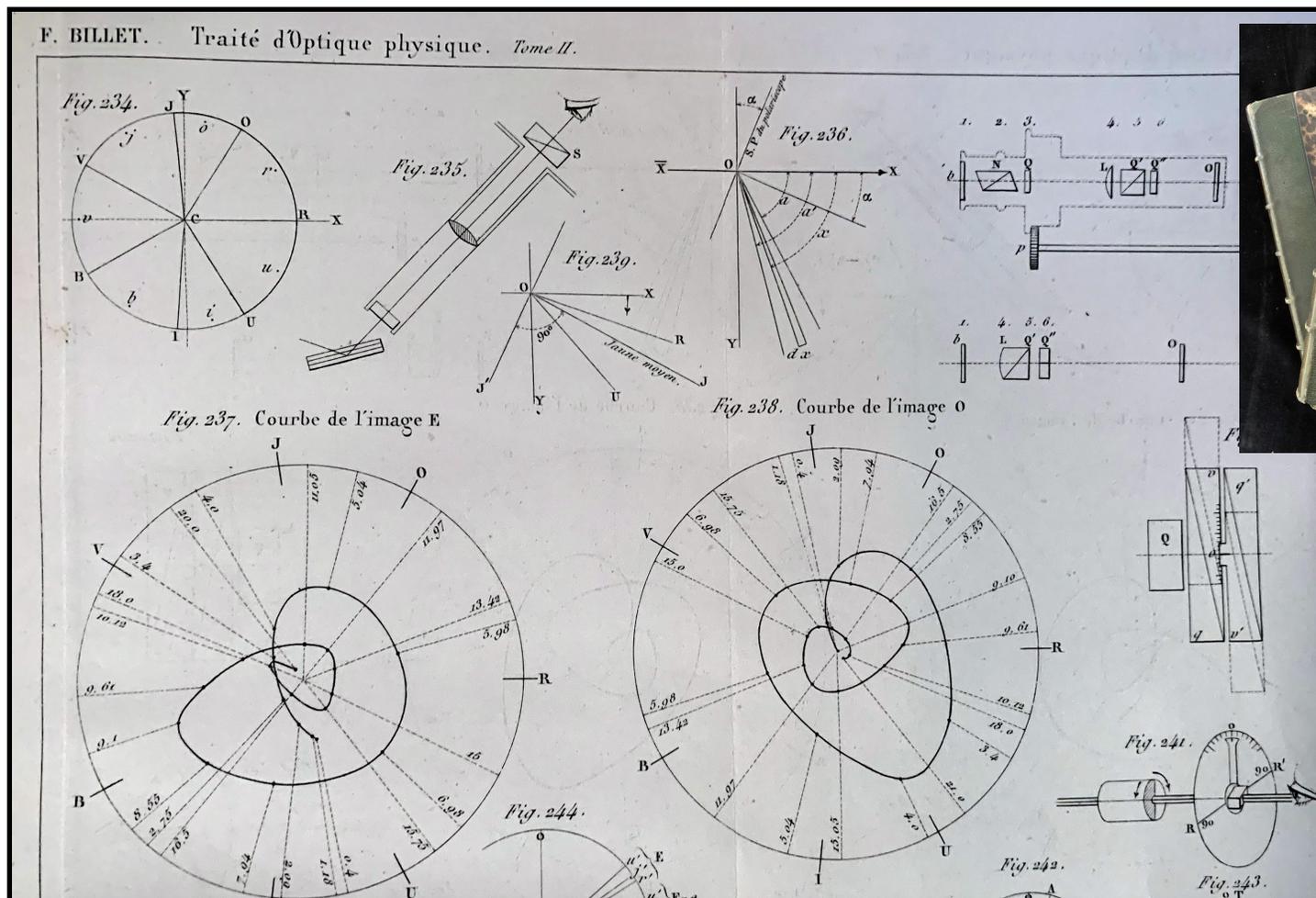
Asaph Hall (1829-1907) was an American astronomer who discovered the two moons of Mars, Deimos and Phobos. Born in Connecticut, Hall studied mathematics and ultimately took a job at the Harvard College Observatory. Six years later he became an assistant astronomer at the U.S. Naval Observatory, where he was made a professor of mathematics a year later.

At the time, the Observatory had the largest refractor telescope in the world. Using it, Hall discovered, in 1877, the two moons of Mars. Much of Hall's later work involved the moons of the outer planets and studies of binary stars. In 1895, he returned to Harvard as professor of astronomy.

Included in the list of authors are Edward Emerson Barnard, George Phillips Bond, Johann Gottfried Galle, Hubert Anson Newton, Wilhelm Heinrich Walter Baade, Ernest Barthélemy Mouchez, and H.C. Schumacher. A complete list of items in the collection will be provided upon request.

\$ 5500.00





FUNDAMENTAL TEXTBOOK ON OPTICS

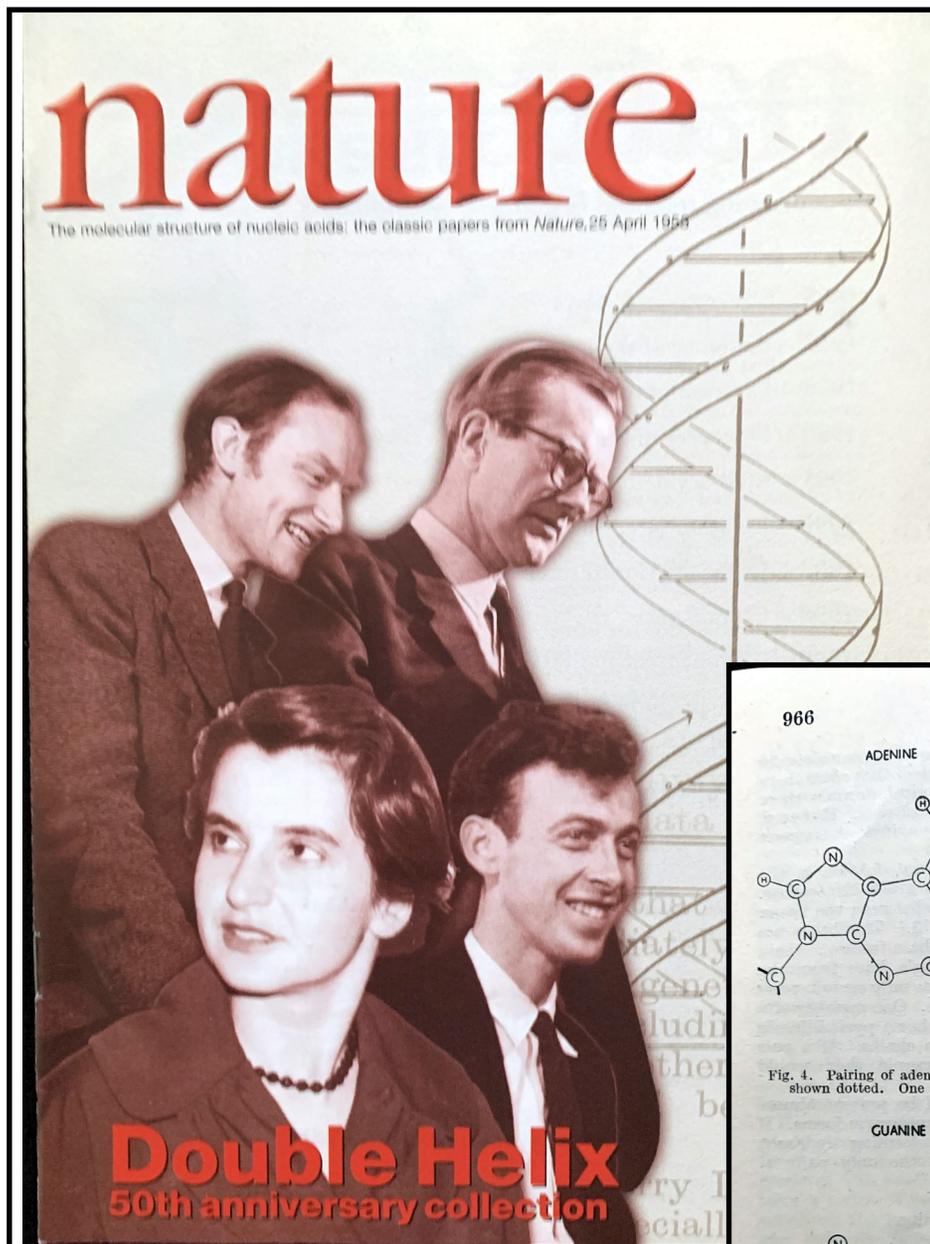
4. BILLET, M. F[élix]

Traité d'optique physique. Paris: Mallet-Bachelier, 1858. Two volumes. 8vo. xv, [i], 540; [iv], xvi, 640 pp. With 14 folding plates. Contemporary marbled boards backed in pebbled calf. Stamp of the Bibliotheque de Sichel with its motto, "Nihil sine opera."

First edition of Billet's fundamental textbook of optics, with emphasis on polarization, refracting and interference. He opens with basic theories and constants of optics, vibratory movements, diffraction, polarized and unpolarized light, and proceeds to detail the new principles of geometric optics, double circular refraction, rotatory polarization and chemistry, and the theories of double refraction, among many other topics.

Billet (1808-1882) was professor of physics at the Faculty of Science at Dijon. He is known for inventing the split lens, as well as an apparatus that made multiple rainbows visible.

It is noted in the DSB (III, pp. 419-420) that Marie Alfred Cornu (1841-1902), who made a number of important contributions to spectrum analysis "was attracted to experimental optics by the exhaustive study of Félix Billet's celebrated *Traité d'optique*, and he repeated all the experiments in this work in his spare time." For his re-determination of the velocity of light, Cornu was awarded the La Caze Prize of the Académie des Sciences and the Rumford Medal of the Royal Society.



**ONE OF THE MOST STARTLING DISCOVERIES
OF THE CENTURY**

5. CRICK, F.H.C. & WATSON, J.D.

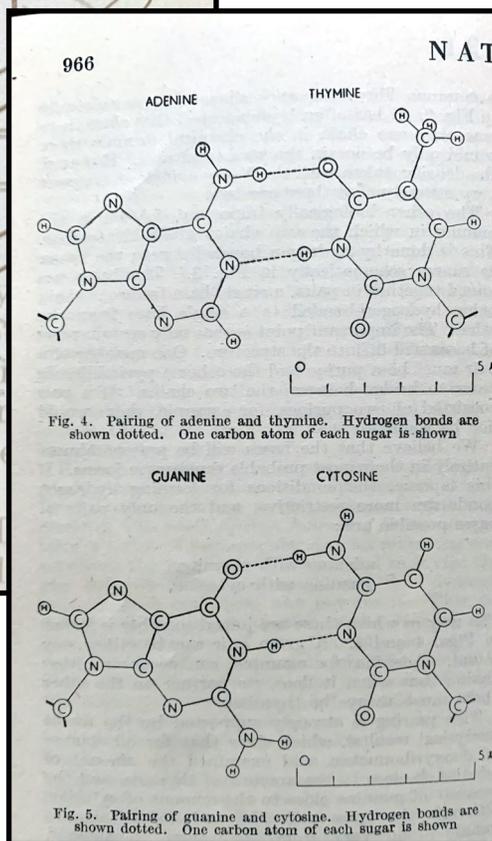
“Molecular Structure of Nucleic Acids. A structure of deoxyribose nucleic acid.” [And:] “Genetical Implications of the Structure of Deoxyribose Nucleic Acid.” [In:] *Nature*, Vol. 171, pp. 737-38 and pp. 964-67, April 25th and May 30th, 1953. London: Macmillan and Co. Ltd., 1953. 4to. lxiv, 1168 pp. Black buckram. The entire Volume 171 for January through June, 1953.

FIRST EDITIONS. “In these two papers Watson & Crick identified the double-helix structure of DNA and explained how it divides prior to mitosis so that each strand can act as a template to pass identical genetic information to each daughter cell.” Watson and Crick shared the Nobel Prize with Wilkins in 1962 for one of the most startling and important discoveries of the century. Dibner, *Heralds of Science*, 200; G&M, 752.1 (the first paper); Grolier, *One Hundred Books Famous in Medicine*, 99.

(Together with):

WILKINS, M.F.H., SEEDS, W.E., STOKES, A.R. & WILSON, H.R. “Helical structure of crystalline deoxypentose nucleic acid.” [In:] *Nature*, Vol. 172, pp. 759-62, October 24th, 1953. London: Macmillan and Co. Ltd., 1953. 4to. lxxi, [i], 1200 pp. Black buckram. The entire volume 172 for July through December, 1953.

FIRST EDITION. Proof of the helical structure of DNA, for which Wilkins shared the Nobel Prize with Watson and Crick. Wilkins and his co-workers combined the observed and calculated intensities of diffraction for crystalline DNA in order to check the plausibility of the structure. G&M, 256.4. \$ 8500.00



The Influence of the Expansion of Space on the Gravitation Fields Surrounding the Individual Stars

ALBERT EINSTEIN AND ERNST G. STRAUS
Institute for Advanced Study, Princeton, New Jersey

STATEMENT OF PROBLEM

IN the theory of relativity one is used to representing the gravitation field in the neighborhood of a single star by the centrally symmetric static solution of the field equations, which was first stated by Schwarzschild. This field goes over asymptotically with increasing distance from the generating mass into the Euclidean (or rather, Minkowskian) space. That is to say, it is embedded in a "flat" space. On the other hand, we know that real space is expanding, and that, for the existence of a non-vanishing average density of matter, the field equations will imply such an expansion.

