

# A PLEA FOR REFLECTORS

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In 1867 John Browning (c1833-1925)<sup>1</sup> published a trade catalogue entitled “*A Plea for Reflectors: Being a Description of the New Astronomical Telescopes with Silvered-Glass Specula; And Instructions for adjusting and Using Them*”. This catalogue had six editions that were published until 1876<sup>2</sup>. Browning describes his range of reflecting telescopes, how to use them and compares these with achromatic refractors of comparable apertures. It also contains numerous details of its extensive range of glass silvered specula, eyepieces, micrometres, barometers and microscopes (Figure 1).

The back of the booklet contains testimonials from satisfied customers, many of them distinguished amateurs and professionals. By publishing “*A Plea for Reflectors*”, J. Browning & Co. became one of the first to mass produce telescopes for the amateur (Figure 2).

The popularity of the Newtonian reflector as the instrument of choice for the amateur astronomer followed the pioneering work of George Henry With (1827-1904). With began making silvered-glass mirrors in the early 1860's following his retirement as schoolmaster at the Blue Coat School, Hereford. With did not actually make telescopes. His principal customer was John Browning, the London instrument maker well-known for his spectroscopes and telescopes. Browning's business flourished to circa 1905, possibly first starting at 1 Norfolk Street, Strand circa 1866. The firm had their 'factory' in Vine Street EC3 (1872-76) and Southampton Street north off the Strand (1877-82) and William Street (1887). The shop was at 111 Minories (near Tower Hill) working under the name Spencer, Browning and Co. However, during the early 1870's Browning moved to larger premises at 63 The Strand. John Browning's home was in Sevenoaks, Kent, but he retired to Chiselhurst<sup>3</sup>.

Browning had two commercial rivals in the field of large silvered glass reflecting telescopes, mainly George Calver (1834-1927). Calver, born in Walpole near Yarmouth, was the son of a farm labourer. His first mirror was a 10-inch f/9 made in 1862. He transferred his business to Widford near Chelmsford in 1870 to get away from the noise and vibration of traffic that made it difficult to perform the delicate figuring and testing process. However, the Widford workshop was on a dusty main road, and he eventually moved back to his old village of Walpole in 1904<sup>4</sup>.

Calver's telescopes and mountings are broadly similar in design and construction to Browning's, but evolved into a somewhat sleeker and more elegant form by the early 1880's. The castings were made by a small firm, T. Lepard and Sons of Yarmouth, and the larger castings by the agricultural firm, Suffolk Iron Foundry near Stowmarket (Figure 3).

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<sup>1</sup> John Browning was born in Welling, Kent around 1833. He became one of the leading scientific instrument makers of his time. He made instruments for the Royal Observatory at Greenwich and Kew Observatory. His trade Card pronounced that he was “Optical & Physical Instrument Maker to her Majesty's Government”.

<sup>2</sup> PDF available at:

[https://books.google.pt/books/about/A\\_Plea\\_for\\_Reflectors.html?id=zf1wtAEACAAJ&redir\\_esc=y](https://books.google.pt/books/about/A_Plea_for_Reflectors.html?id=zf1wtAEACAAJ&redir_esc=y)

<sup>3</sup> <http://www.brayebrookobservatory.org/>

<sup>4</sup> Calver followed Browning's example and issued a congruent trade publication, 'Hints on Silvered-Glass Reflecting Telescopes' which ran to six editions by 1897. PDF available at:

<https://www.gutenberg.org/files/53494/53494-h/53494-h.htm>

A PLEA FOR  
**REFLECTORS,**  
BEING A DESCRIPTION OF THE  
NEW ASTRONOMICAL TELESCOPES  
WITH  
SILVERED-GLASS SPECULA;  
AND  
INSTRUCTIONS FOR ADJUSTING AND USING THEM.

BY  
**JOHN BROWNING,**  
F.R.A.S., F.M.S., & F.M.S.L.



SIR WILLIAM HERSCHEL,  
From an original Seal in the possession of the late R. W. S. LUTWIDGE, Esq., F.R.A.S.

