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Early Scientific Instruments

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CATALOGUE ONE HUNDRED FIFTEEN

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We are always interested in buying single items or collections.

In addition to buying and selling early instruments, we can perform formal appraisals of your single instruments or whole collections, whether to determine fair market value for donation, for insurance, for loss, etc. We were recently engaged to appraise a medical collection of several hundred items being donated to an American museum, and to appraise a major European collection of early scientific instruments, being insured for a loan exhibition.

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founded 1982



* * * * * OUR EARTH * * * * *

IS OUR EARTH ROUND?

PERHAPS NOT - PERHAPS A UNION OF TWO PROLATE SPHEROIDS







1. AN EXTRAORDINARY PROJECTION, French, circa early 19th century. Measuring 5" (13 cm) tall and 3-1/4" (8 cm) in equatorial diameter, this hollow wood globe, separable at the equator, is mounted with ten gores in each hemisphere, printed in color and labeled (in French) with numerous political and geographic locations. The zero longitude prime meridian passes through Paris (as used by the French for almost 200 years, despite strong competition, especially for the Greenwich meridian). Condition is very fine noting general losses to the varnish (but not to the globe paper).

A rare globe, with its fascinating projection, which has the advantage of emphasizing the greater abundance of land masses north of the equator. \$2400.

ON THE OTHER HAND...

Si terra effet tetragona, vmbra quoq; tetragonæ figuræ in eclipíatione lunari appareret.



Here Petrus Apianus, in his 16th century *Cosmographia*, makes the simple and earthdefining observation that the earth's shadow crossing the lunar surface, during lunar eclipses, is always seen to be perfectly round. As depicted in Apianus' wonderful illustration, if the earth were triangular we would see a triangular shadow, likewise for the square, the hexagon, etc. QED. This logic was known even to the ancient Greeks; Aristotle understood the mechanism of eclipses, and found the roundness of the earth's shadow proved the roundness of the earth.



2. MINIATURE TERRESTRIAL GLOBE IN HORIZONTAL STAND, American, second quarter 19th century, signed in the cartouche "A three inch Terrestrial Globe, by Wilson's & Co., Alb'y." This fine globe is printed with considerable detail, and is tan overall with hand-painted brown and greenish outlining and highlighting. The wooden stand is a fine, typically American turned spindle mounting, with dark ball feet, the whole standing 5" (13 cm) tall. Condition is very fine noting only some old stable hairline cracks to the globe.

James Wilson (1763 - 1855) produced his first globes in Bradford, Vermont in 1810. Transferring to Albany, NY, in 1818, he established his "artificial globe manufactury," eventually producing globes of 13", 9", and even such miniature 3" diameter. The firm name changed as James's sons joined the business, and as Cyrus Lancaster entered the family and the firm (see, e.g., D. Warner, *Rittenhouse* 2, pp. 135-7). We can date the present rare globe to second quarter 19th century, probably the 1830's, based on the political boundaries. \$8500.



3. DIMINUTIVE TERRESTRIAL GLOBE ON DECORATIVE STAND, French, 1857, signed "Delamarche à Paris, Rue du Battoir, 25; 1857." This 3-1/8" (8 cm) diameter globe is applied with printed and partially hand-colored paper gores showing extraordinary detail. We note some interesting features including the Prime Meridian (zero degrees longitude) passing through Paris, and the record of the death of Captain Cook, in February 1779, on the island of Hawaii. The globe itself is in fine condition with general light browning, and only very minor scuffing or losses.

Mounted in a brass meridian ring, the globe is wonderfully presented on its chemically darkened cast brass stand with four supporters atop a shaped pillar and base with leaf-and-berry decor. Mounted around the base are symbols of astronomy and geography, viz. protractor, dividers, multi-draw telescope, and sheaf of papers with depictions of sun, moon, and stars. The brass work is all in excellent condition, and the total overall height is 6-7/8" (17.5 cm).

The globe maker was Felix Delamarche, successor to this most important globe manufactory founded by Charles-François Delamarche. A rather similar 8 cm globe figures in a tellurian in the National Maritime Museum collections (Dekker, 1999, p. 321).

We have seen variant forms of the present mounting on small mid-19th century terrestrial globes, noting in particular the Newton globe in Tesseract Catalogue 70 (item 2). It makes for a very handsome desktop stand. \$4500.



4. EARLY AMERICAN SOLID WOOD GLOBE, c.1840, signed "Made by D.C. & A. Murdock, West Boylston, Mass." The 4-3/4" (12 cm) diameter globe is a solid turned wood ball mounted with hand-tinted paper gores, and set in a (replaced) brass meridian ring. The cartography is unusual; the land masses are very well defined, but nomenclature, while well done, is quite sparse. The original wood stand, with its three delicately turned legs, is mounted with a hand-tinted printed paper Zodiacal ring (giving dates, Zodiacal signs, compass headings, equation of time, etc. -- 10% lacking). Condition is good noting one water stain on the globe, the horizon paper losses, and minor spotting to the metal. This is one of the few surviving Murdock globes and thus an important find. David C. and Artemas Murdock constructed 3" and 5" globes in West Boylston, and apparently an orrery in 1837.





5. PRE-WAR MINIATURE JAPANESE GLOBE, 1936, signed in a cartouche for the printer (Yamanaka, in the Umayabashi zone of Honjo



Ward, Tokyo) and publisher (Y. Sukagawa, in Kotobuki Town of

Asakusa Ward of Tokyo), and dated 20 and 25 November 1936 respectively. Standing on a blackened turned wood stand, within a half meridian ring mount, the 3-5/8" (9 cm) diameter hollow globe is mounted with 12 gores extending to the poles. It is printed with highly detailed labeling, with colored highlighting, and includes prominent plotting of long distance railway lines worldwide. Condition is good noting wrinkling of the paper as it shrank, and rubbing around the South pole. An uncommon example of a pre-World War II Japanese globe. \$1250.



UNCOMMON SCHOOLROOM DEMONSTRATION GLOBE, American, c. 1890. 6. signed "C.W. Holbrook's New 8 inch Terrestrial Globe." The globe gores are lithographed, printed in two colors to differentiate land and ocean, and include oceanic currents, isothermal lines, shipping routes, etc. The globe is mounted within a fixed brass meridian ring with rotatable inner band for freedom of inclination of the axis. There is also an unusual adjustable brass latitude band which can be clamped to the meridian ring. The brightly colored horizon ring, also signed, includes Zodiacal, calendrical, directional and equation of time bands, and a circumferential Greek key design. This is all mounted to a three legged stand of cast iron with cast geometric decoration of stars and foliage, finished in the original black and bronze enamels. A remarkable survival is the original dovetailed pine display / storage / shipping case, 13" x 13" x 16" (33 x 33 x 41 cm) overall, with its hinged front and attractively shaped "terraced" opening. Condition is fine throughout, noting minor restoration to the horizon ring, and roughness to the flexible latitude band.

