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Catalogue 196

Proofs

Physics, Mechanics, Engineering,

Technology, & Electricity

Catalogue 196

The Horblit Copy

1. **ACADÉMIE ROYALE DES SCIENCES, Paris.** *Mémoires . . . Année 1823. Tome VI.* Two folding engraved plates. 3 p.l., clxxvi, [3], 612 pp. Large 4to, orig. printed wrappers (rather frayed), uncut. Paris: Firmin Didot, 1827. \$2500.00

“Of particular importance to this collection is Navier’s ‘Mémoire sur les lois du mouvement des fluides.’ This classic paper on fluid mechanics, contains his calculations about fluid flow, and gives his equations for motion of a viscous fluid. Also discovered by Stokes, these calculations are known today as the Navier-Stokes Equations. Navier analyzed the motion of a fluid in much the same fashion as Euler, but considered in addition a hypothetical attraction or repulsion between adjacent molecules . . .

“Also of importance is Ampere’s ‘Mémoire sur la théorie mathématique des phénomènes électro-dynamique, uniquement déduite de l’expérience . . .’ which seeks to provide mathematical foundations for the relationship he had discovered between the phenomena of electricity and magnetism. His discovery resulted from a series of ingenious experiments which are described in the text. This represents the first formulation of the laws of the action of electric currents, and the memoir can be seen as the cornerstone of electrodynamics. This brings together his memoirs read before the Academy 26 December 1820, 10 June 1822,

22 December 1823, 12 September and 23 November of 1825 . . .

“Poisson’s ‘Mémoire sur la théorie du magnétisme en mouvement’ concerns attractive force and formulates new equations for the solution of problems therein. This work influenced the researches of Green (1828) and Gauss (1829). Also in this volume is his ‘Mémoire sur le calcul numérique des intégrales définies’ in which he sets out to improve the method of quadratures . . .

“The following memoirs are also of interest: Legendre’s ‘Recherches sur quelques objets d’analyse indéterminée et particulièrement sur le théorème de Fermat;’ Laplace’s ‘Mémoires sur le développement de l’anomalie vraie et du rayon vecteur elliptique, en séries ordonnées suivant les puissances de l’excentricité;’ as well as Cauchy’s ‘Mémoire sur les développements des fonctions en séries périodiques’ . . .

“The second part of the volume contains a history of the Academy with Fourier’s elegy for William Herschel and Cuvier’s for Duhamel.”—Roberts & Trent, *Bibliotheca Mechanica*, p. 2.

Very good copy, preserved in a box. Book label of Harrison D. Horblit. Ex Bibliotheca Mechanica.

2. ALEMBERT, Jean le Rond d’, CONDORCET, Marie Jean Nicolas, Marquis de, & BOSSUT, Charles. *Nouvelles Expériences sur la Résistance des Fluides* . . . Five folding engraved plates. 2 p.l., 232 pp. 8vo, cont. vellum over boards, red morocco lettering piece on spine. Paris: C.A. Jombert, 1777. \$2250.00

First edition of this account of a well-known series of experiments on fluid resistance. “In 1775 Bossut, d’Alembert, and the Marquis de Condorcet were charged by the government with a series of texts on the resistance of bodies of various shapes in connection with the expanding system of inland navigation. For this purpose, and largely under Bossut’s guidance, a towing tank about 100 feet long, 50 feet wide, and 7 feet deep was provided with a gravity drive, and studies were made on the effect of bow form and relative cross-sectional proportions. The principal conclusion reached was that (as had already been demonstrated in a miniature towing tank by Benjamin Franklin) the resistance increased as the relative area of the channel diminished, and an earlier proposal for the use of underground canals was thereupon dropped.”—Rouse & Ince, *History of Hydraulics*, p. 128—(with illus.).

An unusually fine and attractive copy. Bookplates of “G.P.C.” and Fratelli Salimbeni of Modena. Ex Bibliotheca Mechanica.

♣ Roberts & Trent, *Bibliotheca Mechanica*, p. 9.

The Horblit Copy

3. **AMPÈRE, André Marie.** [Drop-title]: "Expériences relatives à de nouveaux phénomènes électro-dynamiques." One folding engraved plate. General title for the volume & pp. 60-74. 8vo, modern boards. Paris: Crochard, 1822. \$1500.00

An offprint from the *Annales de Chimie et de Physique*, Vol. 20. This is an important contribution by Ampère to the science of electrodynamics.

Fine copy. Booklabel of Harrison D. Horblit (his sale, Sotheby's 1974, lot 33).

4. **ANDERSON, Henry James.** *Mathematical Investigation of the Motion of Solids on Supporting Surfaces, with a complete Solution of the Cases in which the Oscillations are of small Extent . . . First published in the Transactions of the American Philosophical Society . . . Part II, Vol. III, New Series.* 70 pp. Large 4to, cont. cloth-backed green boards (text leaves quite foxed). Philadelphia: J. Kay, 1828. \$450.00

First separate edition. "After reviewing the history of the study of oscillatory motion, Anderson offers his own solutions to the problems of the motion of solids on surfaces in cases of perfect sliding and perfect rolling, with particular attention to small oscillatory movements."—Roberts & Trent, *Bibliotheca Mechanica*, p. 11.

Anderson (1799-1875), was professor of mathematics and astronomy at Columbia University.

Good copy. Contemporary signature of Jas. H. Bell on title. Ex Bibliotheca Mechanica.

The First Didactic Treatise on Hydraulics

5. **AUBUISSON DE VOISINS, Jean François.** *A Treatise on Hydraulics, for the Use of Engineers.* Translated from the French . . . by Joseph Bennett. Five folding plates. xxiii, [1], 532 pp. 8vo, orig. cloth (joints repaired), spine lettered in gilt. Boston: Little, Brown, 1852. \$450.00

First edition in English of the author's *Traité d'Hydraulique* (1st ed.: 1834), which is usually considered to be the first didactic treatise on hydraulics. This book was one of a rapidly growing series of treatises on a subject that in itself was undergoing a continuous expansion.

Very good copy. Ex Bibliotheca Mechanica.

☛ *D.S.B.*, I, pp. 327-28. Roberts & Trent, *Bibliotheca Mechanica*, p. 19—(& see the long description of the first edition for the book's contents and importance). Rouse & Ince, *History of Hydraulics*, p. 161. Rouse, *Hydraulics in the United States 1776-1976*, pp. 34 & 49.

6. BAGLIVI, Giorgio. *De Fibra Motrice, et Morbosa; nec non, de Experimentis, ac Morbis Salivae, Bilis, & Sanguinis. Ubi obiter de Respiratione, & Somno. De Statice aeris, & liquidorum per observationes Barometricas, & Hydrostaticas ad usum respirationis explicata. De Circulatione Sanguinis in testudine, ejusdemque Cordis Anatome. Epistola ad Alexandrum Pascoli.* 58 pp., one blank leaf. Small 4to, antique calf. Perugia: Constantinus, 1700.

\$1350.00

First edition. Baglivi (1668-1707), served as the pupil and assistant of Marcello Malpighi, collaborating with him until Malpighi's death in 1694. In 1695 Baglivi became the pope's second physician and was appointed professor of anatomy at the Sapienza in Rome. His *De Praxi Medica* (1696) revealed him to be a master clinician, exhibiting uncommon logic and common sense.

In this work, Baglivi "describes what we now call striated and smooth muscles and gives an account of their gross and microscopic structure. He believed that striated muscles were used for making short, rapid movements while smooth muscles were used for longer, sustained motions. Baglivi also observed that isolated portions of heart muscle contract and relax without external stimulation and that portions of skeletal muscle contract when stimulated by an external source."—*Heirs of Hippocrates* 737.

"His fundamental research concerning the fibers made him one of the most important students of muscle physiology before Albrecht von Haller."—*D.S.B.*, I, p. 392.

Fine copy. This book is occasionally found bound-in at the end of Alessandro Pascoli's *Il Corpo-Umano* (1700). Ex Bibliotheca Mechanica.

River Regulation

7. BARATTIERI, Giovanni Battista. *Trattato Teorico – Practico circa la Divisione degli Incrementi Fluviali ossia il Terzo, e Quarto Libro della Prima Parte dell'Opera di . . . preceduti da un Discorso Preliminare e corredati di Annotazioni da Francesco Sartorio.* Four folding engraved plates. xvi, 203, [1] pp. 4to, orig. semi-stiff boards. Piacenza: G. Tedeschi, 1783.

\$1500.00

First edition of this reprint of Books 3 and 4 of Barattieri's *Architettura d'Acque* (1st ed.: 1656) with, for the first time, a preliminary discourse and copious annotations by the editor, Francesco Sartorio, an engineer of Piacenza. "Barattieri was engineer to the Duke of Parma, and his book, based on his own observations and experiments and also on the earlier work of Castelli and Corsini, to both of whom he paid due acknowledgment, is perhaps the best example in our period of a practical and scientific work on the problems of river regulation."—Singer et

al., *History of Technology*, III, p. 315.

A fine copy in original state, preserved in a morocco-backed box. Scarce. Ex Bibliotheca Mechanica.

• Riccardi, I, 74. Roberts & Trent, *Bibliotheca Mechanica*, pp. 21-22.

8. BARLOW, Peter. *An Essay on the Strength and Stress of Timber, founded upon Experiments performed at the Royal Military Academy, on Specimens selected from the Royal Arsenal, and His Majesty's Dock-yard, Woolwich: preceded by an Historical Review of former Theories and Experiments; with numerous Tables and Plates. Also an Appendix, on the Strength of Iron, and other Materials.* Six folding engraved plates (each slightly foxed). 1 p.l., xviii, 306 pp. 8vo, cont. blindstamped calf (carefully rebacked with the orig. spine laid-down), spine gilt, red morocco lettering piece on spine. London: J. Taylor, 1826. \$750.00

"Third edition, corrected." This is the first procurable edition; the first edition of 1817 and the second edition are, for some reason, extremely rare.

"This was the work that established Barlow's reputation. Barlow begins the book with a history of strength of materials using material from Girard's book. He then points out the inadequacy of Euler's study of elastic curves and criticizes Lagrange; however, Todhunter notes that Barlow does not fully recognize the source of their errors. He corrects one of Girard's errors in Part III, On the Deflection of Beams, but makes the same error that Duleau did in discussing the theory of bending . . .

"The book does not add anything to the theory of strength of materials, but it contains descriptions of many experiments that were made in the first half of the nineteenth century and which are of historical interest. Thus we find a report on the tests made on iron wires by Barlow for Telford who was then planning the construction of the Runcorn suspension bridge. The author's experiments with iron rails of different shapes are also very interesting.' Timoshenko also remarks that in these tests Barlow 'used the equation of a catenary to determine the tensile force in the cables.'—Timoshenko, 85, 100."—Roberts & Trent, *Bibliotheca Mechanica*, p. 23.

Barlow (1776-1862), though self-educated, was assistant mathematics master at the Royal Military academy at Woolwich. He worked with Telford on the design of the Menai Strait suspension bridge and on the calculation of tides in the Thames.

Very good copy. Ex Bibliotheca Mechanica.

• D.S.B., I, pp. 459-60.

The First Engineering Manual Ever Published

9. **BÉLIDOR, Bernard Forest de.** *La Science des Ingénieurs dans la Conduite des Travaux de Fortification et d'Architecture civile.* Fine engraved frontis., engraved vignette at head of dedication, & 53 engraved plates. 9 p.l. (incl. frontis.), 80, 64, 96, 104, 80, 80, [8] pp. Large thick 4to, antique calf, reusing the old marbled endpapers, orig. red morocco lettering piece on spine. Paris: C.A. Jombert, 1739. \$1250.00

Second edition, a reprint of the 1729 first edition. This was the first engineering manual ever published and the text was reused in various editions and translations well into the 19th century. "The text is divided into six separately paged books. Timoshenko comments favorably on the contribution Bédidor makes to the selection of proper dimensions for retaining walls. This volume also contains his practical experiments on the flexure and rupture of beams, cited by Todhunter and Pearson . . .

"The first two books treat of mechanics as they apply to the engineering and construction of foundations, walls, and vaults, and the third book deals with the properties of materials and their use. Book four treats the construction of military and civil structures, with sections on the strength and resistance of wood and of iron. Book five concerns itself with applied decoration, and is illustrated with a number of plates of the classical orders. Finally, book six explains the technique by which plans are drawn."—Roberts & Trent, *Bibliotheca Mechanica*, pp. 30-31.

Fine fresh copy. Ex Bibliotheca Mechanica.

10. **BELL, Charles & WYMAN, Jeffries.** *Animal Mechanics.* Two ports. & numerous illus. in the text. xi, 135 pp. 8vo, cont. green morocco, triple gilt fillet round sides, spine nicely gilt, a.e.g. Cambridge: Riverside Press, 1902. \$250.00

The essay of Sir Charles Bell (1774-1842) is entitled "Animal Mechanics or Proofs of Design in the Animal Frame. The Perfection of Design in the Bones of the Head, Spine, and Chest, shown by Comparison with Architectural and Mechanical Contrivances." The essay by Jeffries Wyman (1814-74) is entitled "Animal Mechanics on the Cancellated Structure of Some of the Bones of the Human Body or of those Bones which have a Definite Relation to the Erect Position which is Naturally assumed by Man Alone."

Fine copy, handsomely bound. Ex Bibliotheca Mechanica.

- 11. BELLASIS, Edward Skelton.** *A Paper on the Roorkee Hydraulic Experiments. Read before the Society of Engineers... on the 1st March, 1886.* Two folding lithographed plates & illus. in the text. 43 pp. 8vo, orig. blue cloth, upper cover stamped in gilt. N.p.: n.d. [but 1886]. \$200.00

“Rare offprint of Bellasis’ critique of the Roorkee Hydraulic Experiments, which were conducted by Allan Cunningham on the Ganges Canal between 1874 and 1879.”—Roberts & Trent, *Bibliotheca Mechanica*, p. 32. There is no copy in N.U.C. or OCLC.

Bellasis (1855-1945), spent thirty-four years in the service of the Punjab Irrigation Branch and wrote numerous works on hydraulics.

Very good. Ex Bibliotheca Mechanica.

*The Electrovegetometer;
A Royal Copy*

- 12. BERTHOLON, Pierre.** *De l’Électricité des Végétaux. Ouvrage dans lequel on traite de l’électricité de l’atmosphère sur les plantes, de ses effets sur l’économie des végétaux, de leurs vertus médico & nutritivo-électriques, & principalement des moyens de pratique de l’appliquer utilement à l’agriculture, avec l’invention d’un électro-végétomètre.* Three folding engraved plates & one folding printed table. xvi, 468 pp., 1 leaf. 8vo, early 19th-cent. marbled boards, flat spine gilt, orange leather lettering piece on spine. Lyon: Bernuset, 1783. \$1350.00

First edition, Lyon issue (also issued at the same time in Paris by Didot) of one of the author’s three principal works on electricity; it deals with the application of electricity to the growth of plants. Bertholon used an electrovegetometer of his own invention (illustrated on one of the plates). There are many references to the leading electrical experiments of the time.

