

THE ROLE OF PATRONAGE IN AUSTRALIAN AMATEUR ASTRONOMY: GEORGE HOSKINS AND THE NEW SOUTH WALES BRANCH OF THE BRITISH ASTRONOMICAL ASSOCIATION

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Abstract: Patronage was a small but significant feature of Australian amateur astronomy. Arguably the most prominent patron of New South Wales astronomy during the twentieth century was the wealthy Sydney industrialist George Hoskins. During the first forty years of the century he was a prominent member of the New South Wales Branch of the British Astronomical Association, and he used his wealth to assist the Branch.

In this paper we explore how Hoskins donated his 18-inch Newtonian telescope to the Branch and loaned his 8-inch ex-Tebbutt Grubb refractor to Newcastle's Mark Howarth. Through his patronage, Hoskins made it possible for the Branch to contribute in a meaningful way to Australian and international amateur astronomy.

Keywords: Australian amateur astronomy; patronage; New South Wales Branch of the British Astronomical Association; George Hoskins; 18-inch telescope; Central Technical College Observatory; 8-in Grubb telescope; Mark Howarth.

1 INTRODUCTION

Amateur astronomy in Australia underwent aggressive growth during the first forty years of the twentieth century (Orchiston, 1989) as the 'new astronomy' rose to the fore with the establishment of the Commonwealth Solar Observatory near Canberra, the national capital, and the state observatories in Sydney, Melbourne, Hobart, Adelaide and Perth staggered towards inevitable extinction, shackled by that scientific millstone, the Carte du Ciel and International Astrographic Catalogue Project (see Haynes et al., 1996). For Australian localities mentioned in this paper see Figure 1.

The first four decades of the twentieth century saw close links maintained between the nation's astronomical societies and the State Observatories, none more so than that between the New South Wales Branch of the British Astronomical Association (henceforth, the Branch) and Sydney Observatory. This Observatory was the third-oldest of the government observatories (after Rossbank in Hobart and Williamstown in Melbourne), and was founded in 1858 (Merrillees et al., 2018; Orchiston, 1988a; Wood, 1958), while the Branch was established in 1895, just five years after the parent body in Britain (Kelly, 1948; Orchiston, 1988b).

The Branch combined amateur and professional astronomers, and included the largest

collection of active amateur astronomers in the nation, led by Australia's foremost astronomer at that time, John Tebbutt (1834–1916) from Windsor, near Sydney (Orchiston, 2017). Tebbutt and others, like Sydney-based Robert Thorburn Ayton Innes (1861–1933; Orchiston, 2001a; 2003b; 2015), William John Macdonnell (1842–1910; Orchiston, 2001b) and Charles James Merfield (1866–1931; Orchiston, 2015), all acquired international reputations as observational astronomers. There were others in the Branch who were accomplished telescope-makers (e.g. see Orchiston, 2003a; Orchiston and Bembrick, 1995), and others again—including Innes and Tebbutt—who were very involved in astronomy education and outreach (see Orchiston, 1997a). After almost 130 years the successor to the Branch is thriving, but as an independent society named the Sydney City Sky-watchers. As Lomb et al. (2024: 196) explain

... Australia still has strong ties with Britain, Australia's present multicultural population necessitated a change of name. However, neither the origins of the group nor its early members have been forgotten.

Another feature of the Branch from the time of its founding was the number of financially-successful individuals who joined its ranks and assigned their spare time and their surplus funds



Figure 1: Red circles show Australian localities mentioned in the text (map: Wayne Orchiston).

to astronomy. Some of these astronomers also became patrons of amateur astronomy, in the best traditions of the learned scientific 'gentlemen' of the preceding century. One such individual was George Hoskins. This paper discusses his activities as an amateur astronomer and the ways in which his patronage of



Figure 2: George Herbert Hoskins in about 1908 (photograph: Donal J. Hoskins).

the Branch and support for another prominent Branch member, Mark Howarth, benefited New South Wales astronomy.

Apart from a passing mention by [Baracchi \(1914\)](#) and accounts by [Orchiston and Bembrick \(1995; 1997\)](#), [Orchiston \(2017: 521–522\)](#) and presentations by [Jacob \(2025\)](#), [Orchiston \(2024\)](#) and [Orchiston and Bembrick \(2025\)](#), Hoskins has until recently been ignored by historians of Australian science. Meanwhile, Howarth has been the subject of just two short biographical accounts ([Burke, 1997](#); [Orchiston, 2017: 523–524](#)), and a recent seminar paper by [Orchiston and Bembrick \(2025\)](#).

2 GEORGE HOSKINS: A BIOGRAPHICAL SKETCH

George Herbert Hoskins (1883–1953; [Figure 2](#)) was born in Sydney, Australia. He was the eldest son of George J. Hoskins who, with his brother Charles Henry Hoskins, was one of the founders of the Australian steel industry ([Hoskins, 1969](#); [Parsons, 1983](#)). As noted by [Orchiston \(2017: 521\)](#), since



Figure 3: Part of St Cloud, Burwood (right) and G.H. Hoskins' observatory that housed his 12-inch reflector (photograph: Donal J. Hoskins).

The Hoskins were an affluent dynasty, and pioneers of the Australian steel industry ... G.H. Hoskins had the financial means to indulge his avocational passion for astronomy.

George Hoskins received his secondary education at Newington College in Sydney, before joining the firm of G. & C. Hoskins Ltd. and eventually becoming a director of the company.

On 21 October 1910 he married Janet Llewella Ryland in Rowington, England, and they had a son and a daughter.

In 1953, [Mackerras \(1953: 1\)](#) drew attention to the fact that Hoskins was at that time the longest-standing member of the Branch and "... should now be congratulated on having been a member for over 50 years." He died that very year, on 3 August, at the age of 70 ([Death Notice, 1953](#)).

3 GEORGE HOSKINS AND THE BRITISH ASTRONOMICAL ASSOCIATION NEW SOUTH WALES BRANCH CONNECTION

3.1 Introduction

Hoskins joined the Branch on [20 November 1902](#) at just 19 years of age. At that time, he used the name 'George Hoskins Jun.' ([Journal of the British Astronomical Association, 1902](#)). Just over two years later he presented some lantern slides to the Branch and exhibited photographs of Lick Observatory and celestial objects obtained during a recent world trip ([New South Wales Branch Report, 1905](#)). From this date, Hoskins played an increasingly prominent role in the affairs of the Branch. At the 1914 Annual General Meeting of the Branch he was elected to the Committee, and served on it for more than twenty years (see [Dalrymple, 1995: Branch Annual Reports](#)), including as a Vice-President for many sessions. In 1927–1928 he was the Assistant Director of the Mars Section.

Hoskins was also a member of the Branch's party that observed the 27 September 1922 total solar eclipse from Stanthorpe in southern Queensland (see [Lomb and Stevenson, 2023; The Solar Eclipse, 1922](#)).

3.2 The 12-inch Telescope

The first telescope Hoskins owned was a 12-inch (30.5-cm) Newtonian reflector with a Calver mirror, which he had acquired by 1903 ([Hoskins, 1903](#)).¹ While this was comparatively large for a 'first time' instrument, it indicates his commitment to his new hobby and his comfortable financial position—even as a young man just out of his teens. This is also reflected by the commodious observatory that he built in the grounds of his parents' mansion, 'St. Cloud', in the affluent Sydney suburb of Burwood—see [Figure 3](#).

