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From the Director

Mike Frost

I am delighted to be able to announce a section webinar. At 2pm BST on Saturday May 14th, Professor Wayne Orchiston and Darunee Lingling Orchiston will be talking to us about “Asian Observations of the 18 August 1868 Total Solar Eclipse”. They have provided the following abstract:

In the history of astronomy, the total solar eclipse of 18 August 1868 is regarded as a watershed event that led to a major breakthrough in solar physics. Thanks to immaculate timing, this event coincided with international developments in both photography and spectroscopy.

The path of totality extended from Aden in the west to Indonesia in the east, and at the optimal location totality lasted an amazing 6min 50sec. In this talk we will discuss some of the astronomers and instruments who ventured to present-day India, Thailand and Malaysia; compare and contrast their observations; and place these in international context. We will also describe how Thailand’s King Rama IV astutely used the eclipse as a political weapon to foil colonization aspirations by both Britain and France.

You will be able to join by Zoom or via the BAA Youtube Channel, with links from the BAA Events web page.

Wayne Orchiston, who I have known for many years, has been a good friend to the section, contributing posters displayed in our early section meetings. He was Adjunct Professor of Astronomy at the University of Southern Queensland and the Managing Editor of the *Journal of Astronomical History and Heritage*. These days he lives in Thailand with his wife Darunee Lingling Orchiston, who is a successful businesswoman in Chiang Mai and doubles as Wayne Orchiston’s part-time Research Assistant. She has a special interest in Thai astronomical history, and in Indian, Thai, Philippines and New Zealand indigenous astronomy. So, a webinar is an ideal way for us to hear from them.

Looking further ahead, it does finally appear that real-world meetings can take place safely – at the moment, I am giving a roughly 50-50 mixture of zoom talks and in-person lectures. I suspect that we will continue to hold webinars for some time to come – after all,

they do offer opportunities for us to hear from speakers the world over and enable section members from the more far-flung parts of the world to attend.

But I miss the social contact of real-world meetings and aim to move back to them as soon as it is safe to do so. The Society for the History of Astronomy are holding a spring meeting at the Birmingham Midland Institute in March; this was the location we had selected for our 2020 section meeting. The deputy director and I are intending to attend this meeting and will assess if we can sensibly use it for a long-delayed in-the-flesh section meeting.

I hope that you have enjoyed the Christmas quizzes which have appeared in the December Issue of the Journal for each of the last two years, organised by Marie-Louise Archer (well done, Marie-Louise!). As section director, I'm asked to come up with questions. And I have a responsibility to try to make sure that the answers to the questions are correct. Easier said than done. I do my best to be accurate, but I do sometimes get things wrong.

One of my questions in the most recent quiz was "How many Astronomers Royal were ordained?" I said four – John Flamsteed, James Bradley, Nathaniel Bliss and Neville Maskelyne. But one respondent to the quiz suggested that I had got the answer wrong. There was a fifth Reverend, the respondent claimed - the sixth Astronomer Royal, James Pond.

I checked my sources. Dr Emily Winterburn wrote a very readable short guide to the Astronomers Royal, aimed at a younger audience but still a good place for a first check. No sign of Pond being a Reverend. Then I went to the Biographical Encyclopedia of Astronomers – nothing there either. [Coincidentally, the BEA entry for John Pond is by Professor Jay Pasachoff, with whom I visited Pond's grave in Blackheath – for complicated reasons, Pond is buried in the same tomb as Edmond Halley. I told the story of our visit in "Hunting Halley" in edition 11 of the HS newsletter].

Marie Louise, on the other hand, sent me some evidence to suggest that Pond was ordained. There is a monument on Pole Hill, Epping Forest, marking the Greenwich Meridian, with a plaque on it which reads:

This pillar was erected in 1824 under the direction of the Reverend John Pond, MA, Astronomer Royal. It was placed on the Greenwich Meridian and its purpose was to indicate the direction of true north from the transit telescope of the Royal Observatory. The Greenwich Meridian as changed in 1850 and adopted by international agreement in 1884 as the line of zero longitude passes 19 feet to the east of this pillar.

This would seem to be conclusive. The pillar, it's claimed, was erected under the direction of the Reverend Pond. However, the biographies of Pond which I consulted all claimed that Pond never completed his degree, due to ill-health, so the MA attribution is definitely suspect. So perhaps the Reverend was too.

I researched further. I can thoroughly recommend a long and fascinating online article about Pond by Graham Dolan, on the ROG website

<http://www.royalobservatorygreenwich.org/articles.php?article=1301>

Dolan's article addresses the monument and the plaque:

“The text on the plaque also contained at least one and possibly two rather more serious errors. It described Pond as the ‘Reverend John Pond, M.A.’ Firstly, unlike most of his predecessors (Flamsteed, Bradley, Bliss and Maskelyne), Pond had not been ordained and was not a Reverend. Secondly, although Pond may have obtained a Cambridge M.A., he is not shown as having been awarded such a degree in [Alumni Cantabrigienses from the earliest times to 1900](#). It is not presently known who was responsible for the wording on the plaque.”