“Bertholon’s scientific contribution is important both qualitatively and quantitatively, for it included areas of great diversity — including urban public health, agriculture, aerostatics, and fires. He is particularly well known for his work in physics, especially in electricity. He played the same role in the south of France that the Abbé Nollet played in Paris; that is, he contributed greatly to the development of research in electricity.”—*D.S.B.*, II, pp. 82-83. Influenced by his friend Benjamin Franklin, Bertholon supplied southern France with lightning rods.

Fine copy. Stamp on verso of half-title of Prince Ernest Augustus, Duke of Cumberland, and the subsequent Kings of Hanover.

☛ Wheeler Gift Cat. 512bis.

- 13. BOSCOVICH, Roger Joseph.** *Sopra il Turbine che la notte tra gli XI, e XII Giugno del MDCCXLIX danneggiò una gran parte di Roma. Dissertazione.* Woodcut vignette on title. 224, [6] pp. 8vo, orig. semi-stiff boards. Rome: N. & M. Pagliarini, 1749. \$1950.00

First edition of this treatise on the Ostia-Rome waterspout and tornado which occurred near and in the Eternal City in June 1749. This originated in the Tyrrhenian Sea as a waterspout and pursued an easterly land course for more than twenty miles to a point inland of Rome near Tivoli. Its path closely paralleled the Tiber River and the present airport highway. In this work Boscovich describes the evidence left by the windstorm and draws some conclusions about its rotational movement and progressive advance which are far in advance of contemporary thinking. The work was studied by Benjamin Franklin either in the present edition, Azzoni's Latin translation (Prague: 1766), or in a summary which appeared in the *London Monthly Review*, December 1750.

"As to our atmosphere and its behavior, or misbehavior, he investigated a tornado that devastated Rome in June 1749 and attempted to interpret its effects in terms of Stephen Hales's theory of 'fixed air' — it was ever his way to try connecting phenomena in one domain with famous developments in the science of another; his mind ranged over the whole of physical science with more or less cogency, but never without imagination."—*D.S.B.*, II, p. 329. There is an interesting Appendix on the rainbow.

Fine copy preserved in a green morocco-backed box. Ex Bibliotheca Mechanica.

♣ Riccardi, I, 176-77. Roberts & Trent, *Bibliotheca Mechanica*, p. 44. Whyte, *Boscovich*, p. 216.

- 14. BOSSUT, Charles.** *Traité Élémentaire d'Hydrodynamique: Ouvrage dans lequel la Théorie et l'Expérience s'éclaircissent ou se suppléent mutuellement; avec des Notes sur plusieurs endroits qui ont paru mériter d'être approfondis.* 209 figures on 16 folding engraved plates. Titles in red & black. 2 p.l., xxxvii, [1], 394 pp.; 2 p.l., 444 pp. Two vols. 8vo, cont. cat's paw sheep (several skillful repairs to bindings), spines gilt, contrasting morocco lettering pieces on spines. Paris: C.A. Jombert, 1771. \$1950.00

First edition. "Although its title was hydrodynamics, its subject matter was essentially hydraulics...The first volume was original only in arrangement and treatment, but it still provides an excellent picture of the state of knowledge (as he saw it) at Bossut's time. The experimental data presented in the second volume were largely new, and noteworthy even today are his comments on the difficulty of large-scale experiments versus the falsity of those at too small a

scale.”—Rouse & Ince, *History of Hydraulics*, p. 127.

Bossut (1730-1814), assumed the chair of hydrodynamics established by Turgot at the Louvre. He was a major contributor to European scientific education and his texts represent the emergence of a standardized, rigorous system of engineering physics textbooks.

Very good set. Ex Bibliotheca Mechanica.

• D.S.B., II, pp. 334-35. Roberts & Trent, *Bibliotheca Mechanica*, p. 46.

To Be Used at West Point

15. BOUCHARLAT, Jean Louis. *An Elementary Treatise on Mechanics.* Translated from the French...with Additions and Emendations, designed to adapt it to the Use of the Cadets of the U.S. Military Academy. By Edward H. Courtenay. Nine folding engraved plates with 254 figures (slightly foxed). 432 pp. 8vo, cont. mottled sheep (extremities a bit rubbed, some foxing), spine gilt, red morocco lettering piece on spine. New York: J. & J. Harper, 1833. \$250.00

First edition in English of this popular work which went through several French editions as well (1st ed.: 1815). Boucharlat (d. 1848) was professor of mathematics at the Military School at Paris. The translator, Courtenay, was professor of natural and experimental philosophy at West Point.

Apart from the inevitable foxing, a nice copy. Ex Bibliotheca Mechanica.

• Poggendorff, I, 252. Roberts & Trent, *Bibliotheca Mechanica*, p. 48—“Courtenay amended the text to conform with West Point usage and added works by other authors such as Poisson and Navier. Girvin notes that before this translation, the West Point cadets used the text in French.”

16. BOURDET, — . *Traité des Dignes le long des Fleuves et Rivières, au quel on a joint des Regles touchant les Épis, Fascinages et Reversoirs &c.* Nine folding engraved plates. 164, [4] pp. Small 8vo, cont. marbled sheep (rubbed), spine gilt, red & green morocco lettering pieces on spine. Berlin: aux dépens de l’Auteur, 1771. \$950.00

First edition of this uncommon book concerned with the construction of dikes along the sides of rivers. Bourdet, a graduate of the Académie Royale d’Architecture of Paris, was inspector general of hydraulic projects for the King of Prussia. In this book, the author describes a wide variety of dikes, methods of construction, and each one’s specific uses. He also discusses the construction of wharves, fascines, and weirs.

Very good copy, well illustrated with nine plates drawn by the author. Two old library stamps on title of the Royal Prussian War School at Breslau, 1810.

17. **BOURGOIS, Simeón.** *Mémoire sur la Résistance de l'Eau au Mouvement des Corps et particulièrement des Batiments de Mer...* Three folding engraved plates (some foxing). 2 p.l., ix, 248 pp. Large 4to, modern morocco-backed marbled boards (some foxing, perforated stamp of the Franklin Institute on blank portion of title), spine gilt. Paris: A. Bertrand, [1857]. \$650.00

First edition. "Bourgois opens his memoir by giving the theory of fluid resistance, a lengthy account of Beaufoy's experiments with submerged bodies, followed by the experiments conducted on floating bodies by Beaufoy and by Bossut, d'Alembert, and Condorcet. The balance of the book consists of data deriving from experiments conducted by the British and French navies on both wooden ships and steam boats."—Roberts & Trent, *Bibliotheca Mechanica*, p. 49.

Bourgois (1815-87), spent his career in the French navy.

Very good copy. Signature of Henry Harding on title. Ex Bibliotheca Mechanica.

18. **BUCK, George Watson.** *A Practical and Theoretical Essay on Oblique Bridges.* 12 folding engraved plates (some quite large). v, [2], 43, [1] pp. Large 4to, orig. green cloth (upper cover somewhat stained at top, upper joint with a short split), stamped in blind & gilt. London: J. Weale, 1839. \$1500.00

First edition of the classic treatise on oblique bridges, an essential contribution to railway engineering since railways, unlike roads, cannot always approach crossings at right angles.

"This essay is devoted to the construction of oblique arches with spiral courses. Buck acknowledges the contribution to the subject in Nicholson's work on stone cutting (1828), but feels that the earlier work did not enter into sufficient detail. Although known in Italy at least since 1530, the bridge of oblique arches presented certain problems which, up to Buck's time, prevented the use of this design for larger spans . . .

"Herein, Buck provides architects and engineers with the descriptive geometry applying to such structures, the formulae for determining the dimensions and angles, the special formula applying to the working of the voussoirs, and the application of these formulae. This is followed by chapters on the mode of erection, and on the principles of projection, with a concluding chapter discussing the acceptable limits of obliquity and cautions concerning the stability of oblique elliptical arches. A short addendum gives a novel table of trigonometrical equivalents useful in engineering problems."—Roberts & Trent, *Bibliotheca Mechanica*, p. 55.

Very good and fresh copy. 16-page publisher's catalogue bound in at end. Ex

Bibliotheca Mechanica.

☛ Skempton 202.

The Theory of Bending

19. [BUELFINGER (or BUELLFINGER or BILFINGER), Georg Bernhard]. *De Causa Gravitatis Physica Generali Disquisitio Experimentalis quae Praemium à Regia Scientiarum Academia promulgatum, retulit: anno 1728.* Two folding engraved plates. 1 p.l., 40 pp. 4to, modern wrappers. Paris: C. Jombert, 1728. \$1500.00

First edition and very rare; OCLC records no copy in the U.S. Büllfinger (1693-1750), was professor of mathematics at Tübingen. He later was appointed professor of experimental and theoretical physics at St. Petersburg by Peter the Great. He wrote many scientific treatises.

“These experiments conducted in St. Petersburg, were designed to check Galileo’s and Mariotte’s theories of bending. Büllfinger finds the latter theory better for explaining the experimental results. He also found that Hooke’s law was not borne out by the experiments and suggests a parabolic relation . . . where “m” is a constant to be determined experimentally.”—Roberts & Trent, *Bibliotheca Mechanica*, p. 55.

Fine copy preserved in a box. Ex Bibliotheca Mechanica.

☛ Poggendorff, I, 189-90.

20. CHLADNI, Ernst Florens Friedrich. *Beyträge zur praktischen Akustik und zur Lehre vom Instrumentbau, enthaltend die Theorie und Anleitung zum Bau des Clavicylinders und damit verwandter Instrumente.* Five folding plates. xvi, 180 pp. 8vo, mid-19th-cent. sheep (rubbed, final two leaves with long tears well-repaired). Leipzig: Breitkopf & Härtel, 1821. \$1500.00

First edition of Chladni’s least known book, in which he describes his inventions the euphonium and the clavicylinder, keyboard instruments based on the glass harmonica. Chladni devotes much of the work to the acoustical properties of both instruments.

Very good copy. Ex Bibliotheca Mechanica.

☛ D.S.B., III, pp. 258-59. *New Grove*, Vol. 4, pp. 289-90.

“An Excellent Textbook”

21. CLARE, Martin. *The Motion of Fluids, Natural and Artificial; In particular that of the Air and Water, in a familiar Manner, proposed and proved,*

by evident and conclusive Experiments with many useful Remarks. Done with such Plainness and Perspicuity, as that they may be understood by the Unlearned. For whose Sake there is added, a Short Explanation of such Uncommon Terms, which in Treating on this Subject could not . . . be avoided. With plain Draughts of such Experiments and Machines, which, by Description only, might not readily be comprehended. Nine engraved plates & an engraved coat-of-arms serving as a headpiece on A2. 8 p.l., 323, [23] pp., 1 leaf of ads. 8vo, cont. calf (rebacked & corners renewed), spine gilt, red morocco lettering piece on spine. London: 1735. \$1500.00

First edition. "Rouse remarks that, 'For its time, this was an excellent textbook' . . . The work is divided into sixty-seven chapters; chapters 1-37 concern statics and hydrostatics, while chapters 38-67 concern pneumatics. The emphasis is primarily on practical matters, the section of statics and hydrostatics containing chapters on syphons; various forms of pumps including the suction, lifting, forcing, and chain pumps,; as well as two chapters on 'Fire-Engines,' apparently the steam engine of Savery. This section also discusses a water-raising machine, the motion of water in canals and pipes, jets, specific gravity, and the hydrometer . . .

"The section on pneumatics is more varied; in addition to chapters on the barometer, air-pump, and the effects of air pressure, it contains chapters on the effects of atmospheric pressure on animal bodies, on muscular motion, the heart and circulation of the blood, animal respiration, and animal suction. Other chapters concern the spring and elasticity of the air, the manner of cupping (bleeding), the rise of sap in plants, the thermometer, and the hygrometer. From the animal and vegetable kingdoms, Clare's exposition turns to atmospheric phenomena with chapters on the winds, smoky chimneys, the causes of thunder and meteors, precipitation, and the origin of springs. In the closing chapters he discusses sounds, the speaking trumpet, places of hearing or whispering-places, and the echo, with the last chapter devoted to the tides."—Roberts & Trent, *Bibliotheca Mechanica*, p. 73.

A very good copy. This was indeed an excellent — and popular — textbook with later editions in 1737, 1747, and 1802. Ex *Bibliotheca Mechanica*.

22. CLAUBERG, Johann. *Physica, quibus Rerum Corporearum Vis & natura, Mentis ad Corpus relatae proprietates, denique Corporis ac Mentis arcta & admirabilis in Homine conjunctio explicantur.* 8 p.l., 470 pp. Thick 4to, later decorated wrappers. Amsterdam: D. Elzevier, 1664.

[bound & issued with]:

—. *Metaphysica de Ente, quae rectiùs Ontosophia, Aliarum Disciplinarum,*

ipsius quoque Jurisprudentiae & Literarum, studiosis accommodata. Editio tertia, multis locis emendata, aucta & Notis illustrata. 4 p.l., 111 pp. 4to. Amsterdam: D. Elzevier, 1664. \$1250.00

First edition. Clauberg (1622-65), German philosopher, studied the Cartesian philosophy under John Raey at Leyden. Professor of philosophy and theology at Herborn and later at Duisburg, he was one of the earliest teachers of the new doctrines in Germany. Clauberg first suggested the word "ontology" to be used in place of "metaphysics."

For a discussion of Clauberg's ideas and these books, see Thorndike, VII, pp. 651-53.

Very good copies, preserved in a box. Ex Bibliotheca Mechanica.

23. CORIOLIS, Gaspard Gustave de. [Drop-title]: "Mémoire sur le Principe des Forces vives dans les Mouvements relatifs des Machines." Pages [573]-607. Large 4to, modern wrappers, uncut. [Paris: *Mémoires de l'Académie des Sciences, Savans Étrangers*, Vol. III, 1831]. \$350.00

An extract. "This memoir deals with the work done by fluids in hydraulic machines and steam engines, referring to the work of Johann Bernoulli and Ampère. This paper is not known to exist in offprint form."—Roberts & Trent, *Bibliotheca Mechanica*, p. 79.

Fine copy preserved in a calf-backed box. Ex Bibliotheca Mechanica.

24. CORTHELL, Elmer Lawrence. *A History of the Jetties at the Mouth of the Mississippi River.* Frontis. port. of Eads & 34 plates (some folding). xvi, 383 pp. 8vo, cont. green half-calf & marbled boards (joints repaired, lower outer corner of pp. 71-72 missing with loss of about 20 words), spine gilt. New York: J. Wiley & Sons, 1880. \$250.00

First edition of this important engineering history. CortHELL (1840-1916), was a leading practitioner of engineering in its various fields on two continents for more than fifty years. In 1871, he began his work in connection with the levees along the Mississippi River and was chief engineer of the Sny Island Levee, fifty-one miles in length. He became assistant to James B. Eads in the construction of the jetties at the South Pass mouth of the river.