This telescope was put to good use during the 1907 opposition of Mars when Hoskins was able to prepare drawings of the surface features. Seven of these were forwarded to the Mars Section of the parent body in Britain, and one of them was reproduced in the *Journal* (see [Mars Section Report, 1908](#)). He also prepared a short report and forwarded this to London ([Hoskins, 1907](#)). This was to be his only publication in astronomy.

Two years later, Hoskins decided to upgrade the telescope, and he had fellow Branch member, William Edward (Ted) Esdaile (1858/1859–1947), proceed to construct a drive for it:

The clock was a singularly compact one, and embodied the most modern improvements, including maintaining power on Sir H. Grubb's plan, differential gearing for accelerating or retarding motion in R.A., &c ... The President and Mr. Nangle, F.R.A.S., spoke in commendation of the exhibit as a beautiful

piece of work reflecting credit upon its designer. (*New South Wales Branch Report*, 1909b: 442).

Esdaile also made a micrometer that Hoskins could use with the telescope (*New South Wales Branch Report*, 1909a).

Hoskins and other Branch members were attracted by the 1909 opposition of Mars, and at the 19 November 1909 meeting he displayed two drawings of surface features (*New South Wales Branch Report*, 1909c). Antoniadi describes these in his 1909 Interim Report of the Mars Section:

Mr. Hoskins's drawings are finely coloured, and the spots of the planet are truthfully represented on them. A few "canals" are shown as very faint and irregular, diffused streaks. (*Mars Section Report*, 1910: 471).

3.3 The New 18-inch Telescope

In 1917 Hoskins decided to replace the 12-inch telescope with a larger instrument, an 18-inch (45.7-cm) equatorially-mounted Newtonian reflector (*New South Wales Branch Report*, 1917a; *Orchiston*, 2003a),² which he erected at his home at Beecroft (at that time a far north-western suburb of Sydney). A description of Hoskins' new telescope was published in the *Journal of the British Astronomical Association*:

The mirror has a focal length of 12 feet 4 inches, and is equatorially mounted. The polar axis extends beyond the bearings, and branches into a fork. The heavy mirror cell brings the centre of gravity to within about 4 feet of the mirror end, and is swung in the fork, the Declination Circle and Finder being on one axis and a counterpoise on the other. The eyepiece end, which revolves, is reached by a step ladder, 12 feet high. The movements are beautifully smooth, and vibration is entirely absent. All the castings for the mount were made in Sydney from Lithgow iron, and reflect credit on the designer and engineer. (*New South Wales Branch Report*, 1917a: 285).

The telescope featured an open lattice tube (designed to prevent air currents), and—as with his previous telescope—the drive was manufactured by Esdaile. The complete instrument weighted about two tons, but was "... so beautifully balanced that it can be moved in any direction with ease." (*New South Wales Branch Report*, 1921). The f/8.2 mirror was one of those produced by Victoria's most accomplished telescope-makers of that era, Robert W. Wig-

more (1854–1947) of Melbourne (*Orchiston*, 2003a; *Orchiston and Perdrix*, 2004). The 'Finder' referred to above was in fact

A 6-inch Cooke refractor ... [which served] as a guiding telescope and is also used as a finder. Its lens is a very fine one and the telescope is so arranged that two observers can view an object simultaneously and compare notes as the observation proceeds. (*New South Wales Branch Report*, 1921: 299).

Accessories included a micrometer, a Zollner spectroscope and an astrocamera (*ibid.*), and soon after Hoskins acquired the telescope fellow Branch member James Nangle (1868–1941, *Figure 4*; *Cobb*, 1986; *Orchiston*, 2017: 468–469)³ offered to construct a spectrograph for it (*New South Wales Branch Report*, 1919). As it turned out, the timing was ideal, for this appliance would prove to be particularly useful in 1918. Unfortunately, we have been unable to source any photographs of this telescope or its observatory while it was at Beecroft.

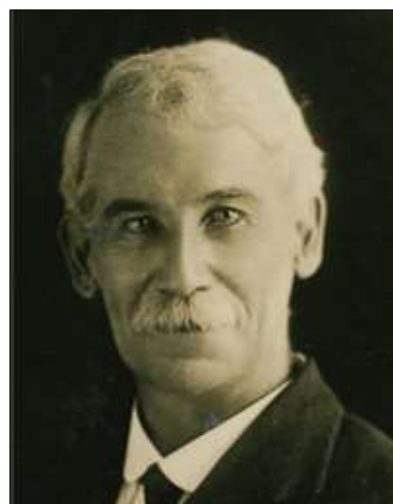


Figure 4: James Nangle in 1928 (courtesy: Museum of Applied Arts and Sciences, Sydney, P3549-112).

The first serious observations that Hoskins reported soon after acquiring the telescope were of Kappa Crucis, and he noted the existence of "... a fifth red star near the four red stars shown in Russell's 1812 plate in Chambers Astronomy, where this star is shown as white." (*New South Wales Branch Report*, 1917a: 286).

Meanwhile, Hoskins was happy to make the telescope available to other members of the Branch, and the Reverend Dr. Thomas Roseby (1844–1918; *Orchiston*, 2017: 424–425) was one of the first to take up this offer. At the June 1917 meeting of the Branch he reported that he had observed a number of objects, including the Ring Nebula in Lyra, the galactic cluster

Kappa Crucis, the globular cluster Omega Centauri, and the enigmatic Eta Carina. His assessment of the instrument and its owner was particularly complementary: “The definition was very fine and reflected great credit on Mr. Hoskins for his enterprise and skill.” (*New South Wales Branch Report, 1917b: 47–48*).

Soon after this, Hoskins began experimenting with astrophotography using the new telescope, and he reported on this work at the 24 March 1918 meeting (see *New South Wales Branch Report, 1918a*).

One of the most significant observations made with this telescope occurred on 4 April 1918 when there was what can only be described as a grazing occultation of the 5.4 magnitude star Number 1524 in the Cape Catalogue by the planet Mars. Hoskins reported:

The clouds broke at 9h. 38m.; luckily his 18-inch reflector was uncovered and provided with an achromatic eyepiece, power 270. At this time the star was nearly in contact with the s.p. limb. It was bright and well defined. After two minutes of interruption by cloud, the star was seen in apparent contact. From 9h. 53m. to 9h. 57m. the star's light dimmed to about half its previous brightness, the image was diffuse and projected upon the bright area just within the south limb, giving the appearance of a polar cap. Clouds intervened at 9h. 57m. and the planet was clear of the star when seen again at 10h. 2m. The image then appeared normal ... Mr. Hoskins in conversation with me [i.e. Walter Gale] the next morning laid special stress on the impression made upon his mind by the apparent projection of the star upon the disk of the planet, stating it might easily have been mistaken for the polar cap when near its minimum size. During an interval of probably half a minute it did not appear to project beyond the limb at all. (*Report of the Meeting ..., 1919: 70*).

