Mr William Strachan and his remarkable telescope

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The observing career of Mr William Strachan of Bournemouth, a BAA member from 1908 to 1935, is described. Despite severe lifelong disability he managed to regularly observe the Sun, variable stars and a few other objects for 26 years. His observing career in later life was only made possible by using a custom made polar refractor Coudé system which he used regularly from 1924 to 1934.

Introduction

For many amateur astronomers their first experience of visual observing at the eyepiece of a large telescope is a less than blissful one. Apart from the usual battle with cloud and dew and the bitterly cold night-time temperatures of winter, the biggest hassle is simply getting comfortable at the eyepiece, even if a variable-height observing chair is employed. This problem is particularly troublesome when the telescope is equatorially mounted, as the resulting eyepiece position can vary considerably depending on where the instrument is pointed. Reflector owners can find themselves teetering precariously on a stepladder in order to observe objects at the zenith, while refractor owners end up kneeling on cold concrete.

These issues are taxing enough for a young and able-bodied observer, but they can make visual work all but impossible if the astronomer is physically disabled. One such observer was William Strachan of Bournemouth, whose final instrument was, surely, the rarest and largest example of a fixed eyepiece instrument ever used regularly by a British amateur astronomer.

Strachan's early years

William Strachan was born in 1874 in Yokohama, Japan. From the late 1850s Yokohama had been the first base of foreign trade between Japan and the West, and Strachan's father (W. M. Strachan, originally from Scotland) was one of the first prominent Western merchants to thrive there. The company business was called W. M. Strachan & Co., Yokohama and Kobe.

However, from infancy William was sent from Japan to London because of his severe disability.[1] He was variously described as 'crippled', 'possessing a paralytic affection which deprived him largely of the use of some of his limbs', or, in later life, 'paralysed', and for operating a telescope he was only able to use his left arm. Clearly, in the relatively primitive world of the late 1800s and early 1900s and given the often gruelling nature of visual amateur astronomy, this disability would have prevented most observers from taking part in the hobby at all. However, it did not dissuade the remarkably determined William Strachan.

Unfortunately William's childhood treatment in London 'under the best medical attention' did not cure his condition and his physical frailty simply increased with the passage of time. Nevertheless, from boyhood he developed a keen interest in astronomy and in early manhood he managed to somehow use a 5-inch (127mm)

Figure 1. William Strachan's first telescope was a 5-inch [127mm] Watson–Conrady refractor similar to the one shown in this advertisement from the BAA *Journal* Vol. 19 no.6 (1909).

altazimuth refractor. On 1909 February 26 he advertised a 5-inch 'Watson-Conrady' refractor for sale in the pages of the *English Mechanic*,[2] whereas later references to his 5-inch refractor described it as either a 5-inch Wray equatorial or a Wray with a Watson tube and a Grubb clock-driven equatorial. So maybe no-one purchased his original telescope and he ended up replacing the lens, keeping the original tube, and mounting it equatorially from 1909 onwards? Certainly the Watson-Conrady refractors advertised in that era were all un-driven alt-azimuth systems. A 5-inch 'Century' model cost £48-10s in 1909 and a 'Royal Century' model (with slow motion controls) cost £65 (see Figure 1).

From his early thirties William Strachan lived at 30 Tregonwell Road in Bournemouth, at a house named 'Burley'. According to the Bournemouth historian Alwyn Ladell the local directories of the early 1900s confirm Burley as the residence of Mr and Mrs W. Strachan, although little is known about Mrs Strachan. Prior to the Strachans moving there the property was the address of the private Bournemouth school called Kurnella, and one can speculate as to whether the glass framed outbuilding in the garden, shown in Figure 2a, eventually became rebuilt as William's observatory.

These days the highly modified building is named 'Lingwood' and sits next door to (south of) the Blue Palms Hotel, which in Strachan's day was called The Hollies Boarding House (from 1903 to the late 1920s). It was later renamed the Inverness Boarding House. That part of Tregonwell Road is on a steep southerly slope which would have afforded splendid views of the sea, less than half a mile away, in the early 1900s.

To the south of Strachan's house, down the steep hill along Tregonwell Road, two neighbouring properties, Wyndham Lodge and The Trossachs, both built in the 1870s, were united in the 1930s as the Cranborne Court Hotel. This became the Winter Gardens Hotel in 1950, but was demolished in 2006.[3] At the time

Figure 2a (top). This picture is from an advertisement for Kurnella School (in a guidebook dated 1900) and shows the south frontage of 30 Tregonwell Road before it became William Strachan's residence 'Burley' a few years later. Bearing in mind the illustration in figure 10a one wonders if the summerhouse/greenhouse structure on the left might have become the location of Strachan's observatory a few years later? Picture supplied from the huge collection of Bournemouth history assembled by Mr Alwyn Ladell.

Figure 2b (bottom). William Strachan's house at 30 Tregonwell Road in the 21st century, as seen from the east, as opposed to the south in the previous figure. The house is now called 'Lingwood' and looks rather different from its appearance more than a century earlier. Photograph by Bournemouth historian Alwyn Ladell.

of writing (2015) considerable building work is taking place all around the area, but, remarkably, Strachan's house still survives (see Figure 2b).

A number of prominent BAA observers also lived in or near Bournemouth during Strachan's lifetime, and being unable to attend meetings he must have greatly valued their visits. From 1919 to 1925 Ernest Elliott Markwick (1853–1925) (Figure 3) lived at West Moors, Dorset, some six miles north of Bournemouth. Walter Goodacre (Figure 4), who wrote Strachan's obituary, also lived in Bournemouth in his final years, until his death in 1938. Goodacre lived in Leicester Road, Branksome Park, roughly two miles west of Strachan and was clearly his good friend and BAA colleague.

Figure 3. Col. Ernest Elliott Markwick (1853–1925). BAA Presidential portrait.

BAA solar work and SS Cygni

On 1908 March 25 William Strachan was elected as a BAA member after being proposed by Frederick William Watson–Baker and seconded by E. W. Maunder (Figure 5), who would become the Solar Section Director from 1910 until 1925. Strachan's name soon appeared as both a dedicated solar observer and an observer of the variable star SS Cygni.[4] He is first mentioned in the Variable Star Section report concerning that star's 1908 variability published in 1909. Col. Markwick listed five SS Cygni observations made from 30 Tregonwell Road and received from Strachan in his first year of BAA membership.

Despite his disabilities, Strachan submitted magnitude estimates of that well-known object until 1931, according to the regular annual summaries in the BAA *Journal*. His first SS Cyg observation was on 1908 Dec 9, according to the BAA VSS database. That resource lists 674 magnitude estimates made by Strachan between 1908 and 1928, whereas adding up the tally from the annual *Journal* mini-reports for this star gives him a total figure of 856 estimates made between 1908 and 1931, a span longer by three years than that given in the database.

Regardless of the actual figure, SS Cyg was undoubtedly Strachan's favourite variable star. Indeed, it was the only variable star he observed with his 5-inch refractor until his increasing disability caused him to find another observing strategy in the early 1920s. In 1914 he made 101 magnitude estimates of SS Cyg, his personal annual record for that object. He also submitted 71 magnitude estimates of Beta Persei (Algol) in the period from 1908 to 1920, as reported some years later by Col. Markwick.[5] Only six other BAA observers submitted magnitude estimates of SS Cyg during Strachan's first year of membership. The next year, 1909, Strachan made 13 estimates of the star[6] and in 1910 he estimated its magnitude 57 times during the year.[7]

Strachan's contributions to the Solar Section also began in 1908, during the final two years of A. L. Cortie's Directorship.[8] During 1909 he also joined the BAA Mars Section,[9] where he was listed as observing with a 10-inch (254mm) reflector, but submitted no actual drawings during the apparition. He was also recorded by the Revd Dr Martin Davidson as carrying out two one-hour duration Lyrid meteor watches,[10] on 1912 April 19 and April 20, with one Lyrid being observed on the latter date.

Figure 4. Walter Goodacre (1856–1938). BAA Presidential portrait.

In the week following those 1912 Lyrid watches Strachan made some observations of Zeta Cancri and the Moon using his 5-inch refractor, which he described in the May 10 edition of the *English Mechanic*.[11] He made the following comments:

'With reference to Mr. G. Whittle's letters Nos. 357 and 358, in your issue of April 26 last, it may perhaps interest him to know how my 5-in. refractor deals with the triple star Zeta Cancri. In virtue of the present correspondence on this subject taking place in your columns, I turned my telescope upon zeta last Sunday, April 28. Definition was not very good, but with power 240 I obtained division every now and then, and the tiny spurious discs of the close pair were quite as distinct from one another as they are depicted in Mr. Whittle's sketch. The position angle I estimated to be either 315 deg. or 100 deg. according as one took the nearer star to, or the farther one from, the distant 'comes'. That of the wide pair was either 100 deg. or 90 deg., depending upon the primary chosen – in the former case the farther from, and in the latter case the nearer to,

the distant star. The colours were, of the close pair both yellow, and of the remote 'comes' light green.