As a result of Dolan’s article, Pond is rapidly becoming one of my favourite astronomers! Many details of his life remain obscure (for example, there is no portrait of him, though a portrait of another John Pond, the livery stable-keeper of Newmarket, was mistakenly used for many years). Conventional wisdom is that the observatory was run down during Pond’s tenure and had to be revitalised by George Biddell Airy after he succeeded Pond, but the full story is, as often, more nuanced. Pond was not an able administrator, so running an observatory was not his forte. But he was an excellent observational astronomer.

One last issue needs to be cleared up. Why isn’t the Pond memorial precisely on the prime meridian? Was this yet another mistake? Well, no, because the exact position of the Greenwich meridian line changed in between the construction of the monument in 1824 and the addition of the plaque later. The prime meridian line was, literally, the north-south line through the transit telescope at Greenwich. Pond observed with one transit telescope; then Airy replaced it in 1850 with another scope 19 feet (5.8m) to the east. This became the prime meridian of the world when the matter was settled at a conference in 1884.

Incidentally, if you ever do visit the memorial in Epping Forest, take a GPS with you! The GPS won’t read 0 deg, 0 min, 0 sec at the monument; but moving east probably won’t get you to zero either, as the GPS longitude system has now been decoupled from the 1884 meridian. Mark Edwards, who spoke to the section last time we met in Birmingham, in 2017, once took a GPS to Greenwich - he discovered that these days the actual prime meridian is marked, not by the brass line which everyone photographs, but by a rubbish bin some metres to the west!

Elsewhere in the newsletter, Lee Macdonald has written an obituary and appreciation of Dr Michael Hoskin, the astronomical historian, who passed away last year. I attended one or two lectures by Dr Hoskin and reviewed one of his magisterial books on Herschel, *“The Construction of the Heavens: William Herschel’s Cosmology”* (CUP, 2012) for the *Journal* but I didn’t know him well – so Lee, who worked with him, is the right person to write the appreciation.

Michael Hoskin was a founder and supporter of the Society for the History of Astronomy and was an Honorary Vice-President of that organisation. I am delighted to say that the SHA have appointed another Herschel expert, Dr Emily Winterburn, who I mention above, to become the new Honorary Vice-President. Emily spoke to the historical section about Herschel’s life as a musician in our section meeting in York in 2016.

Michael Hoskin (1930-2021)

Lee MacDonald

Dr Michael Hoskin, one of the world's most eminent historians of astronomy, died in Cambridge on 5 December 2021, aged 91.

Born in London in 1930 and educated at a local grammar school, Michael Hoskin was a classic example of a historian of science who originally trained in a different field and then came to the subject while it was still in the process of becoming a separate academic discipline. He did both a bachelor's and then a master's degree in mathematics at the University of London, before entering Peterhouse, Cambridge in 1949 to start a PhD in pure mathematics. This he successfully completed in 1952 and he then proceeded to a research fellowship at Jesus College, Cambridge. Later in the 1950s, he decided to take a different turn and was appointed to a newly-established lectureship in the history of science at the University of Leicester. One story tells that Michael switched to a different field because he did not feel that he was in the same league as two of his mathematical contemporaries at Cambridge: the future Nobel Laureate Roger Penrose and also Michael Atiyah, who would become President of the Royal Society!

Michael Hoskin did, however, return to Cambridge fairly soon. In 1959 he became a lecturer in History and Philosophy of Science at Cambridge and remained there for the rest of his career, serving as head of the HPS department from 1975 to 1986. Several of his research students became famous historians of astronomy in their own right – among them Jim Bennett, Simon Schaffer and Robert W. Smith.

While at Cambridge, Hoskin established himself as one of the world's leading experts on the history of astronomy, especially of the Herschel family. His first book on William Herschel was published in 1959. In 1963 he published *William Herschel and the Construction of the Heavens*, which became a classic of Herschel studies and came out in a second edition in 2012. Over the years he published several books and many academic papers on the Herschel family. His 2011 *Discoverers of the Universe: William and Caroline Herschel* can be regarded as a summation of his life's work in this area. His work is particularly notable for establishing the true significance of Caroline Herschel as much more than an assistant to her brother William, but rather a major astronomer in her own right.

In 1969, Michael Hoskin founded the *Journal for the History of Astronomy*, which he edited from its first issue in 1970 right up until 2013. It remains the world's most prestigious journal in this field. In the early 1960s he also helped to found the journal *History of Science*. Hoskin was also a pioneer of archaeoastronomy, with the *Journal for the History of Astronomy* being accompanied by an archaeoastronomy supplement for some years. He became renowned for his surveys of the orientations with respect to the solstices of prehistoric tombs across Europe, particularly in Spain, where he was awarded that

country's Gold Medal of Fine Arts for this work. The medal was presented in 2015 by the King of Spain in person.

A devout Roman Catholic, Hoskin was a Foundation Fellow of St Edmund's House, when in 1965 it became one of the University of Cambridge's new colleges for graduate students. St Edmund's House dates back to 1896, when it was founded as a house for Catholic students and visiting scholars. Among these visitors was the Belgian priest and cosmologist Georges Lemaître, father of what later became known as the 'Big Bang' theory of cosmology, who was at St Edmund's in 1923-1924 when he was working with the renowned astronomer and relativity expert Arthur Eddington. St Edmund's is now a thriving Cambridge college with more than 700 graduate and undergraduate students from around the world, of all faiths and backgrounds. Hoskin also played an instrumental role in founding the Churchill Archives Centre at nearby Churchill College, which houses the papers not only of Sir Winston Churchill but of numerous major political and scientific figures.

