

Will Hay (1888–1949) and his telescopes

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The observing career, observatories and telescopes of one of Britain's favourite 20th century entertainers, who died 60 years ago this month, are analysed and the enduring mystery over the fate of his 6-inch Cooke refractor is discussed.

Introduction

The stage and screen comedian William Thomson Hay (1888 December 6–1949 April 18) was, away from the audiences and cinema screens of the 1930s and '40s, a serious, studious and knowledgeable man with a passion for science, astronomy, sailing and flying. He was also fluent in many languages. Will Hay was a BAA member for the last 17 years of his life and, away from the limelight, could not have been further removed from the bumbling schoolteacher (Figure 1), stationmaster, policeman, sailor or fireman portrayed in his highly popular films. His views on astronomy were nicely summarised in an interview with the *Daily Mail* on 1933 August 9. The *Mail* reporter stated:

He believes astronomers to be the finest brotherhood on earth, the only men who see life in its true proportion. 'If we were all astronomers there'd be no more war' he says. He has the broad, calm philosophy of a man who thinks habitually in terms of universes. All astronomers are philosophers, he will tell you.



Figure 1. Will Hay in the 1935 film *Boys will be boys*, as he is largely remembered by film historians and fans of British comedy; the archetypal 1930s schoolmaster wearing a gown, mortar board and wire rimmed spectacles awry on the bridge of his nose. Here he was Dr Alec Smart, ex-prison tutor and now headmaster of Narkover College, a boys' public school specialising in gambling, forging and thieving! Photo by Chas. Van Enger/Gainsborough Pictures. From a purchased print in the collection of Ken Goward.

and was only 10° above Hay's London horizon. Remarkably, Saturn would have been at a dismal altitude of 17° when Will noticed the spot, transiting at midnight when its altitude would only have risen by a few degrees more. Although the ringed planet was at opposition, it was also in Capricornus, half a degree southeast of 4th magnitude theta Capricornii and at a very poor declination of $-17^\circ 30'$. The 6th magnitude suspected variable star NSV 13549 (GSC 6350-1500) would have been 4 arc-minutes northeast of the planet. But despite the altitude, other northern hemisphere observers also saw the spot. John Pettley of Hampshire claimed, many years later (in a letter to Ian Duff), to have seen it with an 8-inch

(203mm) refractor from the British Army's Aldershot observatory 'about the end of July'.¹ However, he also said that Hay first saw the spot on the same night, which as we have seen was August 3, not 'about the end of July'.²

John E. Willis at the US Naval Observatory in Washington independently noted the spot some 26 hours after Hay,^{3,4} and the Potsdam Astro-Physical Laboratory announced⁵ that Dr Weber, a Reich Bureau of Standards physicist, had seen the spot one hour before the comedian. Nevertheless Will received the most publicity and, in fairness, he was a very keen observer making 14 observations of Saturn⁶ and two sketches of the spot between August 3 and September 14.

Examination of Hay's handwritten notes in his observing logbook suggest that, on the night of the discovery, he ob-

Saturn's 'Great White Spot'

At the start of 1933 August, Hay, already well known for entertaining audiences with live performances such as his 'Fourth Form at St Michael's' routine, and for his comedy work on the radio, really hit the newspaper headlines when he noticed a huge white spot on Saturn using his 6-inch (152mm) Cooke refractor. The time of his observation was August 3 at 22:35 GMT. A gibbous moon, two days from full, was transiting the south meridian in Sagittarius at that time

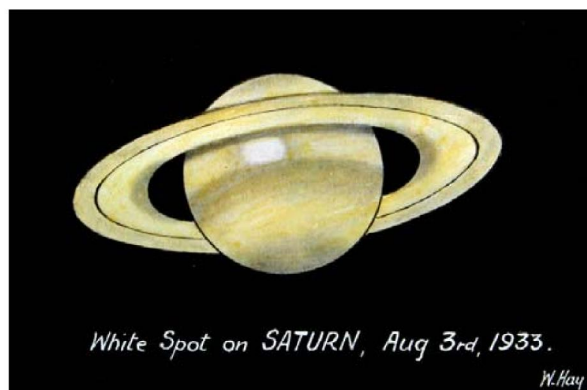


Figure 2a. Will Hay's sketch of the white spot on Saturn that he independently discovered on 1933 August 3 at 22:35 GMT. This is how the sketch appears on page 34 of his observing log. Hay's handwritten caption above the sketch reads: 'The position of spot at discovery was approximately – the following edge of spot was on the meridian. No accurate observation was taken at time of discovery.'

served the spot on his own, despite reports that his wife Gladys was with him (as discussed later). Following his discovery, when time permitted, he observed Saturn at every opportunity from his Norbury Observatory and he even observed it whilst at an engagement in Brighton on August 18 and from Bournemouth on September 13 and 14, his last observations of the spot. Over that period he clearly expended a great amount of thought and time in trying to explain the phenomenon he had observed. This can be amply demonstrated by quoting directly from pages 33 to 55 of Hay's observing log.

Will Hay's observing log: 1933 August 3 to September 14

The following observations are transcribed directly from Will Hay's observing log, without corrections for style or spelling. For example, Hay spells Saturn's Crêpe ring as both Crêpe and Crape in the log. The entries cover all of Hay's observations of the white spot.

August 3rd. G.M.T. 22^H. 35^M.00. Observing Saturn with 6" Cooke Refractor. I was surprised to see a large bright area in the Equatorial region of the planet and just left of the central meridian. I rang up Dr Steavenson who observed the planet thro' his 20½" reflector and confirmed the existence of the bright area. I observed the spot from 1933 Aug 3 22^H.35^M until it reached the limb of the planet at 1933 Aug 4th, 00^H.10^M.00. The large bright area seemed to be followed by the other bright areas tho' not so conspicuous or well defined as the principal one. I also suspected similar bright patches near the N. Polar region of the planet. There was also a well defined shading in Ring A which seemed to divide the Ring, and at times appeared to be almost a fine line. I am inclined to think it is an optical illusion caused by prolonged gazing and focusing on Cassini's division.

[Figure 2a shows the sketch made by Hay on the evening of 1933 August 3.]

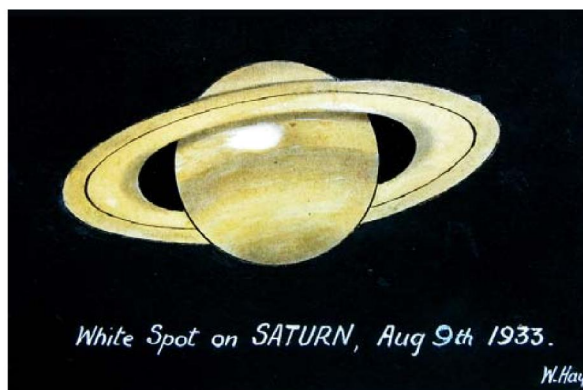


Figure 2b. A further Saturn sketch by Hay, made on 1933 August 9, showing the white spot had become elongated. From an original sketch in Hay's observing log, page 46. See the relevant transcribed notes for August 9 in this paper.

I used power $\times 175$ on the 6" Cooke throughout the observation.

I also observed the planet with the 12.6" Calver reflector; but could not use more than $\times 120$ owing to the bad condition of the mirror.

Aug 4. Observed Saturn at 22^H 30^M U.T. The Equatorial Zone had a mottled appearance but showed no conspicuous spots. Made an estimate of the brightness of this Zone in order to compare it with the bright spot when next observed. I think that the bright spot is not brighter than is the Equatorial Zone generally, but only appears brighter by being separated by a dark division from the rest of the zone. This dark division may possibly be a drift from the dark belt bordering the Equatorial Zone, or, if the dark belt is at a lower altitude than the bright zone it may be a dispersion of the upper vapours showing darker layers underneath, and isolation of the portion which appears as a bright spot.

Aug 6th Dr W H Steavenson and I observed Saturn from 21^H50^M. Dr W.H.S. at the 12" Calver Reflector and I at the 6" Cooke Refractor. Cloudy periods prevented prolonged observation but the white spot was plainly visible and it crossed the central meridian at 22^H12^M (Dr W.H.S.) 22^H13^M (W.H). I estimated that the spot was at the 'discovery' position at 22^H29^M; which gives a rotation period (based on 7 rotations) of 10^H16^M17^S. The region of the Equatorial Zone following the spot seems to be darker than usual, and discontinuous. Seeing conditions fair. Moon just past full. Sky hazy with cloudy intervals. Image only good at intervals. Powers $\times 125$ and $\times 175$ on Cooke. $\times 100$ & $\times 175$ on 12.6" Calver.

Aug 7. Observed Saturn with 6" Cooke from 23^H to 1^H Aug 8 G.M.T. $\times 125$ and $\times 175$. Moon waning. Sky bright and clear.