Very good copy. Ex Bibliotheca Mechanica.

☛ *D.A.B.*, II, pp. 456-57.

With Contributions by Newton

25. COTES, Roger. *Hydrostatical and Pneumatical Lectures . . . published*

with Notes by his Successor Robert Smith LL.D. Master of Mechanicks to His Majesty. Five folding engraved plates. 8 p.l., 243, [7] pp. 8vo, cont. panelled calf (head of spine a bit chipped, short crack to upper joint). London: Printed for the Editor, 1738. \$1500.00

First edition of an important book. "Cotes was a close friend of Newton, who selected him to edit and write the preface for the second edition of the *Principia* in 1713. He succeeded Newton as Lucasian professor at Trinity College in 1706. These lectures were among the earliest of their kind given in England. The appendix contains the only English translation of Newton's Scale of Degrees of Heat, his law of cooling. Also a paper by Halley and two by Dr. Jurin. Robert Smith says that Newton said of Cotes: 'If he had lived, we might have known something'."—Babson 343.

A very good copy. Ex Bibliotheca Mechanica. Contemporary signature of William Cole on free front endpaper.

• Roberts & Trent, *Bibliotheca Mechanica*, pp. 79-80—(& particularly the notes for the 1775 ed.).

"His Major Memoir on Torsion"

26. COULOMB, Charles Augustin. "Recherches théoriques et expérimentales sur la force de torsion, & sur l'élasticité des fils de métal: Application de cette théorie à l'emploi des métaux dans les Arts & dans différentes expériences de Physique: Construction de différentes balances de torsion, pour mesurer les plus petits degrés de force. Observations sur les loix de l'élasticité & de la cohérence." One engraved plate. Pages 229-69 of the *Mémoires* of the Académie Royale des Sciences. Large 4to, attractive antique calf-backed marbled boards, spine gilt, red morocco lettering piece on spine. [Paris: 1784]. \$950.00

First appearance, an extract from the *Mémoires*, read on 9 September 1784. In his "major memoir on torsion, presented 9 September 1784 . . . Coulomb sought (1) to discover the laws of torsion and to determine possible applications of torsion and (2) to investigate the laws of coherence and elasticity of bodies by means of torsion."—*D.S.B.*, III, pp. 443.

Fine copy. Ex Bibliotheca Mechanica.

• Gillmor, *Coulomb and the Evolution of Physics and Engineering in Eighteenth-Century France*, pp. 150-65. Roberts & Trent, *Bibliotheca Mechanica*, p. 81—"In his memoir of 1784 on torsion, Coulomb describes his observations of the torsional rigidity of a wire, from which he obtained the formula for the period of vibration. Further experiments yielded the formula for the torque 'm' and concerned the mechanical properties of the materials from which the wires were made."

27. DELANGES, Paolo. *Meccanica Pratica in cui si Dimostra la Maniera di determinare l'Equilibrio delle Macchine, Computando le Resistenze degli Sfregamenti.* Two folding engraved plates. xiii, [1], 159, [1] pp. Large 4to, cont. semi-stiff blue boards. Verona: Heirs of M. Moroni, 1783.

[bound with]:

— *La Trisegante Nuova Curva, e Pensieri sulla Formula Cardanica.* One folding engraved plate. 28 pp. Large 4to. Verona: Heirs of M. Moroni, 1783. \$1750.00

First editions; both are quite uncommon. Delanges (d. 1810), was professor of mathematics at the military college at Verona and served as director of the hydraulic commission.

“The first work contains the first separate appearances of three papers by Delanges: ‘Esperienze per determinare le leggi colle quali procede la resistenza dello sfregamento del legno, e de’ metalli, e quella prodotto dalla durezza e ruvidita delle funi,’ ‘Difesa e conferma delle leggi seguite dalla resistenza dello sfregamento de’ solidi, dedotte dalle sperienze esposte nella prima Sezione,’ ‘Dell’equilibrio delle macchine, considerando in esse le resistenze degli sfregamenti’ . . .

“The second work appears to be the first publication on the curve which Delanges named the “trisegante’.”—Roberts & Trent, *Bibliotheca Mechanica*, p. 88.

The second work is concerned with the trisection of any angle, one of the three famous problems which faced the ancient Greek mathematicians. This was a topic which interested Cardano and Delanges’ monograph is based on the earlier mathematician’s discoveries.

Fine copies, preserved in a calf-backed box. Ex Bibliotheca Mechanica.

♣ Riccardi, I, 400-01.

“Ferrel’s Law”

28. FERREL, William. “The Motions of Fluids and Solids on the Earth’s Surface,” *Professional Papers of the Signal Service. No. VIII.* Illus. in the text. 51 pp. Large 4to, orig. printed wrappers. Washington: Office of the Chief Signal Officer, 1882. \$1250.00

The reprint of Ferrel’s most significant paper (1st appearance: 1858-60), in which he enunciated his general quantitative theory of relative motion on the earth’s surface and applied it to winds and currents. Ferrel’s law states “that if a body is moving in any direction, there is a force, arising from the earth’s rotation, which always deflects it to the right in the northern hemisphere, and to the left in the southern.”

“After Laplace, Ferrel was the chief founder of the subject now known as geophysical fluid dynamics. He gave the first general formulation of the

equations of motion for a body moving with respect to the rotating earth and drew from them the consequences for atmospheric and oceanic circulation. He contributed to meteorological and tidal theory and to the problem of 'earth wobble'."—*D.S.B.*, IV, p. 590.

Fine copy. Ex Bibliotheca Mechanica.

29. FERREL, William. "Popular Essays on the Movements of the Atmosphere," *Professional Papers of the Signal Service. No. XII.* Illus. in the text. 59 pp. Large 4to, orig. printed wrappers. Washington: Office of the Chief Signal Officer, 1882. \$450.00

Reprint of several other of Ferrel's important papers on meteorology. The essays present here deal with atmospheric circulation, winds, ocean currents, atmospheric pressure, and cyclones.

Fine copy. Ex Bibliotheca Mechanica.

30. FOSSOMBRONI, Vittorio, Conte. *Memoria sul Principio delle Velocità virtuali.* One engraved plate. 191, [1] pp. 4to, modern boards, uncut. Florence: G. Cambiagi, 1796. \$1250.00

First edition of this attractive and scarce book. "Fossombroni's goal was to translate Galileo's formulation of virtual velocities into the algebraic language of Lagrange's *Mécanique analytique* and to apply them to practical hydraulic problems. His work also draws upon the *Hydrodynamica* of Daniel Bernoulli, hydraulic studies by d'Albembert and Euler, and Prony's *Nouvelle architecture hydraulique*."—Roberts & Trent, *Bibliotheca Mechanica*, p. 117.

Fossombroni (1754-1844), Tuscan statesman, hydraulic engineer, and mathematician, wrote a series of works on physics and mathematics during the early years of his career.

Very good copy. Ex Bibliotheca Mechanica.

♣ Poggendorff, I, 779.

Frederick the Great's Contribution

31. [FREDERICK II, King of Prussia]. *Lettre d'un Academicien de Berlin a un Academicien de Paris. Avec la Traduction Allemande.* Woodcut arms of Frederick II on title. 61 pp. 8vo, cont. panelled crushed morocco, panels formed with gilt rules, spine gilt. Berlin: E. de Bourdeaux, 1753.

\$4500.00

First edition of this very rare contribution in the extended controversy over the theory of least action, one of the most notorious scientific quarrels of the 18th

century. The origins of the controversy followed Maupertuis's move to Berlin in 1745 to become vice-president of Frederick the Great's Berlin Academy. Maupertuis formulated the principle of least action which soon brought him into conflict with one of his colleagues, Samuel König, who claimed the principle to have been stated earlier by Leibniz. Maupertuis insisted the Berlin Academy investigate the priority of the discovery, causing a pamphlet war to commence. Voltaire jumped in with an unexpected anonymous satirical attack on Maupertuis which provoked a defense, also in pamphlet form — the present work — by the king himself. Frederick interpreted Voltaire's satire as an affront to his own honor. The pamphlet war, spurred on by Voltaire, continued for several more years and all the journals and gazettes covered it.

Fine and handsomely bound copy printed on thick paper. Printed in German with parallel translation into French.

✦ Terrall, *The Man Who Flattened the Earth. Maupertuis and the Sciences in the Enlightenment*, pp. 270-309.

Phosphorescence — "A Good Résumé"

32. [GALVANI, Camillo]. [Drop-title]: *Della Pietra Fosforica Bolognese*. Three folding engraved plates. 91, [1] pp. 8vo, early 19th cent. sheep-backed marbled boards. [Bologna: Longhi, 1780].

[bound with]:

BOLLETTI, Giuseppe Gaetano. *Dell' Origine e de' Progressi dell' Instituto delle Scienze di Bologna e di tutte le Accademie ad esso unite, con la descrizione delle più notabili cose, che ad uso del Mondo letterario nello stesso Instituto si conservano*. Engraved vignette on title & four folding engraved plates. 111, [1] pp. 8vo (some foxing). Bologna: Lelio dalla Volpe, 1769.

\$1250.00

I. First edition. "In the twelve chapters of the ninety-one page book, the history, color, shape, internal structure, and analysis, etc., of the Bolognian stone are described in considerable detail, and a comparison made with other phosphors. Beccari and his co-workers are particularly referred to and ten pages of experiments reported. Galvani ended with various reflections on the subjects presented. On the whole the book is a good résumé of contemporary knowledge."—Harvey, *A History of Luminescence*, p. 333.

II. Fourth edition (1st ed.: 1751) of the history of the origins and activities of the Academy of Sciences of the Institute of Bologna (founded in 1714), one of the leading scientific academies of the 18th century.

Very good copies.

✦ II. Riccardi, I, 145—"Abbiamo registrato questo libro . . . per l'importanza che esso presenta per la storia della scienza."

33. GAMACHES, Etienne Simon de. *Astronomie Physique, ou Principes généraux de la Nature, appliqués au Mécanisme astronomique, et comparés aux Principes de la Philosophie de M. Newton.* Engraved vignette on title, engraved head- & tailpieces, & 22 fine folding engraved plates. 4 p.l., xlviii, 362, [10] pp. Large 4to, cont. mottled calf (joints & corners carefully repaired, occasional minor marginal dampstaining), spine gilt, red morocco lettering piece on spine. Paris: C.-A. Jombert, 1740. \$1500.00

First edition. "Gamaches was a member of the French Royal Academy of Science and here gives nine dissertations on the Nature and Laws of Movement, the Principles of the Philosophy of Newton, the Theory of the Planets, etc., and a clarification of relative movement and Newtonian attraction."—Babson 63.

The fine vignette and head- and tail-pieces are by Cochin.

Very good copy. Ex Bibliotheca Mechanica.

♣ Roberts & Trent, *Bibliotheca Mechanica*, p. 131.

34. GIRARD, Pierre Simon. *Essai sur les Mouvement des Eaux courantes, et la Figure qu'il convient de donner aux Canaux qui les contiennent.* One folding engraved plate. vii, 60 pp. Large 4to, cont. vellum-backed paste-paper boards (a little rubbed), uncut. Paris: de l'Imprimerie de la République, 1804. \$1500.00

First edition. Girard (1765-1836), was appointed as engineer to the École des Ponts et Chaussées in 1789 and in 1790 was awarded the prize of the Académie des Sciences for his work on lock and canal construction. After returning from Egypt in 1803, where he was one of the scientific experts in Napoleon's expedition, he was appointed "director of the Paris water supply with the special task of connecting the Seine and Ourcq rivers with a ship canal to serve the capital. This led him to study the resistance of the flow of water through pipes and open channels."—*D.S.B.*, V, p. 410.

Fine copy.

♣ Rouse & Ince, *History of Hydraulics*, pp. 140-42.

35. GRANDI, Guido. *Instituzioni Meccaniche. Trattato.* 20 folding engraved plates. Title printed in red & black. viii, 160 pp. 8vo, orig. limp boards, uncut. Florence: G.G. Tartini & S. Franchi, 1739. \$1750.00

First edition. "This treatise is divided into ten chapters; they concern uniform movement, the moment of any kind of force, the center of gravity, motion composed of more uniform motion, as well as machines that facilitate motion. The next two chapters concern, first, accelerated and retarded motions, and

second, motions composed of uniform and of accelerated motion, both of which make reference to his note on naturally accelerated motion which appears in the latest edition of the works of Galileo. The remaining chapters are devoted to percussion, to the pendulum, and finally to the resistance of solids . . .

“As well as the note on naturally accelerated motion mentioned above, Grandi refers in the preface to his other contributions to the latest edition of Galileo’s works. These include his edition of the treatise on the uniform resistance of solids begun by Viviani, and his demonstration concerning the motion of solid bodies in a liquid medium.”—Roberts & Trent, *Bibliotheca Mechanica*, p. 144.

Grandi (1671-1742), a devoted Newtonian, was a member of the Royal Society and introduced Leibnizian calculus into Italy. He also performed successful work in theoretical and practical mechanics; his studies in hydraulics evoked considerable interest from the governments of central Italy.

Fine copy in original state.

♣ *D.S.B.*, V, pp. 498-550. Riccardi, I, 627—“Buona ediz.”

36. GRASHOF, Franz. *Theorie der Elasticität und Festigkeit mit Bezug auf ihre Anwendungen in der Technik.* viii, 408 pp. 8vo, cont. mottled half-calf & cloth, stamp of “W. Denny & Bros.” on upper cover, green morocco lettering piece on spine. Berlin: R. Gaertner, 1878. \$500.00

Second edition, revised. “This volume contains the first appearance of Grashof’s general theory of elasticity. The first edition was published in 1866 with the title *Festigkeitslehre*, but Grashof felt he had so altered it, especially in regards to the equations of elasticity, that this edition deserved a new title. Grashof ‘was the first to present the fundamental equations of the theory of elasticity, in a text on strength of materials in which he treated flexure, torsion, buckling, plates, and shells.’—R. S. Hartenberg in DSB . . .

“Grashof goes beyond St. Venant in considering bending of bars and beyond Lamé in dealing with cylindrical shells. He emphasizes analytical techniques and rarely uses figures. The five chapters deal with the general theory of elasticity, straight rods, curving rods, plates and definitions, making frequent references to Clebsch and St. Venant.”—Roberts & Trent, *Bibliotheca Mechanica*, p. 145.

Grashof (1826-93), “as teacher and engineer, and as founding member, editor, and long-time director of the VDI, influenced a generation of engineers by bringing mathematical and scientific considerations to the burgeoning problems of the steam-engine age.”—*D.S.B.*, V, p. 502.

