

The Barnett Observatory

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The design and construction of one of the UK's earliest large aperture local society telescopes is described.

The finely engineered 18-inch (450mm) Newtonian reflector of Chesterfield Astronomical Society really began in 1955. A photograph of Mr Val Warburton at the eyepiece of his home-made 12-inch (300mm) Newtonian appeared in the *Derbyshire Times*. He was immediately contacted by Mr Douglas Saunderson, a keen observer possessing a 4-inch (100mm) Brachyt-Herschel/Cassegrain, and introduced to Mr Horace Barnett, who was in the process of building a 12-inch for Sheffield Astronomical Society. Thus the dynamic trio who conceived the 'Project' had their first meeting.

On Saturday, 1956 September 15, the Sheffield telescope was officially opened. The mirror had been made by Norman Jinkinson, a Chesterfield science teacher. Curiously, Horace Barnett, who had single-handedly done all the design and hands-on engineering, received little mention either in the inaugural talk or in the Press. This had two effects. Firstly Horace determined to construct a bigger and better telescope on a site in Chesterfield, his home town; secondly William Brown CBE JP, joint managing director of Chesterfield Tube Co. and Horace's employer, became sympathetically and practically involved. He had supplied the scrap metal for the Sheffield instrument and, officiating at its opening, had noticed with concern the lack of recognition accorded to Horace.

Early work

By Friday 1956 September 21, Horace had already made the square head piece which sits on the 18-inch's mounting pillar to this day, and the project had begun. Douglas Saunderson, later the founder president of CAS, undertook to do the administrative work, Horace the engineering and Val Warburton the optics. Finally, with some difficulty, an 18-inch disc was procured, only 1½ inches (38mm) thick. Figuring such a thin disc was to prove a hard task. Grinding, polishing and figuring took three years since,

as a professional musician, Val spent his summers in the Channel Islands.

However before the project really got off the ground, Dr W. H. Steavenson (Director of the BAA Methods of Observation section) warned against the plan. In a letter to Doug Saunderson (1956 Oct 13) he said 'the making and housing of an 18 inch reflector is a very serious undertaking. If you do it properly, it will cost you a lot of money and the observational results may well disappoint you.'

Dr Steavenson had reckoned without the bulldozer persistence and sheer refusal to be beaten of Horace Barnett. Over the next three years Horace spent every spare moment on the task. He devoted every weekend, evening and holiday to preparing the site and building the observatory, tube and mounting. He often stayed until the small hours, working by candlelight. His wife Mary not only put up with this, she actively encouraged him, despite having no personal interest in either astronomy or telescopes.

Financial support

How to fund the project remained a worry and a levy of half a crown (12½p) per week was instituted on a voluntary basis among working colleagues at Chesterfield Tube Co. Guiding spirits behind this were Jim Garrod and Jim Hollingworth, the former having long dreamt of a local astronomical society. The first meeting of the newly formed CAS took place on 1956 November 17, subscription 7/6 (37½p), and following the Tube Co.'s lead of a half crown levy each week.

The telescope project enjoyed invaluable support from local men of influence. William Brown supplied all metal requirements free of charge, Peter Glossop (a local architect and member of CAS) prepared the documents relating to planning permission and W. S. Wilson MBE, Borough Surveyor, offered various sites for short

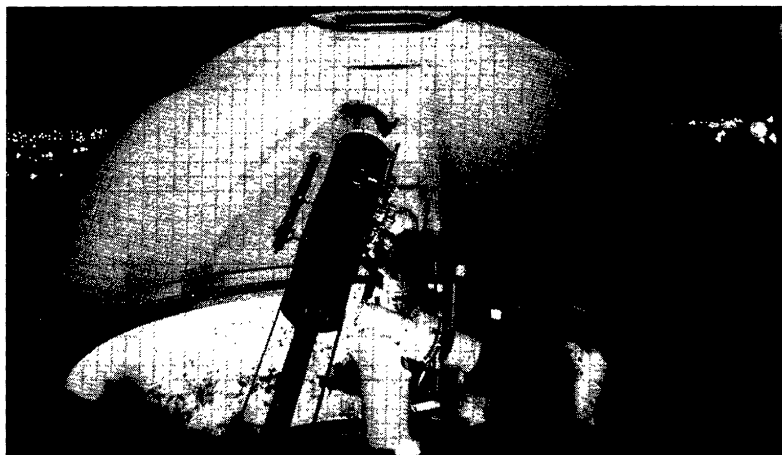


Figure 1. Horace Barnett at night in the dome of the Barnett Observatory.

