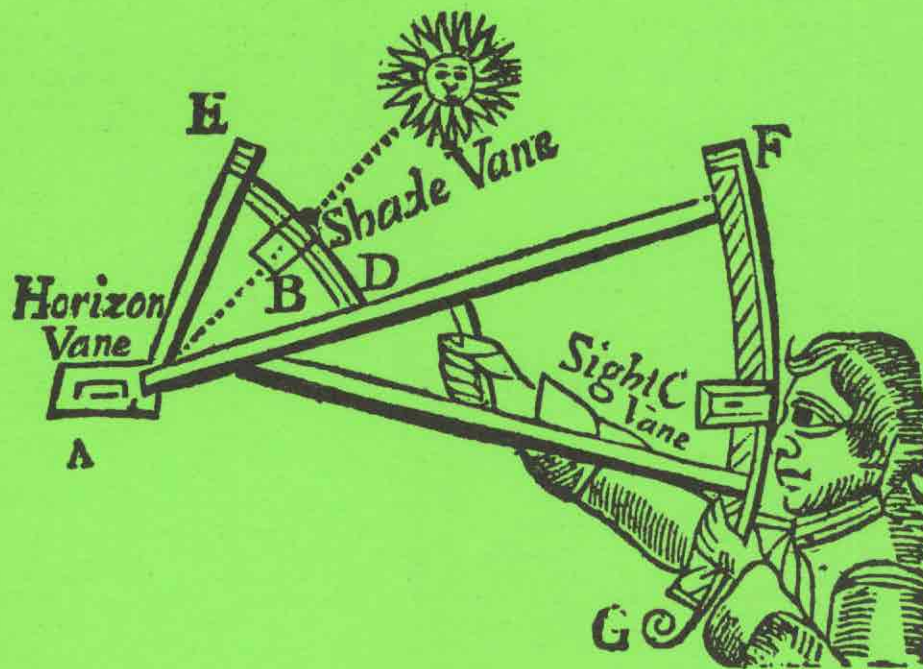


Fall 1975

Two Dollars

Historical Technology

Catalog III



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HOROLOGY

Rare First Edition of the Classic Reference

25. F. J. Britten, "FORMER CLOCK & WATCHMAKERS AND THEIR WORK. Including An Account of the Development of Horological Instruments From the Earliest Mechanism, With Portraits of Masters of the Art; A DIRECTORY OF OVER FIVE THOUSAND NAMES, and Some Examples of Modern Construction.", Spon, London & Spon & Chamberlain, New York, 1894. Original cloth binding 7 3/4" h, 5 1/2" w; pgs. viii, 397. Generally used about fine condition. In 1899 this book was remodelled and expanded into what was then called the first edition of "Old Clocks and Watches and Their Makers", a work which reached its 7th edition in 1956. (postpaid) \$ 45

An Important Treatise on Clock-Work & Orrery Design

26. James Ferguson, "TABLE AND TRACTS, Relative To Several Arts and Sciences.", 2nd Ed, London, 1771. Original leather binding (lacking one of two labels on spine) 8 1/2" h, 5 1/2" w; pgs. xv, 334, (1), 3 foldout engraved plates. Very fine condition with minor edge wear to the covers and hinges beginning to weaken. A composite of a number of separate articles and tables quite similar in style to the author's "Select Mechanical Exercises" but of earlier date (1st ed in 1767). Of special interest are: a 25 page article on an analog computer for problems of spherical astronomy; 26 pages of description of 3 uncommon kinds of clocks; 6 pages on how to represent the motions of Jupiter's 4 satellites in a clock; and 14 pages on Orreries. Many other interesting topics are included as well. (postpaid) \$ 160

27. Thomas Mudge, Jr., "A NARRATIVE OF FACTS RELATING TO SOME TIME-KEEPERS, Constructed by Mr. THOMAS MUDGE, For The DISCOVERY OF THE LONGITUDE AT SEA: Together With OBSERVATIONS Upon The CONDUCT OF THE ASTRONOMER ROYAL RESPECTING THEM.", Thomas Payne, London, 1792. Early (original?) leather backed boards 8 1/4" h, 5 1/4" w; pgs. vii, (4), 94. Front hinge cracked, binding good, contents very fine. This book contains the actual performances of "Blue" and "Green" and shows that Maskelyne's evaluation formula seems to have been conceived so as to indicate a performance inferior to the actual results. Gould notes that, "The main points in Mudge's attack [the book here] were that the first machine [of Mudge, Snr.] had met with unfair usage, and that Maskelyne's method of calculating the rates of "Blue" and "Green" was bound to exaggerate their errors. Maskelyne's defense to the first charge was not very convincing, and to the second still less so, but it must be added, in fairness, that the alternative methods proposed by Mudge, junior, and by Count Bruhl, his father's staunch friend and patron, were equally unsound." Copies of this, the most important published book on Mudge's work, are almost unknown. (postpaid) \$ 315