Nice copy. Ex Bibliotheca Mechanica.

37. GREEN, George. “On the Laws of the Reflexion and Refraction of Light at the common Surface of two non-crystallized Media . . . Read December 11, 1837.” Pages 1-24. Large 4to. [Cambridge]: *Transactions of*

the Cambridge Philosophical Society, Vol. VII, Part I, [1837].

[bound with]:

— “VI. Supplement to a Memoir on the Reflexion and Refraction of Light... Read May 6, 1839.” Pages [113]-20. Large 4to. [Cambridge]: *Transactions of the Cambridge Philosophical Society*, Vol. VII, Part I, [1839].

[bound with]:

— “VII. On the Propagation of Light in Crystallized Media... Read May 20, 1839.” Pages [121]-140. Large 4to. [Cambridge]: *Transactions of the Cambridge Philosophical Society*, Vol. VII, Part II, [1839]. \$1250.00

Extracts from the *Transactions of the Cambridge Philosophical Society*. Green (1793-1841), an extraordinary self-taught mathematician, matriculated at Caius College in 1833, at the age of 40. Due to the importance of the above publications, he was elected as Perse Fellow of Caius in 1839. Green is primarily known for his work in electricity and magnetism and for the formula connecting surface and volume integrals (Green's Theorem) still used in the solution of partial differential equations. Green's general mathematical theory of potential development led, through Kelvin and Maxwell, to the mathematical theories of electricity of the twentieth century. He coined the term “potential.”

“Of interest to the strength of materials is Green's paper ‘On the Laws of Reflexion and Refraction of Light at the Common Surface of Two Non-crystallized Media’ in which he takes up problems of elasticity. This paper started a controversy which gave rise to two schools on the theory of elasticity, the differences between these schools promoting interest in the experimental determination of elastic contents...

“‘Supplement to a Memoir...’ is on the reflexion and refraction of light, following and amplifying the works of Cauchy and Airy while following Lagrange in the method of integration. In it Green applies a formula representing a system of molecules acting on each other, as well as applying the general method of Lagrange's *Mécanique analytique* to a theory of light...

“In the paper ‘On the Propagation of Light...’ Green uses the *vis-viva* theorem (conservation of mechanical energy) to simplify Cauchy's treatment of the same subject...

“Though these papers more immediately relate to the wave theory of light, Todhunter indicates the importance of their ‘demonstration of the body shift-equations for free vibrations of an elastic solid.’ Green's method of obtaining body shift-equations has been followed by the majority of upholders of multi-constancy ever since, including Thomson and Kirchhoff. Pearson objects to this method on many points; in particular he denies the linearity of the stress-strain relation and calls the bi-constant argument on which the method is based ‘fallacious.’—Roberts & Trent, *Bibliotheca Mechanica*, pp. 145-46.

Fine copies. Ex Bibliotheca Mechanica.
 ♣ D.S.B., XV, pp. 199-201.

Machines

38. GUENYVEAU, André. *Essai sur la Science des Machines, dans lequel on traite des Moteurs, des Roues hydrauliques, des Machines à colonne d'eau, du Béliet hydraulique, des Machines à vapeur, des Hommes et des Animaux.* 2 p.l., 290 pp. 8vo, cont. sheep-backed marbled boards (joints a trifle rubbed), flat spine gilt, black leather lettering piece on spine. Lyon: J.B. Kindelem; Paris: Brunot-Labbe & les Libraires pour les Mathématiques, 1810.

\$1950.00

First edition, Lyon issue. "This work represents an attempt to apply mathematical analysis to the study of machines as Lagrange had applied it to the study of mechanics generally. In the preface, the author makes references to the works on machines by Carnot and Prony . . . As well as studying all kinds of heat and hydraulic engines, in the final chapter Guenyveau considers human locomotion and the forces it entails. In the preface to his *Du calcul de l'effet des machines*, Coriolis remarks that this work and one other were the only material available to him . . .

"Cardwell quotes Guenyveau's comment that 'The column-of-water engine is the inverse of a force pump and several German writers use the same formulae for both.' He also remarks on Guenyveau's proposal to attach an air vessel to that engine, so introducing a degree of elasticity, and making its operation in part analogous to that of the steam engine."—Roberts & Trent, *Bibliotheca Mechanica*, pp. 150-51.

Guenyveau (1782-1861), was professor of metallurgy at the École des Mines, succeeding Hassenfratz.

Fine copy. Ex Bibliotheca Mechanica.

♣ Cardwell, *From Watt to Clausius*, pp. 87-88.

39. GUGLIELMINI, Domenico. *Della Natura de' Fiumi, Trattato Fisico-Matematico . . .* Nuova Edizione con le Annotazioni di Eustachio Manfredi. Engraved printer's vignette on title & 18 fine folding engraved plates. 4 p. l., xvi, 427, [1] pp. 4to, cont. vellum over boards, brown morocco lettering piece on spine. Bologna: L. dalla Volpe, 1739.

\$1950.00

Second edition of this classic work; this is an important edition as it has been "enlarged and annotated by Eustachio Manfredi, Guglielmini's successor as Bologna's superintendent for water. Manfredi included much material found in Guglielmini's notes, corrected some errors and added the notes which follow

each chapter; he also greatly expanded the index.”—Roberts & Trent, *Bibliotheca Mechanica*, pp. 152-53.

Guglielmini (1655-1710), studied mathematics and medicine at the University of Bologna. He was one of the leading hydraulic engineers of his time and took the professorship of mathematics at the University of Padua. In 1702, he became professor of medicine at the same university, reflecting his varied and changing interests.

The finely engraved plates show ninety of the observations and experiments described, including the construction of canals, water mills, and dams.

Fine copy. Ex Bibliotheca Mechanica.

♣ Riccardi, I, 643—“Raro ed apprezzato.”

40. HENRY, Daniel Farrand. *Flow of Water in Rivers and Canals*. Two lithographed plates (one folding). 1 p.l., 86 pp. 8vo, orig. printed wrappers (chipped). Detroit: W. Graham’s Steam Presses, 1873.

\$350.00

First separate edition, an author’s offprint with new pagination from the *Journal of the Franklin Institute*, Vol. LXI. “The [first] plate, bearing five figures, illustrates various models of the telegraphic current meter. The text gives a short survey of methods of measuring water flow, then compares the telegraphic current meter with other measuring devices. An appendix gives an account of the controversy between A. A. Humphreys, H. L. Abbot, and Henry concerning the telegraphic current meter, with letter in support of Henry from Prof. S. W. Robinson and data obtained by E. S. Chesbrough using that meter.”—Roberts & Trent, *Bibliotheca Mechanica*, pp. 160-61.

Very good copy preserved in a box. Bookplate of Franklin Institute Library and with its perforated stamp on title-page and another leaf. Ex Bibliotheca Mechanica.

The Venturi Meter

41. HERSCHEL, Clemens. *115 Experiments on the Carrying Capacity of Large, Riveted, Metal Conduits, up to Six Feet per second of Velocity of Flow*. Photographic frontis., 13 photographic plates, & several illus. in the text. iv, [4], 130 pp. 8vo, orig. cloth (a little marked). New York: J. Wiley; London: Chapman & Hall, 1897.

\$350.00

First edition. Herschel (1842-1930), was one of the leading hydraulic engineers in America during the latter part of the 19th century. He was chief engineer of the Holyoke Water Power Company and later of the East Jersey Water Company. Herschel “invented the Venturi meter, a device without moving parts

for the measurement of the flow of water in pipes . . . [it] is the achievement for which he will be best and longest remembered. The Venturi meter is in ever-increasing use the world over in substantially the same form in which Herschel produced it originally."—*D.A.B.*, IV, p. 595.

The present work describes the Venturi meter and its use.

Fine copy. Bookplate of Robert E. Horton who had made some notes and underlinings in pencil. Ex Bibliotheca Mechanica.

♣ Roberts & Trent, *Bibliotheca Mechanica*, p. 162.

42. HOFFMANN, Johann Christian. *Beschreibung und Abbildung einer Wagenwinde von ausserordentlicher Wirksamkeit.* One folding engraved plate. 20 pp. 4to, cont. speckled boards. Leipzig: G. Fleischer the Younger, 1800. \$1250.00

First edition and very rare; OCLC locates no copy in the U.S. Hoffmann (1768-19189), was successively professor of chemistry at Zamosc in Galicia, professor of physics at the Hauptschule in Cracow, and finally professor of economics and technology at the Staatswirthschaftliche Schule at Warsaw.

This is a "description and drawing of an unusual lifting jack. In the foreword, Hoffman notes that this jack is related to one described in Bürja's *Grundlehren der Statik* (1789) and in Oberländer's *Beschreibung einer neuen ungemein grossen Spinnmaschine . . .* (1795)."—Roberts & Trent, *Bibliotheca Mechanica*, pp. 163-64.

The plate depicts various cross-sections of the jack.

Fine copy. Ex Bibliotheca Mechanica.

♣ Poggendorff, I, 1124.

43. HOPKINSON, John. *Original Papers.* Edited with a Memoir by B. Hopkinson. Frontis. port. & another port. facing p. xxx in Vol. I., numerous diagrams in the text. lxvi, 294 pp.; vii, 393, [1] pp. Two vols. 8vo, orig. red cloth, spines gilt. Cambridge: at the University Press, 1901. \$250.00

First edition of this collection. Hopkinson (1849-98), was director of the Siemens Laboratory and professor at King's College, London. "The papers in these two volumes were originally published in the *Proceedings* of the Royal Society and in various engineering journals, and were edited for this publication by the author's son, who also wrote the biography of his father . . .

"The first volume contains Hopkinson's papers on electricity and those relating to his work on electric lighthouses. To those have been joined some addresses and his James Forrest lecture on the relation of mathematics to engineering. The second volume comprises two papers on the residual charge of the Leyden jar, papers on the properties of glass, papers on the magnetic

properties of metals, on the rupture of iron wire, on thermo-elastic properties of solides, as well as additional papers relating to electricity."—Roberts & Trent, *Bibliotheca Mechanica*, pp. 165-66.

Fine set. Ex Bibliotheca Mechanica.

• D.S.B., VI, p. 504.

Plans to Tame the Mississippi

44. HUMPHREYS, Andrew Atkinson & ABBOT, Henry Larcom. *Report upon the Physics and Hydraulics of the Mississippi River; upon the Protection of the Alluvial Region against Overflow; and upon the Deepening of the Mouths: based upon Surveys and Investigations made under the Acts of Congress directing the Topographical and Hydrographical Survey of the Delta of the Mississippi River, with such Investigations as might lead to determine the most Practicable Plan for securing it from Inundation, and the Best Mode of Deepening the Channels at the Mouths of the River.* One large folding colored lithographed map of the Lower Mississippi. xx, 214 pp. 8vo, orig. cloth (lower cover with some dampstaining, light browning), upper cover lettered in gilt. Washington: G.P.O., 1867. \$750.00

"Reprint of introductory letter and chapters 2, 6, 7 and plate 2 from professional papers 13. In their report, Humphreys and Abbot recommend the use of levees for flood control. It has been suggested that their work was read by Mark Twain in preparation for *Life on the Mississippi*."—Roberts & Trent, *Bibliotheca Mechanica*, p. 167.

Good copy. The map is very large and handsomely colored. Stamp of Abby S.A. White Library on free front endpaper. Ex Bibliotheca Mechanica.

45. JOULE, James Prescott. "V. On some Thermo-dynamic Properties of Solids" an extract from the *Philosophical Transactions of the Royal Society of London*. Pages 91-131. Large 4to, modern wrappers. [London: 1859]. \$500.00

"This paper contains a detailed account of experiments bearing on the thermo-elastic relations of metals and india-rubber. Suggested by Sir William Thomson, these investigations concern the 'heat developed by longitudinal compression and that absorbed on the application of tensile force'."—Roberts & Trent, *Bibliotheca Mechanica*, p. 179.

Fine copy preserved in a red cloth folder. Ex Bibliotheca Mechanica.

46. KASTNER, Karl Wilhelm Gottlob. *Grundriss der Experimentalphysik*. Three folding engraved plates. xiv, 464 pp., one leaf

of errata; xii, [465]-930 pp., one leaf of errata. Two vols. 8vo, cont. half-sheep & marbled boards (minor rubbing, some foxing), flat spines gilt, contrasting leather lettering pieces on spines. Heidelberg: Mohr & Zimmer, 1810. \$1250.00

First edition; this is a rare book with no copy in *N.U.C.* or RLIN. Kastner (1783-1857), was professor of chemistry at the universities of Heidelberg, Halle, and Bonn, and in 1821 became professor of chemistry and physics at Erlangen. He was known for being an excellent and much admired lecturer and, according to *N.D.B.*, Vol. XI, p. 324, was one of the most important German chemists of his time.

Very good set. This was a very popular work with two later editions.

☛ *A.D.B.*, Vol. 15, p. 439. Ferchl, p. 268. Partington, IV, p. 294. Poggendorff, I, 1231.

47. KIRKALDY, William G. *Illustrations of David Kirkaldy's System of Mechanical Testing as originated and carried on by him during a Quarter Century. Comprising a large Selection of Tabulated Results, showing the Strength and other Properties of Materials used in Construction, with Explanatory Text, and Historical Sketch.* 25 lithographed plates (22 are double-page), one lithographed port., two folding printed tables, & illus. in the text. xiv, 302, xlix pp. Large 4to, orig. cloth, stamped in gilt & black. London: Sampson Low, 1891. \$1500.00

First edition and a fine, fresh copy. David Kirkaldy (1820-97), a testing consultant and manufacturer of testing machines, made important contributions to the testing of tensile strength. This is the "main printed source of information on Kirkaldy's works, describing the system of testing and the range of materials verified in this way, including cement and concrete, leather belting and ropes as well as iron and steel. It also contains many text results . . . The plates show the resulting fractures and distortions of the materials. In addition there is a biography of David Kirkaldy, recording some of his major involvements, for instance the Indian State railways and the Tay bridge disaster, as well as some disputes where he felt his professional reputation to be at stake. The work was written by David Kirkaldy's son, who became a partner in 1884 and continued the works after his father's death in 1897."—Elton, *Cat.* 6, 118.

Bookplate of the Library Company of Philadelphia with their embossed stamp here and there in margins. Ex *Bibliotheca Mechanica*.

☛ Roberts & Trent, *Bibliotheca Mechanica*, p. 187.

48. KLUEGEL, Georg Simon. *Commentatio de Perturbationibus Corporum Coelestium facilius et concinnius evolvendis. Pars Prima [-Pars Secunda].* One

engraved plate. 38 pp.; 60 pp. 4to, modern boards. [Göttingen: Commentationes Societatis Regiae Scientiarum Gottingensis, Vol. XII, 1793-94]. \$500.00

First separate edition and very rare. Klügel (1739-1812), studied with A.G. Kästner at Göttingen; he became professor of mathematics at Helmstedt in 1767 and later transferred to the chair of mathematics and physics at the University of Halle. Klügel made notable contributions to trigonometry (see *D.S.B.*) and wrote on physics, astronomy, and optics.

