

TESSERACT

Early Scientific Instruments

Special Issue:

100 Catalogues, 100 Instruments

Catalogue One Hundred

Spring, 2015

\$8

CATALOGUE ONE HUNDRED

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— David Coffeen, Ph.D.

— Yola Coffeen, Ph.D.

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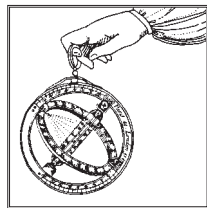
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We are always interested in buying single items or collections.

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 major 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.



founded 1982

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In preparing our 100th Tesseract catalogue, we decided to look back on our 33 years of full-time business and offer from our stock one item from each of our previous catalogues. Some of these were not sold when originally offered; some were repurchased over the years from collectors whose interests evolved. They are all fascinating pieces, dating from the 14th to the 20th century, representing the incredible diversity of the history of science and medicine. And for the 100th entry, we offer a remarkable collection of “instrumental autographs,” signatures on the instruments themselves.

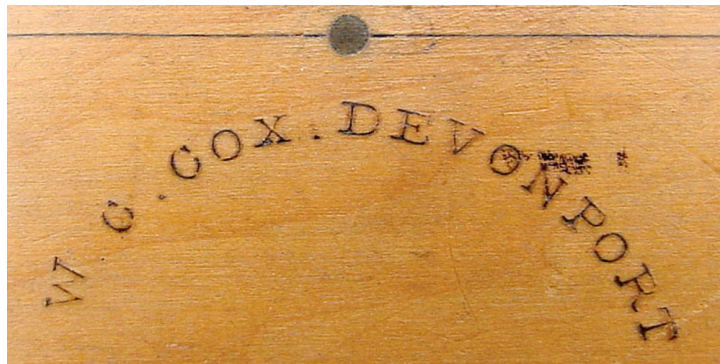


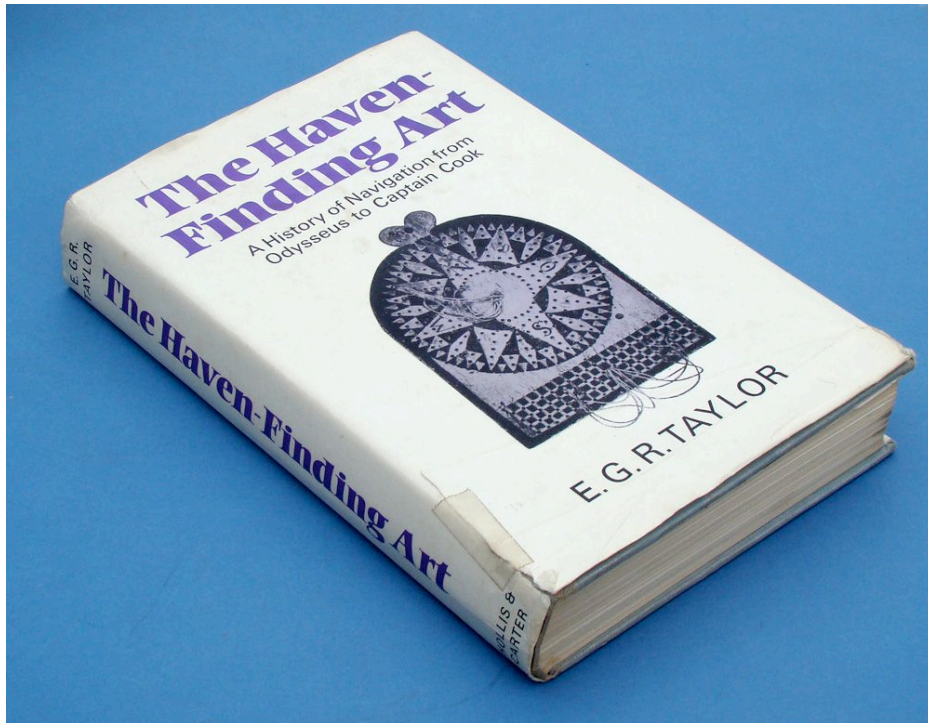


Catalogue 1. MICROPHOTOGRAPHIC SLIDE, English, 19th century, with a numbered (#49) yellow paper label, probably from J.B. Dancer's series. This 1" x 3" glass slide has a fine microphotograph approximately 0."05 square sealed under cover glass, identified as "Raje-Gaut, Bahar." It depicts the view in the 1795 aquatint by Thomas Daniell, showing the fortified guard station on the rugged road leading up to the ancient mountain-top fort in India, with a waterfall in the distance. \$98.



Catalogue 2. RARE SHIP'S WATCH COUNTER, English, second quarter 19th century, signed "W.C. Cox, Devonport." The fruitwood or boxwood frame, 4" x 7" (10 x 18 cm) overall, is fitted with a brass suspension ring, and houses six wood sliders with bone knobs. On the left are six triplets of colored dots which can be partially covered by the several sliders. We believe this unusual device was used on board ship to keep track of the watch -- six watches of four hours each could be followed hour-by-hour throughout the day, simply by moving sliders from far left to far right, each dot representing one hour (two bells). William Charles Cox had a shop on Fore Street in Devonport (Plymouth) c. 1822 - 1857. This watch counter is in fine condition, noting one chip to one knob, and is the first we have encountered. \$950.



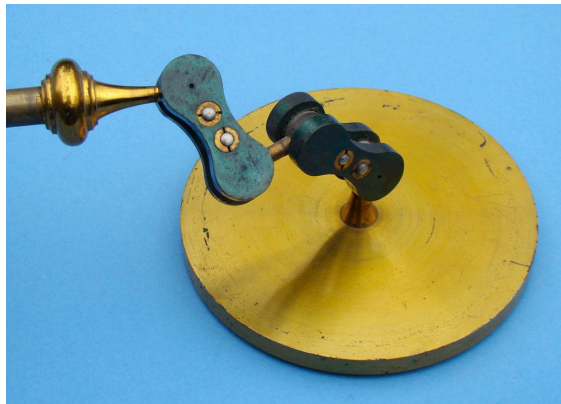


Catalogue 3. Taylor, E.G.R., *The Haven-Finding Art -- A History of Navigation from Odysseus to Captain Cook*, 1958, 295 pp. A very well-researched work on the early navigators, their tools and techniques. Fine condition. \$48.



Catalogue 4. EARLY THREE-DIAL PEDOMETER, English, c. 1785, signed on the enameled dial "Spencer and Perkins, London." The pedometer mechanism is contained in a gilt-brass watch-form case 2-1/4" (6 cm) in diameter, each action of the 6-1/2" (17 cm) long rod causing a single advance of the large hand against a scale of 0-100 paces. The secondary dials record 0-10 miles (at 100 paces to the mile) and 0-144 miles. A quality instrument, in very fine condition, contained in a chamois case.

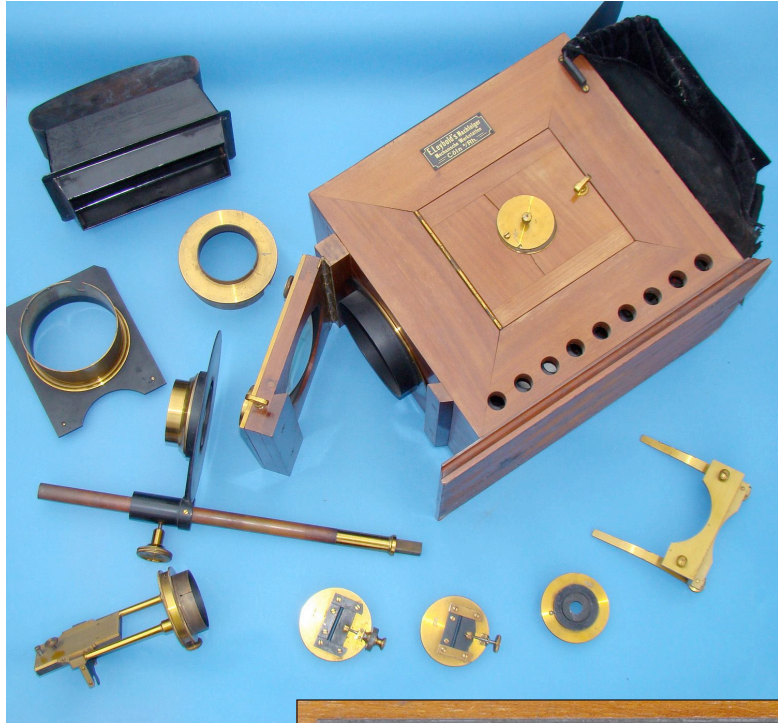
Spencer and Perkins were high quality clockmakers of the last quarter 18th century, recorded working at Snow Hill in London. \$1600.



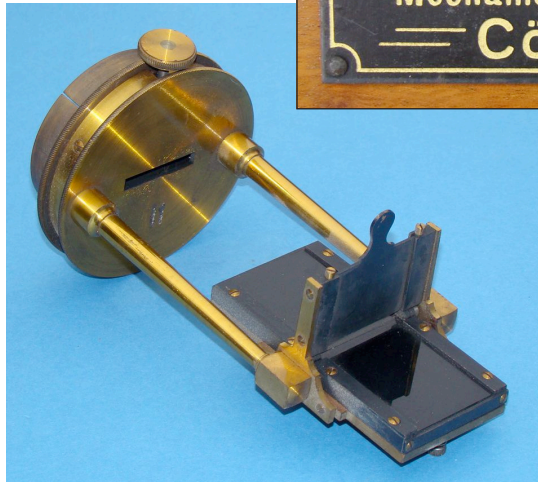
Catalogue 5. DEMONSTRATION MIRROR, 19th century. Extending to a maximum height of 23" (58 cm), this finely made 4" (10 cm) diameter mirror is in a lacquered brass cell supported by two double universal joints for ease of positioning in optical experiments. It is in very fine condition, with most of the original finish on the brass column and cast iron base. \$325.



Catalogue 6. THE UNIVERSAL PROJECTION APPARATUS, German, early 20th century. This elaborate form of scientific magic lantern carries the famous maker's nameplate "E. Leybold's Nachfolger, Mechanische Werkstätten, Coln, a/Rh." The lantern itself has a mahogany body 15" x 12" x 9" (38 x 30 x 23 cm), with brass fittings, and black metal inner housing containing electric lamp and reflector. The body holds the double condenser lens system, and a projection lens focusing by rack-and-pinion on a 15" long rod. This entire front assembly is hinged, probably for vertical projection using a mirror. The lantern is equipped with a number of accessories, including slide carrier, optical mounts, leaf diaphragm, calibrated micrometer-driven slit assembly, and a fascinating Fresnel mirror assembly with adjustable slit, shutter and fine adjustment for the tilt between mirrors. This device demonstrates optical interference patterns, projecting two images of the slit by grazing incidence on the mirrors. This handsome projection system is in very fine condition, a rare example of scientific lantern apparatus. \$4800.



E. Leybold's Nachfolger
Mechanische Werkstätten
— Cöln ^a/Rh. —





Mackneil London

Catalogue 7. THREE-DRAW TELESCOPE BY MACKNEIL, English, very early 19th century, beautifully signed in script "Mackneil, London, Apprentice of the late Mr. Ramsden." With a 1-3/8" diameter greenish triplet achromat, a four element erect-image eye system, a finely grained mahogany main tube, and three brass drawtubes opening from 7-1/2" to 22-1/2" (19 - 57 cm), this is a relatively standard form. But as usual it differs in all the little details, from the use here of four biconvex lenses, to the milling on the brass edges, which is *angled* and finely finished, to the exquisite engraving, to the form of reference: "Apprentice of the late...." Condition is fine, with lens cover and dust slide. McConnell, in the Inland Revenue Apprenticeship Tax registers, finds that Jonathan Mackneil, on 1 Feb. 1786, was indentured to Ramsden for seven years. And Clifton shows him trading in London c. 1799 to 1809. \$2950.

Apprentice of the late Mr. Ramsden



Catalogue 8. IVORY AND WOOD DIP-TYCH DIAL, probably Nuremberg, 17th century. This miniature dial is 2" x 1-3/4" x 1/2" (5 x 4 x 1 cm), the upper leaf of ivory, the base of wood surfaced with ivory plates, with inset glazed compass. The top has a brass lunar volvelle with three calendrical scales. The inner surfaces have vertical and horizontal dials with stamped decoration, colored in black, blue and red. The compass face is stamped with directions in Latin, and with a maker's mark (an outline of a hand). The dial is contained in its original case, leather covered and embossed with floral designs. The dial is in very fine condition with very minor warping, the case fine.

Cowham (2004, p.46) shows a very similar dial, also with the hand symbol, which he attributes to a member of the prolific Karner family of Nuremberg dial makers, probably Albrecht (1619 - 1687). \$1495.

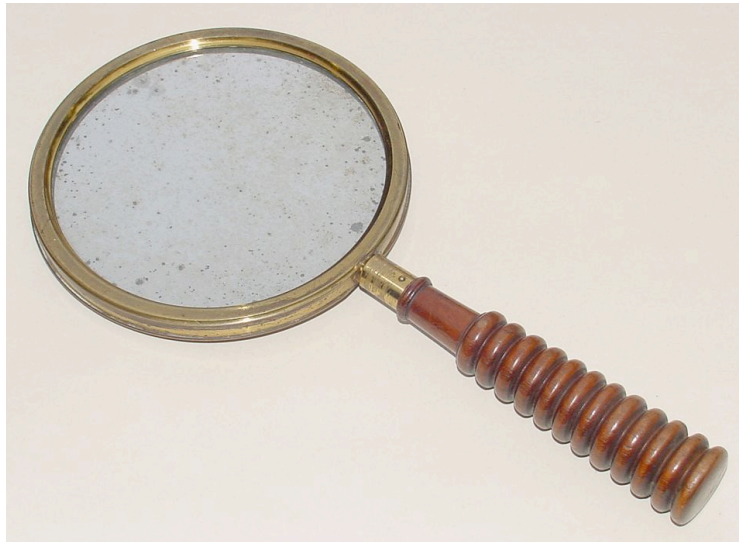


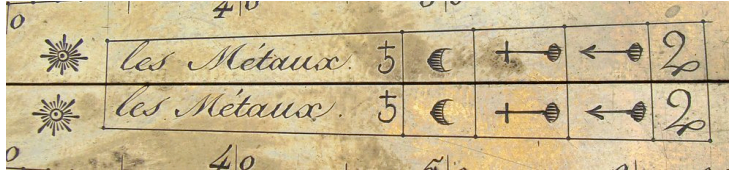


Catalogue 9.
LICK OBSERVATORY PHOTOGRAPH, American, c. 1890, showing the great Warner and Swasey 36" refractor at Lick, with its dome, mount, pier, rising floor, observing furniture, and three fine gentlemen. The photograph is mounted on card, in a glazed gold frame 13-1/2" x 15-1/2" (34 x 39 cm) decorated with floral relief. Fine condition except for some browning, stains on the card mount, and some chipping of the frame. \$320.

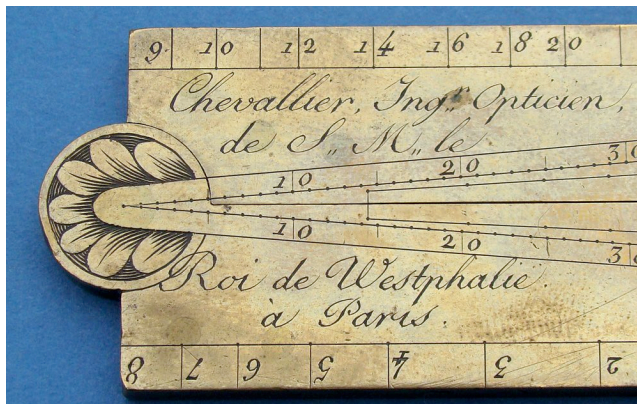


Catalogue 10. DOLLOND HAND MIRROR, English, c. 1800. This unusual, finely crafted "instrument" measures 11-3/4" (30 cm) overall, with a tapered turned wood handle with deeply ringed hand grip. The brass structure contains a plane glass mirror 5" in diameter; the convex brass back plate has the lovely engraved signature of the maker. A handsome object in very fine condition, noting some spotting of the mirror silvering. \$1600.



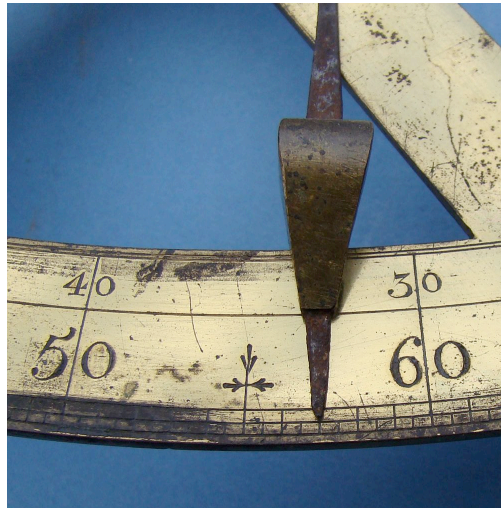


Catalogue 11. FINE CHEVALLIER SECTOR, French, c. 1800, signed “Chevallier, Ingr. Opticien, de S.M. le Roi de Westphalie à Paris.” The brass sector opens to 13” (33 cm), and is finely engraved with scales for polygons, chords, solids, metals, equal parts, weights of shot, calibers of cannon, etc. The maker is probably Jean-Gabriel-Augustin Chevallier, working at the corner of Pont-Neuf and the quai de l’Horloge, at the sign “L’ingénieur Chevallier.” Fine condition, and beautifully engraved, by maker to His Majesty the King of Westphalia. \$1350.





Catalogue 12. FINE STANDING ASTRONOMICAL QUADRANT, probably English, mid-18th century. This finely made brass quadrant, with radius of 8-1/4" (21 cm), is equipped with a weighted pointer on a swinging steel arm. The offset buttressed brass support arm is now mounted on a circular brass base. The quadrant scale is divided every 1/2°, and finely engraved every 10° from 0° to 90° and back again, with decorative divisions every 5°. It is likely that the present quadrant could be used on, for example, a large telescope or other sighting instrument, to indicate star elevations, etc. Much larger versions are discussed by Bion, equipped with their own permanent mounting brackets and telescope swinging in a vertical arc. An uncommon instrument, in fine condition. \$3200.





Catalogue 13. TWIN PRECISION ORTHOGONAL PLOTTING RULES IN ELECTRUM, English, 2nd quarter 19th century. These splendid rules measure 12" (30 cm) long, with a 5" (13 cm) sliding crossbar. Rule and crossbar are divided along each edge, permitting rapid graphical plotting or readout. One has scales of 2 (also 6) "inches to a mile in feet," the other 2 (also 2-1/2) "chains to an inch." Beautifully constructed in silvery electrum alloy, these unusual rules are in pristine condition, in their original velvet lined mahogany case. \$1750.

Catalogue 14.

PHRENOLOGICAL SATIRE, ON A FRUITWOOD SNUFF BOX, French. c. 1820. Measuring 3-1/4" (8 cm) in diameter, the box is made of pressed fruitwood, fully lined with tortoise shell. The lid is decorated with an elaborate satire on the teachings of Dr. Gall, entitled "Marche Comique de Doct'r Gall." The seven vignettes include a comic character carrying handfuls of skulls, Doctor Gall and Madness on horseback, Harlequins, Magicians, etc.



Dr. Franz-Joseph Gall (1758 - 1828) was a Viennese physician who "identified" 27 "organs" on the surface of the brain. The more a given mental function was used, the more the brain grew there, revealing itself in the topography of the skull. Thus was born the "science" of "cranioscopy" and then "phrenology". In the 1820's Gall published his extensive, erudite

six-volume work on the functions of the brain and their manifestations. Phrenology was widely popular, but so was disbelief and derision, leading to various forms of satire. The one reference we find to the *Marche Comique* is in an issue of the *Phrenological Journal and Miscellany*, published in Edinburgh. It records a discourse given by Dr. Fossati in 1827, during a series of lectures at Dr. Gall's house in Paris. Fossati describes Gall's experiences in Europe, where his ideas and research were generally well received by the public, but often ridiculed by the press and by some in the medical profession. In Paris an actual masquerade was prepared, but was prohibited by the important prefect of police, M. le Comte Dubois, who claimed it would be a disgrace to the nation. Fossati adds that he himself owns a plaster medal which Dr. Gall obtained for him, representing the parade of the *Marche Comique* which never happened.

An extraordinary relic of the early controversy over the studies of the physiology of the brain, in very fine condition throughout, the only such box we have seen. \$4950.



Catalogue 15. 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, hinged 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. 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 good condition, noting a few dents and scrapes, and a crack to the glass corner. It retains its original paint decoration. \$950.