This observation was discussed at the 24 April 1918 meeting of the Branch, and co-founder of the Branch and leading Sydney amateur astronomer, Walter Frederick Gale (1865–1945; *Orchiston, 2017: 402–403*) was quick to point out that Hoskins' observation “... was most valuable as it emphasized the fact that Mars had an appreciable atmosphere ...” (*New South Wales Branch Report, 1918a*).⁴

The next astronomical spectacle to attract the attention Branch members was Nova Aquilae 1918, and at the 25 May meeting of the

Branch J.W. Short reported that Hoskins, Gale, Nangle and Brown had made several observations of the spectrum (*New South Wales Branch Report, 1918b*). At the next meeting, on 26 June, Gale showed a slide of the spectrum which was photographed by Hoskins, and this “... showed the lines from the green to the violet very clearly and sharply.” (*ibid.*). A later account in the *Journal* (*New South Wales Branch Reports, 1919*) states that in addition to the photographs, Hoskins, Gale, Nangle, and Brown made

... a series of drawings of the changes in the spectrum, which were plotted and drawn in colour by Mr. J.W. Short, F.R.A.S., the work reflecting great credit on the draughtsman.⁵

3.4 Donation of the 18-inch Telescope to the Branch

Notwithstanding these obvious observational achievements, in 1919 Hoskins decided to donate the 18-inch telescope to the people of Sydney, and the terms of the donation were very clear, as outlined in the letter that *Hoskins (1919)* sent to the President of the Branch, dated 24 January 1919:

I propose to make a gift of this telescope to the N.S.W. Branch of the British Astronomical Association, provided that the following conditions are acceptable:

- (1) That the Association shall arrange with the Government of New South Wales to have the telescope located on the grounds of the Central Technical College at Ultimo.
- (2) That the Association arrange with the Government for the housing of the telescope there.
- (3) That the Association also arrange with the Government for the care and maintenance of the telescope and house.
- (4) That the Association agree in the event of the Branch ceasing to exist in New South Wales, the telescope shall become the property of the Technical Education Department of New South Wales, the latter Department undertaking the care and maintenance of the telescope and house and the public use on the same conditions as hereinafter set out as to be required from your association.
- (5) That the Association agree to the use of the telescope for –



Figure 5: The expansive Central Technical College, Ultimo, in the 1890s
(https://en.wikipedia.org/wiki/Sydney_Technical_College#/media/File:Technological_College,_Sydney.jpg).

- (a) Systematic Scientific Research, and –
- (b) Affording opportunities for the public under the direction of one or some of its members to have views on at least four nights per month; conditions in regard to the latter being such that any member of the public taking the necessary routine steps shall be able to secure a view through the telescope.
- (6) That arrangements shall be made with the Government of New South Wales for an agreement embodying the above conditions.

I should add that there are certain accessories to go with the telescope, viz. Chronometer, a micrometer and position circle, a battery of eye pieces, a Zollner Spectroscope, a moon camera and a 4" portrait lens for photographic work.

I should like to say that I have consulted with the Superintendent of Technical Education who has informed me that it would be quite possible to find a space for the housing of the telescope at the Central Technical college at Ultimo without interfering with any of the plans laid out for future buildings.

A slightly earlier view of the Central Technical College is shown in [Figure 5](#).

The Branch accepted the donation ([Gale, 1919](#); [Nangle, 1919](#)), and subsequently it was

announced in the *Journal of the British Astronomical Association*:

This [telescope] was presented to the Technical College, through the N.S.W. Branch of the association, by our valued Member Mr G.H. Hoskins, and is being installed at the College. It will be under the control of the Association. The public are to be allowed to use it on suitable occasions: the terms of the gift stated not less than twice a month. ([New South Wales Branch Report, 1920](#)).

As we can see, the decision to site the telescope at the Technical College reflects the influence of Hoskins' old friend James Nangle. In addition to his senior role in Branch activities, Nangle had enjoyed a long association with the College, at first as a student, later as Lecturer-In-Charge of the Architecture Department, and subsequently in his capacity as the Superintendent of Technical Education for New South Wales (see [Cobb, 1986](#)). His involvement therefore was critical.

This association with the Branch was clearly demonstrated when those at the November 1921 meeting of the Branch adjourned to the Technical College to examine the telescope, which at that time was being installed:

[Mr Nangle] ... conducted the visitors to a high part of the grounds, close to Harris Street, where the house to contain the instrument has been erected. It is about 15 feet in diameter and is a departure from the regulation observatory. The floor surrounding the concrete block upon which the telescope is fixed is the only stable part of the construct-

ion, the sides and roof revolving ... The shutter in the roof to allow a view of the heavens is also a novelty, not folding or sliding sideways as usual, but running upwards in a frame. It is carefully balanced and is easily operated by mechanical means. (*New South Wales Branch Report, 1921: 298*).

The links between the telescope and the Branch were emphasized at this time:

Regular work with the instrument will be carried out by sections of the Astronomical Association, and skilled Members will be in attendance on evenings when visitors are admitted. (*New South Wales Branch Report, 1921: 299*).

3.5 The Central Technical College Era

Clearly, one of the reasons that Hoskins gave the telescope to the Branch was so that members could make greater use of it at this convenient central-Sydney location, close to Central Railway Station, but unfortunately this does not seem to have happened.

Soon after the November 1921 visit, Branch members were advised that the telescope was "... in working order and is officially open to the use of Members." (*New South Wales Branch Report, 1922a*), and at the April 1922 meeting of the Branch Nangle presented a paper titled "Report on the Hoskins Telescope adapted for photography" (*New South Wales Branch Report, 1922b*), but no one seems to have taken up the challenge.

The first glimmer of hope occurred towards the end of that year, and at the March 1923 meeting of the Branch Nangle gave a lecture on double star measurements which

... was especially appreciated by the members of the Double Star Section, who are about to commence work with the Hoskins 18-in. reflecting telescope. (*Report of the New South Wales Branch, 1923*).

Despite this promise, there is no evidence that any observations were in fact carried out (e.g. see *Double stars, 1926*; *New South Wales Branch Report, 1924a*).

Instead, it was the Jupiter and Saturn Section, newly-formed during the 1923–1924 Session, which came to the rescue. Regular meetings were held at the Technical College Observatory,

... and the opportunity has been taken of becoming acquainted with the instrument in anticipation of more favourable conditions of observation. (*New South Wales Branch Report, 1924b: 356*).

These conditions must have occurred, for the Annual Report for 1924–1925 states that

The Hoskins Telescope at the Technical College Observatory has been used regularly by the observing Sections, and each month the Observatory has been open to the public. (*New South Wales Branch Report, 1925: 303*).

Then the observing programmes suffered a serious interruption during the Association's 1926–1927 session when encroaching buildings forced the College to transfer the telescope to a new site (*New South Wales Branch Report, 1927*), and from that time on there are no further reports of observations by Branch members.

Nothing more is then heard of the Hoskins Telescope until 1948, when it was used to support a project of major importance in the history of radio astronomy involving the 1 November partial eclipse of the Sun. As *Orchiston et al. (2006: 45)* explain,

In the late 1940s the angular resolution of radio telescopes was poor, and observations of total and partial solar eclipses offered an elegant way of pinpointing the positions of localised regions responsible for solar radio emission and also of determining the distribution of radio brightness across the disk of the Sun. The reasoning was that as the Moon's limb moved across the Sun's disk and masked different radio-emitting regions there would be obvious dips in the chart record (*Hey, 1955*). *Covington (1947)* was the first to pioneer this technique, in 1946, and the RP [Sydney CSIRO Division of Radio-physics] radio astronomers were keen to take advantage of the 1948 eclipse which was visible from Australia.