The Holbrook family manufacture of classroom demonstration apparatus began with Josiah (1788-1854) in the 1830's, with his innovative orreries and globes, continued with his sons Alfred and Dwight in the business (Holbrook & Co.; Holbrook Apparatus Mfg. Co.), and was succeeded to by Dwight's son Charles, the maker of the present globe (see D. Warner in *Rittenhouse* volume 2 for more background). According to Warner, Charles Holbrook's globes "were shipped in a case with hinged front which could be used as classroom furniture to hold and protect the globe." A rare, complete globe outfit. \$6500.



7. SUPERB AMERICAN MECHANICAL GLOBE, circa 1870, signed by the patentee Hugh Williamson, and by the craftsman G.C. Wessman, both of New York, and serial numbered 87. The apparatus has a 23" (58 cm) overall height, rising from an elegantly shaped cast metal base which supports a brass pillar to a very substantial 15" (38 cm) diameter meridian ring, itself divided every degree full circle, rotatable and clampable. The ring supports the polar axle which carries the rotatable globe as well as a divided half meridian plus an orthogonal full circle supporting, on both East and West sides, semicircular plates divided every degree of Azimuth (and Amplitude) and with 32 compass points. These wing plates are weighted, and pivot on their centers, such that they maintain a horizontal plane no matter what inclination is given to the entire assembly. It is a clever, unique technique for maintaining the horizon. This is centered by the beautiful 7" (18 cm) diameter hollow metal terrestrial globe. It is all in excellent condition except pitting to the base, and lacking an outer transparent glass sphere which would have represented the heavens. The globe and brass work are in superb condition, almost as new.

Williamson's patent was issued in 1867, and one year later he published *A Manual* of *Problems on the Globes*, designed as an accompaniment to "Williamson's Patent Concentric Celestial and Terrestrial Globes".

Another example, serial number 63, sold for over \$30,000, in 2000; its glass outer globe was not original but a plain replacement. No other example is known to us, except possibly one at Mystic Seaport (Warner, *Rittenhouse* vol. 2, #4). \$15,000.



 UNUSUAL DUTCH GLOBE ON ASTRONOMICAL STAND, c.1905, signed on the globe "Aardglobe door C.L. van Balen, J.B. Wolters, Groningen, Den Haag," and on the base "Wed: J. Bekkers & Zoon, Dordrecht (Holland)." The 4-1/8" (10.5 cm) diameter globe



has color lithographed gores, labeled in Dutch over a hollow sphere, and is in fine condition noting slight scuffing to the varnish only. The meridian ring, horizon / ecliptic ring, and can-shaped mounting base are made of tinplate, color lithographed on the metal, with four splendid astronomical diagrams of eclipses, seasons, ecliptic motion, coordinate systems, etc., all labeled in Dutch, and all in fine condition noting minor surface losses. The globe can be dated to c.1902-1910 by the political divisions, and is similar to one on a four legged tinplate stand (Tesseract Cat. 32 item 4). \$1950.



9. TERRESTRIAL MAGNETIC FIELD GLOBE, English, c.1900. Standing 16-1/4" (41 cm) overall, on a weighted turned wood pillar, this demonstration outfit includes a 5-1/2" diameter

wood sphere mounted with a magnetized metal axis through the offset "magnetic" poles, and a nonmagnetic brass axis through the "geographic" poles. The sphere can be mounted on the turned and



weighted wood stand with either pole upwards. An associated pocket compass can be held in various positions to demonstrate the field direction around this simulated earth. Unusual, in excellent condition. \$1950.







10. HYDRODYNAMIC MARINE GLOBE, French, c. late 19th century, signed "Globe Marin de Monsigneur Rougerie." Standing 23" (58 cm) overall, this marvelous device has a 10" (25 cm) diameter transparent globe with land masses shown on the inside surface in opaque red wax, and an interior blue metal globe driven by crankwork to rotate on the polar axis. Msgr. Rougerie (the Bishop of Pamiers) explains, in his 1894 treatise Le Globe Marin ou Globe Producteur de Courants Semblables aux Courants Marins, that the space between the globes is to be filled with a suspension of tallow candle wax particles in water. The brass splash cap is then put in place, and the crank turned to demonstrate ocean currents, Coriolus forces, etc. The whole is mounted on an attractive cast iron stand, with original yellow and green decorative finishes. This very early example of actual hydrodynamic modeling is in very fine condition except for two repaired breaks in one glass hemisphere. Included is Rougerie's 1894 book, a presentation copy signed by him. \$9800.



* * * * * OUR MOON * * * * *



11. COPERNICUS BY TEMPEL — AN EARLY LUNAR MODEL, European, 1876 or earlier. Sealed within a 9-1/8" x 11-1/4" x 1-7/8" (23 x 29 x 5 cm) glazed wood box is a fine plaster model of the lunar crater Copernicus with its central peak and surrounding debris. A manuscript note within reads (translated from Italian) "Relief of a part of the lunar surface made and offered by his own hand to this College by the illustrious Prof. Guglielmo Tempel. 4 September 1876" and to the reverse is signed "Ramon de Herrera, Florence, April 21/91". The model is in dramatic high relief, with the prominent central crater and nearby ejecta. More distant features (mountains, craters) are shown, and the plaster surround identifies the following: Reinhold, Copernicus, GayLussac, Karpathen, Pytheas. South is toward the top in the model, as seen through an inverting astronomical telescope. Condition is fine noting some roughness to the paper.

Wilhelm Tempel (1821 - 1889) was an exceptional German astronomer, eventually working in France and Italy. A remarkable observer, he discovered 5 asteroids and at least 13 comets. As something of a self-taught astronomer, he struggled for acceptance into the "academy". His many discoveries were eventually acknowledged, and today we have both an asteroid and a lunar crater named after him. In the 1960's the remarkable artist Max Ernst created a series of works based upon Tempel's life and work, including paintings, books, and a movie.

In 1876, the date on this model, he was already working in Italy, at Arcetri, where he presided over the grand observatory from 1873. On the hill of Arcetri, outside Florence, the observatory is located quite close to the last residence of Galileo! \$4500.





12. THE LUNAR CRATER ERATOSTHENES, English, circa 1851, unsigned but by Henry Blunt. This beautiful silvered metal three-dimensional model of lunar topography is mounted under domed glass in a handsome hinged display case of mahogany, 5" x 6-1/2" (13 x 17 cm) overall. Condition is very fine throughout.



This is an electrotype copy produced by Henri Blunt, of his original plaster model of this lunar region. The details are based upon Blunt's own observations, made with his 9" aperture Newtonian reflector in Shrewsbury, Shropshire. The Science Museum has a similar example, and it is recorded as having been shown at the 1851 Crystal Palace exhibition in London. The crater is named for the famous Greek polymath who, by 200 BC, had first calculated both the circumference and the axial tilt of the earth, and with remarkable accuracy. The crater is no less than 28 miles (45 km) across. \$4500.

