PART 2
EXAMPLES OF BEFORE & AFTER CLEANING & RENOVATION

Note the upper part of the brass barrel has pitting corrosion.

Troughton & Simms table top - cased.
Note the pitting corrosion is absent from the underside of the barrel - this is indicative of dew contaminated with either nitrous, sulphurous or carbonic acid, from either a damp rural, or industrial atmosphere.
The lengthways split in the Cuban mahogany case lid is caused by storage at low humidity. The simplest way to repair it, is to leave the empty case in a damp shed, and once the wood expands, infill the split with Cascamite wood glue.
Troughton & Simms on broad pillar & claw stand. The barrel has pitting corrosion to the uppermost part only, caused by dew contaminated with either agricultural or industrial atmospheric pollutants.
Troughton & Simms on braced pillar & claw stand with cabriole legs.

The barrel has been re-polished with Brasso and a rough cloth to remove the lacquer, and paper towel to remove all traces of pitting corrosion, then finished with conservator’s polish PreLm and Renaissance Wax.

Troughton & Simms signature, after re-polishing. The engraving technique, known as machine copying, was used at their 138 Fleet Street factory. Compare the condition of the brasswork with that prior to renovation. The shallow pits left on the surface have been polished out. Renaissance Wax prevents the pitting corrosion getting any worse, and re-lacquering will fill in the shallow depressions, leaving them imperceptible.
Tulley & Sons, Islington, London. 5 feet astronomical refractor c1830. Charles Tulley traded as "Tulley & Sons, with his sons William & Thomas, between 1826 & 1830. The telescope barrel unscrews for storage in two sections. The steady rods collapse for storage against the tube either side of the impact bar (a square brass bar fitted to prevent damage to the tube when pointed near the zenith).
Tulley & Sons, Islington, London. 5 feet astronomical refractor c1830. Charles Tulley traded as "Tulley & Sons, with his sons William & Thomas, between 1826 & 1830. This is one of the earliest known examples of an English made astronomical refractor on a German (Fraunhöfer style) Equatorial mount. The 3.75-inch clear aperture achromatic doublet object glass has blown crown and French (Guinand) flint elements.
Tulley & Sons, Islington, London. 5 foot astronomical refractor c1830. Charles Tulley traded as "Tulley & Sons, with his sons William & Thomas, between 1826 & 1830. This is one of the earliest known examples of an English made astronomical refractor on a German (Fraunhofer style) Equatorial mount.
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CLEANING, RENOVATION & MAINTENANCE OF ANTIQUE & VINTAGE BRASS REFRACTORS (cont.)

Mahogany or fruitwood barrels, if they are cracked, can be glued using PVA wood glue, and wrapped with masking tape whilst the glue sets. The tube can then be re-polished using fine steel wool, or a buffing block, until you obtain a mirror finish, and then varnished with a rag soaked in shellac made from waxed flakes, sometimes referred to as button polish.

Leather bound barrels, where the stitching is intact, should be cleaned with Saddle Soap, then primed with Dubbin, before being polished with the correct shade of wax shoe polish. If the stitching is damaged and the leather has shrunk back you are faced with two choices. If it is beyond repair, remove the leather altogether and either buy a similar piece in the same or a near shade, and stitch it yourself, or simply polish up the brass tube beneath, and discard the leather covering altogether.

Late C19th and C20th signalling telescopes have leather bound barrels and a leather sleeve case and shoulder strap. Treat the leather with Saddle Soap, & Dubbin. Keep the leather supple by applying Dubbin every few months, especially if the telescope is kept in a centrally heated house.

Re-assemble the refractor starting with the first draw, proceeding through the second, third &c draws, ensuring you don’t cross the screw threads. Then the eyecap, the OG cell and glare shield, and OG cover slide. Try the draws to see if they slide smoothly, yet do not slop about. If a drawtube is a slack fit, unscrew the spring collar, and gently push in the spring tabs a little. Later refractors were fitted with felt lined spring collars, that occasionally get grit embedded. Feel the inside of the felt with you finger tip, and tease out any grit with a cocktail stick.

Once re-assembled extend the draws, and apply a modicum of Renaissance Wax to the drawtubes. Renaissance Wax is a Cosmoloid wax that protects the brass from tarnishing, and also helps the tubes slide smoothly. Reapply every few months.