Image of Saturn very distinct and fairly steady. The Equatorial Zone seemed brighter than it does in the region of the bright spot, and the Crape ring and dark zone seemed darker by contrast with this part of the Equatorial Zone than they did with the other region of the Eq Zone. This

leads me to think that the equatorial zone just preceding and following the spot has become darkened. There was no marked mottling in the part of The Equatorial Zone observed tonight, in fact it appears uniformly bright right across the disk. The junction of the dark belt with the Equatorial Zone was so marked that at first glance it appeared as a thin dark line. This is not so apparent in the region of the spot.

Aug 8 (Tuesday) Observed Saturn at 23^H00^M G.M.T. Equatorial Zone uniformly bright and northerly temperate zone dark.

Aug 9 G.M.T. 00^H00^M 00^S. Continued observation on Saturn. The bright spot appeared coming around the limb and the preceding edge seemed less well defined than when first discovered on Aug 3rd. It was rather difficult to determine where the preceding edge of the spot commenced, and I imagined that the main spot was preceded by a smaller bright area from which it was separated by a very faint dark mark. As the whole spot came into view it was clearly noticeable that the following edge was extremely well marked and also that the Equatorial Zone following the spot was very much darker than usual, so much so, that the dark belt seemed to extend right up to the Crape ring in one unbroken dark shading. The spot itself seemed to be slightly longer than before and it encroached into the dark belt on its northern edge. The times of transit and periods deduced therefrom are as follows:-

At Longitude of Central Meridian

Preceding edge	Centre of Spot	Following Edge
1 ^H 7 ^M G.M.T.	1 ^H 34 ^M G.M.T.	1 ^H 58 ^M G.M.T.
Period of rotation based on 5 transits from 1933 August 6 th 22 ^H 13 ^M G.M.T. to August 9 th 1 ^H 34 ^M G.M.T.:		
		10 ^H 16 ^M 12 ^S
Period of rotation based on 12 rotations of the spot from longitude position of discovery to same position in longitude, Aug 3 rd 22 ^H 35 ^M to Aug 9 th 1 ^H 58 ^M G.M.T.:		
		10 ^H 16 ^M 55 ^S .

Throughout practically the whole of the observation, the image was remarkably steady, and distinct. The Crepe ring was easily seen against the sky and Enckes division was undoubtedly in evidence, especially on the following half of Ring A. Powers used $\times 125$ $\times 175$ and $\times 300$ on 6" Cooke Refractor (Equatorial).

Aug 9. Observed spot on Saturn.

When I commenced observation at 21^H55^M preceding edge had already crossed the C.M. The image was not so bright as previous night. The preceding edge of spot was diffuse. The following edge seemed less well defined than at previous observation and the spot seems to be extending & losing its sharp outline. The area immediately following the spot is still dark but becomes brighter farther along in longitude.

The times of transit were :-

	CENTRE	FOLLOWING E.
Aug 9/33	22 ^H 5 ^M G.M.T.	22 ^H 31 ^M G.M.T.

This gives the following rotation period:-

BASED ON 2 ROTATIONS

Centre of Spot

Aug 9/33 1 ^H 34 ^M to Aug 9/33 22 ^H 5 ^M	10 ^H 15 ^M .5
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Following Edge

Aug 9/33 22 ^H 58 ^M to Aug 9/33 22 ^H 31 ^M	10 ^H 16 ^M .5
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BASED ON 7 ROTATIONS

Centre of Spot

Aug 6/33 22 ^H 13 ^M to Aug 9/33 22 ^H 5 ^M	10 ^H 16 ^M .0
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Following Edge 7 and 14 Rotations

* Aug 6/33 22 ^H 29 ^M to Aug 9/33 22 ^H 5 ^M	10 ^H 17 ^M 23 ^S
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* Aug 3/33 22 ^H 25 ^M to " " "	10 ^H 16 ^M 51 ^S
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*These are based on an assumption that the F.E. was on the Meridian at time of discovery, but no importance is attached to these calculations.

[Hay's second sketch of the White Spot, made on the evening of 1933 August 9 is shown in Figure 2b, as it appears in his logbook. Hay pasted BAA Circular No. 137 into his logbook too. This circular described his discovery of the White Spot, although the time was given as 22h 30m U.T., i.e. 5 minutes earlier than Hay's log recorded it. The circular is shown in Figure 3.]

Aug 12 Observed Saturn. Sky very transparent but seeing conditions (for Planetary work) almost impossible. At times the Rings merged into the planet and the whole image was shapeless. I commenced observing at 21^H45^M G.M.T. and I at once noticed that the spot was 'Early'. It was impossible to say accurately when the centre of spot was on the meridian but in the rare glimpses I could get of the spot as a whole I should estimate the transit of C.M. at about 21^H48^M. The spot has lengthened considerably and the p.e. [preceding edge] is almost obliterated. The area following the F.E. is getting brighter. The actual spot, however, still remains conspicuous. I concentrated on the F.E. and timed its transit across the C.M. AT 22^H 10. It was certainly past the C.M. at 22^H 15^M.

Times of transit

Centre	Following end
Aug 12 21 ^H 48 ^M	Aug 12 22 ^H 10

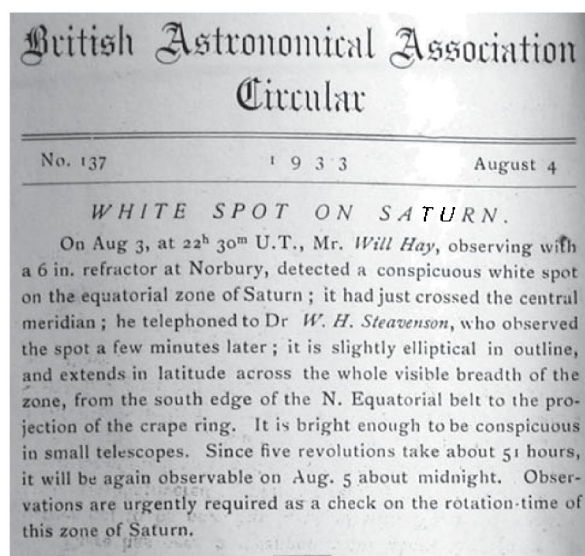


Figure 3. BAA Circular 137 announcing Will Hay's discovery of the 1933 White Spot on Saturn.

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Based on 7 rotations

Centre

Aug 9 22^H5^M to Aug 12 21^H48^M 10^H14^M43

F End

Aug 9 22^H31^M to Aug 12 22^H10^M 10^H14^M8.5^S

The close approximation of the two periods (that for Centre, and for FE) seems to indicate that the spot has altered its speed, or that it has a drift in the 'preceding' direction. It could also be accounted for by a drift of the 'dark' matter over the spot in the 'preceding' direction, at the f.e. and a dispersion of dark matter at the p.e. The rapidity of change in the aspect of the spot and its apparent rapidity of change in speed of rotation, inclines me to think that my first assumption of the 'spot' being caused by the isolation of a bright area by a drift of 'dark' matter may be the real cause of the phenomena. 6" Cooke $\times 175$.

Observed M.13 Ring Neb M12, M31. The clusters were brilliant. Have never seen M.13 better with this aperture. 6" Cooke $\times 175$. Closed down 00^H30^M G.M.T. Aug 13 – 1933.

Aug 13. I venture to suggest that the spot may have been caused in the following manner: Assuming that the Equatorial Zone consists of a bright layer which covers a dark layer situated at a lower altitude, a sudden concentration of bright matter towards a centre, would probably disclose the dark layer at each side of the centre of disturbance. The concentration of bright matter would account for the abnormal brightness of the spot. As the concentrated bright matter subsided it would cause a lengthening of the spot in one direction or another, and if the subsidence adopted a lateral direction of movement as a whole in addition to the vertical one, it would cause an alteration in the apparent rotation period of the spot measured when the concentration was more or less stationary. The concentration would no doubt occur more rapidly than the subsequent subsidence, and would probably remain stationary for a period. The subsidence would no doubt be slower and spread out in any direction, again covering up the lower dark matter. I suggest that at the moment of its greatest concentration it 'overflowed' over the dark northern belt, giving the appearance of having 'bitten' into this area, as observed on Aug 9th, by Dr W.H. Steavenson, Rev T E R Phillips and myself.

Aug 18 G.M.T. 21^H30^M Observed Saturn with 3½" Cooke at Brighton $\times 150$. Altazimuth Stand. Cloudy intervals. Image fairly clear at times. Spot easily visible and seemed to be extended more than ever in the preceding direction. Following end not so well defined as previously seen. Estimated that the F.E. was on the C.M. at 21^H50^M. II Class observation.

[The 3½" Cooke on its altazimuth stand may well be the same instrument that still resides with Hay's descendants. See the final section of this paper.]

Time of Transit

Following end 21^H50^M G.M.T.

Based on 14 rotations F.E.

Aug 12/33 22^H10^M to Aug 18/33 21^H50^M 10^H15^M42^S

Based on 21 rotations F.E.

Aug 9/33 22^H31^M to Aug 18/33 21^H50^M 10^H15^M11.5^S

Aug 21st G.M.T. 23^H10^M00. Observed Saturn. Image not too steady. I imagined I saw a round bright patch on the E.Z. in longitude immediately following the F.E. of the large spot. Clouds interfered with observations and I could not be sure of the existence of this round patch.