DRAMATIC LUNAR RELIEF VIA PHOTOGRAPHED PLASTER



13. NASMYTH AND CARPENTER, 1885, *The Moon: Considered as a Planet, a World, and a Satellite,* third edition. This 6-3/4" x 9" (17 x 23 cm) volume is hardbound, colored blue and bearing a tactile silvered image of "Lunar Craters" on the cover. With 213 pp., it contains various woodcuts in the text, plus 26 wonderful Woodburytypes mounted on full-page plates. Condition is good with some wear to the binding.

James Nasmyth, a very successful Scottish engineer / inventor, in partnership with James Carpenter, observed the moon over 30 years, preparing and revising drawings of various features under all possible lighting conditions (different lunar phases, librations, etc.) Finally the drawings were translated into physical plaster models, which when photographed under raking sunlight yielded the present extraordinarily accurate and communicative images. The resolution here is much higher than achieved with telescopic photography at the time. \$1500.

MOON SHADOWS AND EARTH SHADOWS





14. HENRI ROBERT'S GRAND MODEL ECLIPSAREON, WITH TRIPLE CORD DRIVES, French, circa 1860, signed "Henri Robert". This beautiful wood and brass model has a 28" (71 cm) long platform supported by pillar on a 10" (25 cm) square base. With the sun at center, by manually moving the platform counterclockwise, a system of cords and pulleys drives (1) the small white moon in its CCW orbit around the earth, (2) the inclined orbit of the moon CW, this the retrograde motion of the lunar nodes, and (3) the Zodiacal circle CCW, always showing the position of the sun throughout the year. It gives a splendid demonstration of the conditions necessary for an eclipse, viz. that the sun earth and moon all be in line (syzygy), which demands that the lunar orbit's line of nodes point to the sun at the same moment that the moon is in that line. Condition is very fine, functioning well.

In 1852 Henri Robert published *Les Movements des Corps Célestes* ... *Demontrés a l'aide des Appareils Cosmographiques*, and began producing a series of astronomical demonstration models designed for classrooms. Each model came in a range of sizes, complexities, and prices. Here we have his most complex device, in its largest size!

THE RAPID EVOLUTION OF LUNAR CARTOGRAPHY



15. THE LUNAR SURFACE AS KNOWN IN 1963, American, by Replogle Globes, produced by the Adler Planetarium and Astronomical Museum. The 6" (15 cm) diameter



metal globe is formed in two halves, and printed in shades of green and gray with a myriad of lunar features, many named. Much of the far side is blank, although somewhat more than 180° is mapped from ground-based telescopes thanks to lunar wobbling, lunar libration. And on 7 October 1959 the Russian craft Luna 3 captured the first images of the far side. Condition is fine noting a couple of small dents. It is complete with its little plastic stand formed as lunar craters and mountains.

Luna 3 successfully transmitted 18 resolvable images, covering at least one-third of the far side, although at quite low resolution. Five hundred distinct features were recorded. It was mankind's first ever view of these regions. The results are included here, with many newly

named features, e.g., craters Mendeleev, Tsiolkovsky, Kurchatov, etc. \$325.

16. CRAM'S LUNAR GLOBE, SHOWING THE HIGHLY CRATERED FAR SIDE OF THE MOON, American, circa 1968, by George F. Cram Company of Indianapolis.

This 10-1/2" (27 cm) diameter pasteboard sphere bears 12 lithographed colored gores in each hemisphere, and presents an enormous amount of detailed topography. The features on the near side are extensively labeled. The far side is replete with hundreds of craters of all sizes, but essentially nothing is named. It is a wonderful example of detailed mapping of the far side, carried out by Zond 3 (1965), but prior to IAU approval of feature designations. Condition is fine noting a few minor blemishes, and it is complete with the original circular metal stand.

All of the craters, mountains, etc. are given a three-dimensional sense by incorporating shadowing as having the sun to the left side. \$950.



THE FIRST GLOBE TO SHOW SCHIAPARELLI'S "CANALI"



17. FLAMMARION'S 1884 MARS GLOBE, French, 4-1/8" (10 cm) in diameter, and standing 7" (18 cm) tall on a black marble base. It is signed "Globe Géographique de la Planete Mars d'apres Camille Flammarion, E. Bertaux, Editeur, 25 rue Serpente, Paris". This dramatically patterned globe is printed with orange land masses, pale green and dark green seas, all identified. Continents are boldly named for famous astronomers (Copernic, Herschel, etc.) Condition is fine noting light scuffing, and some wear at the poles.

This globe presents a wonderful moment in the evolution of our mapping of the planet, a moment prominent in the popular understanding of the habitability of other worlds. It is apparently the first globe published by Flammarion, and only two years after the construction of his observatory outside Paris. The presence of canal-like structures on Mars was first mentioned by Schiaparelli in 1877, leading to Flammarion's mapping and this globe production seven years later. The apparent discovery of artificial features on another world influenced all mankind (see Nall, 2019, *News from Mars: Mass Media and the Forging of a New Astronomy 1860 - 1910*). A very rare globe, with only seven other examples documented. We find only one recorded at auction, that in recent years, and realizing \$27,500. Rare.







18. THE FLAMMARION / ANTONIADI MARS GLOBE, French, late 19th century, the cartouche "Globe signed in Géographique de la Planète Mars d'après Camille Flammarion par E. Antoniadi, E. Bertaux Editeur, Paris." The 5-3/4" (15 cm) diameter globe is formed of 12 full gores plus two polar calottes, all printed in browns and blacks to show the seas and canals of Mars, all fully named and overlaid with a Martian system of latitude and longitude. Several "changeable" areas include the years of observation, most impressive being Syrtis Major, whose western edge is shown shifting continuously throughout at least five oppositions (when Mars is closest and best observed), from 1864 through 1896. А

major network of canals is included, appearing almost like loxodromes or spokes connecting various lakes. The globe is mounted on a turned ebonized wood stand with brass fittings, and measures 11-1/2" (29 cm) overall. Condition is excellent throughout.

Eugène Michael Antoniadi (1870 - 1944) was employed by Camille Flammarion, at his private observatory outside Paris, from 1893 - 1902, to pursue planetary mapping studies. Flammarion himself wrote many successful books on astronomy, including La Planète Mars. He accepted the maritime view of Mars, the dark areas being seas and light ones continents. Antoniadi continued his observations, and produced this marvelous globe of the planet. It is also a fine symbol of the furor surrounding Mars studies at the time. Serious astronomers were enveloped in the "canal" theories, in the particularly fine observational opportunity of the close opposition of 1892, and perhaps even by prizes like that offered by the French widow Clara Guzman: 100,000 francs to "the person of whatever nation who will find the means within the next ten years of communicating with a star (planet or otherwise) and of receiving a response." Mars was the obvious target. A rare example. \$12,500.

MARS CARTOGRAPHY AS UNDERSTOOD AT THE DAWN OF EXTRATERRESTRIAL EXPLORATION



19. ATTRACTIVE MARS GLOBE, American, circa early 1970's, signed "Mars by Replogle ... based on NASA photography, Le Roy M. Tolman, Cartographer". The 6" (15 cm) diameter hollow metal globe is formed in two hemispheres, printed in purples and reds directly on the surface, and mounted in an inclined half-meridian ring. Numerous features, of remarkable shapes, are delineated and named. Condition is excellent.