The boundary conditions on which the Schwarzschild solution is based are, therefore, not valid for a real star. In particular the boundary conditions which are valid for the expanding space are dependent on time. One has to expect, therefore, *a priori*, that the field surrounding a single star is essentially dependent on time.

The problem of this time dependence is of particular interest, since such a time-dependent behavior could be of essential importance for the theory of matter. The assumption has been voiced in this connection that there may exist connecting relations between the cosmic and the molecular constants.

The investigation below yields that the expansion of space has no influence on the structure of the field surrounding an individual star, that it is a static field—if only for an exactly delimited neighborhood.

METHOD

As usual for the cosmologic solutions, one starts with a (pressure free) spatially constant density of matter. It is of the form:

$$ds^2 = \frac{-T^2}{(1+zr/2)^2} \delta_{ik} dx_i dx_k + dt^2, \quad (A)$$

where $r = \frac{1}{2}(x_1^2 + x_2^2 + x_3^2)$. T is a function of t alone. The spherical case corresponds to $z=1$, the pseudo-spherical case to $z=-1$, the spatially plane case to $z=0$. The drawing (Fig. 1) is an illustration of the spherical case $z=1$; each of the two circles stands for a three-dimensional spatial section of the four-dimensional continuum. A particle which at the time t_1 is in P_1 and at the time t_2 is always on the same radial line in our picture. The spatial coordinates in (A) are chosen so that for a fixed particle they are independent of t ("cosmic coordinates"). The conformally Euclidean representation has an arbitrarily chosen point as the origin of the spatial coordinates.

We now consider a region G cut from the continuum in the following manner: we consider all (two-dimensional) spheres, with a constant radius independent of time (in "cosmic coordinates"), constructed around the origin of each time section. The common interior of all these spheres is the four-dimensional region G . In this region G we consider the metric field as replaced by one whose generating mass (represented by a singularity of the metric field) is localized at the (spatial) origin $x_1 = x_2 = x_3 = 0$. Outside the singularity this field shall satisfy the equations $R_{ik} = 0$ of empty space. At $r=P$ the field shall pass continuously into the original field (A). At this passage the g_{ik} and their first derivatives shall remain continuous.

The solution of this problem yields a field for the entire continuum, which is generated in the interior of G by a concentrated mass, in the exterior of G by a homogeneous density of matter. Furthermore, it is clear that in other spherical regions outside G one can replace the field by one

EXTREMELY RARE

6. EINSTEIN, Albert & STRAUS, Ernst G.

"The influence of the expansion of space on the gravitation fields surrounding the individual stars." (bound with) "Corrections and additional remarks to our paper. . . ." Off-print from *Reviews of Modern Physics*, Vol. 17, Nos. 2 and 3. Princeton, New Jersey: Institute of Advanced Study, April-July, 1945. 4to. Pages 120-124; 148-49. Stapled as issue.

First edition of this extremely rare offprint that was given to the authors for distribution to colleagues.

Einstein and Straus here correct the means by which the gravitation field in the neighborhood of a single star is represented, based upon the knowledge that space is expanding. Weil, 216. \$ 550.00

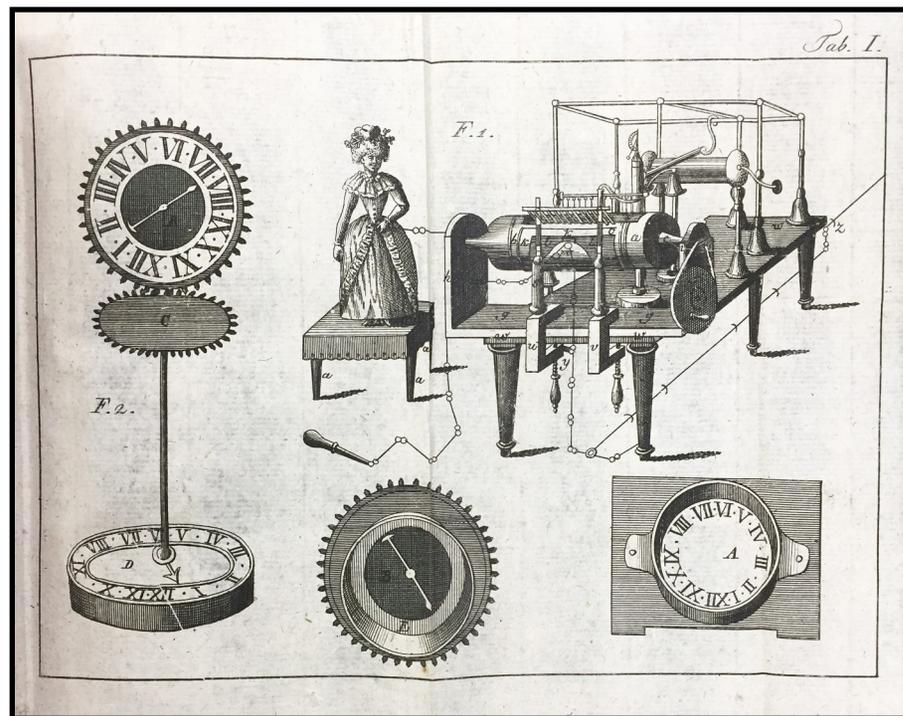
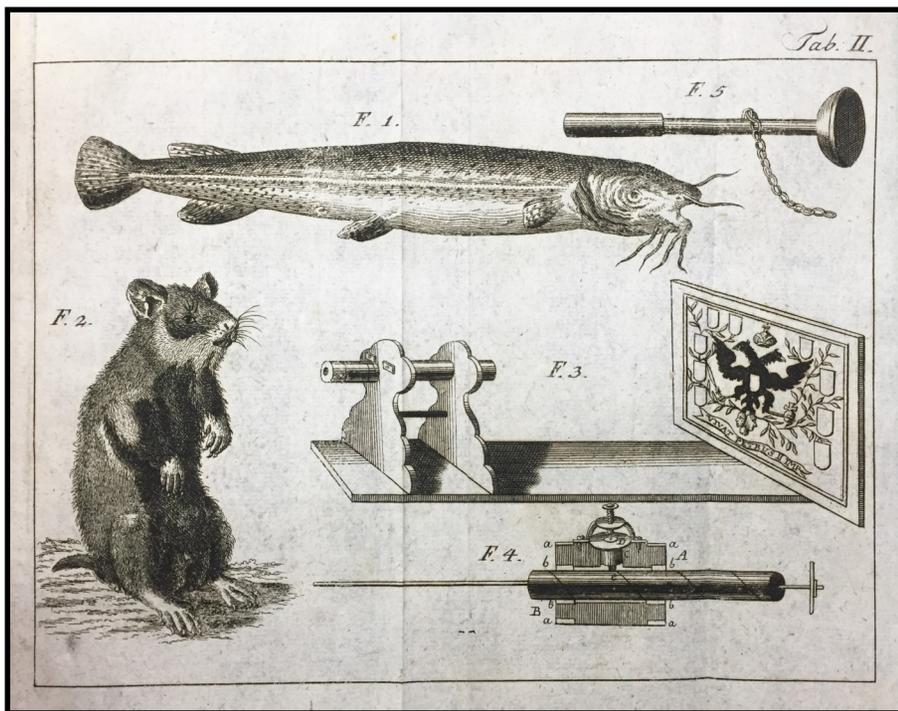
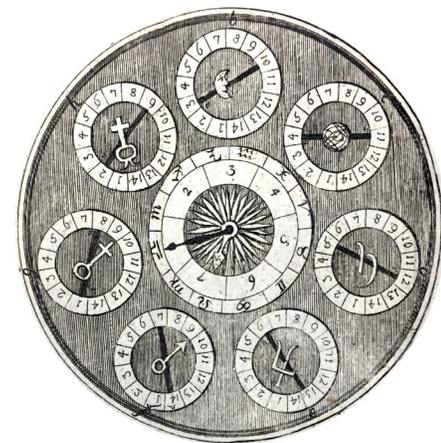
7. HALLE, Johann Samuel

Magie, oder, die Zauberkräfte der Natur, so auf den Nutzen und die Belustigung angewandt worden; (offered with) Fortgesetzte magie, oder, Die Zauberkräfte der Natur, so auf den Nutzen und die Belustigung angewandt worden; (offered with) Neufortgesetzte Magie, oder, die Zauberkräfte der Natur, so auf den Nutzen und die Belustigung angewandt worden. Berlin: Joachim Pauli, 1784, 1784-1786; 1788-90, 1792-98, 1800-1801; 1802. Together, **seventeen volumes in fourteen.** 8vo. Complete with engraved title vignettes, woodcut head- and tailpieces and 124 folding engraved plates; subject indices complete. Uniformly bound in contemporary half-calf over paste-boards; an exceptionally crisp and clean set.

First editions of all volumes (except Volume I in second edition), an absolutely superb set, complete with the rarely seen 1802 *Neufortgesetzte Magie*. This encyclopedia not only covers magic and the history of magic, but documents and illustrates incredible accounts of human knowledge as well as physical science and technology through the eighteenth century.

Halle contributes a huge amount of new material in addition to describing and illustrating the current state of optics, electricity & magnetism, chemistry, mechanics, hydraulics, gunpowder, metallurgy, manufacturing, horology, acoustics, aerostatics (such as those by the Montgolfiers), meteorology (chapters on lightning and lightning conductors), cryptography, paper making, and engraving. The economics and commercial aspects of these subjects are also detailed; for example, Halle specifically discusses games of amusement, keyboard instructions, fortune-telling devices, magic lanterns, talking machines, Kempelen's automaton chess player, mechanical games, stage props, telegraphy, mouse traps, tobacco and coffee, sign language, swimming, botany, plants and animals, artificial pearls, remedies (different herbs and mixtures), opium, distillation and wine making, etc., and all sorts of curiosities.

Halle (1727-1810), a toxicologist, was professor of history at the Royal Prussian Military Academy in Berlin. Little is known of his life, but he wrote many books on subjects of social, economic, technological, and military history. Ferchl, p. 212; Poggendorff, I, 1003; Roller & Goodman, I, p. 505 (another ed.); Wellcome, III, p. 198 (two volumes only). \$ 15,000.00





F. 10.

Tom. 4.

Watson-Crick:
Modell der
doppelte
Nucleinsäure
Struktur.

Thymine Adenin

Exzerpt aus u. Probleme d. Virusforschung.
aus Friksa: Jahrb. d. Max-Planck-Inst. 1953 (Ausgabe Dez 1953)

Abb. 9 Modell d. Desoxyribonucleinsäure (DNA)
"nach Watson u. Crick (Engl.) [Cold Spring Harbor
Symposium on Quantitative Biology, 1953]
Rechts oben Schema d. Verdopplungsprozesses in
der unteren Hälfte Formeln der Nuclein-
Basen und deren Wasserstoffbrücken-Verknüpfung"

Friksa (S 26-27)

Die Nucleinsäuren sind Fadenmoleküle.
Aus der Untersuchung mit Röntgenstrahlen geht
hervor, dass sich zwei Fäden
gegenseitig umschlingen. Die Engländer
Watson u. Crick haben ein Modell
für den Aufbau d. Nucleinsäure ent-
worfen (Abb. 9). Danach sind die um-
einander geschlungenen Nucleinsäurefä-
den durch Querbrücken verbunden.
Diese Querbrücken bestehen immer aus einem
kurzen und einem langen Stück, die auf-
einander passen. Auf der Abb. 9 rechts sind
die Fäden der besseren Übersicht halber
parallel nebeneinander gezeichnet. Man er-
sieht daraus, dass es zwei Typen von kurzen
und zwei Typen von langen Brücken gibt und
nur eines der kurzen auf eines der langen
Brücken glieder passt. [Das gleiche unten
in Formeln angeschlossen] Adenin passt auf
Thymine und Guanin auf Cytosin. Dabei kommt
es, dass bei d. wechselnden Zusammensetzung der Nuclein-
Säuren aus diesen vier Bestandteilen Adenin und
Thymine stets in gleicher Menge vorhanden sind und
ebenso Guanin u. Cytosin. Jeder Faden kann als
Negativ des anderen Fadens aufgefasst werden. Man
kann sich vorstellen, dass durch irgend eine Mechanismus
in der Zelle aus beiden Fäden voneinander getrennt
würden. Dann würde jeder wieder den Muster ge-
fügt für den Aufbau des ergänzenden Fadens aus 5
neuen Bausteinen. Das ist fast recht in d. Schema oben
ausgedrückt. Unklarheiten gehen heute die Verteilung über
Replikation Reproduktion

MAX-PLANCK-INSTITUT FÜR BIOLOGIE
PROF. DR. E. HEITZ
TÜBINGEN, COBENSTR. 41

NOTES FROM THE COLD SPRINGS HARBOR SEMINAR ON DNA

8. HEITZ, Emil

Autograph notes. Tübingen, [not before May 1954]. 1 ½ pp. on single sheet letterhead of Max-Planck-Institut für Biologie. Diagrams of two chemical structures, in pen and ink on verso, and a slip bearing further diagrams (one in pencil of the double helix, two copied over in pen and ink of DNA “unzipping”, and of diagrams of chemical structures) has been laid down.

Notes from the meeting at Cold Springs Harbor, which Prof. Heitz attended, containing a model of DNA from Watson and Crick. The notes were taken from Friksa? “Erkenntnisse u. Probleme d. Virusforschung” (Knowledge and problems in virus research) in *Jahrbuch der Max Planck Institut 1953* (published May 1954), and concerns the structure of DNA. The notes were taken from pages 26-27. A complete citation has been written on the verso, noting the Cold Spring Harbor Symposium at which Watson and Crick made their original presentation.