By using different radio telescopes located at different observing sites and triangulation, the positions of major radio-emitting regions in the solar corona could be identified, and these could then be compared to the positions of optical sunspots and prominences. The Hoskins Telescope was used to photograph and monitor the Sun during the eclipse (see *Figure 6*) from Sydney, while radio telescopes operating at 600 MHz were located at Potts Hill in Sydney, Rockbank, near Melbourne, and Strahan in Tasmania. As the eclipse progressed,

... the declining level of radio emission was punctuated by a succession of small peaks and troughs ... The troughs occurred when centres responsible for enhanced radio emission were cover-

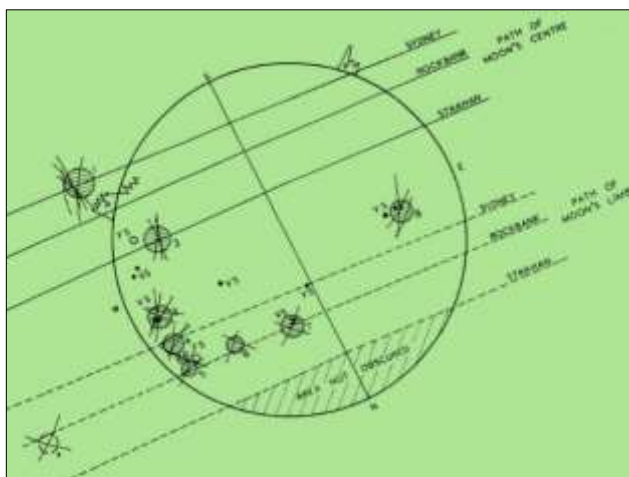


Figure 6: During the 1 November 1948 partial solar eclipse photographs of the Sun were taken with the 6-inch Cooke guidescope attached to the 18-inch Hoskins Telescope at the Central Technical College (courtesy: CSIRO Radio Astronomy Image Archive, B1899-7).

ed, and their precise positions were obtained by plotting the intersections of the Sydney, Strahan and Rockbank lunar limb path paths across the Sun ... (Orchiston et al., 2021: 114).

These locations are shown in Figure 7. Note that

Of the eight centres of enhanced solar



emission, three coincided with the positions of sunspot groups, three others were close to positions occupied by sunspot groups exactly one solar rotation earlier, and a seventh was located about 170,000 km off the south-west limb of the Sun, directly above a magnetically-active region associated with a limb prominence. However, two small sunspot groups and one large group were not associated with measurable levels of radio radiation, showing that there was not always an exact correlation between sunspots and solar emission. (ibid.).

These eclipse observations played a key role in the early development of international radio as-

Figure 7: A map of the Sun showing the distribution of 600 MHz active regions (hatched) during the 1 November 1948 eclipse. The small black dots indicate visible sunspots (VS), P indicates a prominence, and FS marks the position of a sunspot group that was prominent 27 days earlier (after Christiansen et al., 1949: 513).

tronomy and relied on the successful optical observations made with the Hoskins Telescope. We regard these as the most important observations ever carried out with this historic telescope.

One of those who worked at the Technical College during the 1950s and 1960s was Gordon E. Patston who, although a Teacher of Aircraft Construction in the School of Automotive and Aircraft Engineering was a dedicated amateur astronomer. For a time Patston was a Council Member of the Branch, but in about 1955 he founded an opposition group, the Sydney Amateur Astronomers, headquartered at Belfield, intent on encouraging observational astronomy by amateurs (Gould, 1997). Patston was aware of the Hoskins Telescope, and from July 1959 he and J. Greenland (a Teacher of Physics in the School of General Studies) oversaw the restoration of the telescope. Patston (1960: 1) reported that

The instrument was found to be in a dilapidated condition and several parts of the instrument were missing.

The telescope dome-housing was also found to be in a state of disrepair, which contributed to further damage to the telescope by not protecting it from the weather.

By March there had been much progress: the dome was repaired and repainted, the mounting was cleaned and repaired, and a new drive was planned. But undoubtedly the most significant changes involved the optics: the primary and secondary mirrors and eyepiece assembly were found to be in a bad state of repair. The primary mirror was cleaned and then reground and polished to remove a slightly downturned edge, and

As a result of the long focal length of the telescope mirror at the Newtonian focus, it was decided to modify the optical system by incorporating a [new] hyperbolic secondary mirror to give a bassegranian [this was presumably a bent-Cassegrainian, or Nasmyth] system. (Patston, 1960: 2).

Patston (1960: 3) anticipated that all the repairs to the telescope would be completed by the end of 1960, and he reported that

A College Astronomical Group has been formed by the staff and students, and an observing program is being planned for 1961.

There is no documented evidence that this observing program was in fact carried out. That said, in the mid-to late 1960s the second author of this paper visited the Technical College and

saw the refurbished telescope in its repaired dome.

After this, the telescope's association with the Branch and the conditions of its donation were forgotten, or conveniently ignored by Patston, and in 1973 it was dismantled and taken to the country town of Narrabri in north-western New South Wales (Figure 1). There it was placed in the care of the local Council, which assigned it to the Narrabri Astronomical Society (Traynor, 1982). Following investigations by the second author of this paper and William T. (Bill) Tyrrell, another prominent member of the Branch, the whereabouts of the Hoskins Telescope were established in 1982. The plan had been for the Narrabri Astronomical Society to install it in a public observatory, but this never happened (*ibid.*). Then there

... was a very real possibility of the Hoskins Telescope being incorporated in the proposed Visitor Centre at the Australia Telescope facility at Culgoora ... [and] should this eventuate, then CSIRO Radiophysics would be in a position to assist in the refurbishing and restoration of this instrument. (Bembrick, 1985).

This, too, never eventuated, and subsequently the telescope was returned to Sydney and the care of the Branch (Figure 8).⁶ When the telescope was in Narrabri its 6-inch Cooke guide-scope was already missing, and currently we have no information about its whereabouts.

Once the telescope was back in Sydney the original plan was that it would be placed on long-term loan with Macquarie University (Bembrick, 1993; Jackson, 1985), renovated by members of the Branch and staff from the University, and installed in an observatory on the campus where it would be available to Branch members and for teaching astronomy at the University (Roberts, 1985). The hope was that some members of the Branch would also use it for photoelectric photometry and CCD imaging (Orchiston and Bembrick, 1995). However, this never happened, and eventually the Branch donated the telescope to the Museum of Applied Arts and Sciences. There it was fully restored, and is now in storage (see Figure 9).