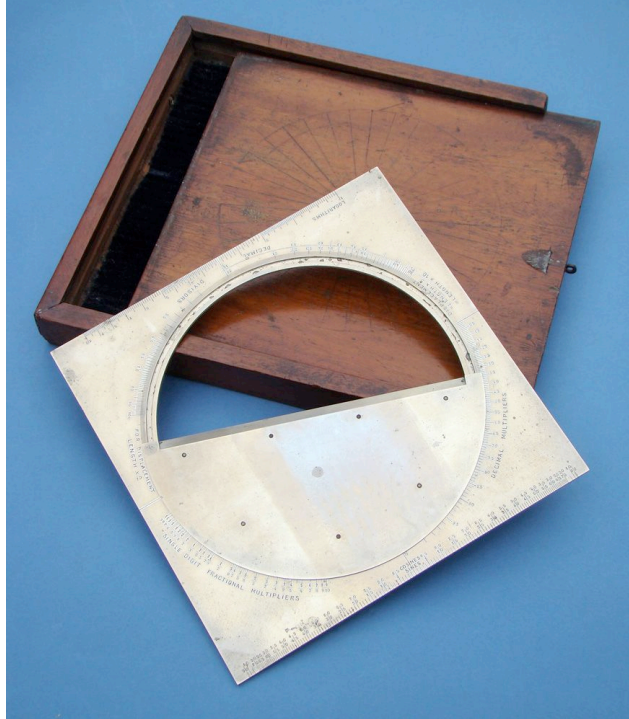


Catalogue 16. EXCEPTIONAL AMERICAN SURVEYING COMPASS WITH INTERNAL VERNIER, c. 1850, signed "Edmund Brown & Son, N. York, Improved." This fine and large brass surveying compass measures 15-1/4" (39 cm) overall with 7" sight vanes and 6" (15 cm) diameter silvered compass. A well-designed magnetic offset system has external control knobs and internal window with degree scale



and one arcminute vernier. The compass face is engraved with an extraordinary band of flowers -- the most original floral decoration we have seen on a surveying instrument. The maker, having apprenticed to Richard Patten, worked in New York City in various partnerships c. 1821 - 1863. Edmund Brown and Son is listed 1841 - 1863. The compass rotation is frozen with age, and there is no case. Otherwise the instrument is in fine condition, all original, a rare and beautiful example of American vernier compass.

\$2200.

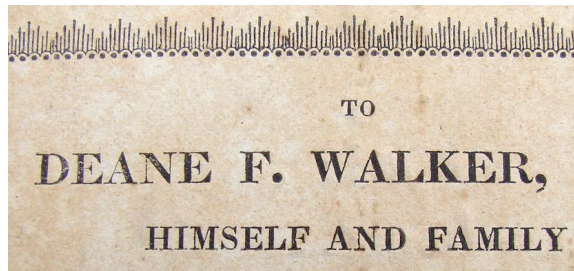


Catalogue 17. MULTIPURPOSE MATHEMATICAL TOOL, English, second half 19th century. Made of electrum 6-1/2" (16.5 cm) square, this plotting tool has a fine central rotating protractor with one arcminute vernier, edge scales of sines, cosines and logarithms, and circular scales for direct angular conversions labeled for single digit fractional multipliers, decimal multipliers, and for different displacement-to-length ratios. Finely made and in fine condition, the only example of this device we have seen. \$1450.





Catalogue 18. ELTON'S TRANSPARENT ORRERY -- AN ASTRONOMICAL SCROLL, English, c. 1820. The paper scroll is hand-colored with seven images of the solar system, eclipses, Orion, etc. It is driven by two ivory handled cranks, and housed in a mahogany stand 8" x 10" x 3" (20 x 25 x 8 cm) overall, with gilt brass mounts and feline feet. The front is glazed and hinged, the back removable for using a candle, etc., as rear illumination of the transparent illustrations. A trade label on the back dedicates Elton's orrery to "Deane F. Walker, Esq., himself and family, having by their lectures diffused a general taste for the Sublime Science of ASTRONOMY." This rare device is in very fine condition, except for some minor repairs to, and possible incompleteness of, the long scroll. \$5800.

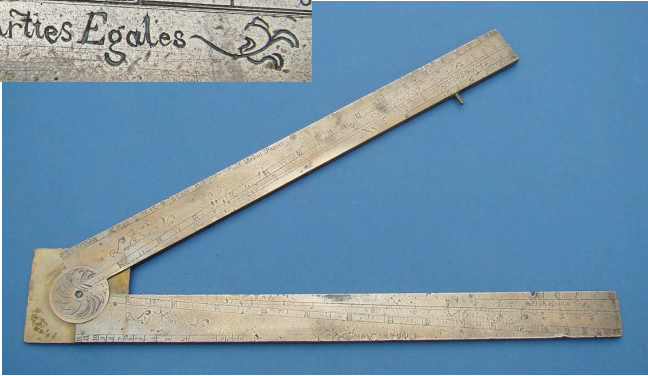


Calibres des Pièces

Ligne des Parties Egales

20	30	40	50	60	70	80
20	30	40	50	60	70	80

Ligne des Parties Egales



A. D. A. Stein

Diamètres & Poids des Boulets de Canons



Catalogue 19. LARGE, EARLY FRENCH SECTOR, 17th or early 18th century. Made of heavy brass and opening to 23" (58 cm), this unusual sector is signed by the maker "J. Guittienne, Sculpsit," and is signed for the original owner "D.A. Stein" (or "A.D.A. Stein"), perhaps of German or Alsatian background. The sector has several very early features including (1) some scales are read with the sector vertical, (2) a protractor scale around the hinge, (3) very decorative flourishes to the capital letters and ends of lines, and (4) the unusual spelling of metals ("Meteaux" rather than "Metaux"). A Latin saying is included, "Quot Arduus Paucis," loosely translated as "little is difficult," or perhaps "nothing is impossible" (especially with this sector!) The scales include solids, metals, polygons, planes, equal parts, chords, calibers, and diameters and weights of cannon balls. Possibly by a provincial maker, the sector is in good condition noting numerous nicks but no serious wear to the engraving. A very rare example of a large early sector, by an unrecorded French maker. \$5500.

* * *



Catalogue 20. AMERICAN 100 YEAR REVOLVING ALMANAC, c. 1837, by John Balch of Massachusetts. This handsome almanac includes a table of Dominical Letters for all years from 1800 to 1900, which with a revolving disk indicates the correct calendars for each month of the particular year. The calendar is designed as an arch supported by elaborate columns. The original, rather worn, instructions and tables are mounted on the reverse and include new moons, weather forecasting, sun rise and set, etc. The almanac itself is in very fine condition, with the original glazing and framing, 8-1/2" x 11" (22 x 28 cm) overall. \$1800.



Catalogue 21. NEHEMIAH BENNET'S COLONIAL AMERICAN BRASS SURVEYING QUADRANT, 1775. Measuring 10" (25 cm) in radius, the quadrant is made of heavy hammered brass with a uniform dark patina. It is mounted with sight vanes on the ends, and a double slit vane at the apex, each 1-1/2" tall, the vanes now somewhat bent. The top is stamped with the date 1774 and corrected to 1775, the bottom engraved "Made by Nehemiah Bennet 1775." A hole is provided to suspend a plumb bob or to swing a trough compass, now lacking. It is a very fine example of primitive but accurate early American manufacture, with a good "feel" to it.

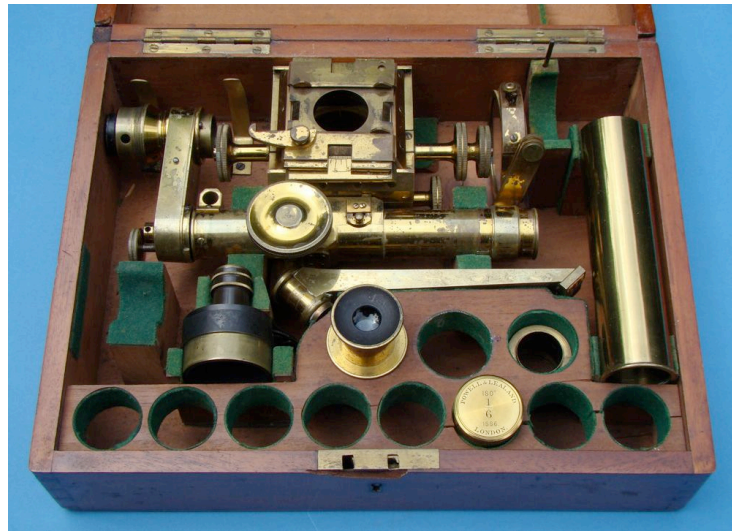
One other signed example of this instrument is known (see Bedini *Thinkers and Tinkers* Fig. 73), that one signed in ink "N. Bennet Middleboro 1777". The quadrant could be used on a plane table to sight various landmarks and lay out the directions directly on paper, by ruling along the edges of the device. It also serves as a surveying square, to establish a right angle in the field. If equipped with a pivoting trough compass, as shown in Bedini, it would permit direct readout of headings from magnetic north. Alternatively, the instrument could be used with a plumb bob, and held in a vertical plane to measure altitudes of the sun, of buildings or mountains, etc.

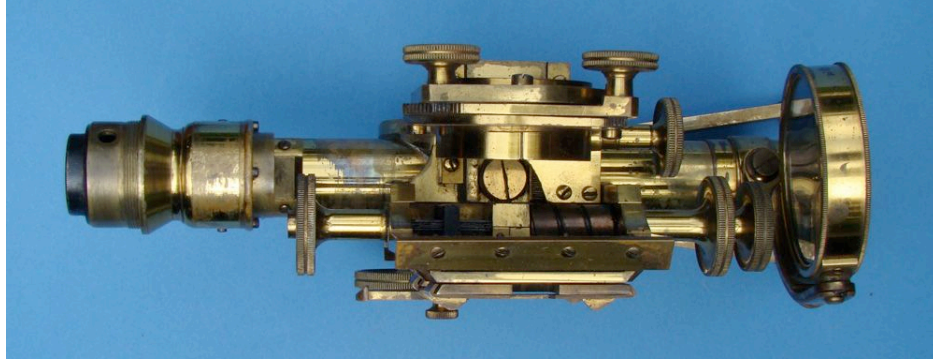
Little is known of the maker/inventor. We find, however, that the Bennet (also spelled Bennett) family was an important presence in Middleboro, Massachusetts, from the 17th century, with many members serving in the Revolutionary War. One Nehemiah Bennet was born, according to church records, c.1695, married in 1721, had one son and three grandchildren, and died in 1769. In 1795, a committee including one Nehemiah Bennett, Esq., was appointed to take into consideration the establishment of a town house for Middleboro.

A most rare Colonial American brass instrument.

\$4950.







Catalogue 22. POWELL & LEALAND'S COLLAPSIBLE "PORTABLE" MODEL, English, 1885, signed "Powell & Lealand, 170 Euston Road, London, 1885." In its collapsed form in the case, this remarkable brass microscope occupies a space 9" x 5-1/2" x 3" (23 x 14 x 8 cm) overall. But when the legs are swung out, the stage rotated and locked, the mirror unlimbered, and the accessories mounted, it becomes a professional stand extending to 17" (43 cm) tall, and equipped with racked coarse and rear-lever fine focus, rotatable mechanical stage of Turrell's design, racked substage fitted with geared motions in arcuate nearly orthogonal directions, and quadruple-jointed articulated double mirror. Accessories include an original ocular; splendid 180°, 1/6"



objective with correction collar dated 1886; and the impressive achromatic condenser with two stacked lens elements and twin wheels of stops and complex masks. All is original, in fine condition throughout, the somewhat spotted brass retaining about half its original bright lacquer finish. The original fitted case is good, with a couple of chips, and space for a number of accessories not included. This stand is the most impressive of the portable Victorian designs, a handsome versatile instrument by the master makers.

\$8900.



Catalogue 23. CLASSICAL-REVIVAL BAROMETER, German, c. 1900, signed "Anéroïd Barometer" and with the maker's "ARDE" (?) logo. The 2-5/8" (7 cm) diameter barometer has a 69 - 80 scale with fine arrow pointer and settable index pointer. Weather conditions are listed from "Sturm" to "Strocken."

The barometer is mounted atop a wonderful winged sphinx in bronze, the sphinx sitting on a pedestal on a black marble base with four bronze feet. The whole stands 7-3/8" (19 cm) tall. Condition is very fine, the brass darkening a bit.

The sculptural figure is that of the classical Greek sphinx, with the body of a lion, breast and head of a woman, eagle's wings, and perhaps serpent-headed tail. The figure incorporates the "nemes," the striped headress of the pharaohs. \$1750.



Catalogue 24. LARGE GREGORIAN REFLECTOR BY FRANCIS WATKINS THE ELDER, English,



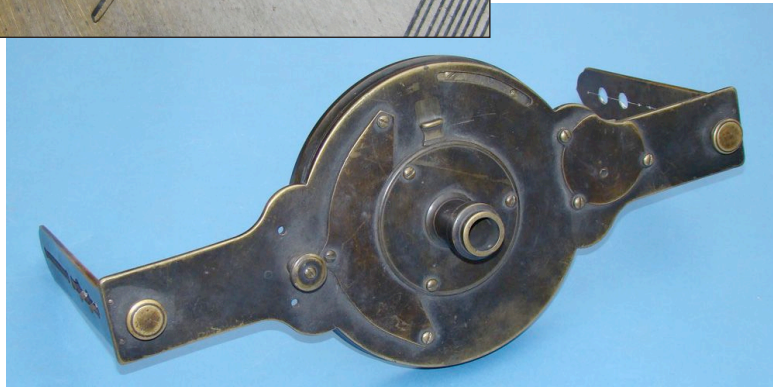
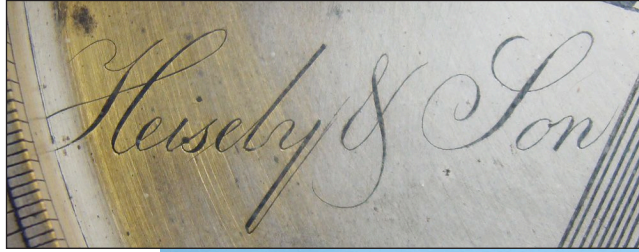
mid-18th century, beautifully signed on the telescope baseplate, "Fra. Watkins, Charing Crofs, London." The construction is brass, the main tube 5" (13 cm) in diameter and 39" (99 cm) overall supported on a finely shaped pillar with folding cabriole legs and a geared altazimuth mount with quick-release fast motions. The mirrors are of polished speculum metal, the secondary with external long screw focus control. The instrument is complete with dust cap, sliding eye aperture tube, and screw-on solar filter. Condition is good noting a replaced finder telescope and the addition of three pressure pad screws on the baseplate. This early Gregorian still gives good images. A handsome, sophisticated instrument with geared motions, by one of the outstanding makers of the 18th century. \$4950.



Catalogue 25. NEAR-MINIATURE GEARED THEODOLITE, English, c.1800, signed "Harris, 47 Holborn, London." Standing only 5-1/2" (14 cm) tall overall, this early brass theodolite has an achromatic telescope with sliding focus to the triplet objective and mounted with spirit level, 2" diameter compass, geared altazimuth motions with a semicircular cut rack and a canted circular scale, both divided each degree directly on the brass and with vernier readouts, and staff mount below. The telescope is provided with an adjustable reticle and is reversible in its wyes for backsighting or reversed readings.

The maker was William Harris of Holborn, at his earliest known address. In fine condition, noting two wye clip pads lacking, the brass darkening with age, a rare example of an early form miniature theodolite. \$1800.





Catalogue 26. HARRISBURG, PENNSYLVANIA VERNIER COMPASS, American, c.1820, signed on the silvered face "Heisely & Son, Harrisburg." Measuring 14" (36 cm) overall, with the original 6-1/2" (17 cm) tall sight vanes, this fine surveying compass has geared rotation of the 6" diameter compass, with readout of magnetic declination in an internal window with vernier. The face is finely decorated with an eight point rose and hub, and has an internal spirit level, plus needle lifter activated by thumb slide below. An outkeeper with finger wheel is mounted on one arm, with readout window 0-16. Condition is fine, noting two thumbscrews lacking, the brass now quite dark with age.

Frederick Heisely (b.1759) and his son George (b.1789) are both known for the construction of town clocks in Pennsylvania, and were in business making surveying instruments in Harrisburg from 1811. During service in the Pennsylvania Militia, in the defense of Baltimore, George Heisely (a flute player with a tune book) was (according to tradition) instrumental in choosing the tune for the verses of Francis Scott Key's *The Star Spangled Banner*. He is further credited with being the first person to ever play it.

A rare, impressive example of the work of this instrument maker (and his father) who played a fascinating role in America's history. \$3800.



Catalogue 27. MINIATURE TABLE DIAL BY BERINGER, German, late 18th century, signed "JB." The 2-1/2" (6 cm) square brass dial plate is mounted on a shaped wood base with brass feet, and contains a glazed compass with hand-colored paper rose. A shaped folding gnomon casts its shadow on the beautifully engraved chapter ring. The maker was apparently the elusive J. Beringer, close relative of David Beringer of Nuremberg. A lovely dial in fine condition, all original, a very rare example of this maker's work. \$1350.





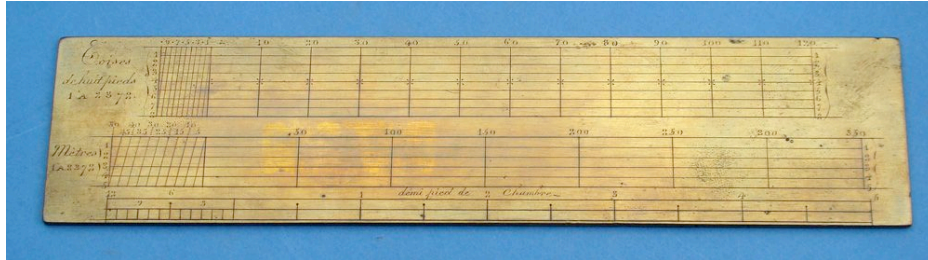
Catalogue 28. EARLY SET OF PREPARED GLASS SLIDES, for the English market, mid-19th century. The 7-1/2" (19 cm) wide mahogany carrying case contains 45 slides with three empty slots. Each slide is glass, a small 2" x 5/8" in size, covered in decorative colored paper, with a prepared specimen mounted under mica cover "glass" and with a printed identification label. Subjects range from cuticle of onion to hair of a bee to potassium bichromate. A splendid, professionally made outfit, excellent. \$895.



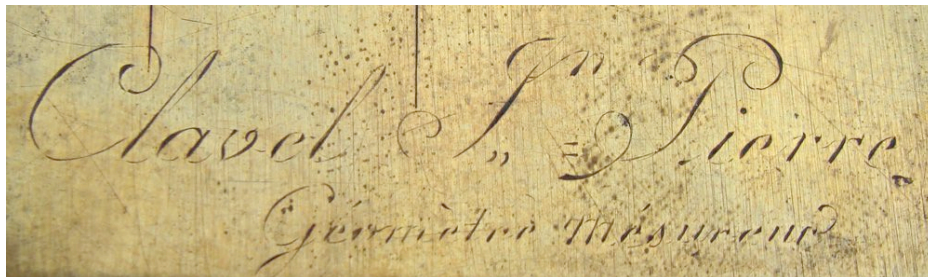


Catalogue 29. PROFESSIONAL “RADIESTHESIE” OUTFIT, French, early 20th century, signed in the case “Les Fils d’Emile Deyrolle, 46 rue du Bac, Paris.” Contained in the 12” (30 cm) long fitted case is a curious assortment of devices of “exploration,” including a magnetic compass, a wood-cased magnetic bar with needle suspension support, a double wand of baleen strips, a black wooden bucket with suspension cord and whalebone handle, and solid wood and solid glass balls each with suspension cords and whalebone handles. The outfit is complete and all original, in superb near mint condition. It was acquired in Northern Canada, where the Inuit related that it was used by a missionary priest to locate missing persons and victims of drowning. Such apparatus was made to find sources of water as well, particularly with the baleen “witching wand.” In use the balls were held as pendulums to determine direction. Professionally made by a company specializing in natural history specimens, mineralogic and chemical instrumentation, etc. A rare “pseudoscientific” outfit. \$2950.





Catalogue 30. UNUSUAL SURVEYOR'S OR ARCHITECT'S RULE, probably French, early 19th century, signed in lovely script "Clavel Jn-Pierre, Géomètre Mésureur." The 7-1/2" (19 cm) long brass rule has scales on both sides for equal parts, with interpolation grids, in both old and new measure. Included are "Toises de 8 pieds (1:2500), Mètres (1:2500), Decimètre Naturel, Toises de huit pieds (1:2372), Mètres (1:2372)" and the unusual "demi pied de Chambre." Condition is fine, noting general wear to the surface. The curiously named "pied de Chambre" was equal to the pied de Savoie, and was used in particular by carpenters in the entire Duchy of Savoy. The maker Jean-Pierre Clavel, although unrecorded in the standard references, produced this splendid rule with an exquisite style of engraving. \$1450.



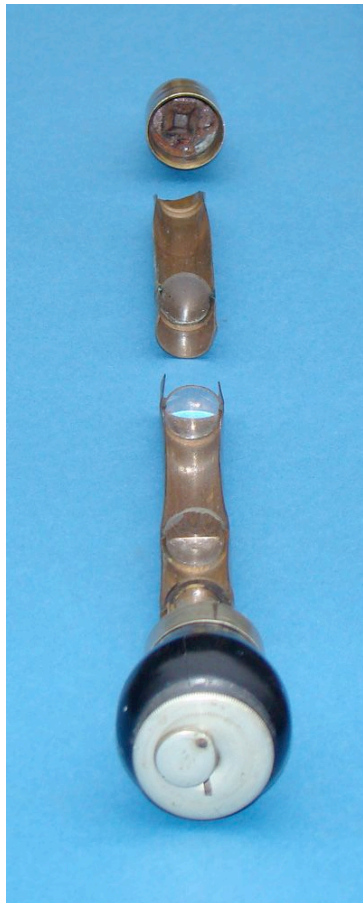


Catalogue 31. DANCER'S PATENT SPEED INDICATOR, English, c.1870. With gearwork contained in a fine lacquered brass housing 2-1/2" (6 cm) in diameter, this form of odometer permits accurate measurement of the speed of machinery. It is complete with friction wheel, toothed wheel, adjustable stabilizing guide, and push-button release mechanism. The patent (1867) holder, and probable maker, was John Benjamin Dancer, "Mathematical Instrument Maker" of Manchester, famous for his microphotographic slides and ingenious mechanical devices. A very rare instrument, in very fine condition, complete with original mahogany case. \$1950.