Heitz (1892-1965) was a German scientist who established the longitudinal differentiation of chromosomes both genetically active and genetically inert – a keystone in cytogenetics. He also co-discovered the giant salivary chromosomes of the fly. Despite his major contributions to the field, Heitz’s findings were not celebrated in his lifetime, suffering from the political disturbances of his time. \$ 1250.00

(FAC-SIMILE OF PLATE.)

ELEMENTS.

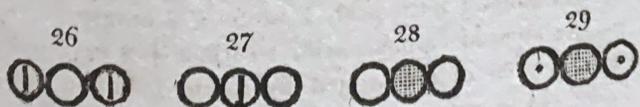
SIMPLE.



BINARY.



TERNARY.



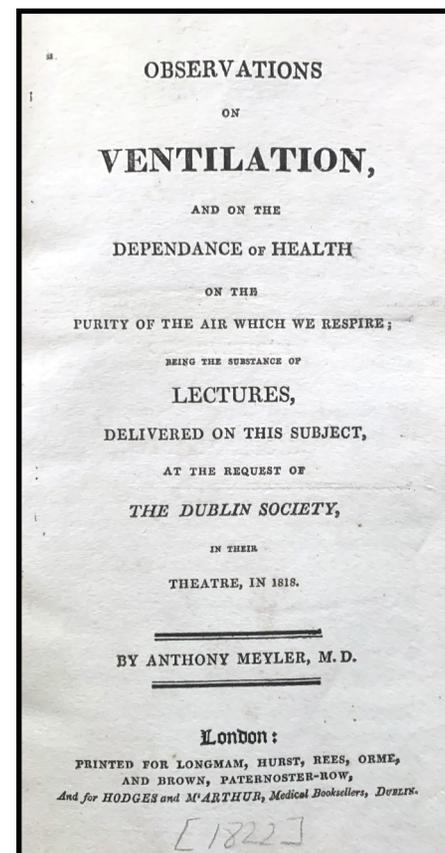
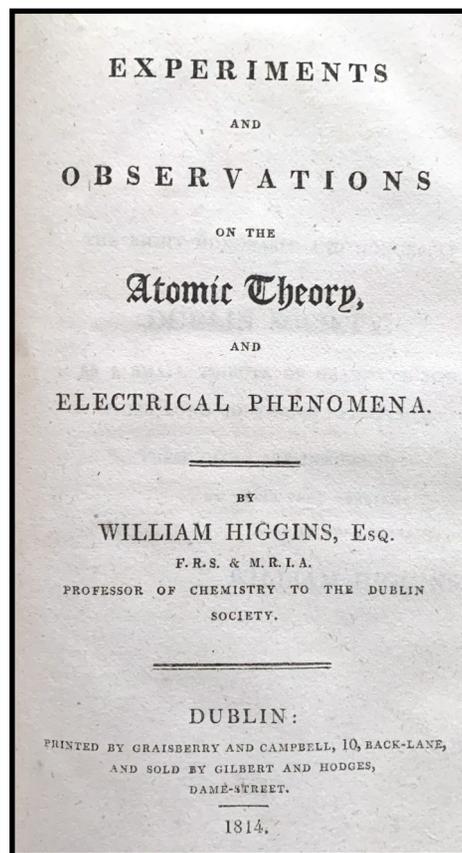
DALTON A PLAGARIST?

9. HIGGINS, William

Experiments and observations on the atomic theory, and electrical phenomena. Dublin: Graisberry and Campbell, 1814. (bound after) MEYLER, Anthony. *Observations on ventilation . . .* London: Longman, Hurst, Rees, Orme and Brown, [1822]. Two works in one. 8vo. Contemporary calf over marbled boards. From the library of John Lort Stokes, British admiral who served on the Beagle with Darwin. Bookplate of the British chemist Franz Sondheimer.

First edition. Higgins claimed to have anticipated Dalton's chemical atomic theory in his *Comparative view of the phlogistic and antiphlogistic theories* (London, 1789). "I cannot with propriety or delicacy say that Mr. Dalton is a plagiarist, although appearances are against him. Probably he never read my book. . . ." Bound with the second edition of Meyler's work on ventilation.

\$ 1500.00



MECHANICS AND OPTICS

10. HUYGENS, Christian

Opera reliqua. (with) *Opera posthuma.* Amsterdam: Janssonio-Waesbergios, 1728. Two works in one. 4to. With 58 folding engraved plates. Contemporary calf; a very wide-margined copy.

First edition. The present volumes contain his works on gravity and accelerated motion, the laws of elastic bodies, and the undulatory theory of light, perhaps his most important achievement. Also included are his tracts on optics, instructions on grinding lenses for telescopes, and a description of the Planetary Automate machine he constructed portraying the movements of the solar system. This machine, as well as a number of other innovations and discoveries, are all depicted in the finely engraved illustrations. \$ 7000.00

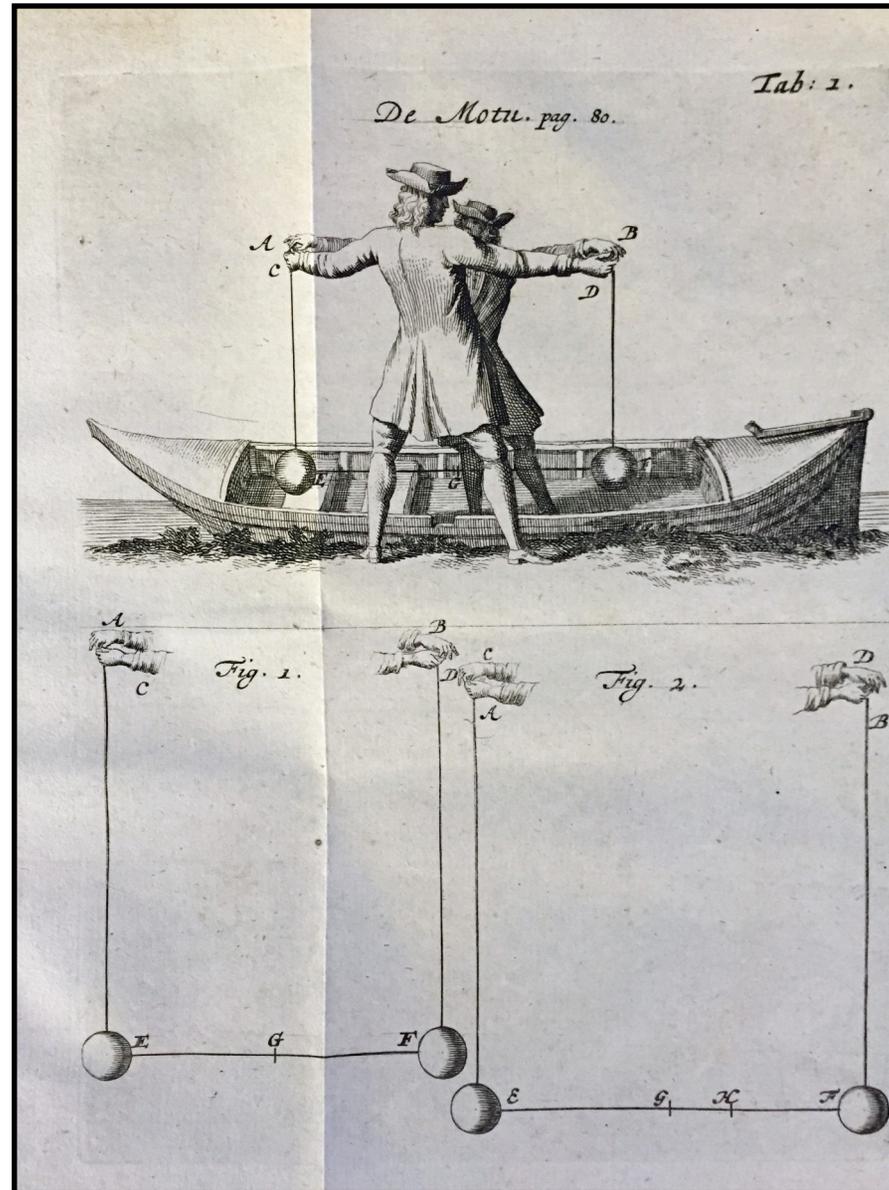
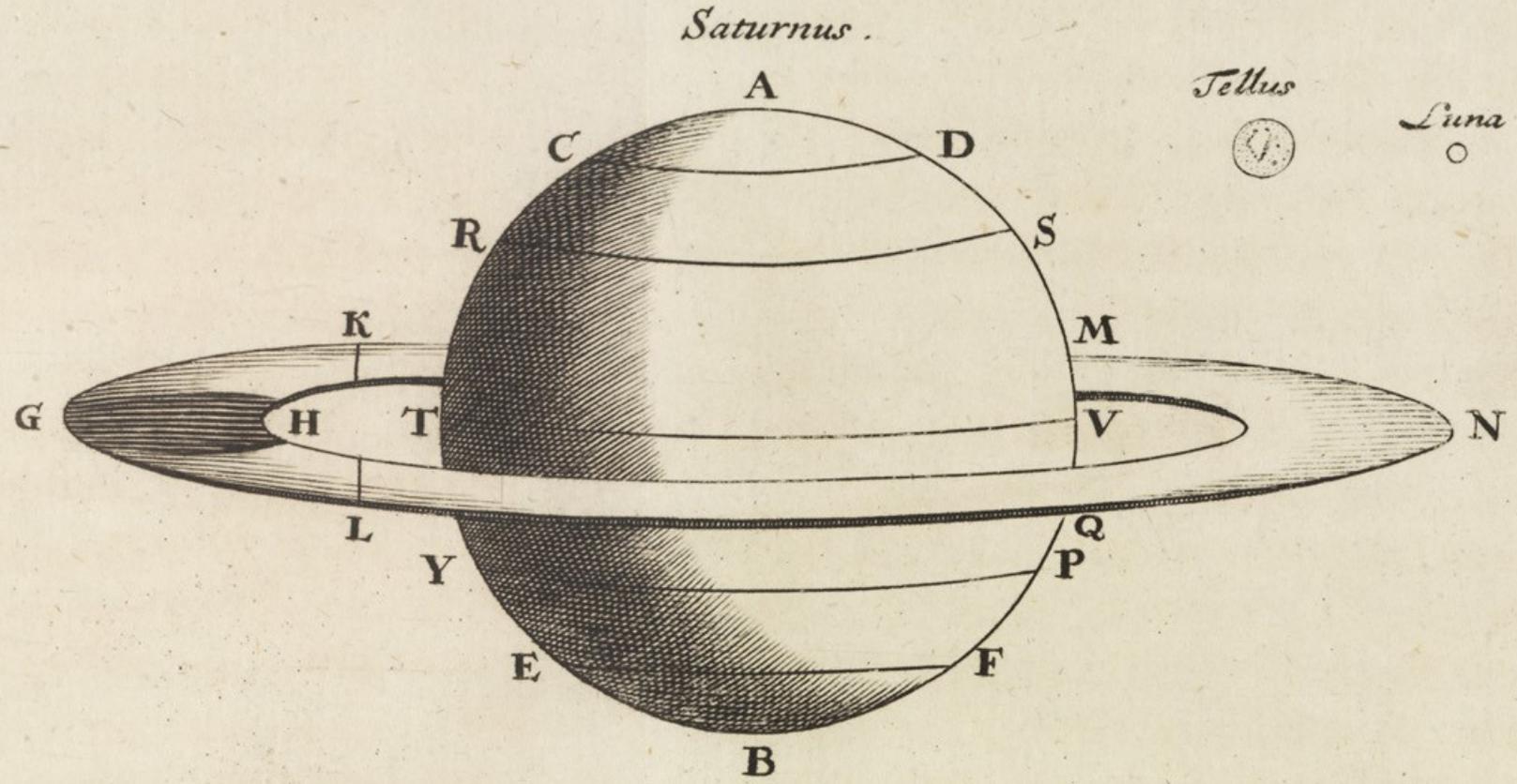
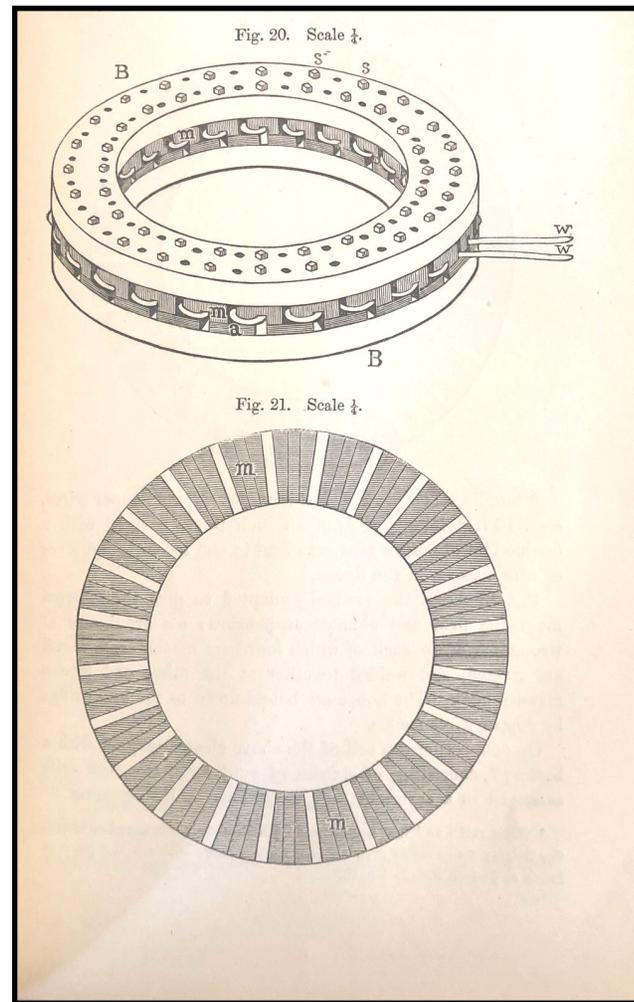


Fig. 4.

p. 125





FIRST APPEARANCE OF HIS MOST VALUABLE PAPER

11. JOULE, James Prescott

The scientific papers. London: The Physical Society of London, Taylor & Francis, 1884; 1887. Two volumes. 8vo. xxix, [i], 657; xiii, [i], 391 pp. Frontispiece portrait, 7 plates, 1 large folding table, and numerous text illustrations. Original cloth, A very fine set.