LAND SURVEYING

28. (Anonymous), "FELD-MESSER wie auch SONNEN-UIREN-MACHER, ohne Lehrmeister und ohne Instrument;", Johann Conrad Wohler, Ulm, 1762. Original leather binding (beginning to age) 6 3/4" h, 4" w; pgs. 76, (1), 21, (5), 4 foldout engraved plates (no. III repeated), foldout table. Contents in very fine condition. This book was intended for the self-instruction ("without teacher") of those wishing to learn how to lay out fields and plots of land by linear measurement only ("without instrument"). The second part describes the layout of sundials, again by relatively simple means. (In gothic letter German) (postpaid) \$ 70
29. Cosimo Bartoli, "DEL MODO DI MISURARE LE DISTANTIE, le superficie, i corpi, le piante, le prouincie, le prospettive, & tutte le altre cose terrene, che possono occurrere a gli huomini, secondo le vere regole d'Euclid & de gli altri piu lodati scrittori", 2nd Ed, Per Francesco Franceschi Sanese, Venice, 1589. Early vellum binding 9" h, 6 3/4" w; 148 leaves including fine wood cut title and portrait, 2 fold-out plates, and over 100 wood cut diagrams in text. Fine overall condition with very minor worming in margin. This major Italian book on surveying (1st ed in 1564) is of particular interest because it illustrates the major surveying instruments of the period (the square with pivoted alidade, classical simple quadrant, and astrolabe) with many diagrams showing their use. Editions of this popular work were published into the 17th century. (One finds London booksellers now asking more for these later editions than we do for this one of the 16th century.) (In Italian) (postpaid) \$ 195
30. Octavio Fabri, "L'VSO DEL LA SQVEDRA MOBILE", 1st Ed, Francesco Barilletti, Venice, 1598. Early vellum binding 8 3/4" h, 6" w; engraved title, 119 pages numbered by leaves, mostly, with some misnumbering (a problem which seems to have troubled many editions of this book), and 26 (one repeated) exquisite engraved plates by Fabri himself on text pages. Issued before the fold-out plate was added. Extremely fine condition. The "Squadra Mobile" was a portable surveying instrument of Fabri's innovation. Level was determined by a plumb line and a pair of pivoted alidades with peep sights were used for sightings. Readout was on combined circular and rectified scales so that either angles or trigonometric functions thereof could be obtained. This is a fine and beautiful book written to illustrate an unique surveying instrument. (In Italian) (postpaid) \$ 200

31. Robert Gibson, "A TREATISE OF Practical Surveying; which is demonstrated From its First PRINCIPLES.", 3rd Ed, Laurence Flin and Richard Fitzsimons, Dublin, no date (after 1767 if Taylor is correct). Early half leather binding 7 1/2" h, 4 3/4" w; pgs. (6), 319, 12 engraved plates at end. Binding shows some wear but is sound, contents generally fine except for plates which are a bit worn and a few with tears from extensive use. Taylor 2 notes a second edition of 1767, but the implication was that it was London published. She notes that Gibson may have been Irish, due to some of his terminology, suggesting that she has not seen any Dublin editions. There were English editions of this work and then a great number of American editions. (postpaid) \$ 65
32. Willaim Leybourn, "THE COMPLEAT SURVEYOR: Or, the WHOLE ART of SURVEYING OF LAND, BY A NEW INSTRUMENT lately invented; As also by the Plain Table, Circumferentor, the Theodolite as now improv'd, or by the Chain only. . . . Every Operation both Geometrical & Arithmetical being examin'd, AND AN Appendix Added to the WHOLE, Consisting of Practical Observations in Land Surveying, By SAMUEL CUNN.", 5th Ed, Ballard, Ward, & Woodward, London, 1722. Original gold tooled leather binding (repaired at hinges) 12" h, 8" w; pgs. frontis protrait of Leybourn (somewhat discolored), title in red and black, (10), 1-45, (46, 7 not included in numbering), 48-100, 166, 1-65, 62, 63, 68-155, (1), 14 foldout engraved plates. Fine condition, except as noted, with some page darkening (probably due to composition of paper); ex library copy. Leybourn (1626-1716) was a noted teacher and writer on astronomy, navigation, mathematics, surveying (he was one of the surveyors of London after the Great Fire of 1666), and dialling. This book was first published in 1653 with editions in 1657, 1674, 1679, and 1722 (this one). There were significant changes from edition to edition; only 5 engraved plates in the 3rd ed, 6 in the 4th, and 14 in this one. Samuel Cunn's Appendix of 51 pages appears here only. This is one of the major works on surveying in the English language. (postpaid) \$ 240

The Grand Theololite & Triangulation Across the English Channel

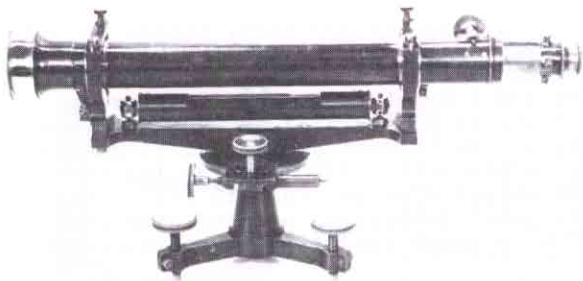
33. Major-general William Roy, "AN ACCOUNT OF THE TRIGONOMETRICAL OPERATION, WHEREBY THE DISTANCE BETWEEN THE MERIDIANS OF THE OBSERVATORIES OF GREENWICH AND PARIS HAS BEEN DETERMINED.", author's reprint from the Philosophical Transactions, London, 1790. Later board covers 11 1/2" h, 9 1/2" w; pages uncut; 162 pages, the 11 very large fold-out engraved plates including one of Ramsden's chain, 4 of his Grand Theodolite and 1 just of the crane required for its moving, and the 4 fold-out tables. A 3" long tear in one plate, otherwise excellent condition. This book is the detailed documentation of the greatest surveying operation undertaken in the 18th century; the triangulation between London and Paris with sighting across the English channel. Ramsden's Great Theodolite, now on exhibit in the Science Museum, London, with its 3' dia azimuth readout circle and its two 36" focal length telescopes, took ten years to construct. Even Roy remarks that after establishing the base line on Hounslow Heath in 1784 "it was little expected, that nearly three full years would have elapsed before, even in this country, an instrument could be obtained for taking the angles!" A verification base line was established on Romney Marsh. The first sighting was made on July 31, 1787 and continued on into the autumn until bad weather set in. General Roy goes on to describd the actual operations, data reduction and design details of the instruments used. This is an easily read book which should be of equal interest to the student of instrument design as well as of geodesy. (postpaid) \$ 165