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PRICE ONE SHILLING.

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SIXTH EDITION.

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LONDON:  
JOHN BROWNING, 63, STRAND, AND SOUTHAMPTON STREET, W.C.  
1876.

Figure 1- A Plea for Reflectors by J. Browning, sixth edition, 1876.

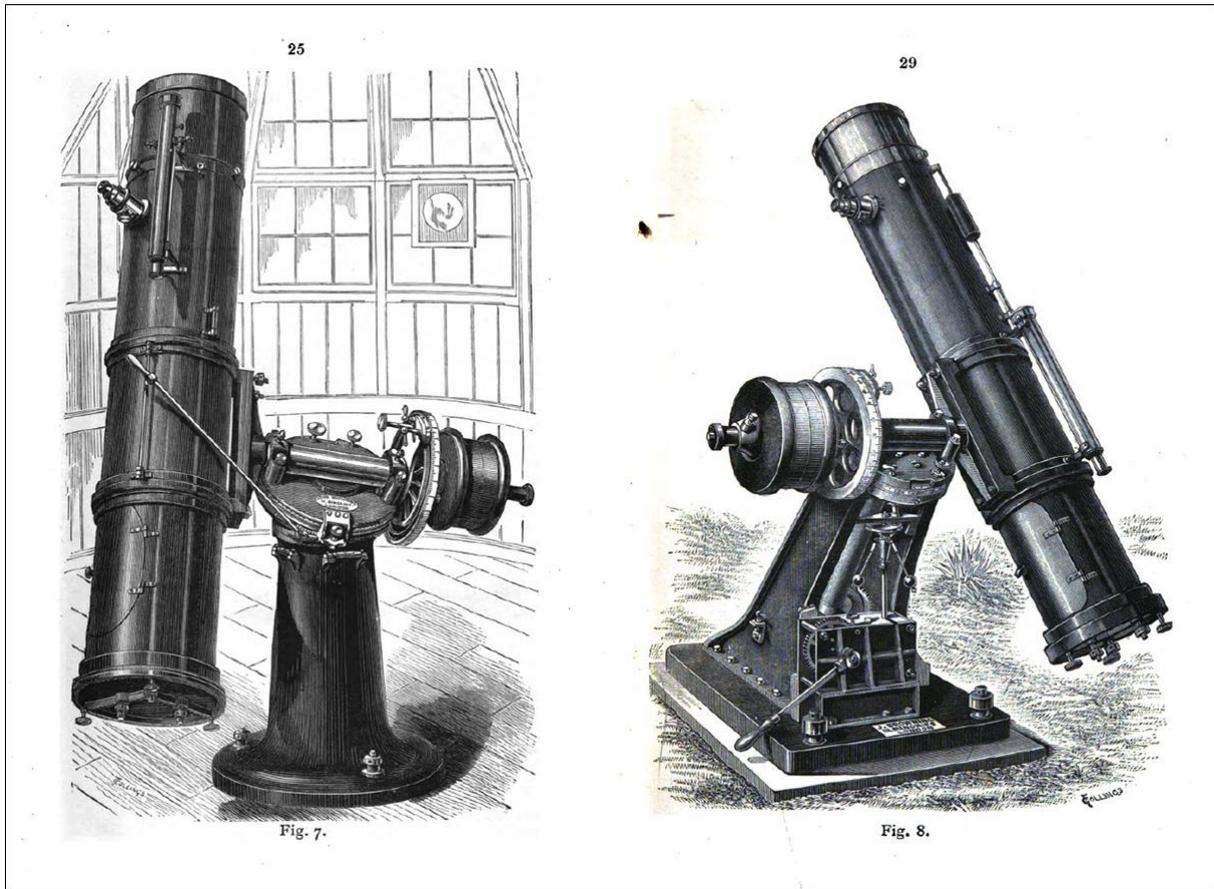


Figure 2- Reflector telescopes by John Browning.