I came to know Michael Hoskin personally while I was a student at St Edmund's in 2007-2008. Hoskin often attended the College's formal dinners with his delightful wife Jane (died 2013) and I learned a lot from him about doing research in the history of astronomy. His work lives on, in both his writings and in the many scholars who learned their trade from him.

Erwin Finlay Freundlich (1885 - 1964)

Mike Frost

In addition to my lecturing to astronomical societies, I am a STEM ambassador, talking about Science, Technology, Engineering and Mathematics in schools. My employer supports this activity and so I can cover all four of the STEM branches, talking about my day job in engineering as well as my interests in astronomy, physics, and maths. Indeed, many of the STEM activities in the Midlands are organized by the Institute of Engineering and Technology (of which I am a Fellow), and run by their STEM Coordinator, an inspirational man called Derrick Willer, who has received an MBE for this work.

When I was just starting to do STEM work for the IET, Derrick organized a networking evening for STEM ambassadors at one of the local schools. I wasn't keen to go, as I didn't think I would know anyone there and I can find these sorts of events quite intimidating. However, I have also come to realize that it's worth persevering; if you don't know anyone, go talk to someone! So I went, and of course, I had an enjoyable evening: I did already know a few people, as it turned out.

One new friend I enjoyed talking to was a chap called Willy Goldschmidt. Willy is retired now from a career in the IT industry and is an enthusiastic speaker on careers. But when he found out that I was an astronomer, he dropped a bombshell.

“Oh, you might be interested in my grandfather. He worked with Einstein...”

Reader, you will not be surprised to know that I was very interested!

Erwin Finlay Freundlich, it turns out, did not just work with Einstein, but was a close collaborator in the early years. Indeed, Einstein wrote a preface to Freundlich’s pamphlet “The Foundation of Einstein’s Theory of Gravitation” and concludes with “*he is the first amongst fellow scientists who has taken pains to put the theory to the test*”



Figure 1: Prof. Erwin Finlay Freundlich (1885-1964)

Erwin Freundlich (as we’ll see, the Finlay was added later) was born in Biebrich, a suburb of Wiesbaden, Germany on 29th May 1885, one of seven children. His father was Friedrich Philipp Ernst Freundlich, a manufacturer, and his mother Ellen Elizabeth (Ellie) Finlayson, a woman of British ancestry. Although Freundlich senior was of Jewish heritage, the family were brought up as protestants.

After leaving school in 1903, Freundlich originally started working in the shipyards in Stettin, north-east Germany, and studying naval architecture at the Charlottenburg University in Berlin. However, within a year, he had switched to studying mathematics and astronomy at Gottingen University in central Germany. Gottingen has a strong reputation for science – the great mathematician Karl Friedrich Gauss worked there, for example – and Freundlich’s lecturers included the geometer Felix Klein and Karl Schwarzschild, another collaborator of Einstein who gives his name to the Schwarzschild radius of a black hole, the point of no return beyond which even light cannot escape.

Freundlich gained a doctorate from Göttingen in 1910 and went to work as an assistant at the Royal Berlin Observatory. Here he made the acquaintance of Albert Einstein. This was not just a casual acquaintance; Freundlich and Einstein collaborated on problems in relativity. Erwin Freundlich features as a character (played by Luke Allen-Gale) in National Geographic's 2017 series "Genius" about the life of Einstein (played by Johnny Flynn and Geoffrey Rush). He is also a character in Stuart Clark's 2014 novel "The Day Without Yesterday", about the revolution in cosmology in the early years of the 20th Century.

Erwin Freundlich wanted to see if he could find ways of taking measurements which could distinguish between Newtonian gravity and Einstein's General Relativity. Einstein had thought of three possible tests, and over the next few years Freundlich tried to help him acquire data for all three tests.

The first test was to see if the General Theory could explain the precession of the orbit of Mercury, which couldn't quite be explained by the existing theory of gravity. Freundlich helped calculate exactly how big the discrepancy was between prediction and measurement and came up with the now famous 43 seconds of arc per century. A tiny amount! But Einstein could explain it.

For the second test, Einstein realized that mass curved spacetime, meaning that the path followed by light was not a straight line, although it differed little in all but the strongest gravitational fields. The strongest gravity in the solar system is close to the Sun, but clearly the Sun is so overwhelmingly bright that any deviation of light as it passes the Sun is difficult to observe. Freundlich suggested that the light from distant stars, passing close to the Sun, could be observed during the few brief minutes of a total solar eclipse, when the light of the Sun's photosphere is blocked by the Moon. This may be familiar to you, but you will probably know it from Eddington's expedition of 1919. But Freundlich was first to attempt the observation!