On the evening of April 24 last, at about 9.15 p.m., I was observing the Straight Wall to the east of the lunar crater Thebit, but I did not confirm the brown tint of the shadow cast by this formation which Webb mentions. It was quite black to me. To my eye this 'Wall' seemed to be the edge of a plateau extending to the west, the country to the east being much lower. I could fancy that the plateau sloped gently down westward, as Nasmyth says. I easily found the minute curved cleft described by Webb just eastward of the crater Birt, which Klein declares is like the bed of an old river. Its northern extremity broadens out into a pear-shaped hollow, and appears to cut into higher ground. The foregoing observations were made with the same eyepiece as I employed upon Zeta Cancri. At 9.30 p.m. the next object to come under my notice was the curious white spot mentioned by Webb as being to the east of the formation known as Lassell; but the Rev. gentleman says nothing concerning the small crater which I saw with an ocular magnifying about 300 times, touching the spot on its south margin.'

Figure 5. Edward Walter Maunder (1851–1928). Photographed by Elliott & Fry, 55 Baker Street, London.

In the same communication to the *English Mechanic* Strachan then goes on to mention his view of the hybrid solar eclipse of 1912 April 17, whose central track passed close to Paris and which would have had a magnitude of 0.914 from Bournemouth, with an 88.98% obscuration. According to modern data, computed by Fred Espenak of NASA, precise first contact at Bournemouth would have occurred at 10:47:08 UT, maximum eclipse was at 12:06:52 UT, and last contact occurred at 13:27:42 UT. Strachan reported the following times and observations, with the last contact timing agreeing well with modern calculations:

'I had a fine view of the recent Solar Eclipse, the weather and definition in Bournemouth being remarkably good the whole time. The first contact took place at 10h 50m 53s a.m. G.M.T.; the greatest phase at 12h 10m 30s p.m., G.M.T.; and the last contact at lh 27m 30s p.m. G.M.T. Two photographs which I took with an ordinary J-plate camera of the greatest phase show the cusps clearly blunted. Unfortunately, I did not look for this peculiarity with the telescope. William Strachan, Burley, Tregonwell-road, Bournemouth.'

Apart from observing SS Cyg with his 5-inch refractor, when his health permitted, Strachan's main scientific output from 1908 onwards was his study of the solar surface. He made daily observations where possible and it was a rare year when his name was not prominently mentioned in the BAA Solar Section report. The two Solar Section Directors during Strachan's most productive years, Maunder (Director from 1910 to 1925) and Newbegin (Director from 1925 until 1937) were always keen to publicise his valiant work. Not surprisingly, given his physical disabilities, observing in daylight and recording the positions of sunspots on the solar disk with his refractor, was far more comfortable than enduring a cold night-time battle. It was therefore as a solar observer that Strachan excelled.

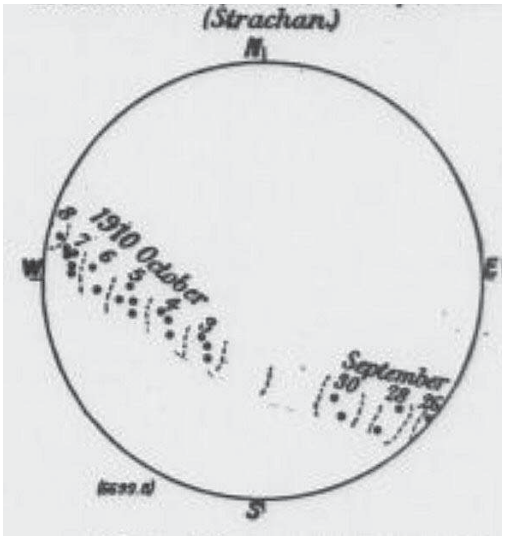


Figure 6. Strachan wrote in detail in the Solar Section *Memoir* about 'Group 59' (Greenwich spot group 6893/6894). He watched it cross the disk from 1910 Sept 26 to 1910 Oct 8, as depicted in this diagram from the *Memoir*.

In E. Walter Maunder's reports of solar activity during the years of the Great War, William Strachan is always mentioned. For the 1914 report Maunder states: 'The old cycle seems now to have definitely come to a close, since spots are no longer seen in the equatorial region; all spots are now found in relatively high latitudes. The above details are derived from monthly reports supplied by Mr. William Strachan and from examination, kindly permitted by the Astronomer Royal, of the solar photographs taken at the Royal Observatory, Greenwich.'[12]

For the 1914/1915 session Maunder lists the main Solar Section observers as Professor Moye, William Strachan and Miss Grace Cook,[13] and in 1915/16 the main contributors were, once again, Professor Moye, William Strachan, Mr Alexander Amaftounsky of Minsk in Russia (who became a member after working with the BAA Saturn Section Director Patrick Hepburn during the 1914 total solar eclipse) and the Revd C. D. P. Davies.[14]

In 1916 January Strachan was elected as a Fellow of the RAS, proposed, as was the case with his BAA membership, by E. Walter Maunder. Being the BAA Solar Section Director Maunder was only too aware of Strachan's impressive work made under difficult circumstances.[15,16]

As was the case with many amateur astronomers of that era (such as Captain Ainslie) Strachan was also keen on microscopy and occasionally mentioned this work in the *English Mechanic*. In the 1916 Oct 20 edition[17] he offers for sale his Watson's 'Edinburgh H' model body for £8. That model of microscope was highly successful for Watson & Sons, with more than 10,000 models of 'Edinburgh Stand H' being sold between 1892 and 1907 according to the 2006 January edition of *Micscape* magazine.

In the Solar Section report for the 1916/17 session[18] Maunder noted that: 'Mr. W. Strachan has maintained his daily careful scrutiny of the solar surface and is arranging to take photographs of the solar surface with his 5-inch refractor on a scale of about 6 inches to the solar diameter.' In 1917/18, once again, the main observers were listed as Moye and Strachan along with H. B. Adams and W. Barnett.[19]

It is clear that despite his health restrictions Strachan was an absolute backbone of the BAA Solar Section at this time. He also featured prominently in the 1921 Solar Section *Memoir*[20] where at one point he is invited to compare his sunspot records to those recorded at Greenwich Observatory in 1915 November, a month in which there were a considerable number of small ephemeral sunspots recorded on the disk; as many as 35 by the end of the month. The contribution nicely illustrated his painstaking work and attention to detail. Strachan stated that his results: 'Were principally obtained by the use of a rough reticulated micrometer photographed on

glass, the resulting positions being finally measured with the Stonyhurst discs. Some of the work was done by projection and a few of the diagrams were drawn from measures of my small solar negatives superposed on square paper. The images on these plates are about 2 and 1/8th inches in diameter'. In that month alone, with the Sun low in the November sky, Strachan observed on 10 days, and his meticulous sunspot positions agree precisely with those made at Greenwich on the same days. In most cases his recordings of sunspot latitudes and longitudes are within a degree of the Greenwich measurements, made by able-bodied professional astronomers.

Also in that same 1921 Solar Section *Memoir*, which covered the BAA observations obtained from 1910 to 1919, Strachan contributed an article starting on page 33 entitled 'History and Types of the last great Spot-Group of the Cycle 1901–1913', as observed by projection with his '5-inch Wray refractor, Watson tube and Grubb clock-driven equatorial.' Strachan wrote in detail about 'Group 59' (Greenwich spot group 6893/6894) as it crossed the disc from 1910 Sept 26 to 1910 Oct 8 (see Figure 6). On Sept 30 in the afternoon, at 3h 5m p.m. G.M.T., Strachan described the group as follows: 'A stupendous disturbance, 114,100 miles long. The group consisted of wildly irregular umbrae in a great region of shattered penumbral matter. Principal spot, 48,600 miles in diameter.'[21] The Solar Section Director, Maunder, listed the principal contributors to that Section *Memoir* as being Adames, Barnett, Davies, Du Martheray, Markwick, Prentice and Strachan.

However, it is clear from the number of observations submitted by Strachan that his physical disability was worsening after 1917, at least for serious night-time work. His annual magnitude estimates of SS Cygni had dropped from a high of 101 observations in 1914 to a mere 27 in 1918, 26 in 1919 and 23 in 1920. For the SS Cygni 1921 Variable Star Section report Charles Lewis Brook, the outgoing Section Director, reported on behalf of Felix de Roy that the Section 'regrets the loss of the observations by Strachan, but we welcome two new observers, Mr. Chandra in India and Mr. Waterfield in British Colombia; their work will be very useful and we now only require another observer (say) in Japan to complete the circuit of the globe.'[22]

After 12 years of observing the heavens Strachan's nocturnal work seems to have come to a very abrupt halt at this point and he is barely mentioned in any of the BAA observing Section reports. Even so, Strachan was still clearly in contact with other prominent BAA members at that time. For example, in 1921 November (Vol. 32, no. 2 of the *Journal*) he seconded the Rev. T. E. R. Phillips' proposal that Miss Alice Mary Pearce, of The Mount, Bassett, Southampton, should be elected as a member of the BAA. According to *The Tablet*, the International Catholic News weekly magazine (1928 August 4 edition) that same Miss Pearce was the daughter of the Mayor of Southampton, Mr A. W. Pearce, J. P.