Catalogue 32. BRONZE ZODIACAL BEAKER, Indonesian, c.14th century. The bronze beaker, 4" (10 cm) tall with 4-1/2" diameter opening, has around the base the twelve figures of the Zodiac in relief, and above this a band of stylized figures. Condition is fine noting one plugged hole in the base, and variegated brown and green patina to the beaker. Readily recognizable are figures for the Crab, the Balance, the Scorpion, the Archer, etc. A very similar beaker, with the Saka date of 1283 (=1361 A.D.) is published in the catalogue of the Domela Nieuwenhuis collection of Indonesian bronzes. A fascinating example of early Zodiacal symbolism. \$1500.





Catalogue 33. RARE AMERICAN WALKING STICK TELESCOPE, c.1865, signed "W.H. Baker, Pat. Dec. 8, 1863." This elegant walking stick measures 34" (86 cm) overall, with fine rosewood shaft, ebony handle, plated brass fittings and eyeshutter, and iron tip which unscrews. The stick is hollow with an erect-image optical system running the full length. The objective holder may be slid outwards for best focus, and the multi-element eyepiece system may be withdrawn. Condition is very fine throughout.

William H. Baker received, in 1863, a U.S. patent for "Improvement in Telescopes" relating to the means of mounting lenses securely against the effects of concussion, particularly for telescopes attached to firearms (or in this case the sharp concussion of the walking stick on paving stones, etc.) Baker is listed, from 1859, as a gunsmith in upstate New York; this activity led to the Baker Gun Co., which by 1919 had produced 150,000 guns! A very rare American telescope, complete with a photocopy of the patent specifications. \$3300.

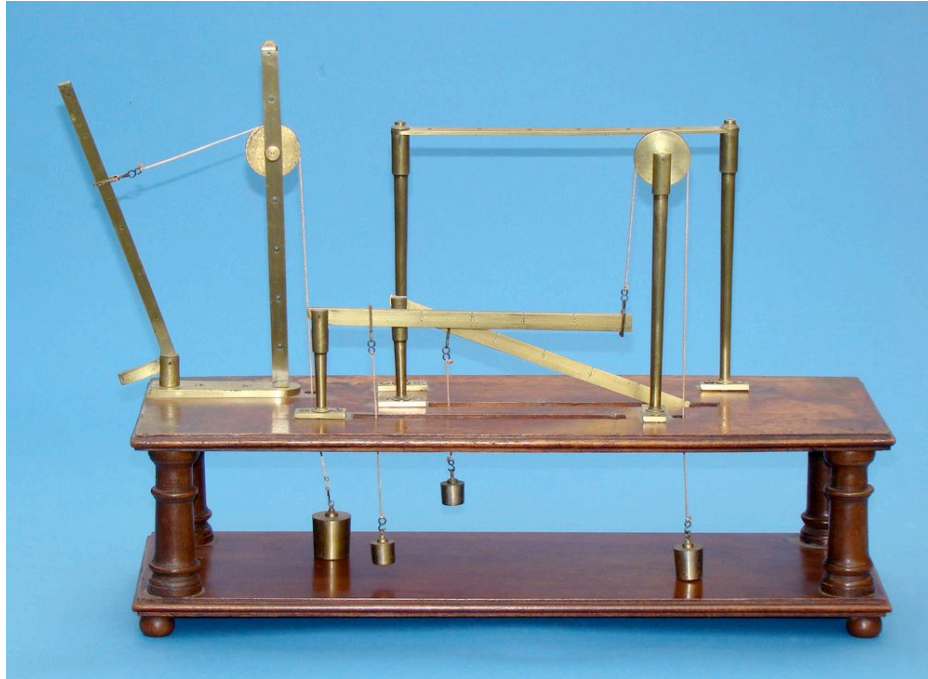


Catalogue 34. RARE ARTICULATED-ARM SELF ENEMA, English, c.1840, signed on the elaborate plaque “Dr. Scott’s Patent, Manufactured by S^r. & J^h. Nye, London,” and with the Royal coat of arms. The 9” (23 cm) long brass syringe has plunger with suction nozzle, return pipe, and fine turned ivory head. An articulated mechanical arm leads to the pewter applicator.

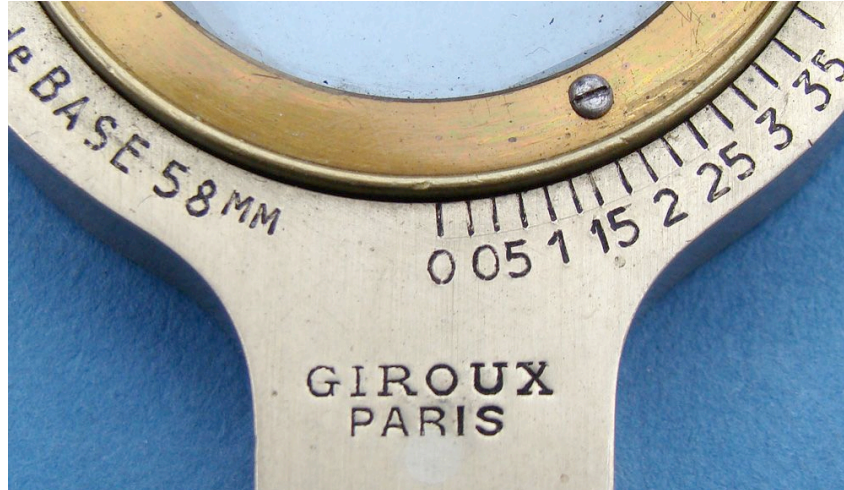
The inventor is certainly the same Dr. Scott who patented a mechanical garden pump which could be carried about the house “by an infant” to quickly water all the plants. We find that device and Scott’s Clyso Pump “for the removal and prevention of confinement of the bowels” being advertised in 1835 newspapers, “English prejudices having yielded to the wholesome practice of using Lavements....” Quite the inventor, Scott apparently held patents for ear cornets, safety razors, hot air disinfecting chambers (for clothes of smallpox patients), etc.

The makers are elusive, although surely connected with the S. Nye & Co. makers of mechanical coffee grinders, knife sharpeners, etc.

An unusual rather elegant form, in very fine condition, the original mahogany case fair. \$1450.



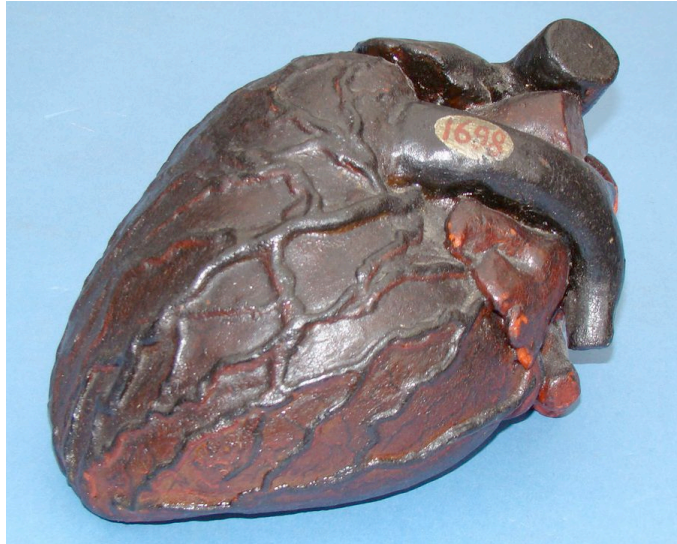
Catalogue 35. MECHANICAL POWERS DEMONSTRATION APPARATUS, possibly American, c.1850. Mounted on the 5" x 15" (13 x 38 cm) wood platform are a number of brass supports for levers, pulleys, etc., with calibrations in inches. Four brass weights are suspended by strings and fulcrum fittings to provide opposing forces of known amounts, enabling quantitative demonstrations of the laws of static equilibrium. The wood platform is pierced with slots for the weights to hang below, and is raised on four turned columns above a lower platform on four bun feet. Condition is good, noting that several weights (and pulleys?) are apparently lacking. The apparatus is unsigned, but has an American "feel" to it, and resembles rather closely mechanical powers assemblies illustrated in the 1848 descriptive catalogue of the famous New York maker and merchant, Benjamin Pike, Jr. \$2400.



Catalogue 36. THE "MOBILE PRISM OF CRETES WITH VARIABLE ANGLE" -- AN UNCOMMON OPHTHALMIC INSTRUMENT, French, c.1885, 5-1/2" (14 cm) overall, of plated brass, serial #41, precision made by Giroux of Paris. Twin rotating prisms permit direct measurement of the patient's degree of convergence and strabismic angle. Condition is very fine.

In 1872 the Parisian optician A. Cretes adapted Sir John Herschel's (the astronomer's) rotating double prism concept to create this useful but infrequently encountered instrument. \$1350.





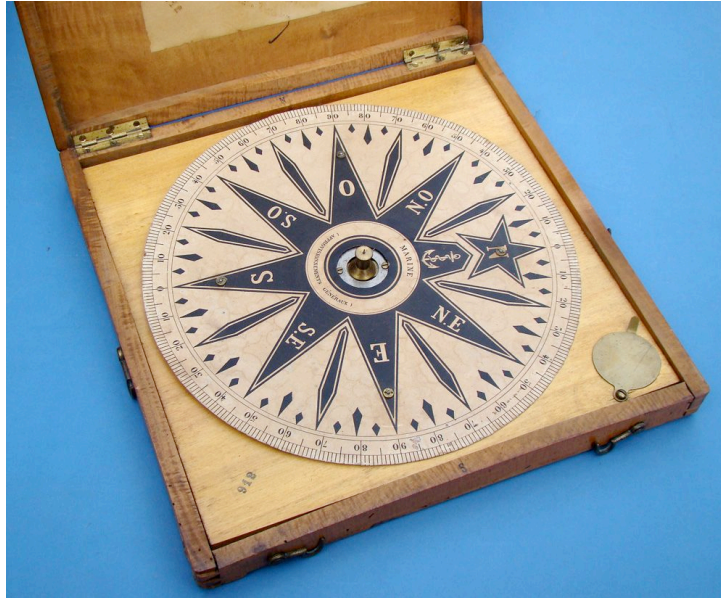
Catalogue 37.
FINE WAX
MODEL OF
THE HEART,
 probably 18th
 century,
 possibly by
 Chovet. This
 finely sculpted
 solid wax
 model is 7" (18
 cm) overall,
 colored in blues
 and reds,
 depicting the
 external
 morphology of



of the heart and the blood flow in and out. In the 19th century, this model was part of the collections of the Anatomical Museum of the University of Pennsylvania. It is probable that it formed part of Dr. Abraham Chovet's (1704 - 1790) figure of a man, with removable parts, which was made c.1775, and which upon his death in 1790 was sold to the Pennsylvania Hospital, and thence given to the U. of P. along with the rest of his collection of models, dissections etc. Most were destroyed by fire in 1884, but a few were preserved and finally deaccessioned. According to legend a wild scene occurred during the fire, with heroic "rescuers" hurling wax body parts, etc., from the windows of the burning building.

An extraordinary find, in excellent condition.

\$3500.



Catalogue 38. EMILE DUCHEMIN'S INNOVATIVE COMPASS CARD BY RÜHMKORFF, French, 1879, signed "Boussole Circulaire, Emile Marin Duchemin, Maison Ruhmkorff, No. 872," and "Marine (Approvisionnement Généraux)." The dry card is almost 10" (25 cm) in diameter, laminated to a mica sheet for rigidity, and mounted to a bar magnet plus two concentric circular magnets, with brass hub and stone (German onyx) bearing cap. Atop the hub of the card is a pivot to support the tiny magnetic test needle provided. Although ring shaped compass "needles" had been proposed much earlier, it was in the 1870's that Duchemin developed the present form, which was subjected to several years of sea trials by the French Navy, and subsequently ordered for official use. A rare form in very fine condition, with its original case and instructions. \$950.

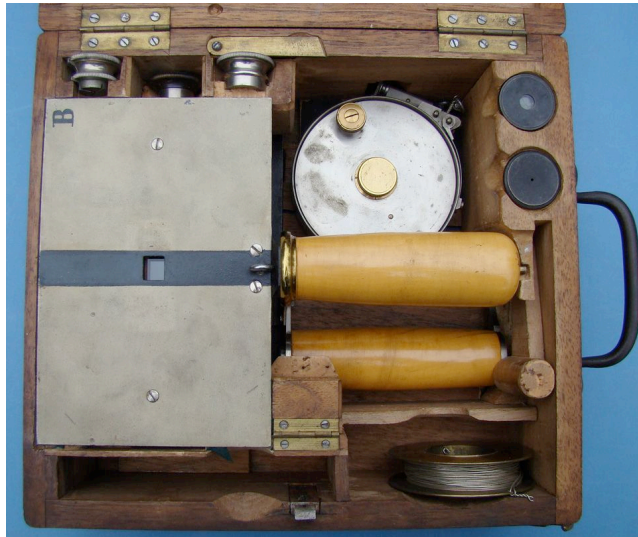


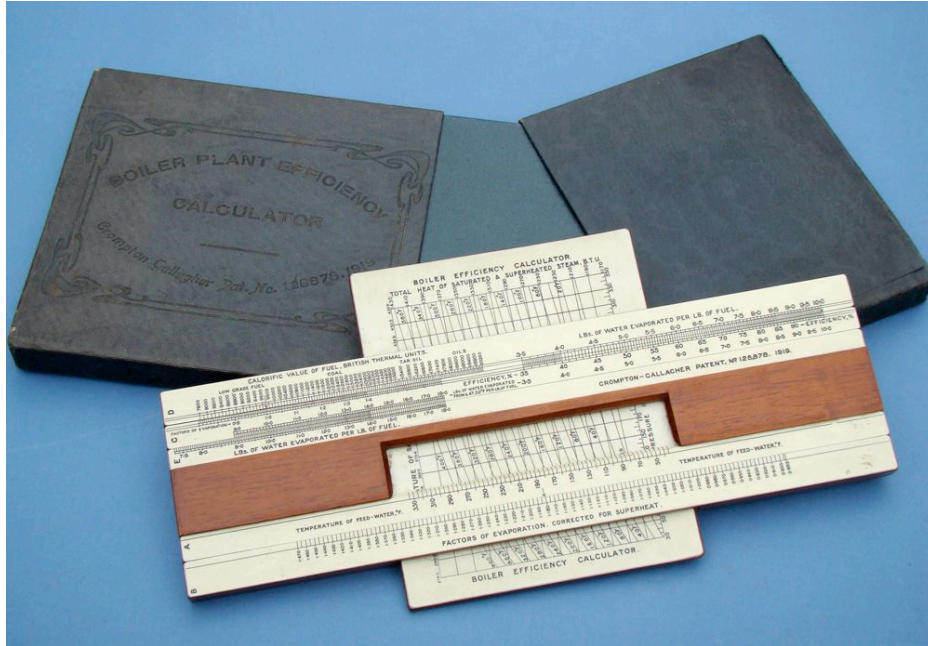


Catalogue 39. EXQUISITE FIXED-LATITUDE SILVER BUTTERFIELD-DIAL BY BUTTERFIELD, French, c.1700, beautifully signed "Butterfield à Paris." This relatively large 3" (8 cm) long, eight-sided dial is engraved with a chapter ring for 46° North latitude (that of Lyons and Geneva), with divisions every quarter hour from 4am until 8pm. The folding gnomon is set for this fixed latitude, and engraved both sides with floral designs atop an unusual architectural plinth design. Top and bottom surfaces are beautifully embellished with engraved decoration, including geometric patterns, running leaf-tip borders and images of vegetation and ripe fruit in abundance. A splendid, unusual example, in very fine condition. \$9800.

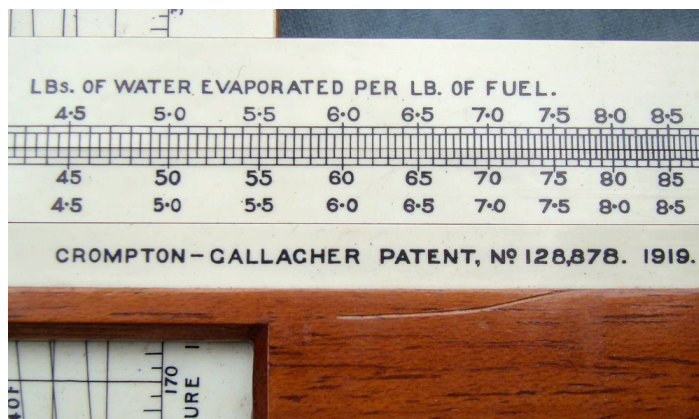


Catalogue 40. GOULIER'S TRIANGULATION TELEMETER OUTFIT, French, c.1870, signed "Tavernier Gravet, 39 rue de Babylone, Paris," serial #378. The 8-1/2" x 9-1/2" x 3-1/2" (22 x 24 x 9 cm) fruitwood case contains an elaborate telemetric outfit, as devised by Commander Goulier of the engineer corps, in 1864. Twin sighting paddles, made of plated brass with fruitwood handles, are connected by wire 40 meters long to establish a fixed baseline. Each paddle contains a five sided prism to give simultaneous orthogonal views. One paddle contains a lens element which can be interposed by rackwork, to deviate the beam and permit accurate triangulation on a distant object, the element cell moving against calibrated distance scales (for 20 and 40 meter baselines). The outfit includes a reel of extra wire, ten wire extension links, auxiliary eyepieces, and two curious tools. At one time such ranging apparatus was required of French artillery batteries. An unusual outfit, in fine condition. \$2400.





Catalogue 41. RARE BI-DIRECTIONAL SLIDE RULE, English, c.1920, signed, on the case and rule “Boiler Plant Efficiency Calculator, Crompton-Gallagher Patent No. 128,878. 1919.” The 10” (25 cm) long mahogany rule, with printed paper scales, has two horizontal sliders and one vertical slider, variously labeled “Temperature of Feed Water; Caloric Value of Fuel; Lbs. of Water Evaporated; Superheat Curves; etc.” A most elaborate rule, in very fine condition. \$895.





Catalogue 42. PIANO-SHAPED SOUNDING BOX, c.1900. Measuring 7" x 8" x 4" (18 x 20 x 10 cm), the black painted wood "piano" is mounted with a tuning fork in silver finish, and is stamped "A435." With turned wood legs, and sounding slots, it is an unusual acoustic device in fine condition.

The cryptic label is the acoustic frequency (435 vibrations per second) of the tuning fork and box. This was officially standardized as the value for "concert pitch", of A above middle C, by the French government in 1859. (This did not prevent individual orchestras and musicians from raising or lowering the frequency a bit, and today the official standard is 440 Hz.)

\$1550.





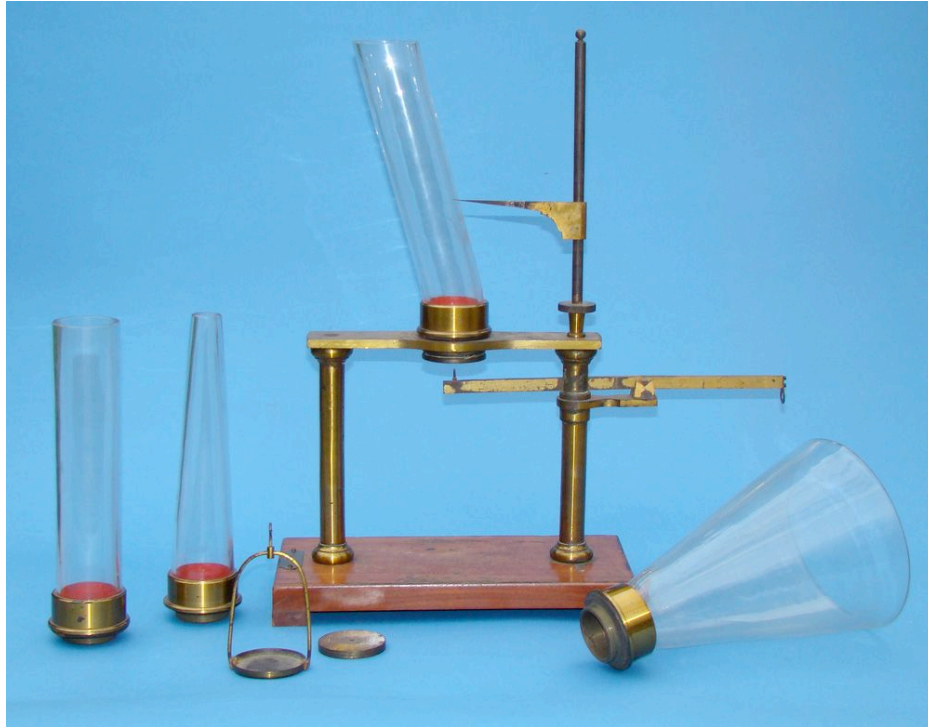
Catalogue 43. BENJAMIN BELL'S SPLIT-SHAFT PUNCH ELEVATOR, English, c.1795, 5-1/2" (14 cm) overall with tapered eight-sided wood handle. Introduced in 1789 by the innovative surgeon Benjamin Bell (1749-1806), the steel instrument has twin curved elevators, toothed at one end, their separation adjustable by sliding ring (see Bennion, *Antique Dental Instruments*, p.41). A very rare instrument, complete and in fine condition. \$1200.



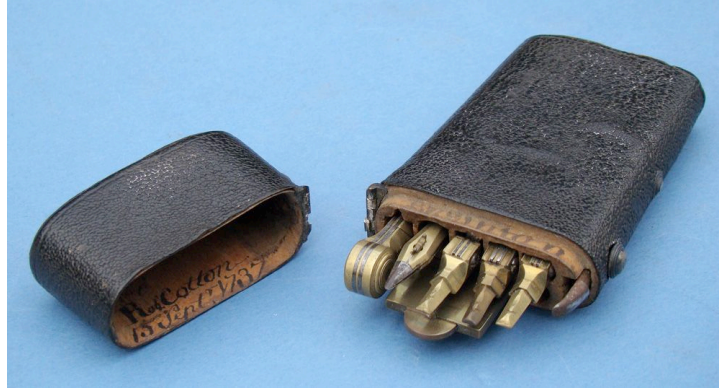
Механич. Отдѣленіе. В. М. Дѣпо.
№ 700 1836.