Erwin organized and led an expedition, financed by the Krupp family, to Crimea in 1914 to observe the total eclipse of August 21st. However, 1914 was not an auspicious time for scientific expeditions. Even as Freundlich and his party set out, war broke out between Germany and Russia. In Crimea, Freundlich was arrested, and his scientific instruments confiscated. [The BAA did organise a similar expedition to observe this eclipse, and with similar results. Ed]

Freundlich was released a few days after the eclipse in a prisoner swap and was able to return to Berlin. With hindsight, however, his failure to be in place for the 1914 eclipse was a lucky break for Einstein, as his theory of General Relativity had not reached its final formulation at this time. In particular, Einstein's prediction for the amount of deflection by the Sun changed (doubled) between 1914 and 1915. Had Freundlich managed to measure starlight deflection in 1914, he might have proved Einstein's 1914 theory wrong, and dealt a blow to his reputation. Freundlich travelled to the total eclipses of 1922, 1926 and 1929 to

try to repeat the experiments he couldn't conduct in 1914. He was clouded out in 1922 and 1926, but in 1929, he believed he had measured a deflection greater than that predicted by General Relativity, although consensus is now that his measurements had a systematic error in them. Nonetheless, this meant that he never fully accepted General Relativity, even though he had been so closely involved in the early tests of the theory.

Freundlich pursued a third means of testing Einstein's predictions. General Relativity predicted a doppler shift of the frequency of light in a gravitational field. Freundlich had already suggested that a small positive bias (the K-term) in the redshifts of stars which were meant to be at rest relative to the Sun were actually due to gravitational redshift; his interpretation was not widely accepted. Erwin further proposed to use the Sun's gravity to test Einstein, this time by careful measurement of the wavelength (and thus frequency) of emission lines in the solar spectrum. To do this he proposed to build a quite extraordinary telescope, the Einstein Türm (Einstein Tower) a solar telescope at the Kaiser Wilhelm Institute in Potsdam, to the west of Berlin, and resigned from the Berlin Observatory to pursue this work. Willy Goldschmidt has a photograph of Erwin and Einstein walking together in the grounds of the Potsdam Observatory (annotated "*Freundlich, Einstein and Prof K Müller searching the site for the Einstein Tower in the park of the Astro Physical Observatory in Potsdam.*"). Unfortunately, the photograph is taken from behind, so it is impossible to recognise any of them! Freundlich's plan was realized by Erich Mendelsohn, who built the Einstein Tower as a solar observatory between 1919 and 1921, becoming operational in 1924.



Figure 2: Freundlich, Einstein and Müller (in no particular order)

I visited the Einstein Türm in 2016. This peculiar and distinctive building looks like an observatory as envisaged by Salvador Dali. Einstein, when he toured it, described it as "organic", perhaps because many of the walls of the building are curved. It's a four-story tower, surmounted by a dome, all sat on a multi-level base. A coelostat in the dome reflects the solar image down the tower to the base, where a spectroscope splits the light into its constituent colours for analysis. All the moving parts are at the top of the tower, and its height means that the effects of atmospheric turbulence at the top are negligible compared to those at its base. The original plan to use concrete for the building was hampered by a lack of building materials and it was eventually constructed using brick and

white stucco, leading to a redesign of some of the scientific layout, though without a loss of sensitivity. In recent years, the tower has been restored to something approaching its original design.



Figure 3: The Einstein Tower Observatory (IAU Observatory Code 042)

Unfortunately, it turned out that the Einstein Tower wasn't able to carry out its set task of verifying General Relativity. The problem lay in the turbulent outer layers of the Sun, which added unpredictable redshifts due to velocity on top of the predicted gravitational redshift. It wasn't until the 1950s that scientists were able to tease out the small gravitational redshift of solar radiation from the larger turbulence effects. Nonetheless, the observatory was used successfully as a solar observatory for many years. In particular, Walter Grotrian carries out work of international importance on the solar corona during the 1930s. He determined that a particularly impressive spectral line in the corona, which had been suggested was due to a new element, "Nebulium", was actually due to heavily ionized iron.

The careers of Einstein and Freundlich drifted apart during the 1920's (Freundlich is only in one episode out of ten of "Genius"). Additionally, world events once again interfered

with Finlay Freundlich's life. Erwin had married Kate Hirschberg, who was Jewish, in 1913. His Jewish connections began to make life increasingly difficult as Hitler rose to power through the early 1930s, and Freundlich decided to move elsewhere.

In 1933 he accepted a post as astronomer at the Istanbul Observatory. Turkey, under Ataturk, began to modernize during the 1930s, and science was favoured. Freundlich wrote an astronomy textbook, which became the first such to be translated into Turkish. However, Freundlich did not stay long, moving on to the Charles Observatory in Prague in 1937. This may have been better for his career, but once again world events foiled his plans; it became clear that central Europe was no longer safe. Freundlich had been making enquiries about a job in Britain, adding "Finlay" to his name to emphasise family connections to the UK through his mother. Freundlich travelled to England in 1939 and, with the help of Eddington, was able to secure an academic position at the University of St Andrews. When Germany occupied Czechoslovakia in 1939, Erwin's wife and family fled, on one of the last trains out. Willy Goldschmidt's family have testimony from Freundlich's wife and daughter about how terrifying the journey was; in particular, a day spent at the German-Dutch border, where the passengers on the train had to prove that they were entitled to leave Germany; many were left behind.