For easy casual observing Strachan did sometimes still manage to use his 5-inch refractor at night, presumably at times when he was stronger or had help with his observing. One such event was the lunar occultation of Aldebaran on the evening of 1923 Oct 27. Writing in the *English Mechanic* a few weeks later[23] he mentioned that he had been unable to observe the occultations of other Hyades stars that evening but at 11.10 p.m. he enjoyed a good view of Aldebaran close to the north limb of the waning gibbous Moon, using 50× on his 5-inch refractor. Cloud intervened but he estimated the star must have disappeared at around 11.13 p.m. at a p.a. of about 15°. Skies then cleared and Strachan timed the reappearance of Aldebaran at the dark limb as occurring 'with the usual startling suddenness at 11h 52m 55s p.m. G.M.T. by my watch, and I estimated the p.a. to be about 330°.'

A 9-inch Coudé

At some stage at the very end of 1923 William Strachan started using a large, brand new, and highly unusual telescope at 30 Tregonwell Road. This was a huge instrument with a fixed eyepiece and with all the controls placed within easy reach of the operator, so it was ideal for Strachan's condition. The first specific BAA mention of his new telescope appears in the meeting report for 1924 January 3. A large exhibition of Section work was exhibited in the Sion College anteroom and, under the Photographic Section report, a note stated: 'A photograph of a sunspot stream, taken by Mr and Mrs Strachan, with his new 9-inch Cooke-Coudé.'[24]

Precise information about this new instrument is very sparse in BAA records, but years later, Walter Goodacre (who was, as noted

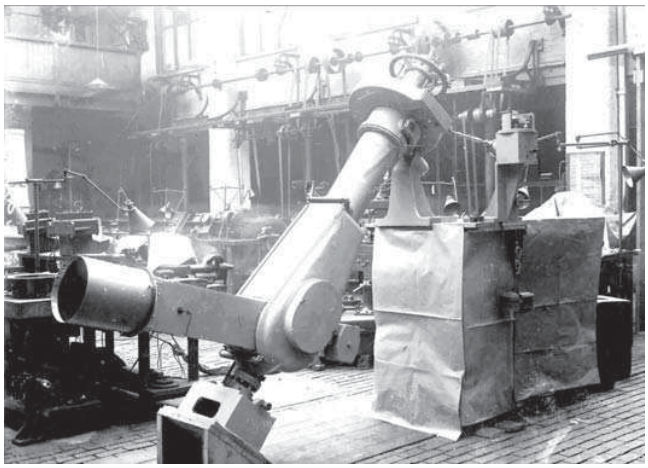


Figure 7a. William Strachan's 9-inch Cooke–Coudé viewed from the south-east position. Photograph dated as being taken in the early 1920s (almost certainly 1923) inside the Cooke factory at York, as detailed in the Borthwick archive/University of York records. The original negative was severely scratched in many places and the author has repaired much of the damage.

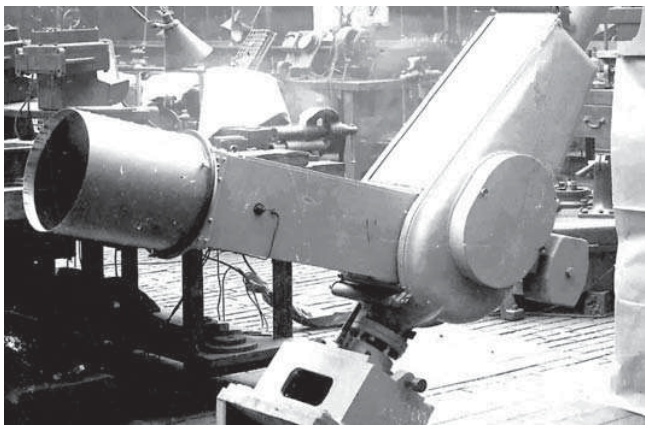


Figure 7b. A close-up (from the previous figure) of the polar axis mounting, lens cap and declination 'hinge' of the 9-inch Cooke–Coudé. Note the counterweight on the right hand side, balancing the weight of the lens, tube and dew cap. Also note the wire behind the lens, entering the tube. This wire also enters the tube on the opposite side, as seen in Figure 9a. The flat, south-facing metal panel on the polar axis looks as if it is designed to slide up and out, to give access to the mirror mechanism inside.

Figure 7c. William Strachan's 9-inch Cooke–Coudé viewed from the north east position inside the Cooke factory at York, as located in the Borthwick archive/University of York image database. Despite the poor quality of this image the huge instrument is clearly visible on the left hand side, with factory workers nearby.

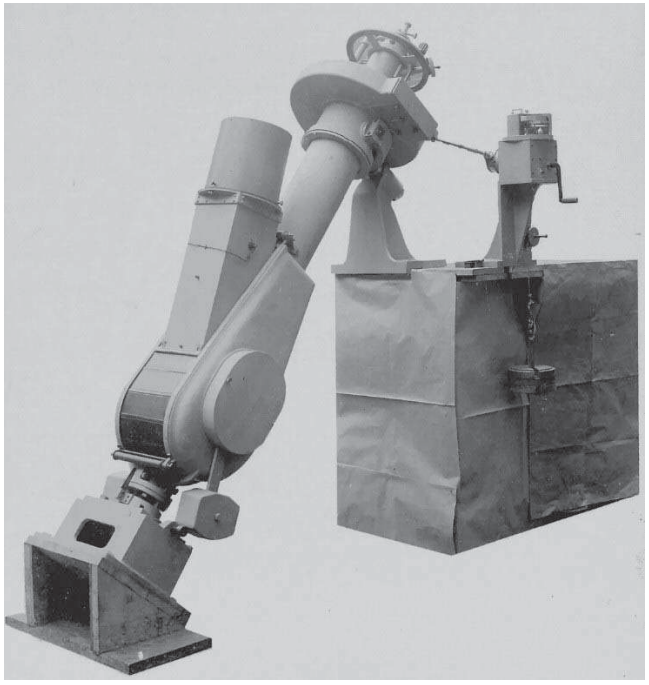


Figure 8a. The completed 9-inch Cooke–Coudé ready to be delivered, photographed from the south-eastern aspect of the instrument. A falling weight for the clock drive can just be seen against the dark side of the main box-shaped support structure, below the RA drive pedestal and handle. From the Borthwick archive.

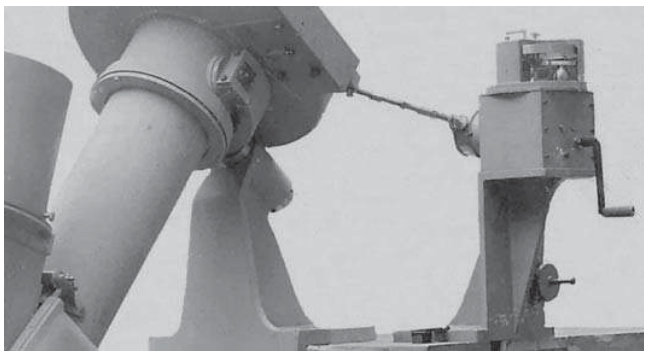


Figure 8b. A close-up of the upper polar axis and RA drive mechanism as shown in the previous image. A rotating spindle transfers the RA drive power to the enclosed worm wheel via the linkage. From the Borthwick archive.

earlier, based just two miles from Strachan from the late 1920s) noted: 'He acquired a very fine Coudé Equatorial fitted with a 9-inch O.G. and a 10-inch plane mirror, by Cooke of York. With this instrument he was able to work in greater comfort.'[25] Clearly, a 9-inch (229mm) Coudé was, and is, a very rare astronomical telescope indeed, and given that it seems to have seen 'first light' in 1923 and was made by Cooke of York (which had actually become Cooke, Troughton & Simms in 1922) a telescope of that type, size and vintage must surely be unique.

That company was taken over by Vickers in 1924 and archival Cooke material survives in the Borthwick Institute Vickers archive at the University of York. The author examined all of the surviving, scanned images in this archive in 2015 (more than a thousand in total) and located a number of photographs of Strachan's remarkable Coudé telescope. According to Alison Brech of the Borthwick Institute the Cooke order books cannot be located in the University of York collection, which is unfortunate, as they may have contained details on the telescope's purchase, order date and delivery date. However, the pictures of Strachan's 9-inch Equatorial Coudé that the author located are definitely derived from negatives 'taken in the early 1920s' and the first mention of this instrument appears in the Cooke, Troughton & Simms records for 1924.

