



---

The British Astronomical Association

Historical Section

Director: Mike Frost – [FrostMA@aol.com](mailto:FrostMA@aol.com)

Deputy Director: Bill Barton – [barton.bill@hotmail.com](mailto:barton.bill@hotmail.com)

---

Newsletter No. 31

Spring 2025

## Contents:

- p.1 From the Director - Mike Frost
- p.5 An Astronomical Paper, without References, or, searching out the Astronomical Luminaries of Australia, in daylight - Garry P Dalrymple
- p.8 World War II, Dr Elizabeth Alexander and the Birth of Solar Radio Astronomy - Wayne Orchiston
- p.15 Lockyer Sun - Mike Frost
- p.18 Shuckburgh Hall - Mike Frost
- p.21 An ancient observation of T Corona Borealis?
- p.21 Journal of Astronomical History and Heritage - Wayne Orchiston
- p.26 Dates for your diary

## From the Director

### *Mike Frost*

Our next section meeting will take place on Saturday 31<sup>st</sup> May 2025, at the Devon and Exeter Institution, 7 Cathedral Close, Exeter, Devon EX1 1EZ. This is the home of the remarkable Victorian Moon globe, produced by the “stationmaster astronomer” Roger Langdon, whose 200<sup>th</sup> birthday we will be celebrating. The DEI will be pleased to show us some of the other astronomical treasures of their library.

The DEI is in the centre of the city of Exeter, only 1km from Exeter station. As you might expect from the address, the building is close to Exeter’s beautiful cathedral.

Two themes have emerged for the week-end – the Moon, and the Norman Lockyer observatory.

I will be speaking to the Norman Lockyer Observatory Society about “Norman Lockyer: his early life and times in the Midlands” on Friday May 30<sup>th</sup>. You are welcome to come along.

For the Saturday meeting, our line-up is as follows:

- 10:00 Doors open, welcome and housekeeping announcements
- 10:10 Bill Barton – “Roger Langdon”

11:05 A tour of the DEI library

12:00 Lunch. The DEI does not have a café, however the DEI is in the centre of Exeter, so there are plenty of places to eat nearby.

13:00 Welcome back

13:05 Beatrice Steele – “The Norman Lockyer Observatory and Archaeoastronomy”

“It has long been acknowledged that Norman Lockyer played a central role in the foundation of archaeoastronomy in the late nineteenth and early twentieth centuries. Whilst he is often framed as a lonely figure working at the dawn of the field, newly digitised lantern slides from the Norman Lockyer Observatory archives reveal his extensive interactions with a dedicated network of British archaeoastronomical researchers. This talk seeks to explain why his archaeoastronomic work was not well-received by prominent archaeologists, and why the discourse around archaeoastronomy up until this time smothered his attempts to legitimise the theory of orientation.”

14:00 Carolyn Kennett – “Mary Proctor”

“Mary Proctor illuminated the wonders of the cosmos with her engaging storytelling and passion for astronomy. A renowned populariser of the subject, she authored numerous works, including in 1928 *The Romance of the Moon*. This talk will explore her remarkable life, her contributions to science education, and her enduring connection to the Moon.”

14:55 Break

15:05 Professor Wayne Orchiston – “John Tebbutt”

“The Australian amateur astronomer John Tebbutt (1834-1916) has a crater named after him on the Moon. In this presentation I will describe Tebbutt's Windsor Observatory, his astronomical and other scientific observations, his education and outreach activities, his involvement with early Australian astronomical groups (including the BAA New South Wales Branch), and his publications. During the nineteenth century Tebbutt was a prominent figure in international positional astronomy, and he is living proof that it was still possible for a talented, dedicated amateur astronomer working in virtual geographical and intellectual isolation to make a valuable contribution to forefront astronomical research at this time.”

16:00 Meeting closes (the DEI closes at this time too)

Further details and a registration form (we're not charging, but we'd like to know numbers) can be found at: <https://britastro.org/event/historical-section-meeting-2025>

I'm sure we will be dining in Exeter on Saturday evening, so if you want to join us, let us know.

On Sunday June 1<sup>st</sup>, we'll offer the chance to visit the Norman Lockyer Observatory in Sidmouth, 15 miles to the east of Exeter. We'll arrange lifts to the NLO from the DEI, departing at 9:20 AM and arriving in Sidmouth at 10:00 AM. David Strange, the NLO director, will show us round the observatory, the tour taking around 2 hours. If people are interested, we can pay a visit to the Lockyer family plot in the nearby churchyard at Salcombe Regis.