Freundlich's brother, a professor of chemistry, also came to the UK and worked at UCL before emigrating to America. Erwin, however, was happy at St Andrews. During the war he taught Aircrews how to navigate by the stars when flying at night.

Another refugee from Germany, Max Born, also settled in Scotland. Max Born and Erwin Finlay Freundlich worked together in the 1940s and 50s on an attempt to explain cosmological redshift by means of "tired light" theories, another indication of Finlay Freundlich's unhappiness with relativity. Max Born, a Nobel prize-winner in Physics, is not a central character in this story but his story is similar to Freundlich's in a number of intriguing ways. Born also studied at Gottingen, though he managed to annoy Felix Klein by not entering a prize competition Klein had suggested (they made up and Born eventually won the prize). Like Finlay Freundlich, Born had Jewish heritage which forced him to leave Germany for the UK; he became a British citizen the day before WW2 broke out. He worked first at St Johns College, Cambridge, but became a professor at Edinburgh University. One of Max Born's grandchildren is the singer Olivia Newton-John.

At St Andrews, Erwin Finlay Freundlich constructed a new observatory and commissioned a Schmidt Camera to his design. The ultimate aim was to give the observatory a professional-class instrument, but first of all a smaller prototype camera was to be built. To test the camera, he installed it at the Mills Observatory in Dundee. This was a curious decision as the Mills Observatory is a public observatory, and it isn't possible to look through a Schmidt Camera! Eventually Freundlich brought the Schmidt Camera back to St Andrews and proposed that it be replaced in the Mills observatory by an 1871 Cook Refractor which had been used for training purposes by astronomy students at St Andrews. This was a much better telescope for the Mills observatory, and is still in use,

though showing its age. I visited the Mills observatory when the BAA met in Dundee in 2016. Freundlich attempted to commission a larger Schmidt Camera for St Andrews, but this eventually foundered as he neared retirement. Professor Stubbs, who succeeded him at St Andrews, didn't allow him access to complete the project. The camera was never a success.



Figure 4: The Mills Observatory, Dundee

Dr Dave Gavine, former director of the BAA Aurora section, was a student of Finlay Freundlich's at St Andrews. Dave and I met for lunch a day or two prior to the Historical Section meeting in Stirling in 2018, at which Dave spoke. We had a very enjoyable time reminiscing about his life. Dave is unfortunately no longer with us, and I think he was keen to tell his stories to me and as many other people as possible before he left us. Dave's memories of Finlay Freundlich were of an imposing and distant figure; he particularly recalled a slide from one of his lectures, which was impenetrably annotated in gothic German.

Finlay Freundlich retired from St Andrews in 1959. As West Germany recovered from the war, he decided to move back to Wiesbaden, and so spent his last few years in his birth town, with an emeritus position at the University of Mainz. (In another echo of Finlay Freundlich's life, Max Born also returned to West Germany in retirement). Erwin Finlay Freundlich died on 24 July 1964.

Erwin Finlay Freundlich's story is remarkable. He was clearly a talented man, who forged a distinguished career. Yet his most important achievements are so closely yoked to Albert Einstein's career, even though they only overlapped for a few years. And his life serves as a reminder of how lives and careers can be at the mercy of political events completely outside our control. The eclipse of 1914, which could have sealed Finlay Freundlich's reputation, was torn from his grasp by the onset of World War 1. And he was lucky to avoid the terrible fate befallen by so many in World War 2.

Sources:

The photograph of Einstein and Finlay Freundlich together is courtesy of Willy Goldschmidt. I am very very grateful to Willy for his family's insights into Erwin's life.

The photograph (figure 1) of Finlay Freundlich was provided by Dr. Dave Gavine.

https://en.wikipedia.org/wiki/Erwin_Finlay-Freundlich

Kragh H. (2007) Freundlich, Erwin. In: Hockey T. et al. (eds) The Biographical Encyclopaedia of Astronomers. Springer, New York, NY.
https://doi.org/10.1007/978-0-387-30400-7_481

Series 1 of "Genius", directed by Ron Howard, tells Einstein's life story (series 2 is about Pablo Picasso and series 3 about Aretha Franklin). It's a well-written drama, focusing as much on Albert's complicated personal life as on his scientific achievements. Finlay Freundlich appears in episode 6.

"The Day Without Yesterday" by Stuart Clark (Polygon, 2014)

Two New Zealand Refractors with English Pedigrees *Wayne Orchiston*

In recent years I've published research papers about two notable New Zealand-based Cooke telescopes that originally were associated with well-known English amateur astronomers:

Orchiston, W., 2016a. From Crossley to Carter: the life and times of an historic Cooke refractor. In Orchiston, W., *Exploring the History of New Zealand Astronomy: Trials, Tribulations, Telescopes and Transits*. Cham (Switzerland), Springer. Pp. 337–367.

Orchiston, W., 2016b. The Wanganui refractor and its remarkable English equatorial mounting. In Orchiston, W., *Exploring the History of New Zealand Astronomy: Trials, Tribulations, Telescopes and Transits*. Cham (Switzerland), Springer. Pp. 293–313.