First edition of Joule's collected works, containing the first appearance in a book of his most valuable paper, On the caloric effects of magneto-electricity, as well as his famous treatise, The mechanical value of heat. The first volume records the research for which he alone was responsible, while the second volume includes a number of projects which he carried out in association with Scoresby, Playfair, and William Thomson.

Joule (1818-1889) concluded that heat was a measurable form of energy, and that in a given system the sum total of energy was constant and convertible. His work led to the determination of absolute zero and the establishment of the unit "joule." Cajori, *History of Physics*, p. 219; Dibner, *Heralds of Science*, 158; Sparrow, *Milestones of Science*, 113; Wheeler Gift Catalogue, I, 2363; Zeitlinger 9919. \$ 850.00

FIRST TEXTBOOK ON NEWTONIAN PHYSICS

12. KEILL, Jo[hn]

Introductio ad veram physicam: seu lectiones physicae habitae in schola naturalis philosophiae academiae Oxoniensis, A.D. 1700. Quibus accedunt Christiani Hugenii theoremata de vi centrifuga & motu circulari demonstrata. London & Cambridge: Geo. Strahan & G. Thurlbourn, 1741. 8vo. [xx], 291, [1] pp., plus 12 folding plates. Engraved title vignette. Contemporary calf.

This sixth edition (originally published in 1701) of Keill's lecture notes on Newtonian mechanics, based on the series of experimental lectures on natural philosophy Keill had given at Oxford. These were the first such lectures ever given. . . . "their attempt to derive Newton's laws experimentally did much to influence later publications." Of special interest is the author's support of Huygens' approximation of the quadrature, in which he located the center of gravity of a segment of a circle.

Keill (1671-1721), a famous mathematician and astronomer, was a friend and early champion of Isaac Newton and his *Principia*. He was a student of David Gregory and Savilian professor of astronomy at Oxford, where he was a lecturer and the first to teach natural philosophy by experiments in a mathematical manner at Oxford. As a member of the Royal Society, he contributed many papers, chiefly in support of Newton. Keill attacked Spinoza and Hobbes, and discredited Leibniz and Bernoulli in order to protect and maintain Newton's priority.

\$ 600.00

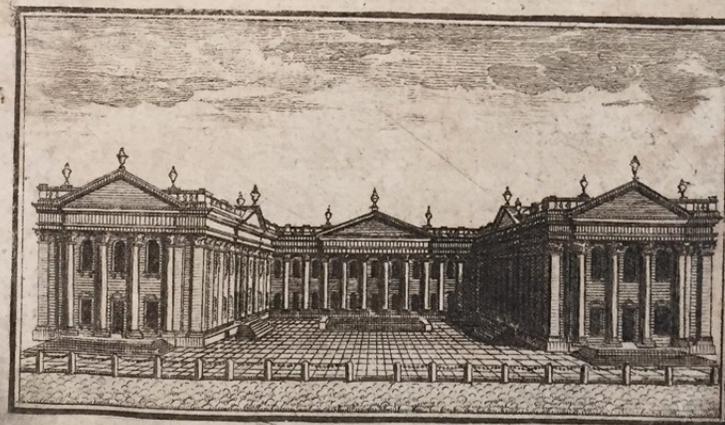
INTRODUCTIO AD VERAM PHYSICAM:

SEU
LECTIONES PHYSICAE
Habitae in Schola Naturalis Philosophiae
Academiae OXONIENSIS, A.D. 1700:

Quibus accedunt
Christiani Hugenii THEOREMATA de Vi Centrifuga
& Motu Circulari demonstrata.

Per JO. KEILL è Coll. Bal. A. M. & Reg. Soc. Socium.

EDITIO SEXTA, ab aliarum editionum mendis purgata.



CANTABRIGIAE:
TYPIS ACADEMICIS.
Impensis Geo. Strahan Londini, & Gul. Thurlbourn Cantabrigiae.

MDCCLXI.

1741

GEOLOGICAL

E S S A Y S.

BY RICHARD KIRWAN, Esq.

F. R. SS. Lond. & Edin. M. R. I. A.

OF THE ACADEMIES OF STOCKHOLM, UPSAL, BERLIN,
MANCHESTER, PHILADELPHIA;
OF THE MINERALOGICAL SOCIETY OF JENA, &c.
AND INSPECTOR GENERAL OF HIS MAJESTY'S MINES IN THE
KINGDOM OF IRELAND.

LONDON:

PRINTED BY T. BENSLEY, BOLT COURT, FLEET STREET,

FOR D. BREMNER, (SUCCESSOR TO MR. ELMSLY) STRAND.

1799.

RECONCILING GEOLOGY WITH GENESIS

13. KIRWAN, Richard

Geological essays. London: D. Bremner, 1799. 8vo. xvi, 502 pp., plus leaf of publisher's advertisements. An uncut copy in the original boards, which have been re-backed with the original spine laid down. In fantastic condition.

First edition of Kirwan's attempt to reconcile his geological observations with the history of the earth as related in Genesis. The first part of the book comprises a basic primer of geology, with a substantial amount of chemical and mineralogical information. The final chapter contains a bitter attack on James Hutton's geomorphological theory. Kirwan points out that many of Hutton's ideas are inconsistent with chemical facts. Although an earlier paper published by Kirwan (in 1793) led Hutton to expand his original paper into the two-volume *Theory of the Earth*, "it has often been overlooked that Kirwan's attack, if forthright, was less acrimonious than either Hutton's reply in the second chapter of his book or John Playfair's later defense of Hutton" (DSB).

Kirwan (1733-1812), an Irish scientist, was elected FRS in 1780, two years before being awarded the Copley Medal from that organization. Having moved to Dublin in 1787, Kirwan helped to found the Royal Irish Society, in 1799 becoming its president. He contributed a number of articles to the Society's Proceedings, most dealing with meteorology, chemistry and mineralogy. He was one of the last supporters of the phlogiston theory. DSB, VII, pp. 387-389; Neville, p. 30; Ward & Carozzi, 1268; Zeitlinger, Supp. 4293. \$ 1850.00

THE GREAT LUNAR PHOTOGRAPHIC ATLAS WITH SUPPLEMENT— WHICH OPENED THE WAY FOR THE APOLLO 11 MOON LANDING

14. KUIPER, G.P.

1. *Photographic lunar atlas*. Chicago: University of Chicago Press, 1960. Elephant folio. With 281 photographs on 230 sheets loose in the original cloth folding box.

First edition, the civilian issue, originally printed for the United States armed forces. The purpose of the atlas was to provide the United States government with the most complete and best photographic coverage of the moon. These photographs proved to be invaluable for the planning and operational stages of later spacecraft missions to the moon.

The atlas contains photographs taken at the observatories at Mount Wilson, Lick, McDonald, Yerkes and Pic Du Midi. They are reproduced lithographically, on large sheets. It is divided into 3 parts, including an introduction showing a sub-division of the Lunar surface into the 44 fields and giving the names of the maria, mountain ranges and craters based on the system of Blagg and Muller; the main body of the *Atlas* composed of 4 sheets per field, or 176 sheets, to which are added two additional sheets each for the 4 polar areas, making 184 sheets in body of atlas; and the 35 Supplementary sheets. (offered with)

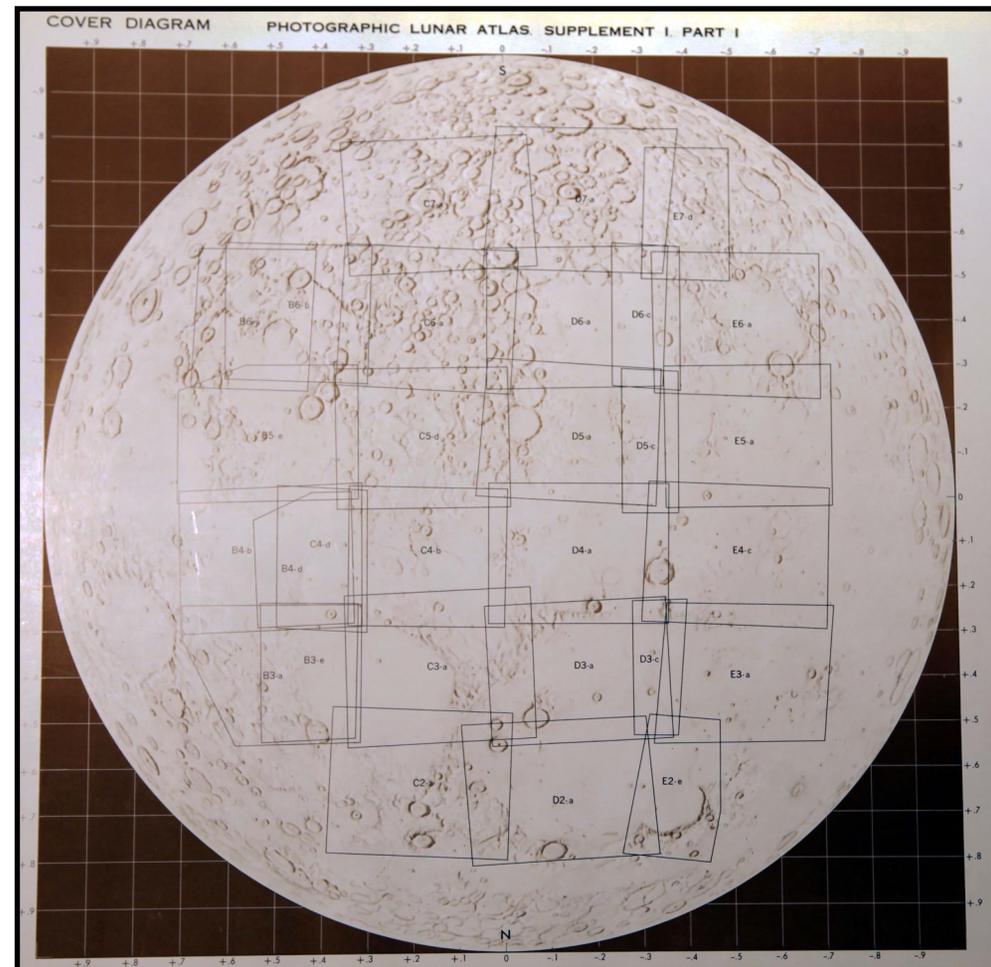
ARTHUR, D.W.G., WHITAKER, E.A., & KUIPER, G.P.

2. *Orthographic Atlas of the Moon. Supplement Number One to the Photographic Lunar Atlas*. Tuscon: University of Arizona Press, 1961. Elephant Folio. With 60 plates. Blue cloth.

First edition, second issue (Edition B). This Edition B has both the first section (Central Area) which appeared in the earlier Edition A, but has an added second section (Limb Regions) with an additional 29 plates, all showing the standard orthographic coordinate grid. The *Orthographic Atlas of the Moon* consists of the best photos for each of the 44 fields in the earlier atlas overprinted with the rectangular xi-eta grid (adjusted to the correct librations for the photo) at a spacing of 0.01 lunar radius, with colored lines of latitude and longitude at intervals of 2° . Kuiper, born in the Netherlands in 1905 and educated at Leiden University, came to the United States in 1933 and became a naturalized American citizen in 1937. In 1960 Kuiper founded the University of Arizona Lunar and Planetary Laboratory. There he focused on the solar system at a time when most astronomers had their eyes on more distant, more exotic objects. The astronomy world had no idea how important planetary science would become.

With the help of a group of researchers he assembled at Arizona, Kuiper orchestrated the production of a new, more complete photographic lunar atlas. Eventually his team would produce three lunar atlases (a second supplement was published three years later focusing on the limb regions of the Moon). Without Kuiper's efforts, the July 20, 1969 landing of Apollo 11 on the moon could not have occurred.

\$ 3000.00





**ORTHOGRAPHIC
ATLAS OF THE MOON**

Supplement Number One to the
PHOTOGRAPHIC LUNAR ATLAS

Compiled By
D. W. G. Arthur
E. A. Whitaker

Edited By
Derek F. K. K. K.

THE UNIVERSITY OF ARIZONA PRESS

1965
52-2
111

This sheet carries the lines of the standard orthographic map grid at intervals of 0.01 of the lunar radius. Positions may be interpolated to 0.001 or better. The vertical lines correspond to the abscissa $\lambda = \cos \beta / \sin \lambda$ and the horizontals to $\phi = \sin \beta$. The selenographic longitude (λ) and latitude (β) may be computed from $\sin \beta = \phi$ and $\sin \lambda = \lambda / \cos \beta$.

AUTHORITIES
The positions on which the grid depends are those of S.A. Saunder (Mémoir 60, Royal Astronomical Society), J. Franz (Randauschalten des Mondes) and D.W.G. Arthur (unpublished). In the event that the same point is determined by more than one authority, Saunder's value is accepted in preference to that of Franz, and Franz's value in preference to that of Arthur.