The instrument is shown here in Figures 7a to 9c, with that final figure showing a man using the telescope, which gives a good idea of its size. This is not thought to be Strachan (who would have been around 50) as the man appears to be too young, so he is probably a Cooke, Troughton & Simms employee. However, it does show how an observer, seated in a normal chair, could use the instrument in blissful comfort. Clearly the 1924 appearance ties up with the first BAA mention of this instrument in January of the same year. No other 9-inch Coudé telescope is mentioned in the

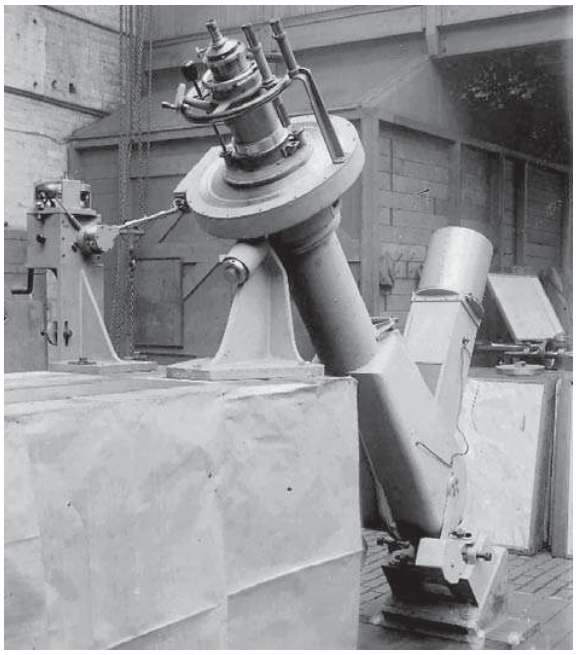


Figure 9a. The completed 9-inch Cooke–Coudé ready to be delivered, photographed from the north-western aspect of the instrument, inside the Cooke factory in 1923. Note the wire along the side of the polar axis, entering the broken tube behind the lens/dew cap. This wire can also be seen on the opposite side in Figure 7b. Maybe this is some sort of illumination system for an internal declination circle? Or it could be the electrical supply for an iris shutter to stop down the aperture, or a lens dew prevention heater? From the Borthwick archive.

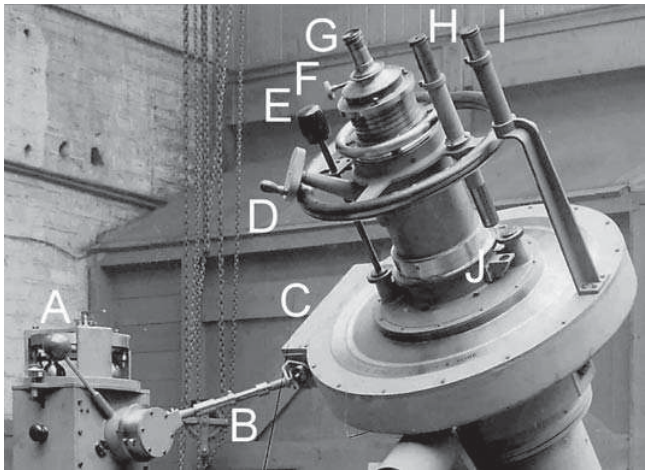


Figure 9b. A close-up of the business end of the Cooké–Coude from the previous figure. Note how all the controls operated by hand have been specifically placed on the left side due to Strachan's only having the use of his left hand. The features have been labelled by the author as follows:
A. Lever to control the Right Ascension drive, mounted on the side of the clock mechanism.
B. Mechanical linkage to transfer clock drive to RA worm.
C. RA worm housing.
D. Probably the declination adjustment control wheel?
E. Probably the RA manual control, as its base links to a spur gear that drives a large gear rack surrounding the top of the RA wheel housing.
F. Rack and pinion focuser with the wheel on the left hand side.
G. Eyepiece.
H. An optical finder pointing directly at a prism.
I. Another optical finder which seems simply to be a magnifier reading the engraved RA circle.
J. A prism lined up with the first optical finder. It is conceivable that the prism directed light from an illuminated internal declination scale so that the observer would always know where the telescope was pointed in declination.

Cooke archives, so it was clearly a one-off instrument.

The Cooke, Troughton & Simms 'Catalogue of Astronomical Instruments and Observatory Equipment' (publication 570) of 1924, first mentions Strachan's instrument on page 40. The catalogue illustration (no. 24) shows how the instrument should be mounted in a garden (Figure 10a). The lower end of the polar axis has been sunk into the ground, with only the lower part of the telescope exposed to the air. A building has been erected to the north for the observer to sit in. On the right hand side a photograph of a real garden appears. Perhaps this was Strachan's garden and the illustrators decided an artist's impression might be preferable for the observatory itself, as maybe Strachan's observatory did not look photogenic enough?

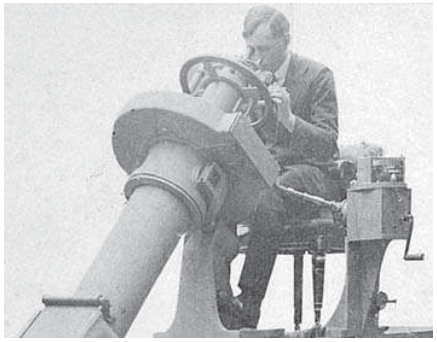


Figure 9c. This image from the Borthwick archive shows a man looking through the eyepiece of the 9-inch Coudé in the York factory of Cooke, Troughton & Simms in 1923, presumably an employee. The original image was in a very poor state but has been enhanced by the author.

The 1930 version of the Cooke, Troughton & Simms catalogue (publication 700) also mentions the telescope on page 37, although later versions, from 700A onward, do not (Figure 10b).

Of course, many variants of the Coudé design exist and there is more than one way to keep the eyepiece position of a refractor fixed. Perhaps the most popular Coudé refractor design is that popularised by Zeiss, a 6-inch example of which survives at the Cody Astronomical Society Observatory on the Technology Park at Farnborough, Hampshire. In that traditional design the refractor, mounted on a German equatorial mount, looks almost conventional with the light from the lens being diverted by mirrors through the hollow declination and polar axes, until it emerges at a fixed eyepiece at the base of the polar axis.

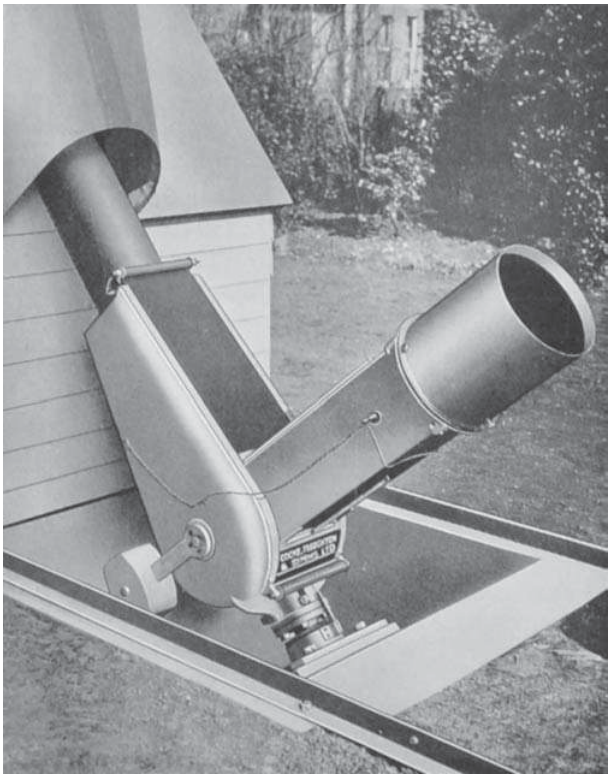


Figure 10a. This illustration of Strachan's 9-inch Coudé first appeared in the 1924 Cooke, Troughton & Simms Catalogue publication 570, on p. 40 and is listed as 'Figure 24'. Note the artwork depicting how the telescope should be mounted.The text describes the northern end building as the 'observing chamber' and explains that 'all settings are made from the telescope eye end'. The garden rails either side of the polar axis and hinge/lens assembly suggest a small roll-off box might have been Strachan's preferred method of covering the lens end of his instrument. Is the garden featured in the background that at 30 Tregonwell Road? Maybe, but it is clearly not possible to be sure. The observatory might have been located where the summerhouse/greenhouse appears in Figure 2a. From the Borthwick archive.