For 2026, I'd like to hold a section meeting in the north of England. In previous years, we have held meetings in York and Liverpool, and it would be great to meet in another northern city. Let me know if you can suggest a suitable venue, or if you are a member of a society who are willing to host us.

\*\*\*

There are a few matters arising from the last edition's editorial:

I put a "breaking news" note into the last editorial, advertising a new section in the section website listing all the solar system objects named after BAA members. This follows on from our attempts to find all asteroids named after BAA members. We have now extended this to comets, craters on Mercury, Venus, Mars and the Moon, and other features around the solar system. I am, as often, very grateful to my predecessor as section director, Tony Kinder, who provided most of this information. I'm delighted to provide a platform for his many years of careful research.

I also want to say a big thanks to Finbarr Connolly, who has done a very thorough review of the Obituaries section of our website, identifying some errors but also filling in a lot of birth and death dates which aren't obvious, or don't appear, in the texts of the obituaries.

\*\*\*

Just before Christmas, I received some very sad news about the passing of a stalwart of our section, Christopher Taylor. Christopher has been a regular at our section meetings and spoke at our Liverpool meeting in 2016 about "William Herschel and the Expansion of the Universe". He contributed several times to the newsletter; my favourite was a long and insightful essay on "Einstein, Eddington and 1919" in edition 21. He was also a regular contributor to the Journal. He was the supervisor of the Hanwell Community Observatory, in the grounds of Hanwell Castle, near Banbury. The annual "Stars and Snowdrops" event there attracted hundreds of visitors to the castle grounds and the observatory.

Christopher attended the section meeting in May 2024 in Ipswich, where he helped lead a non-invasive investigation of the telescope which George Seabroke brought along and spoke about, deducing the nature of the lens by counting the reflections from a mobile phone light shone into the aperture. A few weeks later in late June he attended the annual picnic of the Society for the History of Astronomy, which took place at Rugby School (in my hometown) in the Midlands. Christopher was very keen to see the beautiful Alvan Clark refractor, which I have written about in previous newsletters. Christopher had renovated a similar school telescope at Wellington School and was hoping to do the same for Rugby's Clark refractor.

In mid-August, I visited Christopher and Rowena at Hanwell. By this time Christopher had been told his cancer was incurable; he had come to terms with his prognosis and was determined to do as much as he could in the time remaining. He showed me round his workshop and his library, and we walked a little round the castle grounds. This was the last time I saw him. A few days later we swapped emails. His last email concluded:

*Good luck with all your endeavours Mike, and I hope we'll yet have the chance 'to talk of many things',*  
*Christopher.*

Sadly, like his plans to renovate the Clark refractor, it was not to be. I'm sure there will be obituaries to follow, but I wanted pay tribute here to a good friend. RIP Christopher.

\*\*\*

I would be remiss not to mention another project which Christopher Taylor was involved in – the attempts to secure a blue plaque in Tulse Hill in South London to commemorate William and Margaret Huggins, the pioneering spectroscopists. Last year marked the bicentenary of the birth of Sir William Huggins, and Jack Martin spoke at our Ipswich meeting about his research into the Hugginses. In the last newsletter, I suggested that we should apply for a blue plaque.

Christopher contacted me to say that he had already made some considerable efforts to do this; first through the Royal Astronomical Society, and then through the Society for the History of Astronomy. He reminded me that he had spoken to the SHA in 2018 (when I was working outside the UK) about the Hugginses, making the remarkable claim, which I had not previously appreciated, that they had essentially discovered the Balmer series of hydrogen lines. The extraordinary mathematical relationship between the frequencies of the spectral lines, utterly inexplicable until the development of quantum mechanics, was first noted by the Hugginses. Curiously, Barbara Becker's otherwise excellent biography, *Unravelling Starlight*, which does so much to highlight the contributions of Margaret Huggins, has little to say about their observations of hydrogen.

So, there is a strong case to commemorate William and Margaret at the site of their observatory (and home) where they made these observations from. Why not a blue plaque? Well, there is a problem – the house no longer exists. It was demolished after the second world war when much of London was redeveloped following the blitz. I have never been to Tulse Hill, but I am told that a very non-descript housing development now stands there. With no plaque. Indeed, the English Heritage website, where one can suggest candidates for blue plaques, states, rather sternly, "We do not consider 'sites' of now-demolished buildings, or properties with significantly altered appearances or facsimile frontages." English Heritage blue plaques commemorate buildings, not their occupants.