The first of these papers deals with the 9.33-inch refractor made in 1867 by T. Cooke & Sons for Edward Crossley (1841–1905), which was housed in his 'Bermerside Observatory' on the outskirts of Halifax, between Manchester and Leeds. Crossley was so busy that he employed a full-time astronomer, Joseph Gledhill (1837–1906), to run the Observatory and make most of the observations. In 1896 the achromatic Cooke objective was replaced by one of Dennis Taylor's new photovisual triplets, which gave improved performance and was optimised for photography. At the time, this was one of the largest photovisual objectives made by Taylor. After Crossley died the telescope was sold to the Reverend Dr David Kennedy in New Zealand in 1906, and eventually ended up at Carter Observatory in the nation's capital, Wellington, when this national facility was established in 1941. This historic telescope, now with a replacement 9.75-inch aplanatic objective that was made in

2001, still has pride of place as a major visitor attraction at the Carter Observatory (Figure 1).

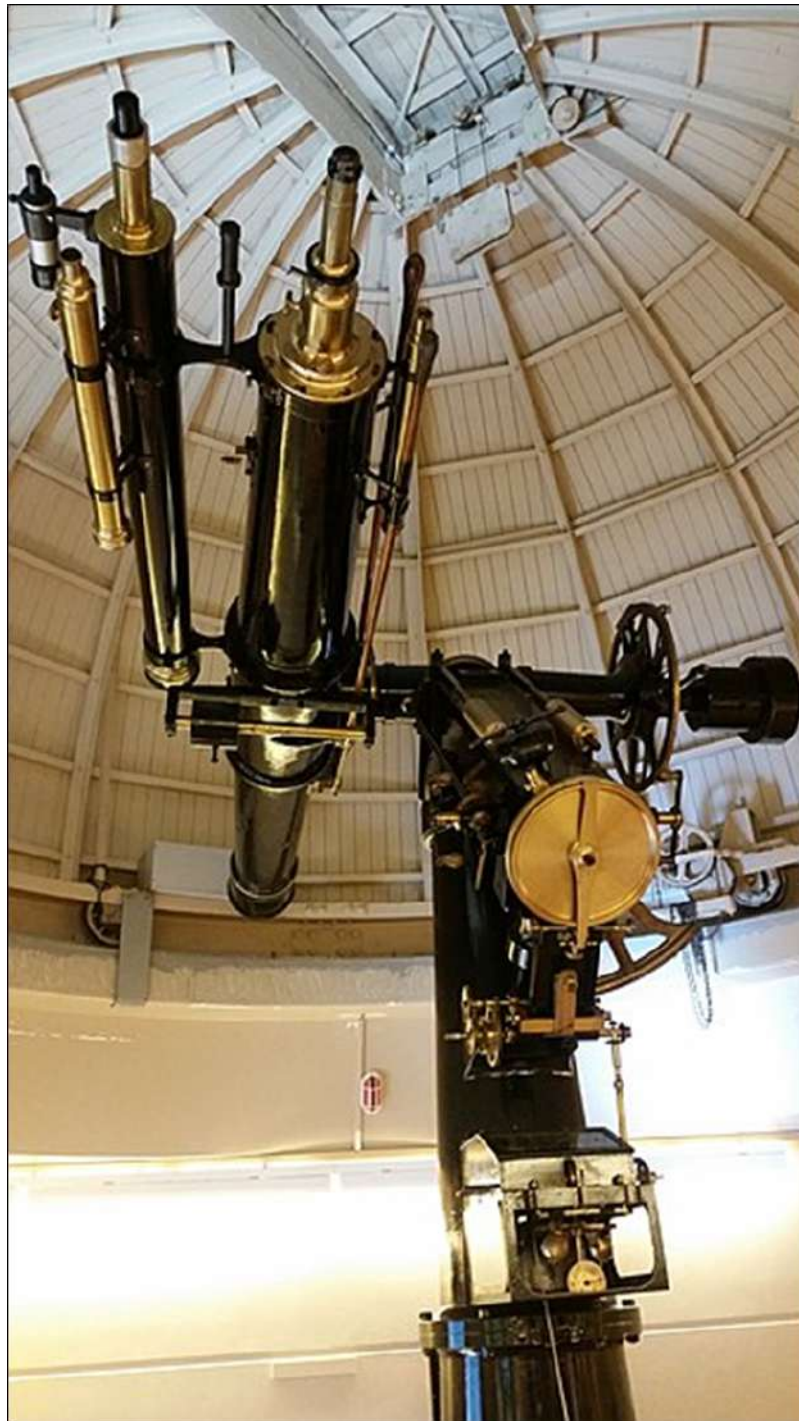


Figure 1: The 9.75-inch refractor at Carter Observatory in Wellington, New Zealand.

The second paper discusses the history of a 9.5-inch Cooke refractor that was made for Isaac Fletcher (1827–1879) in 1859 and housed in his Tarn Bank Observatory adjacent to his house in Carlisle, in far north-western England. At the time this ranked as about the 15th-largest refractor in the world, but what made it even more important was that it featured the first-ever all-metal English Equatorial Mounting. While the optics and tube assemble were by Cooke, Fletcher has his brother (who ran an engineering business) fabricate the mounting. There is considerable confusion about this telescope in the

literature because H.C. King erroneously assigned it to John Fletcher Miller in his otherwise trustworthy book *The History of the Telescope*. After Fletcher died suddenly in 1879 the telescope was purchased by the Manchester amateur astronomer Samuel Chatwood (1833–1909, see Figure 2), but he made little use of it. In 1902 Chatwood sold the telescope to the Wanganui Astronomical Society in New Zealand, and it remains in Wanganui to this day at the Ward-Wanganui Observatory.