Our knowledge of Martian topography evolved rapidly over the past 150 years, from the apparent system of canals to the detailed mapping by orbiter and lander. This makes for a fascinating collecting possibility, here showing the degree of exploration achieved just at the epoch of the very first successful Mars orbiting spacecraft. \$450.

* * * * * OUR SUN * * * * *







20. WITH FOCUS ON THE SUN – A SET OF ASTRONOMICAL LANTERN SLIDES, English, circa 1875, signed on the slides and on the worn box lid "Newton & Co. Opticians, 3 Fleet St." Each of the fifteen 4" x 6-1/2" (10 x 17 cm) mahogany frames holds a glass image, most 3-1/4" square, one a long sliding glass, and one frame empty. The subjects are spectra, solar prominences, eclipse, dimensions, etc. All slides are labeled in ink. Condition is fine. A most unusual solar set. \$1350. Alles &

***** OUR NEPTUNE ***** THE ENTHRONIZATION OF THE NEW PLANET,

ABLEQUIN OUT of PLACE. er of the New Planet. BTON W. CLIPTORS, DINE SAY, BEAM, Bo STONE LONDON BY NIGHT, The POLYTECHNIC Institution: The EGYPTIAN HALL. of the Rholl der is Show, & Monette, W HITK, Ber, Witer Rholl der is Show, & Moners, SLACK, Ber, BF VARIOUS MAGNITURES, Berniter, Ried Professor of THE HAUNT OF THE WILLS In " Open " Brary Level" h " Adaptive" h " Adaptive" and done by the Light of the More, h Hammer William AULFIELD. FARL QUIN'S Tableaux Vivans! THE ENTHRONIZATION OF THE NEW PLANET. If I is it to be a set of the state of the S A NEW & ORIGINAL FARCE

21. PLANETS PERSONIFIED - AN EXTRAORDINARY PLAYBILL, English, circa 1847. This London playbill is framed and glazed, measuring 9" x 21" (23 x 53 cm). It invites one to attend the 37th performance of "THE NEW PLANET! or, Harlequin out of Place". This "undoubted Heavenly body, absurdly called 'Neptune' by persons who have not the honor of her acquaintance" is played by Miss P. Horton. The play is followed by various entertainments, including "a series of Experiments illustrative of the Electro-Magnetic Telegraph, and Professor Schonbein's Gun Cotton", and concludes with "The Enthronization of the New Planet". Printed on W.S. Johnson's "Nassau Steam Press" in St. Martin's Lane, this is a rare artifact of the public excitement following the announcement of the discovery of Neptune in 1846. Noting light browning, this original playbill of an astronomical extravaganza is in very fine \$4500. condition.

The Star Chamber of the New Planet.		
The New Planet, fan undoubted Heaven ly body, absurdly called ' Neptune' by Miss P. HORTON,		
Juno, 7		Mins REYNOLDS.
Venus,	her Celestial Sisters, forming a ' Beautiful	Miss JULIA BENNETT.
Pallas,	Gal'-axy not to be outshone in any existing	Miss CARRE.
Ceres,	Theatrical Hemisphere,	Miss TELBIN
Vesta,		Miss A D A MS
Mercury,	1	M. BUCKSTONE
Jupiter,	Masculine Planets	Mr. CAULFIELD
Mars.	> of parious dearces	M. LAMES BLAND
Saturn,	of eccentricity.	Mr. BOGERS
Uranus, alias Georgium Sidus,		
The Earth. (a Planet of a certain i.e. uncertain age.) Mrs. W. CLLEFODD		
A cluster of Stars in attendance on the New Planet, Messrs. BRIGHT, SHINE, RAY, BEAM, &c. The Satellites or Moons of Uranus, by A SMALL SET-OLIGHTS (2017)		
Harlequi	in, Mir.]	BUCKSTONE.

* * * * * OUR SOLAR SYSTEM * * * *



22. LAING'S PLANETARIUM, American, circa 1900, signed on the 13-1/2" (34 cm) long wooden arm "Laing Planetarium Co., Detroit, Mich." This rotatable arm carries the muted-gold solid-wood Sun ball, the inner planet Venus, the Earth and our Moon, all with complex articulations using string drives to over a dozen wooden pulleys and little metal guide wheels. The earth globe



has an applied cartouche for the Laing company, and is signed "Rand McNally & Co's New 3 inch Terrestrial Globe, Copyright 1891", the globe with 12 applied gores all printed in color. The whole mechanism is supported by a turned wood base and pillar, the base 7-1/4" (18 cm) in diameter and bearing a circular printed metal label with scales of months, Zodiacal houses, and seasons. Condition is fine noting an age crack to the sun, and the full apparatus restrung with waxed cord.

Quoting from *Facts of Mathematical Geography* (Laing, 1900) "To view the Planetarium while its motions so clearly illustrate the changing of the seasons, the moon's phases, inclination of axis, orbital and rotary motions, eclipses and the like,



creates in the mind an indelible impression regarding these problems". The booklet concludes with a fascinating full page on "How To String The Planetarium". Without summarizing, we just note that in the ideal case one can differentiate between, and have available, braided silk fish line, plus crochet silk line, plus buttonhole silk line, each appropriately stretched with specified weights and times, and drawn through shoemaker's wax! (and see back cover of this catalogue)

A fine American invention. \$5500.



23. ASTRONOMICAL DEMONSTRATOR – RETROGRADE PLANETARY MOTION, French, mid-19th century, signed on the printed paper table "Henri Robert, Horloger de la Marine, Brevete, S.G.D.G. à Paris". This rare astronomical demonstration device is a form of geared orrery, the sun represented by a central brass



disk, the earth and Jupiter by brass balls on arms driven by handcrank and gearbox underneath. The sidereal projection of Jupiter on the heavens is represented by a brass disk on an extension of the sun-Jupiter line. The apparent position of Jupiter on the heavens, as seen from the earth, is shown by another disk, controlled by a sliding wire linkage between earth and Jupiter. As the planets rotate about the sun, the more rapid angular motion of the earth causes the outer planet to appear at times to move forward in its orbit, and at times to actually move backwards — the retrograde motion, graphically demonstrated by this unusual mechanism. The device is mounted in a fine wood frame 12-5/8" (32 cm) square, with a diagram showing the days, months, Zodiacal signs, and seasons. The instrument is in very

fine condition, noting some darkening to the varnished paper.

The maker was well known as a distinguished clockmaker of Paris, once a pupil a Breguet. This is one of the series of Henri Robert's models which he developed for astronomical instruction (and see the large eclipsareon in this catalogue). \$4800.

HENRI ROBERT, Horloger de la Marine, Breveté.