3.6 Later Telescopes

Soon after donating the 18-inch reflector to the Branch Hoskins attempted to purchase a 24-inch (61-cm) Grubb reflector. This instrument had been manufactured in 1880 (Glass, 1997: 108) for William Edward Wilson (1851–1908), and was housed in a private observatory at Dramona House on his estate in Ireland. A photograph of the instrument and its large accom-

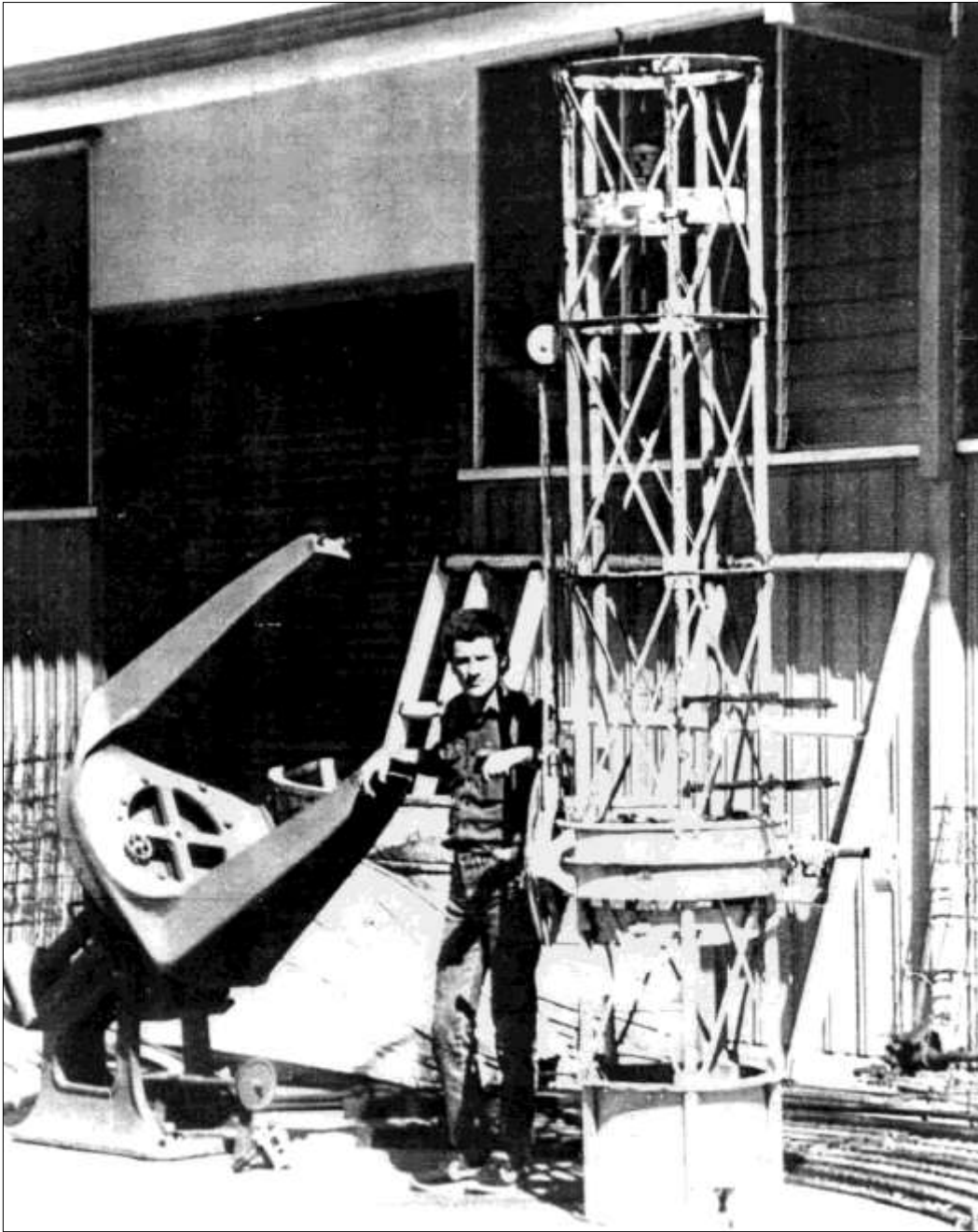


Figure 8: Elements of the Hoskins Telescope in Narrabri, being preparing for their return to Sydney (after *The Bulletin*, 639 (Jun/Jul 1987): front cover; also see [Smith, 1987](#)).

-panying guidescope is shown in [McNally and Hoskin \(1988: 150\)](#). Wilson took a series of high-quality photographs of galactic and extra-galactic objects with this telescope, and it was also used for pioneering work in photoelectric photometry (see [Hearnshaw, 1996](#)). Wilson died in 1908, and when the family began planning its move to England (which occurred in 1922) the fate of the telescope became an issue. Hoskins' attempt to secure the telescope was probably unsuccessful because Wilson had intended that it should go to the Radcliffe Observatory at Oxford. Instead, it went to the University of London in 1925 ([McNally and Hoskin, 1988](#)).

In 1920 November, while he was awaiting an outcome on the Wilson telescope purchase, Hoskins made a verbal arrangement with fellow Branch member, Ernest H. Beattie (1864–1931; [Orchiston, 2017: 467–468](#)), to acquire his 6-inch (15.2-cm) Grubb refractor. He only proceeded with the purchase in March 1921, after hearing that he had missed out on the large Grubb reflector. The purchase price was £224.18.3 ([White, 1921a](#)). Hoskins then went and almost immediately on-sold this telescope to a Queensland timber-mill owner named Brims ([White, 1921b](#)), who installed it in a domed observatory in the Brisbane suburb of Milton (for



Figure 9: The renovated Hoskins Telescope in storage at the Museum of Applied Arts and Sciences in Sydney in 2023 (courtesy: Ann Cairns).

more details see [Orchiston, 1997b](#)).

These two examples show Hoskins' ongoing interest in acquiring telescopes after parting with the 18-inch reflector, even though he had little time to observe with them. Like his Sydney fellow-Branch members Walter Gale, Horace Edgar Frank Pinnock and Dr. Con Tenukest ([Orchiston, 1990](#)) Hoskins was an accomplished 'telescope-broker', but unlike them he was a patron of Australian amateur astronomy. This is discussed further in the next Section of this paper.

4 HOWARTH AND THE 8-inch (20.3-cm) GRUBB REFRACTOR

The last telescope that Hoskins owned was the 8-inch (20.3-cm) equatorially-mounted Grubb refractor ([Figure 10](#)) that was imported into Australia by the Castlemaine medical practitioner Dr. William Bone (1836–1885; [Orchiston, 2017: 236–237](#)) in 1883 ([Orchiston, 1986; 1987](#)), employed very effectively by John Tebbutt from 1886 to 1916 ([Orchiston, 1982; 2017](#)), and used intermittently thereafter by Walter Gale

([Orchiston, 1997b](#)).

Hoskins had a close association with Branch stalwart and co-founder Walter Gale ([Figure 11](#)) that extended beyond astronomy into the business arena: when Gale retired from the Government Savings Bank of New South Wales in 1925 he became Manager of the Hoskins Investment Company ([Gale, 1964](#)). Soon after Gale took up this appointment Hoskins purchased the Grubb refractor from him, but business commitments left him with little free time and in 1933 he decided to loan the instrument to Mark Howarth of Newcastle. Subsequently, Hoskins tried unsuccessfully to sell Howarth the telescope ([C. Tenukest, pers. comm., 1985](#)).

Mark Howarth (1884–1971; [Figure 12](#); [Orchiston, 2017: 523–524](#)) was an accomplished Australian amateur astronomer. He was born in Warrington, England, on 26 November 1884, awarded an O.B.E. in 1958 for his services to the community in Australia and died in 1971. He received technical training while serving in the Royal Navy, and in 1921 settled in Newcastle as the founding Manager of the engineer-

ing firm, Ryland Bros. Pty. Ltd. (Burke, 1997).⁷ Newcastle was an industrial city, and was the second largest city in New South Wales after Sydney. It was located 142 km north of central Sydney as the crow flies, on the coast, and Howarth settled in the outer north-western suburb of Mayfield (see Figure 13). Howarth was a Fellow of the Royal Astronomical Society and a prominent member of the Branch during the 1930s and 1940s (see Orchiston and Perdrix, 1990).