A Major English Compendium of Surveying

34. John Wing, "Geodaetes Practicus Redivivus. THE ART OF SURVEYING: Formerly Publish'd by Vincent Wing, Math. . . . with an APPENDIX . . . a New Instrument CALLED THE EMPERIAL TABLE . . . WITH THE DESCRIPTION and USE OF A NEW QUADRANT. To which is Added by way of Supplement, SCIENTIA STELLARUM:", A. & J. Churchill, London, 1700. A large and impressive volume in modern half leather binding 12" h, 8" w; pgs. (8), 384, 134, (1), 7 engraved plates, 2 of which fold out (one of which measures 13" x 17"). Some foxing, small tears in the folding plates, fine overall condition. The instruments are by Thomas Tuttle; the plate of the Imperial Table by the cartographer, Herman Moll. This instrument did all the work of the plane-table, theodolite, circumferentor, peracter, 'chard' and needle, according to the author. The astronomical is fitted with lines for Lat. 52° N. A table of refractions (partly incorrect) and the Equation of Time are added, and there is a section on dialling, since the Surveyor was expected to direct the erection of outdoor sundials. The mathematics necessary for surveying are also included. John Wing (b. c. 1655, fl. 1673-1715) according to Taylor 1, "nephew of the famous Vincent Wing was a mathematical practitioner in the full sense of the word - almanack-maker, diallist, mathematical teacher, land surveyor, . . . His grandson Tycho Wing was still carrying on the teaching of the 'mathematical arts' in 1727, . . .". This is a grand book. (postpaid) \$ 270

THE BAROMETER

35. Alexander Adie, "DESCRIPTION OF THE PATENT SYMPIESOMETER Or New Air Barometer.", no origin or date, probably Edinburgh, 1820 or 21. Modern cloth binding 9" h, 5 1/2" w; 10 pages. Fine condition. Adie (1774-1858) patented his light liquid barometer in 1818 and a description of it appeared in the Edinburgh Philosophical Journal in 1819. This booklet seems to be a revised version of the 1819 article. (postpaid) \$ 40



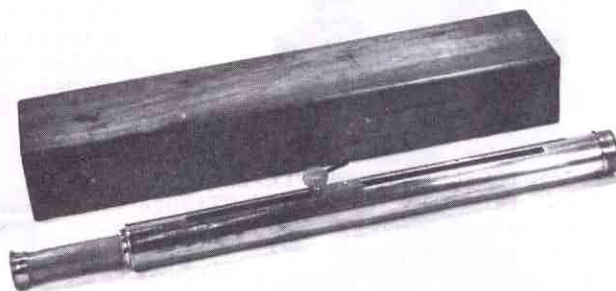
97. SPANISH EGAULT'S LEVEL - probably toward the latter 19th c, signed "VDA DE AMADO LAGUNA ING./No. 1440/ZARAGOZA". Brass instrument with purple-black oxidized finish on most surfaces, bright lacquered screws and adjustment knobs, 18 1/2" long (max exten.), 7 1/2" h incl 3-screw leveling base. Objective lens 1 1/2" d, rack & pinion focus of eyepiece, 6 3/4" bubble level, tangent screw on azimuth rotation. Telescope reverses in wyes. Original dovetailed mahogany case 17" x 9 1/2" x 7 1/2" h. Case in generally sound condition although it has seen field use, instrument in fine to very fine condition with minor fading/rubbing of oxidized finish.

This instrument of French design is an unusual combination of wye and Dumpy levels. The bubble level is attached to the frame (can be adjusted) while the telescope by itself can be reversed in the wyes, one of which is screw adjustable. The 3-screw base permits its use on a plane table with a screw hole for tripod mounting. This form of instrument is virtually unknown in our country.

(25 lbs UP, air freight)

\$ 230

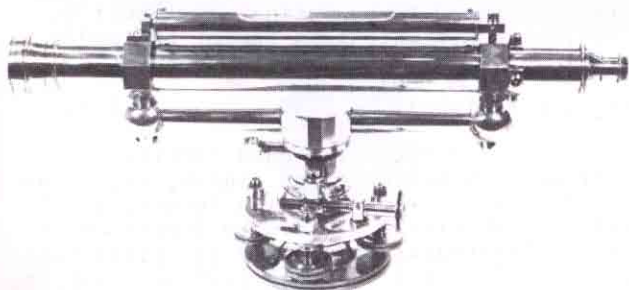
98. RANGE-FINDING TELESCOPE - French, c. 1860, trade card in case reads, "MAISON LEREBOURS & SECRETAN./SECRETAN./SUCCESSEUR/Opticien/de l'Observatoire & de la Marine/MAGASINS: 13, PLACE DU PONT-NEUF/ATELIERS: 28, PLACE DAUPHINE/PARIS". Brass telescope with original lacquer finish 1 5/8" d x 22 1/2" long (extended). Engraved calibration scale on telescope with rack and pinion movement of internal variable lens, vernier readout. Original hand dovetailed walnut case 2 7/8" x 4 1/8" x 20 1/2" long. Case in fine and telescope in very fine condition, the variable lens a modern restoration.