Aug 23 G.M.T. 23^H15^M00. Observed Saturn until 1^H00^M00 Aug 24th G.M.T. The spot has become very elongated and the preceding end indistinguishable from the rest of the E Zone. The following end is still visible but seeing conditions were not good enough to permit of taking a reliable estimate of the time of its C.M. passage.

Hay's August 21 and 23 observations are assumed to have taken place at Norbury, although there is nothing noted to confirm this. His final observations of the white spot were not from Norbury but from Bournemouth, and were recorded on page 57 of his log book thus:

Sept 13. Observed Saturn at Bournemouth with Mr Strachan's Coudé 9" O.G. Also observed M13.

Sept 14. Observed Saturn at Bournemouth with Mr Strachan's 9" Coudé. The F.E. of spot had just crossed the C.M. at 19^H10^M G.M.T.

W. Strachan was elected to the RAS in 1908 and the BAA in 1910 and was a member of the BAA Variable Star Section as well as a solar observer. He was a noted observer in the BAA of the 1930s and an obituary appeared in *JBAA* 45, 289 (1935). He died, aged 61, on 1935 March 16, only 19 months after Hay made his last white spot observation at Strachan's Bournemouth observatory. Strachan had been disabled since infancy and so his 9-inch Coudé refractor with its fixed eyepiece position was the only instrument he could manage.

According to the Saturn Section summary by Howard L. Kelly in the 1948 memoir (Vol. 36 part 2) *The British Astronomical Association – The First Fifty Years*, the BAA members who submitted observations of the 1933 White Spot were: Hay, Steavenson, Phillips, Parr, Waterfield, Hargreaves, Strachan, Butterson (New Zealand) and Ainslie (the Saturn Section Director, observing from the Cape, South Africa).

Media and public reaction

The national press spared no time or effort in publicising Hay's white spot discovery in 1933 August. The *London Evening News* even printed a cartoon of Hay, dressed in his schoolmaster's gown, but depicted as a Saturnian astronomer, standing on the rings and discovering black trouble spots on the Earth. Hay described his discovery to the BAA two months later at the AGM and remarked that he regretted that a more regular and constant observer had not seen the white spot first.⁷

A national newspaper⁸ reported that when on stage in Manchester three months after his Saturn spot discovery, Hay would have liked to have visited the nearby Stonyhurst College Observatory with its 15-inch (381mm)

refractor, but his schedule did not allow it. However, Hay added that the Director of Stonyhurst, Fr Rowland, who had himself observed the Saturnian spot, would be attending Hay's lecture to the Royal Astronomical Society in London in the near future.

Hay's silver screen popularity sky-rocketed after his white spot discovery and a string of 19 comedy films were shot between 1934 and 1943, the best of which were every bit as popular in the UK as those of Charlie Chaplin and Laurel & Hardy (whose eras overlapped Hay's) and George Formby, his only serious British comedy rival in that era. Films such as *Boys will be Boys*, *Windbag the Sailor*, *Good Morning Boys*, *Oh Mr Porter!*, *Convict 99*, *Ask a Policeman* and *Where's that Fire?* resulted in huge takings at the British box office. In his best loved films, made at the Gainsborough studios in Hackney, Hay would pair up with his stooges, the dentally challenged Moore Marriott and the young actor Graham Moffatt, to form a bumbling trio that would guarantee hysterical laughter from cinema audiences and set the standard and tone of British film comedy for generations to come. Some of Hay's younger silver screen colleagues will be familiar to BAA members today. In Hay's 1941 film, *The Ghost of St Michaels*, a young John Laurie (Private Fraser in the BBC's *Dad's Army*) played the role of Jamie the Scottish caretaker, a man who revels in dour and frightening stories of 'Mad McKinnon', the ghost of the haunted castle, a grim story-telling role a much older Laurie would often resurrect with much success in the *Dad's Army* series in the late 1960s and '70s. BAA members who recall the 1970s Gerry Anderson series *Space 1999* may be interested to learn that Barry Morse (1918–2008), who played Prof Victor Bergman in that series, had his film debut alongside Will Hay in *The Goose Steps Out* in 1942. Charles Hawtrey, John Mills and Peter Ustinov are other notable actors who played roles alongside Hay early in their careers. A young Thora Hird played Hay's secretary in *The Black Sheep of Whitehall* and she also played his daughter in a jovial 1942 public information film entitled *Go to Blazes* about extinguishing wartime incendiary bombs.

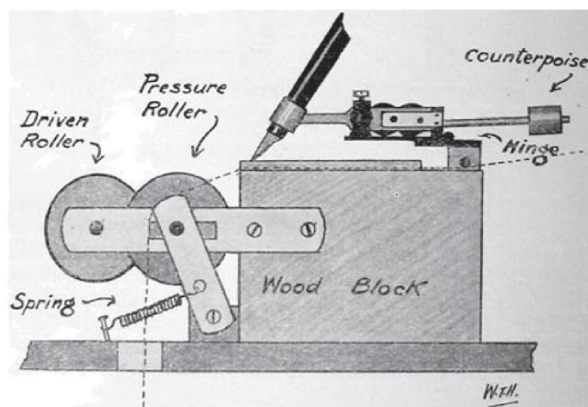


Figure 4a. Will Hay's own sketch of the central section of his original Meccano chronograph, from the 1932 December BAA *Journal* (43, no. 2, page 82).

The amateur astronomer

Away from the audiences, microphones and cameras Hay's routine observational work was appreciated by the keenest amateur astronomers of the 1930s and '40s, and occasionally he attended and spoke at meetings of the BAA and the RAS in London. While the white spot discovery received the most attention he contributed many other routine observations that did not attract any headlines. According to a recent radio documentary,⁹ his fascination with intellectual pursuits was so strong that when he finished work for the day he would go home and sit with a doodle pad and work out mathematical problems; and when he had finished after an evening performance in the theatre he would stroll outside, and stage managers would even say they had found him on the roof staring up at the sky.

Despite a long interest in astronomy Hay joined the BAA relatively late in life, in 1932 June; that same month he acquired the 6-inch Cooke refractor. He was also elected as a member of the RAS the same year. Hay remained a member of both societies until his untimely death from a third stroke in 1949. Within the BAA he was a keen member of the Comet Section and also served on Council. Amongst his closest BAA acquaintances were Dr W. H. Steavenson (1894–1975), Dr R. M. Fry (1896–1980), Dr G. Merton (1893–1983) and F. M. Holborn (1884–1962). Dr J. G. Porter (1900–1981) and Steavenson's close friend Dr R. L. Waterfield (1900–1986) were well known to him also. According to the 1978 biography *Good Morning Boys* by Seaton & Martin, Hay and Steavenson shared a passion for photography, archaeology, Sherlock Holmes and astronomy.

Will Hay wrote a trio of detailed papers in the BAA *Journal* in 1932, 1934 and 1936 entitled 'A simple chronograph',¹⁰ 'An improved simple chronograph',¹¹ and 'Application of a synchronous motor to a chronograph'.¹² They detailed his patient design, construction and improvement of a timekeeping apparatus for use in the observatory, built (from electrical gramophone components and Meccano parts) after a suggestion from Dr Steavenson (see Figures 4a and 4b), for whom

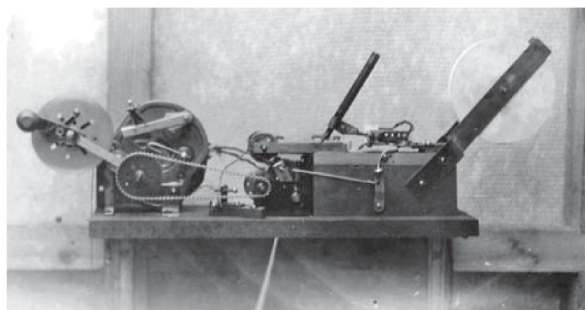


Figure 4b. Will Hay's photograph of his chronograph in the run-off roof building of his Cooke refractor at Norbury. (Another version may be stored behind Hay in Figure 7). As well as the parts sketched in Figure 4a a gramophone motor (left hand side) has been employed to power, via a Meccano chain, the driven roller. Thus a paper tape (reel visible on the right hand side) is pulled through the system while a pen is used to mark intervals of seconds (and observation points via a hand switch). Photograph by kind permission of the RAS/Peter Hingley. © Royal Astronomical Society.

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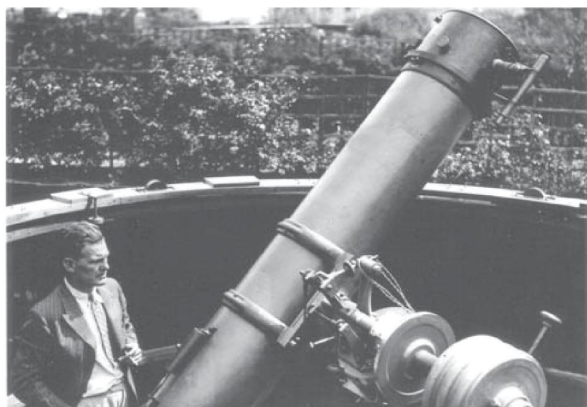


Figure 5. Will Hay and his 12½-inch/318mm f/7.2 Calver in the back garden of his home at 45 The Chase, Norbury in South London, just after his independent 1933 discovery of the Saturnian White Spot. Note that a circular wall has been constructed, with wheels on the rim, but no dome is yet in place. Two years later, in 1935, Hay would separate from his wife, give the Calver away, and move north to Hendon. Image by kind permission of Mirrorpix. © MirrorPrintStore.