Christopher had made an alternative approach, via Lambeth Council, which was more promising. The Lambeth archivist made some investigations but as of 2022 had been unable to identify a suitable site for the plaque. When I contacted Lambeth Council they suggested I got in touch with local history groups on Tulse Hill.

I think it's a fitting tribute to Christopher Taylor that I continue this line of enquiry.

Mike Frost

\*\*\*

# **An Astronomical Paper, without References, or, searching out the Astronomical Luminaries of Australia, in daylight**

*Garry P Dalrymple*

Abstract – The purpose of this highly misleading title is to introduce a brief article on my experiences in searching for details of the lives of Astronomers active in Australia by using TROVE, a free and public access activity of the Australian National Library, which through it's 'trove' of digitally accessible Australian newspaper articles (1801 to 1990 in some cases), offers a source of information on the lives and Public Astronomy work of many Australian Astronomy pioneers, and also offers some searchable commentaries on significant International Astronomical events/discoveries and activities that were frequently re-published in Australian newspapers.

Firstly – My point of interest has always been 'Public Astronomy' the 'What did they Know When' that informed members of the public may have picked up from the public announcements of local Astronomers and the news from overseas. The world of society journals was not as interesting to me, as what information was given out to the general public by official and self-appointed Astronomical spokes men (and of course, almost all of them were 'spokes men', although Dr Toner Stephenson has done some excellent work in identifying the Women of Australia who contributed to Astronomy in Australia, and their many achievements.

My aim has always been to lift the corner of the carpet of history and to blow away a little of the accumulated dust of the ages, in order to encourage others to have their own look through Trove and make their own re-discoveries about Astronomy and Astronomers of the past, rather than delivering the definitive account of the Grand Progress of Astronomy.

The rest of this article is going to be a number of almost random points, about what our great recent Prime Minister would refer to as 'Learnings' about what I have discovered during my self-appointed mission to search out and 'edit' the Astronomer and Astronomy related articles carried by Australian Newspapers.

How Trove works – The National library of Australia is as you might expect, a repository for many old Australian newspapers (except for those owned by Mr Rupert Murdoch?) and much other printed material. Like many other National libraries, in order to assist public access to this otherwise very fragile material, much of this material is made available on line as a scanned image facsimile, but Trove also offers a Digital transcription of these facsimile texts, with a degree of accuracy ranging from 'spot on' to 'Dead Sea Scrolls' levels of illegibility. As a 'Trove Editor' you are invited to try to read/interpret these illegible bits and to then submit your suggestions of corrections. The idea being, that if you are interested in the topic of the article, i.e., an article about a person and their family history, then you have a greater ability than any existing transcription programme to more accurately guess or more accurately interpret that series of non-letter transcriptions trailing off over a margin as being 'Pauline' or 'Mrs Pauline Anderson-Taylor', who you know to have been your great Aunt's sister-in-law. Consequently, someone with some knowledge of Astronomical terms and people, is an asset in achieving a more accurate transcription of what otherwise would be illegible Astronomically denominated newspaper articles.

I got into Trove in a major way around 2011/12, when the NSW Department of Education decided that as an 'non degree qualified, over fifty year old clerk,' I was intellectually insufficient for any employment, I would eventually have to be let go. Over several months until my last day of service, I found that after the workday was over, I could spend my time using my departmentally supplied desk top computer to access Trove and to start looking up and correcting the first of many newspaper articles about John Tebbutt and James Dunlop, as my consolation during these difficult times.

The B.A.A. - There are many instances of articles mentioning both the events of BAA meetings, both the Manchester to London meetings, as well as the activities of the NSW, Victoria, West Australian and Queensland Branches, missing from this list is South Australia and Tasmania, where in the former, an Astronomical Society commenced Before the BAA and in the latter, Tasmania, where the local 'Natural History and Philosophy' society. The commencement of the BAA was widely reported and commented on in Australian Newspapers (Tebbutt et al) and at times the reports of London meetings tend to get confused with the reportage of local branch meetings. Details such as the election of new committees and the text of Branch President's addresses, also provide a sense of what the Astronomical concerns of those days were.