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term lease. The one selected was in Newbold, on a hill, where seeing remains tolerable in spite of the modern enemy of sodium lighting. Ease of access was another reason since few members owned cars in 1956. Richard Clegg, town clerk, also freely gave his time and advice. In Spring 1957 he gave official permission for building to begin on site.

During his long constructional sessions, Horace was normally accompanied by George Hasselby of Whittington and often by Douglas Saunderson, who became part-time bricklayer and odd job man. Thanks to an unlimited supply of free bricks from Chesterfield Council, who were busy demolishing antiquated housing, the observatory and lecture room began to take shape. 'Furniture and fittings' nevertheless remained to be purchased and to this end the chairman of Robinson and Son Ltd., a local firm, offered to raise funds from town business concerns. £450 in cash was thus contributed, a useful sum in 1957.

Observatory and telescope

The telescope mounting is a solidly built cylinder, 9 feet (2.74m) long and 16 inches (406mm) wide, buried in concrete to a depth of 4 feet (1.22m). It carries a 'German' equatorial head. The tube is 10½ feet (3.2m) long, 20 inches (508mm) wide and ¾ inch (9.5mm) thick. It also had eight carefully cut sections removed to reduce its weight (¾ ton, 762kg). Much of the cutting and welding was carried out in Chesterfield Tube Co.'s workshops, free of charge, as was the transport by lorry to the Observatory.



Figure 2. The 18-inch telescope in close-up.

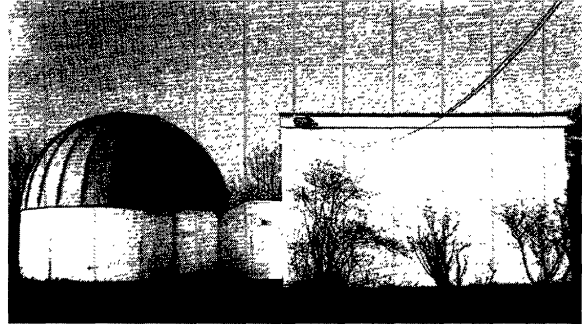


Figure 3. The dome and lecture room in 1995 (Photos by G. Jenkinson).

During the spring and summer of 1957, there were plenty of helpers from the recently formed CAS to erect the observatory and adjacent lecture room. There is a short corridor between the two in order to avoid warm air currents affecting the optics. The west face of the lecture room was finished in white stone, acquired free from a recently demolished farm just to the north of the site. This was a successful attempt to match the nearby listed Eyre Chapel.

The circular wall of the observatory itself was built by Raymond Farmer and the aluminium roof sections were donated by Reynolds Aluminium Ltd. The dome design was by Rosemary Naylor, the sections being laid on T-shaped girders. The ever inventive Horace made a simple machine to bend these girders without kinking. A specialist firm had quoted £2000 for labour only, so the job was done for nothing by society members.

The mirror has an 18 point flotation system to prevent flexing. There were times when, after working for hours on the mirror in the unheated lecture room in winter, Val Warburton despaired of the task. Finally however, after some help from a nationally known mirror maker named Mason, Val completed the job himself. The figure is an excellent one and the instrument performs up to capacity under the (rare) right conditions.

The friction drive for the telescope and the design for the setting circles were invented by Horace Barnett and are still in impeccable order 34 years later.

Completion

On 1960 April 23 the Barnett Observatory, housing the William Brown telescope, was officially opened by the then Astronomer Royal, Dr Richard Woolley. Patrick Moore, shortly before, had described it as 'probably the finest amateur set-up in the country.' Many societies have since equalled or outstripped CAS in their instrumentation but Chesterfield was one of the very first to go for superbly engineered large aperture. Horace Barnett's unremitting labours will not be forgotten and he still remains closely involved with CAS and with 'his' telescope.

The 18-inch is used twice a week by the Society when clear and frequently by individual members who have passed 'the test'. Open nights attract large numbers of local people: the Jupiter/SL9 event, for example brought in 200 over the two nights we were in session. The telescope is also increasingly used for BAA sectional work.

In compiling this article I am indebted to Messrs W. H. Barnett and V. Warburton and to the written deposition of founder president Douglas Saunderson.

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