However, Strachan's Coudé was of the 'polar refractor' or 'polar siderostat' design. With this system the telescope tube is, in effect, the main polar axis, so any movement in Right Ascension is achieved by rotation about the axis of the telescope tube. A single tilting mirror at the end of the system allows movement in declination to be achieved, with the final image therefore being mirror-flipped. The advantage of a 'polar refractor' system is that the eyepiece end can be situated a considerable distance from the lens/mirror end, so that the focus can be brought indoors into a warm and comfortable environment. Perhaps the most well-known 'amateur telescope making' example of such an instrument in modern times was the 6-inch (152mm) f/18 polar refractor of Indiana amateur telescope maker Oscar Knab.[26–28]

Even with the polar refractor design, there are several options. A flat mirror can be mounted after the refractor lens, as with Oscar Knab's instrument (and the commercial 'Sky Window' binocular mount) but it is then exposed to the damp night air. In the 1920s mirrors were silvered, not aluminised, and such a coating could

rapidly deteriorate within months of night-time usage by a keen observer like Strachan. An alternative polar refractor design, and the one chosen by Strachan, incorporates the mirror inside the telescope tube, not too far from the lens. The refractor tube is therefore effectively 'broken'. This method protects the first surface mirror from the damp night air and the lens/dew cap points directly at the target. However, the internal mirror needs to be able to swivel smoothly at half the rate that the broken end moves in declination, to preserve collimation and prevent vignetting.

Clearly a Coudé of this type cannot be used at all declinations without some loss of light, even with an oversized mirror. In Strachan's case the mirror was said by Goodacre to be 10 inches in diameter, which could, presumably, have been the length of an elliptical mirror's major axis, or it may even have been circular. This mirror was located at a point some 25% downstream from the 9-inch diameter lens, where the light cone from the objective would be roughly 7-inches (178mm) in diameter. With the telescope pointed at the celestial equator the mirror would be angled at 45° with respect to both ends of the 'broken' tube, resulting in an effective diameter of around 7-inches (10 inches × 0.7), in other words, without any loss of light in the centre of the field.

There appear to be no known surviving detailed descriptions of Strachan's telescope recorded by himself, or by BAA members who knew him. However, in November 1925 he did briefly describe his unusual instrument in the *English Mechanic* when mentioning his solar observations of 1925 July:

'I think it is quite possible that the group of scattered spots, which Mr. F. M. Holborn (letter 90) saw on the E. limb on July 2nd, was identical with my group No. 3. I observed the Sun on that day; but the only spot visible to me near the E. limb was a small umbra in Lat. 35°S. This obviously could not have been my group No. 3, for that disturbance was in Lat. 13° S.

My failure to detect the group on the 2nd inst. was probably due to the fact that definition in my 9" Coudé, even at times when good seeing obtains in ordinary refractors, is always very tremulous owing to the presence of air currents in the tube which cannot, it seems, be eradicated. They cause the limb to 'boil' furiously, with the result that it is extremely difficult to detect small spots when these are very near the edge of the disc. This trouble is increased by the fact that the lowest power which I use for Solar work magnifies fully 80 times. In order that this eyepiece might provide 'birdseye' views of the Sun and Moon, I had its field-lens made large enough to pass '*in toto*' the primary solar image which, in my telescope, is of 1.1" diameter. It is very difficult for me to use the ordinary refractor and reflector because I am paralysed, and have only the use of my left arm: it is to these facts that my Coudé owes its origin. The construction of the instrument is very similar to that of the Coudé at Cambridge, and the handles controlling the slow motions, the clamps, and the starting handle of the driving clock, are on the left side so as to make the manipulation of the instrument possible for me. William Strachan, F.R.A.S.'[29]

Figure 10b. The Cooke, Troughton & Simms 'Catalogue of Astronomical Instruments and Observatory Equipment' included Strachan's telescope from 1924 to 1930.

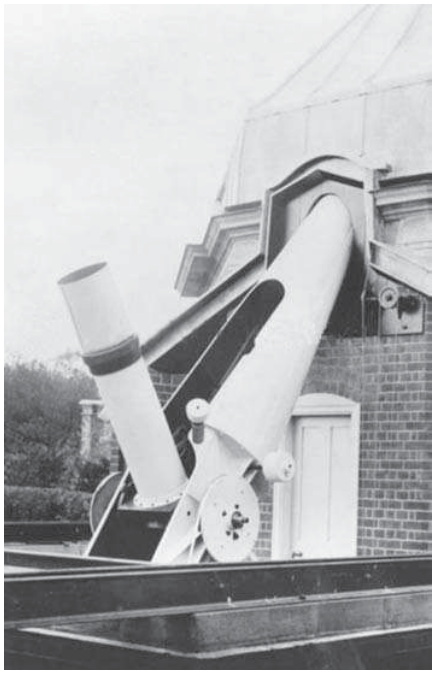


Figure 11. The Cambridge Sheepshanks 32cm f/18.5 telescope seems to have been the inspiration for Strachan's telescope. It was used at public open nights, between 1898 and 1959. *Royal Astronomical Society/Science Photo Library.*

If there was any lingering doubt that the 9-inch Coudé instrument pictured in the Borthwick Cooke archives was indeed William Strachan's telescope, those words by Strachan remove them. When the images are reproduced with the right orientation, so the words 'T. Cooke & Sons of London & York' on the drive wheel cover are not mirror-imaged it is clear that, as desired by Strachan, every single control of this customised instrument is indeed clustered on the left-hand side. In addition, Strachan's revelation that his prime focus solar image is 1.1 inches in diameter tells us its focal length, as this equates to 126 inches for a half degree disc, so the massive Coudé instrument had a focal length of ten and a half feet and was therefore a 9-inch [228mm] f/14 system. It also tells us that his lowest power eyepiece had a 40mm focal length, with an apparent field of 40°.

The Coudé instrument at Cambridge which Strachan mentions was clearly the inspiration for the design of his telescope. That instrument was the 12½-inch (318mm) Sheepshanks telescope (see Figure 11). It was built by the telescope manufacturers Grubb, following a design by Robert Stawell Ball (1840–1913), and installed in 1898. That polar refractor Coudé system was named after the British astronomer Richard Sheepshanks (1794–1855), who worked at Cambridge University, and his sister, Anne, who set up a legacy in his memory. The legacy was used to purchase the telescope.[30]

The Cambridge Sheepshanks instrument had a 32 cm lens with a focal length of 5.9 metres (f/18.5). It was in use, mainly at public open nights, between 1898 and 1959, after which the lens was transferred to the Cambridge Observatory Northumberland Re-

fractor. So, in Strachan's time, the Sheepshanks instrument was in regular use. In every respect Strachan's 9-inch instrument appears to be a 70% scaled down copy of the 12½-inch Sheepshanks instrument.

Observations with the Cooke Coudé

With the Coudé up and running William Strachan could not only resume his BAA observing work, but dramatically increase it. From being rarely able to observe variable stars at all since 1921, his comfortable observing station at the fixed eyepiece, and the new instrument's far superior light grasp (compared to his 5-inch refractor) enabled him to observe much fainter stellar targets. The telescope was even used to photograph sunspots, although it must have been stopped down, or filtered, because a 9-inch refractor is surely a very dangerous instrument indeed when pointed at the Sun.

From 1924 (according to *Journal* reports by Felix de Roy, where Strachan's observations restart slightly earlier than in the VSS database) Strachan added the study of S Aql[31] and R Cyg[32] to his observing schedule. He also added U Boo, V Tau, S UMa,T UMa[33] and U Gem in 1925, and R And, W And, U Cyg and V Cyg in 1926. His faintest magnitude estimates with the 9-inch Coudé were of R And, down to 14.9, and his brightest estimates were of this same star, up to mag 6.8.[34] Strachan's observations of his favourite star SS Cyg were back as well, with 38 magnitude estimates reported for 1925, as documented by Charles Lewis Brook.[35]

The VSS database also contains six observations of S Her, all made between 1933 July and September. In terms of declination the variable stars he studied with the Coudé were all in the northern hemisphere of the sky, ranging from S Her and V Tau (+14° 572 and +17° 322 respectively) up to S UMa at 61° 52.

The years 1924 to 1932 would be the most productive observing years for William Strachan. Despite only having the use of his left arm the Cooke Coudé enabled him to make many more observations of a variety of objects, not just variable stars. Indeed, in that first full year of the telescope being in use the planet Mars was at perihelic opposition on August 23, with a diameter of 25 arcseconds and a declination of –17° in Aquarius. Despite transiting at less than 22° altitude from Bournemouth, Strachan's new telescope could reach down that low and enabled him to make the only drawings he seems to have ever submitted to the Mars Section. His three sketches were made with the 9-inch Coudé at a magnification of ×224 on Aug 24 (with the planet exceptionally low down), Sept 14 and Sept 17; these are reproduced in Figures 12a, b and c. On the last two sketches the words 'full aperture' confirm that the instrument could be stopped down if required.

Richard McKim provided the following comments about Strachan's sketches: 'Peek was briefly Director (though in 1931 not 1924) and perhaps the sketches came via him from the then Director Steavenson. The name [Strachan] has also been added by Peek in pencil. If the drawings look a little yellowed it is because they were 'fixed' by floating them upon skimmed milk, a technique widely used to avoid later smudging. The drawings are of a good standard, particularly the middle one showing the Mare Sirenum area as it was in 1924. The shrinkage of the SPC is also evident.'