Fine copy with the stamp of Franz Xaver von Zach (1754-1832), the astronomer (see *D.S.B.*) who formed a large and distinguished scientific library.

♣ *D.S.B.*, VII, pp. 404-05. Lalande, p. 635. Poggendorff, I, 1277-78.

"First Book on Theory of Elasticity"

49. LAMÉ, Gabriel. *Leçons sur la Théorie mathématique de l'Élasticité des Corps solides.* One folding lithographed plate. xvi, 335 pp. 8vo, orig. printed wrappers (upper wrapper detached, spine somewhat frayed, some foxing), uncut. Paris: Bachelier, 1852. \$1500.00

First edition. "The first book on theory of elasticity, this work is the product of Lamé's investigations of a spherical elastic envelope subject to a given distribution of load. Based on an earlier memoir written in conjunction with Clapeyron, it gives a clear and concise presentation of theoretical results dealing with elastic deformations of isotropic materials. In the present work 'the form of the equations was somewhat changed since Lamé had come to the conclusion that to determine the elastic properties of an isotropic material, two elastic constants were required.' He introduces problems on vibrations, discusses the motions of strings, membranes, and bars, as well as the propagation of waves in an elastic medium. In addition, the book covers curvilinear coordinates and deformations of spherical shells in more depth than was possible in the memoir...

"These lessons on the elasticity of solid bodies formed part of the course in mathematical physics Lamé taught at the Faculty of Sciences. Todhunter said that the 'work of Lamé cannot be too highly commended,' praised his mathematical investigations as clear and convincing, and complimented the general reflections for 'their elegance of language and depth of thought'."—Roberts & Trent, *Bibliotheca Mechanica*, p. 194.

Lamé (1795-1870), was professor of physics at the École Polytechnique in Paris and made original contributions to differential geometry, number theory, thermodynamics, and applied mechanics. His name is immortalized by the "Lamé Equations" for determining the strength of thick cylinders.

Very good copy, preserved in a morocco-backed box. Ex Bibliotheca

Mechanica.

• D.S.B., VII, pp. 601-02.

50. LANGSDORF, Karl Christian. *Grundlehren der mechanischen Wissenschaften welche die Statik und Mechanik, die Hydrostatik, Aerometrie, Hydraulik und die Maschinenlehre enthalten. Mit besonderer Rücksicht auf Physiker und Praktiker.* Twelve folding engraved plates. lxviii, 755, [1] pp. Thick 8vo, cont. marbled boards (extremities worn), flat spine gilt, red vellum lettering pieces on spine. Erlangen: J.J. Palm, 1802.

[bound with]:

— *Theorie des Krummzapfens, eine der wichtigsten für die praktische Maschinenlehre ein bisher noch nicht aufgelöstes Problem, in aller Schärfe erwiesen und in einer sehr einfachen Formel dargestellt.* 32 pp. 8vo. Erlangen: J.J. Palm, 1803. \$1500.00

First editions and scarce.

I. "The contents of this work is [sic] divided into: dynamics or the statics and mechanics of solid bodies (ten chapters), hydrostatics (three chapters), aerometry or pneumatics (six chapters), hydraulics (six chapters), and the study of machines (thirty-three chapters). The section on machines opens with fundamentals of machinery, describing the entire range of simple machines, water wheels, windmills, etc. Among the more advanced machines described are a stamping press and the steam engine of Watt and Boulton, see p. 533."—Roberts & Trent, *Bibliotheca Mechanica*, p. 196.

II. This work is concerned with cranks and crankshafts.

Langsdorf (1757-1834), was professor of engineering at Erlangen and later became professor of mathematics at Heidelberg.

Very good copies in a somewhat worn binding. Duplicate stamp of the Library of Congress on free front endpaper. Ex *Bibliotheca Mechanica*.

• Poggendorff, I, 1372.

51. LARDNER, Dionysius. *A Treatise on Hydrostatics and Pneumatics.* Engraved title & illus. in the text. [iii]-viii, 353, [1] pp. Small 8vo, cont. half-morocco & marbled boards, spine gilt, black leather lettering piece on spine. London: Longman et al., 1831. \$250.00

First edition. "This is a systematic textbook devoted to hydrostatics, hydraulics, and pneumatics. Of interest are his descriptions of pneumatic machines such as the suction pump, fire engine, siphon, air gun, balloon, and diving bell."—Roberts & Trent, *Bibliotheca Mechanica*, p. 199.

"Elected in 1827 to the chair of natural philosophy and astronomy in the

recently founded London University... he was a man of great and versatile ability, master of a lucid style, and as a populariser of science did excellent work."—*D.N.B.*, XI, p. 586.

Nice copy. Half-title lacking. Ex Bibliotheca Mechanica.

The Experiments of Poncelet & Lebros

52. LEBROS, Joseph Aimé. "Expériences Hydrauliques sur les Lois de l'Écoulement de l'Eau a travers les Orifices Rectangulaires Verticaux a Grandes Dimensions, entreprises a Metz, d'après les Ordres de M. le Ministre de la Guerre, pendant les trois derniers mois de 1828 et pendant les années 1829, 1831 et 1835. Par M. Lebros, Colonel de Genie. Prix de Mécanique de 1850" in *Mémoires présentés par divers Savants a l'Académie des Sciences de l'Institut National de France... Sciences Mathématiques et Physiques*, Vol. 13. 37 folding lithographed plates. 3 p.l., 579 pp. Large 4to, orig. paste-paper boards (a little worn), orig. printed label on spine (label abraded). Paris: Imprimerie Nationale, 1852. \$500.00

First edition. "This very rare prize-winning memoir of 1850 is based upon the experiments performed by Poncelet and Lebros in 1828, and the later experiments undertaken by Lebros. These hydraulic experiments, which took place at Metz, concerned the laws governing the circulation of water through large, rectangular, vertical orifices. The experiments were undertaken at the order of the Ministry of War which governed the engineering corps."—Roberts & Trent, *Bibliotheca Mechanica*, p. 201.

The memoir by Lebros occupies pp. 1-509 and all of the plates pertain to Lebros' work.

Fine copy. Ex Bibliotheca Mechanica.

53. LITTA, [Alfonso] Agostino. *Memoria Idrostatica... concernente lo Sperimento pubblico fatto nel 1774. di spurgare la Fossa interiore del Naviglio della Città di Milano colla semplice forza, ed uso dell' acqua sua corrente.* 4 p.l., 69, [1] pp. Large 4to, cont. mottled sheep (rubbed), single gilt fillet round sides, flat spine gilt, a.e.g. [Milano: G. Marelli, 1775]. \$950.00

First edition and very rare. In this work, Litta (d. 1781), a Milanese nobleman, describes the attempt to flush out the drainage ditch of the main canal of Milan using an increased flow of water.

Fine copy.

♣ Poggendorff, I, 1478-79. Riccardi, II, 45.

Large Paper Copy

- 54. MACLAURIN, Colin.** *An Account of Sir Isaac Newton's Philosophical Discoveries, in Four Books...* published from the Author's Manuscript Papers, by Patrick Murdoch, M.A. and F.R.S. Six folding engraved plates. 14 p.l., xx, 392 pp. Large 4to, attractive antique sprinkled calf, spine nicely gilt, red morocco lettering piece on spine. London: Printed for the Author's Children, 1748. \$2500.00

First edition, a fine large paper copy, measuring 275 x 225 mm. This is a study of Newton's discoveries, written by a friend and disciple. Maclaurin (1698-1746), was the greatest of the 18th-century writers on fluxions after Newton; his *Treatise on Fluxions* (1742) has been described as the earliest logical and systematic publication of the Newtonian methods. Newton had great respect for Maclaurin's mathematical abilities, and he personally recommended him for a professorship at the University of Edinburgh.

The "Account of the Life and Writings of the Author" by Murdoch, which serves as a preface, is the chief authority for the life and writings of Maclaurin.

An attractive copy. Ex Bibliotheca Mechanica.

• Babson 85.

A Classic of Mechanics by the "Bohemian Galileo"

- 55. MARCIA KRONLAND, Johannes Marcus.** *De Proportione Motus Figurarum Recti Linearum et Circuli Quadratura ex Motu.* Finely engraved title, fine engraved port. of the author on verso of fourth preliminary leaf, & 32 engraved illus. in the text. Each page of text printed within a border of printer's ornaments. 72 unnumbered leaves & one leaf of errata (this leaf is somewhat browned due to a different paper stock). Small 4to, cont. vellum over boards, sides richly decorated with silver stamping, now oxidized to black, ties gone, a.e.g. Prague: [ex Typographia Academica], 1648. \$16,500.00

First edition of what I believe to be the rarest of all the books by Marcus Marci (1595-1667), professor of medicine at Prague University. Marci has been called the "Bohemian Galileo."

The present book, concerned with the theory of collisions, is a continuation and elaboration of his 1639 publication *De Proportione Motus seu Regula Sphygmica*. In this work, Marci responds to criticisms made of his 1639 book and develops new theories concerning the geometrical form of bodies in movement, the properties of free fall, the duration of the oscillation of a pendulum and its length, etc. There are a number of references to Galileo.

Marci "was the first to make substantial progress with the difficult problem of impact, a problem that Galileo touched on without success and that Descartes

completely muffed.”—E.C. Watson in *American Journal of Physics*, Vol. 16 (1948), pp. 246-47.

Fine fresh copy of a very attractively printed book.

• D.S.B., IX, pp. 96-98. Roberts & Trent, *Bibliotheca Mechanica*, p. 215.

With Some of Legendre's Earliest Writings

56. MARIE, Joseph François. *Traité de Méchanique*. Twelve folding engraved plates. viii, 440 pp. Large 4to, cont. marbled sheep (carefully rebacked), spine gilt, red morocco lettering piece on spine. Paris: la Veuve Desaint, 1774. \$1500.00

First edition. “This textbook of mechanics was written with the assistance of Legendre and contains some of his earliest work. The introduction spells out the principles of mechanics and deals with the theories of movement and equilibrium. Following the usual division of the subject into statics and dynamics, the first part deals with the center of gravity and machines, while the second part deals with the free movement of a body, its movement on a path and the mutual influence of several bodies. It is the second part which reflects Legendre’s contributions.”—Roberts & Trent, *Bibliotheca Mechanica*, p. 216.

Marie (1738-1810), was professor of philosophy and mathematics at the Sorbonne. Among his students was Legendre, with whom he arranged for the publication of Lagrange’s classic *Méchanique Analitique* (1788).

Fine copy. Ex Bibliotheca Mechanica.

57. MATHIEU, Émile Léonard. *Théorie de l’Élasticité des Corps Solides . . . Première Partie. Considérations générales sur l’élasticité. Emploi des coordonnées curvilignes. Problèmes relatifs à l’équilibre d’élasticité. Placques vibrantes. [Seconde Partie. Mouvements vibratoires des corps solides. Équilibre d’élasticité des lames courbes et du prisme rectangle]*. Two vols. viii, 219 pp.; 2 p.l., 184 pp. Large 4to, orig. printed wrappers, uncut. Paris: Gauthier-Villars, 1890. \$750.00

First edition. Mathieu (1835-90), professor of mathematics at Nancy, belongs to the great French tradition of mathematical physicists; he contributed to the field of partial differential equations.

“These two volumes on the theory of the elasticity of solid bodies form parts six and seven of his *Traité de physique mathématique* [these are volumes 6 and 7; each was published independently]. The first volume discusses the theory of elasticity, use of curvilinear coordinates, and problems regarding the equilibrium of elastic and vibrating plates. The second considers vibrations of solid bodies and the elastic equilibrium of thin curving plates and that of rectangular prisms. The work is a natural extension of that of Sophie Germain.”—Roberts & Trent,

Bibliotheca Mechanica, p. 220.

Fine set in original condition, preserved in a cloth-covered box.

☛ *D.S.B.*, IX, pp. 174-75.

58. [MAZIÈRES, Jean Simon]. *Traité des Petits Tourbillons de la Matière subtile. Où l'on fait voir par les seuls effets du choc, que l'Univers est rempli d'une matière très-fluide, très-agitée, & composée d'une infinité de Tourbillons de figure sphérique, qui produisent tous les ressorts de la Nature. Pour servir d'introduction à une nouvelle Physique, & Eclaircissement à la Pièce qui a remporté le Prix de l'Académie Royale des Sciences en 1726.* Par un Prêtre de l'Oratoire. x, [2], 56 pp. Large 4to, modern calf-backed boards (minor browning). Paris: C. Jombert & Pissot, 1727. \$950.00

First edition of this rare work on fluid mechanics. Mazières (1679?-1761), was a priest from Pontoise.

Fine copy. Ex *Bibliotheca Mechanica*.

☛ *Poggendorff*, II, 97.

59. MICHELOTTI, Francesco Domenico. *Sperimenti Idraulici. Principalmente diretti a confermare la Teorica, e facilitare la Pratica del misurare le Acque Correnti.* Finely engraved vignette on each title, folding frontispiece of King Carlo Emanuele in Vol. I, eleven folding engraved plates, & engraved headpieces. 12 p.l., 67, [1], 7 folding printed tables, 69-206 pp.; 4 p.l., 234, [6] pp. Two vols. Large 4to, antique half-sheep & marbled boards, spines gilt, uncut. Torino: nella Stamperia Reale, 1767-71.

\$1950.00

First edition of the author's most important work. Michelotti (1710-77), was professor of mathematics at the University of Torino and the author of a series of works on hydrostatics and hydraulics. This work contains descriptions of most of his experiments including those with his "stadera idraulica," a device which balanced the water pressure on a vertical plate, and his hydrometric pendulum.

"In cui, oltre alle nuove sperienze, si contengono le risposte dell'autore ad alcuni celebri matematici d'Italia, e due esercitazioni analitiche; nella prima delle quali si dimostra una nuova teoria delle progressioni, e proporzioni geometriche; e nella seconda un esame delle equazioni dette irriducibili di terzo grado, l'una e l'altra feconde di utilissime notizie. Fra i quali meritano speciale menzione l'esperienza fatte cogli strumenti usati per misurare la velocità dell'acque, rilevandone i difetti e proponendo all'uopo utili perfezionamenti."—Riccardi.

The attractive plates depict many devices used to measure the velocity of flowing water, control rivers, and irrigate fields and gardens.

A fine crisp set.

• Poggendorff, II, 146. Riccardi, II, 157—"questa pregevole opera." Roberts & Trent, *Bibliotheca Mechanica*, p. 225—(Vol. I only).