NUBIUM N. D5-a

LIGHTNING RODS IN DETAIL

15. LANDRIANI, Marsilio

Dell'utilità dei conduttori elettrici. Milan: Marelli, 1784. 8vo. xxxiv, 304 pp. Engraved title vignette, head-piece, initial, and 1 folding engraved plate. Original wrappers, an excellent unsophisticated copy preserved in a folding clamshell box.

First edition of the author's fascinating treatise on lightning rods. Landriani treats not only practical matters of construction and use, but also incorporates a section on scientific theory, differentiating between natural and artificial electricity. He provides a detailed description of Franklin's experiments, and includes a catalogue of all known lightning rods installed in Europe.

Landriani (1746-1815), physicist and inventor, was one of a small group of eighteenth-century Italian scientists who received government funds to travel for the purpose of investigating scientific advances in other countries. A number of letters from scientists such as Saussure and Toaldo, among others, are published here for the first time. Along with Fontana, Landriani also developed the science of eudiometry, a method of verifying the healthiness of the air. Gartrell, 301; Overmier & Senior, *The Bakken*, 78; Ronalds, p. 285; *Wheeler Gift Catalogue*, I, 523.

\$ 2000.00

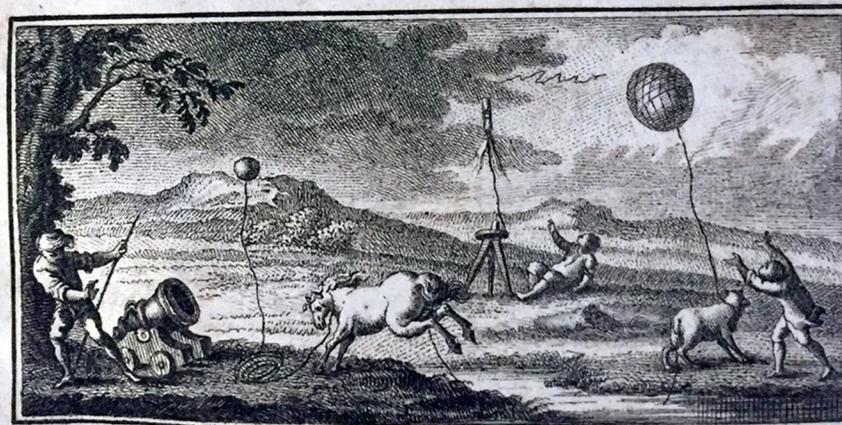
DELL'UTILITÀ DEI CONDUTTORI ELETTRICI Dissertazione

DI MARSILIO LANDRIANI

Patr. Milanese, Cav. dell'Ins. Ordine Milit.
di S.^o Stefano P. e M. Membro delle R. Accad.
delle Scienze di Berlino, di Erfurt, di Torino,
di Napoli, di Firenze, di Padova, di Mantova:
della Soc. Fis. di Zurigo: della Soc. Italiana;
dell'Accad. Metereol. di Manheim: della
Soc. Patr. di Milano & R. Prof. di
Fisica Sperimentale &c. &c. &c.

PUBBLICATA PER ORDINE DEL GOVERNO

*Fortior adversus celi minas surge et cum
mundus undique exarsit cogitare nihil
habere perdendum. Seneca Quæst. Nat. Lib. II.*



He nuge seria ducent, Hor. Poet.

MILANO per il Marelli MDCLXXXIV

DEFENDING NEWTON

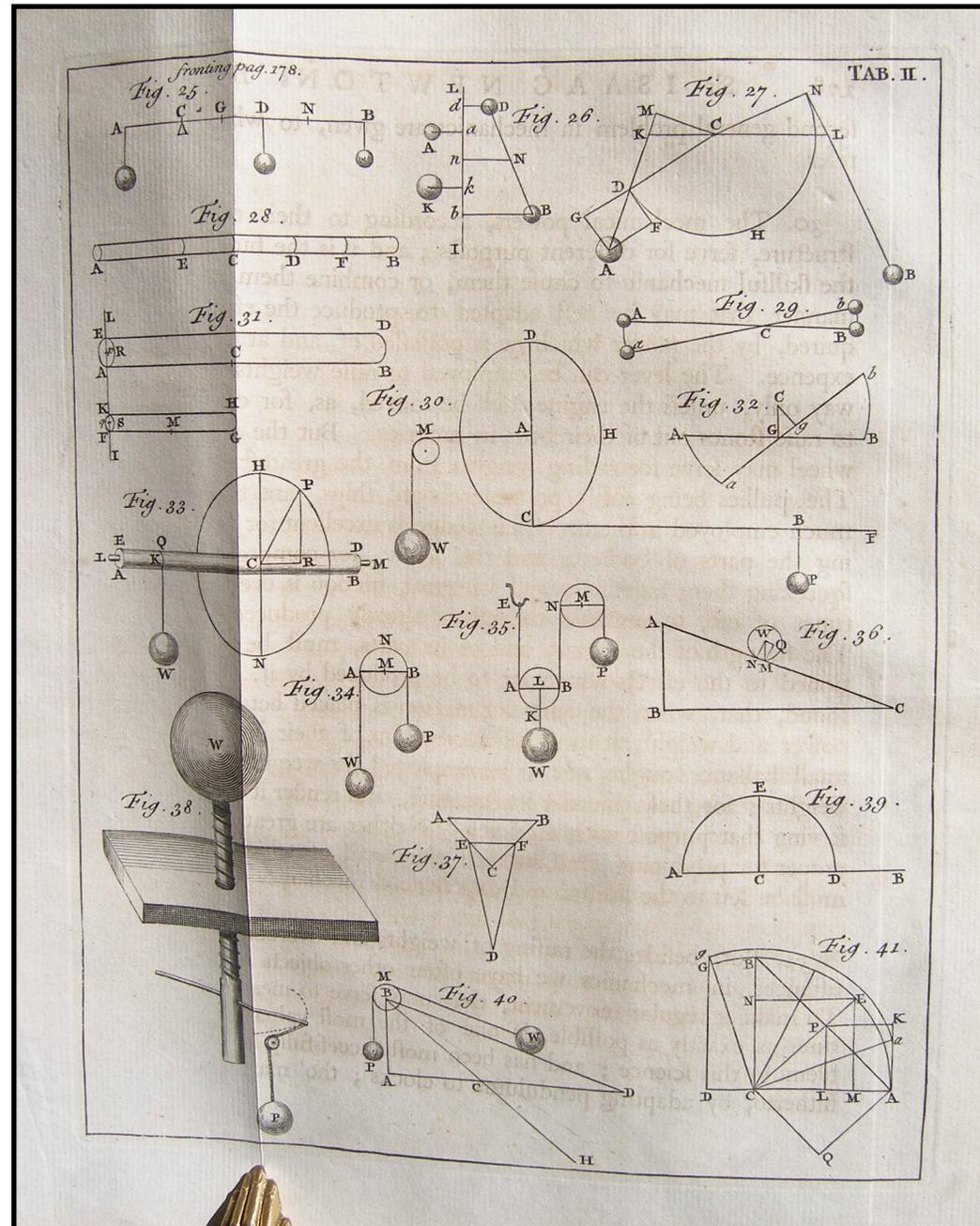
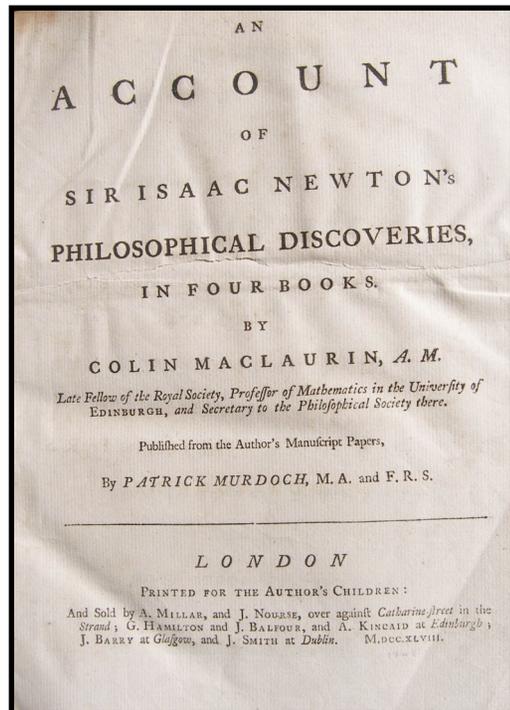
16. [NEWTON, Isaac]. MACLAURIN, Collin

An account of Sir Isaac Newton's philosophical discoveries, in four books. London: Printed for the author's children, 1748. 4to. [xxvi], xx, 392 pp. With half-title, a 20-page list of subscribers, errata and 6 folding engraved plates. Later calf-back and marbled boards.

First edition of this author's defense of the most controversial points of Newton's cosmology, as well as his theories of celestial motion and gravity. Published posthumously by subscription for the benefit of the author's family, this edition contains a biography of Maclaurin by Patrick Murdoch, still the primary source of biographical information on the author.

Maclaurin (1698-1746), a leading mathematician, natural philosopher, and friend of Newton who was appointed to his chair of mathematics at Edinburgh on Newton's recommendation, introduced a method of generating conics named in his honor. He is also renowned for his proof that a homogeneous liquid mass revolving uniformly around an axis under the action of gravity must assume an ellipsoid form of revolution. Babson, 85; Gray, 112.