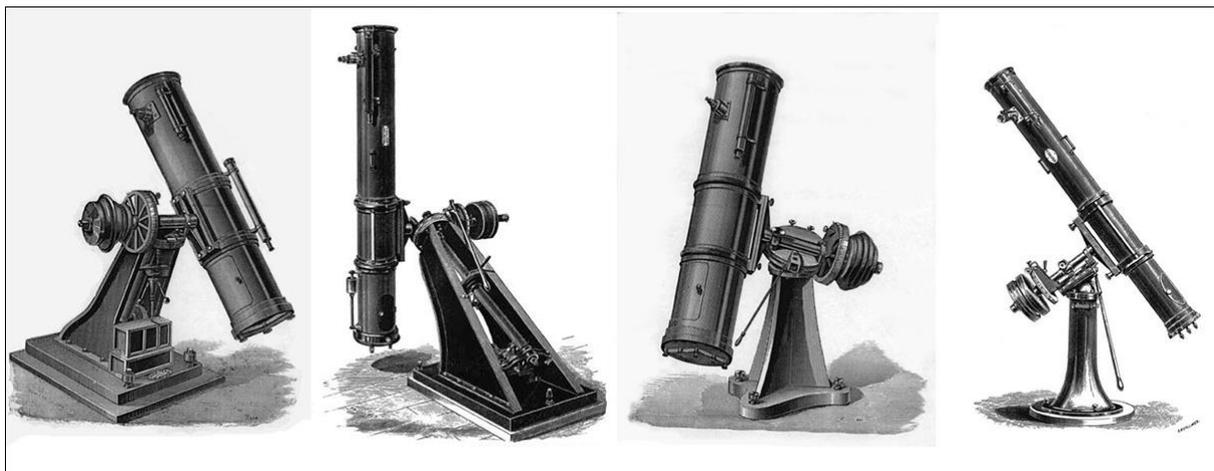


Figure 3- Reflector telescopes by George Carver.

Browning describes in his catalogue the Silvered Glass Reflecting Telescope:

*These telescopes are of the kind called Newtonian, a form so well known, that it is, perhaps, scarcely necessary to describe it; but I append a plain diagram (Fig. 7) and brief description, because it will assist in making clearer the instructions I have given further on, of the method of adjusting the instrument. The Newtonian telescope consists of a tube closed at the lower end, which is occupied by a concave mirror M. The cone of rays reflected from this mirror is again reflected at right angles from the surface of a small plane mirror, m n mounted at an angle of 45° near the open end of the tube, into the eye-piece, which is exactly opposite. The path of the rays is shown in the diagram (Fig. 7) page 28.*

*In reflecting telescopes, as originally constructed, the concave mirror was made of an extremely hard alloy, known as speculum metal. These metallic mirrors possessed several disadvantages so serious in character, that they have, for some time, fallen out of general use. The principal defects were the following:*

- 1. From the extreme brittleness of the alloy they were very liable to fractures, sometimes breaking merely from a sudden change of temperature.*
- 2. From their great weight it was extremely difficult to mount them in such a way as to prevent flexure, the smallest amount of which greatly injured their optical performance.*
- 3. Their greatest drawback, however, consisted in the fact that the surface of the metal, from damp or other causes, sometimes became very rapidly tarnished, and this tarnish could seldom be removed, except by repolishing, and, consequently, refiguring the mirror; and this involved nearly as great an outlay as the purchase of a new speculum, besides incurring the serious risk of a fine figure being irretrievably lost.*

*In the telescope now described, the metallic mirror is replaced by one of glass, on the surface of which a coating of pure silver has been deposited by Liebig's process. These glass mirrors are not at all injuriously affected by change of temperature, and their lightness very considerably reduces their liability to flexure.*

*The coating of pure silver reflects fully one third more light than the best speculum metal, as the alloy before mentioned is called. But the greatest superiority of silvered glass over metallic mirrors consists in the fact that, should they become tarnished, their brilliancy may readily be restored by gentle friction with soft leather, and a little of the finest rouge; and even should the silver coating become utterly spoiled, it may be easily removed, without in any way impairing either the figure or polish of the glass speculum, and a fresh one deposited at a trifling cost, thus making the mirror equal to new; and this may be repeated indefinitely. Should the owner possess a little patience, he may renew the coating himself at the cost of only a few pence. The silvering process is fully described in an appendix.*

Browning offered several telescopes in his catalogue: (i) Small Altazimuth; (ii) Educational Reflector; (iii) Large Altazimuth; (iv) Equatorial.