The firm of Secretan was founded in 1855 upon the death of his partner Lerebours. The trade card seems to date from shortly after this time. The principle of operation of this instrument is quite unusual. The moveable lens (very weak positive curvature) changes the effective focal length of the objective. Thus if the lens is set at one end of the readout scale and the eyepiece focussed on a target at a known distance, objects at other distances will be brought into sharp focus by movement of the lens. The scale readout, after calibration, would then correspond to the correct range. Different lenses could have been used for different distance ranges. The lens in place at the present has not been calibrated.

(10 lbs, UP, PS)

\$ 180



99. ELEGANT SURVEYOR'S LEVEL - American, 3rd qtr 19th c, unsigned. Bright brass 15 3/4" long, 7" h incl'd 4-screw leveling base, 8" level bubble. Focussing by eyepiece draw tube. Original dovetailed mahogany case with front doors 18" w, 6 1/4" deep, 8 3/4" h. Case in good to very good, level in very fine condition.

This is a form of Dumpy level, that is a rigid frame instrument with both the telescope and level bubble fixed and adjustable to the frame. The multifacet surfaces of the support frame center, telescope mounts, and the tangent screw fittings match the work

of Pool of Easton, Massachusetts so closely that we are of the opinion that this firm was the actual maker. Even the case is a Pool design. Pool instruments of this form tend to be particularly elegant in appearance and this one is no exception.

(25 lbs UP, air freight)

\$ 240

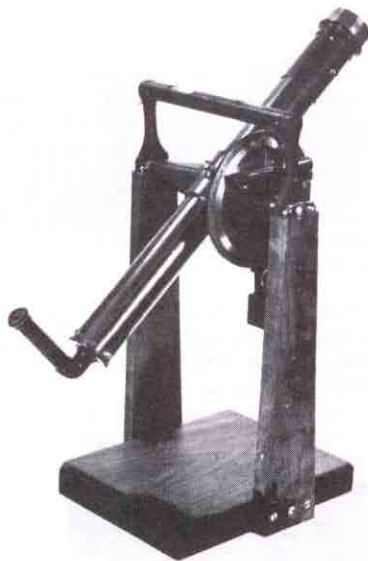
100. THE MODEL 5310 VERNIER SURVEYOR'S COMPASS - American, early 20th c, possibly c. 1900, signed "KEUFFEL & ESSER CO/ 2682/NEW YORK". Cast and machined brass in green-black oxidized lacquered finish, white faced compass 6 1/2" d with 5 1/2" needle, 16" long base with 7" h screw-on sight vanes. Half the ball swivel joint is missing. Bubble levels are inset below the instrument base and this model has the optional surveying leg counter. Pin-turned knob on bottom is used for setting in the compass variation as shown by the vernier scale within the compass face. Overall fine condition with two cracks into the edge of the compass cover glass. Original mahogany case 16 3/4" x 8 1/2" x 3 1/4" h with the name plate of the Department of Practical Military Engineering of the U.S.M.A., West Point; very good condition.



Keuffel & Esser, founded in 1867, first manufactured surveying instruments in 1885. This is a good example of their largest and best improved form of surveyor's compass. In addition to the features given above, one of the detachable sights is graduated and provided with a sliding cross-piece for measuring vertical angles.

(18 lbs UP, air freight)

\$ 225

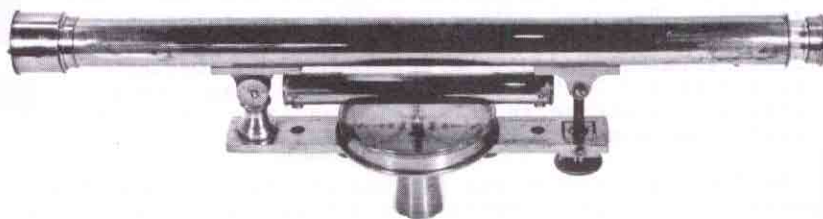


101. PORTABLE TRANSIT INSTRUMENT - English, before 1897, signed on the eyepiece "T. COOKE & SONS, YORK" with the serial "No. 864" on the readout circle. Brass in black oxidized finish, telescope 19" long with 1 5/8" d objective and 2 eyepieces. Vertical readout circle 5 1/2" d, silvered, 1 arc minute vernier readout, swingaway magnifier and 4" bubble level. The removable lateral alignment bubble level is 8 1/2" long on brackets 3 3/4" h. The instrument is shown mounted in a modern walnut display stand 13 1/2" h with a 7 3/4" x 10 3/4" base. Original dovetailed painted pine case 21" long, 10 1/2" w, 6 1/2" h in sound condition. The instrument is in excellent condition.

Thomas Cooke of York (1807-1868) established one of England's major optical firms in 1837. Between 1868 and 1897 it was known as T. Cooke & Sons (the name on this instrument), then T. Cooke Ltd. until 1922 when they merged with another great instrument making firm to become Cooke, Troughton & Simms. An instrument such as this, together with a good chronometer, was the surveyor's primary longitude reference or, conversely, his primary time calibration reference. As usual, the original support structure and the cased portable instrument have become separated, and so a modern display stand has been substituted to show how the instrument would have been used.