Hay made the device. He also constructed a blink microscope which he presented to the BAA¹³ and was only too happy to build parts for other close friends within the Association who needed the same equipment. Arguably his second most significant observational contribution was the visual determination of cometary positions using the micrometer and chronograph he had constructed. His most significant contribution was, obviously, the discovery of the white spot on Saturn which was featured in the *Journal* too.¹⁴ In addition he was a keen observer of Jupiter and Mars.

The telescopes

From 1927 to 1934 Hay lived at 45 The Chase, Norbury, in south London, roughly midway between Streatham Common and Norbury Park. According to *Good Morning Boys* his next door neighbour was the Windmill Theatre music hall artist Gus Chevalier, one of the first faces on the experimental BBC television of the early 1930s, transmitted to less than a hundred London viewers.

Some 70 years after his Norbury period, on 2000 October 1, in front of an assembly of some of Hay's grandchildren, great-grandchildren and the comedian Roy Hudd,¹⁵ a blue plaque was attached to the current house at no. 45, The Chase, reading:

'HAY, Will (1888–1949), Comic Actor and Astronomer, lived here 1927–1934.'

Hay owned a number of telescopes at Norbury, but the largest instruments were his 12½-inch (318mm) equatorially mounted f/7.2 Newtonian made by George Calver in 1895 (see Figures 5 and 6) and a very fine equatorially mounted 6-inch (152mm) Cooke refractor (see Figures 7 and 8). With a steady stream of theatre and radio work in the capital he could at last indulge in his nocturnal hobby using large, permanently mounted instruments, even if he would still carry a portable telescope with him when performing away from home.

The large Calver Newtonian was acquired by W. H. Steavenson and Will Hay in the 1920s after the female relatives of a deceased amateur astronomer (thought to be a Mr Paxton) asked for advice on how to dispose of it.¹⁶ The telescope mirror was refigured by the Rev W. F. A. Ellison before it was set to work in Hay's Norbury garden. Hay's Calver was very similar to that used by the prolific observer P. B. Molesworth.¹⁷ In his observing log Hay sometimes calls the Calver a 12½-inch (317.5mm) instrument but often refers to a 12.6-inch (320mm) instrument which is the true mirror diameter.

Hay and Dr Steavenson lived in close proximity during the comedian's seven years at Norbury, and at the start of the period Steavenson was midway through his two year term as BAA President (1926–1928) and was the Association's Mars Section Director. When J. H. Hindle, a Lancastrian manufacturing engineer and mirror maker, presented Steavenson with a complete 500mm f/4 Newtonian around 1930 (in response to Steavenson's claim that a satisfactory f/4 mirror could not be made), Will Hay was roped into a mirror silvering gang for the new instrument at West Norwood. The gang consisted of a foreman (Steavenson), two mirror lifters (Will Hay and Frank Holborn) and one 'screwboy' (G. E. Patston). Later in the process, R. M. Fry replaced Hay as a lifter. Minutes were kept at each meeting of this silvering gang, in the hope that any faults might be corrected the next time.¹⁸



Figure 6. A 2008 image of the 318mm f/7.2 Calver at its home in Thame. Picture by kind permission of Dr Robert Paterson, who acquired the telescope in 1967.

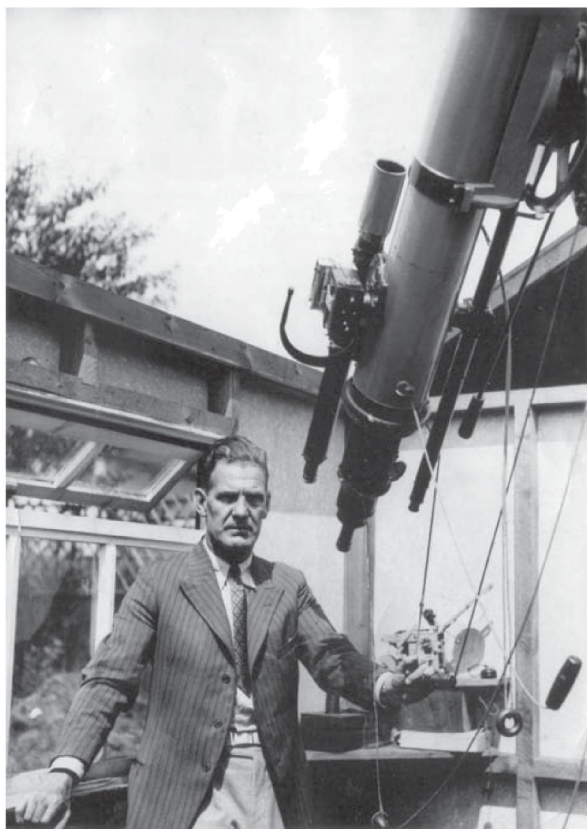


Figure 7. Will Hay and his 6-inch/152mm Cooke refractor in what appears to be a run-off roof type of observatory at his home at 45 The Chase, Norbury in South London, just after his independent discovery of the Saturnian White Spot. Image by kind permission of Mirrorpix. © MirrorPrintStore.

According to Hay's observing log (which opens on 1932 April 28) the 6-inch Cooke refractor was purchased by him from Broadhurst Clarkson on 1932 June 17 and it was his favourite instrument for planetary observation. The comedian often made time to visit Broadhurst Clarkson's shop in Farringdon even when he was involved in busy filming schedules at the Gainsborough studios in the mid 1930s.¹⁹

On 1932 June 20 the same observing log records that the telescope was delivered to Hay by none other than Dr Steavenson himself (a stone's throw away at West Norwood) and he assisted Will in erecting the instrument at his observatory on that and the following day. Hay's 'first light' with the refractor was recorded (on page 7 of his observing log) as June 22 (at 22h 45m to 00h 30m), when he observed the Ring Nebula in Lyra, M13, M97, the double stars Zeta Boötis and Otto Struve 371 (in Lyra), and also Saturn. Saturn received rather more attention than the other objects and Hay records that the Cassini division was strongly marked. 'Seeing V'. (V refers to the Antoniadi five point scale of seeing where 'I' is excellent and 'V' is very poor).

Analysis of surviving pictures indicates that the massive German equatorial head of the refractor was mounted at a height of maybe 1.8 metres above ground level on an iron plinth some 25cm in diameter. Thus the eyepiece would have been at a reasonable height even for objects at high altitude. In the *Good Morning Boys* biography picture Hay is obviously standing on a chair for the photographer.

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When Hay discovered the Saturnian white spot the *Daily Mirror* for 1933 August 8 showed him on the cover with his larger Newtonian, even if the discovery was actually made with the 6-inch Cooke refractor, which the newspaper reporter had photographed too. The headline read:

'Comedian's Big Discovery on Planet. Spot as clue to Saturn's Mysteries? Will Hay beats America'

It also (accurately) reported him as having phoned Dr Steavenson as soon as he saw the spot. As we saw from Hay's notes Steavenson confirmed the feature with a return phone call as soon as he had seen it through his largest telescope and advised Hay to contact the RAS. According to *Good Morning Boys*, on the night of the discovery Will was measuring stars (i.e. the separation of double stars) assisted by his wife Gladys. Will aligned the refractor on Saturn so Gladys could take a look at the planet before she retired to bed. Will continued observing alone but later called Gladys from her bed to take a look at 'something unusual'. At first Gladys saw nothing different with the view of Saturn but then she too saw the white spot. An apocryphal story told to one of the authors (KJG) at several astronomy exhibitions where he was exhibiting Will Hay material, and mentioned in *Good Morning Boys*, is that Will invited Gladys into his observatory to look at Saturn and she remarked that he must have a spot or speck of dust on the telescope's OG when *SHE* told Hay of the spot! However, as we have seen, in Hay's own log book there is no mention at all of Gladys'

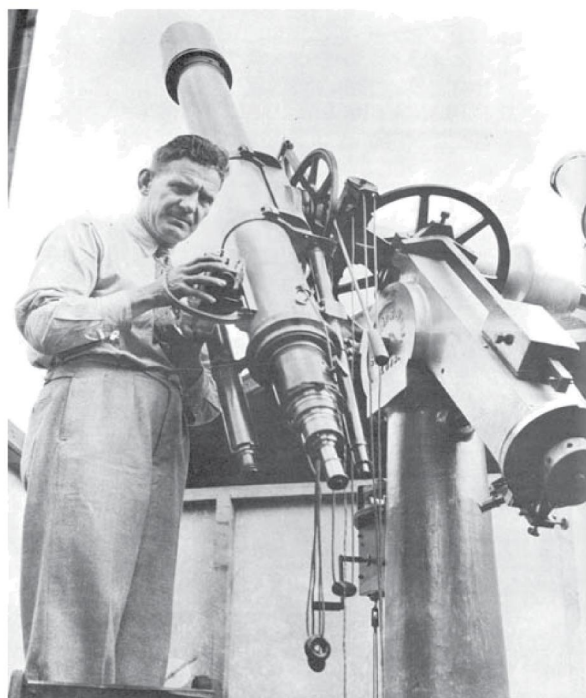


Figure 8. Will Hay, standing on a chair, next to his 6-inch Cooke refractor at Norbury. The observatory building is obviously the same as that in figure 7. The piggybacked instrument just visible on the Dec. axis (extreme right hand edge) may be Hay's 5-inch f/5 Zeiss triplet lens. This picture appears in Hay's biography *Good Morning Boys*, by Seaton & Martin, published by Barrie & Jenkins in 1978. The original photographer is unknown. Reprinted by permission of The Random House Group Ltd.