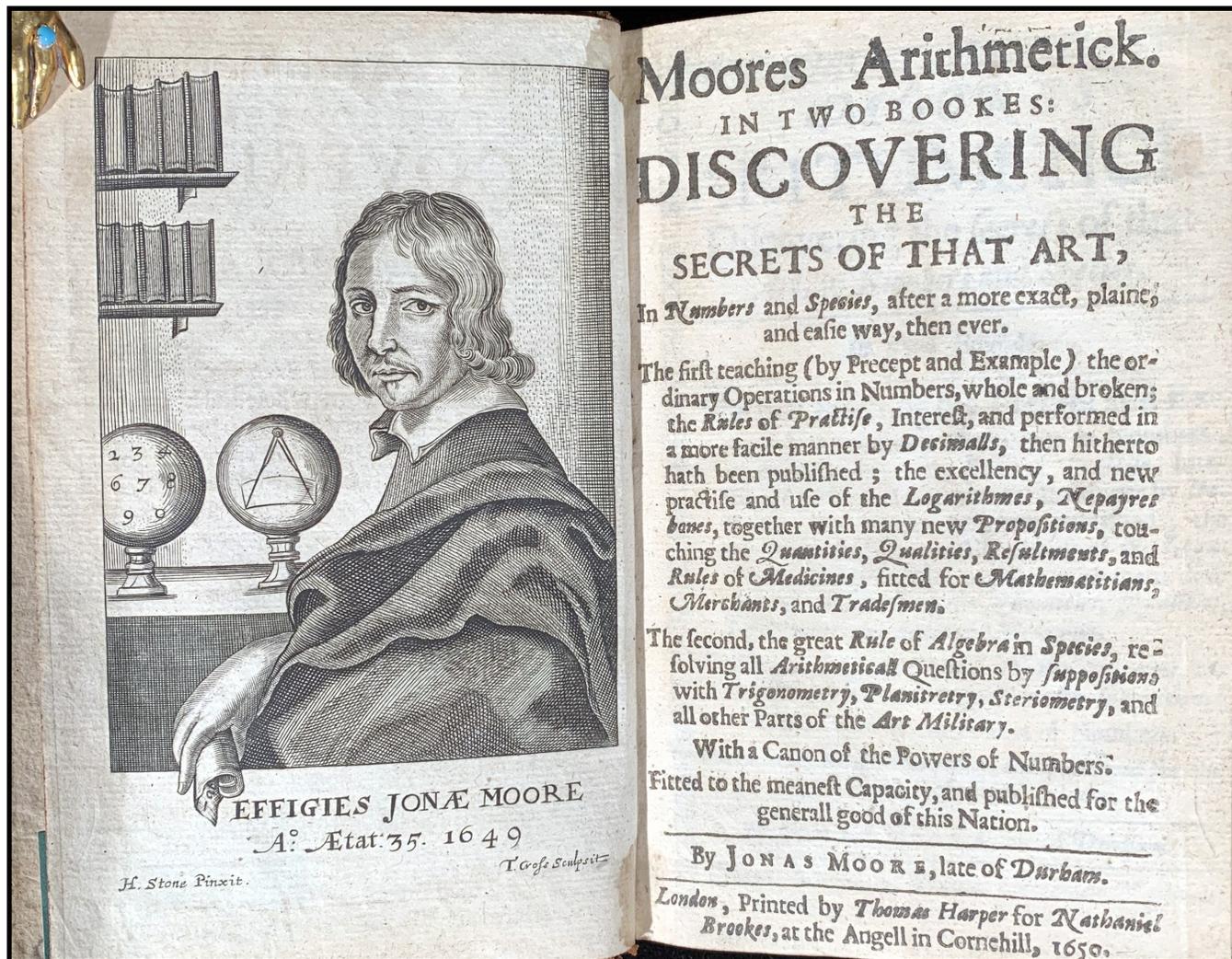
\$ 2500.00



THE HARRISON HORBLIT COPY

17. MOORE, Jonas

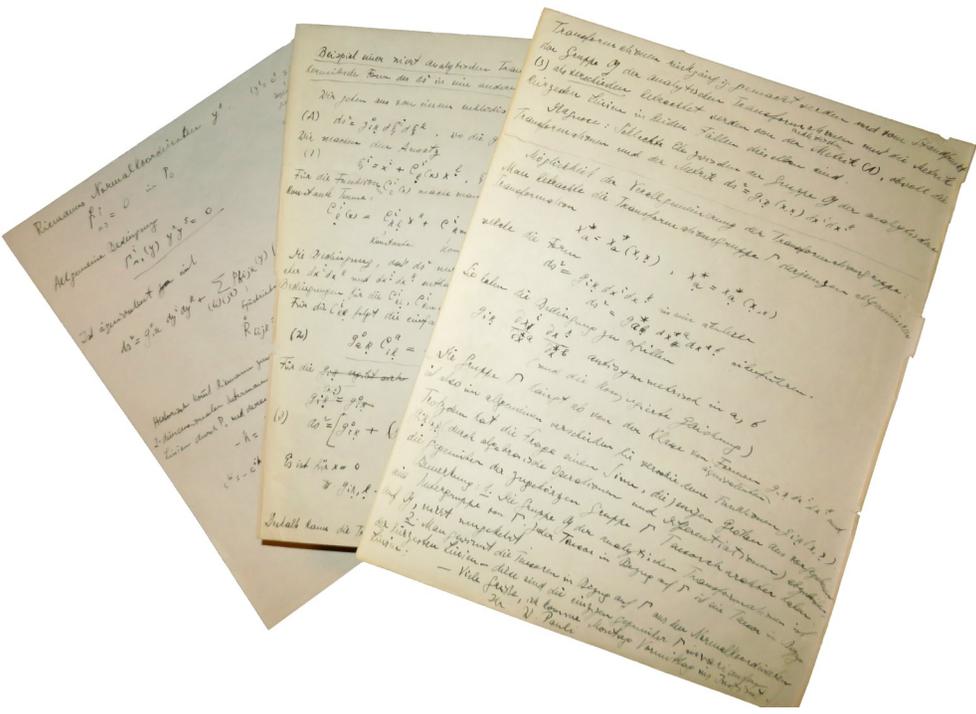
Moore's arithmetick. In two bookes: discovering the secrets of that art, in numbers and species, after a more exact, plaine, and easie way, then ever ... (Second title): *Arithmeticke in species. The second book. Wherein after a most easie and obvious maner, the most difficult questions, by that mysterious art, received their analytically lawes and resolutions. . . .* London: Thomas Harper for Nathaniel Brookes, 1650. Two parts in one. 8vo. [xvi], 272; [iv], 141 (i.e. 147) pp. Frontispiece portrait of Moore, separate title for each part, 3 folding tables. Full contemporary calf, preserved in a red morocco slipcase. From the libraries of Harrison Horblit and Erwin Tomash.



First edition, rare, of the author's first work of mathematics in which he provides a short introduction and proceeds to explain in detail various aspects of the subject, always utilizing practical applications. As a mathematician he is best known as the first to use the notation *cot*. However, he is famous for his support of the sciences which made numerous mathematical and astronomical advances possible. Though debates at the time on the nature of mathematics raised questions about the value of instruments, they remained essential to his work as a teacher, as Surveyor of the Fens and as Surveyor-General of the Ordnance, where he gained great success by keeping the sea out of Norfolk, surveying the coasts and constructing a map of Cambridgeshire, and helping to survey London after the great fire.

Moore (1617-1679) was the mathematics teacher to the Duke of York and a patron of John Flamsteed, to whom he provided instruments (sextant and clocks) to carry out his astronomical observations on longitude. Wing, M2563.

\$ 12,000.00



PAULI'S MANUSCRIPT NOTES FOR EINSTEIN

18. PAULI, Wolfgang

Manuscript. Three pages on two 8 1/2 x 11 in. leaves. In German. Princeton, NJ: No later than 1945.

The calculations in the first two pages relate to a generalization of the general theory of relativity that Einstein was working on in connection with his unified field theory. In a paper of June 19, 1945, Einstein had proposed a generalization of the mathematical foundations of general relativity. He proposed to generalize the theory such that distances in space would be invariant (unchanging) not only under changes of the frame of reference (as in the original theory) but also invariant under so-called Hermitian transformations. In a follow-up paper of January 24, 1946 (co-written with E.G. Straus), the authors note that Pauli had shown them that the limitation to Hermitian transformations is not necessary for the theory. Indeed, in the first two pages of the document Pauli shows that a restriction to Hermitian transformations is problematic, and he suggests an even more general transformation group, and thereby provides a generalization of the alleged structure of space and time that goes further than that proposed by Einstein in his 1945 papers.

The pages were very likely written for Einstein. They are not formally addressed to him, most likely because Einstein and Pauli were both at the same Institute at the time and Pauli could just put his notes in Einstein's departmental pigeonhole himself. Still, the calculations finish on a personal note: "Best regards, on Monday morning I'll come to the Institute, Yours, W. Pauli"; likely an invitation for further discussion between two of the greatest minds of the twentieth century.

Einstein was at the Institute for Advanced Studies at Princeton from 1933 to his death in 1955. Pauli was a visiting professor in 1935 and then again from 1940 to 1946. When Pauli received the Nobel Prize in 1945, Einstein gave a speech in which he called Pauli his intellectual heir. Indeed, there are many signs that Einstein and Pauli had regular contact and conversations on physics during their joint time at Princeton, and the first two pages of the manuscript are likely an important testament to their collaboration.

The third page is also in Pauli's hand, but it is not directly related to the preceding pages, even though it, too, contains differential geometric calculations, related to curvature of spacetime and which paths through spacetime are the straightest ones.

Pauli (1900-1958) was certainly one of the foremost theoretical physicist of modern times. He was one of the co-creators of quantum mechanics, he formulated the Pauli exclusion principle (which allows for a quantum mechanical explanation of the periodic table of chemistry), gave the first theoretical account of electron spin, and successfully predicted the elementary particle we today call the neutrino. Pauli formulated the CPT Theorem, which links the symmetries of space and time to the properties of elementary particles. For decades, he was the nexus of international correspondence on theoretical physics, maybe the last theoretician who overlooked the entire field, and was aptly called "the conscience of physics" by most of his contemporaries due to his relentless criticism of everyone's work, no matter their stature.

By the age of 21 Pauli had authored a comprehensive textbook on the general theory of relativity that was immediately praised by Einstein as an astounding piece of work. It remained one of the most important textbooks on the topic for at least four decades. Thanks to Dr. Denis Lehmkuhl of the Einstein Papers Project at Cal Tech for his help in translation and explanation.

\$ 65,000.00

THE MOST SIGNIFICANT WORK ON PHYSICS OF THE TIME

19. PRIVAT-DESCHANEL, A[ugustin]

Elementary treatise on natural philosophy. Translated and edited with extensive additions by J.D. Everett, professor in Queens College, Belfast. London: Blackie & Son, 1872. Four parts in two volumes. 8vo. [vi]-iv-xxviii; 566; [ii], 568-1050 pp. Consecutive pagination with half-title, errata, 3 colored plates and a map, as well as hundreds of text illustrations. Contemporary half-calf over marbled boards. Generally an excellent copy from the library of George Alexander Philips Haldane Duncan, Earl of Camperdown, avid book collector, with his bookplate containing his coat of arms and motto (*Disce pati* [learn to suffer]).

First English edition, considered one of the best works on physics of the time. Detailed chapters on mechanics, heat, electricity, magnetism, acoustics, optics, and much more. Each subject includes a discussion of all the great scientists and their experiments, the methods they employed, any imperfections and variations by other scientists, and the solutions as far as the latest investigations known. Most of the subjects have been enlarged with extensive additions by the editor such as thermodynamics and electrical subjects by William Thomson and Michael Faraday, which had not as yet been established in France.

Privat-Deschanel (1821-1883) was a professor of physical sciences at Limoges, Lyon, Versailles and later at Lycee Louis-le-Grand, where he was headmaster. According to Everett's preface, "this treatise is remarkable for the vigour of its style, which specially commends it as a book for private reading. But its leading excellence, as compared with the best works at present in use, is the thoroughly rational character of the information which it presents."

\$ 550.00

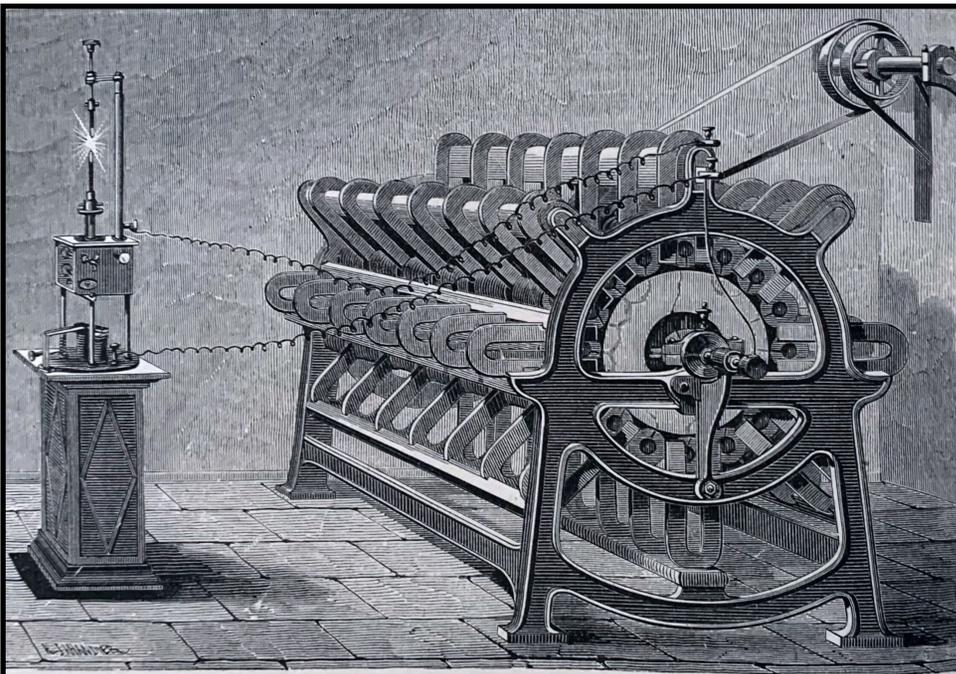
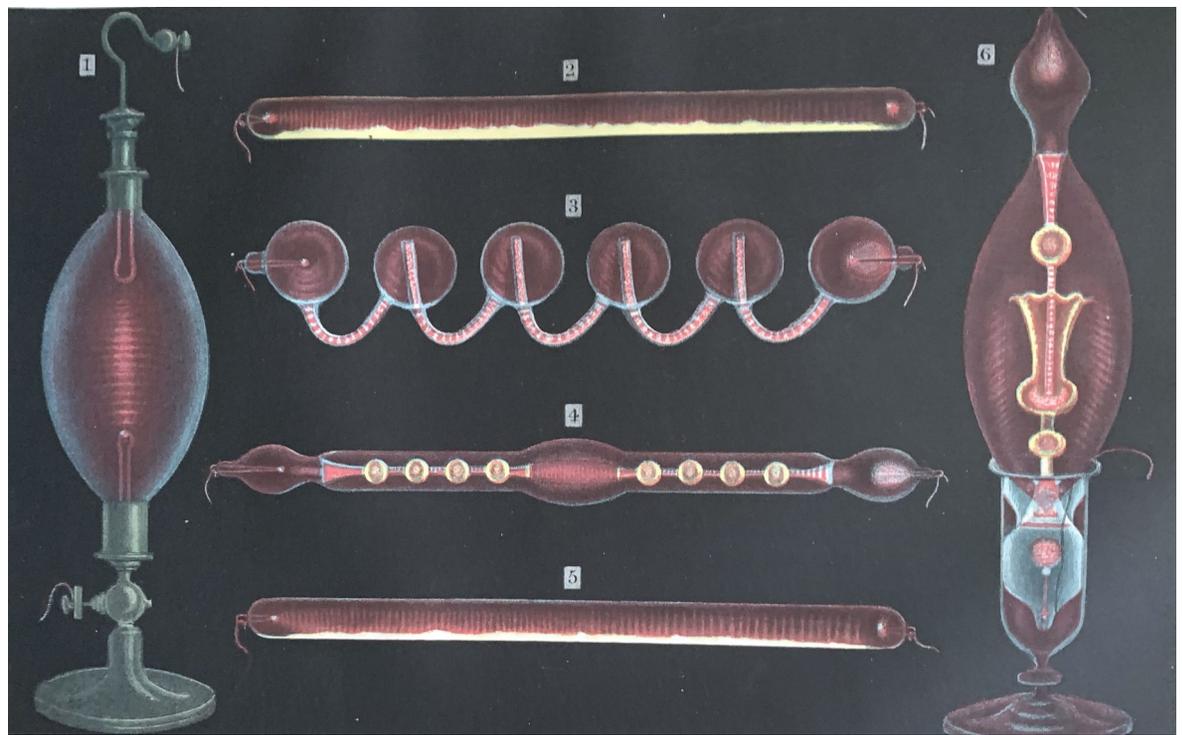


Fig. 555.—Lighthouse Machine.