(30 lbs UP, air Freight) \$ 450

102. EXCEPTIONAL TROUGHTON LEVEL - English, late 18th c, signed "Troughton/London". Bright brass with original lacquer finish 98% intact (mostly minor pin-point spotting), telescope 21" long, 1 1/4" d fixed focus objective, draw tube focussing of eyepiece upon cross hairs, 7" bubble level above 4 1/4" d compass with silvered face, 3 3/8" needle, signed on 10 1/4" long base, 5 3/4" overall ht. Missing protective shutter from slide-on sun shield, otherwise complete and in very fine condition. No case.



Design details, including the fixed focus objective, and the fact that 19th century texts do not illustrate this form of level, suggest that this was an early instrument by Edward Troughton. It was his later "Improved Level" (Item 144, Catalog 105) which is described by Frederick Simms (and other writers). Although any Troughton instrument is worthy of note, those dating from the 1790 period tend to be quite rare and of major importance in following his career as one of England's two greatest makers of scientific instruments (the other being, of course, Jesse Ramsden).

(12 lbs UP, air freight)

\$ 525



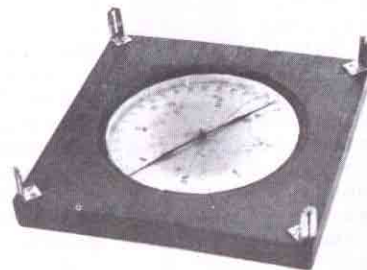
103. ARCHITECT'S Y LEVEL - American, early 20th c, signed "KEUFFEL & ESSER CO./NEW YORK/25593". Brass in black oxidized finish, telescope 11" long with 1" exten of objective by rack & pinion focussing. 5" bubble level, 3" d silvered azimuth circle divided to degrees with vernier readout to 5 minutes. Triangular base plate for plane table use. Original field case 12 1/4" x 5 1/4" x 8 1/2" h. Case in fair, level in fine condition with minor wear to oxidized finish.

These small levels were also known as "Builder's Y Levels" and were intended for use in the construction of buildings rather than land surveying. The example here was designated model no. 5110 and appears to have been a standard K & E instrument from the late 19th c onward.

(15 lbs, UP, PS) \$ 150

(A fitting tripod can be supplied for an additional \$ 15.00.)

104. UNUSUAL WOODEN SURVEYOR'S CROSS - English, possibly 18th c, unsigned. Mahogany body 9" sq x 1" h, 6 1/2" d inset compass with pen & ink drawn compass card, 5 7/8" needle. Four 1 1/4" h sight vanes in the corners. Signs of a mounting bar on the underside (now lacking but easily restored if so desired). Generally fine condition except for age warping which has cracked the original cover glass.



The simple surveyor's cross (pairs of sights at right angles) was already in use in the 16th century for laying out rectangular plots. The addition of the compass (as with this example) greatly extends its utility because it can then be used for taking relative bearings as well, and even mapping against the magnetic azimuth reference. This example could have been made either by a local surveyor or under his direction. It does not follow a standard design.

(5 lbs, UP, PS)

\$ 145



105. POCKET VERNIER COMPASS ON JACOBS STAFF - English, 2nd half 19th c, marked "MADE IN ENGLAND" but no maker's name. Brass compass in black oxidized finish 4 1/2" d, 3 1/4" h folding sight vanes, 4" d silvered dial with inset bubble levels, 3 1/2" needle, vernier scale for setting in the variation at extreme edge of dial. Octagonal oaken Jacobs staff 50" h terminated by brass ball & socket joint. Compass and staff in fine condition. Although the Jacobs staff must have been quite common as a means of mounting surveying instruments, almost none seem to have survived (possibly because they were so simple). Thus, although the compass is a quite nice little item by itself, this combination should be of very great interest to the historian of the technology of land surveying.

(12 lbs, UP, PS)

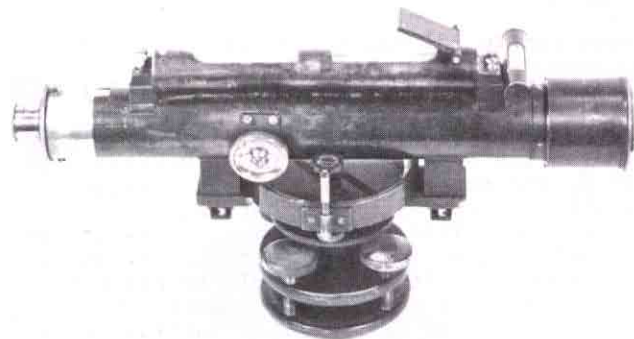
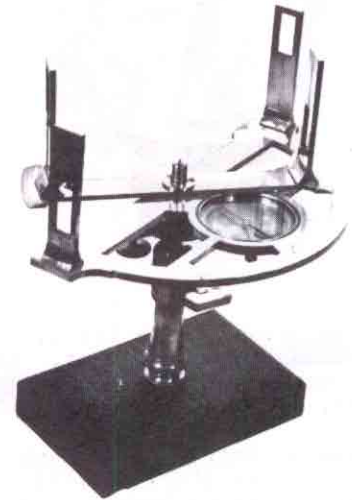
\$ 145

106. GRAPHOMETRE OF QUALITY - French, c. 1860, signed "Secrétan à Paris" and also "Syndicat du Lagoin" (probably the user of the instrument). Bright brass, 10 1/4" h overall (including display stand), the fixed plate 10" long with readout semi-circle of 4 1/4" rad, 2 3/8" d inset compass with silvered dial, 2" needle. The moveable arm is 7 7/8" long with opposing arc minute verniers. The 4 sight vanes 3 5/16" h each. Azimuth motion locking screw and plate, ball joint center post. No case. The walnut display stand is

of modern origin. Extremely fine overall condition.