Mobberley & Goward: Will Hay and his telescopes



Figure 9a. The White Lodge just off the Great North Way, Hendon (now also known as the Barnet bypass). This substantial property was owned by Hay, after his separation from Gladys, from 1935 until his death in 1949. The dome containing the 6-inch Cooke refractor was located in the back garden. Photograph taken in 2008 by David Arditti.

presence that night, despite Will’s noting the presence of other observers, on other nights, elsewhere in the log.

In 1933 Hay’s big Calver reflector was housed in a 12-foot rotating dome observatory; at least that was Hay’s description on page 6 of his observing log. However, pictures show that in August of that year it was actually a circular silo-like structure, namely, a traditional observatory but with the dome itself still awaiting construction. In the *Daily Mirror* picture of the Newtonian the wheels for the dome were clearly already in place, built into the silo rim. Pictures of the 6-inch refractor when it was at Norbury show it was housed in a rectangular building with glass windows and a sloping roof. It looks like it had some sort of run-off roof arrangement and may even have been part of a house extension. According to his observatory equipment list (see Table 1) Hay designed the structure himself and had it erected by a company called ‘Overends’. By 1934 May he records (on page 56 of his observing log) that after removal of the 12½-inch Calver Newtonian, the 6-inch Cooke refractor was moved to the 12-foot dome and ‘the old observatory is being made into a workshop and laboratory’. He also noted that a 6½-inch Calver instrument referred to in his equipment list was presented to a Mr Lee. Why did Hay dispose of the big Calver? Maybe he just preferred the elegance and fixed collimation of a refractor. However, one gets the impression from his observing log that the mirror was often in need of resilvering and, for a man so busy with film and stage commitments, this maintenance ritual may well have been one hassle too many.

It is perhaps worth mentioning that Dr David Dewhirst informed one of the authors (KJG) of a photograph he had seen amongst Steavenson’s possessions (taken by Steavenson) where Will Hay, the Rev. T. E. R. Phillips and Dr Gerald Merton were captured standing in the slit of Hay’s dome. Sadly, all attempts to locate this photograph in the RAS folders on Hay, Steavenson and Merton have failed.

Hay’s 12½-inch Newtonian telescope is still in use today.²⁰ Will gave it to Dr R. M. Fry in 1934 May and it moved with Fry from London to Cambridge. In 1967, Dr Steavenson introduced Dr Fry to Dr Robert Paterson of Thame and the telescope has been in the safe hands of Dr Paterson for over

Table 1. Observatory equipment list

This is Will Hay’s own list of his observatory equipment prior to 1934 May, transcribed directly from his observing log by KJG. The figures in mms against the eyepieces seem, perhaps, to relate to exit pupil size, principally with the 6" Cooke, as multiplying the number by the magnification results, in 5 cases, in a value between 152 and 156mm, i.e. close to the aperture of the 6" (152mm) Cooke refractor. Other magnifications, not listed here, appear in his log book. Hay did not include his smaller portable refractors in this list.

6" Cooke	17/6/32	Refractor	Equatorial.	C.D.
Eyepiece	No 1	2.6 mm.	×45	Field 2 ^m .43 ^s
"	"	No 2	1.3 "	×120
"	"	No 3	.52 "	×300
"	"	No 4	.39 "	×390
"	"	No 5	.33 "	×460
"	"	No 6	.29 "	×600
Comet Eyepiece	3.9	"	×53	
Ach Ramsden X Bar			×65	Field 1 ^m .50 ^s
Ach. Ramsden X Bar	1.95		×90	
Large X Bar	3.9	"	×53	
Moon Power	5.1	"	×30	
Finder				Field 2°. 30'
Hilger Spectroscope	(Prisms & Grating)			
Thorpe ditto	(direct vision) purchased from A. P. Okell Dec 15/32			
Bi-Filar Micrometer	by Hilger			
Camera – Zeiss triple	– 5" aperture f5.			
Camera – Busch Lens.	(Dec 20/32)			
Chronograph (by W. T. Hay)	Mark II (remade into Mark IV)			
Blink Microscope	(Hay–Steavenson) made by Hay’s.			
Synchrone Clock	(Master clock & observatory clock)			
Observatory – By Overends.	(designed by W. T. Hay)			
Chronograph (by Hay)	Elec drive. Mark V			
12½" Calver Reflector	equatorial (presented by the Misses Paxton)			
6½"	"	"	"	"
12 foot Revolving Dome Observatory, designed and erected by W. T. Hay.				

40 years. Hay’s Calver is still in regular use more than 70 years after Hay disposed of it and a full 114 years (in 2009) after its construction by that legendary East Anglian telescope maker. Robert Paterson calls his telescope the HST (the Hay–Steavenson Telescope). When he took delivery of the HST from Dr Fry it had a coat of silvery paint on the tube, with the mounting being a darker colour. He suspects the original Calver telescope was a ‘muted green’ colour. Nowadays it is painted white. The telescope has always had a rotating top end on which the eyepiece, finder, and Newtonian flat reside. The telescope stays in collimation even when the 15-inch (381mm) diameter top end is rotated. At f/7.2 the diffraction limited sweet spot is some 8mm in diameter, making this feat perfectly possible.

In Hay’s observing log a page is dedicated to listing his observatory equipment. Table 1 is a transcription of that handwritten list.

The move to Hendon

In 1935, at the start of his peak years in popularity, Hay permanently separated from his wife of 27 years, Gladys; their two daughters and one son were, by then, adults and Hay was already a grandfather. Gladys may well have preferred a judicial separation to a divorce because of her strong Catholic upbringing. Will moved north of the Thames to a large mock Tudor house called ‘The White Lodge’ at 6, Great North Way,

Hendon,²¹ near the junction of the Great North Way and Sunny Gardens Road (see Figure 9a); this was roughly a mile to the southeast of London's Mill Hill Observatory and two thirds of a mile northeast of Hendon aerodrome. Both of these facilities were of great interest to Hay and the RAS still owns his pilot's log book which details his flying activities. As we have seen, he disposed of the 12½-inch (318mm) Newtonian when he moved to Hendon, along with his 6½-inch (165mm) reflector, as described in his log book.

Hay relocated the 6-inch Cooke refractor and housed it in a substantial fully domed observatory (see Figure 9b) at the White Lodge. Even today the site has fine views over parkland to the west and southwest, despite being part of Greater London. However, he seems to have had little time for regular observing after the move and although there are some 124 nights of observations in the log book these were made over 12 years (1932–1944) and the 14 nights observing his white spot in 1933 dominate the first half of the log. No doubt the break up of his marriage, the house move, and his prolific period of film work prevented him from doing regular observing after 1934. However, page 57 of his observing log does record that the transfer of the dome from Norbury to Hendon was swift. His last observation from Norbury was of Jupiter on 1935 June 8 and the observatory was dismantled 3 months later in 1935 September. Just below these entries Hay records that on 1935 October 20 the observatory was 're-erected at Gt. North Way Hendon' and '6"

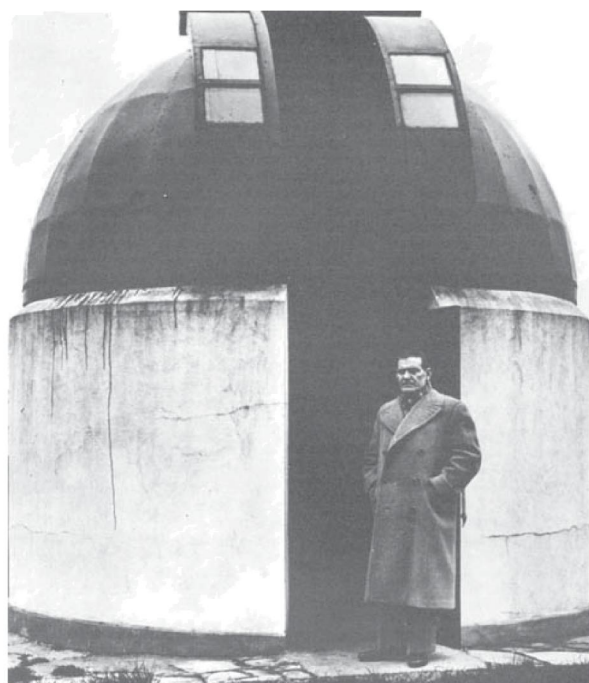


Figure 9b. Will Hay outside his dome at the White Lodge, containing his Cooke refractor. Picture from *Good Morning Boys*. The original photographer is unknown. Reprinted by permission of The Random House Group Ltd.