Australia – the Land of Astronomical Discovery? It is fairly well known that the 'Discovery' of Australia, or rather the mapping of much of it's East Coast by Lieutenant James Cook R.N. and F.R.A.S. was a result of an Astronomical imperative – to accurately observe the Transit of Venus, in order to establish the dimensions of the Solar System. 111 years later, the recurrence of this incident resulted a re-emergence of many details of this earlier event. In addition to this, as part of the blueprint of the British settlement of NSW, a marine officer, Lieutenant William Dawes was instructed by Astronomer Royal Maskelyne and equipped with some rudimentary equipment in order to try to observe the predicted recurrence of a comet, which, Dawes was unable to do, and after two years he left the settlement, his observatory was abandoned and he undertook a career as a Colonial Administrator, Slavery Abolition Activist, and the father of a professional Astronomer of some note. I mention the example of Dawes, as while Trove does not offer contemporary articles, about his Astronomical work in Sydney, there are subsequent comments recorded about his period.

Tebbutt and Dunlop – The Greatest volume of the Trove articles I have read and corrected, by far, are those relating to the work of the two self-taught NSW Astronomers, James Dunlop (1793-1849), Parramatta and John Tebbutt (1834-1916), Windsor. The record provided by trove highlights an effect that some readers might be aware of, that of there being a time before 'Astronomy' and news about Astronomical developments were delivered by state funded institutions. For example, the next NSW Astronomer of note was Governor Sir Thomas Brisbane, independently wealthy enough to bring with him a staff of Carl/Karl Runker/Rumker and John Dunlop, and to build an observatory out the back of his principal residence at Parramatta, in order to conduct Astronomy, for his private recreation. It must be pointed out that this work, starting in 1822 and continuing (with several disputational interruptions) by Brisbane, Rumker and Dunlop, until 1848, preceded that of the Herschel South African Observatory as the Southern Station of Astronomy on 'the Other' side of the world, for some decades.

The Perils of success - As the Trove Articles are digitally scanned and indexed there are occasionally issues like trying to sip the nectar of discovery, from a fire hose of frequently



tangential articles. For example, Sir Joseph Banks, F.R.A.S. and a host of other initials, is to my mind an Astronomer (More of a Naturalist you might say), but in Sydney he has geographic locations named after him and consequently there are THOUSANDS of hits for 'Banks', 'Sir Joseph Banks' etc. as the algorithm attempts to find what it considers as 'partial matches' to what you are seeking. So, at times you have to try an oblique search, such as 'Banks' and 'Telescope' or 'Banks' and 'Sun/Venus'.

You can hardly imagine the grief that I experience when I search for 'BAA NSW', as there is a town in NSW called 'Baan Baa' and every street, business or reference to this place flashes before your eyes, instantly blinding you to BAA NSW Astronomical references. To find these, I have to search for 'Astronomical' or 'Astronomy Society' and then be prepared to do a LOT of search refining.

The only thing worse than trying to find authentic articles about the life of a person significant enough to have places and things named after them, is if the name is used for a racehorse (and John Tebbutt had a lot to say about racehorses and gambling), as you get a 'hit' for every race, and every form guide mention, in nearly EVERY newspaper that was in print at the time a success.

Why you might be interested in looking up Trove, from where you are? Firstly, as Trove is digitally indexed, you might find it easier to access the essentials on any Astronomical topic or person, as summarized in a re-reporting in an Australian newspaper slightly after the event, than by wading through page after page of Front-Page fire hose of knowledge treatment by UK newspapers.

There was a regular influx (and reflux?) of British Migrants to Australia, and astronomically interested visitors were not excluded, so your local Astronomer who 'went missing' may well have turned up in Australia, to fulfil a job or to settle permanently. Shipping arrival details are frequently quoted, as are the subsequent Births, Deaths and Marriages details of those who stayed here permanently. There was a lot more 'disclosure' going on in newspapers of the past, as there seemed to be no fear of 'identity theft' in those days. There are of course newspaper accounts of the travels and the talks given by important UK and US Astronomers touring Australia, and frequently some local reportage of Eclipse and other Astronomical expeditions, usually giving greater detail than that carried in the 'home' newspapers that you have access to.