Although the graphometre (semi-circumferentor in English) is an early form of surveying instrument, the French seem to have preferred it to later designs even through the late 19th c. This example by Marc Secrétan, one of France's leading makers of scientific instruments at mid 19th c, follows earlier traditions. Its quality is typical of the work turned out by Lerebours et Secrétan (1845-55) and then by Secrétan after his partner's death.

(10 lbs UP, \$ 10 registered mail) \$ 365

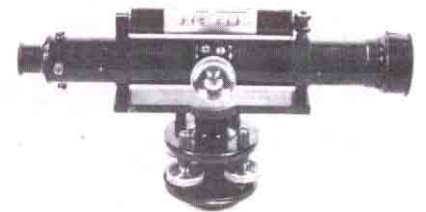


107. HIGH QUALITY DUMPY LEVEL WITH COMPASS - English, mid 19th c, signed "Troughton & Simms, London". All brass in green-black oxidized finish, 8" overall ht including 4-screw leveling base and removable inclined mirror for rear viewing of leveling bubble, telescope 11" long extending by rack and pinion eyepiece focussing to 13", 3 3/4" d compass mounted below telescope. Main leveling bubble 6 1/2" long and cross bubble 2 1/4" long. Original dovetailed mahogany case 5" w, 4 3/4" h, 16 1/2" long. Level in almost fine condition with minor fading and wear of oxidized finish, rotating dust cover on lens hood a later replacement, case is sound and with very good surfaces.

This instrument appears to follow Troughton's "Improved Level" in design sequence. It is functionally identical but has design changes which made it easier to manufacture and, even more importantly, easier to adjust in the field. Troughton & Simms was established in 1826 when William Simms was taken in as a partner so that the firm could continue, Edward Troughton having no family and his brothers having died years earlier.

(16 lbs UP, air freight) \$ 240

108. NICE BUILDER'S LEVEL - English, c. 1900, unsigned, of a design made by Stanley and possibly others. Brass in black lacquered finish, 10" long by 5 1/4" h including 4-screw leveling base. Rack and pinion objective lens focussing. 4" level bubble adjusts with respect to the telescope, the telescope mount is rigid. Original mahogany case 11" x 6 1/2" x 3 1/4" h. Case in very good (crack in cover) and level in almost fine condition. There are post WWII repair labels in the cover of the case but design considerations (i.e. 4-screw base) date the instrument to the turn of the century.



(10 lbs, UP, PS)

\$ 105



109. POCKET SURVEYOR'S COMPASS - French, c. 1900, unsigned, but marked "MADE IN FRANCE" (for the American market). All brass in original bright lacquered and black finish, 4" compass OD, 7 1/4" h on universal staff mount. Silvered dial 3 1/8" d, 2 3/8" needle, crossed bubble levels in bottom of dial. Blackened fold-down sight vanes 2 3/4" h with notches for suspension on line. Original leather-like case 6" x 4 3/4" x 1 1/4" h (not shown). Compass in near mint condition, case shows minor wear. Such instruments were intended for preliminary field surveying & mapping, and checking construction work.

(4 lbs, UP, PS) \$ 95



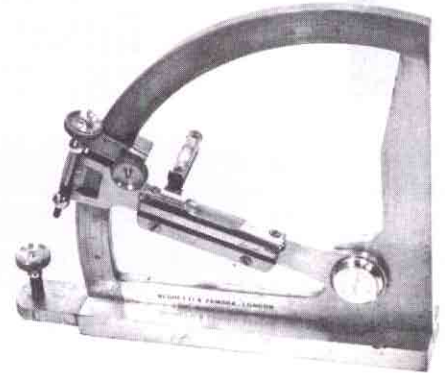
110. SURVEYOR'S TRANSIT - American, possibly c. 1875, signed "Stackpole & Brother/ New York/1753". Bright brass with silvered scales and 5 1/4" d compass dial. Overall ht (telescope horizontal) 12" including 4-screw leveling base, telescope 10 1/4" long with rack and pinion objective focussing and 6 1/4" bubble level, the base plate 7 1/4" d. The 6" d azimuth readout circle is fitted with opposing 1/2 arcmin. verniers. Part of the azimuth tangent screw assembly is missing, otherwise the instrument is in very fine display condition. No case.

Stackpole & Brother was founded in 1851 and continued until 1910. The older brother, William (1819-1895) had established himself as an instrument maker in New York City in 1843, later forming the company with his brother Robert (1823-1873). The firm played an important role in American instrument making in that it is known that both F. E. Brandis and G. L. Buff worked for them before establishing their own businesses, and there may have been others.

(25 lbs UP, air freight)

\$ 335

111. AN IMPRESSIVE CLINOMETER - English, 2nd half 19th c, signed "NEGRETTI & ZAMBRA. LONDON". Bright brass, original lacquer finish 7 7/8" h, base 1 1/2" w x 9" long. Pivoted arm with 3" radial bubble level, 1 1/2" swing-out transverse bubble level, 3 arc minute vernier readout and tangent screw fine adjustment. Well engraved readout scale. Original dovetailed mahogany case 10 1/4" x 8 3/4" x 2 3/4" h. Case in good, clinometer in extremely fine condition.