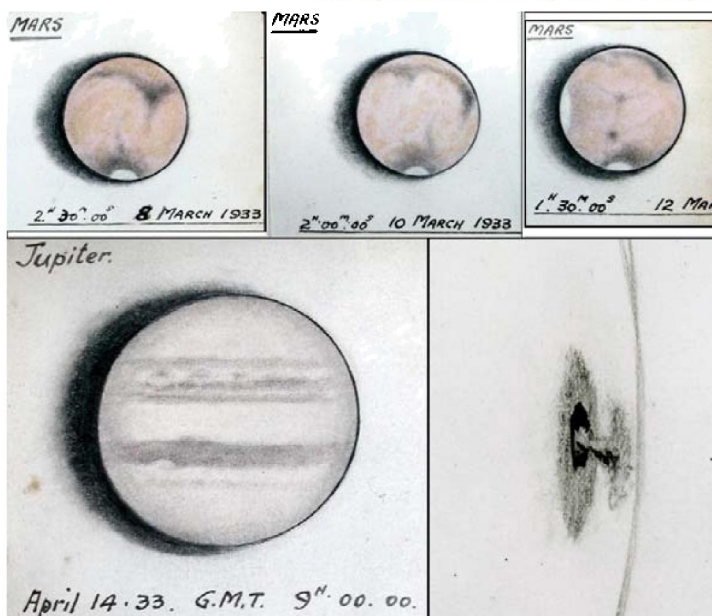


Figure 10. A selection of sketches from Will Hay's logbook. On the top row are Mars drawings made in the early hours of 1933 March 8, 10 and 12. Below are sketches of Jupiter, made from the USA on 1933 April 14, and a sunspot sketch drawn on 1935 November 3, shortly after Hay relocated to Hendon. Photograph by kind permission of the RAS/Peter Hingley. ©Royal Astronomical Society.

Cooke re-installed and adjusted. Saturn was observed from the new observatory over the following nights with 'Seeing fair to very good'. The only other observation in 1935 October was an entry made on Oct 29 where he records further observations of Saturn and 'Seeing fair. Sky clear. High Winds. Good night for faint objects, Orion Nebula extremely good'. A selection of Hay's sketches, including one of a sunspot made in November 1935, is shown in Figure 10.

The dome at the new site was easily visible to anyone travelling along the Great North Way and in the biography *Good Morning Boys*²² it looks like a much more substantial building than the circular Norbury silo shown in 1933 press photographs, despite the fact that his observing notes hint it was the same basic structure he had designed and erected at Norbury. Also in 1935, his book *Through my telescope* was published by John Murray, copies of which still change hands for serious money today. He had originally written the book some years earlier but hesitated to publish it in case it 'might be thought that he was seeking to advertise himself for professional purposes'.²³ On a recent BBC7 radio program²⁴ a recording of the late stand-up comedian Tommy Trinder (1909–1989) was aired, with Trinder reminiscing about visiting Hay at his White Lodge home:

'One of the things he used to love to do was to take you to his home, and out in the backyard in Hendon he had this telescope; he was so enthusiastic about it all. He used to get you to look through this spy hole. All I ever saw looked like a steam pudding and Bill used to go into raptures over it, so much so he sounded more like Fanny Craddock than an astronomer!'

While at Hendon Hay made valuable observations of a number of astronomical objects and reported his findings to the RAS and the BAA. It appears that he made particularly valuable photographs, observations and measurements of

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Figure 11. An offset guided photograph of Comet Peltier 1936 K1 (1936a in Hay's observing log) from page 78 of Hay's log book. The exposure was made on 1936 July 25. The comet reached 3rd magnitude. Hay used his 5-inch aperture f/5 Zeiss lens, piggybacked on the Cooke refractor, for his comet photography. Photograph by kind permission of the RAS/Peter Hingley. ©Royal Astronomical Society.

Comet Peltier 1936 K1 (originally designated 1936 II or 1936a) and Comet Van Gent 1941 K2²⁵ (originally designated 1941 VIII or 1941d). The astrometric measurements of the latter comet were described in the *BAA Journal* along with the description of the cross bar micrometer.²⁶ A photograph of Comet Peltier (1936 K1), taken by Hay with his 5-inch Zeiss triplet lens, is shown in Figure 11 and may be the same picture that the late Harold Ridley recalled appeared in a national newspaper. Hay also photographed the Moon on a number of occasions.

A solar eclipse and the Merz refractor

Will Hay was a widely travelled man in an era when you had to be wealthy to journey abroad. His comedy act had taken him to the USA, Australia and South Africa, but total solar eclipses tempted him to travel too. In 1936 March the



Figure 12a. A photograph of the 1936 June total solar eclipse taken by Dr J. L. Haughton, using a 10½-inch/266mm focal length Cooke lens at f/4.5. The exposure was 2 seconds on an Ilford Double Xpress plate, starting 10 seconds after the start of totality. Venus is just discernible near the top edge (top right of the Sun). From the 1936 December *BAA Journal* (47 no. 2). Haughton was on the same eclipse expedition as Will Hay. A very similar (but underexposed for the coronal reflection in the sea) eclipse photo appears in Hay's log book.

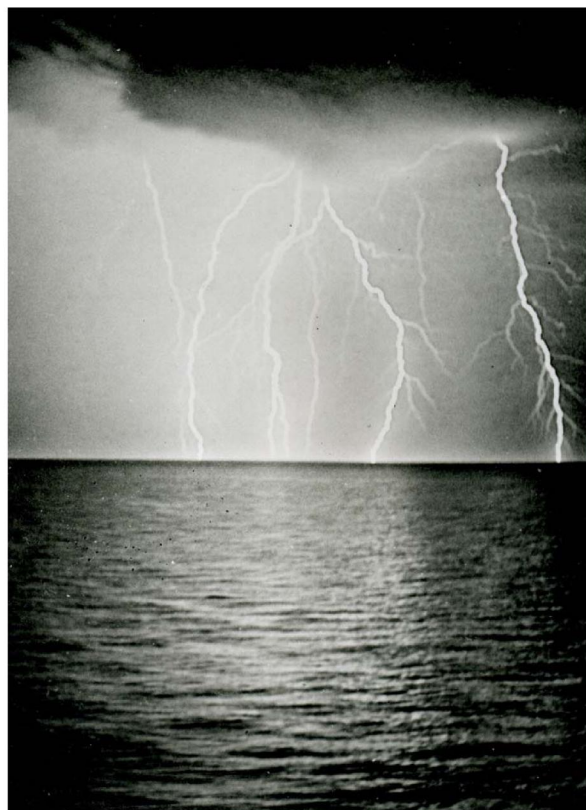


Figure 12b. A violent lightning storm on the night after the 1936 June total solar eclipse, taken from the deck of the P&O lines SS *Strathaird*, by Will Hay 'around midnight'. Photograph by kind permission of the RAS/Peter Hingley. ©Royal Astronomical Society.

BAA Mars Section Director, Dr Reggie Waterfield, described to members at the monthly BAA meeting his plans to travel to that year's June 19 total solar eclipse, the track of which, conveniently, started in the calm seas of the Mediterranean.²⁷ Waterfield served on the 'Joint Permanent Eclipse Committee' and the 1936 totality would be his 3rd successful campaign.²⁸ His plan involved sailing on a cruise ship, the P&O lines SS *Strathaird*, to the island of Chios in the Aegean Sea. Hay signed up for the cruise which was a huge success, attended by many of the wealthier BAA members. Remarkably, one of Hay's fellow travellers on that trip, Nielsen, made an independent discovery of the 2nd magnitude Nova CP Lac while on the ship. A photograph of totality taken by J. L. Haughton on that expedition appeared in the 1936 December *Journal* (47 no. 2); it is reproduced in Figure 12a. A very similar picture appears in Hay's log book, but the Haughton print better captures the reflection of the corona in the sea.

Will Hay gave a brief presentation at the 1936 November 25 BAA meeting,²⁹ during which he showed a 16mm format cine film of the June 19 eclipse, shot through a 150mm focal length f/4.5 lens. The film included scenes on board the cruise ship and must have been watched by a fascinated audience. At that same meeting Hay delivered a talk on the application of a synchronous motor to his chronograph. Hay's observing notes include a dramatic photograph of lightning (see Figure 12b) he took on the night following the Mediterranean total eclipse.



Figure 13a. Will Hay's portable 3-inch Merz refractor, now owned by Dr Robert Paterson (on right). Picture kindly supplied by Dale Holt (on left).

