Concerning Heritage Telescopes

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Book and Heritage Review

I introduce the magnif cent Wolf collection of historic telescopes and its newly-published catalogue. Along the way I survey some of the oldest telescopes in New Zealand, and uncover a fortuitous link with the Wolf collection.

Wolf Telescopes: A Collection of Historical Telescopes
by *Edward D. Wolf*
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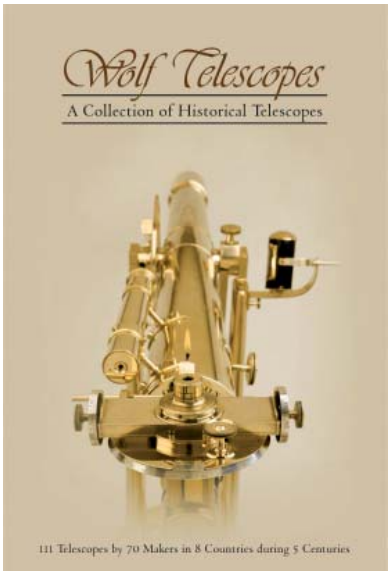

What do people do in their retirement? Some write reviews for *Southern Stars*. Others, like Ed Wolf, collect vintage telescopes. Wolf Telescopes is the beautiful illustrated catalogue of Ed's magnificent collection. With postage, a printed copy will cost serious money – over $200 – but do not despair. Most of the material is available on the author's website, at least for the next year or two.

Ed is an emeritus professor at Cornell University in the United States, who after a doctorate in physical chemistry worked in diverse fields including the aerospace industry and nanotechnology. Since 2001 he has collected an astounding 111 telescopes, which averages to a new one every six weeks! The collection is focused, one might say, on astronomical telescopes, but includes some for terrestrial use (or with terrestrial eyepieces), a handful of binoculars, and three surveying instruments.

Wolf Telescopes is a joint production between Ed, his wife Marlene (who proof-read), his daughter Shelly (responsible for the layout of both book and website), grand-daughter Hannah (who made dimensional measurements and helped with the collection), and photographer Gary L. Hodges, who over two years snapped the 1,500 images that illustrate the work. These crystal-clear photographs are superb, and as Ed notes, technically difficult, often requiring a large depth of field on objects composed of parts with significantly-different reflectivities.

Ed began his collection with tripod-mounted refractors, the archetypal amateur instrument. His idea was that collecting was an investment activity. It soon turned into an addictive hobby. The range of telescope types widened, though pedestal-mounted instruments were excluded for obvious practical reasons. So thinking of historic telescopes in New Zealand, there are no telescopes akin to the 18-inch Brashear refractor still in store in Canterbury or the large Cooke, Grubb or Zeiss refractors in Wellington, W(h)anganui and Christchurch, though the collection does contain smaller telescopes by all these makers bar Cooke.[1] But that does not mean Ed's telescopes are all small – the biggest (or rather, longest) is an 18th-century 3½-inch refractor signed by the Dollond firm in London with a remarkable 12-foot tube. The original objective has been lost, but the enormous focal length suggests that it was not an achromat for which the Dollonds were so famous. (Another telescope is signed "Dolland" – doubtless by some faker hoping to profit from confusion with the Dollond reputation.) Nor has Ed collected specialised instruments such as the transit telescopes or the Danjon Impersonal Astrolabe that survive in Wellington.

The Wolf collection is nevertheless broad, representing the work of some seventy makers in eight countries. All but eight instruments are signed. The collection boasts examples from many of the famous English, French, German and American firms, such as Adams, Bardou, Alvan Clark, Dollond, Grubb Parsons, Lemaire, Lerebours & Secretan and successors, Mailhat, Merz, Nairne, Negretti & Zambra, Passemant, Plössl, Ramsden, Short, Steinheil, Troughton & Simms, Utzschneider & Fraunhofer, and Zeiss.

Ed Wolf with his restored and renovated 12-foot Dollond refractor. Original brasswork near the eyepiece indicated a missing stabilising rod and hence a lost stand. Ed has made replacements. As pictured, the objective is almost 5 metres of f the ground.

The most modern instrument dates from the 21st century, a 90-mm Questar reflecting telescope made for the company's 50th anniversary in 2002. The majority are significantly older, from the 18th and 19th centuries. The oldest (and one of the prettiest) is a Japanese spyglass, with a ¾-inch objective lens and a peony and ivy decoration on the tube and draws. It is signed Mori Nizaemon Masatomi, who is unknown. If he is an older relative of telescope-maker Mori Nizaemon Masakatsu (1673-1754), then the telescope might just date from as early as 1690. If so, the Wolf collection includes telescopes from five different centuries, which is the most you can aspire to.