MAKE YOUR OWN TELLURIAN





24. SHERRIN'S DYNAMICAL MODELS, English, c. 1925, signed on the case lid and instruction book "Popular Experiments in Dynamics, by George C. Sherrin; George Philip & Son, Ltd., The London Geographical Institute, 32 Fleet St., London E.C. 4; Philip, Son & Nephew, Ltd, 20 Church St., Liverpool." This mechanical models outfit is contained in its original simple wood box 8-3/4" x 8" x 2-3/4" (22 x 20 x 7 cm). Included are a wood base, blue and yellow wood balls, a small steel ball, a large cylinder of metal and card, and numerous threaded steel rods and brass fittings and weights. Of all these interchangeable rods and fittings only one short pivot and one long spoke seem to be lacking. Condition is very good noting losses to the booklet cover and some rubbing to the box.

In the first experiment, the set assembles to make a "Model of the Universe," demonstrating the movements of the Earth and the Moon around the Sun. Further arrangements show "the Laws which prevent the Moon gravitating to Earth," centrifugal force, various gyroscopes and precession, Galileo's pendulum, Foucault's pendulum, and even the "Flettner Rotary Cylinder." The latter shows an intriguing aerodynamic effect: in 1924 a sailing ship was constructed with tall revolving cylinders instead of sails, and wind striking the cylinders propelled the ship at right angles to the wind direction. It was this event that prompted Sherrin to develop his models. \$2950.



25. JAMBON'S GRAND ORRERY, French, circa 1825. This elaborate crank-work orrery represents the annual motions of all the planets known at the time (i.e., the planets out to Uranus, including the four large asteroids) as well as the diurnal and seasonal motions of the Earth, and the orbital motion of the Moon. The 2-1/4" (6 cm) diameter Earth globe has printed paper gores, signed by Delamarche of Paris. Jupiter has four satellites, Saturn five plus its tilted ring, and Uranus six. A single crank drives all of the planetary motions. The Earth spins as it moves around the sun, maintaining its axis fixed in space all the while. The four asteroids Juno, Pallas, Ceres, and Vesta move about the sun as important planets, being the only asteroids known until 1845. The complex brass gearwork is contained within the base and in a brass cage above.

The maximum diameter of this model planetary system is 40" (102 cm). The footed base is 19" (48 cm) in diameter and 5-3/4" (15 cm) tall, 12-sided (for the 12 months or 12 Zodiacal houses), inlaid with fine woods. Although not signed, the orrery has construction details characteristic of the work of R. F. Jambon, author of *Nouveau cours demonstratif et elementaire d'astronomie a la portee des gens du monde* (Paris, 1828, 3rd ed.), and is mentioned for his "Machine geocyclique" in the works of Delamarche. We have here his "Machine planétaire complète". In his *Astronomie* (1815) he describes just the present disposition of moons and planets.

This wonderful planetary machine is in very fine condition. Three internal mounting feet and a few small screws have been replaced. Otherwise it appears to be all original, and in full working order (although one must crank it gently, as there are many gears that must turn simultaneously!) One of the most elaborate orreries to come on the market in years. \$65,000.



(JAMBON, 1828)









FOR AUDITORIUM / LECTURE HALL LANTERN SHOWS



EXTRAORDINARY PROFESSIONAL MECHANICAL LANTERN SLIDES, English, third quarter 19th century. Each of these crank-work slides is built on a large dense mahogany block 5-5/8" x 11-1/4" x 9/16" (29 x 1.4 cm) pierced with a glazed aperture 4-1/4" (11 cm) in diameter, and set with brass fittings. They were designed for the very largest of magic lantern projectors, and are extremely rare, the only such we have seen:



26. COMPLEX ORRERY WITH EIGHT CONCENTRIC RING GEARS, ALL DRIVEN BY A HAND CRANK TO LONG PINION GEAR. The rings carry the transparent planets (some hand-colored) and their satellites, around the central yellow sun, as follows: Mercury, Venus, Earth with Moon, red Mars and 7 asteroids, banded Jupiter with its 4 Galilean satellites, ringed Saturn with 8 moons, blue Uranus with no less than 6, and ringed(!) Neptune with 2. Condition is very fine and functional.

Dating is possible by the discovery of Neptune (1846) and especially by the numbers of known, and mistaken(!) satellites. For example, the eighth moon of Saturn was discovered 1848, and

Mars was discovered to have moons in 1877. Some fascinating observational errors are included, as the illusionary rings of Neptune which Lassell reported in 1846. \$6500.

27. ECLIPSES OF THE MOON, the fixed glass plate with a lovely hand-painted full moon, the second plate painted with two dark patches and driven by hand crank to the circumferential ring gear. The patches represent the earth's shadow, and by cranking we see the progression of the shadow obscuring the moon in either a partial or total eclipse. Very fine and functional. \$2500.





28. VAN LAUN ORRERY KIT, Dutch, circa 1810. Offered here is a group of quite distinctive planetary arms, solar system bodies, and indicator arms, all of which would have been fittings to an orrery by the innovative Hartog Van Laun. Included is the gilt gessoed wood sun ball (pierced to support a brass pointer arm) mounted on post, the fine mounted earth ball with 12 gores on the wooden sphere signed "Globe Terrestre, à Paris, chez Delamarche géog., Rue du Jardinet No. 13", the gores printed with much detail and prime meridian through the Isle de Fer, six brass arms ranging from 2" to 7-3/4" (5 to 20 cm) in length each with graduated-sized fittings for drive posts and set with wooden planet balls in various mechanical configurations. Three arms are mounted with pulleys and string drives, one an eccentric drive, one with a very long spring motion. There are also two long brass rods with fittings. Condition is good but for rather universal losses of white paint on the sunlit sides of the wooden planet balls. All are housed in a modern fitted card box.

These orrery fittings are unlike any others except those of Hartog van Laun (1734-1815), Amsterdam instrument maker and inventive scientist, specialized in the construction of orreries capable of a wide variety of astronomical demonstrations. These would be performed on a circular table of his own making. The man and his works are well described by Hooijmaijers in the *SIS Bulletin* (2010). Here we have a rare example of one of van Laun's astronomical "kits." We note that Hooijmaijers found only 17 surviving orreries or fragments of orreries; 16 of these are in museums, only one in private hands. We note a fine example in the Museum Elburg. Very rare. \$2950.















29. LARGE VERSION OF THE "NEW PORTABLE ORRERY," English, c. 1795, signed "Designed for the New Portable Orreries by W. Jones, and Made and Sold by W. & S. Jones, 30 Holborn, London; Jan'y 1st, 1794, Published as the Act directs by W. & S. Jones," and simply "Jones, London" on the earth globe, and with an early provenance to the Manchester Philosophical Society. Contained in the original 13-1/2" x 13-1/2" x 8" (34 x 34 x 20 cm) brown-stained pine box is the complete outfit fully described and illustrated by William Jones in his Description and Use of a New Portable Orrery, first published 1782. His portable orrery, in this large version, consists of the fully-geared hand-cranked Tellurian displaying the annual motions of the inner planets, and of the earth / moon system, about the sun. It maintains the earth's axis fixed in space, while driving the moon in its inclined monthly orbit, and showing the diurnal rotation of the earth. The rest of his orrery is the Planetarium, with the eight planets (out through Uranus, discovered 1781, but of course not yet Neptune 1846) surrounded by their known satellites, all positionable by hand. The baseplates are wood mounted with printed, hand-colored and varnished calendrical sheets presenting a great variety of solar system facts.