An Important Newtonian Textbook of Mechanics

60. MOTTE, Andrew. *A Treatise of the Mechanical Powers: Wherein the Laws of Motion, and the Properties of those Powers are Explained and Demonstrated in an easie and familiar Method.* Three engraved plates & numerous illus. in the text (several full-page). 4 p.l., 222, [2] pp. 8vo, cont. calf (rebacked), double gilt fillet round sides. London: B. Motte, 1727.

\$1500.00

First edition of this important Newtonian textbook of mechanics, published two years before the author's translation of the *Principia*. "This work is intended by the author for students of natural philosophy and for the workman who deals with machines on a daily basis. Thoroughly Newtonian in spirit, it contains sections on the laws of motion with respect to forces and with respect to bodies, on the balance, lever, pulls, wheel, inclined plane, wedge, and screw. There is a chapter of general observations, followed by chapters on friction and the sail, with an appendix."—Roberts & Trent, *Bibliotheca Mechanica*, p. 231.

Very good copy. Ex Bibliotheca Mechanica.

Marine Architecture

61. NORDMARK, Zacharias. *Principes d'une Nouvelle Théorie de la Résistance des Fluides... Mémoire qui a remporté un Prix Du Departement Impérial de la Marine de Russie.* Eight folding engraved plates. 2 p.l., 154 pp. 4to, cont. marbled sheep (upper joint partly cracked but strong), single gilt fillet round sides, flat spine gilt, green morocco lettering piece on spine. St. Petersburg: de l'Imprimerie de la Marine, 1808. \$1250.00

First edition and very rare with no copy in OCLC. "Nordmark's prize-winning response to a problem posed by the Russian Imperial Department de la Marine in July 1804 concerning fluid resistance and its application to marine architecture. The intention of the academy was to elicit either a refinement of the theories of Juan y Santacilla and Romme, or to obtain a new theory, which would have practical application. Though his paper did not achieve the desired result, Nordmark was awarded the prize for having formulated a new theory, which, though without applications to marine architecture, was in some respects preferable to those of Romme and Juan."—Roberts & Trent, *Bibliotheca Mechanica*, p. 241.

Nordmark (1751-1828), was professor of physics at Greifswald and later at

Uppsala.

Very good copy. Ex Bibliotheca Mechanica.

• Poggendorff, II, 299-300.

A "Small" Scientific Controversy

- 62. NYSTROM, John William.** *On Force of Falling Bodies and Dynamics of Matter, classified with Precision to the Meaning of Dynamical Terms.* Several illus. in the text. 31 pp. 8vo, cont. red half-morocco & cloth sides (spine a little chipped), spine lettered in gilt. Philadelphia: J.B. Lippincott, 1873. \$250.00

First edition. "This pamphlet contains a series of letters which appeared in the *Scientific American*, all inspired by a question published in that journal, June 8th, 1872:

'Force of Falling Bodies. – We have a steam-hammer weighing exactly three tons, including piston and rod; the stroke is four feet, and the hammer falls by its own gravity. What will be the force of the blow, making no allowance for friction? What is the formula for the calculation?'"

"Four letters attempting to answer this question follow, all of which were found inadequate by Nystrom, who responded with his own letter on August 31, 1872. Nystrom's findings were in turn disputed by Prof. P. H. Vander Weyde, resulting in a small controversy. In support of his position, Nystrom presents here a classification of dynamical terms and a series of formulae representing their relationships. He stresses that dynamical problems are not sufficiently understood and implies that the scientific establishment and the *Scientific American* are impeding his attempts to cast light on the problem."—Roberts & Trent, *Bibliotheca Mechanica*, p. 242.

Nystrom (1824-85), was an engineer based in Philadelphia who had a special interest in water supply problems.

Bookplate and embossed stamp of the U.S. Patent Office. Ex Bibliotheca Mechanica.

- 63. NYSTROM, John William.** *A New Treatise on Elements of Mechanics establishing Strict Precision in the Meaning of Dynamical Terms. Accompanied with an Appendix on Duodenal Arithmetic and Metrology.* Illus. & tables in the text. 352 pp. 8vo, orig. cloth, spine decorated in gilt. Philadelphia: Porter & Coates, 1875. \$250.00

First edition. "In this textbook on statics and dynamics, Nystrom attempts to define mechanical terms and to resolve a perceived conceptual confusion in the

area of dynamics. To this end, Nystrom recommends the use of 'machine-shop vocabulary.' In an appendix he argues for a duodecimal system of metrology."—Roberts & Trent, *Bibliotheca Mechanica*, p. 243.

Fine copy. Early bookplate of John Francis O'Rourke. Ex Bibliotheca Mechanica.

Presentation Copy

64. (PERRONET, J.C.). *Notice pour servir à l'Éloge de M. Perronet, Premier Ingénieur des Ponts et Chaussées de France...* By Pierre Charles Lesage. Finely engraved frontispiece port. of Perronet by Queneday after Cochin fils, one folding engraved map, & one engraved plate, delicately printed in sepia (see below). 2 p.l., 128 pp. Large 4to, orig. pink paste-paper boards (corners a little worn or jammed), uncut. Paris: Bernard, 1805.

\$1950.00

First edition, presentation copy, with an inscription on the free front endpaper stating that this copy was given by the author to "Mr De Caux," dated 12 May 1803. Perronet (1708-94), performed epoch-making work in the construction of stone bridges, among them the Pont de la Concorde in Paris and the Pont de Neuilly. The present volume, which contains the first biography of Perronet, describes in great technical detail all the bridges constructed by Perronet and those designed by him but not executed. It also contains several memoirs by Perronet and descriptions of machinery which he invented. The last chapter deals with some of the public works in which Perronet acted as consultant: construction of harbors, a cannon foundry, buildings for the porcelain factory at Sèvres, etc.

This copy is complete. OCLC provides a false collation, based on the extra-illustrated copy (10 plates) at the Smithsonian. Other libraries have slavishly copied that collation. This is an excellent example of how on-line catalogues can make mischief.

Fine and fresh uncut copy. Ex Bibliotheca Mechanica.

• D.S.B., X, pp. 527-28—"In the design of bridges, Perronet developed the classical stone arch bridge to its ultimate perfection."

Dynamics

65. PIOLA, Gabrio. *Di un Principio controverso della Meccanica Analitica di Lagrange, e delle Molteplici sue Applicazioni. Memoria postuma...* pubblicata per cura del Professore Francesco Brioschi. 110 pp. Large 4to, orig. printed wrappers bound in modern green half-calf &

marbled boards, spine gilt, uncut. Milan: G. Bernardoni di Giovanni, 1856. \$250.00

Separate offprint "from Vol. VI of the *Memorie* of the Royal Institute of Sciences, Letters, and Arts of Milan. It has been suggested that the present paper was intended as a continuation of a memoir which appeared in the first part of Tome XXIV of the *Atti della Societa Italiana* of Modena . . . However, Todhunter and Pearson devote a number of articles to Piola's 'La Meccanica de' corpi naturalmente estesi trattata col calcola delle variazioni' which appeared in the *Opuscoli matematici e fisici* (1833). That memoir was a discussion of the theory of elasticity, done in the manner of Lagrange and was called 'memoria prima,' Piola intending that a series of other memoirs follow it."—Roberts & Trent, *Bibliotheca Mechanica*, p. 252.

Piola (1791-1850), professor of mathematics at Milan, wrote on discontinuous functions, on hydraulics, on the pendulum, and on the application of calculus to indeterminate analysis.

Very good copy. Ex Bibliotheca Mechanica.

66. POINCARÉ, Henri. *Théorie des Tourbillons. Leçons professées pendant le deuxième semestre 1891-92.* Figures in the text. 2 p.l., 211, [1] pp. 8vo, orig. wrappers (upper wrapper nearly detached), uncut. Paris: Gauthier-Villars, 1893. \$250.00

First edition. One of the great mathematician's masterpieces. Very good copy, preserved in a box. Ex Bibliotheca Mechanica.

• D.S.B., XI, pp. 51-61.

67. POISSON, Siméon Denis. [Drop-title]: "Mémoire sur l'Équilibre et le Mouvement des Corps élastiques . . . Lu à l'Académie, le 14 avril 1828." Pp. [357]-570. Large 4to, cont. wrappers, uncut. [Paris, an extract from the *Mémoires* de l'Académie des Sciences, Vol. 8, 1829]. \$1500.00

The original printing of one of Poisson's most important works. "This memoir is 'one of th most famous written by this great mathematician.'"—Todhunter & Pearson. Poisson did much to lay the foundations of the theory of elasticity based on the idea of molecular structure. His principal results are incorporated in this memoir and in his "Mémoire sur les équations générales de l'équilibre et du mouvement des corps élastiques et des fluides."—Roberts & Trent, *Bibliotheca Mechanica*, p. 259.

Fine copy preserved in a calf-backed box. Ex Bibliotheca Mechanica.

• D.S.B., XV, p. 488.

68. **POISSON, Siméon Denis.** [Drop-title]: "Note sur le Problème des Ondes... Lu à l'Académie des Sciences, le 7 juillet 1828." Pp. [571]-627. Large 4to, cont. wrappers, uncut. [Paris, an extract from the *Mémoires de l'Académie des Sciences*, Vol. 8, 1829]. \$500.00

Poisson's chief contribution to the problems of waves. Fine copy preserved in a calf-backed box. Ex Bibliotheca Mechanica.

☛ D.S.B., XV, p. 488. Roberts & Trent, *Bibliotheca Mechanica*, p. 259.

69. **POISSON, Siméon-Denis.** *Nouvelle Théorie de l'Action capillaire.* One folding plate. 2 p.l., 300 pp. Large 4to, cont. half-sheep & marbled boards (extremities a little worn, some foxing), flat spine gilt, green leather lettering piece on spine. Paris: Bachelier, 1831. \$1250.00

First edition. "This is the first part of his projected *Traité de physique mathématique*. A second edition appeared in 1833, as well as a second part to this projected work, *Théorie mathématique de la chaleur*, 1835."—Roberts & Trent, *Bibliotheca Mechanica*, p. 260.

Good copy with several old library stamps on title and verso of plate. Ex Bibliotheca Mechanica.

☛ D.S.B., XV, pp. 480-90.

70. **POLINI, Giovanni.** *De Motu Aquae Mixto Libri Duo. Quibus multa nova pertinentia ad Aestuaria, ad Portus, atque ad Flumina continentur.* Engraved vignette on title & three engraved plates. 4 p.l., 132 pp., 2 leaves. Large 4to, orig. semi-stiff boards, uncut. Padua: J. Comini, 1717. \$1500.00

First edition. "As an engineer, Poleni was a consultant in matters of water supply and flood control and an arbitrator between rules of neighboring states. In his 'De motu aquae mixto' of 1717 he treated the discharge from a rectangular opening extending to the free surface as occurring in a series of horizontal elements, the velocity of each being assumed proportional to the square root of its distance below the original surface level... Because this same approach was later used in deriving the discharge relationship for sharp-crested weirs, the basic weir equation... is often named after Poleni."—Rouse & Ince, *History of Hydraulics*, pp. 113-14.

Poleni (1683-1761), professor of mathematics at the University of Padua, established an important laboratory of experimental physics and corresponded with many of the leading scientists of the day including Euler, Maupertuis, the

Bernoullis, and Cassini III.

Fine copy preserved in a calf-backed box. Two stamps inexpertly removed from blank portion of title. Ex Bibliotheca Mechanica.

♣ D.S.B., XI, pp. 65-66. Maffioli, *Out of Galileo. The Science of Waters 1628-1718*, pp. 326-90. Riccardi, II, 291-92—"bella edizione." Roberts & Trent, *Bibliotheca Mechanica*, p. 262.

"This Valuable Collection"

71. POLENI, Giovanni. *Epistolarum Mathematicarum Fasciculus*. Woodcut device on title & 11 engraved plates (mostly folding). 99 unnumbered leaves. Large 4to, cont. decorative paste-paper boards, entirely uncut. Padua: [ex Typographia Seminarii], 1729. \$1750.00

First edition. "The letters in this valuable collection are addressed to such well-known scientists as Guido Grandi, J. G. Marinoni, and G. Manfredi. The subjects include anatomy, mathematics (construction of curves), physics (*vis-viva*), and astronomy. A letter to Marinoni deals with the recent eclipse of the sun and some experiments in hydraulics showing the influence of Newton and Huygens, and has, as an appendix, the text of the very rare treatise *De fluentis aquae mensura* by Giovanni Buteo from Dauphiné (1492-1564). This treatise occupies itself mostly with the work of Julius Frontinus on the water supply of Rome. Buteo credits him with the invention of a system for measuring water . . .

"Among the letters on astronomy are descriptions of eclipses of mercury, the moon, and the sun; and the letters on physiology include a rather scientific treatise on muscular movement and the circulation of the blood, still others concern geometry and logarithms."—Roberts & Trent, *Bibliotheca Mechanica*, p. 263.

Three old and small library stamps on title, otherwise a nice copy. Ex Bibliotheca Mechanica.

♣ Riccardi, I, 294—"Bella e rara edizione."

Poncelet's Water Wheel

72. PONCELET, Jean Victor. *Mémoire sur les Roues hydrauliques à Aubes courbes, mues par-dessous, suivi d'Expériences sur les Effets mécaniques de ces roues . . . Nouvelle Édition revue, corrigée. et augmentée d'un Second Mémoire sur des Expériences en grand relatives à la nouvelle Roue, contenant une Instruction pratique sur la Manière de procéder à son Établissement*. Two folding engraved plates. vii, 146 pp. Large 4to, attractive antique calf-

backed marbled boards. Metz: Thiel, 1827. \$1500.00

First collected edition of these two works on an improved water wheel designed by the author. The wheel was virtually an undershot wheel converted into a kind of turbine and was used for falls up to 6 feet and its efficiency approached 65 percent.

Poncelet (1788-1867), made important contributions to geometry, hydraulics, the theory of machines, and industrial mechanics (see *D.S.B.*, XI, pp. 76-82 for a long and excellent discussion).

Fine copy. Ex Bibliotheca Mechanica.

The Famous Experiments of Bossut & Du Buat Continued

73. PONCELET, Jean Victor & LESBROS, Joseph Aimé. *Expériences hydrauliques sur les Lois de l'Écoulement de l'Eau à travers les Orifices rectangulaires verticaux à grandes Dimensions.* Seven folding engraved plates. 2 p.l., 267, [1] pp. Large 4to, cont. boards (a little rubbed & marked). Paris: de l'Imprimerie Royale, 1832. \$1500.00

First edition. Poncelet (1788-1867), made important contributions to geometry, hydraulics, the theory of machines, and industrial mechanics (see *D.S.B.*, XI, pp. 76-82 for a long and excellent discussion). Lesbros (1790-1860), was an engineer in the French army.

Fine copy.