SCARCE NEWTON-INFLUENCED
RESEARCH ON OPTICS

[ISAAC NEWTON]

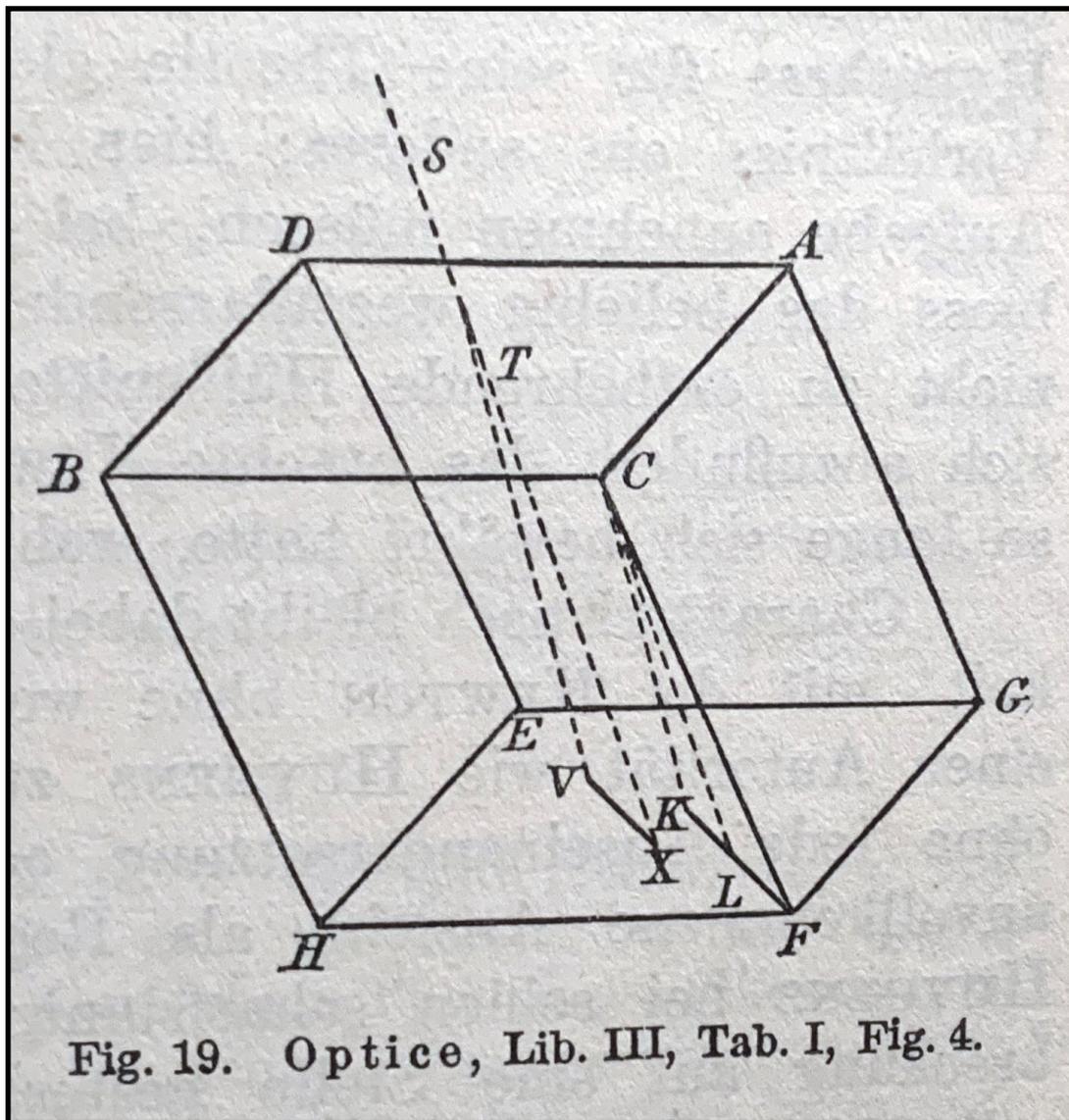
20. ROSENBERGER. Dr. Ferd[inand]

Isaac Newton und seine physikalischen principien. Ein hauptstück aus der entwicklungsgeschichte der modernen physik. Leipzig: Johann Ambrosius Barth, 1895. 8vo. vi, 536 pp., plus leaf of publisher's advertisements. Complete with half-title and 25 text diagrams. Original cloth-backed marbled boards; in excellent condition. From the libraries of Stillman Drake and E.N. Da C. Andrade, with their bookplates.

First edition and surprisingly quite scarce. OCLC locates numerous modern reprinted versions with a very few original editions. The focus of the book is Newton's work in optics. The author provides a detailed description of the state of physical optics up to the point when Newton's interest propelled him into conducting research in the field. He further explains the underlying concepts of the *Opticks*, including the various theories in opposition to those taken by Newton, and finally discusses Newton's transition from work in optics to celestial mechanics.

Rosenberger (1845-1899) was a German historian of science. He studied math and science and taught school in Frankfurt. He became famous for his history of physics and this work on the physical thinking of Isaac Newton. According to Babson, Rosenberger's work is "the best account in German of Newton's discoveries." Bernard Cohen considers this as one of the major surveys of the development of physics "to which historians must refer." Babson, 105; Cohen, *Franklin and Newton*, 1956, p. 114; Westfall, *Never at Rest*, 1980 ("unsurpassed in Newton biography").

\$ 750.00



CARL SAGAN

THE DRAGONS OF EDEN

SPECULATIONS ON THE EVOLUTION OF HUMAN INTELLIGENCE



PULITZER PRIZE WINNING EVOLUTION

21. SAGAN, Carl

The dragons of Eden: speculations on the evolution of human intelligence. New York: Random House, 1977. 8vo. [xvi], 263, [2] pp. Text figures. Green cloth over boards, original dust jacket; in excellent condition.

First edition of Sagan's popular work on human evolution. Sagan creates an interdisciplinary approach to study the evolution of human intelligence using the fields of anthropology, evolutionary biology, psychology, and computer science. In the text, Sagan provides a summary of evolution from the Big Bang to human civilization using the analogy of the "cosmic calendar" in which 1 billion years correlates to twenty-four days. His main goal, however, is searching for a quantitative way to analyze intelligence. *The Dragons of Eden* won the Pulitzer Prize in 1978.

Sagan (1934–1996) was an American scientist who wrote extensively on astronomy, cosmology, astrophysics, and astrobiology. Campbell, "Fascinating Popularization of Special Interest to Educators," *Phi Delta Kappan* 59/8 (1978): p. 567-8; Gerschwind, "Review," *American Scientist* 66/1 (1978): p. 91; Klopfer, "Review," *The Quarterly Review of Biology* 53/4 (1978): p. 495; Pitt, "Review," *Human Ecology* 6/4 (1978): p. 471-3; D. Sagan and J. Skoyles, *Up from Dragons: the Evolution of Human Intelligence* (2002) . \$ 200.00

T H E
CHEMICAL ESSAYS

O F

CHARLES-WILLIAM SCHEELE.

TRANSLATED FROM THE

T R A N S A C T I O N S

O F T H E

ACADEMY OF SCIENCES AT STOCKHOLM.

WITH ADDITIONS.

L O N D O N :

PRINTED FOR J. MURRAY, N^o 32. FLEET-STREET ;
W. GORDON AND C. ELLIOT, EDINBURGH.

M,DCC,LXXXVI.

DISCOVERY OF ACIDS

22. SCHEELE, Karl Wilhelm

The chemical essays of Charles-William Scheele. Translated from the Transactions of the Academy of Sciences at Stockholm. With additions. London: J. Murray, 1786. 8vo. xiii, [i], ii, 406 pp. Contemporary calf. A fine copy from the library of Sir Lucius O'Brien, Bart., with his bookplate.

First English edition of a most important and now very rare book. "A collection of some of the author's most important memoirs, edited by Thomas Beddoes. It contains accounts of his discovery of hydrofluoric, tartaric, benzoic, arsenious, molybdic, lactic, citric, malic, oxalic, gallic and other acids. He also separated independently chlorine, baryta, oxygen, glycerine, H₂S and obtained salts of manganese and showed how the latter coloured glass" (Duveen, 533).

Scheele (1742-1786) was a Swedish apothecary who devoted his life to chemical research. "Scheele was an experimental genius; he made more discoveries of first-rate importance with fewer opportunities and scantier appliances than any one else, and his skill, insight and power of illuminating experimental results have never been surpassed, if, indeed, they have ever been equalled" (Ferguson, II, p. 331). *Torchbearers of Chemistry*, pp. 225-227, contains reproductions of his portrait and two sculptures. \$ 2000.00

THE COLLECTED PAPERS OF LORD KELVIN

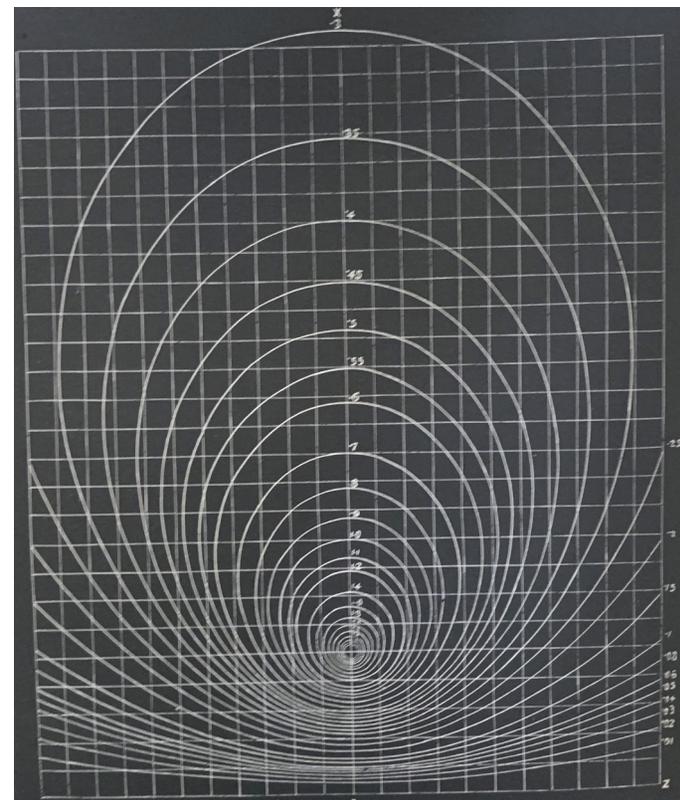
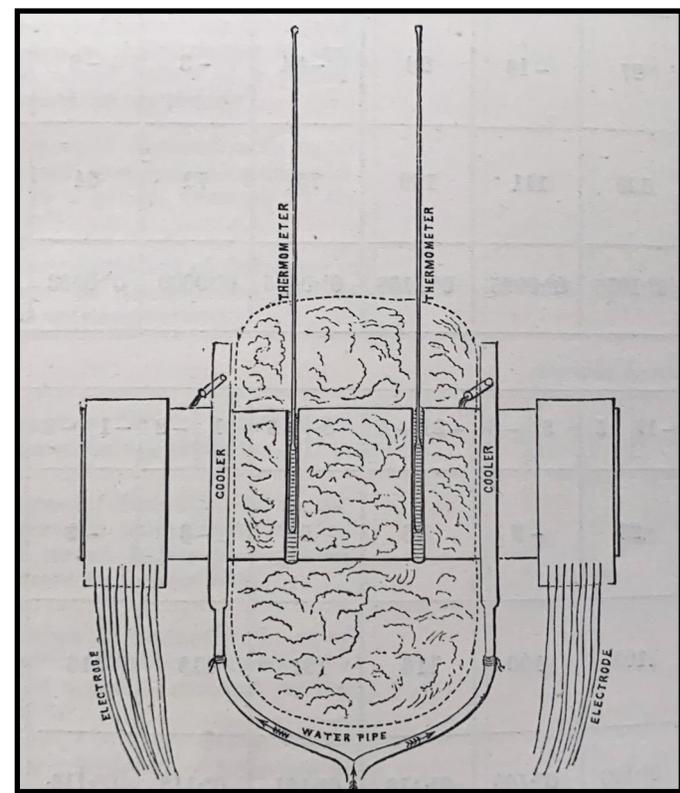
23. THOMSON, Sir William [Lord Kelvin]

Mathematical and physical papers. Cambridge: University Press, 1882-1911. Six volumes. 8vo. With text illustrations throughout, 25 plates, and errata in volumes III, IV, and V. Publisher's green cloth.

First edition of the collected papers of Lord Kelvin. This important set comprises of nearly all of Thomson's papers published in various scientific periodicals from May 1841 through the end of his career. Given that most of his publications took the form of journal articles, this set provides an invaluable resource in the fields of mathematics, physics, and engineering. Included are many of his most well-known articles such *An account of Carnot's theory of the motive power of heat; with numerical results deduced from Regnault's experiments on steam.* This essential set covers an extensive range of subjects including thermodynamics, hydrodynamics, elasticity and heat, electricity, electromagnetism, vortex motion, dynamical theory of tides, voltaic theory, radioactivity, and general dynamics. In particular, the second volume focuses exclusively on Thomson's renowned work on the electric telegraph which won him public acclaim and celebration, as well as pioneered priceless technology for wireless communication in the coming years.

Thomson (1824-1907) is widely considered to be the founder of British physics. He was a foremost figure in the world of nineteenth-century science, particularly as a scientist involved with the practical application of theoretical physics as well as his numerous contributions to the field of physical instrumentation. His research and experimentation in thermodynamics produced the absolute temperature scale and the qualification of absolute zero, the point at which no further heat can be transferred (Rouse & Ince, *History of Hydraulics*, pp. 211-212).