The firm of Negretti and Zambra was founded in 1850 by Henry Negretti (born in Italy in 1818 as Enrico Angelo Ludovico Negretti) and Joseph Warren Zambra (born in the little English town of Saffron Walden in 1822). It is still in business with a shop on New Bond Street, London. They sold, and manufactured and sold, a tremendous range of scientific apparatus. Their 1859 catalogue ran to 181 pages listing 2,134 separate items.

(11 lbs, UP, PS)

\$ 170



112. MINING SURVEYOR'S PROTRACTOR - English, probably 2nd qtr 19th c, signed "Davis & Son, London & Derby." and the back stamped "C. H. PLEVINS BARLOW COLLIERY". Bronze, 8 1/8" d, the scale divided to half degrees through 360 deg. A few minor stains, typical bronze patina, fine to very fine overall condition. No case. This protractor is somewhat out of the ordinary because of the material of its construction. Brass was the standard metal for such instruments. It is difficult to place the maker of this instrument since Davis was a rather common name. However, Taylor 2 lists a John Davis (fl c. 1830) in Derby. This instrument may have been made by a firm composed of this man and his son, with a branch in London.

(4 lbs, UP, PS) \$ 65

113. INTERESTING VERNIER COMPASS - American, 3rd qtr 19th c, unsigned. Bright brass, base 13 1/2" long with screw-on vanes 6 3/4" h, circular bubble level (fluid now lacking), and readout scale for vernier. Compass 6" d with silvered face and edge scale divided by 1/2 degrees, 5" needle, press-on cover. Generally fine condition although with wear from use, solder repairs to the compass cover, and the knob for the needle lifter is a modern restoration.

Although unsigned, it is our opinion that this is an early example of the work of Arnold & Co. of Chicago (founded 1863). It is similar in design to the signed instrument listed as Item 114 in our Catalog 103. There are a number of features which suggest that it could be one of the earlier works of a firm far removed from the industrialized north-east. The vanes are built of pieces of brass plate riveted together, the central portion of the dial is scribed rather than engraved as are the vernier scales, and the knobs of the vane and vernier rotation locking screws appear to have been turned on a very primitive lathe. The circular bubble level supports the attribution because it did not appear much before mid-century and so this instrument could not have been made by one of the established firms during their early years because of this design conflict.



(10 lbs UP, \$ 12 registered mail)

\$ 245



114. SUPERB CIRCUMFERENTOR - English, early 19th c, signed "Bradford Maker. 136/Minories London". Brass, original lacquer finish, silvered compass dial and outer scale of 7 3/4" d, the compass of 5" d, 4" needle, with cross bubble levels inserted in its face. Inner and outer sight vanes 4" and 4 3/4" h respectively, instrument 5 3/4" h overall. Original dovetailed mahogany case 8 1/2" sq by 3 1/2" h contains original 6" d 360 deg brass protractor as well as circumferentor. Case in very good, instrument in extremely fine condition with some loss of silvering on outer ring.

Taylor 2 lists George Bradford at 99 Minories from 1817 and we know that his nephew followed him at the same address. Thus this instrument must date from before Bradford's move to 99. The 4-vane circumferentor is a relatively rare instrument, possibly because it was quite costly; it was possible to use the far less expensive surveyor's compass for the same type of work. Thus, in reality, it was a design hold-over from earlier times and probably made more for its impressive appearance than a practical need.

(12 lbs UP, \$ 15 registered mail) \$ 995

115. EXPLORER'S SIGHT VANE ALIDADE - English, late 19th c, signed "CASELLA/LONDON No. 9114" and "ROYAL GEOGRAPHICAL SOCIETY No. 30". Black oxidized brass, rule 1 3/4" w x 18 1/4" long with circular bubble level and 6 1/2" h folding vanes. Original dovetailed mahogany case 19 1/2" long, 3 1/4" w, 1 3/4" h fitted with box compass 4 7/8" long (R. G. S. no. 24). Case shows use as does alidade with its finish worn thin in places. Very good overall condition.



These plane table alidades seem to have been popular with explorers heading to the remote parts of the world. They were light in weight compared to the standard transit and permitted maps to be drawn in the field without the need for recording quantities of numerical data. The Royal Geographical Society serial number may even enable one to determine on which world famous (or not so famous) expedition(s) this instrument saw use.

(7 lbs, UP, PS) \$ 68



116. WELL MADE SURVEYOR'S COMPASS - English, 1st qtr 19th c, signed "Spencer & Company/LONDON". Bright brass, base 12 3/4" long, screw-on sight vanes 5 1/8" h, compass 4 7/8" d with silvered face, 3 3/4" needle, 6 1/2" overall ht. Staff clamping screw lost, otherwise very fine overall condition. No case.

The firm Spencer, Browning & Rust (SBR) first appeared in the London Directories between 1780 and 1784. Their mass-produced ebony mariner's quadrants were signed with the full name. However, it seems that in the 1800 to 1830 period, their higher quality instruments in brass were more likely signed as above. Between 1845 and 1850 the firm became Spencer, Browning & Co. John Browning (after c. 1865) the noted spectrometer and microscope maker, seems to have been the

last of the family to have represented this old and well known company.