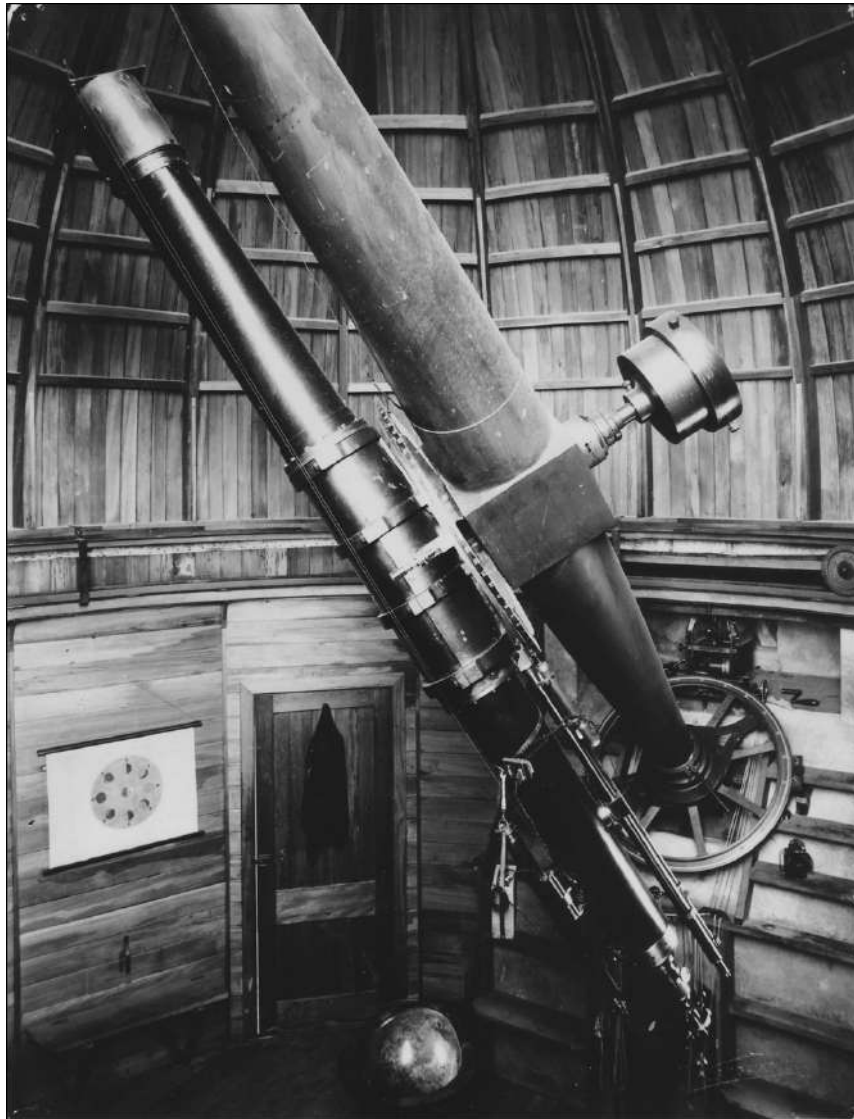


Figure 2: The 9.5-inch Cooke refractor in Mr Chatwood's Observatory.

E-copies of both chapters are available from the author.

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Oxford University Astronomical Society

Christopher Taylor

Dear Bill, dear Mike,

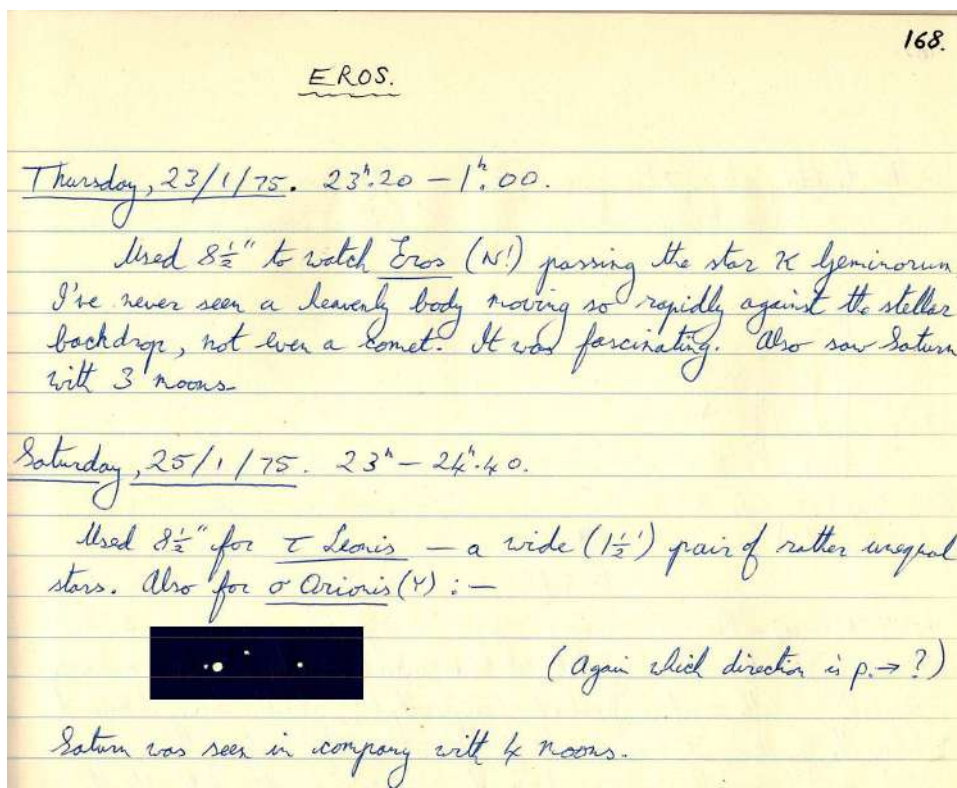
Re the current section newsletter [No 24.], I was not aware of having met Peter Morris before but, as you'll see from the attached page-scan of my obs.-journal entry for 23rd Jan. 1975, he and I must have been of the same party that night in Oxford observing the close pass of Eros with the Oxford University Astronomical Society's telescope! I had, in fact, been using the telescope quite a bit that week on double stars and deep sky, as I now see from the obs.-journal of the time (but had clean forgot until looking up the entry for that ever-memorable fly-past of Eros).