Some antique and vintage refractors have plated or chemically patinated brasswork, either nickel, silver or gold plated, or blued or bronzed. Obviously the plating or coating was applied by the maker and ought to be retained. Gun bluing can be applied to damaged or worn patina, and silver or gold gilt applied to damaged or worn plated brasswork. Suppliers of gilding liquids are ‘Alec Tiranti’ or ‘Joseph Cornellian’ or ‘Meadows & Passmore’. Suppliers of gun blue too numerous to mention. Use cold bluing applied with a clean dry cloth.

NOTES ON BRITISH INSTRUMENT MAKERS

Out of preference I only collect antique telescopes made by British instrument makers, especially English, because I find it involves less time and effort researching their histories. On-line research only takes you so far, most local information about particular instrument makers has not been digitised and probably never will be. One is obliged to ferret out articles and obituary notices in reference libraries, and the national archive at Kew.

The leading English instrument makers of the C18th & C19th, The Dollonds, Benjamin Martin, Ramsden, Cary, Adams, Jones, Nevil, Derge, the Watkins, the Tullleys, Browning, Clarkson, Watson, Thomas Cooke, W. Ottway, Home & Thornthwaite, Negretti & Zambra, J.H. Steward, and the most famous of all, Troughton & Simms, have well documented and researched histories. Lesser known makers such as J. Ceti, H.Hughes, Spencer, Broadhurst & Rust, London, Henry Husband of Bristol, require further delving, as do John Dance, Joseph Casartelli & William Aaronsberg of Manchester & Henry Frodsham of Liverpool. C20th telescope makers, Broadhurst, Clarkson & Co., Ltd., Hilger & Watts, & Ross, also have well documented histories. One of the delights in collecting antique telescopes is coming across a lesser known make, and doing a little research about the maker.

Useful directories of British instrument makers are Webster’s "Instrument Maker's Biographies" which is a free on-line data base. Gloria Clifton's "Directory of British Scientific Instrument Makers, 1550-1851" which is ridiculously expensive at ~£150, & Mary Holbrook's "Science Preserved, a directory of scientific instruments in collections in the United Kingdom and Eire" 1992, & "Making Scientific Instruments in the Industrial Revolution" by A.D. Morrison-Low, 2007, which covers the period 1700-1945, but is also expensive at ~£70.
There are scant few worthwhile textbooks on this subject. Reginald Cheetham's "Old Telescopes", 1997, had a limited print run and is rare. Peter Hunt's "Collecting Old Telescopes", a recent publication, being assemblage of advertisements published between 1500 & 1960. Gerard L'E Turner's "Antique Scientific Instruments" BLANDFORD PRESS, 1980, is an adequate reference work, & there is a small Science Museum illustrated booklet on Astronomical Telescopes by A.G. Thoday, 1971. "Collecting and Restoring Scientific Instruments" by Ronald Pearson, Arco Publishing, 1974, is the only publication dedicated to this hobby.

In my opinion Ronald Pearson's book is the only one available, although out-of-print, which is worth having. I'd like to quote you what he has to say on the subject of cleaning and renovation, because it is clearly apposite.

"COLLECTING AND RESTORING SCIENTIFIC INSTRUMENTS" 1974

'CLEANING AND RENOVATION OF SCIENTIFIC INSTRUMENTS'
CHAPTER 14 p182

It is still not unusual to find the more out of the way scientific instruments tucked away in the corners of junk shops, the owners of which have no idea what the objects are, and although this is not true of instantly recognisable things such as telescopes and microscopes, even these can be found in a sorry state. The collector on finding an instrument in need of a good refurbishing will have a choice of whether to bring the instrument up into tip-top condition, with gleaming brass and immaculate woodwork, or to merely remove the dirt, grease and rust and have an interesting objet d'art rather than a working instrument. Some collectors even think there is something vulgar about shining brass.

The author cannot share these delusions. A beautiful object should be presented at its best, whether it is a picture, a piece of furniture, or an instrument. Scientific instruments, unless one has an exceptionally deep pocket, are unlikely to qualify as objects where the main attraction is age, as in old oak, where the machinations of long-dead woodworm and the inroads of the occasional death-watch beetle add to the aesthetic appeal.

A scientific instrument can be divided into a maximum of four parts: (a) the metalwork, (b) the woodwork, (c) the optics (if any), (d) the covering (if any). By covering is meant the parchment, leather, shagreen, etc., used to cover the tubes of microscopes and telescopes.

The metal will more often than not be brass, and brass is very responsive to attention. If the metalwork on a scientific instrument is in a bad way, covered with grime, grease and a generation of dirt, one should not have any preconceived ideas on what it should eventually look like. In the early nineteen century workers in brass preferred the red brasses, as they were easier to work, but with the patented method of Muntz brasses became much yellower. Muntz metal, or yellow metal as it is often called, should be treated as brass.