Strachan would have been greatly saddened when his Bournemouth BAA colleague Col. Markwick passed away on 1925 July 4, only two years after the Cooke–Coudé was acquired. As noted by Jeremy Shears,[36] Strachan wrote an obituary of Markwick in the *English Mechanic*.[37] One cannot help but think that Strachan is referring to Markwick's encouragement of his own work when, in that obituary, he says: 'Markwick was an observer of great ability and experience, and his vast fund of practical knowledge in this respect was ever at the disposal of the veriest tyro in telescopic work. He was never so happy as when helping astronomical 'lame dogs over stiles' and this assistance and guidance were always given with an ability, charm of manner, and kindliness peculiarly his own...'

In 1928 Walter Goodacre appealed in the February and March editions of the *Journal*[38,39] for observers to catalogue lunar craters with and without central peaks (after a suggestion from Mr Tomkins). He suggested using the 25 sections of his lunar map to distribute the teamwork amongst pairs of observers. By May some eighteen BAA members had volunteered to help[40] (thus covering nine map sections) and Goodacre announced that he was covering Region 1 (the central part including *Sinus Medii*, *Sinus Aestuum*, Ptolemaeus, Triesnecker and Hyginus) working with William Strachan as his team mate (Figure 13). Goodacre would use his 10-inch refractor and Strachan would use his 9-inch Coudé.

In the *English Mechanic* on 1926 Jan 22, Strachan, now a dedicated user of his fixed eyepiece Coudé, had seemingly decided that his daily solar reporting could no longer continue.[41] He wrote that his January 26 solar observation would be his last, on account of his poor health. However, this solar hiatus did not last for ever. By 1930 the Sun was still an object which Strachan was keen to study as often as possible and in the October *Journal* he was quoted as saying:

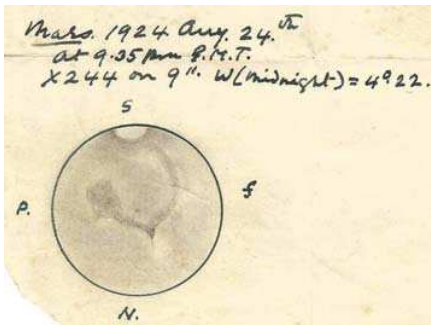


Figure 12a. Mars, very low down, sketched by Strachan on 1924 Aug 24 at 9:35 p.m. GMT, using ×244 with the 9-inch Coudé.

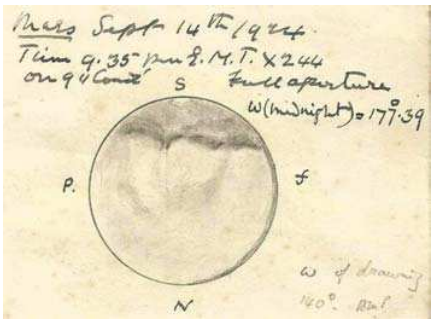


Figure 12b. Mars sketched by Strachan on 1924 Sept 14 at 9:35 p.m. GMT, using ×244 with the 9-inch Coudé. The Mare Sirenum is shown. As pointed out by Richard McKim, Peek has pencilled in the CM longitude at the time of the observation (as opposed to Strachan's value for midnight).

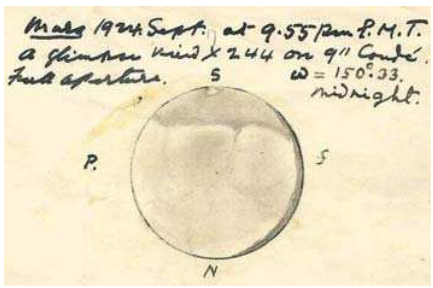


Figure 12c. Mars sketched by Strachan on 1924 Sept 17 at 9:55 p.m. GMT, using ×244 with the 9-inch Coudé.

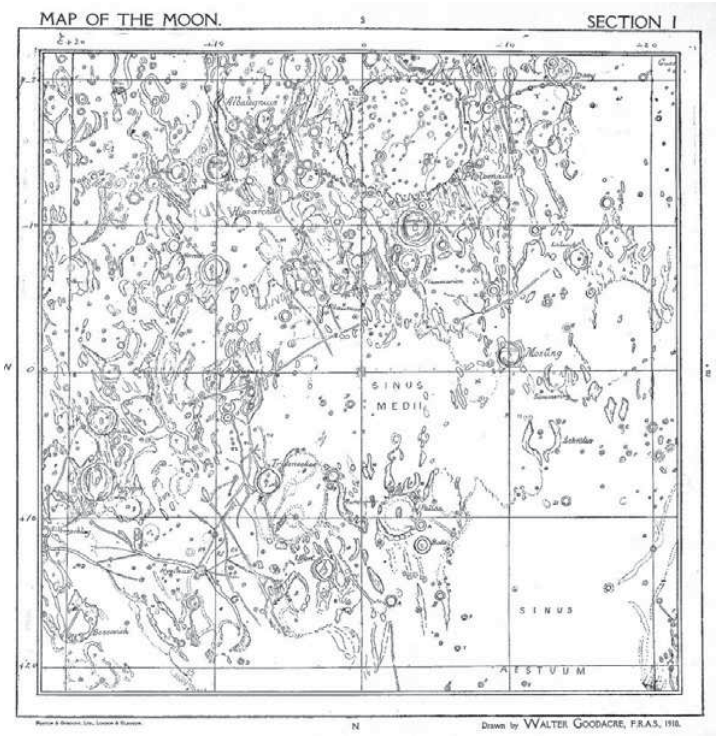


Figure 13. Region 1 of Goodacre's Moon Map was the region covered by Goodacre himself, working with Strachan, in a study of crater types. The region covers Ptolemaeus (top) to Hyginus (lower left) and includes the *Sinus Medii* and *Sinus Aestuum*.

'During the year ending August 1930, 98 sunspot groups have been observed. Of these, 59 were in the N. hemisphere and 39 in the S. hemisphere – a preponderance for northern latitudes of 20 spot groups. The percentage of southern groups observed was 397. The great majority of spots observed were born on the invisible disc.'[42]

Despite having used the 9-inch Coudé to take early sunspot photographs when he first acquired the instrument in 1923, experiments were still continuing seven years later. In 1930 December Solar Section Director A. M. Newbegin mentioned that Mr Maby of Oxford and Mr Tetley of Headingley were contributing photographs, and added: 'There is another prospective worker with the camera in the person of Mr. Strachan of Bournemouth: he has been trying different filters with his 9-inch Cooke Coudé, and this instrument, when finally adjusted for photographic work, should yield some very fine results.'[43]

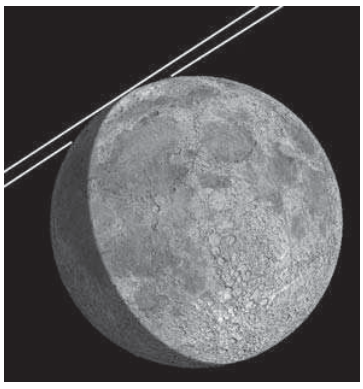


Figure 14. The 1933 April 6 occultation of Regulus. The lower track marks the situation as seen from Strachan and Goodacre's Bournemouth locations, with the disappearance at the dark limb being seen, but the reappearance at the bright limb being cloudy. The upper track marks the graze along the limb, which was clouded out along the Dover/Canterbury road.

On 1933 April 6 Regulus was occulted by the waxing gibbous Moon (see Figure 14). This was a grazing occultation at the north-west (IAU system) lunar limb, for observers on a line from Dover to Cheshire, with the Moon 50° above the horizon. Twelve teams of hardy BAA observers were dispatched to the narrow graze line, where the star would, hopefully, wink on and off many times as it passed behind lunar peaks on the edge of the disc. The start of the track lay conveniently (for observers in the south-east of England) along the Canterbury to Dover road, but the intrepid observers stationed there met with total failure due to complete cloud cover on the night.[44] Will Hay was due to be one of the observers positioned along the graze track, but had to pull out at the last moment. The event was mentioned in a humorous tone in the *Journal* where it was reported by J. T. Foxell that the occultation itself was observed 'under very favourable conditions with a 3-inch refractor from a yard behind Crewe Railway Station.' [Note: Foxell specialised in predicting such events and was a Computing Section colleague of Major A. E. Levin. One year later Levin and Foxell would propose and second an 11 year-old Patrick Moore for BAA membership.]

On the south coast only two observing stations were successful. Away from the graze track itself Walter Goodacre & Herbert Brown timed the immersion (through gaps in the cloud) with Goodacre's 10-inch refractor at Bournemouth. Just two miles away Strachan managed to observe the immersion too, with the 9-inch Coudé. Goodacre & Brown recorded a timing of 20h 47m 30s, which agreed with Strachan's timing.