Incidentally, the OUAS telescope then was an AE Luton 8¹/₂-inch Newtonian on steel-tripod-mounted German equatorial head, actually rather a good instrument in my recollection, although hauling it out of the cupboard where it was stored to set up outside for the night was a decidedly strenuous exercise. The site, in the middle of St. Catz. coll., wasn't ideal thanks to light-spill from closely adjacent windows but it's surprising what galaxies, etc we still managed to see there with the 8¹/₂-inch. I believe the society disposed of the telescope some years later to contribute to funds for a larger, permanently mounted instrument. Unfortunately, OUAS appears to have been dormant for the last few years and I have had no news of student astronomy in Oxford for some time now.

He is v. welcome to contact me. Maybe we'll resume that brief acquaintance of so many years ago?

Very cordially yours as ever,
Christopher Taylor

(In those far-off days, a 3rd-year physicist at Lincoln College passing himself off as 'John Taylor', a committee-member in '76-77.)



Oxford University Astronomical Society

Paul Leyland

Hi Mike,

Just read your latest newsletter and came across someone I knew well. Peter Morris and I were at Oxford together and the old OUAS telescope was indeed an 8" (as we called it in those days) AE Newtonian reflector. It was replaced in 1979 or so with a 27.5 MakCas made by Peter Drew (who is still alive and kicking) of Bedford Astronomical Supplies.

All the best, Paul

[ed. We would be delighted to hear more about the history of Oxford University Astronomical Society – or indeed any of the other university astronomical societies]

Dates for your diary

"New Views of William Herschel (1738-1822)" will be presented as a Zoom Webinar at 6pm GMT on Saturday 5th March 2022. The session is dedicated to the memory of the preeminent Herschel scholar Michael Hoskin and is sponsored by the Historical Astronomy Division of the American Astronomical Society. The full programme (including abstracts) is available at:

[https://had.aas.org/sites/had.aas.org/files/New%20Views%20of%20William%20Herschel%20Webinar%20\(program\).pdf](https://had.aas.org/sites/had.aas.org/files/New%20Views%20of%20William%20Herschel%20Webinar%20(program).pdf)

Free compulsory registration at:

https://aas-org.zoom.us/webinar/register/WN_gWV4aX0qTJWVZZVeeqPDCA

SHA Spring Conference Saturday, 12 March 2022, 10am to 5pm, a physical meeting at the Birmingham & Midland Institute, 9 Margaret St., Birmingham. Booking essential, email meetings@shastro.org.uk to attend.

"Astronomy in the Great Mosque of Damascus: Towards a Social History of Mamluk Astronomy", Yusuf Tayara, Oxford History Department, 15th March 2022, 5pm GMT Hybrid event. To register:

In person: <https://www.eventbrite.co.uk/e/yusuf-tayara-oxford-astronomy-in-the-great-mosque-of-damascus-tickets-256033261377>

Online via Zoom:

https://durhamuniversity.zoom.us/webinar/register/WN_0NNMAmXZQASDB29iFJrfzQ

BAA Webinar: "The History of Silvering Telescope Mirrors", Wed 16th March 2022 at 7pm GMT. Howard Banich will lead this webinar on the history of silvering telescope mirrors.

SHA Webinar: "Walcher of Malvern", with Dr Philipp Nothhaft, Research Fellow, Trinity College Dublin. Monday, 28th March 2022 at 8pm (BST). Places are limited.

For Zoom link details and to register, email meetings@shastro.org.uk

BAA Historical Section on-line Meeting 2022, Saturday 14th May 2022 at 2pm (BST).

"Cosmic Harmonies" a symposium celebrating the life, science, music and legacy of William Herschel (1738-1822), 19th June 2022, York Festival of Ideas.