Adelaide South Australia, as the centre of the Universe? As far as the Trove Universe is concerned, after 1870, and before the transpacific telegraph cables were laid, the Capital city of South Australia, Adelaide, stands as the portal for most news of the world entering Australia and its newspapers, as the overland telegraph from Singapore joined the Australian network, after traversing the length of the Northern Territory after coming ashore at Darwin and proceeding through South Australia, ran from Darwin to Adelaide, so Adelaide Newspapers frequently had the important telegraphed news first, and ships carrying overseas newspapers also called in at Adelaide, before they arrived at the larger cities of Melbourne or Sydney. So, if you want to chase an Astronomical news story, then it may make sense to start searching the Adelaide newspapers, before taking a steamer or the train to Sydney or Melbourne and then work your way out into the country and regional newspapers.

Twoobasenjis – To log on to Trove you are allowed to make up a unique user name, as Trove is intended to be a publicly accessible and permanent record. Mine is

'Twoobasenjis', for reasons we need not discuss here. Why take a Trove Username? well, as 'Researcher on Pluto' rather than under your own name, 'Mr Jones' you might want to make where you have already searched known to other people doing similarly inclined work, thus, if you are interested in NSW Astronomers and Public Astronomy, you may well call up the record and follow the tracks of 'Twoobasenjis', a dogged investigator of Astronomers and Astronomy references. It may lead you to some of my discoveries, it may show you things that may be more important to you than me, but most importantly it allows a guide to where I have NOT explored, which may guide you to areas not yet looked at or give you a sense of what I have most recently been working on. Work on Trove can also be tagged, downloaded or commented on as you choose. Or you may not, it is all up to you, in a non-deterministic universe that permits the illusion of Free Will?

Some Statistics – Currently I am credited with having edited 339,628 'lines' of text on trove, all, or part, which makes me Trove Editor 237 of 75,116, but this league table score and position is likely to change daily, as other people edit their own articles of Family History or other Interest.

If you care to log on to Trove, you may find the following 'score' of indexed digitised articles:

Indexed word/s	No.
BAA NSW	159,804
British Astronomical Association	21,681
British Astronomical Association NSW	3,877
British Astronomical Association London	13,848
British Astronomical Association Manchester	2,217
British Astronomical Association Sydney	12,544
Royal Astronomical Society	37,378

Some Advice - But, before you get too excited, at this apparent bounty of historical documents, a word of caution is needed, as without resorting to "Indexed Word's" the above numbers include many articles that somewhere within the article mention one of the indexed/searched for words, and many of these articles will turn out to be much less than useless in your search, presenting many time wasting and unproductive distractions. To more easily exactly match your search to outcomes, you should try these as "Royal Astronomical Society" as this will deliver you a list of articles that only include the search term, as you have input it. Of course, this may steer you past some perfectly relevant articles, which incorrectly render the name of the organization as the "Royal Astronomical Association" or something similar. When looking for specific Astronomers, their names are frequently indexed under misspelling, so predictable variations and 'Telescope' or 'Astronomy' might also help you find the James Dunlop you are looking for, for example, there are some useful 'John Tebbutt F.R.A.S. articles out there where Tebbutt is rendered and indexed as having one 'b' or just one 't'.

\*\*\*



# World War II, Dr Elizabeth Alexander and the Birth of Solar Radio Astronomy

*Wayne Orchiston*

University of Science and Technology of China (Hefei), and Centre for Astrophysics, University of Southern Queensland (Toowoomba, Australia) wayne.orchiston@gmail.com

## 1 Introduction

Sir Bernard Lovell (1977), amongst others, has written on scientific and technological breakthroughs in wartime, especially in astronomy. WWII was no different, when scientists or radar staff in Australia, England, Germany, New Zealand and the USA all independently detected solar radio emission (although these discoveries, for the most part, remained 'Top Secret' until after the war).

The New Zealand discovery was made by the English scientist Dr Elizabeth Alexander, who in 1942 was evacuated from Singapore to New Zealand, where she continued to carry out research on radar. This is her story.

## 2 Dr Elizabeth Alexander: A Biographical Sketch

Frances Elizabeth Somerville Caldwell (1908–1958; Figure 1; Orchiston, 2016: 629–651) was born in England on 13 December 1908, but spent her early years in India, where her father was the first Professor of Chemistry at Patna Science College. She returned to England for her secondary schooling, and then studied Physics and Geology at Cambridge University, eventually graduating with a PhD in Geology.