There are several accessories and alternate arrangements. A small oil lamp may be substituted for the Planetarium's sun, to demonstrate eclipses. Jones also recommends using this in a dark room, where the shadow of Jupiter and the four Galilean satellites explains the linear telescopic appearance of the Jovian system. He writes of many failures of the earth-centered Ptolemaic system, all demonstrable with his Orrery. There is even a small brass ball provided to replace the Sun ball, with the Earth transferred to the center. Another accessory shows the retrograde motion of planets as seen from earth, although only the long arm remains, lacking its mounting brackets. Otherwise the outfit is complete throughout, in very fine condition, noting only some slight disturbance of the paper due to wood shrinkage, and some losses of black enamel on the "night" sides of the planet balls.

The outfit was designed by William Jones, pupil of Benjamin Martin and employee of George Adams, and manufactured by Jones, partnering with his brother Samuel. Their firm was quite active, with special ability in the construction of philosophical demonstration apparatus (see, e.g., their Atwood's Machine outfit, Tesseract Catalogue 4, item 55), and Ferguson's Mechanical Wedge (5/56).

A remarkable survival of Jones' complete mechanical model of the machinery of the solar system. \$85,000.



30. E X T R A -ORDINARY ASTRONOMICAL LANTERN SLIDE **OUTFIT**, probably English, mid-19th century. Contained in the 14" x 7-1/2" x 5" (36 x 19 x 13 cm) fitted mahogany case is a set of nine 3-7/8" (10 cm) diameter brass disks. Each disk is fitted with a hand-painted image on glass, and mounted with а second. rotating, brass holder fitted with its own painted glass pane. In some cells partial or total eclipses progress during rotation, in one the moon drives tides, in others planets or satellites move in their orbits.



A hinged mahogany and brass holder accommodates each disk in turn, for use in a magic lantern. A (replaced) hand crank drives the rotation via internal ring and worm gearing.

There are in addition twelve long mahogany-framed static slides, the glass panels hand-painted with several dozen astronomical scenes. Eight of the slides are each mounted with three finely painted glass disks within lacquered brass frames. This most remarkable outfit is in very fine condition, noting an empty slot for, presumably, a second slide carrier. \$8500.

TWO GLOBE PAIRS: EARTH FROM SPACE; SPACE FROM EARTH



31. PAIR OF FRENCH ARMILLARY GLOBES, c. 1831, the 9-1/2" (24 cm) diameter globes each mounted with orthogonal brass rings (the meridian ring divided every degree from the equator to the North and South poles) and with an adjustable pewter horizon / equatorial ring divided with directional degrees (the terrestrial also with geographic directions, the celestial with Zodiacal signs and calendrical scale). These adjustable rings are most uncommon, and permit demonstration of the terrestrial and celestial equators as well as the observer's own horizon, as in an armillary sphere. Each globe mounts to a cast iron bracket, turned brass support, and ebonized turned wood base bearing a pierced silver monogram. Condition is fine throughout, noting light foxing, paper shrinkage, and slight rubbing.

The terrestrial is signed "Globe Clafsique publié par Ch. Dien, 1831, à Paris, chez Ch. Dien, Auteur des Globes Célestes, Dressés sous l'Inspection de Mr. Bouvard, rue Hautefeuille, No. 13." Charles Dien, Sr. was associated with the Delamarche firm early in the 19th century, and his son Charles Dien, Jr. (1809-1870) became an astronomer and cosmographer, and authored several astronomical atlases and globes. The present globes seem to be one of his earliest efforts.

Standing 19" (48 cm) overall, these globes make a most handsome, as well as technically interesting pair. \$9500.



32. SIGNIFICANT PAIR OF AMERICAN TABLE GLOBES, 1826 & 1828, each dated and signed "J. Wilson & Sons, Albany, St. N.Y." These fine 13" (33 cm) diameter globes are superbly mounted with tan gores printed with a wealth of political, geographic, and astronomical information. Coastlines, constellations, etc. are enhanced with delicate hand coloring. They are mounted within fine brass meridian rings divided every degree of latitude, 0° - 90° in each quadrant, and have rotatable polar time pointers. They rotate, and are adjustable in latitude, within the original four-legged turned wood stands with cross-stretchers, clamp screws, and horizon rings printed and hand colored.

The 1826 "New American Celestial Globe" has wonderful constellation figures and plots the positions of almost 5000 heavenly bodies. Stars are sized according to seven different magnitudes, and nebulae, clusters and double stars are shown. Constellation figures are named in both Latin and English, and include Mariner's Compass, Telescope, Air Pump, Sculptor's Tools, and Engraver's Burins (Caela Sculptoria).

The 1828 "A New American Thirteen Inch Terrestrial Globe" explains, in a wonderful cartouche, that it incorporates all the new discoveries and "Political Alterations" right up to 1828. Signed in the vignette are the names of the cartographer "D.W. Wilson del." (Wilson's son) and the printer "Balch, Rawdon & Co. fect." Included on the globe are numerous dated tracks of oceanic circumnavigators. The polar demarcations, in the 1820's, are still rather undefined. Condition is very fine, with minimal restoration, notably to some patches on the horizon ring paper.

James Wilson (1763 - 1855) produced his first globes in Bradford, Vermont. Transferring to Albany, N.Y., in 1818, he established his "artificial globe manufactory,"

eventually producing globes of 13", 9", and 3" diameter. (see item 2 in this catalogue), The firm name changed as James's sons joined the business and later as Cyrus Lancaster entered the family and the firm (see, e.g., D. Warner, *Rittenhouse* 2, pp.135-7).

A number of Wilson globes are known, most in institutional collections. Yonge (1968, *A Catalogue of Early Globes*) reports a similar 1826 / 1828 pair in the Mariner's Museum, Newport News, Virginia. An exceptional early pair by America's foremost globe maker. \$38,500.





33. GREIG'S CONSTELLATION FIGURES OF 1810, *Astrography, or the Heavens Displayed on a New Plan*, London, with fold-out celestial planispheres and lunar map, plus numerous constellation figures with descriptions. It carries the book plate of the famous historian A. R. Michaelis, and is in fine condition noting leather front cover slightly loose and small losses to spine. Greig's goal was to introduce astronomy to his students gradually, from first principles, thus retaining their interest without overwhelming with details. The wonderful constellation figures add to this. \$850.





34. EARLY CELESTIAL LAMP, French, circa 19th century, signed "Delamarche Paris". Standing 20-1/2" (52 cm) overall, the lamp is constructed with a substantial hand-blown and hand-cut glass reservoir over a weighted turned tin base. A brass kerosene burner has pierced decor and height adjustment for the large cloth wick within. Above this rises the glass chimney. The celestial globe itself is 6-7/8" in diameter, of opal glass with brass fittings, mounted with 12 North and South gores printed in blue with cream colored figures of the constellations. Stars are graded in size, according to their brightness as seen from the Earth, the brighter ones named or identified by their Greek letter designations. Constellations are all named (in French). Condition is very good but for areas of browning of the paper from the heat of the lamp.