(7 lbs UP, \$ 8 regis. mail) \$ 235

117. MAP-MAKER'S ADJUSTABLE PLANIMETER - Unknown, possibly German origin, signed "STANLEY, LONDON." with serial no. 57464. German silver with major arm 10" long. In fitted black-cloth-covered case 12" long, 2" w, 1 1/2" h. Instrument in extremely fine condition, case a bit worn. Planimeters are used to obtain the areas of irregular shapes on maps by tracing out their perimeters. This example is adjustable for different map scales and is probably still useable for one who knows how. The origin of this instrument is unknown to us. We have seen several identical ones with different maker's (more likely seller's) names from both sides of the Atlantic and believe that they were all made by the same firm.



(4 lbs, UP, PS) \$ 55



118. ENGINEER'S LEVEL - English, early 19th c, unsigned. All brass 11 5/8" long, 3 1/2" h, bubble 6" long. Slide tube focussing of 7/8" d objective. Inverted image. Extremely fine condition with original lacquer finish. Such instruments were intended for use during construction work. Without wyes for reversal this is, in many ways, an early form of the basic "Dumpy level".

(5 lbs, UP, PS) \$ 105



119. A RARE & GREAT 18TH CENTURY INSTRUMENT - English, c. 1750, signed "B. Martin London". Brass semi-circumferentor (restored bright lacquer finish), fixed readout circle of 11 3/4" d with 5" h slide-on sight vanes, rotating arm of 10 1/2" d with vernier readout to 5 arc minutes and 4 3/8" h slide-on sight vane. Central compass 6" d with silvered dial and 4 3/4" needle, original protective brass cover (not shown). Overall ht 10" incl ball and socket center post. Original wooden (oak) tripod with brass fittings and tripod head, legs 47 1/2" long each, one leg with noticeable working. The compass coverglass and central stud are modern restorations (see story below) as are one tripod screw and one center post locking screw. Very fine overall condition.

Benjamin Martin (1714-1782), lecturer, author, and instrument maker was one of the most inventive of the mid 18th c instrument makers and possibly the finest craftsman of them all. He provided Harvard University with its first good instruments (now mostly lost). Yet this instrument has its own interesting story. It was found in poor condition, the central portion having been converted into a conventional surveyor's compass and so fitted to the tripod. However, for some reason, the fixed circle with its vanes and central mounting washer were kept with

the rest of the instrument. Thus it was determined from a study of English circumferentors of the period that a reconstruction of a proper central stud and reattachment of the original parts would return the instrument to its original form. This was done and we now have an example of one of Benjamin Martin's finest surveying instruments complete and, except for usual wear and loss of minor parts (screws, etc.) in the same state as when first completed.

(25 lbs UP, air freight)

\$ 1150

120. SMALL BUILDER'S LEVEL - American, probably early 20th c, signed "THE L. BECKMANN CO. TOLEDO, OHIO. U.S.A. 8112". Bright brass (originally painted black) 5 1/2" h incl 4-screw leveling base, telescope 12 3/4" long extended, 3 3/8" bubble level on 7" long frame. Very fine condition except for 3 holes drilled in base plate for mounting purposes. No case.



Smart notes that Ludwig (or Louis) Beckmann (1845-1914) came to the U. S. from Germany in 1870 and started making surveying instruments in 1874. After his death in 1914, his son Louis Beckmann Jr. continued the firm's work until 1945 when actual manufacture of instruments was discontinued. Repair service continued after this date.

(6 lbs, UP, PS)

\$ 65



121. ARCHITECT'S GRAND PARALLEL RULE - Probably American, 19th c, unsigned. Walnut rules 15/16" w x 46" long connected by 11" long parallel bars. An elegant parallel rule in fine to very fine condition.

(8 lbs, UP, PS) \$ 48

122. BUILDER'S BUBBLE LEVEL - English, late 19th c, unsigned. Black finish brass level 11" long, 2 1/4" h, feet 3 1/4" w. Original dovetailed mahogany case 12 1/4" x 3 1/4" h x 4 3/4" w. Case in fine, bubble level in excellent condition. Such levels were placed on cylindrical parts - piping, machinery shafts, etc. - during construction, rebuilding and installation operations.

(7 lbs, UP, PS)

\$ 40



123. 6-DRAW PROSPECT GLASS - English, 1st half 19th c, signed "Thos. Rubergall Coventry Strt LONDON". Gilt brass construction with the metal ringed wooden outside barrel 1 3/4" d x only 1" h; the telescope 4" long extended.

The achromatic objective has a clear aperture of 1 5/16", the eyepiece is Galilean, magnification of 2 1/2 x's. Extremely fine condition. Goodison lists Thomas Rubergall, optician to George III, at 27 Coventry St 1805-23 and at 24 Coventry St 1826-54, putting outside limits on the date of this instrument. The large number of draw tubes makes this little telescope quite a "tour-de-force".

(2 lbs, UP, PS)

\$ 85



124. SOLAR ECLIPSE TELESCOPE - English, 19th c, unsigned. Brass tube 3/4" d x 5" long (unextended) with single draw tube eyepiece. Clear aperture 1/2" d with Galilean eyepiece giving approx 2 x power. Very dark filter glass mounted in eyepiece to reduce the intensity of the sun's rays. Generally fine condition with some spotting of original lacquer finish. An interesting little item, probably made just prior to a solar eclipse.

(2 lbs, UP, PS)

\$ 35