During her doctoral years she met the New Zealander, Norman Stanley Alexander (1907–1997), who was studying for a PhD in Physics. They married and he was then appointed founding Professor of Physics at Raffles College in Singapore. In Singapore Elizabeth (as she preferred to be known) worked for the Royal Navy, carrying out research on radar. On 4 January 1942, when the Japanese occupation of Singapore was inevitable, the Royal Navy evacuated her and their three small children to New Zealand, while Norman ended up a prisoner-of-war in the infamous Changi camp.

After the war Norman and Elizabeth eventually returned to Singapore, and the children stayed in England with Elizabeth's sister. In 1952 Norman was appointed Professor of Physics at Ibadan University College and they moved to Nigeria. Elizabeth was a Junior Lecturer in the Agriculture Department. Tragically, on 15 October 1958 she died from a stroke just two months before her 50th birthday, whilst setting up a Geology Department at the University College.

It was while she was in Wellington during WWII that Elizabeth ended up being involved a new field that just a few years later would be-come known as 'radio astronomy'. After arriving in New Zealand from Singapore she was appointed Head of Operations Research in the NZ Radio Development Laboratory, based in a non-descript office building in downtown Wellington. She had her own experimental radar unit nearby, and was responsible for all RNZAF radar units. Her work included investigating any examples of

'anomalous' signals received at these radar stations. One of these was the mysterious 'Norfolk Island Effect'.

### 3 Researching the 'Norfolk Island Effect'

Between 27 March and 1 April 1945 there was an unexplained increase in 200 MHz 'noise' at the RNZAF radar station on Norfolk Island just after sunrise and before sunset.

This was dubbed the 'Norfolk Island Effect' and was investigated at the five RNZAF radar stations shown on the map in Figure 2, one on Norfolk Island, the others in Northland; the Whangaroa Radar Station is shown in Figure 3. Detections were made at all five radar stations (see Table 1), with Elizabeth Alexander concluding that the emission derived from the Sun and was non-thermal. Further monitoring between September and December 1945 only revealed solar radio bursts on several days in October.

Before leaving NZ in 1946, after the War had ended, Elizabeth Alexander (1946) wrote a 3-page paper on "The Sun's radio energy", which was published in the first edition of the new New Zealand journal *Radio and Electronics*.

### 4 Role Model and Catalyst

Dr Elizabeth Alexander proved to be a perfect role model, and was the catalyst that led to a three other New Zealand projects in immediate post-War radio astronomy. One involved a young physics graduate student, Alan Maxwell (1926–2021; Skinner et al., 2022), who completed an MSc on "Enhanced Solar Radiation at 3-metre Wavelength" in the Physics Department at Auckland University College. I believe that this 1948 thesis "... was probably the first on radio astronomy completed anywhere in the world." (Orchiston and Hearnshaw, 2024: 890). Maxwell went from Auckland to Manchester University, where he completed a PhD (Figure 4). In 1955 he accepted a position at Harvard University, and he went on to found the Fort Davis field station in SW Texas (Thompson, 2010) and build an international reputation in solar radio astronomy

Ivan Thomsen (1910–1969; Eiby, 1970), Director of the Government-funded Carter Observatory in the New Zealand capital Wellington, was primarily an optical solar astronomy but was inspired by the research carried out by Elizabeth Alexander and by Alan Maxwell. He was one of the first to prove there was a direct correlation between optical features (such as sunspots, prominences, and flares) and radio emission, when he published a paper in *Nature* in 1948 (Thomsen, 1948) comparing Carter Observatory optical observations with contemporaneous radio data from England (Figure 5).

Elizabeth Alexander was also responsible for a third early New Zealand radio astronomy project, when in 1947 solar monitoring was carried out with a 97 MHz radar immediately after sunrise and before sunset as part of the much larger radio-meteorological Canterbury Project. This was an international collaboration between New Zealand, Britain and the USA. Although many solar bursts were recorded, Elizabeth Alexander and Alan Maxwell had long left New Zealand shores and Ivan Thomsen did not have time to analyse or write up these observations.