It must be a fine sight with the lamp going, diffusing light through the room, the magical constellation figures seeming to glow of their own accord. \$3400.





- **35.** LARGE CELESTIAL VOLVELLE, English, probably 17th century. The 7-3/8" (19 cm) diameter cast(?) pewter(?) disk bears the Northern hemisphere stars and classical constellation figures. A concentric band is divided CW every degree 0 360, followed by a calendrical ring divided daily throughout the year (English month spellings; vernal equinox 11 March). The disk is pierced at the center as for the volvelles often found on the reverse of horary quadrants (e.g. Tesseract Catalogue 90 item 2). Condition is good. The quality of fine divisions, constellation shapes, etc., is quite good, although the quality of casting is mediocre.
 - This is a remarkably large astronomical volvelle, with imagery similar to, but different from, that published by Edmund Gunter. The constellation figures are depicted simply but quite distinctively. A survey of celestial maps (see in particular Warner, *The Sky Explored, Celestial Cartography 1500 1800*), shows enormous variety in design, the figures being adapted to the age and culture and technology, religious and political vogue, etc. But nowhere do we find exactly the present imagery. The apparent lack of clothing on the individual figures is noteworthy! \$2500.







36. CHINESE ASTRONOMICAL MIRROR DEPICTING THE 28 PRINCIPAL CONSTELLATIONS, bronze, 10-1/2" (27 cm) in diameter, of a Tang dynasty design. This large bronze mirror is highly decorated with astronomical significance, most important being the constellation diagrams of the 28 *hsiu*, the "lunar mansions" along the

equator, bounded by the hour circles in the sky. The next band inside shows the eight trigrams separated floral by decorations, then the 12 animals of the Chinese cycle, then the four symbolic animals of the Celestial Palaces, with a central animal providing the knop for attachment of a cord handle. Needham presents a seemingly identical mirror (1959,



Science and Civilization in China, Vol.III, Fig. 93) from the Tang dynasty (618 - 907 AD), along with a translation of the poem in the outer circle, which tells us the virtues and essence of the mirror, identifies the contents of the various circles, and promises to the mirror's owner good fortune and exalted rank. Chinese mirror decoration frequently has astronomical significance, but it is very rare to find one with constellation maps.

This mirror is in very fine condition, the front with a uniform dark finish, noting wear to the central knop, the reverse slightly convex, with areas showing high polish / silvering, others with a rather scratched thin corrosion patina layer. It is relatively impossible to date this casting without extensive metallurgical testing. It is quite likely later than its original Tang design and could even be a 20th-century version. We purchased it from a reliable source 50 years ago. In any case it is a significant example of this rare form of constellation-mirror. \$4500.

THE FIRST STAR ATLAS PUBLISHED IN THE WEST, HERE IN THE RARE FIRST EDITION OF 1540, AND WITH PROVENANCE TO THE PICCOLOMINI FAMILY

37.







ALESSANDRO PICCOLOMINI, Italian (Venice), 1540, De la sfera del mondo and De le stelle fisse, the two works in a 6-1/2" x 9" (17 x 23 cm) volume bound in circa 18th century half vellum, the spine bearing a label "Piccolomini Annotazi". The title page is signed in ink by Francisci Marie Piccolomini, and with a matching note to the rear "Costo in Siena legato mezo scudo nel 1541". There are woodcut diagrams in the text and various tables but most notably the second work has 47 (misnumbered to 48 in the plates) full-page star maps of various constellations (see Orion shown here), and with the innovation (still in use today) of identifying a given constellation's stars by letters. Condition is good throughout, with good margins, the fine 16th century paper fresh and clear, with the strong star maps.

Alessandro Piccolomini (1508 - 1578) wrote extensively, and was a very early, important popularizer of science. This work was extremely popular, followed by many later additions. He became Bishop of Patrae, and we note that his ecclesiastical family produced no less than two Popes. The book's owner was Alessandro's relative Francesco Piccolomini, Bishop of Montalcino, who notes that he paid half a scudo, apparently for having this book bound, in Siena, in 1541. A very important copy of the very first publication of a Western star atlas. \$14,000.

IN VENETIA AL SEGNO DEL POZZO. Con Privilegio conceduto dala Santità di. N. S. PP. PAVOLO. 111. E dal illustrissimo Senato VENETO, per anni.XII. come ne i breui.

Francisci Marie Piccolominei Spi Ilcinensis.



38. MASSIVE GEOMANCER'S COMPASS AND CELESTIAL PLANISPHERE, Chinese, probably 20th century, with a three-line inscription in ink (translating from the Chinese) "Made during the bing-yin year [1686] of Emperor Kangxi's rule during the Qing dynasty, under the supervision of the Astronomy and Geography Division, Imperial Astronomical Bureau". This large wooden instrument is 20" (51 cm) in diameter and 1-3/8" (3.5 cm) thick, mounted with a small central glazed compass. As with most globes, in fact, the iconography and cartography are on printed sheets, applied to the base and protected with a transparent orange lacquer. The disk has red edging and a couple of red highlights. Condition is very fine noting just a few small nicks.

The upper surface pattern is made in four applied quadrants, and presents no less than 49 concentric bands. It is to be compared with the description by J. Needham (1962, *Science and Civilization in China*, Vol. 4, Pt. 1, pp.293 -301) where he shows a medium size compass with 24 bands, each band fully explained. Needham notes much local variation in compass design, referring to ones from Anhui (a Chinese center for woodworking) with 33 and even 40 circles. And we recommend the exhaustive *Guide to the Feng Shui Compass* (Skinner, 2017, 448pp. thoroughly illustrated).

The reverse has two semicircular prints applied, forming a celestial planisphere with dozens of named constellations and two outer divisional rings. Many celestial features are plotted and labeled. It is a rare example of a Chinese sky map. Interestingly, the Imperial Astronomical Bureau was at one time under the governance of Ferdinand Verbiest (1623 - 1688), the Flemish Jesuit mathematician and astronomer who worked closely with the Kangxi Emporer.

This massive instrument is difficult to date, being part of a continuing cultural tradition. It is not one of the typical feng-shui compasses made for tourists, and is only the second such large example we have seen in 40 years of business. It was acquired by us 24 years ago, so we can say with some confidence that the date of manufacture is no earlier than that inscribed (1686), and no later than 1999! \$4500.

STARS BY CANDLELIGHT



39. CLARKE'S ASTRONOMICAL CANDLE-LANTERN, American, c.1875. This painted tin lantern measures 12" x 9" x 6" (30 x 23 x 15 cm) overall, complete with carrying handle, shaded smoke stack, rear door, four candle holders, and ground glass screen. A slot in front of the glass would accommodate various perforated cards of star patterns, for comparison with the night sky. One original card is present. Patented in 1870 by James Freeman Clarke of West Roxbury Mass., the Astronomical Lantern is an unusual example of Yankee ingenuity. Clarke (1810-1888) was a noted author, clergyman, and Harvard professor. This lantern is in fine condition, noting a crack to the glass corner and a few dents and scratches. It retains its original paint decoration.