Catalogue 44. FINE RUSSIAN PROTRACTOR, 1836, signed in Cyrillic, serial numbered and dated. Measuring 6" (15 cm) across, of clear lacquered brass, the protractor is decoratively shaped and divided every half degree. It is contained in the original mahogany case lined in green velvet and satin, with gold trim, equipped with a part set of drafting instruments, including a pair of dividers with a fine five-leaf hinge in brass and steel. Condition is fine noting scratches to the lacquer on the protractor. Russian instruments are uncommon, this a fine example, beautifully signed.

The expanded engraving translates as "Mechanical Department of the Military Topographical Depot, No. 700, 1836." This department was set up in St. Petersburg by the master mechanic A. Sperling, who during the 1830's was producing all manner of high quality surveying instruments. \$950.



Catalogue 45. PASCAL VASES OUTFIT, German, late 19th century, signed "C. Gerhardt, "Bonn." Constructed of bright lacquered brass with four interchangeable blown glass "vases," the apparatus is mounted to a 5" x 10" (13 x 25 cm) mahogany base. An adjustable pointer rides on a calibrated column, and a balance beam supports a brass plug on one end and a hanging pan on the other. Condition is fine noting various stains to the finish. In use one fills the container until water just begins to seep through the base, indicating that the water pressure is just balancing the weighted pan. One finds this condition occurs for the same heights of water regardless of the shape of the container, thus establishing the hydrostatic principle. A good example of the apparatus. \$2200.



Catalogue 46. MINIATURE DRAFTING SET BY THOMAS WRIGHT, English, c.1735, signed on the sector "T. Wright, Fecit" and in ink on the case interior "Robt. Cotton 15 Sept. 1737" and "P. Dunhabin, cost £3.3.0." Bound in black fishskin with silver mounts, the pocket case measures 3-1/2" (9 cm) tall and only 5/8" (1.6 cm) thick. It contains a fine pair of compasses in brass and steel, with five-leaf hinge and interchangeable divider point, pencil holder, ink pen, and dotting wheel, the latter three articulated. There is also a finely turned ink pen with removable scriber point in the handle. Finally there is the miniature sector with folding strut; it is divided on the external edge in inches by tenths, on one side with scales of inches and diverging lines of equal parts ("L," the line of lines) and of regular polygons, and on the other face with a lovely spartan set of sector lines of equal parts. Condition is very fine noting one small tool lacking, and the case hinge separated.

The maker, Thomas Wright (c.1686 - 1748), was successor to Rowley and famed for his orreries and fine mathematical instruments. The owner could be one Sir Robert Cotton (1669 - 1749), great grandson of Sir Robert Bruce Cotton, the Elizabethan antiquary who formed the renowned Cottonian Library which was eventually transferred to the nation in 1702.

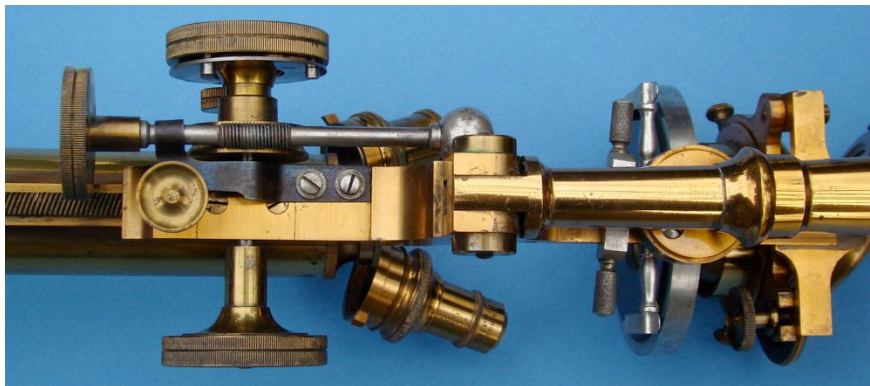
\$3950.





Catalogue 47. THE GRIFFITH CLUB MICROSCOPE, American, c.1890, signed on the base "E.H. Griffith, Pat. Dec. 14, '86, Rochester, N.Y. #1070." Made of golden lacquered brass with nickel plated fittings, this handsome instrument extends from 12" tall to 16-1/2" (30 to 42 cm) by drawtube and racked focus. A setscrew acting against a spring engages the unusual worm and ring gear fine focus action. A separate thumbwheel acts as a clutch against the main focus knob. This unusual instrument is equipped with one ocular, double nosepiece carrying a signed Griffith objective (#355) and a signed Bausch & Lomb objective, black glass stage with synchronized slide clips, clampable swing away substage condenser cell with two dimensional centering motions, signed Griffith achromatic condenser, and double mirror on swinging tailpiece calibrated in degrees. The microscope stands on three ball feet to a tapered pillar, with hinged joint 6" off the table top. This pillar breaks down to permit direct mounting of the microscope to a table, and inverted use of the base as a slide preparation turntable, complete with its spring-loaded slide grips (see illustration in Padgitt, p. 117). The microscope is stamped throughout with assembly #20. There is no case. Condition is very fine, noting the mirror and cell are replaced.

Designed by Ezra H. Griffith of Fairport, N.Y., and manufactured by Bausch & Lomb, the Club microscope is uniquely American. Few examples are known; serial #1069 is in the Billings Collection. An excellent example of one of the rarest of American microscopes. \$9500.



E.H.GRIFFITH. PAT. DEC. 14. 86.
ROCHESTER. N.Y.
1070



Catalogue 48. THE “SPEEDY CALCULATOR” -- A SEEMINGLY UNRECORDED SPIRAL SLIDE RULE, c. early 20th century, signed three places on the wood housing “Speedy Calculator, Bté. S.G.D.G.” Measuring 19” (48 cm) wide overall, the calculator has a golden oak housing, celluloid window with cursor line, twin pointers on double metal slides, external button, and two large logarithmic drums, independently rotatable. Condition is good, the drum rotation now quite tight. The machine apparently uses twin drum scales in direct analogy to twin sliders on a straight in-line slide rule, for all matters of multiplication and division. Possibly of French manufacture for the English market (or vice-versa ?), we find no example of this machine in the catalogues of the Science Museum and C.N.A.M. collections, nor any record in the standard literature, including Cajori’s comprehensive list. \$2850.





Catalogue 49. EXQUISITE POCKET COMPASS / DIAL, English, early 18th century.

Made of brass, 3" (8 cm) in diameter, the dial has a finely shaped folding gnomon, chapter ring divided every five minutes from 4 am to 8 pm and with lovely running leaf tip and "bubble" decoration, glazed compass with elegant needle and a splendid compass



rose and degree scale engraved directly on the brass, plus the original domed brass cover decorated with concentric rings. Condition is very fine and all original throughout. This is one of the finest examples of the circular pocket compass / dial we have seen. It is very much in the c.1720 style of William Deane and of Richard Glyne. \$3950.





Catalogue 50. FRESNEL MIRRORS FOR INTERFERENCE OF LIGHT, probably Continental, c. second quarter 19th century. The two front surface mirrors are made of thick black glass held in a precision mount of bright lacquered brass, 7-3/4" (20 cm) wide. The mirrors are spring-loaded against three thumbscrews for fine adjustment of tilt. There is a hinged mounting bracket to the rear.



Condition is very fine noting one small corner chip. The original shaped wood case is covered in decorated black leather and lined in green velvet with braiding, fine except for external scuffing.

In use one reflects a single light source from both mirrors simultaneously, and observes light and dark bands in the projected beam, provided there is a very slight angle between the planes of the mirrors. The banding is the direct result of interference of light, and disappears when either mirror is covered up. This experiment, devised by Augustin Jean Fresnel (1788-1827), was the *experimentum crucis* of the wave theory of light. A splendid early example of Fresnel's mirrors.

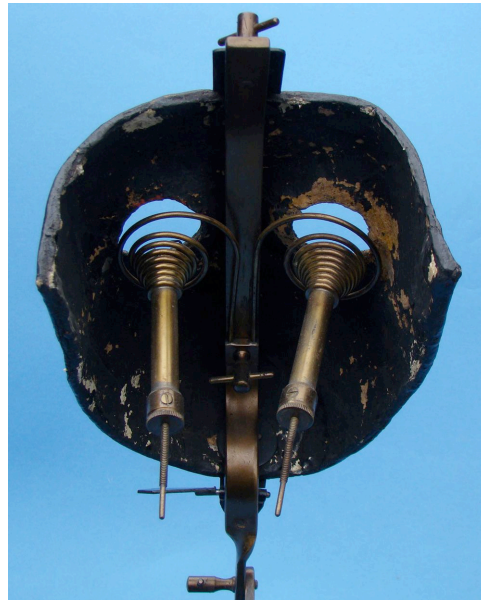
\$1900.



Catalogue 51. SOLAR / LUNAR ALMANAC SNUFF BOX WITH RUNIC CALENDAR, Swedish, 1787, signed "Runstafwen försvvenskad 1787 4/1; En beständig Almanach. C: Norman." Made of pressed brass with a heavily tinned interior, this unusual box measures 5" x 2-1/4" x 3/4" (13 x 6 x 2 cm). For each month it gives a line of week days (A through G, repeating); a corresponding line of intermingled numbers (days of month from 1 to 31) and letters (19 of them, adapted from runic almanacs and giving a sequence of golden numbers); and a wonderful line of pictorial symbols for saint's days, festivals, and seasonal images. Condition is fine noting some wear and minor denting. A. Turner, in the *SIS Bulletin* (No. 36, p.18), has translated the inscription as "The Runic calendar made Swedish 1787 April 1; A perpetual almanac C. Norman," and illustrates and describes this very example. He finds that the letter / number sequence has a cycle of 29 days, thus representing the lunar month on the same scale. Unusual. \$1350.



**Catalogue 52. WHOLE-FACE OPH-
THALMOPHANTOME**, probably
American or French, c.1900.
Standing 17" (43 cm) tall, the
articulated brass stand has a
circular black-enameled cast iron
base, clear enameled brass linkage
with two clampable joints for
tilt, two clamps for the mask,
and clamp holding the twin
spring-mounted adjustable
eyeholders with pincers. The 6" x
5-1/4" x 3" mask itself is made
of hard papier maché, well shaped
and black painted. The apparatus
is complete and in very fine
condition throughout, noting
many old retouchings to the
mask's finish. Designed for
students of ophthalmology to
practice, the ophthalmophantome
is a marvellous object of medical
science and of art, especially
rare in its whole-face form. \$5800.





Catalogue 53. WIGZELL'S SEA SOUNDER, English, early 20th century. Contained in the original 27" (69 cm) long wood case is the metal sounding tube with internal transparent tube, rope sling with shackles for attachment to a sounding wire and to a sinker weight, wood rule calibrated with fathom scale (from 5 to 100 fathoms), and instruction label with barometric corrections. The system permits accurate depth sounding based on the compression of air in the tube by the pressure of water at depth. In fine condition. \$1250.

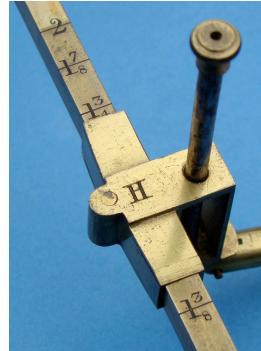
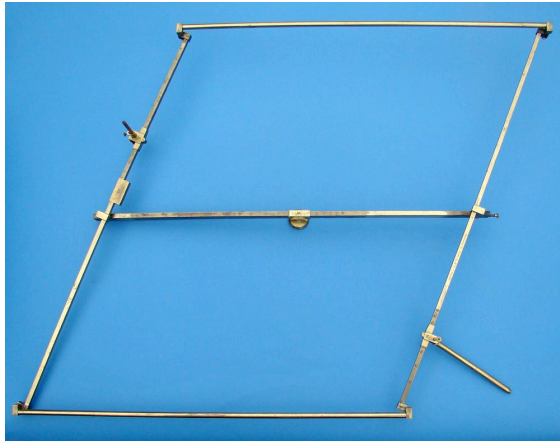




Catalogue 54.
**IMPRESSIVE
AMERICAN
VACUUM PUMP,**
second quarter 19th century, unsigned but by Wightman of Boston. The pump stands 19" (48 cm) overall, handsomely constructed of mahogany, brass, and bronzed iron, with rosewood handle, and incorporating four graceful turned wood pillars with brass caps. An additional 12" bell jar, of purplish glass with knob and ground rim, mounts atop the pump. The pump is designed with a single cylinder being lifted along two parallel guide rails, against a fixed piston, by large handle linkage. There is a stopcock below the table and thumbscrew valve adjustment to the front. It is a handsome pump, in fine condition throughout.

Joseph Milner Wightman entered the business of manufacturing and selling philosophical apparatus in Boston, in the early 1830's in partnership with Timothy Claxton. He took over the business in 1835, and proceeded to supply schools and laboratories with fine apparatus of his own design and manufacture. His speciality was the single barreled air pump (see *Rittenhouse* 6, 65). We are aware of two surviving examples -- the splendid one offered here, and a quite similar signed example sold 32 years ago (see **Tesseract Catalogue B**, Item 63). \$5950.

Invented & Made by W & A. Smith.



N^o 332. 1 8 1 7 1 6 1 5

Catalogue 55. SMITH'S EARLY EIDOGRAPH, English, c.1840, signed "Invented & Made by W. & A. Smith, No. 332." This all brass eidograph -- an improvement on the pantograph -- assembles into a rectangle 20" x 22" (51 x 56 cm) with crossbar. Various reduction and enlargement ratios are given on the crossbar (for setting the pivot), along one arm (for setting the pointer with handle), and along the opposite arm (for setting the pencil holder). The outfit includes pivot rest, sliding weight, tracing point, pencil holder, and original mahogany case. A most uncommon form, in fine condition, the brass retaining most of its original clear lacquer finish. \$1600.





Catalogue 56. DANIELL'S REGISTER PYROMETER, English, c.1830, made of brass, 5-3/4" (15 cm) long, with inlaid silver scale and vernier on articulated long arms. The scale is divided in angular degrees from 0° to 32° by thirds; the vernier is divided to one arcminute, and is mounted on an arm spring-loaded to return to 0°, and with a steel knife-edge index. A brass trough would hold the heated sample. Condition is very fine, noting some spotting to the brass, complete with the original shaped fitted mahogany case.

This precision pyrometer was invented in 1830 by John Frederic Daniell (1790 - 1845), first professor of chemistry at King's College, London, known also for his efficient zinc-acid battery and his popular dew-point hygrometer. It is based on the contraction of a clay block with increasing high temperature, and is a rarely seen precision instrument for temperature measurement. \$1400.



Catalogue 57. SPECTACULAR OVAL DIAL, English, c.1700, probably by Edmund Culpeper. Measuring 3-1/4" x 2-5/8" (8 x 7 cm) this large oval brass pocket dial has a main plate engraved with three chapter rings (for 45, 51, and 55 degrees latitude) and embellished with heads of mythical creatures emerging from elaborate foliate bodies, folding double-bird gnomon adjustable for latitude (with 40° - 65° latitude scales on both sides), and inset glazed compass with a beautifully engraved compass rose on brass, and $\pm 20^\circ$ scale of magnetic declination. The base is plain but for a decoratively engraved spring plate, and button to directly rotate the compass base for declination adjustment! Condition is excellent, complete with the original fishskin covered case in good condition showing some losses.

The attribution to Culpeper is on stylistic grounds. The numeral shapes certainly place this as late 17th / early 18th century English. And the decoration can be compared in detail with **Tesseract** Catalogue 14, Item 17 (and C46-14).

An exceptional dial.
\$6500.





Catalogue 58. FOLDING STANDARD METER, French, 1849-1853, signed "Collot Frères à Paris," and with two French certification stamps. This unusual folding rule is made of hollow brass bar, with brass and steel hinge, opening to just over one meter in length (40-1/4"). It is divided in centimeters and millimeters, and has external stops at each end to serve as a master gauge for meter (and shorter) bars. Condition is very fine, the brass darkening slightly with age.

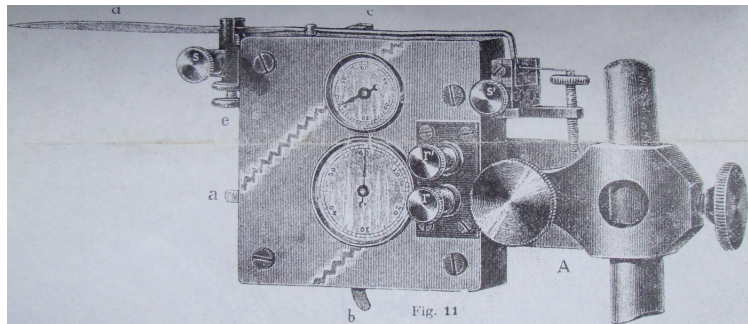
The name Collot appears in 19th century Paris directories -- one Collot was working in the 1820's as maker of scientific glassware and thermometers, and "Collot Frères" are listed as scale, weight, and measure makers starting in 1851.

The certification symbol used here is that of clasped hands, a handshake, certifying the measures on the rule. This mark, known as "à la bonne foi", was applied by the French department of weights and measures, and was a "good faith" assurance of the divisions. It was used in this form for only a period of four years. Unusual. \$1495.

ETS G. BOULITTE
INGÉNIEURS-CONSTRUCTEURS
15-21 R. ROBILLOT, PARIS, 13^e



Catalogue 59. PROFESSOR JACQUET'S CHRONOGRAPH, French, c.1900, signed "Boullitte" and in the case "Ets. G. Boullitte, Ingénieurs-Constructeurs, 15-21 r. Robillot, Paris, 13e." The 8-1/2" (22 cm) long fitted case holds this plated metal marking chronograph, with its 2" square spring-wound clockwork, pillar clamp, scriber arm, and tension controls. Twin dials show seconds and minutes. The mechanism can be set to deliver one tic mark every second, or every one fifth of a second! In use it would provide accurate timing on a drum recording of quantitative physiologic parameters (e.g., blood pressure, fluid velocity, muscle contraction, respiration, cardiac activity, etc., etc., even the motion of the larynx). Such measurements were highly developed by, and a particular passion of, the French medical system in the late 19th century (see the recording pneograph in **Tesseract** Cat. 16 Item 75, the myographe transducer in **Tesseract** 42-77, and the recording sphygmograph, also signed by Boullitte, 58-53). An unusual apparatus of medical diagnostics, in fine functional condition. \$1200.





Catalogue 60. INNOVATIVE LIGHTWEIGHT “AMERICAN HISTOLOGICAL MICROSCOPE” BY ZENTMAYER, late 19th century, signed on the base “J. Zentmayer, Phila., Pat'd. Aug. 15, '76.” The microscope extends from an overall height of 11” to 16” (28 x 41 cm) by racked coarse focus and drawtube. With its unusual conical support pillar and patented swinging substage with removeable aperture and double mirror, this is a fine example of Zentmayer's “American Histological” stand. It is a lightweight version, with an innovative base made of black enameled aluminum, the newly available miracle metal. Limb and fittings are of bright lacquered brass, the main tube of blackened brass. The microscope features rear pillar fine focus, and the possibility of above stage illumination, with the mirror arm rotatable about a center lying in the specimen plane. Accessories include two oculars, three objectives, finely made stage forceps with ball mount, live box, and original walnut case. This is a handsome stand in an unusual combination of materials and finishes, in very fine condition. We note that Joseph Zentmayer produced this model in all brass (see **Tesseract** Cat. 35 Item 10), and with an iron base (Cat. 32 Item 17). \$2250.





Catalogue 61.

**EXCEPTIONAL
EIGHTEENTH
CENTURY
LEVELLING
GRAPHOMETER,**

French, c. mid-18th
century, signed "Lasnier
à Paris."

This 7-1/2" (19 cm) wide brass graphometer has two fixed sights and, on the rotating alidade, two tall sights with twin verniers reading to one arcminute against the semicircular degree scale.

An inset compass has a silvered scale divided every degree. Mounted underneath is an ingenious, spring-loaded plumb surmount and brass plumb; when flipped into position it extends 3" below the graphometer, and provides accurate leveling of the instrument. It is a clever innovation which we have found on no other graphometer. The universal staff mount below is contemporary 18th century but not original. The main plate of the instrument is pierced and engraved with fantastic floral designs. A beautiful, ingenious instrument, in fine condition. Marcelin records brothers Pierre Alexis and Charles-Henri Lasnier active in mid-18th century Paris.

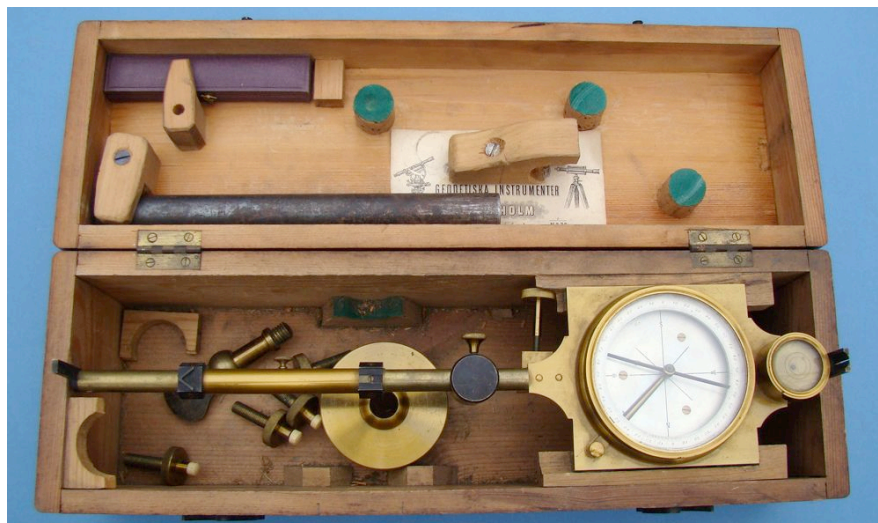
\$3950.