Will Hay uses the Coudé

Will Hay's discovery of a white spot on Saturn on 1933 August 3 made the national newspaper headlines – he was an active planetary and cometary observer at that time (see Figure 15).[45] Although he was already a household name when he discovered the White Spot his peak silver screen career lay ahead of him, but for theatre goers and radio listeners Hay was already one of the most popular entertainers in the country. Because of this he was constantly touring the theatres of Britain and drawing packed audiences with his 'Fourth Form at St Michaels' comedy routine. In 1933 September, six weeks after his discovery, his comedy performance took him to the Pavilion at Bournemouth which was opened four years earlier as a Concert Hall and re-opened in 1933 as a more appealing Theatre.[46,47]

Away from home and without access to a large telescope Hay was obviously keen to view the White Spot as many times as he could before Saturn disappeared from view. Hay's logbook was studied by this author in 2009 and on the consecutive evenings of September 13 and 14 (a Wednesday and Thursday) he paid a visit to William Strachan at 30 Tregonwell Road, less than half a mile from the theatre in Westover Road where Hay was performing. If only there was a photograph of that historic encounter! Hay's page 57 logbook entries for those dates are shown in Figure 16 and read as follows:

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 19h 10m G.M.T.

That September 14 observation with the Bournemouth Cooke–Coudé was the final one of the White Spot that Hay recorded in his logbook, so was probably his last ever view of his own famous discovery. At the time of the observation the planet would only have been at an altitude of 15° from the latitude of Bournemouth, at an azimuth of 147°. The Sun was only 8° below the horizon, so this was a twilight observation. Saturn was in Capricornus at the time, at a southerly declination of –18°, so clearly Strachan's Coudé could reach pretty low altitudes, at least in the south and south-east (as we have already seen with regard to his 1924 Mars sketches). M13, observed the previous evening, would have been a much higher evening target in the western Bournemouth sky, and that

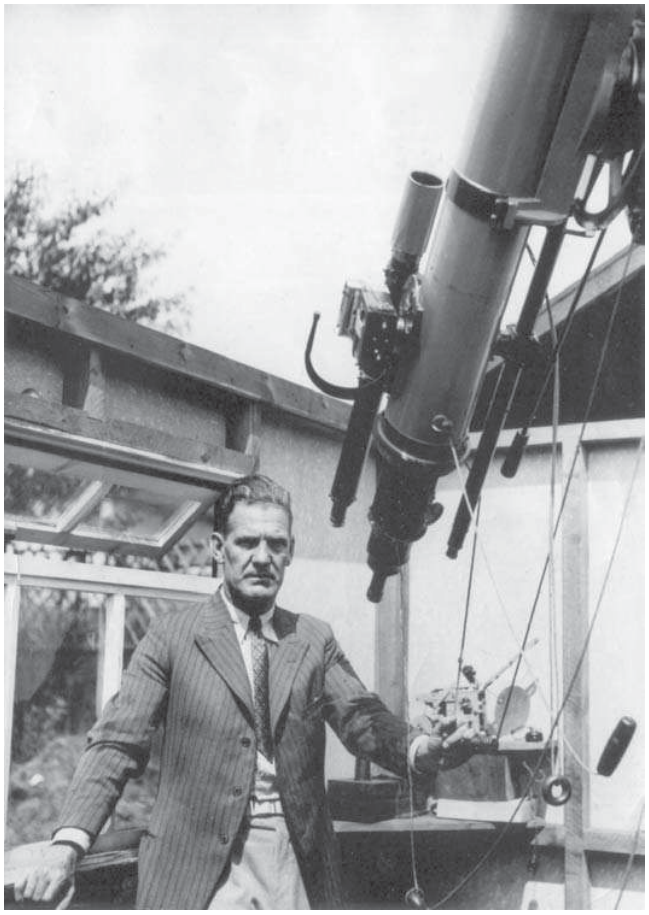


Figure 15. Will Hay with his 6-inch Cooke refractor at 45 The Chase, Norbury, in South London. This picture was taken in early August 1933, as photographed by the Daily Mirror, just after Hay had discovered the White Spot. One month later he visited William Strachan at Bournemouth. *Image by kind permission of Mirrorpix.*

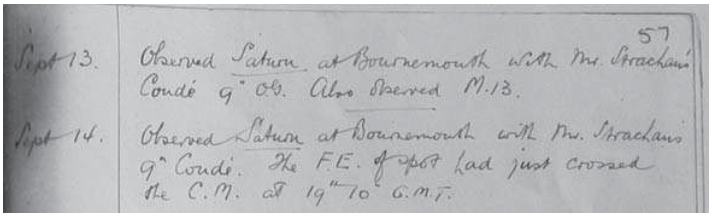
wonderful globular cluster seems to have been a favourite observing target for Hay's own refractor in London.

Hay's logbook does not record anyone else's presence on September 14 at Strachan's house, but clearly he may have met up there with other local astronomers, such as Walter Goodacre. Maybe Goodacre even attended the comedy performance? We shall probably never know!

Apart from the observation on Sept 14 made by Hay, Strachan used his 9-inch Coudé to observe the White Spot himself on Aug 6, 9, 22, 30 and on Sept 8 and 11, as noted in the BAA report of the feature.[48]

At the 1933 Oct 25 BAA meeting Hay gave an account of his observations of the White Spot and, following his talk, Walter Goodacre added that its shape, when elongated, had taken the form of two ovals in contact, a fact that 'had been confirmed by Mr Strachan'.[49]

Strachan also used his 9-inch Coudé to occasionally observe Jupiter, in addition to Saturn. In the report of the Jupiter Section covering the apparitions of 1929–'30 and 1930–'31 the Rev T. E. R. Phillips wrote: 'Mr W. Strachan, despite his severe physical infirmities which made draughtsmanship impossible, showed great keenness in observing with his fine 9-inch Coudé telescope and contributed notes and transit observations during two or three apparitions.'[50] In fact, despite Phillips' comments, we have already seen that draughtsmanship was not totally impossible for Strachan, at least not in the 1920s.


57

Sept 13. Observed Saturn at Bournemouth with Mr. Strachan's Coudé 9" Obs. Also observed M.13.

Sept 14. Observed Saturn at Bournemouth with Mr. Strachan's 9" Coudé. The F.E. of spot had just crossed the C.M. at 19h 10 G.M.T.

Figure 16. Page 57 of Will Hay's logbook for 1933 Sept 13 and 14, when he used William Strachan's Coudé at Tregonwell Road. Photograph by the author.

The Coudé after 1935

According to Goodacre, around 1933 Strachan's health began to fail[51] and 'he suffered very acutely, bearing, however, his sufferings with great fortitude.' His failing health is presumably the reason why he advertised the sale of his 5-inch Wray refractor in the *Journal* in 1934. The advertisement[52] read as follows:

> EXCEPTIONALLY FINE 5" Wray O.G. in high-class brass tube having rackwork focusing and centring counter-cell; set of 6 astro oculars (50–320) in box. Also a Watson Bi-filar Micrometer, fitted electric illumination. All in excellent condition. £55, or near offer.– Apply to W. STRACHAN, 30 Tregonwell Road, Bournemouth.

The last ever variable star observation by Strachan recorded in the BAA VSS database was of R Cyg, which he estimated at magnitude 13.4 on 1934 Oct 29.

Strachan died at Bournemouth on 1935 March 16. Goodacre himself would die just three years later, aged 82. It is interesting to note that, eight months after William Strachan's death, Walter Goodacre and F. J. Sellers proposed a woman named as Mrs Mary Strachan of Woodcutts, Martello Road, Branksome Park, Bournemouth, as a new BAA member. This address was very close to Goodacre's own Bournemouth property,'Waratah', in Leicester Road, Branksome Park. Mrs Mary Strachan, still living at that address, died 21 years later, on 1956 August 22.[53] Was this the same Mrs Strachan who previously lived with William at Tregonwell Road? It seems very likely, given the address, timing and astronomical connection. Of course, she might not have been William's wife, as the family name could simply mean it was a female relative, devoted to caring for William. So far, the precise details regarding Mrs Strachan of Tregonwell Road remain unclear. [Note: To avoid confusion, it may be worth adding that there is no known connection between Mrs Mary Strachan and Miss Alice Mary Pearce of Southampton, who Phillips & Strachan proposed for BAA membership in 1921].

Strachan's will bequeathed his Coudé to the Hon. Lionel Guest[54] (born 1880), the fourth son of the first Lord Wimborne, who lived at Ferring-by-Sea (see Figure 17). This is a village which is now part of Worthing, some 70 miles east along the southern English coastline from Bournemouth. Guest had also suffered from deteriorating health since 1930 and had even set about designing a Coudé instrument himself, which would enable him to also have the eyepiece end within a warm room. Guest owned an unwieldy 8½-inch f/14 Grubb Equatorial refractor and it seems that he intended using those Grubb optics to build his own polar refractor Coudé system. However, upon Strachan's death he was bequeathed the custom built 9-inch Cooke Coudé at Bournemouth. He quickly erected Strachan's telescope on the south side of his Ferring house, 'Wookyi-Tipi', on Sea Lane, but then disaster struck in the cruellest twist of fate possible. Barely had Guest installed the system he had so long desired when he too passed away, just six months after Strachan.