It is complete with the likewise extremely rare 16-page booklet published by Clarke in 1873, in good condition with slight wear. It contains detailed descriptions of the constellations, stars including double and variable stars, clusters, nebulae, etc., visible at each season, as were shown on the complete series of 17 semi-transparent thin card slides perforated for the bright Clarke explains the advantages of carrying the stars. illuminated celestial maps out into the night and describes how we forget details of the indoor atlas or globe, when going out, and vice versa for the appearance of the night sky. In a wonderful quote, Clarke states: "... we have retained the names and designation of the stars, but have omitted the figures of Bears, Bulls, Unicorns, Sheep, Virgins, Dragons, Lions, and the like, which have so long disfigured the celestial globe. Instead of these confusing figures..." The booklet is signed by its owner, J.L. Hammett, important Boston manufacturer of school materials. \$2750.



* * * * * OUR GEOMETRY * * * * *





40. AN ARMILLARY SPHERE FOR THE PUBLIC, French, circa 1860's. signed "Cosmographe, Ouvière de Marseille, Brevet S.G.D.G." This small brass armillary stands 11" (28 cm) overall with its cast iron platform. The rotating armillary is mounted in a yoke and shows, all labeled, the equator, meridian, polar axis, tropics of Cancer and Capricorn, solar declination scales, celestial pole, etc. A long notation in French explains that the Earth's North polar axis is not directed at the north star but is offset 1.5 degrees toward the first star in the tail of the Great Bear constellation (i.e. the Big Dipper). Condition is fine throughout.

This small "Portable Cosmographe" was produced by François Ouvière (1807-1867) for astronomical demonstration in the classroom. But

his main thrust was the placing of monumental versions in public parks throughout France. These were rather well accepted, and twelve were funded and placed throughout



the country. Several survive today including one in the sunny courtyard of the lycée Henri-IV in Paris, this apparently the original one, which was exposed at the Universal Exhibition of 1855. The full story has just been written by J.-M. Faidit (2022, Les Cosmographes d'Ouvière). Translating from Faidit's dedication "To...Ouvière, little known genius of the popularization of astronomy, by which the cosmographe in public spaces has facilitated the discovery of the sky in three before dimensions the invention of planetariums in 1923". \$1950.





41. VALE'S GEOGRAPHICAL AND ASTRONOMICAL CARD, American, 1846, the 4-1/2" x 7-1/4" (11 x 18 cm) thin card printed with a central earth, external meridian



circles, Earth positions at the solstices, and a star field. It is mounted with its original four-point rotating index arm held by original thread, the arms representing travelers on the earth, and their horizons. Condition is good noting edge chips and slight browning.

This is accompanied by the equally extremely rare booklet *Illustration of G. Vale's Astronomical Card: And Elements of Astronomy. Price three Shillings*, published in New York by Vale at 3 Franklin Square. Similar in size to the card, this manual runs to 24 pages, complete with printed wraps illustrating Vale's three-dimensional creation, his "Globe and Transparent Sphere" (somewhat similar to Wessman's Cosmosphere, item 7 in this catalogue, but with real particularities). Condition is good, again slightly browned, and with cover wrap detached.

Gilbert Vale (1788 - 1866) is listed in NY directories for only a few years mid-19th century. He ran Vale's Nautical and Mathematical Academy, and received an 1843 patent for an "Astronomical Globe" (see Warner, 1988, *Rittenhouse* 2, p. 133). \$2400.

UNDERSTANDING THE SPHERICAL GLOBE



42. GLOBE APPARATUS, French, circa 1870, signed on the arc "Dumoulin-Froment à Paris" and "Tachet à Paris" and "Baraban". Contained in the original fitted case, 8" (20 cm) square, is a complete set of tools for accurate measurement and marking on 5" diameter globes. A great circle clamp ring and a 36x90x90 degree spherical triangle are made of silvered brass and lined with protective paper. Both are accurately divided both in degrees and grads, the triangle with additional markings and engraved definitions of specific arcs, e.g., Da=10° 48'44.34" A boxwood arc carries two fine lacquered brass trammels, one with lead-screw fine motion, the needle point replaceable with pencil holder and ink pen. The set is all original and complete, in very fine condition, the case good. A remarkable example. A modern wooden globe is included, for device demonstration and experimentation. \$5500.

OUR UNIVERSE IN REFERENCE BOOKS



43. Calvert, H.R. Astronomy I: Globes, Orreries and Other Models. 1967, Small booklet with color illustrations and descriptions of 20 fine instruments. Near Fine. Paperback. \$20.00

44. Dahl, E.H. and J.-F. Gauvin. **Spherae Mundi, Early Globes at the Stewart Museum**, 2000, 208pp.,with color illus. of this wonderful collection. New. Hardcover w/ dj. \$75.00

45. Dekker, Elly and Peter van der Krogt. **Globes from the Western World**. 1993. Exhaustive beautifully illustrated study. New. Hardcover with dust jacket. \$125.00

46. Eisinga, Eise. **Planetarium-boek**. 1928. 416pp. with large fold-out diagram. Illustrated, and with extensive details on this "mother of all orreries". Used. Hardback. Covers loosening. (In Dutch.) \$125.00

47. Gibbs, S. with G. Saliba. Planispheric Astrolabes from the National Museum of American History. 1984, 231pp, Paperback. Cover very rumpled. \$50.00

48. Maurice, and Mayr (eds.). **The Clockwork Universe, German Clocks and Automata, 1550-1650**. 1980, 322pp., Early clocks, celestial globes, etc. New. Hardcover w/ dj. \$75.00

49. Millburn, J.R., with HC. King. Wheelwright of the Heavens -- The Life and Work of James Ferguson, FRS. 1988, 328pp, illus. Thorough. New. Hardcover w/ dj. \$58.00

50. Snyder, G.S. Maps of the Heavens. 1984. 144pp. A delightful large coffee-table book with wonderful historical illustrations of the skies. New. Hardcover with dust jacket. \$50.00

51. Stevenson, E.L. **Terrestrial & Celestial Globes.** 2004 reprint of the original 1921 edition, 2 volumes in 1 book. 291pp. Well-illustrated, and with worldwide inventory of celestial globes and their makers, locations, etc. New. Hardcover. \$75.00

52. Van der Krogt, P. **Old Globes in the Netherlands**. 1984. 290 pp. Well illustrated, researched, and described inventory of early globes. New. Hardcover w/ dj. \$95.00

53. Webster, R. and M. Western Astrolabes -- Volume One of Historic Scientific Instruments at the Adler Planetarium and Astronomy Museum. 1998, 179pp. An extraordinary collection, fully illustrated. New. Hardcover with dust jacket. \$45.00



"The above represents the Planetarium in the hands of Mr. Laing, the inventor and patentee, showing manner of holding it." (Laing, 1900)

see item 22