Pearson's approach to the restoration of antique telescopes is similar to mine. A school has arisen that equates a distressed state with "history." In the case of antique telescopes & microscopes, there is no direct relationship between "patina" and age. One ought not presume the degree of tarnish or density of pock marks, dents, and gouges, can by some empirical formula be equated with duration of existence. This presumption is demonstrably erroneous. Is one to take this to its logical conclusion? Ought one therefore to adopt the malpractice of "distressing" a piece, as one finds in those frightful Indian replicas? How is one to distinguish between comparatively recent damage and that inflicted many decades ago? How does one know the last time a telescope was polished? It clearly is not right to presume that each time a telescope is polished, all tarnish and verdigris is assiduously removed. What if the last time it was polished, it was only given the once over so to speak. What is one expected to do if the telescope is knocked over and the tube bent? Do you leave it like that? Is the accidental damage to be worn as a badge of pride, the wrinkles on the face of a much loved friend?

I'm firmly of the opinion this deluded view owes much to TV antique show pundits who go on about "patina" as if it's the Holy Grail. These people are furniture specialists, who sometimes put it about that the grease and oil exuded by skin and deposited along with the dust of centuries onto wood imbues that piece with beauty. No. What it imbues it with is an easy way for the specialist valuer to decide if the piece has been mucked about with, since the patina acts as an impossible-to-replicate signal that something is original. The specialist valuer finds that vitally useful, but it is not beautiful. Beautiful is how it looked when the maker had just finished making it.

My approach is to research the maker, his techniques, and the instruments he made which are either in museums such as the Whipple collection, or in private collections. This gives one a good idea as to what the telescope ought to look like once you have finished restoring it. I've been collecting old telescopes since I was 17. All of them were restored to working condition. During my 7 year apprenticeship in mechanical engineering I learned the skills to recreate missing parts in the style of the master craftsman who made the original. My long association with the late Ronald N. Irving, Britain's last traditional brass & glass scientific instrument maker, enabled me to acquire some of his skills.

I have read that brass can be "over-polished" to which I say, "nonsense". The only reason an antique brass telescope ends up tarnished or corroded is due to the indifference of the previous owner. When a brass telescope left the workshop of Troughton & Simms for example, it would have gleamed like gold. There would be a hint of tarnish or discoloration. The rack & pinion focuser and sliding drawtube would have slid smoothly, as smooth as silk. The lenses would be polished, and dust and dirt free. The image would be crystal clear. And that is what a restored telescope ought to look and work like. It should be indistinguishable from the day it left William Simms' hands. The object being to present the telescope as its maker intended, rather than preserve the accumulated insults of subsequent unworthy owners.

An antique telescope is a thing of beauty and a joy forever. Happy antique telescope hunting.

FOOTNOTE

The phenomenon reported by conservators of brass developing micro-crystalline surface fracturing in the presence of Ammonia has been used to support their argument that Brasso, which contains Ammonium Hydroxide & Ammonio-Thallate, is unsuitable for polishing antique telescopes. I have found no evidence whatsoever for Brasso producing this effect when used as the principal re-polishing agent in renovating antique brass telescope parts, including tubes, cells, stand fittings, pillars, legs &c. Moreover there doesn't appear to be any evidence supporting the claim. With this in mind I have conducted an experiment
using three drawtubes from a junked 3-draw hand held refractor made by J. Woodward, who flourished at St. Clements Inn between 1823 & 1856.

The three drawtubes, together with the draw slides, had not been polished for a long while and had a dark reddish brown patina. To one of the tubes I applied Brasso, liberally, with only a modicum of rubbing, leaving the tube smothered in residue. This tube was left in a garden shed. To another of the tubes I applied the conservator’s ammonia free brass polish, “PreLim” again leaving it smothered in the paste, and left it in my garage. Alongside was left the third, untreated tube as a control. The start date was 17th October 2013.

| BRASSO | PRELIM | CONTROL |

There is no information available as to how long the micro-crystalline surface fractures take to develop in telescope tubing. After a week, there was no difference between the control, the PreLim or the Brasso tubes. Likewise after a month, 2 months, 3 months. The trial is to continue for 6 months, or a year.

I concluded from this experiment that Brasso has no detrimental effect on telescope tubing whatsoever, even when the residue is left on the surface, or trapped underneath draw slides.