Catalogue 62. SWEDISH MAGNETOMETER, third quarter 19th century, signed on the trade label "Frans I. Berg, Geodetiska Instrumenter, Stockholm, No. 76 Drottninggatan." Made of bright lacquered brass with silvered compass and blackened brass fittings, this fine instrument measures 14-1/2" (37 cm) overall. It features long sighting arm with sight vanes and two sliding holders for magnetic needle and for large iron rod, circular spirit level now dry, glazed compass with circle divided every half degree, clamp and tangent screw azimuth motion, and mounting head with four horizontal adjusting screws. The original fitted case contains the cased magnetic needle, massive iron bar, plus four leveling screws and auxiliary staff head (for which an adapter may be lacking). Condition is very fine throughout.

Frans Johan Berg (1825-1898) founded in 1850 a successful business in surveying and mining instruments. A prospecting compass and several leveling tubes by Berg are in the collections of the Royal Swedish Academy of Sciences (see Pipping). \$2800.



REEVES'S PATTERN FOLDING TELESCOPIC ALIDADE. Nº 8062.

Catalogue 63. AN EXPLORATION OUTFIT WITH TELESCOPIC ALIDADE ON PARALLEL RULE.

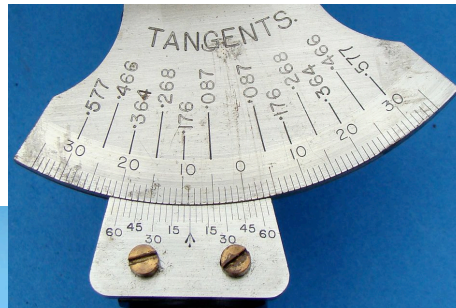
English, c.1900, signed "C.F. Casella & Co., Ltd; 11, 13, 15 Rochester Row, London S.W." and "Reeves's Pattern Folding Telescopic Alidade, No. 8062." The platform is brass, 20" (51 cm) long, with parallel rule motion and twin spirit levels (one cracked) for use on a plane



table. The hinged telescope has sliding focus to the eyepiece and objective lenses, reticle, and vertical arc with degree and tangent scales, and five arcminute vernier. Condition is very fine, complete with the original fitted mahogany case and sturdy outer canvas carrying case (stenciled for the owner "I.N. Dracopoli, F.R.G.S.")

Ignatius Nicolas Dracopoli (1887 - 1923) authored, in 1914, *Through Jubaland to the Lorian swamp; an adventurous journey... in the unknown Africa...* He had traveled on safari for four months through extremely difficult "closed" territory unseen by white man. Among his limited instrumentation taken overland, he lists one "Plane table with folding telescopic alidade." And we note that in 1912 he was writing of the advantage to explorers of taking courses in Geographical Surveying from a Mr. E.A. Reeves at the Royal Geographical Society in London.

A splendid example of a less common exploration instrument, with remarkable provenance to very remotest Africa. \$2950.

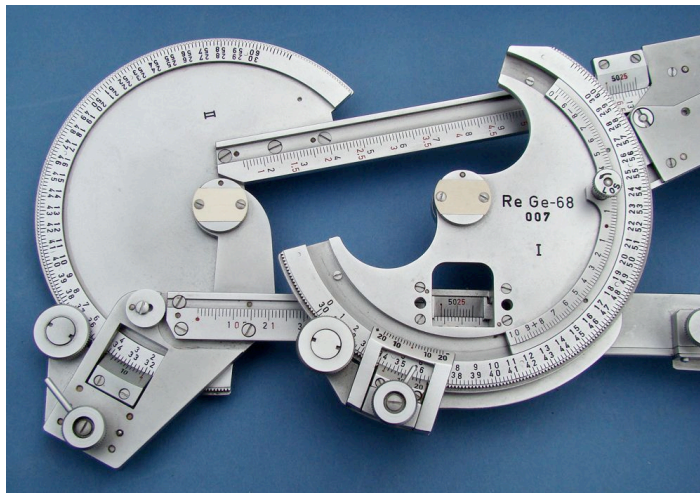




Catalogue 64. COMPLEX ANALOGUE COMPUTER, German, mid-20th century, marked "Re Ge-68, 007." Made of plated steel, 15-1/2" (39 cm) long overall, the computer has twin calibrated circular arcs with geared clampable followers linked by three calibrated linear arms. There are eleven graduated scales plus six vernier scales with a total of eight readouts. There are seven clampscrews and three knurled rotator knobs.

Condition is excellent, as new, complete with waterproof carrying case and photocopy of cryptic instructions. A remarkable linkage, in fine condition, awaiting mathematical deciphering.

\$1500.



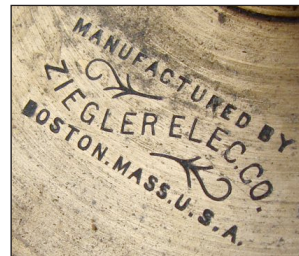
Catalogue 65. FLOWERS ON AN AMERICAN AIR PUMP,

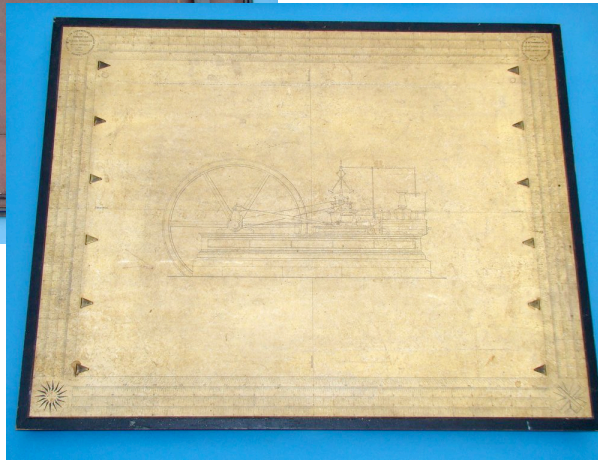
second half 19th century, signed by the maker on the baseboard and on the cylinder "Manufactured by Ziegler Elec. Co., Boston, Mass.," and by the retailer on a stopcock "Jas. W. Queen & Co." The pump is mounted on a massive beautifully grained walnut platform 13" x 25" (33 x 64 cm), sitting on four turned wood feet. The pump lever action is made of cast iron, red enameled and decorated with painted pinstriping and delicate flowers in red, white, gold, and green. This action has a turned wood handle, and sits atop a fine turned wood pillar, with an overall height of 23". The action drives a linkage giving vertical motion to a



the large cylinder of lacquered brass, with its oil cup and oil overflow reservoir. Piping and stop cocks lead to the iron receiver plate, mounted with a fine hand blown glass bell jar with knob and ground base. Condition is very fine throughout, noting one very small chip.

This form of lever air pump was retailed by J.W. Queen and Co. of Philadelphia -- we find it listed in their 1881 catalogue of Physical Instruments, for example. It is a most elegant and decorative instrument, with its combination of materials and forms, and artistic decoration. \$2400.





Catalogue 66.

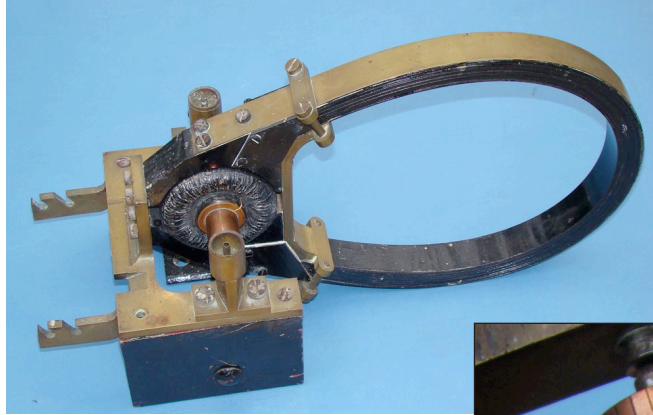
**PRODUCTION
MODEL OF CHAM-
BERLIN'S
IMPROVED
DRAUGHTING
BOARD,**

American, c. 1850,

signed "Chamberlin's Improved Draughting Boards, Patented Dec. 1849." The large 23-1/4" x 29-1/4" (59 cm x 74 cm) board is made of red stained wood with a rectangular ebonized wood frame (for T-square use). Permanently mounted to the front is a large print with various protracting and linear rule edge scales on all four sides, plus signature and decoration cartouches to the corners, plus a large central image of a steam engine. Twelve brass finger clips (to hold down the drafting paper) rise above this surface, controlled by two edge bars and a large oval spring ring to the rear. Condition is fine noting a few scratches and rubbing, and some warping. This is a very rare example of the plane table / drawing board invented by Henry W. Chamberlin of Pittsfield, Massachusetts in 1849 -- the first production model we have seen, although we had Chamberlin's original patent model in **Tesseract** Catalogue 55 Item 35.

\$1950.





Catalogue 67. RARE GRAMME

DYNAMO-ELECTRIC MACHINE BY BREGUET, French, c. third

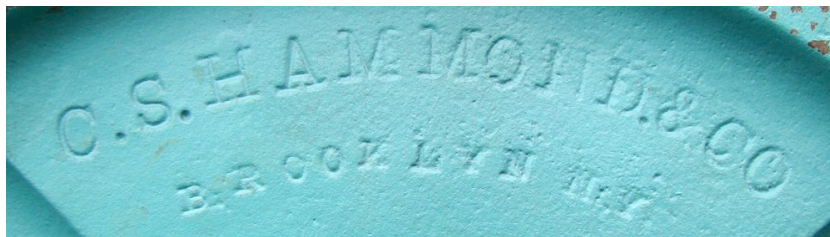
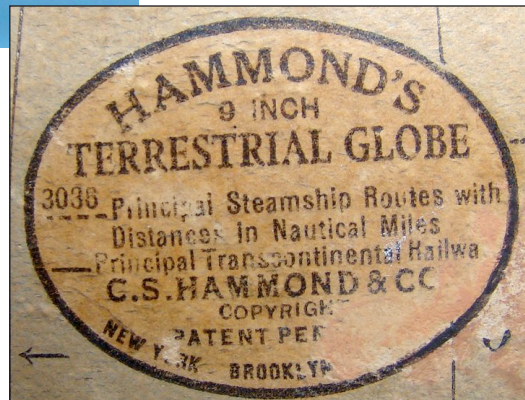
quarter 19th century, signed "Gramme Inv'r., Breveté S.G.D.G., Breguet Ft., No. 121, Aimant Jamin, B'te S.G.D.G." (i.e., Invented by Gramme, patented; Made by Breguet; serial # 121; Jamin magnet, patented). It measures 19" x 8" x 10" (48 x 20 x 25cm) overall, and has a large brass-bound permanent magnet made up of many iron strips, as invented by Jamin, an adjustable rotating 3-1/4" diameter wire coil, with attached pulleys and commutator, and brass and wood mounting blocks. Gramme's "motor" was used as a dynamo, a generator of electricity, by turning his ring armature within the strong field of the Jamin permanent magnet. Gramme developed the winding which made this possible. The condition of the piece is reasonably good, now lacking the brushes.

According to the Larousse encyclopedia, Zénobe Théophile Gramme (1826 - 1901), born in Belgium, was the inventor of the first industrial dynamo which permitted the production of an electric current. Quoting from Knight's *New American Mechanical Dictionary* (1883) "The Gramme machine ... consists of a permanent field magnet, between the poles of which are armatures of peculiar construction, formed by coiling around a soft-iron core a wire of copper, forming the entire coil into an endless bobbin, in the shape of a cylinder or ring; the wire being provided at suitable intervals with metallic rods or conductors for allowing the proper exit of the electric current generated. These rods extend axially of the core, and at their ends on diametrically opposite sides of said axis connect with two rolling commutators which lead to line." His machine was particularly important in powering early electric lighting.

Jules Célestin Jamin (1818 - 1886) was of course the inventor of the very efficient permanent magnet using multiple iron straps. He was lecturer in physics at the Ecole Polytechnique from 1851 to 1880, and published a three volume course of physics. And Breguet was the famous French firm of horologists, eventually with a specialty in electromagnetic devices. Breguet had built Jamin's magnet in 1847, and collaborated with Gramme, in 1872, to make these first dynamos. \$4800.



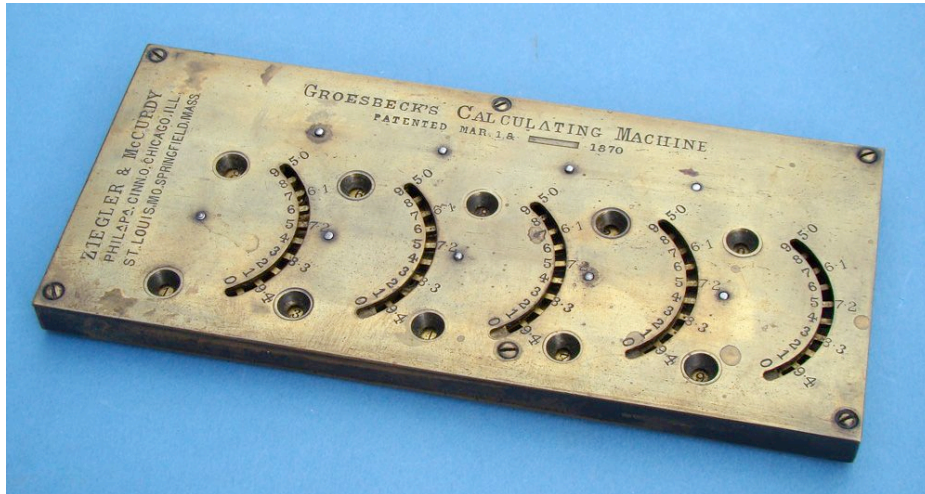
Catalogue 68.
AMERICAN GLOBE ON
SCULPTURAL STAND, c. 1930,
signed "Hammond's 9 inch
Terrestrial Globe." The globe is a
hollow metal sphere, 9" (23 cm) in
diameter, mounted with paper gores
printed in pale colors. It rotates
within a 360° inclinable meridian
ring divided every degree, on a most
sculptural base signed underneath
"C.S. Hammond & Co., Brooklyn,
N.Y." Ring and base are made of
cast iron with an attractive finish
simulating the green of ancient
bronze. The overall design is that of
Classical Revival. Condition is fine
noting a couple of stains and light
browning but no dents to the globe.
An attractive desk globe. \$850.





Catalogue 69. MECHANICAL PELICAN WITH SCREW MECHANISM, Continental, c. 1800, made of shaped steel with finely-grained hardwood handle, 5-3/4" (15 cm) overall (extending another 1" in adjustment range). This tooth extracting "pelican" is constructed with a symmetrical bolster with three ranks of serrated teeth, and a swiveling claw with offset arm and serrated two-pointed tip. A long screw is driven by turning the hardwood handle, which advances the claw arm (which is attached by a hand-cut eight-sided steel nut). Condition is fine and all original, noting minor pitting.

The screw mechanism makes for a "universal" pelican, obviating the need for multiple claws or multiple bolsters. We have had several pelicans over the years, and Bennion illustrates several forms with screw mechanisms. None are exactly like the present example, although a rather similar one is found in the Museum of the History of Science at Oxford. \$3500.



Catalogue 70. GROESBECK'S CALCULATOR, American, c. 1875, signed "Groesbeck's Calculating Machine, patented Mar. 18, 1870; Ziegler & McCurdy, Phila., Pa., Cinn., O., Chicago, Ill., St. Louis, Mo., Springfield, Mass."⁵⁵ This sturdy brass-cased instrument measures 6-5/8" x 3" x 3/8" (17 x 8 x 1 cm), with five entry wheels (each labeled from 0 to 9 upwards, and then half as often from 0 to 4, and from 5 to 9, downwards). There are ten readout windows (five addition and five subtraction). Condition is fine and functional, noting some stains to the reverse.

Groesbeck's cogged disk machine, which is an evolution from Pascal's mid-17th century and from Dr. Roth's mid-19th century forms, is of great rarity, and was barely known to Martin (*Die Rechenmaschinen und ihre Entwicklungsgeschichte*, 1925). \$3200.





Catalogue 71. FINE RAYSKIN-COVERED TWIN-POWER MONOCULAR, English, late 18th century. Opening from 3-1/2" to 5-1/4" (9 - 13 cm), the brass telescope has Galilean optics with a fine triplet objective, twin eye lenses on a swivel mount separated by dust stop, and replaced dust cover for the objective. The main tube has its original beautiful green rayskin binding. A lovely telescope in fine condition. \$1150.

GENAILLE ED. LUCAS B ^{te} s. g. d. g.		5	8
1	0 5	0 8	
2	1 0	1 6	
3	1 5	2 4	



Catalogue 72. “LES RÉGLETTES NÉPÉRIENNES,” French, c. 1885, the set of ten true Napier’s rods made of wood sticks 4” (10 cm) long covered on all four sides with printed paper scales, by Genaille and Lucas, in very fine condition housed in the original somewhat worn box with original printed label and instructions. These Napier’s “bones” permit easy multiplication of multi-digit numbers. Very rare, even rarer than the rod designs invented by Genaille. \$2800.



Catalogue 73. PRISTINE AMERICAN AMPUTATION SET, c. 1875, signed “G. Tiemann & Co., 67 Chatham St., NY.” This two-layer field set is contained in a fine mahogany case measuring 15-1/2” x 4-3/4” x 2-1/2” (39 x 12 x 6.5 cm), with inset owner’s plaque engraved “Dr. John E. Combs.” The fitted interior is lined in red velvet and contains Satterlee’s capital amputation saw, metacarpal saw, straight bone forceps, long Liston knife, two double-bladed Catling knives, scalpel, tenaculum, artery forceps with twin slide-catch, and Petit’s spiral tourniquet. All tools are original and signed “Tiemann,” with polished steel working surfaces and checkered ebony handles. A small compartment even holds suture material.

George Tiemann’s firm changed addresses, as well as trade label designs, several times during the successful expansion of its manufactory and sales premises in New York City. The 67 Chatham Street address, a corner building in lower Manhattan, was in place from 1864 to 1886 (see Edmonson and Hambrecht’s introduction to the 1989 centennial reprint of Tiemann’s *American Armamentarium Chirurgicum*).

An American special purpose amputation set, in excellent condition throughout.
\$5950.



Catalogue 74. MINIATURE ITALIAN MONOCULAR, c. second half 18th century, signed "Angelo Deregni." Opening from 2-1/4" to 3" (5.7 - 7.6 cm), this little telescope is made of pasteboard with light and dark horn fittings, the main tube bound in vellum stamped with oval portraits, floral patterns and rococo panels. It is equipped with Galilean optics giving good erect images of low magnification. Condition is fine noting an age crack and minor chips to the eyepiece mount.

Little is known of the maker, who was apparently an 18th century Northern Italian contemporary of Leonardo Semitecolo, and of Olivo of Venice. Telescopes by Deregni are recorded in the Websters' index, but this is the smallest signed example by any of these makers that we have seen. \$950.



Catalogue 75. POND'S SPHYGMOGRAPH -- A RARE AMERICAN INVENTION, c. 1880. This 5-3/4" (15 cm) tall mechanical linkage is made of nickel plated brass, with a blue non-metallic "handle." A plunger rests on the radial artery, and a double lever (with five thumbscrew adjustments!) amplifies the motion to a delicate scriber point which rests on a sheet of smoked mica(!) The mica recording sheet is driven through friction rollers by the miniature spring wound motor. The outfit is contained in the original walnut case, complete with four mica strips in a fitted compartment, a small charcoal block, and a lovely silver depressor (perhaps associated, perhaps for controlling the arterial flow) signed "Geo. W. Shiebler & Co., New York, Sterling." Condition is very fine and functional throughout.

This most rare recording sphygmograph was invented by Dr. E.A. Pond (or Pound) of Rutland, Vermont, in 1878. Marey (1881) described it as a most elegantly constructed device, and Davis (1981) illustrates one in the NMAH collection. \$5500.

* * *





Catalogue 76.
UNUSUAL
REFRACTING
TELESCOPE
OUTFIT, French,
 c. mid-19th century,
 signed "Lunette
 Parabolique,
 Inventé par
 Fattorini, Op'en.,
 breveté en France et
 en Angleterre, rue

N've. Breda 22, à Paris." The 11" x 5" x 2-3/4" (28 x 13 x 7 cm) French walnut box contains the full outfit, with its 12-3/4" (32 cm) long (open) lacquered brass telescope with dust cover, racked focus, air-spaced doublet achromatic objective, and stackable eyepiece system, the first a two-element eyepiece giving good inverted images, the second a two-element system which when added results in erect images of higher magnification. Also stowed in the case is the lacquered brass tripod stand with brass pillar and articulated dovetail head. Condition is excellent throughout noting only light wear to the finish.