New Zealand also played host to an ambitious early non-solar radio astronomy project. In 1948 two young scientists from the CSIRO's Division of Radiophysics in Sydney, John

Bolton (1922–1993; Robertson, 2017) and Gordon Stanley (1921–2001; Kellermann et al., 2005), spent nearly three months carrying out observations of ‘radio stars’ from Pakiri Hill and Piha near Auckland (Piha is shown in Figure 2) while the third member of their team, Bruce Slee (1924–2016; Orchiston, 2004), continued parallel observations from Sydney (Orchiston, 1993; 1994). This project was not initiated from New Zealand and no local New Zealand scientists were involved (although Stanley was born in New Zealand, while Bolton was from England). Bolton and Stanley merely exploited the availability of much higher cliffs in New Zealand than near Sydney, so the improved resolution of their mobile radio telescope would allow them to obtain much more accurate positions of their radio sources. They were then able to correlate all but one of these sources with known optical objects (Bolton et al., 1949), showing in the process that the term ‘radio stars’ was a misnomer. One of the sources (Taurus A) was associated with the Crab Nebula. Elsewhere I have stated that

This pioneering New Zealand expedition led to a breakthrough in astronomy and clear proof that radio astronomy was capable of making a major contribution to astrophysics—and later cosmology ... [It also] cemented the international reputations of the three radio astronomers, all of whom went on to achieve international eminence. (Orchiston and Hearnshaw, 2024: 893).

## 5 Concluding Remarks

English-born Dr Elizabeth Alexander was one of those involved in the independent detection of solar radio emission during WWII, while based in New Zealand. She was a multi-faceted scientist (see Harris, 2017), and deserves to be recognized as the world’s first female radio astronomer.

Elizabeth Alexander also inspired other early New Zealand pioneering radio astronomy projects. But more than this, she was the catalyst that led to the launch of solar, and soon afterwards, non-solar, radio astronomy in Australia. Both Britain and Australia witnessed rapid growth in this exciting new field and by the end of the 1940s were world leaders (Goss et al., 2023). Meanwhile, post-War New Zealand lacked the funding and the leadership to follow on from the pioneering efforts of 1945–1948 and radio astronomy died, only to emerge from the ashes half a century later.

## 6 Acknowledgements

I am grateful to Mary Harris (one of Elizabeth Alexander’s daughters) and Susan Maxwell Skinner for kindly supplying Figures 1 and 4.

## 7 References

- Alexander, F.E.S., 1946. The Sun’s radio energy. *Radio and Electronics*, 1(1), 16–17, 20.
- Bolton, J.G., Stanley, G.J., and Slee, O.B., 1949. Positions of three discrete sources of galactic radio-frequency radiation. *Nature*, 164, 101–102.
- Eiby, G.A., 1970. Obituaries. Ivan Leslie Thomsen. *Southern Stars*, 23, 113–116.

- Goss, W.M., Hooker, C., and Ekers, R.D., 20-23. *Joe Pawsey and the Founding of Australian Radio Astronomy: Early Discoveries, from the Sun to the Cosmos*. Cham (Switzerland), Springer.
- Harris, M., 2017. *Rocks, Radio and Radar: The Extraordinary Scientific, Social and Military History of Elizabeth Alexander*. London, Imperial College Press.
- Kellermann, K.I., Orchiston, W., and Slee, B., 2005. Gordon James Stanley and the early development of radio astronomy in Australia and the United States. *Publications of the Astronomical Society of Australia*, 22, 13–23.
- Lovell, A.C.B., 1977. The effects of defence science on the advance of astronomy. *Journal for the History of Astronomy*, 8, 151–173.
- Maxwell, A., 1948. Enhanced Solar Radiation at 3 Metres Wavelength. MSc Thesis, Physics Department, Auckland University College, Auckland, New Zealand.
- Orchiston, W., 1993. New Zealand's role in the identification of the first "radio stars". *Southern Stars*, 35, 46–52.
- Orchiston, W., 1994. John Bolton, discrete sources, and the New Zealand field-trip of 1948. *Australian Journal of Physics*, 47, 541–547.
- Orchiston, W., 2004. From the solar corona to clusters of galaxies: the radio astronomy of Bruce Slee. *Publications of the Astronomical Society of Australia*, 21, 23–71.
- Orchiston, W., 2016. *Exploring the History of New Zealand Astronomy: Trials, Tribulations, Telescopes and Transits*. Cham (Switzerland), Springer.
- Orchiston, W., and Hearnshaw, J., 2024. From Bickerton to Bateson: the challenge to establish astrophysics in Aotearoa / New Zealand. *Journal of Astronomical History and Heritage*, 27(4), 871–906.
- Robertson, P., 2017. *Radio Astronomer: John Bolton and a New Window on the Universe*. Sydney, NewSouth Publishing.
- Skinner, S.M., Orchiston, W., and Parkins, S., 2022. Alan Maxwell (1926–2021): pioneering New Zealand radio astronomer. *Southern Stars*, 61(3), 11–17.
- Thompson, A.R., 2010. The Harvard Radio Astronomy Station at Fort Davis, Texas. *Journal of Astronomical History and Heritage*, 13, 17–27.
- Thomsen, I.L., 1948. Solar radio emissions and sunspots. *Nature*, 161, 134–136.