This raises the question "Which is the oldest telescope in New Zealand?" One can never know what may be in private hands, but the prime candidate must be the small Gregorian telescope held by the Otago Museum. Appropriately enough for Dunedin, it was made in Edinburgh by the Scottish optician James Short (1710-1768). Short only ever made reflecting telescopes. Most of them are Gregorians, which produce an upright image useful for terrestrial as well as celestial use. He engraved each with a 'formula,' which for the Otago reflector is "1736 41/93". This indicates that the instrument dates from 1736, that it was the 41st telescope of this size, and the 93rd of any size, made by Short. The primary mirror has a diameter of 59 mm (close to 2⅓ inches) while its focal length must be about 9 inches. Previously owned by John Campbell Begg, who was instrumental in setting up the Beverly-Begg Observatory, it was donated to the Otago Museum by his son John Wyndham Begg. Prior to Short, almost all telescopes were refractors, so even if not the oldest telescope in the country, it is likely to be the oldest reflector. It is also a very early Short: the oldest known is only two years its senior (Willach, 2001). Thanks to a grant from Dunedin's Dodd-Walls Centre for Photonic and Quantum Technologies, this 280 year-old telescope is being restored and should soon be on public display.

There are two contenders for New Zealand's second oldest telescope, both in Wellington. One is another, larger Short Gregorian, on display in the foyer at Space Place (formerly the Carter Observatory). It has roughly a 4-inch diameter primary mirror, an alt-azimuth mount, and a pillar and scroll-leg support. By the time it was made, Short had moved to London and had changed the form of his formula. The Space Place formula is "170/1086 = 18", which means that this is the 1086th telescope made by him, and the 170th with a primary mirror of about 18-inches focal length. Guess what?

The components of the James Short Gregorian telescope held by the Otago Museum. It is currently being restored.
Photo: Courtesy Ian Griffin, Otago Museum

The Wolf collection includes the next telescope to have come out of Short's workshop, and it is of the same size, formula "171/1087 = 18". The date is no longer explicit, but from the serial numbers of extant instruments, some of which can be dated by surviving invoices and the like (Willach, 2007), it can be deduced that the Space Place and Wolf telescopes were both made in 1758.[2] The Wellington one once belonged to renowned TV astronomer Peter Read (1923-1981), who bought it from a now-forgotten Aucklander in 1970 for a sum cited as £100, even though this was three years after decimalisation. On display at Space Place since the exhibition devoted to Read in 2011, it has recently become a permanent feature, the initial loan by his son Adam having generously been turned into a gift this September (for a short video, see Space Place, 2016).[3]

The Space Place and Wolf Shorts are superficially similar to the other contender for Aotearoa's second-oldest telescope. This too is a Gregorian, now at Te Papa, which Wayne Orchiston (2016) believes is probably the instrument used for an observation of the 1769 Transit of Venus made from Tahiti by Daniel Solander, the naturalist on Cook's first voyage to the South Seas. However, the Te Papa instrument differs in detail. Its primary mirror is bigger, being 5 inches in diameter, and it has a correspondingly longer tube, and levelling screws in its feet. Most significantly, it was made by a different London firm, Heath & Wing. It must thus have been made between 1751, when Thomas Heath and Tycho Wing began trading together, and 1768 when the Endeavour left Plymouth, if it is indeed Solander's telescope, or otherwise 1773, the year in which Heath's death and Wing's retirement put an end to the firm. The Space Place and Te Papa telescopes are thus of similar age, but additional evidence would be needed to determine which is older.

There are many small telescopes in museums around New Zealand, inventoried on the websites *www.nzmuseums.co.nz* and *ehive.com*. Most are nautical spyglasses that look to date from the 19th century. Only a few carry a maker's mark – Bodson, Dollond, Wm Hogg, J.H. Steward and Wray. That only Dollond and Steward appear amongst Ed's seventy makers is an indication of how many telescope-making businesses there once were in the world.

In amassing his collection, Ed gave preference to instruments that had retained associated accessories – multiple eyepieces, solar and coloured filters, micrometers, dust caps, storage boxes, tripods and the like. The images in the catalogue thus provide valuable guidance concerning these items which have often been lost. As necessary, the telescopes were cleaned, repaired or restored. A long section of before-and-after photographs and text details some of these restorations along with a 'Do's and Dont's' list. "In general, don't restore!" advises Ed, but if you must, his recommendations include carpeting the workshop floor (to preserve dropped optics), keeping two hands on the screwdriver with slotted-head screws (to prevent deep scratches from a slip), having a plentiful supply of zip-lock plastic bags (for storing small parts), and getting to know the local musical-instrument repairer (because such people really know brass). Other chapters compare makers' signatures, mounts and tripods, and ocular focusers.