In 1874 Baron Miklos Konkoly Thege purchased for £180 a 10.25-inch equatorial reflector from J. Browning. He donated this instrument to Eugen Von Gothard to be used in his Hereny Astrophysical Observatory.

Eugene V. Gothard played an important role in European astronomy at the end of the nineteenth century. His pioneering astrophotographs were known worldwide. The scientific inheritance of Gothard is preserved by the Gothard Astrophysical Observatory at the Loránd Eötvös University. A valuable part of this material is the astronomical plate collection of 455 plates obtained from 1882 to

1900, containing unique images of comets, star clusters, nebulae, galaxies, and stellar spectra. Eugene recorded the central star of the Ring Nebula, Messier 57, for the first time in September 1, 1886, and in doing so became the first amateur astrophotographer<sup>5</sup>.

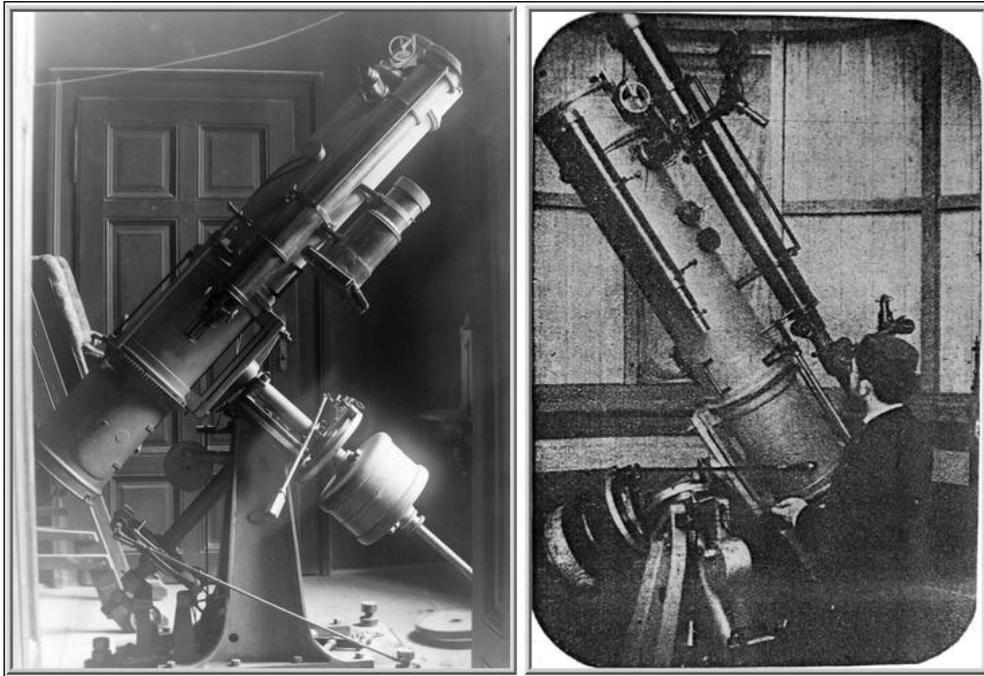


Figure 4- 254 mm Newton reflector, the main instrument of the Gothard's observatory.



Figure 5- Gothard's original plate recording the central star of the Ring Nebula (M57) for the first time in September 1, 1886.

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<sup>5</sup> Ré, P. (2020). Eugene Von Gothard (1857-1909) the first amateur astrophotographer. [PDF](#)