Hoskins knew Howarth through the Branch and family links, and was aware of his commitment to observational astronomy:



Figure 10: A tired old photograph of an equally tired John Tebbutt with his 8-inch Grubb telescope in 1915, just one year before his death (photograph: Orchiston Collection).

I have always felt that every amateur Astronomer should have some regular routine work to do that makes it necessary for him to go to his observatory on a number of nights every month. If he has no such routine work there is a tendency to slack up, particularly in the Winter months. (Howarth, 1940: 3).

Their common engineering pedigree may also have been a factor when Hoskins decided to loan the Grubb refractor to Howarth rather than another Branch member. Also, maybe Hoskins reflected on how his earlier donation of a telescope to the full membership of the Branch did



Figure 11: A painting of Walter Frederick Gale (courtesy: Museum of Applied Arts and Sciences, P3549-2).

little to promote amateur astronomy in Sydney, so he now chose to bring specific observational benefits to just one talented individual. In doing so, he would maintain his role as a patron of amateur astronomy in New South Wales.

For his part, Howarth responded admirably to the challenge. At the time he lived in Mayfield where he owned adjacent properties at 40 and 44 Bull Street. In 1933 he established the Grange Mount Observatory at 40 Bull Street (Obituary, 1971); this comprised two adjacent roll-off roof buildings (Figure 14). The larger building, measuring 4.3 m square, was home to the 8-inch Grubb (Burke, pers. comm. 1996),



Figure 12: Mark Howarth (courtesy: Newcastle Region Public Library: 0104-005241).



Figure 13: A map of Newcastle in around 1918, showing the later location of Howarth's Grange Mount Observatory (red bullseye) in the outer north-western suburb of Mayfield (<https://nla.gov.au/nla.obj-259844523/view>).

while the other observatory building housed yet another historic ex-Tebbutt telescope, an 11.4-cm Cooke refractor (that Howarth personally owned).

Although Howarth (1937) liked to observe sunspots, did some solar photography, and observed the 1936 annular solar eclipse, his main preoccupation was variable stars and from early 1936 he was one of the most prolific

observers in the Branch's Variable Star Section (Anonymous, 1936). In addition to his visual observations, Howarth also liked to photograph selected variable stars with an astro-camera mounted on one of his telescopes (Howarth, 1940), and in 1937 he discovered two new variable stars recorded on plates taken at his Grange Mount Observatory (Anonymous, 1938).

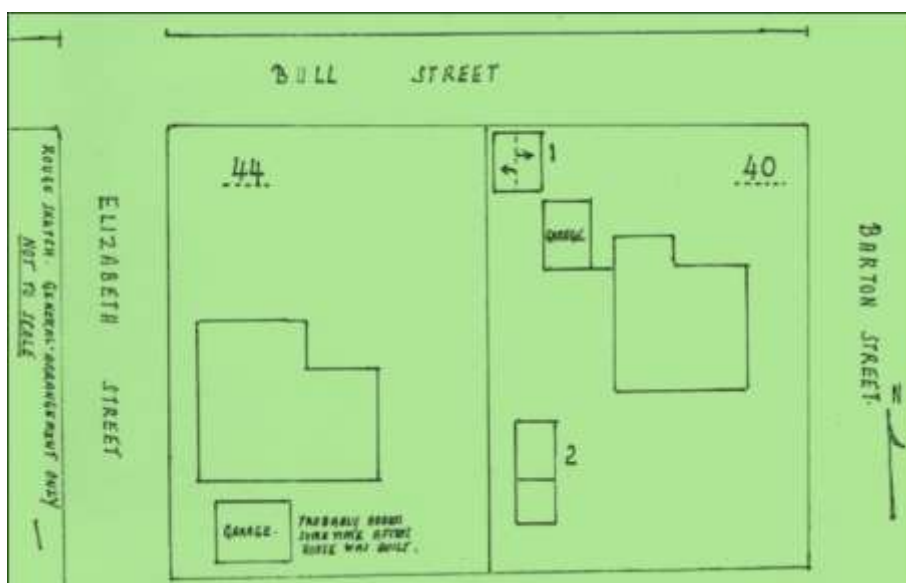


Figure 14: Mark Howarth's adjacent properties at 40 and 44 Bull Street, Mayfield. His roll-off roof observatories were both at 40 Bull Street, #1 housing the 8-inch Grubb refractor and #2 the 4.5-inch Cooke refractor. Both observatories were later demolished when 40 Bull Street was subdivided, and two 2-storey apartments were erected on what became 42 Bull Street. Number 40 Bull street was also subdivided and a 3-storey apartment was erected at 92a Barton Street (site plan: Pat Burke).

By the beginning of 1940, Hoskins had retrieved the Grubb refractor and installed it in a roll-off roof observatory at his country property, 'Euarra', near Bathurst (Figure 15).⁸ In February 1940, Howarth, Gale and two others visited Hoskins, and after refreshments

... there was an exodus to the Observatory where the 8 inch was put through its paces showing such objects as the companion of Rigel, Star Clusters, 47 Toucani[sic], and Omega Centauri, and various nebulae, including the ring Nebulae in the Lesser Magellanic Cloud, with remarkable clearness ... detail. (A recent astronomical pilgrimage, 1940).

Hoskins had little free time for observational astronomy so five years later he arranged for the telescope to be overhauled by Esdaile's firm in Sydney, and the instrument was then sold to the New Zealand astronomer Frank Maine Bateson (1909–2007; Bateson, 1989; Orchiston, 2017: 526–528).

Meanwhile, both of Howarth's observatory buildings survived into the present millennium with one of them (#2) having been converted into a comfortable cottage. Then 40 Bull Street was subdivided so as to include both observatories and the garage adjacent to the house at 40 Bull Street (see Figure 14). The new allotment became 42 Bull Street. Sometime between 2010 and 2015 both historic observatories and the old garage were demolished and two 2-storey apartments were erected on 42 Bull Street.

However, this did not mark Australia's final association with the historic 8-inch Grubb telescope. Back in 1960 Dr. Bateson sold the telescope to the Whakatane Astronomical Society in New Zealand, and it was installed in their Hillcrest Observatory. Then in 1986 it was repatriated to Australia after one of John Tebbutt's grandsons, John Halley Tebbutt, decided

to renovate the existing Windsor Observatory buildings and convert them into a unique astronomical museum (Orchiston, 2017: Chapter 15). The Grubb telescope now resides in its original dome at Windsor (Figure 16), a memorial not just to John Tebbutt, but also the observational achievements of Mark Howarth and Frank Bateson.

Meanwhile, Mark Howarth maintained his Mount Grange Observatory right up until he moved to Wollongong in 1964, when he sold the Cooke refractor to a Mr Mashman of Sydney. Mark Howarth died on 23 October 1971 at the age of 87 (Obituary, 1971).

5 DISCUSSION

During the nineteenth and early twentieth centuries, patronage was common in scientific societies worldwide, and is perhaps best exemplified in an astronomical context by the range of instruments donated to the Royal Astronomical Society (see Howse, 1986).