Hay was a multi-talented man and no stranger to seafaring skills. He could probably have sailed the cruise ship to the eclipse track himself. According to *Good Morning Boys*, Hay was in Norway with his mistress when World War II broke out. He sailed his cabin cruiser back from there, narrowly avoiding German U-boats. He described his exploits of the perilous crossing in a BBC radio interview, now sadly deleted from the archives of the BBC.

Hay's portable 3-inch (76mm) Merz refractor (an instrument with an f /ratio of 8 or so), which he took on foreign trips, along with its travel case, became the property of Dr Steavenson after Hay's death. Following Steavenson's own demise in 1975 the small refractor (see Figure 13a) and case were eventually purchased, via Steavenson's niece, by the same Dr Robert Paterson who owns Hay's 12½-inch Newtonian.

According to Dr Paterson³⁰ the case for the Merz refractor (see Figure 13b) has two incomplete and faded labels with Cabin, P&O and SS (no name entered) on the one and Hotel Bel(g?)rave, Kimberley on the other. Dr Paterson is of the opinion that the 'Kimberley' location is the South African town where Hay may have taken the refractor. It is just possible Dr Steavenson may have taken Hay's Merz there when he was originally site testing for the Radcliffe Observatory trustees³¹ in 1930 January; a 6-inch refractor from the Royal Observatory, Greenwich was definitely taken on that trip by Steavenson.³² The P&O labels could relate to Hay's 1936 eclipse cruise trip or a separate cruise to South Africa, a country he visited more than once.

A rare picture of Hay with Steavenson at an RAS club dinner in 1936 is shown in Figure 14. This was unearthed by Peter Hingley of the RAS library, following a trawl through Gerald Merton's RAS records.

Final years

The first years of World War II were the last in which Hay enjoyed good health and was still able to regularly practise serious astronomy. The biography *Good Morning Boys* mentions a talk Hay gave to members of the armed forces at that time. It was delivered at the RAS headquarters at Bur-

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lington House. The talk was entitled 'Life on Other Planets'. Hay is quoted as saying 'The likes of Hitler don't belong on this or any other planet'.

During the final half of the War, in 1943, Hay suspected the onset of rectal cancer. He was right and his early diagnosis enabled a successful operation to be carried out. However, although the cancer was defeated he would never truly enjoy good health from that point on; he was only in his mid fifties. His dark comedy film of 1943, *My Learned Friend*, would be his last.

In 1945, with World War II finally over, he was elected to serve on the BAA Council. A year later Hay had a major stroke while on holiday and the right side of his body and his speech were seriously affected; it became increasingly difficult for him to use any of his astronomical equipment. In 1947, after a six month period of recuperation in South Africa, Hay returned to London. His health was still poor and, after a further stroke, he instructed two friends, in 1948, to clear out his Hendon home so he could move to somewhere smaller. These friends were the variety artist and juggler Tom Elder Hearn (who billed himself as 'the laziest juggler on Earth') and Hearn's son-in-law Frank Biggs.³³ Biggs managed to save some of Will's personal scrapbooks regarding his stage and film career, which he gave to the British Film Institute in the 1970s. His surviving observing notes were eventually passed to the RAS some 30 years later by the former London neighbours of Will's daughter Gladys (a Mr and Mrs Piper).

While the house was being cleared, and prior to Hay's finding a smaller place to live, he moved into the Mount Royal hotel at London's Marble Arch (now renamed the Thistle Marble Arch).



Figure 13b. The carrying case for Hay's 3-inch Merz refractor, also owned by Robert Paterson. Picture kindly supplied by Dale Holt. See text for details.



Figure 14. Dr W. H. Steavenson (Steave to his friends) and Will Hay at the 877th RAS Club Dinner on 1936 March 13, aged 41 and 47 respectively. Hay's films *Windbag the Sailor* and *Where there's a Will* were released in 1936 and *Good Morning Boys* and *Oh Mr Porter!* were released the following year. Photograph taken by Dr Gerald Merton. ©Royal Astronomical Society and courtesy of the RAS Club.

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According to Hay's descendants one of his telescopes was, apparently, sold for 'a good price'. Which telescope is unclear but the 6-inch Cooke was certainly the most valuable. His granddaughters remember that in his Chelsea Embankment flat (he moved there in 1949 March, one month before his death) a cabinet contained the last remnants of his astronomical equipment and observing charts. Hay's Hendon home was auctioned after his death and a friend, the boxing promoter Jack Solomons (1900–1979), acquired the house and dome. As a young man the lantern-jawed Hay had been a boxer himself. Whether Hay's friends had to clear the Cooke out of the observatory dome or even leave it inside for Jack Solomons is, sadly, unknown. It may well have been dismantled years earlier.

Hay died of a third stroke in his new Chelsea flat in the early hours of Easter Monday 1949 (April 18) aged just 60. Only three days earlier he had given a speech at a meeting of the show business charity organisation the Water Rats, and he had a date with some friends at the Savoy on the day he died. He never made the appointment. Nine days later his death was announced to the BAA by the President, Dr J. G. Porter, at the 1949 April 27 Ordinary Meeting, following the brief annual 'conversation meeting' and exhibition in the upper library at Burlington House.³⁴ The President's comments were recorded as:

'Members will have heard with deep regret of the passing of Will Hay. William Thomson Hay became a member of our Association in 1932 June and his ability as an astronomer will be known to you all. Much prominence has been given to his discovery of the white spot on Saturn in 1933 and his descriptions of micrometers and a chronograph and other devices for observational work will be found in our Journal. A painstaking observer; he was always ready to help those less experienced than himself; and, indeed, those of us who were privileged to have known him will remember him best in that way – as a great friend of all who were interested in astronomy.'

The year 1949 would see another prominent BAA colleague of Hay's era struck down with illness. It was the year Reggie Waterfield contracted polio, confining him to a wheelchair for the remaining 37 years of his life.³⁵

Where is the 6-inch Cooke now?

The current whereabouts of Will Hay's Cooke refractor, used to discover the 1933 White Spot on Saturn, are an enduring mystery and all lines of enquiry to date, by various researchers, have failed to trace it. It is hard to believe that such a famous instrument, owned by one of the 1930s and '40s most popular entertainers, could simply have vanished, but no-one has yet managed to locate it. An appeal for information about its whereabouts was placed by Dale Holt in the 2008 February BAA *Journal*.

Those contacted regarding this mystery include: Hay's great-grandson Steve Potter (and, via him, Hay's surviving granddaughters); Mill Hill/UCL Observatory; Robert

Paterson (owner of Hay's Calver and Merz refractors); Bob Marriott (BAA Instruments curator); Graham Rinaldi (author of an imminent book on Hay, to be published by Tomahawk Press); the Local Studies and Archives Centre for the London Borough of Barnet at Mill Hill; Will Hay fan Dale Holt; Prof Richard Gregory; Steavenson's executor Dr David Dewhirst; Prof John Zarnecki; and the owner of Broadhurst Clarkson & Fuller, Dudley Fuller. In addition, a number of 6-inch Cooke refractors owned by local societies have been eliminated from the enquiry. For example, Doug Daniels³⁶ of the Hampstead astronomical society contacted one of the authors with evidence that removed that society's 6-inch refractor from the enquiry, despite a prominent figure suggesting it might be Hay's old instrument. The Hampstead 6-inch Cooke was presented to the Society in 1923 by a member whose name was George Avenall. There is a plaque on the tube to testify to this, and that instrument was originally tripod mounted as an altazimuth system, only being converted onto a modern equatorial mount in the 1970s. Many urban myths seem to surround old society telescopes, especially in connection with Will Hay!

RAS records and BAA *Journals* have also been scoured for any clues as to the fate of Hay's refractor or its possible sale. Of course, the instrument may have been sold or auctioned by Hay, his family, or even Jack Solomons, and the identity of the famous owner not passed on, although as Will Hay's association with the Saturnian white spot is so well known it seems unlikely that this would not have been commercially exploited if sold by a dealer.

Hay's surviving observing notes, kept by the RAS and studied by one of the authors (KJG), reveal that his use of the Cooke thinned out as the 2nd World War approached and the last observation with the refractor in Hay's observing log was made on 1942 May 1, where he merely recorded having observed Jupiter without further comment, in this, his last year of good health. Regular observations of any kind appeared to end in 1942 November and the final two entries are in 1944 April and May.

The Mill Hill myth

Hay's Hendon home was little more than a mile to the south-east of the Mill Hill observatory (now the University College London Observatory) and Hay was well acquainted with the Director, Christopher Clive Langton Gregory. C. C. L. Gregory was the father of Prof Richard Gregory, the founder of the 'Exploratory', a well-known hands-on science centre in Bristol. C. C. L. Gregory occasionally addressed BAA audiences in Hay's era. All this has prompted speculation that Hay bequeathed some instruments to the Mill Hill observatory, as claimed in Hay's *Wikipedia* entry, but there is absolutely no evidence to support this. As the war ended Hay was invited to the re-opening of the nearby Observatory in 1945³⁷ by C. C. L. Gregory. His son, Prof Richard Gregory, in an e-mail to one of the authors (MPM) on 2008 January 14 com-



Figure 15. The Playfair Cooke refractor at Edinburgh, showing the R.A. circle and polar axis in detail. These features are identical to those seen on Hay's 6-inch Cooke in Figure 8. Image by kind permission of Graham Rule.

mented on this event:

My father C. C. L. Gregory did indeed know Will Hay, and had a high regard for his astronomy. I remember Will Hay only vaguely, as I was in my early teens at this time, and am muddled over actually meeting him and seeing his films. He was not a frequent visitor to our house in Mill Hill (Mote House). I remember that Will Hay could not get to the opening of the observatory as there was a thunder storm and his house was hit by lightning!