• Roberts & Trent, *Bibliotheca Mechanica*, p. 264—"These experiments, a continuation of those undertaken by Bossut and Du Buat at Mézières, were conducted from November of 1827 through 1828."

74. PRINCIPJIDROMECCANICI. *Saggio Fisico-Matematico da darsi nel Collegio di S. Michele di Volterra.* Sotto la direzione dei PP. delle Scuole Pie dai Signori Giuseppe Ceramelli... Emilio Tonini... Ab. Filippo Forti... Giuliano Serragli... Cosimo Gherardi... Giuseppe Battista Pandolfini... Francesco Castellini... Marche. Antonino della Stufa... Studenti di Fisica — Matematica nel suddetto Collegio. One folding engraved plate (detached). 43 pp. 4to, orig. stiff wrappers. Florence: P. Allegrini, 1803. \$500.00

First edition; no copy in OCLC. "This rare work on hydrostatics was apparently written by a committee of doctoral candidates in physics and mathematics at the college."—Roberts & Trent, *Bibliotheca Mechanica*, p. 267. Volterra is a town in Tuscany near Siena.

Fine copy. Ex Bibliotheca Mechanica.

• Riccardi, II, 320—"di qualche importanza."

75. PRONY, Gaspard Clair François Marie Riche. *Mécanique philosophique, ou Analyse raisonnée des diverses Parties de la Science de l'Équilibre et du Mouvement.* 1 p.l., vii, 477, [2] pp. Large 4to, cont. sheep-backed paste-paper boards (upper joint with a short crack, a little worn), vellum corners, spine gilt, red morocco lettering piece on spine. Paris: de l'Imprimerie de la République, An VIII [1800]. \$1500.00

First edition. In the present work, Prony "proposed to do for mechanics what Fourcroy had done for chemistry in *Philosophie chimique* (1792), namely to give a taxonomy of the theorems of mechanics."—*D.S.B.*, XI, p. 164.

Good copy. Stamp of "C.D." and a Jesuit library on title. Franklin Institute Library bookplate. Ex Bibliotheca Mechanica.

• Roberts & Trent, *Bibliotheca Mechanica*, p. 268—the book "is based largely on materials which Prony used for his courses at the École Polytechnique. The information is presented in the form of synoptic tables."

76. PRONY, Gaspard Clair François Marie Riche. *Recherches Physico-Mathématiques sur la Théorie des Eaux courantes.* Two folding engraved plates & 7 folding printed leaves. Numerous tables in the text. xxii, 130, [1] pp. Large 4to, orig. wrappers (spine largely perished, stitching a little loose), uncut. Paris: de l'Imprimerie Impériale, 1804.

\$1250.00

First edition and a good copy in original state. "Prony's researches were undertaken while he was in Italy at the command of Napoleon to study Italian methods of water management. He presents the principles of mechanics and organizes his experiments in such a way that they require a minimal amount of calculation by the reader. His research is limited to fluids flowing sufficient distances to insure constant speed and equality between the forces of gravity and of cohesion and friction (here Prony is drawing upon Coulomb's study of 1800). Topics discussed include velocity and pressure of water, practical applications of canals and pipes, experiments on the movement of water in cylindrical pipes, and experiments in open canals."—Roberts & Trent, *Bibliotheca Mechanica*, pp. 269-70.

Preserved in a calf-backed box. Ex Bibliotheca Mechanica.

• *D.S.B.*, XI, pp. 163-66.

Earth Thrust

77. PRONY, Gaspard Clair François Marie Riche. *Instruction-Pratique sur une Méthode pour déterminer les Dimensions des Murs de revêtement, en se servant de la Formule graphique . . .* One large folding engraved plate. 16

pp. Large 4to, attractive calf-backed speckled boards (two small wormholes becoming one in extreme lower outer corner, not touching text), spine gilt. Paris: Firmin Didot, 1809. \$750.00

Second edition (1st ed.: 1802) and very rare; no copy in OCLC. This book "provides simple and practical instructions in the use of the graphic method, giving as cases a wall designed to retain fluids or water-impregnated soils, and that of a wall occasionally subjected to a flow of water. It also gives formulas for calculating the dimensions of retaining walls, and for calculating that of walls surmounted by parapets."—Roberts & Trent, *Bibliotheca Mechanica*, p. 269.

The large and handsome plate depicts Prony's graphic methods.

Fine copy. Ex Bibliotheca Mechanica.

78. PRONY, Gaspard Clair François Marie Riche. [Drop-title]: "Nouveaux Moyens d'augmenter la précision des Observations barométriques. — Nivellement barométrique de la traversée du Mont-Cénis, depuis Suze jusqu'à Lans-le-Bourg. — Nouvelles Formules barométriques." 14 pp. 8vo, bound in modern wrappers. N.p.: n.d. [?extract from the *Journal des Mines*, no. 206, February 1814?]. \$350.00

First separate edition, presentation copy, inscribed "A Monsieur [Mallet?] de la part de l'Auteur" and with a three-line note on page 13 critical of some of the figures, both in Prony's hand.

"This article presents new means of increasing the precision of barometric observations, together with a barometric survey of Mont-Cènis from Suz to Lans-le-Bourg, as well as some new barometric formulas."—Roberts & Trent, *Bibliotheca Mechanica*, p. 270.

Very good copy, preserved in a morocco-backed box. The first four lines of the inscription have been cropped. Ex Bibliotheca Mechanica.

Prize Binding

79. RANKINE, William John Macquorn. *Miscellaneous Scientific Papers.* Frontis. port., four folding plates, & numerous illus. in the text. xxxvi, 567, [1] pp. Thick 8vo, prize binding of cont. calf, arms of the University of Glasgow on upper cover, double gilt fillet round sides, spine richly gilt, red morocco lettering piece on spine. London: C. Griffin, 1881.

\$750.00

First collected edition. Rankine (1820-72), professor of civil engineering at Glasgow from 1855 to his death, was an extremely influential teacher and author

of standard textbooks on engineering and mechanics. He is best known for his work on the mechanical theory of heat and is considered one of the pioneers of thermodynamics.

“Rankine’s collected papers appear here with an excellent evaluation by Peter Guthrie Tait of his scientific contributions. The papers originally appeared in the *Transactions* and the *Proceedings* of the Royal Society, as well as other scientific journals. The papers in the first part are devoted to temperature, elasticity, and the expansion of vapors, liquids, and solids. Those in part two are dedicated to energy and its transformation, and those in part three to wave forms and the propulsion of ships. The most important contributions are those in thermodynamics (on the action of heat in the steam engine) and in hydrodynamics (on the forms of waves and water-lines of ships).”—Roberts & Trent, *Bibliotheca Mechanica*, p. 273.

Fine and handsome copy. Minor foxing. Ex Bibliotheca Mechanica.

♣ D.S.B., XI, pp. 291-95.

“This Very Important Paper”

80. REGNAULT, Henry Victor. [Drop-title]: “Recherches sur les Chaleurs spécifiques des Fluides élastiques.” 12 pp. Large 4to, disbound (a little foxed). [Paris]: “Extrait des *Comptes rendus des séances de l’Académie des Sciences*, Vol. XXXVI, Séance du 18 avril 1853.” \$1250.00

The very rare separately issued offprint; no copy in *N.U.C.* or OCLC. “In this very important paper Regnault declared his acceptance of the principle of the conservation of heat. Though he states that he had subscribed to the mechanical theory ‘for a long time’ and that he had been led to it by his own experiments, that appears not to be the case. He was later to measure the mechanical equivalent of heat, although with only moderate success. Timoshenko, 262 notes that in 1846 while a student of Regnault, Kelvin participated in his experiments on heat.”—Roberts & Trent, *Bibliotheca Mechanica*, p. 275.

Regnault (1810-78), graduated from the *École Polytechnique* in 1832 and entered the *École des Mines*, later travelling extensively through Europe to study mining and metallurgical practices. He returned to the Polytechnique as assistant to Gay-Lussac, succeeding him in the chair of chemistry in 1840. The following year he became professor of physics at the *Collège de France*, where he performed his most important experimental work. From 1854 he was director of the famous Sèvres porcelain factory.

Fine copy preserved in a blue morocco-backed box. Ex Bibliotheca Mechanica.

One of His Rarest Books

- 81. RITTER, Johann Wilhelm.** *Die Physik als Kunst. Ein Versuch, die Tendenz der Physik aus ihrer Geschichte zu deuten. Zur Stiftungsfeyer der Königlich-baierischen Akademie der Wissenschaften am 28sten März 1806.* 1 p.l., 62 pp. 8vo, modern decorated boards (minor foxing). Munich: J. Lindauer, 1806. \$3500.00

First edition; this is one of the author's rarest works. Ritter (1776-1810), who tragically died at a young age, discovered ultra-violet light, gave the earliest account of the decomposition of water by an electric current, and was the first to construct an electrical accumulator.

This is the first scientific work written by Ritter while under the influence of *Naturphilosophie* which had become prevalent in several German intellectual centers, including Munich.

Fine copy.

• D.S.B., XI, pp. 473-75. Poggendorff, II, 652-53.

- 83. RUMFORD, Benjamin Thompson, Count.** *Mémoires sur la Chaleur.* Several woodcuts in the text. lxxviii, 166 pp. 8vo, cont. sheep-backed paste-paper boards (upper joint slightly cracked, foot of lower joint a little worn), flat spine gilt. Paris: Firmin-Didot, 1804. \$1350.00

First edition. "A series of four essays, the first being a historical notice of various experiments on heat, and a sort of scientific autobiography describing his own experiments. The paper is remarkable for its lively description of Rumford's relationships with such contemporaries as Davy, Leslie, Biot, Bertholet, Laplace, Playfair, and De Saussure . . .

"The second essay is the translation of his *Enquiry Concerning the Nature of Heat*; while the third, 'Mémoire sur la Chaleur,' is a summary of his research on heat read before the Institut National 25 June 1804. The last, 'Observations sur les Puits' is a translation of a paper presented to the Royal Society in November of 1803, and describes the holes which form in the glaciers at Chamonix during the summer. It is related to his studies on the propagation of heat in fluids from which he concluded that water is not a conductor of heat."—Roberts & Trent, *Bibliotheca Mechanica*, p. 286.

Very good copy. Ex Bibliotheca Mechanica.

• Neville, II, p. 546—"uncommon."

Rough Seas

- 84. SAINT-VENANT, Adhémar Jean Claude Barré de.** *Du Roulis sur Mer houleuse. Calculé en ayant Égard à l'Effet retardateur produit par la*

Résistance de l'Eau. 66, [1] pp. 8vo, orig. blue printed wrappers (frayed, punched for a 3-hole binder, each leaf loose). Paris: Dunod & Gauthier-Villars, 1871. \$250.00

First separate edition, a separately paginated "Extrait des Memoires de la Société des Sciences naturelles de Cherbourg, T. XVI."

"In this paper, St. Venant discusses waves on rough seas, calculating them with regard to the retarding effect produced by the resistance of the water . . .

"St. Venant's purpose in these researches is to show whatever the known form on the surface of the wave might be, that the integration of the wave in a non-resistant water can be integrated. From this form, to take the integral, relative to the troichoidal form, even in taking, as proposed by Bertin in a suite to his work of 1869, for the variable direction of the resulting fluid pressure, not precisely the normal at the surface of the wave in the environment of the part occupied by the vessel, but an average between the directions of the normals at the curve of level, also troichoidal, traversing the vessel at a certain depth, for example, that at the center of the keel . . .

"Finally, to take account analytically of the effect of resistances opposed by the water, and up to a certain point by the air, to the movement of waves on vessels; an effect which is easily calculated for the case of a calm sea, in simply adapting to the question the solution that Poisson gave of the movement of a pendulum in an environment which resisted it proportionally either to its speed or to the square of that speed relative to the water. The evaluation of the same effect for the case of a rolling sea is found comprised in the integral of the equation of the movement, which one can again obtain in completed form when one supposes the resistance proportional to the simple speed, a supposition which, after a great number of hydraulic facts, appeared realized in the low movements, as those that the builders of vessels look for, above all today, to obtain for their waves."—Roberts & Trent, *Bibliotheca Mechanica*, pp. 288-89.

Not at all a good copy, but really rare. Preserved in a black morocco-backed box. Ex Bibliotheca Mechanica.

Presentation Copy

85. SAINT-VENANT, Adhémar Jean Claude Barré de. "Sur la torsion des prismes à base mixtiligne, et sur une singularité que peuvent offrir certains emplois de la coordonnée logarithmique du système cylindrique isotherme de Lamé." Pages 1-12. Large 4to, unbound (a little frayed & soiled). [Paris]: "Extrait des *Comptes rendus des séances de l'Académie des Sciences*, t. LXXXVII, séances des 2 et 9 décembre 1878." \$650.00

First separate edition, issued with new pagination. This is a fine presentation copy, inscribed on the first leaf: "Á M. Tait offert par l'auteur de St. Venant à

Vendôme." The recipient was, of course, Peter Guthrie Tait (1831-1901), professor of natural philosophy at Edinburgh, who made original contributions in the fields of thermoelectricity, thermodynamics, and on the compressibility and kinetic theory of gases.

This is another important contribution to the study of the strength of materials.

Saint-Venant (1797-1886), who was elected to the mechanics section of the Académie des Sciences, succeeding Poncelet, made important contributions to "the mechanics of solid bodies, elasticity, hydrostatics, and hydrodynamics."—*D.S.B.*, XII, pp. 73-74.

Very good copy. Ex Bibliotheca Mechanica.

86. SCHEUCHZER, Johann Jakob. *Jobi Physica Sacra, oder Hiobs Naturwissenschaft verglichen mit der Heutigen*. Title printed in red & black. 16 p.l., 467, [16] pp. 4to, cont. half-sheep & speckled boards (corners & head of spine a bit worn), spine gilt, contrasting leather lettering piece on spine. Zurich: Bodmer, 1721. \$1750.00

First edition of the preliminary work for Scheuchzer's monumental *Physica Sacra* (1731-35), a detailed explication of events in the Bible in terms of physics, medicine, and natural history.

Scheuchzer (1672-1733), the founder of paleobotany and European paleontology, was professor of mathematics at the Carolinum, professor of physics at the Academy, and *premier médecin* of Zurich as well as director of the city's Museum of Natural History.

Very good copy of a very scarce book. Old stamp of "Bibliothek vom Schloss Püchau" on title and with several other old library markings on free front endpapers.

• *D.S.B.*, XII, p. 159.

87. SEGUIN, Marc. [Drop-title]: *Mécanique Industrielle. Mémoire sur un nouveau Système de Moteur fonctionnant toujours avec la même vapeur, à laquelle on restitue, à chaque coup de piston, la chaleur qu'elle a perdue en produisant l'effet mécanique*. Illus. in the text. 17 pp. Large 4to, disbound. [Paris]: *Comptes rendus des séances de l'Académie*, t. XL, no. 1, 3 Janvier 1855. \$500.00

First separate edition, with new pagination. This is another of Seguin's important contributions to the study of heat, the principle of energy conservation, and the development of the steam engine.