The innovative maker and his telescope system are somewhat elusive to research. Antonio, and Joseph, Fattorini (sic) appear as barometer makers in mid-19th century England (see Goodison and the Websters' Index). And for example, Thomas Fattorini Ltd, established 1827, is still in business in Birmingham, as medallists, sword makers, etc. But we find only a single reference to such a Parisian telescope maker in the standard references: at the 30 April 1849 meeting of the French Academy of Sciences, one Monsieur Fattorini presented an astronomical telescope smaller yet with the same "power" as larger ones, and did this in the presence of Commissioners Arago, Babinet, and Laugier. The street "Neuve Breda" no longer exists by this name, but in 1838 it was described as running between the rue des Martyrs and place Breda, in the north of Paris, and as having been built about 10 years earlier, in an area of vacant land already being



filled with beautiful houses. As a further puzzle, what could be parabolic in Fattorini's optical design? Or was he capitalizing on the popularity of the term at the time (as in the high quality parabolic mirrors of reflecting telescopes)? A fine example of an innovative telescope.
 \$3950.



Catalogue 77. GOOD EARLY LODESTONE, probably Continental, 17th or early 18th century, measuring 3" x 2" x 1-3/4" (7.5 x 5 x 4.5 cm) overall, with its brass-bound natural magnetite stone and iron pole pieces. It has a brass suspension ring, twin portals for viewing the stone, decorative shaping to the caps, and floral wreath engraving to two sides. The stone retains considerable magnetism, and there is an associated keeper with tassel. Condition is good and all original, noting numerous dents and scratches to the brass. Overall it is a handsome example of this most important navigational aid, considered almost "magical" at the time, with its power to remagnetize one's failing compass needle. \$5200.



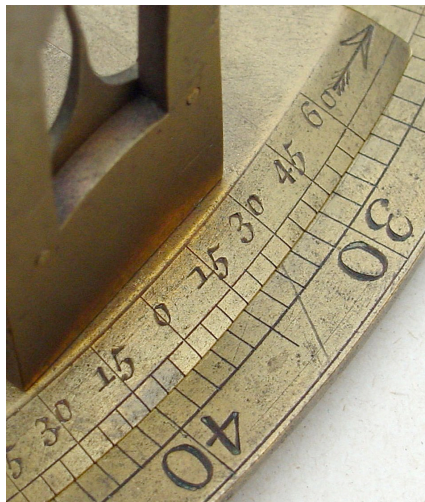


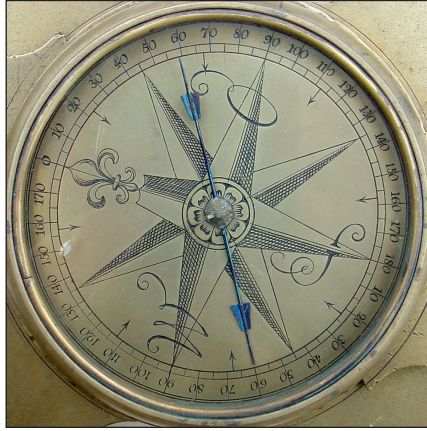
Catalogue 78. VICTORIAN BUTTERFLY SCALE ARRANGEMENT BY THE MASTER. English, second half 19th century, signed on the "H. DALTON" paper label "Butterfly Scales arranged as a Rooster Hen & chicks." Within a 1/8" (3 mm) diameter area, on a standard 1" x 3" microscope slide, is laid out a farmyard scene of crowing rooster and attentive hen with four small chicks, all in the wonderful colors of actual tiny butterfly scales. It is a rare example of the work of the master of this microscopic art form. Dalton (1829 - 1911), born in England the son of a physician, traveled widely in Europe and became famous for his mosaics of butterfly scales and diatoms. More recently his work has been featured in an article in *Smithsonian Magazine* (October 1980). Very fine except for a break to one blank corner of the slide, complete with its presentation case. \$1850.



Catalogue 79. FINE EXPLORER'S COMPENDIUM, English, c. 1900, the 5-3/4" (15 cm) wide case containing a glazed watch case compass with floating mother-of-pearl compass "card" and gilt body; an ivory mounted thermometer with Fahrenheit and Centigrade scales; and a matching gilt watch case barometer with rotatable altitude scale. The case is bound in red Morocco leather and lined in green silk and velvet. Condition is very fine throughout. \$950.

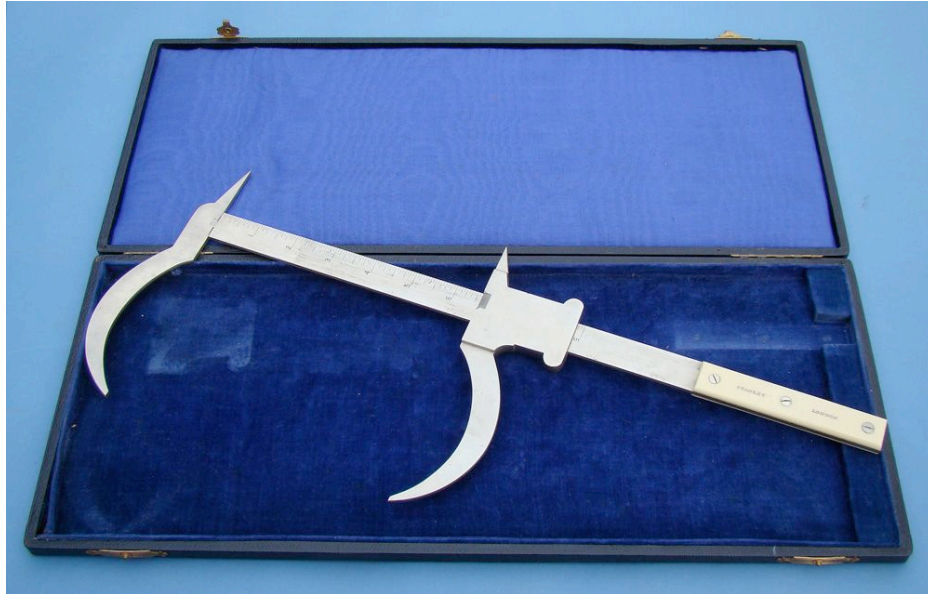
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Catalogue 80. A FINE DUTCH HOLLAND CIRCLE, 1757, signed in flowing script “J. v. Wyk, Amsterd., 1759.” The 11-1/2” (29 cm) brass main plate is boldly divided with a circumferential degree scale, and set with four fixed sight vanes spaced 90° apart, and with a fine suspension mount for vertical use. A rotating alidade has two tall (3-3/4”) sight vanes, twin verniers reading to five arcminutes, and a compass engraved with degree scale and splendid rose marked with Dutch directionals. Main plate and alidade are both pierced with lovely arcuate shaping. Each vane has both slit and pointer sights, in alternating order, designed for fore and back sighting. There is no longer any mounting bracket below, but four large screw heads could function as feet, for use on a plane table. Otherwise condition is fine, noting some darkening to the brass.

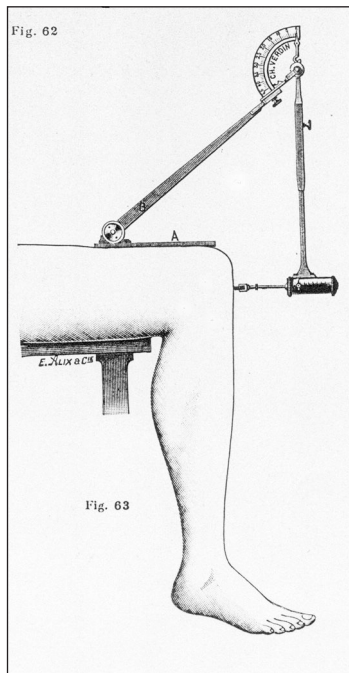
Here is a true Holland circle, designed to measure both vertical and horizontal angles and angular differences. Kiely finds the form described as early as 1612 (by Jan Dou). The present example was made by Jan (or his brother Jacobus) van Wyk (also Wijk), recorded by Rooseboom and by the Websters as maker of octants and surveying instruments, flourishing c. 1759 - 1785. The Boerhaave, and the Utrecht University Museum, each have examples of physics demonstration apparatus by van Wyk. And Mörzer Bruyns, in his 2003 thesis on the octant, records seven surviving van Wyk octants (and see **Tesseract Catalogue 29 Item 32**). \$12,500.



Catalogue 81. "FLOWER'S CRANIOMETER," English, c. late 19th century, signed on the ivory handle guards "Flower's Craniometer, Stanley, London." Made of electrum (i.e., "nickel silver"), by the pre-eminent tool-and-rule maker, the calipers are 17" (43 cm) overall, with scales divided from 0 to 9 inches, in sixteenths and from 0 to 22 cm, in millimeters. Designed for both outside and point-to-point measurement, the calipers and their original fitted case are in excellent condition throughout. A rare tool of medical physiognomy, they would have been useful for phrenological or anthropological studies during the heyday of the correlation of social behavior and mental ability with variations in cranial morphology.

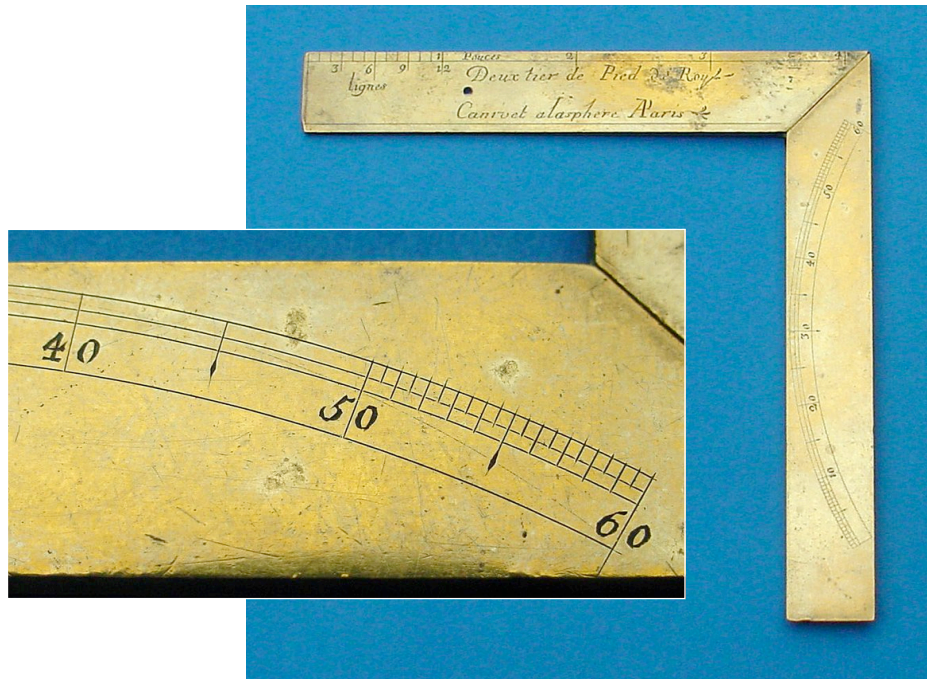
"Flower" refers to Sir William Henry Flower, the famous and prolific zoologist and anthropologist who curated the Hunterian Museum (The Museum of the Royal College of Surgeons) from 1861 until 1884, when he became Director of the Natural History Museum, serving until 1898. His interests and capabilities were far reaching, but among his major contributions were studies of cranial characteristics among various races of men. At the Hunterian he produced an osteological catalogue after measuring each of 1300 skulls, having developed new methods for quantitative characterization of the cranium. To determine the cubical capacity of skulls, Flower used craniometer measurements and mustard seeds! (see Cornish, 1904, and Green, 1906). \$3500.





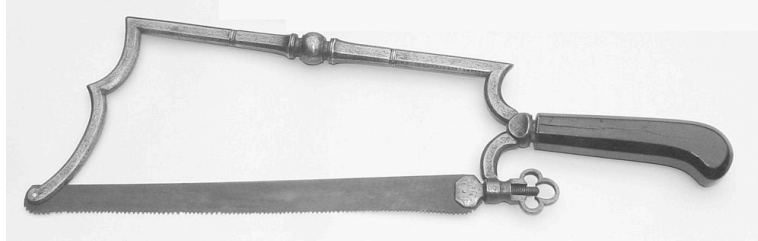
Catalogue 82. THE REFLEXOMETER OF DR. VARNALI, French, early 20th century, signed "G. Boulitte, Paris." Constructed of electrum (nickel silver), the instrument is contained in its original 10-1/2" x 4-3/4" x 1-1/2" (27 x 12 x 4 cm) fitted case lined in red plush and covered with black fabric. The fascinating device assembles with a base section and hinged support, carrying the adjustable pendulous arm with angular readout of swing, and spring plunger with remains of cork pad and calibrated depth of plunge. Both readouts have manually resettable pointers. Condition is very fine and functional. In use one sets it up as illustrated, moves the (upper) swing pointer to 0, moves the plunge pointer to 0, pulls back the pendulum to the degree desired (as read on the 0(1)45 scale on the swing arc), releases, then reads out the plunged distance recorded on the 100(10)500 scale. One then repeats at different swing angles as desired. This is a very rare example of this remarkably quantitative instrument, identified in the Verdin catalogue as the reflexometer of Doctor Varnali, of Bucharest. The maker is the well-known firm of G. Boulitte, successor to Verdin and active in the first quarter 20th century.

The first such quantitative reflex hammer we have seen. \$3650.



Catalogue 83. GEOMETRICAL CHORDS ON A FOLDING RULE, French, second half 18th century, signed “Canivet à la sphère à Paris.” This finely crafted folding brass square opens to 4-1/2” x 4-1/2” (11.4 cm), and has a charming scale of French inches (“Pouces”) and twelfths (“lignes”) labeled “Deux tier de Pied de Roy” (i.e., “Two-thirds of the King’s foot”, although this is a mistake, as in reality the length is *one-third* of the King’s foot). The other arm is engraved with a 60° arc of a circle subdivided every 5°, the ranges 0° - 10° and 50° - 60° further subdivided every 0.5°. Using a pair of dividers gives the lengths of chords of a circle (of radius 3.18 French inches, determined here by simply measuring the 60° chord length). Linear scales of chords are frequently applied to sectors, Gunter’s rules, surveying alidades, etc., but we note only one other instance of the arc laid out directly on a rule, that on a *reigle platte* (Tesseract Catalogue 78 Item 31). Scales and labels are very finely engraved. Condition is fine noting a little pitting. \$1400.





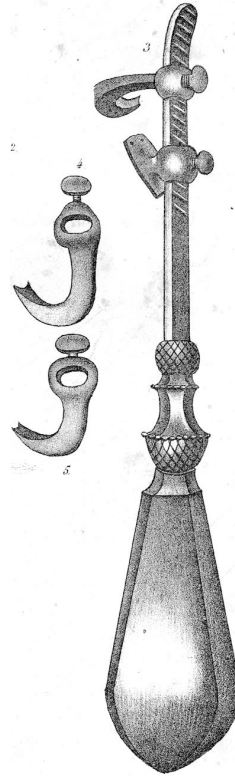
Catalogue 84.

**MASTERPIECE
SURGICAL SAW,**

probably French, first half 18th century, stamped three places with an indistinct mark. The saw is 19" (48 cm) overall, with iron body and fittings, eight-sided shaped ebony handle and steel blade. The iron is beautifully shaped, of 18th century form, as described in great detail (even down to actual dimensions and shapes of the curves) in Garengéot (1725, pp. 173-183). But here the shaping is perhaps even bolder, and the lower curve at the far end is considerably longer, giving improved leverage and cut. The trefoil nut for tightening the blade is similar to adjustment knobs used by Garengéot on a wide variety of surgical instruments. However the truly spectacular feature of this saw is the engraving on the iron throughout. Running leaf tips and vines abound; the photos here tell the story; it is an example of the best of ironwork (see for example Bernt, *Altes Werkzeug*, 1939, for comparable pieces). An extraordinary 18th century amputation saw.

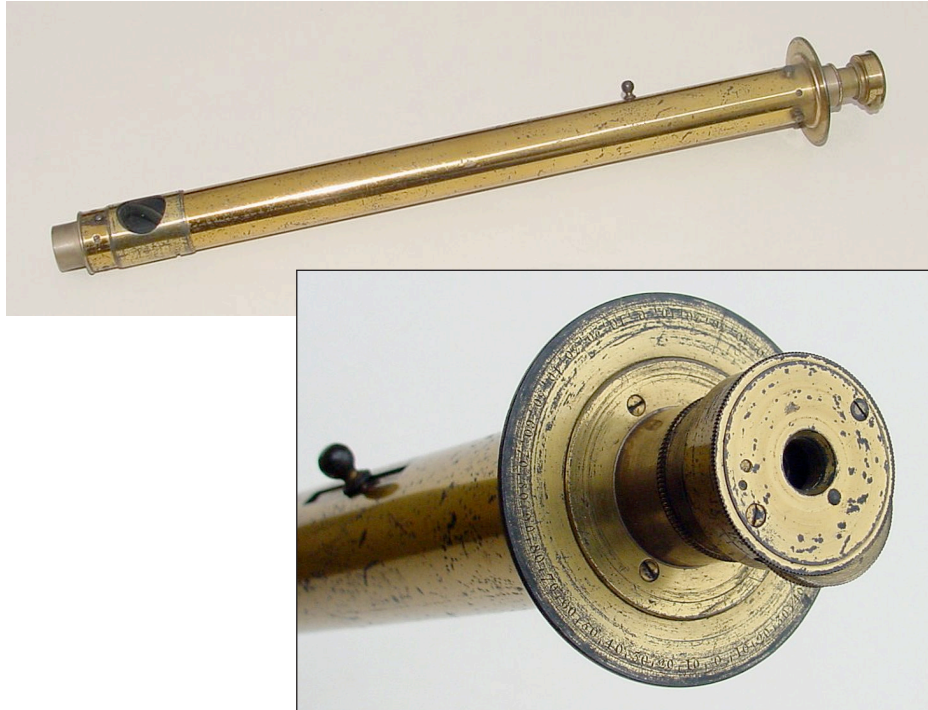


\$19,500.



Catalogue 85. TOOTH KEY ON A STICK -- THE "LEVIER A CROCHET ET A PLAQUE MOBILES" OF PROFESSOR MAURY, French, second quarter 19th century, signed "Charrière." This *exhibition quality* dental tool is 6-1/2" (16.5 cm) overall, made of beautifully shaped and faceted polished steel with a long ridged stem, slightly curved at the end, and set with an eight-sided pear-shaped ivory handle with silver ferrule. It is complete with its original articulated bolster (which would have been used with a leather cover) and the set of three interchangeable claws, one ending in a spike, the other two in serrated double tines. All four fittings have clamp screws for adjustable placement on the stem. Condition is very fine, noting light spotting on the steel.

This is a multi-purpose "levier" instrument, designed to extract teeth, and roots in particular, and to replace many other dental instruments with a single, more efficient and effective one. It is well illustrated and described by F. Maury, dentist with the Royal Polytechnic School, author of the *Traité Complet de l'art du Dentiste* in 1828. The decor and workmanship are totally characteristic of Maury. For similar high quality tools which match his designs, we refer to the c. 1825 dental trousse made in Paris for Empress Marie-Louise, and now in the dental collection of the Utrecht University Museum. The maker of the present instrument was Joseph-Frédéric-Benoît Charrière (1803 - 1876), who founded his surgical instrument manufactory in 1820, and went on to become the most famous French producer of medical tools in the 19th century. \$4800.



Catalogue 86. A MYSTERY TELESCOPE, English, c. 1812, signed "Tho's. Jones, 21 Oxendon Street." This very unusual lacquered brass telescope measures 14-3/4" (37 cm) long, and has a relatively small diameter objective mounted in internal sliding tube, permitting focussing from infinity down to 12 feet. Just beyond the objective is a transparent glass plate mounted at 45°, with rotating shutter, so one can view along and / or at 90° to the optical axis. In the focal plane is a reticle of four fine wires. Focused on this is the eyepiece, composed of just two elements in the design developed by Ramsden, to produce the flattest possible achromatic field for viewing micrometer wires (see King, and Ramsden's 1782 paper *A Description of a new Construction of Eye-glasses for such Telescopes as may be applied to Mathematical Instruments*). A filter wheel over the eyepiece presents open, green, red, and dark red positions, and a rotatable disk surrounding the eyepiece is very finely divided every degree full circle, and calibrated 0° - 90° in each quadrant. Condition is very fine, retaining much of the original clear lacquer finish. Near each end are 1/2" long cylindrical areas which were never lacquered, suggesting areas of mounting (?).

We have yet to identify this fascinating instrument, which typifies Jones' innovation and craftsmanship. It bears some similarities to Ramsden's rare optigraph, yet it differs... Jones is listed at this address in Piccadilly only from 1811 until 1814. \$2750.

Tho's Jones 21 Oxendon Street

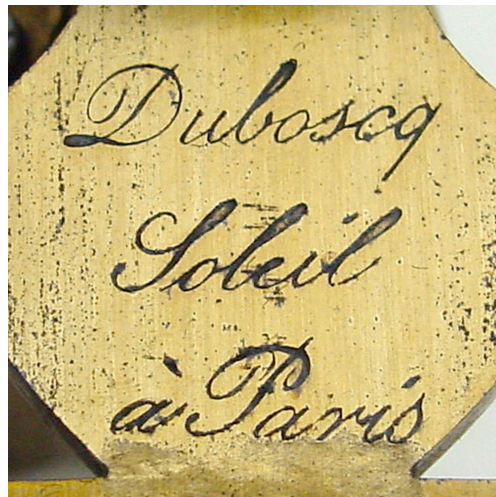


Catalogue 87. MINIATURE PAINTING OF AN ASTRONOMER, Continental, c. mid-19th century or earlier. Measuring only 1-3/4" x 2-3/8" (4.5 x 6 cm), the miniature is executed on ivory, apparently, and is mounted under glass in a carved gilt wood frame. Shown in fine color is a distinguished gentleman of a certain age, with full beard, dressed in dark robes with an intricate lace collar, and wearing chains and a large medallion. On the table beside him is a large three-draw telescope, a globe in fine table mount, and a variety of instruments and/or geometrical figures. There is a possible signature or initials in the lower right. Condition is very fine. We

have not unsealed the frame, but an old manuscript note on the back reads "Tycho Brahe by Mitens." A much more recent paper is attached showing the painting's entry in a 1971 Christie's catalogue of miniatures.