The New South Wales Branch of the British Astronomical Association was Sydney's first enduring astronomical group (Orchiston, 1988b; 2002; Orchiston and Perdrix, 2002), and had its fair share of wealthy members. Indeed, Hoskins was not the first to demonstrate philanthropic tastes. In 1905, the Branch's founding President, John Tebbutt (see Orchiston, 2017), received the Jackson-Gwilt Medal and Gift from the Royal Astronomical Society, and he decided to present the 'Gift' of £25 to the Branch in the belief that "... the money part of the award should properly be devoted to the advancement of astronomy ..." (Tebbutt, 1905). Some of this much appreciated donation was spent purchasing a slide projector and expanding the Branch's collection of lantern slides (Wright, 1906).

This donation pales into financial insignificance when compared with Hoskins' presentation of his 18-inch reflector to the Branch, yet

Figure 15: The roll-off roof wooden observatory that Hoskins erected at his country property, Euarra, near Bathurst (New South Wales) in about 1939. The ex-Tebbutt ex-Gale 8-inch Grubb refractor is clearly seen silhouetted against a background tree. Note that this simple rustic observatory has been restored, and still exists (photograph courtesy: Peter Hoskins).



this proved to be no isolated gift for in the very same year a founding member of the Branch, C.H. Matthews ([Lomb et al., 2024](#); [Wright, 1908](#)), also

... handed his 18-in. Calver mirror to our President, Mr. W.F. Gale, for his special use, and at his demise he desired the instrument should remain in the custody of the N.S.W. Branch. ([New South Wales Branch Report, 1920](#)).

In fact, Gale did not honour Matthews' wishes and eventually disposed of this telescope (see



Figure 16: A November 1996 photograph of John Halley Tebbutt (b. 1942) with the 8-inch Grubb refractor which is now back in its original 1894 dome at Windsor Observatory, near Sydney (photograph: Wayne Orchiston).

[Orchiston and Bembrick, 1995](#)). It must be admitted that by 1918 reflecting telescopes of 18-inch aperture were extremely modest by world standards (e.g. see [King, 1979](#); [Welther, 1984](#)), but if placed in skilled hands they were capable of useful work. Potentially they provided the means for Branch members to conduct serious on-going visual and spectroscopic observational programmes, yet despite the leadership of such people as Nangle (who was destined to become a professional astronomer) this did not occur. In hindsight, the Hoskins reflector possibly would have made a more significant contribution to New South Wales as-

tronomy had it remained in private ownership and been available to members with worthwhile projects to pursue. As we have suggested, this realisation may have prompted Hoskins to loan his 8-inch Grubb refractor to Howarth, a decision which was to prove beneficial to international variable star astronomy. Yet, by this time, Australian amateur astronomers had for the most part ceased to publish their own research papers or observational notes and instead were content merely to submit their observations to the relevant sections of the British Astronomical Association and the Royal Astronomical Society of New Zealand. As a result, no published papers resulted from Howarth's extensive use of the Grubb refractor.

6 CONCLUDING REMARKS

George Herbert Hoskins was an active member of the New South Wales Branch of the British Astronomical Association for more than thirty-five years of his fifty-year membership and contributed to the observational programmes of the Branch with two different telescopes. The larger of these, an 18-inch reflector, was subsequently donated to the Branch, and for about ten years was used to promote a popular interest in astronomy among the citizens of Sydney. However, its potential as an instrument for serious observational programs was largely squandered.

This is in stark contrast to a similarly-sized reflector, the 20-inch Grubb Catts Telescope, which also was owned by various Sydney amateur astronomers during the 1930s and 1940s, but only was able to make a valuable contribution to international astrophysics once it was acquired by Mt. Stromlo Observatory ([Orchiston, 2010](#)). This was at a time when the 74-inch reflector and the refurbished 'Great Melbourne Telescope' were still under construction ([Frame and Faulkner, 2003](#)), so modest instruments like the Catts and Hoskins Telescopes could be used by professional astronomers and graduate students for galactic and extragalactic research.

So, timing and target audience were critical factors in Hoskins' initial patronage. During the 1920s astronomers at the Australian State Observatories were immersed in positional astronomy, not astrophysics, so access to the Hoskins Telescope would have been of little interest. Meanwhile, the founding of the Commonwealth Solar Observatory came some years after Hoskins' donation ([Allen, 1978](#)), but a conventional reflecting telescope would only have become an attraction once this institution evolved into Mt. Stromlo Observatory and espoused astrophysics. Instead, the Hoskins

Telescope went to a technical college that lacked an astronomy department, or even professional astronomers in the physics department, where the use of this telescope for astrophysical research relied on Branch members, none of whom was trained to conduct such work. Moreover, the housing and maintenance of the Telescope at the College relied critically on Nangle's Directorship of the College, but he soon moved to other positions (including the Honorary Directorship of Sydney Observatory). In hindsight, Hoskins would have done better had he retained the 18-inch telescope or loaned it to a talented and dedicated observational astronomer from the Branch.

Fortunately, this logic prevailed later when Hoskins loaned his 8-inch Grubb refractor to Branch stalwart, Mark Howarth. As we have seen, Howarth made extensive variable star observations with this historic telescope.

Nonetheless, George Herbert Hoskins was one of a small number of Sydney amateur astronomers with the financial means to indulge his passion for astronomy, and through his patronage he was able to enhance the overall contribution of the New South Wales Branch to New South Wales, Australian and international amateur astronomy.

7 NOTES

1. Despite searches, the authors of this paper, and Peter Anderson from Brisbane in Queensland, have not been able to locate any photographs of this telescope, other than ones of the primary mirror.
2. [Anderson and Orchiston \(2020\)](#) discovered that Hoskins sold this telescope to the Queensland Popular Science and Art Society in Brisbane.
3. Subsequently, James Nangle became the Honorary Director of Sydney Observatory, and held this post from 1926 until his death in 1941 ([Wood, 1958](#)). He was yet another example of an Australian amateur astronomer who succeeded in making the transfer to professional ranks, i.e. an ATP (or amateur-turned-professional). For details of this phenomenon in Australian astronomy see [Orchiston \(2015\)](#).
4. Another Branch member, Dr. C. Moreton Olson of Forbes, New South Wales, also observed this event, and he also reported on the dimming of the star's light and its diffuse appearance ([Burnet, 1926](#); [Report of the Meeting, 1919](#)).
5. James W. Short (1865–1943; [Wood, 1958](#)) was a strong supporter of the Branch, and between 1890 and 1930 was employed by Sydney Observatory as the Astronomical Photographer at the Observatory's Red Hill outstation at Pennant Hills, on the north-western outskirts of suburban Sydney (<https://collection.powerhouse.com.au/object/348184>).
6. The retrieval was a non-trivial affair involving the second author of this paper, Brian Horsfall, George Smith and his son Neil. All but the last-mentioned were members of the Branch. An entertaining account of this challenging exercise is recounted in [Smith \(1987\)](#) and is yet another example of the way in which Professor Geoffrey Blainey's concept of the 'tyranny of distance' impacted directly on Australian astronomy, given the distances involved in transferring telescopes any distance within the enormous Australian continent, and the limitations imposed by the associated transportation technology. This is discussed by [Orchiston \(1986\)](#) in regard to the transfer of the 8-inch Grubb telescope (eventually owned by John Tebbutt, and mentioned in this paper) from Castlemaine in Victoria to Windsor near Sydney in New South Wales, and Dr. MacFarlane's 7-inch Grubb refractor from Irvinebank in far north Queensland to Riverview Observatory in Sydney (see, [Orchiston, 1985](#)). For these localities and the associated distances involved see [Figure 1](#)).
7. Note that eleven years earlier, in 1910, Hoskins had married a Ryland.
8. After parting with the 8-inch Grubb telescope [Howarth \(1941\)](#) continued his observational programs using the Cooke telescope and an astrocamera. One immediate by-product of the variable star observing programme was his independent discovery on 16 June 1941 of Comet C/1941 K1 (van Gent) ([Comet Howarth, 1941](#)) as a "... diffuse patch 1 min. of arc in diameter with a central nucleus, and ... of the tenth magnitude." ([Another new comet ..., 1941](#)). The South African astronomer Dr H. van Gent actually discovered this comet on 27 May ([Comet van Gent, 1941](#); [Marsden, 1982: 37](#)), but because of wartime telecommunication restrictions news of this did not reach Australia until sometime after Howarth's independent discovery. Since Howarth was only the second independent discoverer, there is a legitimate case for the official renaming of this object as Comet C/1941 KI (van Gent–Howarth). The fact that he was awarded both the Donovan Medal (from Sydney) and the Donohoe Medal by the Astronomical Society of the Pacific ([Mr. Mark Howarth honoured, 1942](#)) adds further weight to this co-discovery claim ([Orchiston, 1997c](#)).