\$ 1850.00



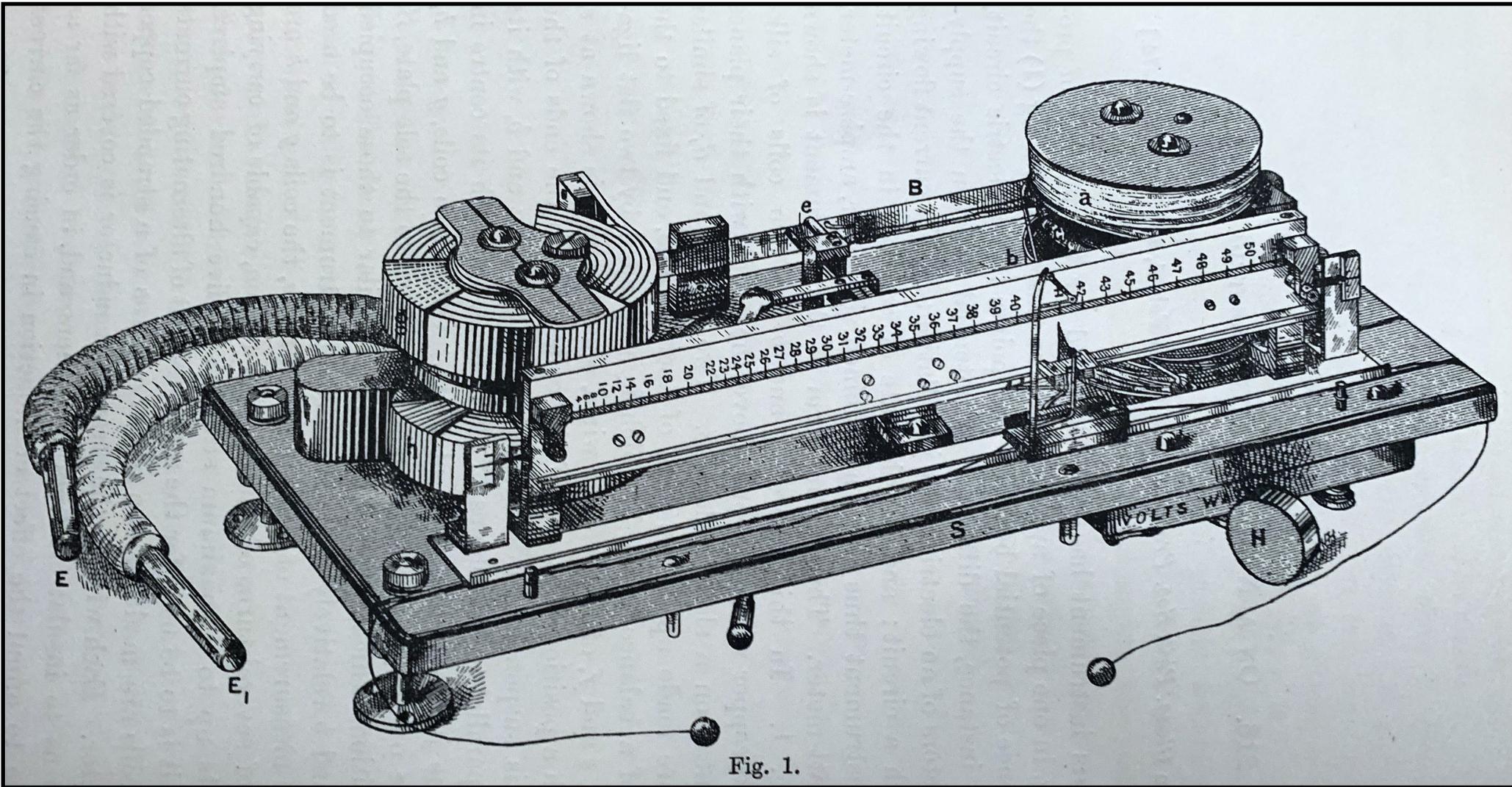


Fig. 1.

THEORETICAL ASTRONOMY

RELATING TO THE

MOTIONS OF THE HEAVENLY BODIES

REVOLVING AROUND THE SUN IN ACCORDANCE WITH
THE LAW OF UNIVERSAL GRAVITATION

EMBRACING

A SYSTEMATIC DERIVATION OF THE FORMULE FOR THE CALCULATION OF THE GEOCENTRIC AND HELIO-
CENTRIC PLACES, FOR THE DETERMINATION OF THE ORBITS OF PLANETS AND COMETS, FOR
THE CORRECTION OF APPROXIMATE ELEMENTS, AND FOR THE COMPUTATION OF
SPECIAL PERTURBATIONS; TOGETHER WITH THE THEORY OF THE COMBI-
NATION OF OBSERVATIONS AND THE METHOD OF LEAST SQUARES.

With Numerical Examples and Auxiliary Tables

BY

JAMES C. WATSON

DIRECTOR OF THE OBSERVATORY AT ANN ARBOR, AND PROFESSOR OF ASTRONOMY IN THE
UNIVERSITY OF MICHIGAN

PHILADELPHIA
J. B. LIPPINCOTT & CO.
LONDON: TRUBNER & CO.
1868

FROM THE DISCOVERER OF THE PLANET VULCAN

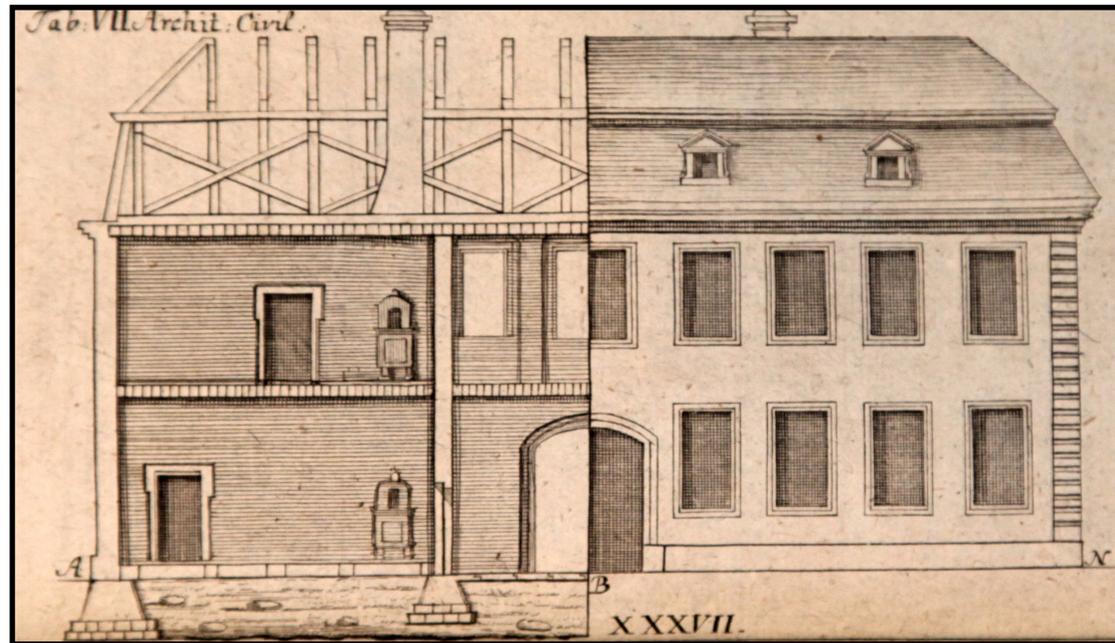
24. WATSON, James C.

Theoretical astronomy relating to the motions of the heavenly bodies revolving around the sun in accordance with the law of universal gravitation. London: Trubner & Co., 1868. 4to. [xiv]. 662 pp. Publisher's pebbled cloth.

First edition of this thorough and valuable investigation of theoretical astronomy. Watson provides an in-depth analysis of planetary motion and the discovery of new comets, noting in his preface the fundamental complications of dynamics and all the problems presented. He states historical facts relating to difficulties with theoretical astronomy, citing Newton, Euler, Boscovich, Lagrange, and Laplace, among others. Through a series of observations and tables, Watson attempts to determine the orbit of the "heavenly bodies."

At age 15, Watson (1838-1880) matriculated at the University of Michigan, where he began studying classical languages and later focused on astronomy with professor Franz Brünnow. He then became the second director of Detroit Observatory, succeeding his late professor.

Watson is best known for his announcement of the discovery of the planet Vulcan, a body between Mercury and the sun. It is now assumed that what he actually viewed were the results of sun spots and small planetoids, which may exist. It is also assumed (in astronomical lore) that his imagined celestial body was the inspiration for the planet Vulcan in the *Star Trek* series. \$ 1650.00



ILLUSTRATED ENCYCLOPEDIA OF SCIENCE

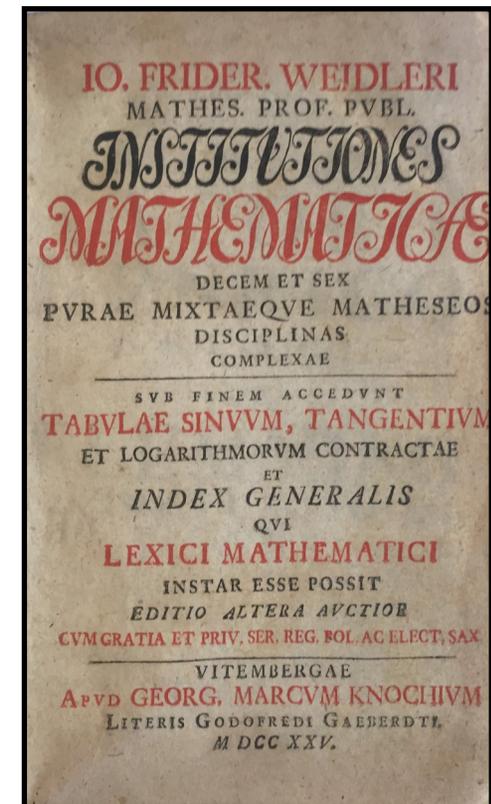
25. WEIDLER, Johann Friedrich

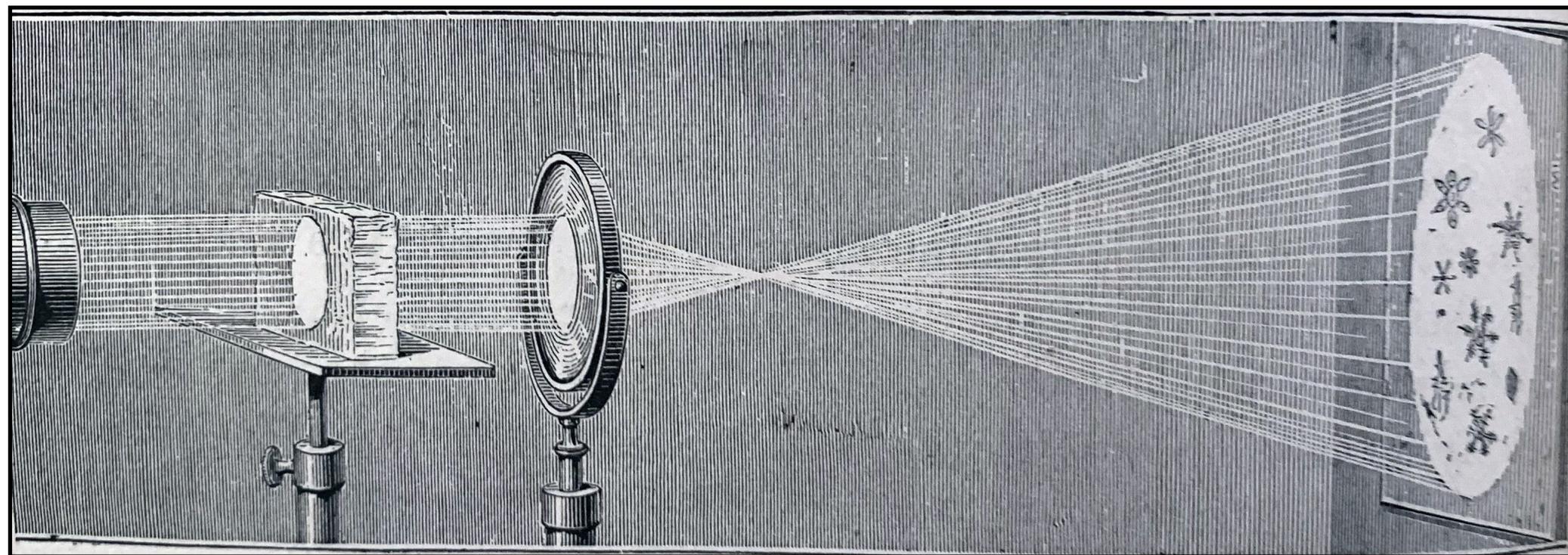
Institutiones mathematicae decem et sex purae mixtaeque matheseos disciplinas complexae; sub finem accedunt tabulae sinuum, tangentium et logarithmorum contractae et index generalis. . . . Vitembergae: Georg Marcum Knochium, 1725. 8vo. [xvi], 876, [20], 32 pp. Title in red and black. With 48 leaves of plates. In a contemporary full calf binding dated 1729 in blind on the back cover.

Second edition, greatly enlarged with over 100 additional text pages and illustrations. This early encyclopaedia of science is Weidler's most important work, of significant value for its abundance of data and details in each area of science. Among the subjects covered include: arithmetic, geometry, plane trigonometry, optics, perspective, spherical trigonometry, spherical and dynamical astronomy, geography (on the sphere), chronology, dialling, mechanics, hydrostatics, hydraulics, civil and military architecture, fortifications, and mathematical analysis concluding with differential and integral calculus. The work is notable for Weidler's method of stating, defining, and presenting results, or answers to problems. The format was typical of the Continental approach to education. Thus, because it is one of the best examples of its kind, this book is of great value to today's scholar.

Weidler (1691-1755) held the chair of mathematics at the University of Wittenberg, was a Fellow of the Royal Society, and wrote many esteemed books on scientific subjects. His most notable was the first general bibliography of astronomy as well as the first complete history of astronomy (see Houzeau & Lancaster, 11 and 86, and Lalande, pp. 414 and 458).

\$ 1500.00





19. PRIVAT-DESCHANEL

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