Is this indeed Tycho Brahe, the illustrious Danish astronomer? We don't see the exaggerated mustache, prominent in most period likenesses of Tycho, and there is no hint of his prosthetic metal nose (the result of a duel at age 20). But we do see his traditional lace collar, gold chains, and royal medallions. The sketchy instruments also remind us of some of Tycho's principal observatory equipment, illustrated in his 1598 *Astronomiae Instauratae Mechanica*. And could the painter actually be Daniel Mytens the Elder, the famous Anglo-Dutch portraitist (1590 - 1647), or more likely one of the later Dutch "Mytens" (or "Mijtens") painters? An interesting mystery and a charming astronomical image. \$4500.





Catalogue 88. ARTICULATED TRIPLE PRISM ON STAND, French, c. third quarter 19th century, signed "Duboscq Soleil à Paris." Three 1-1/2" x 1-3/4" (37 x 45 mm) prisms, of differing prism angle, are set in clear lacquered brass mounts and linked so they can be used singly, doubly, or with all three in contact. It clearly demonstrates minimum deviation, color aberration, etc. French trade catalogues of the period offer the triple prism to demonstrate "the theory of achromatism." The whole assembly is rotatable and tiltable, atop its 13" (33 cm) tall (minimum) pillar on lead-weighted brass base. In fine condition, a rare example of this interesting optical demonstration device, by the premier makers of the time. \$1550.

Catalogue 89. GARBICH'S DROMOSCOPE -- A CALCULATOR OF MAGNETIC COMPASS OFFSET,

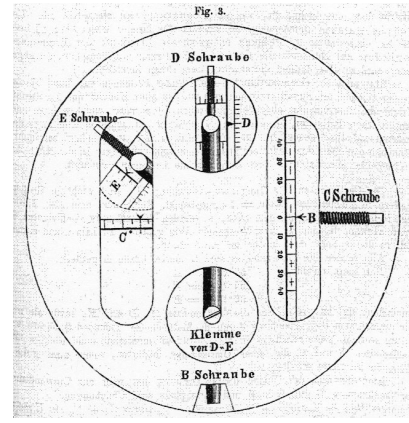
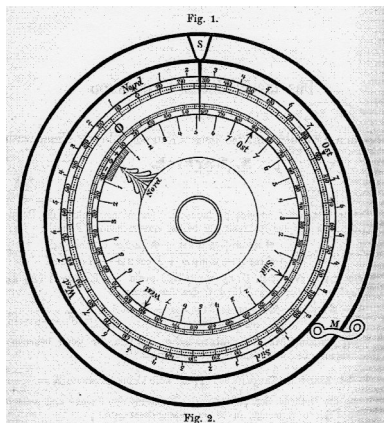
Austro-Hungarian Empire, 1877, signed "Dromoscopio Garbich, H. & F. Müller, Triest" and scratch dated on the back of the name plate "21 Juni 1877."

This substantial instrument is contained in a glazed, golden-lacquered brass case 4" (10 cm) in diameter and 1-1/2" (4 cm) thick. There is a suspension ring and activation thumbscrew. The complex dial face has three independent calibrated rings, the outer with compass directionals, the circle divided into 128 parts. The second ring has degree divisions only over $\pm 45^\circ$, and the third (the inner disk) is again divided with a compass rose and 128 divisions. A central clamp screw allows this disk to be loosened and offset up to $\pm 5^\circ$ as indicated through a viewing window. A blued steel pointer allows simultaneous readout of the three scales. The interior mechanism is finely crafted with patterned and lacquered brass, silvered brass, and blued steel screws, and involves complex gearing and multiple calibrated offsets. Condition is very fine and functional throughout, noting only that the front face has patchy darkening to the silvered and natural brass surfaces.



This analog calculator, the Mechanical Dromoscope, was published by N. Garbich, "nautical consulting lawyer of Austro-Hungarian Lloyd, advisor to the department of finance," in 1875. The device enabled relatively sophisticated compass corrections for the magnetic variation (or declination) caused by the local difference between geographic north and magnetic north, and for the magnetic deviation, caused by magnetism of iron in the vessel. It was thus of major importance for the economic success of a shipping company!

A remarkable calculator, complete with photocopy of Garbich's German publication. \$2950.



CHROMORADIOMÈTRE

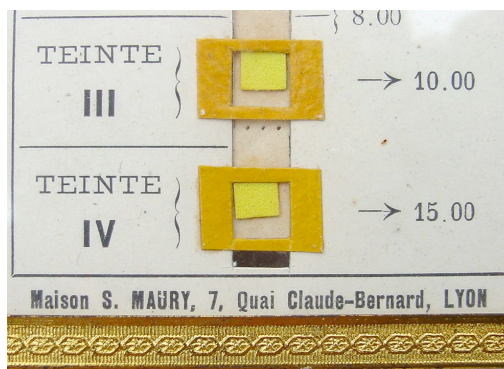


Catalogue 90.

THE CHROMORADIOMETRE OF DR. H. BORDIER, French, c. 1910, contained in the original 6-5/8" x 5-1/8" (17 x 13 cm) fitted case lined in red silk and red velvet. The device was made by "Maison S. Maury, 7 Quai Claude-Bernard, Lyon," and consists of a printed card in a glazed gilt metal frame with suspension chain. Six colored paper windows are pasted along a central slot in the card, and a considerable supply of small comparison test disks are included. Condition is very fine and all original.

In use one glues a disk to the patient's skin or other tissue, irradiates with x-rays, and compares the disk's color with the standards along the slot, as a measure of dosage. The disks are made of barium platinocyanide, which changes color progressively from green to dark yellow-orange as a result of irradiation.

An early attempt to quantize radiation dosage, this was apparently the first commercial dosimeter. \$1150.

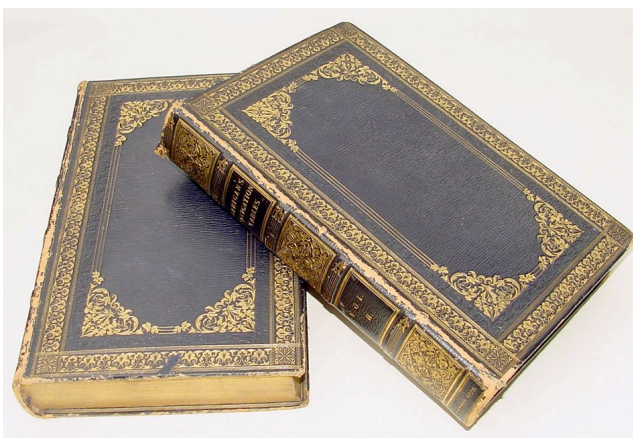




Catalogue 91. KERIGAN'S NAVIGATION TABLES, English, 1828, the two-volume work by Thomas Kerigan, R.N., published in London, entitled *The Complete Mathematical and General Navigation Tables, Including every table necessary to be used with The Nautical Almanac in finding the Latitude and Longitude...and their direct application to Plane and Spherical Trigonometry, Navigation, Nautical Astronomy, Dialling, Practical Gunnery, Mensuration, Gauging, &c., &c.* Volume 1 has a nice folding frontispiece of a compass card, and xxxvi + 722 pp, and is devoted to description and use of the tables, with many applications. Volume 2 has xii + 664 pp., and is dense with tables, some quite interesting, as the lists of worldwide landmarks and their co-ordinates, some also with magnetic variation and authority from which taken. Some tables are even quite entertaining, as the "General Victualling Table," in which we discover that 10,000 men should be provided, *each day*, with 10,000 pounds of bread, 10,000 *gallons* of beer, 3750 pounds of salt beef (likewise of salt pork and of flour), 625 pounds of cocoa, 156 pounds of tea, etc. Peas are also listed, as well as sugar, oatmeal, vinegar, and spirits in lieu of beer. Neither fruits nor other vegetables appear, of course.

Each volume measures 10" x 6-1/2" x 1-5/8" (25 x 16.5 x 4 cm), fully leather bound and gilt stamped with exquisite floral patterns on three faces. The page edges are gilt, and most surprisingly, when their front edges are fanned out, reveal wonderful hand drawn maritime scenes in color. On Volume 1 we see numerous sailing ships under way in somewhat choppy seas. On Volume 2, the scene is calmer, perhaps on the Thames estuary; we can make out boat passengers, military men, a distant grand building, etc.

The books are in good condition, the covers a bit scuffed and bumped. We also note that each volume bears a fine bookplate, and that an *unsubstantiated* penciled notation declares "from the Library of King William IV with his bookplate"! \$2650.





Catalogue 92. SPECTACULAR EXHIBITION OPHTHALMIC SURGERY SET,

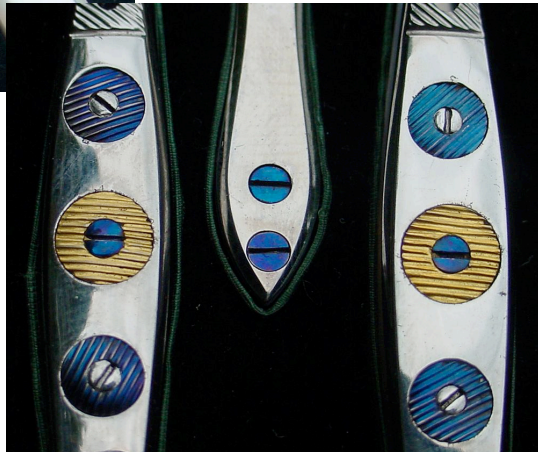
French, c. 1860, boldly signed twice on the box and minutely on many of the instruments "Charrière à Paris." The black leather covered wood case measures 11" x 8" x 2" (28 x 20 x 5 cm), the edges with gilt bands. The interior is lined in luxurious green watered silk and green velvet, with gilt brass straps and hinges, and ivory knobs. The lower level is complete with 25 ophthalmic surgical tools with iridescent mother-of-pearl handles, gold or gilt ferrules, and polished steel blades, hooks, probes, etc., all different. Notable are the precision thumb-activated pincers (the *serretelle* of Dr. Desmarres, for operating on secondary cataracts) with their contrasting blued steel and gilt fittings. The lid is only *half* full, with nine original ophthalmic tweezers, forceps, clamps, etc., all exquisite in polished steel with gilt and blued fittings. All is original, and the condition is excellent noting only that the lid is very slightly warped. The unused near-mint exhibition state of this set is attested to by the presence of various original retaining clips and the bold signed retaining strap, holding pieces in place.

This set figured in the pedagogic museum of Maison Charrière, where the finest examples of their creations were deposited. This "historic collection" was a place where the showcases would be opened to young surgeons and their students, who could inspect and manipulate the rarest and the latest developments in their field. It had been proposed by Frédéric Charrière as early as 1844; to translate from his notice of 1851, "(it) will present the methodical classification of my historic collection of old and modern instruments forming the complete arsenal of instrumental surgery assembled at great cost and classed by order of operations. This collection will be permanently housed under glass in a special room open to students and foreigners." Charrière even discussed having two formal instructive seances weekly (see Drulhon, *Frédéric Charrière, Fabricant d'Instruments de Chirurgie*, 2008.)

One of the most beautiful ophthalmic surgical sets we have seen and in the finest condition. \$14,500.



Charrière à Paris





Catalogue 93. AN INVENTOR'S REWARDS, English, 1878 - 1885, comprising a silver medal, a second-prize tag, a red-and-blue silk bag, and the exhibitor's complimentary ticket. The 2-5/8" (6.7 cm) tall folding ticket is made of heavy card, gilt embossed with fine scenes of industry and music, inlaid with printed papers specifying the terms of free admission to the full run of this "International Inventions Exhibition, Season 1885" as well as to the Royal Albert Hall, the papers signed to the exhibitor "Messrs. Bayley & Son". On the little paper tag is written "Models in Metal, Second Prize, Mr. J.C. Bayley." And on the 1" (26 mm) diameter "pie-crust" medal is finely engraved "In Commemoration of the first Electric Light Exhibition in Bournemouth, Nov. 1878." Condition is very fine throughout.

It is recorded that engineers Bayley and Sons were very active in Bournemouth and in nearby Poole, on the south coast of England. In *Bournemouth: 1810 - 1910* we read of their giving early lighting exhibitions, and running local telephone lines in 1884. The authors (Mate and Riddle) also write "Electric Lighting was first introduced to the notice of the people of Bournemouth in 1878...[with] a grand exhibition of arc lighting...Nearly 3000 persons are reported to have attended to witness 'the latest scientific novelty'...On the second evening there was a football match... [The winners] were each presented with a silver medal inscribed 'In commemoration....'"

\$1350.



Catalogue 94. TYPHOON BAROMETER AND CYCLONOMETER, Philippine-German, early 20th century, signed for the inventor "By José Algué, S.J., Director of the Manila Observatory," and for the barometer maker "Schmidt & Ziegler, Remscheid," and with serial number 317, and stamped with a "cyclone" logo mark, and job number "12" inside. Set into the 8-1/2" (22 cm) square mahogany case is a sturdy aneroid barometer with pressure scales in inches and millimeters of mercury, lookup table of mean sea level pressure as a function of date and latitude (0°-50° North), and rotating scale of atmospheric pressure representing distance to the typhoon. A "cyclonometer" in the lid has a compass rose, rotating glass with wind vectors painted on the reverse, and two adjustable cursors, one with distance calibrations. Condition is very fine throughout, functional and complete with key.

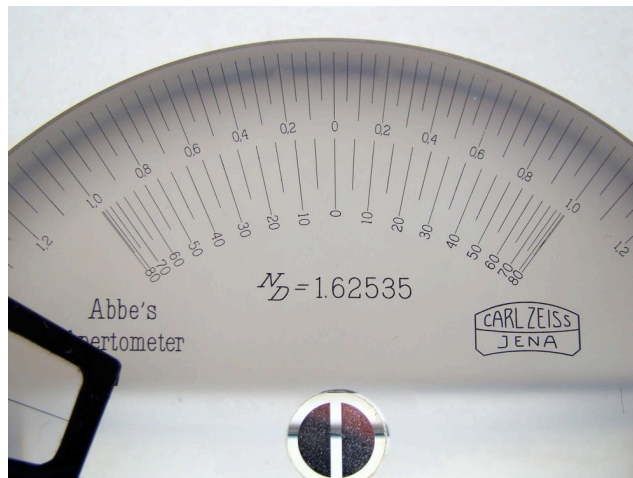
José Maria Algué (1856 - 1930), meteorologist, was part of the Jesuit Mission to the Philippines, becoming director of the Manila Observatory. He continued Father Faura's work on predicting typhoons, and in 1897 published (in Spanish) his major work *The Cyclones of the Far East*. This included full details on his barocyclonometer, with which one could determine the position and direction of motion of a distant cyclone. The cyclonometer "wind-disk" provided an adjustable model of the low pressure circulation system. The instrument was such a success that Algué went to New York and Washington to discuss its use in the Atlantic Ocean; the January 1913 issue of *Popular Mechanics Magazine* reported that Algué's barocyclonometer was being installed on the flagship of the commander of the U.S. Navy in the Atlantic, and predicted its use on all American naval vessels. The German manufactory was founded c. 1860, producing many types of machine tools, cutlery, locks, etc. The diversity ranged from straight razors to this barocyclonometer, to a pipe organ installed in the Spanish Philippines in 1885. A rare example of Algué's typhoon predictor. \$5950.





Catalogue 95. ABBE APERTOMETER, German, c. early 20th century, signed “Carl Zeiss, Jena, ND=1.62535.” The 4-1/2” (11 cm) wide black-enameled brass block carries a thick glass plate in the shape of a segment of a circle. The glass has a central target, a beveled totally reflecting under side, a polished periphery, a rotating index with white illumination spot and readout window, and scales of numerical aperture and angle. Condition is excellent, complete with original fitted case, lacking a supplemental objective.

In use the apertometer is placed on the microscope stage, with the microscope objective over the center of curvature. The index is rotated until the white spot just becomes visible, giving the numerical aperture of the lens immediately. This “N.A.” of an objective lens is a measure of its acceptance cone, and thus of its light gathering power and resolution. \$475.



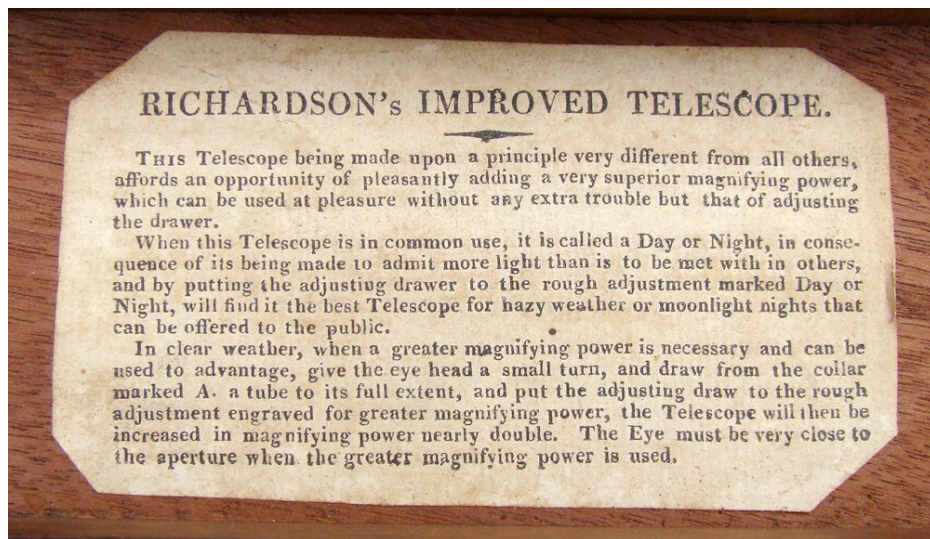


Catalogue 96. RICHARDSON'S IMPROVED TELESCOPE, English, c. 1810, signed "Richardson, London," and " * Improv'd = Telescope," engraved "Adjustment for Greater Magnifying Power, for Day or Night" on a drawtube, scratch numbered "XVIII" inside, and with Richardson's instructional label in the case. The telescope is constructed of brass, with polished mahogany main tube, and extends from 14-3/4" to 45" (37 - 114 cm) by two long drawtubes, an optional third draw, plus a sunshade / aperture extension. It is equipped with a 1-5/8" diameter achromatic triplet objective, and a four-element eyepiece system of adjustable separation, giving fine erect images. Condition is fine throughout, the darkening brass retaining some of its original clear lacquer finish. The telescope is complete with its original mahogany case with bone escutcheon and printed label for "Richardson's Improved Telescope."

This is a form of continuously-variable-magnifying-power telescope, similar to that published by Dr. Kitchiner and publicized as his "Pancratic" eyetube design (see **Tesseract** Cat 58 Item 1). The designer and maker of the present instrument was surely one of the Richardson family of makers active in London in the first quarter 19th century, and recorded by Clifton, who lists John (I) working 1790 - 1822, John (II) working 1801 - 1822, and the latter's brother George working 1807 - 1830.

There is a fascinating historical note recorded in an 1851 catalogue of a Mons'r. Donnadieu's autograph collection. In it Dr. Autommarchi, private physician to Napoleon, writes of several items given to him to dispose of. No. 1 was "an improved telescope by Richardson, London, for day or night, which the Emperor gave to him, saying (here we translate from the French): "Dr., take this telescope which has served me well in my campaigns; at dawn and at each sounding of an alarm, you will rush to see what is happening and inform me of what you have seen and noticed --- Several days later the Dr. having wished to return the telescope, was told by Napoleon who had grabbed him by his ears, Why you rascal Dr, you don't want it!" The reason for Napoleon's gifting is not evident, but it is clear he was pleased with the performance of Richardson's telescope. Dr. Francesco Autommarchi (a young Corsican anatomist) served as physician to Napoleon on St. Helena, from 1819 until the exiled Emperor's death in 1821. Autommarchi went on to publish a remarkable edition, *Planches anatomiques du corps humain*, with its life-size plates in an early use of lithography. Significant, and very rare. \$2950.

AS FAVORED BY NAPOLEON

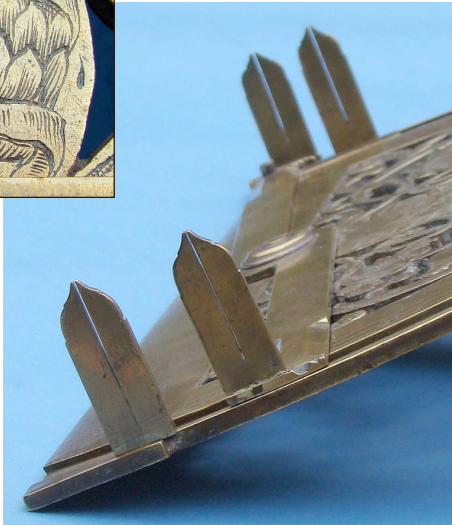




Catalogue 97. A TRULY EXCEPTIONAL GRAPHOMETER, probably German, 17th century, the brass instrument 12" (30 cm) across, the thick main plate pierced and engraved with the most exuberant decoration of swirling stems, blooming flowers and winged putti. An elaborate engraved floral wreath surrounds the little glazed (French) compass, and a second wreath surrounds the initials "M.S." and a heraldic design. The suspension point is finely engraved with drapery, and there are two fixed sight vanes. The semicircular arc is divided every degree, and there is a concentric "polygonal" scale numbered from 4 to 12, twice, aligning with the angles formed by adjacent sides of regular polygons (thus 90° for a square, 60° for a hexagon, 30° for a 12-sided dodecagon, etc.) A lower 7" long scale of equal parts has a transversal readout grid at each end. The plate is mounted with finely shaped alidade bearing two sight vanes and, very unusually, a vernier scale divided on a brass segment sliding in a dovetailed slot which runs around the whole instrument. There is a large staff mount underneath, with universal joint permitting both horizontal and vertical use. Condition is fine with some roughness to the surface, and the reverse now quite dark.