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Professor Wayne Orchiston was born in Auckland (New Zealand) in 1943, and has BA First Class Honours and PhD degrees from the University of Sydney. Currently, he is employed by the University of Science and Technology of China in Hefei as the Co-editor of the *Journal of Astronomical History and Heritage*. He is also an Adjunct Professor of Astronomy in the Centre for Astrophysics at the University of Southern Queensland (USQ) in Toowoomba, Australia. Formerly, Wayne worked at observatories, research institutes and universities in Australia, New Zealand and Thailand.



Over the past two decades Wayne has supervised more than 35 Master of Astronomy and PhD history of astronomy research projects through three different Australian universities.

Wayne has wide-ranging research interests and more than 500 publications, mainly about historic transits of Venus; historic solar eclipses; historic telescopes and observatories; the emergence of astrophysics in Asia and Oceania; the history of cometary and meteor astronomy; the astronomy of James Cook's three voyages to the Pacific; amateur astronomy and the amateur–professional interface; the history of meteoritics; Indian, Southeast Asian and Māori ethnoastronomy; and the history of radio astronomy in Australia, France, India, Japan, New Zealand and the USA.

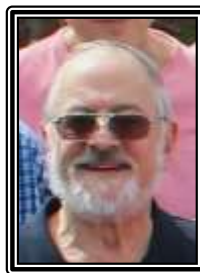
Recent books by Wayne include *Exploring the History of New Zealand Astronomy ...* (2016, Springer); *John Tebbutt: Rebuilding and Strengthening the Foundations of Australian Astronomy* (2017, Springer); *The Emergence of Astrophysics in Asia ...* (2017, Springer, co-edited by Tsuko Nakamura); *Exploring the History of Southeast Asian Astronomy ...* (2021, Springer, co-edited by Mayank Vahia) and *Golden Years of Australian Radio Astronomy: An Illustrated History* (2021, Springer, co-authored by Peter Robertson and Woody Sullivan). He has also edited or co-edited a succession of conference proceedings.

Since 1985 Wayne has been a member of the IAU, and he is a former President of Commission C3 (History of Astronomy). In 2003 he founded the IAU's Historical Radio Astronomy Working Group, and is the current Radio Astronomy Subject Editor for the Third Edition of Springer's *Biographical Encyclopedia of Astronomers*. He also founded the IAU Working Group on Historic Transits of Venus, and is the founding Director of the Historical Section of the Royal Astronomical Society of New Zealand. Wayne is also an Editor of Springer's Series on Cultural and Historical Astronomy.

In 1998 Wayne co-founded the *Journal of Astronomical History and Heritage*, and was the Managing Editor until 31 July 2022 when he passed ownership of the journal to the University of Science and Technology of China. In 2013 the IAU named minor planet 48471 'Orchiston', and in 2019 he and Dr Stella Cottam were co-recipients of the American Astronomical Society's Donald E. Osterbrock Book Prize for their 2015 Springer book, *Eclipses, Transits and Comets of the Nineteenth Century: How America's Perception of the Skies Changed*. In 2023 Wayne was elected an Honorary Member of the Royal Astronomical Society of New Zealand, and Springer published the following Festschrift: Gullberg, S., and Robertson, P. (eds), *Essays in Astronomical History and Heritage: A Tribute to Wayne Orchiston on His 80th Birthday*. In 2024 Wayne and Darunee Lingling Orchiston attended the Winter Meeting of the American Astronomical Society in New Orleans, where he was presented with the 2024 Le Roy E. Doggett Prize for History of Astronomy.

Wayne and Darunee Lingling Orchiston live in a quiet village near Chiang Mai in northern Thailand. When not involved in astronomy Wayne enjoys following Australian and New Zealand athletics and Formula 1 and Indycar racing.

Colin Bembrick is a retired geologist and astronomer. He was born in Sydney (Australia) in 1942, and has a BSc (Honours) in Geology from the University of New South Wales. He became seriously interested in astronomy after observing Sputnik 1 in 1957, and later pursued this interest in amateur astronomy through the Sutherland Astronomical Society and New South Wales Branch of the British Astronomical Association in Sydney. During 1986–1988 he served as the President of the latter group.



In 1979 Col resigned from the Geological Survey of New South Wales to take up a geology consulting position with Robertson Research Australia, and ten years later transferred to professional astronomy when he was appointed as a Technical Officer by the School of Physics at the University of New South Wales. Col was then responsible for their Automated Patrol Telescope (APT) at Siding Spring, and he contributed to the redesign and up-grading of this old Baker-Nunn camera.

In 1988 Col moved his own Mt Tarana Observatory to Napoleon Reef (near Bathurst, in central Western New South Wales) where he housed his 16-inch (40.6-cm) Meade Cassegrain telescope in a roll-off roof observatory and used it extensively to make CCD photometric observations of minor planets and eclipsing binary stars. He published a succession of papers on this work, mainly in the *Minor Planet Bulletin* and in the *Journal of the British Astronomical Association*. In the 1980s, Col and Wayne Orchiston also did photoelectric photometry of the flare star UV Ceti from Mt Stromlo Observatory using a Gencom Starlight Photometer and the 30-inch (76.2-cm) Reynolds Reflector. Col also was interested in comets, and he and Branch colleagues used the old ex-Sydney Observatory Carte du Ciel 13-inch (33.0-cm) astrograph to make positional observations of Comet 1P/Halley in 1985 as part of the International Halley Watch.

Another one of Col's interest is astronomical history. In the 1990s he published a number of co-authored papers with Wayne Orchiston in the now-defunct *Australian Journal of Astronomy* on historically significant telescopes owned by Australian amateur astronomers.

In 2004 Col was awarded the Berenice Page Medal by the Astronomical Society of Australia for his work on minor planets.