The 6-inch Joynson Cooke refractor at Mill Hill is similar in appearance to Hay's instrument but then so are countless other 6-inch Cooke refractors manufactured in the 1890s. A closer match is the 6-inch Cooke instrument in the Playfair building at Edinburgh (see Figure 15). The equatorial head appears to be of an identical design to that of Hay's Cooke and so must be of the same vintage. Dr Mike Dworetzky and Prof Derek McNally at Mill Hill have both stated there are no Hay telescopes at the Mill Hill Observatory and this is reflected in the website data.^{38,39} The official Mill Hill Observatory history, written in 1962, states that the Joynson refractor was presented in 1932 (the year Hay acquired his Cooke) by the Trustees of the late Mr John Joynson of Liverpool, and placed in the North Dome (Chadwick Dome) in the front quad at the main UCL site at Gower Street in London. After the War it was moved to the Mill Hill Observatory (ULO) in 1946 (the year of Hay's first stroke) and was used for artificial double star experiments for students, on a static mounting under the Radcliffe refractor.

The renowned cosmologist Margaret Burbidge (born 1919) was at Mill Hill from 1940 to 1950 and was C. C. L. Gregory's assistant when she left the observatory. Dr Burbidge kindly e-mailed the authors in February 2008 with her similar (though not identical) recollections of the Joynson Cooke refractor and its 'mothballed' status during the war years:

From 1940 on (during the war) the 6-inch telescope was packed up and left in a crate inside the 6-inch dome. As far as I am aware it was not used at all, and I do not remember anytime when Will Hay visited Mill Hill. I never saw him.

The presence of a very similar Cooke refractor at an ob-

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servatory Hay knew well, and lived close to, is purely coincidental, despite any claims to the contrary.

Hay's final assets

A total of eight items of Hay's inventory were presented to the BAA and its members in 1947,⁴⁰ the year in which the post of instruments curator passed from J. H. J. Burt to K. F. Stonebridge. Hay donated a short focus 5.5-inch aperture (140mm) f/5 Zeiss photographic triplet lens to the association (listed as 5-inch f/5 in his log), as well as a blink microscope and a direct vision Hilger solar spectroscope. These were, respectively, BAA instruments 100, 101 and 102. He also donated a cross bar micrometer graticule jig, his bifilar micrometer, his chronograph and a handheld terrestrial telescope which was later auctioned via Sotheby's. These were, respectively, BAA instruments 103 through 106. Potentially, the most interesting donation to the BAA was instrument 107, 'an equatorial head with circles and clock drive'. Could this be the massive head of the 6-inch Cooke refractor perhaps? Instrument 107 is listed as being given to Highgate school in North London, not far from Hay's Hendon home. Prof John C. Zarnecki, lead scientist on the Cassini-Huygens project, is a former pupil (Cholmeleian) of that school (1956–1968), but has told the authors he does not recall any astronomical equipment being at Highgate in his era. However, at the time of writing further investigations, via John, are ongoing.

The blink microscope parts and a measuring machine owned by Hay ended up initially with the comet photographer Reggie Waterfield.⁴¹ Reggie's own 6-inch refractor has been eliminated from the Cooke enquiry as that particular instrument was originally owned by the multi-millionaire tobacco industrialist, J. Player, at Cheltenham and its history is traceable. It is currently owned by Dr Richard McKim. Will Hay fan Dale Holt has informed the authors that it was strongly suggested to him that Hay's refractor was donated, after his death, to the Vatican observatory at Castel Gandolfo, near Rome. With Hay's widow being a Catholic this seemed like a theory worth following up. Dale checked this out by contacting Brother Guy Consolmagno of the Vatican observatory who examined the records, including those of smaller refractors used as finders, but no trace could be found of a 6-inch Cooke or of one having been donated. So that story seems to be yet another myth.

When Hay's assets were disposed of and the will published his estate was far smaller than many had imagined for such a successful entertainer. However, he had not worked for many years and had spent large amounts of money on first class foreign travel and hotel accommodation after the war. He left £27,155 and 9 shillings (£27,155.45)⁴² at a time when a typical skilled craftsman might be earning £350 per year. Apparently this was divided up into £500 for his brother, Harold Gordon Hay; £500 to his sister, Mrs Evelyn Cleaver of Swindon; £500 to Mrs Muriel Constance French (his former secretary) and the remaining £25,655 and 9 shillings went to

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his daughter Gladys (named after her mother) who was, therefore, the main beneficiary of his estate. His wife Gladys was left nothing but did not contest the will. Gladys junior's two daughters (Hay's granddaughters) survive today. Gladys' son is no longer alive, but *his* son, Steve Potter (Hay's great-grandson) gave details to the authors of the only major instrument the family currently owns:⁴³

Still in the family's possession is one of Will's brass refractor telescopes with original caliper leg wooden stand and various optical attachments. I used to look at the moon with it quite regularly when I was young ... The telescope illustrated on page 121 of Will's 'Through my telescope' is very similar to the one in the family's possession and could actually be a drawing of it.

However that surviving refractor is a portable altazimuth instrument and not the heavy, equatorially mounted, Cooke refractor used to discover the 1933 White Spot on Saturn. From Steve Potter's description it may well be the same 3½-inch altazimuth Cooke that Hay used to observe his white spot, from Brighton, on 1933 August 18.

Hay had many contacts outside the UK, in America, Australia, South Africa and Norway, any of whom might have snapped up the 6-inch instrument in a private deal well before his death. He had a boat, usually kept on the Norwegian fjords, and a young Norwegian mistress called Randi Kopstadt. Maybe she inherited the refractor? However, investigations by Dale Holt, specifically e-mails to Norwegian contacts, have so far drawn a blank on the Cooke refractor being there.

As we have seen, a couple of Hay's friends from the entertainment world cleared out Hay's home and some remnants of his astronomical equipment were moved to his Chelsea flat just before his death. However, a 6-inch refractor atop a massive equatorial head is too big to be tucked away in a flat and so it may indeed have been left in the dome at Hay's Hendon house or disposed of in a private sale, or auction, well before Hay's demise. Will Hay was in poor health for many years before his death and pushing a massive refractor around the sky would not have been possible after his first stroke, and certainly not after the second. Indeed, as the logbook shows, Hay does not seem to have made serious observations with the refractor during the last seven years of his life. Then there is the option that the refractor's tube and the equatorial head may have been disposed of separately, and the tantalising possibility that BAA instrument 107, mentioned earlier was, indeed, the head for the Cooke.

It is quite possible that Dr Steavenson played a role in



Figure 16. The 6-inch f/19 Wray refractor of W. H. Steavenson, sited at West Norwood (only a stone's throw from Hay's Norbury address from 1927 to 1934). The clock drive can be seen under the lower bearing of the polar axis and its weight hangs down inside the pier. The posts surrounding the telescope are to support the rails carrying the run-off shed which houses the telescope when not in use. Photograph by former (and youngest) BAA President W. H. Steavenson as it appeared in *Splendour of the Heavens* (published 1923) on page 755.

the disposal of Hay's scientific assets. He acquired the portable Merz refractor and was, apparently, the only prominent astronomer at Hay's funeral.⁴⁴ Steavenson's own 6-inch refractor has been completely eliminated from the investigation. It was not the same design as Hay's Cooke which was probably about f/15. Steavenson's instrument was a long 6-inch Wray⁴⁵ (thought to be f/19) on a completely different equatorial head and was featured in Hutchinson's *Splendour of the Heavens* (see Figure 16). It was donated to Steavenson by J. E. Drower. Dr Paterson, the owner of Hay's Calver and Merz, had many conversations with Dr Steavenson, but does not recall him ever mentioning the fate of the comedian's biggest refractor. Dale Holt has recently acquired a 6-inch f/15 refractor tube from the Institute of Astronomy at Cambridge. The instrument was supposedly owned by Steavenson in his later

years but is much shorter than his original f/19 instrument, despite also having a Wray objective. Could that tube somehow be connected to Hay's Cooke refractor? Probably not, but we simply do not know.

So, the current whereabouts of the 6-inch Cooke are still unknown, after several years of investigation, but the search goes on and if any BAA members know where it is we would be very happy to hear from them!

In conclusion it is worth mentioning that asteroid 3125 (discovered in 1982 January by Bowell at Anderson Mesa) was named Hay in honour of the comedian and astronomer, following a suggestion by Barry Hetherington. The authors are unaware of any amateur images of this minor planet.

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It is with great sadness that we report that Kenneth J. Goward died on 2009 February 26. An obituary by Martin Mobberley will appear in the June *Journal*.

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