Fine copy and rare. Preserved in a cloth box. Ex Bibliotheca Mechanica.

• *D.S.B.*, XII, pp. 287-89.

A Royal Copy

88. SIGAUD-LAFOND, Joseph Aignan. *Précis Historique et Expérimental des Phénomènes Électriques, depuis l'Origine de cette Découverte jusqu'à ce jour.* Ten folding engraved plates. xvi, [4], 624, [3] pp. 8vo, early 19th-cent. marbled boards, flat spine gilt, orange leather lettering piece on spine. Paris: Rue & Hôtel Serpente, 1785. \$1500.00

Second edition, greatly "revised and augmented" (1st ed.: 1781). "Work of merit in which the phenomena and laws of electricity and magnetism are discussed at length; electric and magnetic phenomena compared; application to the cure of disease; historical development."—Wheeler Gift Cat. 505a. The attractive plates illustrate electrical instruments and experiments.

Sigaud (1730-1810), succeeded Abbé Nollet to the chair at the Collège Louis-le-Grand where he taught experimental science, anatomy, and physiology.

Fine copy. Stamp on verso of half-title and title of Prince Ernest Augustus, Duke of Cumberland, and the subsequent Kings of Hanover.

• *D.S.B.*, XII, pp. 427-28. Neville, II, pp. 475-76—"As with his other works on physics, this contains numerous references to chemical experiments and phenomena."

Translated by Pierre Simon Girard

89. SMEATON, John. *Recherches expérimentales sur l'Eau et le Vent, considérés comme Forces motrices applicables aux Moulins et autres Machines à Mouvement circulaire, etc.; suivies d'Expériences sur la Transmission du Mouvement et la Collision des Corps...* Ouvrage traduit de l'anglais, et précédé d'une Introduction; par M. P.S. Girard. Five folding engraved plates. 2 p.l., xxviii, 102 pp., one leaf of errata. Large 4to, attractive antique calf-backed marbled boards, flat spine gilt. Paris: Courcier; The Hague: Immerzeel, 1810. \$1500.00

First edition in French, translated and containing for the first time the valuable introduction by Pierre Simon Girard (1765-1836), one of the leading French engineers of his generation.

This is an influential and important translation of Smeaton's famous *An Experimental Enquiry concerning the Natural Power of Water and Wind to turn Mills* (1794). His reputation largely sprang from the three seminal papers contained here. "The first and most famous, on wind and water mills, ('justly regarded as the most masterly report ever published on this subject', comments Samuel Smiles), established an empirical tradition, in British engineering as well as the use of scale model testing in fluid mechanics. The second paper, which grew directly out of the first, is concerned with prime-mover experiments, particularly in relation to the concept of work, while the third on the collision of bodies, sets

out successfully to measure exactly the loss of energy on impact using an instrument designed and made by Smeaton himself. In all three he is concerned to apply sound theory to practical engineering and 'in taking this position . . . was equalled by few and excelled by none (Norman Smith, 'Scientific Work' in *John Smeaton, FRS* edited by A.W. Skempton) . . .

"All three were widely disseminated and influential. Originally published in the Royal Society's *Phil. Trans.* in 1760, 1776 and 1782, this is their first appearance together. The volume was published posthumously in 1794 and followed by a second edition in 1796 . . . French translations appeared in 1810 and 1826."—Elton, *Cat.* 13, 207.

Fine copy and somewhat scarce. Ex Bibliotheca Mechanica.

90. STEWART, Matthew. *Tracts Physical and Mathematical. Containing, An Explication of Several Important Points in Physical Astronomy; and, A New Method of ascertaining the Sun's Distance from the Earth, by the Theory of Gravity.* 19 folding engraved plates. vii, [1], 411 pp. Thick 8vo, cont. speckled calf (very skillfully rebacked), orig. red morocco lettering piece on spine. Edinburgh: A. Millar & J. Nourse, 1761. \$1650.00

First edition. Stewart (1717-85), was the successor to Colin Maclaurin in the chair of mathematics at Edinburgh and established his reputation as a mathematician by the publication of his *General Theorems* (1746).

"After his election to the chair [in 1746], Stewart's interests turned to astronomy and natural philosophy; and he displayed great ingenuity in devising purely geometrical proofs of results in these subjects that had previously been established by the use of algebraic and analytical methods. Examples of this kind are to be seen in [the present book]."—*D.S.B.*, XIII, p. 54.

Fine copy with the stamp of the Royal Society of Edinburgh on title.

91. SUCKOW, Lorenz Johann Daniel. *Entwurf einer Naturlehre.* Engraved vignette on title & eleven folding engraved plates containing 178 figures. 12 p.l., 602, [38] pp. 8vo, cont. half-sheep & boards (boards rubbed, occasional light foxing), contrasting leather lettering piece on spine. Jena: C.H. Cuno, 1761. \$950.00

First edition of this very rare introductory textbook on natural philosophy in its widest sense. Suckow (1722-1801), a member of the prominent German family of scientists, was professor of mathematics and physics at the University of Jena and the author of many books on the sciences, technology, and natural history.

Very good copy.

• *A.D.B.*, Vol. 37, p. 105. Poggendorff, II, 1046.

- 92. TAYLOR, David Watson.** *Resistance of Ships and Screw Propulsion*. One folding printed table & numerous tables in the text. ix, 234 pp. 8vo, orig. green pebbled cloth (corners a bit worn, upper hinge cracked), spine gilt. New York: Macmillan, 1893. \$250.00

First edition. "Taylor's first book, this short but important treatise set the standard of U.S. naval construction. Results of his numerous tests were summarized in tables, enabling naval architects to determine in advance the horsepower and hull configuration most appropriate to the specifications given for a ship. Taylor's ideas were developed on the basis of work by William and R.E. Froude, and he rejected Rankine's method as being of little value."—Roberts & Trent, *Bibliotheca Mechanica*, p. 316.

Taylor (1864-1946), graduated first in his class at Annapolis and, after studying marine construction and naval engineering at the Royal Naval College at Greenwich, became Chief Naval Constructor and director of the Experimental Model Basin, which now bears his name.

Very good copy. Ex Bibliotheca Mechanica.

- 93. THOMSON, Thomas.** *History of the Royal Society, from its Institution to the End of the Eighteenth Century*. viii, 552, xc, [1] pp. Large 4to, cont. half-calf & marbled boards (well-rebacked), flat spine gilt. London: R. Baldwin, 1812. \$1250.00

First edition of this standard history of the Royal Society by Thomson (1773-1852), professor of chemistry at the University of Glasgow and fellow of the Society. "Containing an account of the most important papers in each branch of science published in the 'Philosophical Transactions'; also a chronological and alphabetical list of Fellows."—Sotheran, I, 4838.

A fine copy. Bookplate of H.C. Plimmer, F.R.S.

• D.S.B., XIII, pp. 372-74.

- 94. TRABAUD, —.** *Principes sur le Mouvement et l'Équilibre, pour servir d'Introduction aux Mécaniques et à la Physique*. 25 folding engraved plates. 2 p.l., 446 pp.; 1 p.l., xxiv, 447-616, lvii, [1] pp. (a few leaves misbound). Two vols. in one. 4to, modern sheep-backed marbled boards. Paris: J. Desaint & C. Saillant, 1741. \$950.00

First edition. "This rare work appears here complete with the two treatises at the end, 'Sur la formation de l'ellipse' and 'Réflexions sur le mouvement,' which are often lacking. Trabaud's work is divided into six books. Book one deals with all aspects of the movement of bodies, the second book with the movement of weight, book three with percussion, and book four with statics, or the

equilibrium of forces and weights. The fifth book is devoted to hydrostatics, or the equilibrium of fluids, and the sixth book to hydrodynamics, or the movement of fluids. In the text Traubaud makes reference to Jean Bernoulli, Leibniz, Varignon, Descartes, de la Hire, and other authors."—Roberts & Trent, *Bibliotheca Mechanica*, p. 325.

One of the plates has a number of overlays which, when folded, represent complex forms.

Very good copy. Some relatively minor marginal worming to gutter of first eighty leaves. Ex Bibliotheca Mechanica.

95. TURNBULL, William. *A Treatise on the Strength, Flexure, and Stiffness of Cast Iron Beams and Columns, shewing their Fitness to resist Transverse Strains, Torsion, Compression, Tension, and Impulsion; with Tables of Constants, to be used for Calculating the Strength, Flexure, and Stiffness of Similar Beams and Columns of Wrought Iron, and several Sorts of Timber . . . to which is added, by way of Appendix, a Collection of Rules in Words at length, for calculating the most important Practical Cases investigated in the course of the Work . . .* Illus. & tables in the text. viii, 194 pp. 8vo, orig. green cloth (minor wear, some browning), uncut. London: J. Taylor, 1832. \$350.00

First edition. Very good copy. Ex Bibliotheca Mechanica.

96. TYNDALL, John. *Contributions to Molecular Physics in the Domain of Radiant Heat. A Series of Memoirs published in the 'Philosophical Transactions' and 'Philosophical Magazine,' with Additions.* Folding frontis., one double-page plate, & numerous illus. in the text. xiv, [2], 446 pp. 8vo, orig. brown cloth, spine stamped in gilt. New York: D. Appleton, 1885.

\$100.00

First American edition of one of Tyndall's most important works. "Collection of Tyndall's papers on radiant heat and on the absorption of heat by liquids and gases, which were first presented in the *Philosophical Magazine* (1872-1885). An explorer of molecular conditions, Tyndall's studies were updated when necessary and are accompanied by newly written 'analyses'."—Roberts & Trent, *Bibliotheca Mechanica*, pp. 329-30.

Fine copy. Ex Bibliotheca Mechanica.

☛ *D.S.B.*, XIII, pp. 521-24.

97. TYNDALL, John. *New Fragments.* 3 p.l., 500 pp. 8vo, orig. blind-stamped purple cloth (joints a little rubbed), spine lettered in gilt (spine

a bit faded). London: Longmans, Green, 1892. \$125.00

First edition of Tyndall's final book. "A collection of essays on various topics, including notes on Count Rumford, Pasteur, Thomas Young, atomic and molecular theories, and ether waves."—Roberts & Trent, *Bibliotheca Mechanica*, p. 330.

Nice copy. Ex Bibliotheca Mechanica.

• D.S.B., XIII, pp. 521-24.

With Important Authorial Corrections

98. **VALERIO, Luca.** *De Centro Gravitatis Solidorum Libri Tres . . . in hac nostra editione, servata ad unguem Auctoris mente, multò correctiores.* Woodcut printer's device on title & numerous woodcut diagrams in the text. 4 p.l., 260 pp. 4to, cont. limp boards (a little soiled, unimportant marginal dampstaining). Bologna: Heirs of Ducci, 1661. \$2750.00

Second edition, combining the *De Centro Gravitatis Solidorum* and the *Quadratura parabola*; this edition contains important authorial additions and corrections. These two texts had a considerable influence on Galileo and his studies on motion.

Valerio (1552-1618), who had studied under Clavius, met Galileo in Pisa in 1590 and influenced him to renew his studies on the centers of gravity. In 1609 they began an extensive correspondence on problems of motion and mathematics. It was during this time that Galileo was preparing his treatise on motion and mechanics which later became the *Discorsi* of 1638. "In December 1612, having completed his *Sunspot Letters*, Galileo considered having the Linceans print his work on centers of gravity of paraboloids, probably in the form of a letter to Luca Valerio. Ensuing correspondence shows that he sent this to Cesi, who in discussing the matter with Valerio found that he was then revising his own book on a similar subject, published in 1603-4. Galileo accordingly gracefully withdrew his work from publication at this time, for which Valerio expressed his gratitude. In fact Valerio did not reprint his book, and Galileo eventually placed his investigations of centers of gravity in an appendix to his own last book in 1638."—Drake, *Galileo at Work*, p. 202.

Valerio's influence on Galileo, through his correspondence and these two books, was enormous, and he was singled out for praise in the *Discorsi*; where he is described as "our greatest geometer, the New Archimedes of our age." This was high praise indeed, for Valerio was critical of Galileo's Copernicanism and had been expelled from the Accademia dei Lincei in 1616 for his views.

"Valerio's *De centro gravitatis* consists of the application of Archimedean methods to the determination of the volumes and centers of gravity of the various solids of rotation and their segments . . . Among the mathematicians who studied him and spoke highly of him were Cavalieri, Torricelli, and J. C. de la

Faille. He also had a direct influence on Guldin, Gregorius Saint Vincent, and Tacquet."—*D.S.B.*, XIII, pp. 560-61.

Fine copy, preserved in a calf-backed box. Ex Bibliotheca Mechanica.

• M.E. Baron, *The Origins of the Infinitesimal Calculus*, pp. 101-03. Riccardi, II, 570—"Raro e pregiato." Roberts & Trent, *Bibliotheca Mechanica*, pp. 332-33.

99. VINTON, Francis Laurens. *Theory of the Strength of Materials, illustrated by Applications to Machines and Buildings.* Five plates on four folding sheets & numerous diagrams in the text. 3 p.l., 182 pp. 8vo, orig. blind-stamped black cloth (head of spine a bit chipped), upper cover stamped in gilt. New York: Tobitt & Bunce, 1874. \$250.00

First edition. Vinton (1835-79), graduated from West Point in 1856 and then attended the École des Mines from 1856 to 1860. He was one of the founders of the School of Mines at Columbia University where he served as professor of civil and mining engineering.

Very good copy. Bookplates and stamps of the School of Mines, Columbia University and the Franklin Institute on title. Ex Bibliotheca Mechanica.

*"The First Work to Apply Hydrodynamics to the
Circulation of the Blood"*

100. WEBER, Ernst Heinrich & Wilhelm Eduard. *Wellenlehre auf Experimente gegründet oder über die Wellen tropfbarer Flüssigkeiten mit Anwendung auf die Schall- und Lichthwellen.* 18 folding engraved plates (some dampstaining) & two folding printed tables. xxviii, 574 pp., 1 leaf of errata. 8vo, cont. half-sheep & speckled board (occasional light dampstaining), spine gilt. Leipzig: G. Fleischer, 1825. \$1000.00

First edition. In 1821, the Weber brothers "began a long physical study of the flow and the progress of waves in fluids, particularly in elastic tubes. In their *Wellenlehre* (1825) they formulated the basic laws of hydrodynamics and were the first to apply that branch of physics to the circulation of the blood."—*D.S.B.*, XIV, p. 200.

Good copy. Library stamp on title and several other places. Ex Bibliotheca Mechanica.

• Garrison-Morton 766—"The first work to apply hydrodynamics to the circulation of the blood." Roberts & Trent, *Bibliotheca Mechanica*, p. 349.