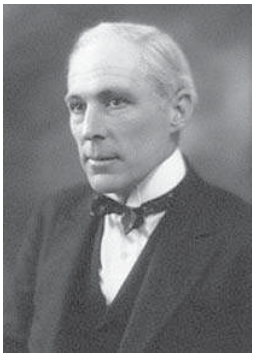


Figure 17. The Hon. Lionel George William Guest (1880–1935) inherited Strachan's Coudé in 1935 March, but tragically died in September of that year, not long after he had installed it. The 9-inch Coudé then transferred to Newbegin, who loaned it to Pitcher. Guest's own 8½-inch Grubb lenses were bequeathed to Captain Ainslie, who had them re-worked by Horace Dall and installed in his Dall-designed 'Jack-Knife' folded refractor.

Upon Guest's death his wife Flora bequeathed the Grubb 8½-inch f/14 lens to Captain Ainslie; this formed the basis of his folded refractor 'Jack-Knife' telescope, designed by Horace Dall. Ainslie was a former BAA President, who was based at Bournemouth from the mid-1930s. I wrote about 'The Skipper' and that 'Jack-Knife telescope' in 2010.[55,56] [Note: at that stage I wondered if Ainslie's 8½-inch 'Jack-Knife' Grubb lens was really the 9-inch one from Strachan's Coudé, but clearly it was not]. Guest's wife then gave the huge 9-inch Cooke–Coudé instrument, and her late husband's Synchronome clock[57] to a nearby Worthing resident. This was no less a person than A. M. Newbegin (1885–1965) who, as we have seen, had worked closely with William Strachan in his solar studies, because from 1925 to 1937 he was the BAA Solar Section Director, succeeding Maunder. [A. M. Newbegin's father, G. J. Newbegin, owned a 9-inch refractor from 1888 until his death in 1919.[58] This was only a few years before Strachan's 9-inch polar refractor Coudé saw first light. The younger Newbegin used a smaller 6½-inch refractor for his studies. Was the same lens common to both telescopes? If so, maybe Flora Guest was simply returning the 9-inch lens to its original owner's son? However, the lens aperture is probably no more than a coincidence and without any information the theory is merely wild speculation on the author's part!]

Being unable to erect the hefty Cooke–Coudé at his 'Starween' observatory in Down View Road, Worthing, Newbegin offered it on permanent loan to a friend of his, often resident in Worthing, within five minutes' walk of Newbegin's own observatory. Newbegin had suffered increasingly from deafness from his late teens and his young friend, Bernard Pitcher (1909–2000), was another very active member of the local Worthing deaf community and an amateur astronomer as well. Pitcher contributed two papers to 'The Dene Hollow School for the Deaf Magazine', one in 1933, on the subject of astronomy and the mysteries of the Sun and Jupiter, and the other in 1934, about Mars, the Red Planet. His future thesis on fossils, entitled 'The Upper Valentian Gastropod Fauna of Shropshire', earned him a Ph.D. in May 1939. He thus became the first congenitally deaf person in the United Kingdom to have achieved a doctorate.[59]

Strachan's 9-inch Cooke–Coudé was erected at Pitcher's Worthing home, or rather, the home of his parents, where he lived when not at Bristol University. Unfortunately, Pitcher's studies of the aforementioned gastropod fauna of Shropshire, and his other academic geological interests, meant that amateur astronomy had to take a back seat and the Coudé was rarely used during the years just before the Second World War and during the War itself.

Nevertheless, in the RAS *Monthly Notices* Newbegin did give occasional updates on the use of the Coudé instrument. For example, in 1937 he wrote the following:

'The 9-inch Coudé telescope, in the hands of Mr B. L. Pitcher, has been in use on many nights on the Moon and some of the more open clusters, but a definite programme of work for this instrument is yet to be decided upon.'[60]

In 1938 Newbegin added 'The 9-inch Coudé has been out of use for the greater part of the year, Mr Bernard Pitcher being away at the University of Bristol engaged on Geological Research work.'[61]

In 1939 Newbegin added the following note: 'The 9-inch Coudé telescope, in the hands of Mr Bernard Pitcher, has been in use for general work so far as his duties at the University of Bristol permitted, and a number of observations of sunspots were made.'[62]

In 1940 Newbegin added yet another update: 'Work with the Coudé Equatorial has been in abeyance throughout the year, largely on account of the illness of Mr. Bernard Pitcher.'[63]

However, things quickly became far more complicated because World War II meant that many parts of Worthing were evacuated during the early 1940s. Newbegin relocated to Sherborne for two years (during which time, sadly, his first wife passed away) and the location of the Cooke–Coudé on loan to Bernard Pitcher was also within the evacuation area. Not surprisingly, from this point on, the trail of the 9-inch Coudé goes cold for almost a decade. It was a massive instrument, designed so that the eyepiece end could enter the body of a house, or observatory, and so was not a very practical instrument to relocate.

In 1946, six years after the death of his first wife, Newbegin married his second wife, a lady named Ann Cox. Months later, after the end of 1946, he decided to terminate his observing;[64,65] he and his new wife moved to Paignton, and he donated all of his equipment to the Royal Observatory at Greenwich in 1947. There is no record of the Cooke–Coudé being considered in that donation, just his own 6½-inch Cooke refractor and its 22-foot diameter dome. That refractor was used at Herstmonceux until 1974 and then relocated to Greenwich.[66]

However, recent information supplied to the author by Bob Marriott (in 2015 August) shows that the 9-inch Cooke–Coudé was eventually presented to the BAA by Newbegin (it became Instrument No. 96) and was subsequently loaned to J. G. Miller from 1952 to 1961, seven years after Newbegin had relocated to Paignton. It was then loaned to Frank Wilsenham Hyde (1909–1984) at Clacton, from 1961 to 1965. The eyepiece end was enclosed in a huge wooden shed, which was tilted at a precarious angle, on sloping ground, during Hyde's ownership of the instrument. Newbegin died in 1965 and during that year the BAA Curator of Instruments, Henry Wildey, with obvious anger, wrote in his logbook that Hyde (then the departing *Journal* Editor) had broken the Coudé up and 'lost all the parts'. Disturbingly, Hyde managed to lose, destroy, or report as stolen, many other pieces of BAA equipment as well!

So, the 9-inch Cooke–Coudé of William Strachan was only regularly used for a ten year period, between 1924 and 1934, but it was surely a remarkable and unique instrument, in the possession of an equally remarkable amateur astronomer during that time.

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the author with additional *English Mechanic* information. In addition, I am most grateful to Richard McKim, whose vast knowledge of the BAA Mars archives reminded him that, against the odds (and contrary to the Rev. T. E. R. Phillips' comments) Strachan could make drawings and even produced three Mars sketches in 1924, which Richard scanned for this paper. Finally, I am indebted to the Bournemouth historian and prolific photographer Alwyn Ladell for his local knowledge and photographic archive relevant to Tregonwell Road.

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New members ... *continued from p. 339*

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HUDSON Thomas, Macclesfield, Cheshire
HUGHES Alan, Rugby, Warwickshire
HULTON David, Bolton, Lancashire
JOHNSON Robin, Wokingham, Berkshire
KIRTON-VAUGHAN Andrew, Swinton, S. Yorks.
LEES Margaret, Gourock, Inverclyde
LEES Stuart, Gourock, Inverclyde
LEWIS Dr Peter, Leeds, West Yorkshire
LINDOP Brian, Perton, Wolverhampton
MACIVER Sheila, Edinburgh
MANDRY Kenneth, Eastleigh, Hampshire
MCNEILL Marion Ella, Gourock, Inverclyde
MCNEILL Ian, Gourock, Inverclyde
MOORE Argon, Newport, Gwent
NORRIS Roy Allan, Newtown, Powys.
NORRIS Pauline Anne, Newtown, Powys.
PARKER Nicholas Robert, Maidstone, Kent
PATEL Naresh, Harrow Weald, London
PATEL Alpa, Harrow Weald, London
PATERSON David Noble, Rait, Perthshire
PUGH Gwen, Heathfield, East Sussex
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SWARBRICK Dr Sean James, Exeter, Devon
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TAYLOR Dr John, Jersey, Channel Islands
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TURNER Frank, Feltham, Middlesex
WATSON Thomas, Dublin, Ireland
WELLS Derek, Bodmin, Cornwall
WHITAKER Richard H. M., Newbury, Berkshire
WILSON Rob, Sidcup, Kent
WOOD Michael Francis, Grimsby, Lincolnshire
WOOTTON Alan, Macclesfield, Cheshire
ZIELONKA Adrian, Laneport, Somerset