One of the most visually stunning telescopes in the Wolf collection is this Foucault-Secretan reflector with a 4-(French)-inch mirror and walnut alt-azimuth mounting. Commercial production of this first silvered-glass telescope began in 1858 so the telescope, numbered 4, must date from about then. A round label signed by Foucault guarantees authenticity.

The 29 floor-standing refractors in the Wolf collection are typical of what wealthy amateurs would have possessed. Ed finds it hard to choose a flagship instrument among them – telescopes by Bardou, Alvan Clark and others vie for this honour. One of the candidates is shown on Wolf Telescope's cover. It is a 3½-inch Dollond from c.1830 with a candle or oil lamp to illuminate a Troughton & Simms filar micrometer. Ed is more certain as to which are the "visually most spectacular" telescopes in his collection. These are two silvered-glass, table-top reflecting telescopes made by the Secretan company in Paris in collaboration with Léon Foucault (1819-1868), of pendulum fame. Foucault is the father of the telescope in its modern form with a glass or ceramic mirror that during polishing is tested and corrected to obtain optical perfection. His signature graces the older of the two instruments. Indeed – full disclosure here – it was these two reflectors, and a third on a tripod, that brought me to Ed's collection. Trying in retirement to put my accumulated specialist knowledge onto paper (or rather, into the bytes of the cloud), I have recently published an open-access article on the evolution of these telescopes (Tobin, 2016). Ed and his telescopes provided essential data.

In summary, I heartily recommend consulting Wolf Telescopes, or the associated website, to explore this wonderful collection further and to look for links with other heritage instruments. The collection has just been bought by the Beijing Planetarium. It is expected that it will be put on public display at the Beijing Ancient Observatory, founded in 1442, and now run as a museum affiliated with the Planetarium. If you are visiting China's capital, the Wolf collection will be a highlight.

Acknowledgments

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Footnotes

1. Concerning the 6-inch Townsend-Teece Cooke refractor damaged in the Christchurch earthquakes, restoration is proceeding apace. See Pollard (2016) for a report and photographs.

2. The Space Place Short does not appear in Willach's list (2007), which does however include a telescope "180/1068=18" belonging to an "unknown private owner." This formula cannot be correct, because the National Museum of Scotland holds instrument "180/1098=18". Willach takes "180/1068=18" to be a transcription error for "170/1068=18". The Space Place instrument "170/1086=18" shows this cannot be correct either, but could 1068 be a second transcription error (for 1086), and the Space Place telescope be the private-ownership instrument incorrectly reported as "180/1068=18"? Julie Orford of National Museums Scotland has examined the files dating back to the 1960s from which the Willach list was compiled, and the answer is "No." "180/1098=18" appears to have been mis-recorded in a preliminary list as "180/1068=18", possibly because if seen upside down or at an angle the 9 could have been confused with a 6. This was corrected in a second list, but the error was reintroduced when the two lists were combined to form the list published by Willach. The conclusion must be that the Space Place telescope is a previously-unrecorded Short reflector.

3. Peter Read was the donor behind another historic telescope in Wellington, a 6-inch Cooke & Sons refractor dating from the early 20th century. The optics were rebuilt by Gary Nankivell in the 1960s. Loaned for some years to the Phoenix Astronomical Society, it is currently in store at Space Place with hopes for early reassembly and display.

References

Orchiston, W., 2016. *The 'Cook' Gregorian telescope in the Museum of New Zealand Te Papa Tongarewa.* In Orchiston, W., Exploring the History of New Zealand Astronomy, Cham: Springer. Pp. 207-226.

Pollard, K., 2016. Great progress on the Townsend-Teece Telescope restoration project. *Physics & Astronomy Department Fortnightly Newsletter*, **33** (36), 2 (October 14). On-line at *www.phys.canterbury.ac.nz/newsletter*

Space Place, 2016. Space Place are now the proud owners... Video posted September 11 on *www.facebook.com/spaceplacenz/videos/10154606882605513/*

Tobin, W., 2016. Evolution of the Foucault-Secretan reflecting telescope. *Journal of Astronomical History & Heritage*, **19**, 106-184. On-line via *adsabs.harvard.edu*

Willach, R., 2001. James Short and the development of the reflecting telescope. *Journal of the Antique Telescope Society,* **20**, 3-18. On-line via *adsabs.harvard.edu*

Willach, R., 2007. List of extant reflecting telescopes made by James Short. *Journal of the Antique Telescope Society*, **29**, 10-22. On-line via *adsabs.harvard.edu*

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