Certainly the finest graphometer we have had, this has masterful execution of its rococo designs. The feeling is definitely 17th century German, despite its French compass rose. It is tempting to attribute the initials to that exceptional innovative maker of instruments, Michael Scheffelt (1652 - 1720) of Ulm, who made splendid graphometers, and who authored a book on the sector (see **Tesseract** Catalogue 91, Item 31). But more likely these are the initials of the as yet unidentified burgher who commissioned this piece.

Only a very few such highly pierced and decorated graphometers and Holland circles are known (see, e.g., Item 130 in the Nacet collection, also with figural supporters to the compass). It is a surveying instrument befitting royalty. \$31,000.





Catalogue 98.

**COMPLETE SET OF
“ U R A N I A ’ S
M I R R O R ” A S T R O -
N O M I C A L C A R D S
A N D B O O K**, English,
1825, published by
Samuel Leigh of 18
Strand, London. This is
a complete set of 32
hand-colored cards,
each 5-1/2” x 7-3/4” (14
x 20 cm), printed with
constellation figures,
the brighter stars
identified and pierced
with holes and the cards
backed with tissue
paper, making visible
the star patterns when
held to a light. The

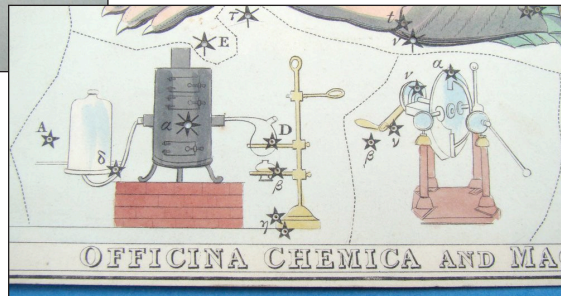
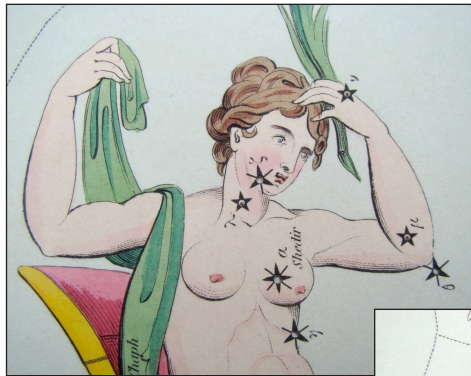


cards are delicately colored, and contained in the original cardboard box. Some of the more unusual technology-related constellations are included, e.g., Machina Electrica, Officina Chemica, and Antlia Pneumatica. This rare early set of astronomical cards is complete, with bright colors, in fine condition noting light soiling and one card never colored. Some of the backing tissues bear old manuscript poems. The box, with its original title plate, is in fair condition.

This outfit is complete with Jehoshaphat Aspin’s 200-page *Familiar Treatise on Astronomy* to accompany *Urania’s Mirror*. This book, published by Leigh in 1825,

includes four fold-out plates, and is in good condition, noting a bit of foxing and corner staining. It has a very fine later half-leather binding. Aspin refers to *Urania’s Mirror* as “consisting of thirty-two cards, on which are represented all the constellations visible in the British empire, on a plan perfectly original, designed by a Lady.”

A good example of a most attractive but now hard-to-find astronomical set. \$5500.





Catalogue 99. CHROMATOPHOPTOMETRE DU DR. CHIBRET -- COLOR MATCHING USING POLARIZATION OPTICS, French, c. 1895, signed by the maker "Giroux, Paris" and emblazoned in the case for Giroux, successor to P. Roulot." This brass instrument measures 8" (20 cm) overall, and is most handsome with its original clear lacquered, blackened, and silvered finishes. The cylinder is mounted with a finger ring and a swing-away aperture, and contains an optical train including a cut quartz plate and polarizing Nicol prism. Two side-by-side circular images are formed, of variable color and saturation. Three adjustments (rotating the near element against a calibrated 45° scale, rotating the distant element over a 0(1)15 scale, and turning the geared knob over a calibrated scale running from Yellow to Orange to Red to Violet) allow the patient to equalize color and depth in the two images, as best as possible. Condition is excellent, and functional, noting one little index pointer broken off. It is complete with the original wood box bound in black leather (granulated to simulate fishskin), and lined in red velvet and red satin.

The chromophotoptomètre was designed to give an impartial diagnosis of color blindness, its type and degree. It was said that 2700 discrete nuances of color could be produced. The inventor was Dr. Paul Chibret (1844 - 1911) who published it in 1885. Despite becoming virtually blind in his 20's, he continued his remarkable career, founding the French Society of Ophthalmology in 1883, traveling extensively, researching, inventing, etc.

A rare example, in excellent condition.

\$2400.

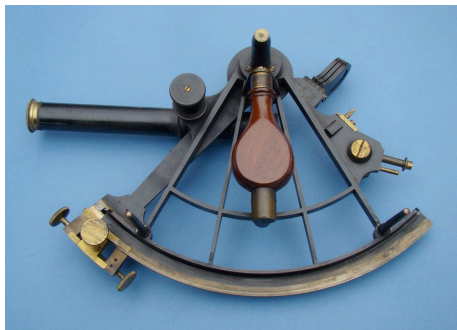
Chromatophotoptometre du D^r Chibret

And for our 100th Tesseract catalogue, we present:
AUTOGRAPHS OF THE CRAFTSMEN



Catalogue 100. "INSTRUMENT SIGNATURES" Over the years we have collected some important (and not so important) "signatures" -- makers' names engraved on instruments, on metal fragments, etc. We find these to be significant just as autographs are valued and collected. An interesting difference, of course, is that the instrument maker's name was often applied by an engraver in the workshop and only sometimes by the actual maker. But the "signatures" remain as characteristic evidence of the particular workshop, guided by the styles of the time and the place, and the maker's own often very distinctive letter and numeral designs. It is frequently possible to narrow down country of origin, and period, based simply on these shapes. Gerard Turner took a scientific approach to this, in particular for early English instruments (see Turner, *Elizabethan Instrument Makers*, 2000). Likewise Jane Turner explored the attribution of various early instruments to specific makers (see J. Turner, *Engraved Lettering on Mathematical Instruments*, dissertation, 1982). The latter author states that Edmund Culpeper, for example, did all of his own engraving, and "developed a strong personal style which characterizes his work." He used both roman and script letter forms, and exhibited "a high degree of consistency," with only subtle changes over time "typical of the trends in calligraphic style" over the late 17th and early 18th centuries.

The present rather modest collection includes some very rare "autographs," like the early and fine Culpeper one, the elaborate Brander ones, and the Milchmeyer. Other autographs are significant for their varied calligraphic forms, or for their very survival, or even for their placement on the object. Seventeen different signatures are presented, as follows:



Association des Ouvriers en Instruments de Précision à Paris, finely signed on an inlaid silver plaque on a fine but somewhat incomplete 8" (20 cm) tall French sextant dating c. 1900. Founded in 1896, the AOIP was a French worker's cooperative in Paris, producing electric, electronic, and optical equipment. It continued in existence, in one form or another, until quite recently (2003). Scientific and navigation instruments by them are very rarely seen; this one, with finely engraved signature plaque, is the first we have encountered.

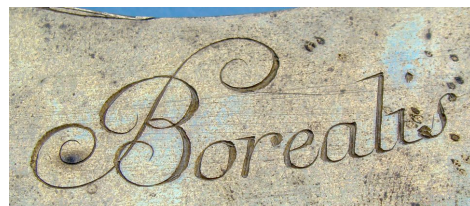


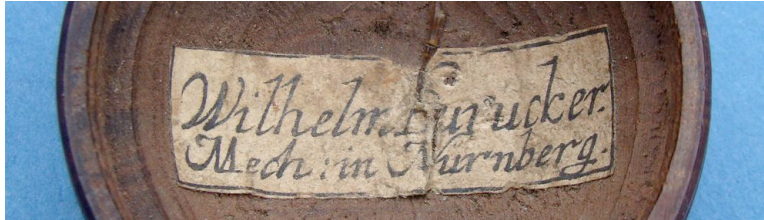
BANKS Inv't 441 Strand London, engraved directly on 3-1/8" (8 cm) tall brass bar cut with rackwork and fitted with a pinion drive. The bar is in fact the surviving limb of a small case-mounting simple microscope. This London maker, working first quarter 19th century, often signed his works "Bancks." He is known for a variety of instruments, but especially for his "Improved Pocket Microscope" which featured a dual-purpose mirror cell mountable above

the stage for illumination of opaque specimens (see item 29 in **The Naturalist's Microscope** at www.eTesseract.com/NM.pdf).



G.F. Brander, fecit, Aug. Vind., so engraved on both sides of the 11" (28 cm) tall heavy brass mounting bracket and $\pm 90^\circ$ altitude arc of his extraordinary c. 1776 equatorial star finder (see Brachner et al. 1983, pp. 193-198). The exceptionally fine engraving extends to intertwined floral patterns and extremely accurate degree divisions. The maker was the famous Georg Friedrich Brander (1713 - 1783) working in Augsburg ("Augustus Vindilacorum" in Latin), Germany. We have located only three surviving examples of his starfinder, which combined a telescope on this fine equatorial mount, rotating above a planisphere of the heavens. The present "signature" mount came from the famous 18th century Zallinger collection.





Wilhelm Burucker, Mech: in Nürnberg, German, c. third quarter 18th century, the bold signature printed on a paper label mounted within a 1-3/4" (4.4 cm) diameter turned wood domed lid. The lid has a repaired break and a fine external patina, and would have undoubtedly covered a pocket compass/sundial. Burucker is known as an 18th century Nuremberg sundial maker, recorded from 1729 (see Zinner). He produced clever combinations of instruments, normally of hand-colored printed paper mounted on wood. We once had a compendium of standing pillar dial with folding gnomon stowing within the cylinder, with floating dry-card compass unscrewing from the base, and with miniature telescope hidden within the cylinder (Tesseract Catalogue 6, Item 29).



Charpentier fils, Balancier, Rue de la Ferronnerie, 10 & 12, A Paris, on an ivory plaque inset into the 4" (10 cm) mahogany lid of a (now empty) box for small round weights (down to "Demi Milli-Grammes"). The maker, Louis-Germain Charpentier, was active in the first half 19th century, and was at one time "balancier du trésor publique de la Banque de France."



Charles Chevalier, Ingénieur Opticien, Palais Royal 163, Paris, exquisitely engraved on the somewhat scratched 2-1/4" (6 cm) diameter brass cell made for a rather large substage mirror of a Chevalier microscope. A member of the large Chevalier family of optical instrument makers, Charles is listed at the present address from 1832 to 1842. He collaborated with his father Jacques Louis Vincent Chevalier in the development of the achromatic microscope.



E. Culpeper, engraved with a banner design on a 1-1/4" (3 cm) long platform for use on an early 18th century English screwbarrel microscope. The reverse has an equally well executed engraving of a rather humorous, rather bizarre, grinning face, the head with large horns on which is draped a substantial fabric. The platform itself is pierced longitudinally, mounted with the original adjustable specimen arm bearing forceps holder, ebony disk with spring clamp, and ivory disk with spring clamp.

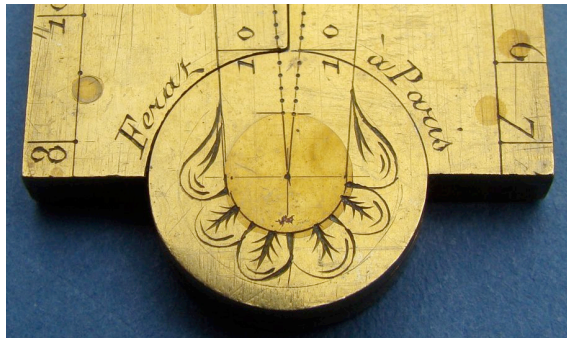
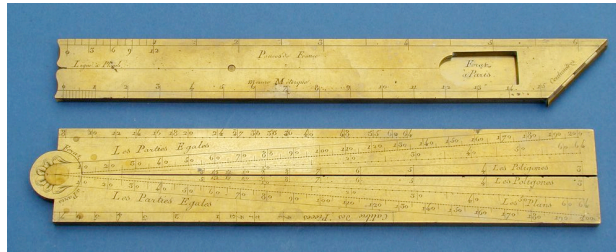


The signer was Edmund Culpeper, who took over from Walter Hayes, and was perhaps the most important English mathematical instrument maker of the early 18th century. His more elaborate and innovative screwbarrel outfits included an offset arm for supporting a lower-power lens external to the body of the screwbarrel. With the present platform device in place, the lens could be focused on any of the three specimen holders. Culpeper was a prolific maker, but only on his very earliest pieces have we seen this sort of imaginative decoration. In particular we note the love symbols on an early (1687) sundial (Oxford), the floral designs on a Gunter's quadrant (Cambridge), and the angels on a surveying compass (Tesseract).



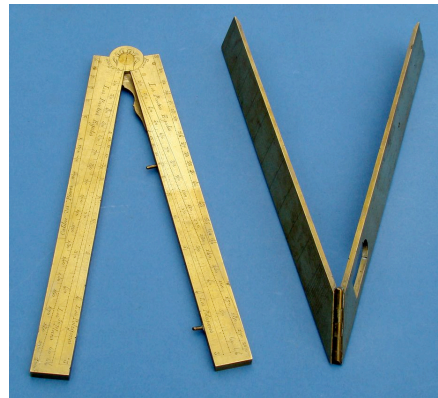
E.I. DENT'S PATENT MERIDIAN INSTRUMENT, 82 Strand & 33 Cockspur St., LONDON, beautifully engraved on the 2-1/4" (6 cm) diameter brass cover for a diploidoscope, c. 1870. Dent's invention gave an optical indication of the precise instant of local noon. It permitted accurate adjustment and synchronization of clocks and watches, especially important for the newly developed railroads in the days before the telegraph. The diploidoscope was made in a wide range of complexity, from the simple fixed version (see **Tesseract** Cat 61 Item 13) to the universal telescopic one, capable of giving a time mark anywhere in the world at any sunny hour (see **Tesseract** Cat 60 Item 15).

TWO IMAGINATIVE SIGNATURE LOCATIONS

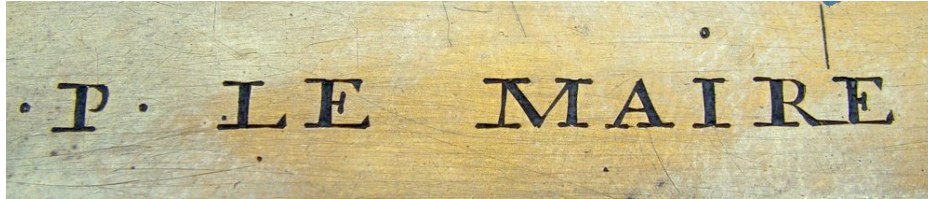


Ferat à Paris, signed unusually in tiny script around the decorated hinge of a 6-7/8" (17 cm) long (closed) fine brass mathematical sector, c. 1800. The maker is recorded from 1799 to 1806, relocating frequently, through four different Paris addresses over seven years (see Marcelin). The young Gambey worked for him. He excelled at high-precision rules; **Tesseract** Catalogue 91 Item 22 is an important rule Ferat made for the

War Department's "Dépot Général." The fineness of his engraving is exceptional.



Ferat à Paris, again in fine script on a 6-7/8" (17 cm) folding square, the signature hiding within the cutout plumb bob window, and noticeable only when the rule is closed. As with the sector, it is extremely finely engraved with tiny lettering, here with lines of "Ligne à Plomb, Pouces de France, mesure Métrique," etc. The placement of signatures on the standard French folding squares and sectors is quite traditional, but here this innovative maker struck out on his own with charming labeling of the highest quality.



P. LE MAIRE A PARIS on a 3-3/4" (10 cm) wide brass protractor divided every degree from 0 to 180 and back, dating c. 1720. The maker was Pierre LeMaire *senior* (1695 - 1745), a splendid craftsman of quality instruments of science (see Rocca in *SIS Bulletin*, 2012).



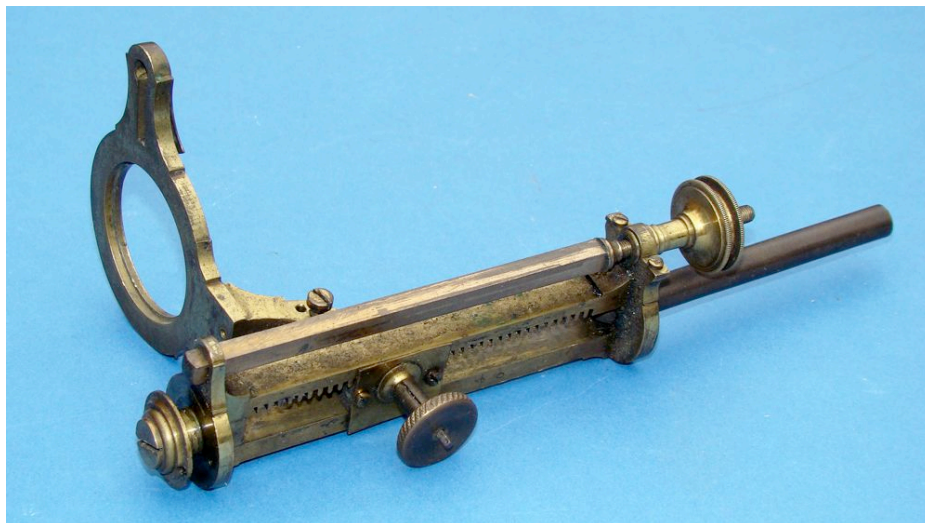
P. Le Maire A Paris on a 3-3/8" (9 cm) wide brass protractor divided every degree from 0 to 180 and back, dating c. 1720. These two Pierre le Maire (senior) signatures show an



interesting contrast between two concurrent styles popular in the late 17th / early 18th centuries. One is the sort of bold neo-Roman, neo-Classical block lettering of the item above, the other the semi-script form with curling, flowing capital letter forms shown here. We find the same two styles on French Butterfield-type pocket sundials of the same period. We also note different numeral shapes on the two instruments, most notably the flat-topped versus rounded "8".



B. MARTIN *Inv't et Fecit* N. 14 on the vertical racked pillar of a fine Benjamin Martin microscope, c.1770. Included is the stage with coarse focus pinion drive, reading against a 1 - 6 scale designed for a sequence (on a wheel?) of objective lenses, and the side-pillar fine focus by thumbscrew below. This appears to be a structure from one of Martin's "Universal" microscopes, and bears his rarely found serial number. His No. 1 is at Oxford, and the highest number recorded is 26 (according to G. Turner, 1981, pp. 60-61).



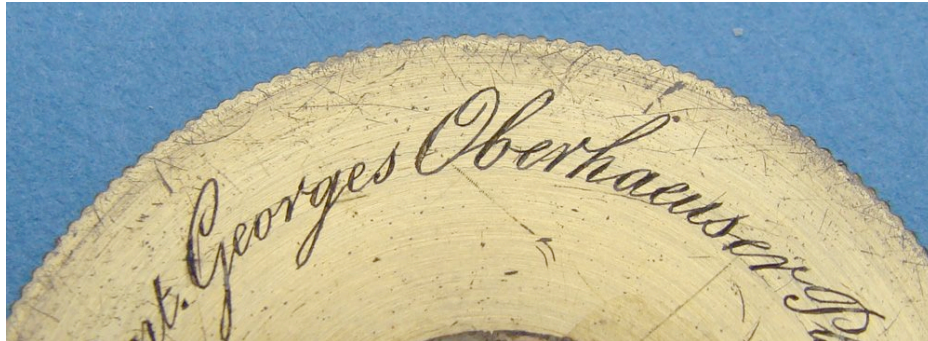


B. Martin, London on the brass terminus of the ebony index arm on a large (20" or 51 cm overall) but quite incomplete ebony octant. It dates c. third quarter 18th century, and is a rather rare example. Martin later joined with his son and was granted a patent for an improved octant featuring an index arm mirror easily adjustable about two axes (see **Tesseract** Cat 44 Item 23).



J.M. Milchmeyer, Uhrmacher, und Opticus in Frankfurt, on a 6-1/2" (17 cm) long substantial brass mounting plate with handle. All is crafted in rococo design, and the plate bears fine floral engraving. Johann Michael Milchmeyer was a fine craftsman, working third quarter 18th century, yet little-known today. We have located two surviving microscopes, one an exceptional compound outfit bearing atop the case a similar plaque with handle (see Hemmerling and Feustel, 1983, describing the collections of the Hessischen Landesmuseum in Darmstadt). Moe (1990) illustrates a good case-mounted simple microscope with long-screw fine focus, now in a private collection. And Moe reproduces an 1896 illustration of an innovative case-mounted compass microscope by Milchmeyer.





Georges Oberhaeuser Place dauphine 19 Paris. Le Cinquième de Millimètre en Cent. on a small 1-1/2" (4 cm) diameter stage-top brass disk inset with a precision micrometer ruled on glass, second quarter 19th century. Georges Oberhaeuser (1798 - 1865) had apprenticed to Gambey, and worked under his own name from 1827 to 1854. He developed the famous "Oberhaeuser" type vertical microscope with its cut-away drum base, patented in 1837 (see **Tesseract** Cat 72 Item 11). Here we have his very finely engraved "signature" with a finely divided stage micrometer.

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