Figure 1: Dr Elizabeth Alexander (photograph courtesy: Mary Harris).

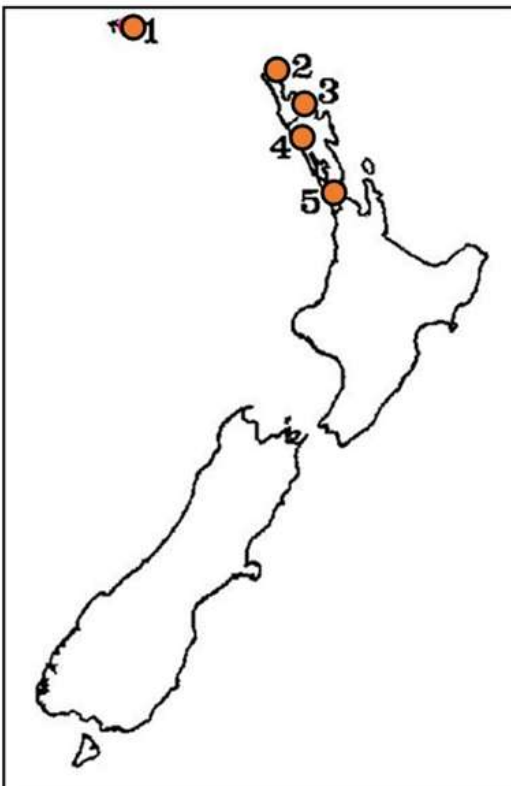


Figure 2: A map of New Zealand showing the locations of the five Royal New Zealand Air Force radar stations involved in solar monitoring from 10 to 23 April 1945. Key: 1 = Norfolk Island; 2 = North Cape; 3 = Whangaroa; 4 = Maunganui Bluff; 5 = Piha. While Norfolk Island was Australian territory, it was included by the USA in the New Zealand WWII 'theatre' which is why it hosted an RNZAF radar station (map: Wayne Orchiston).

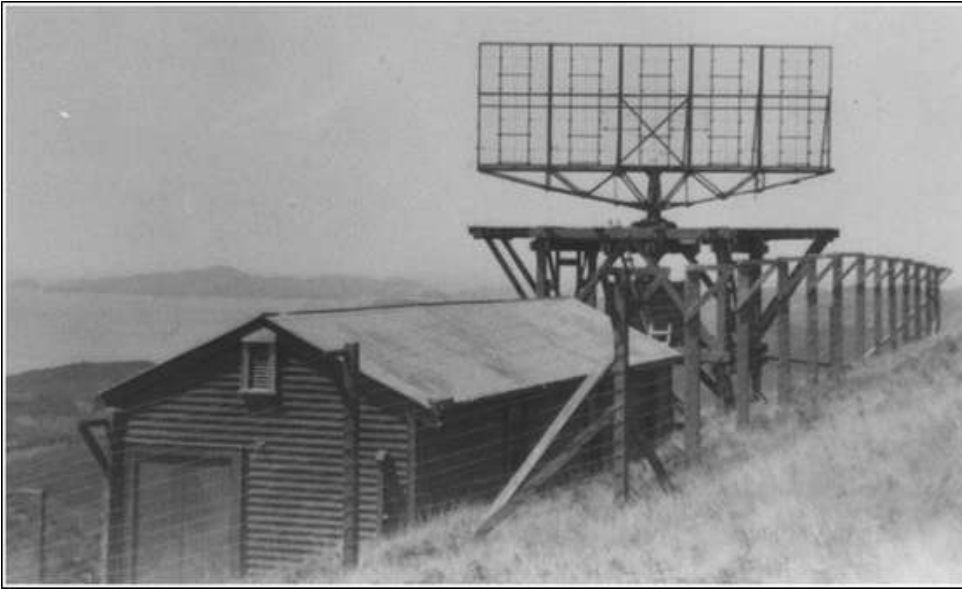
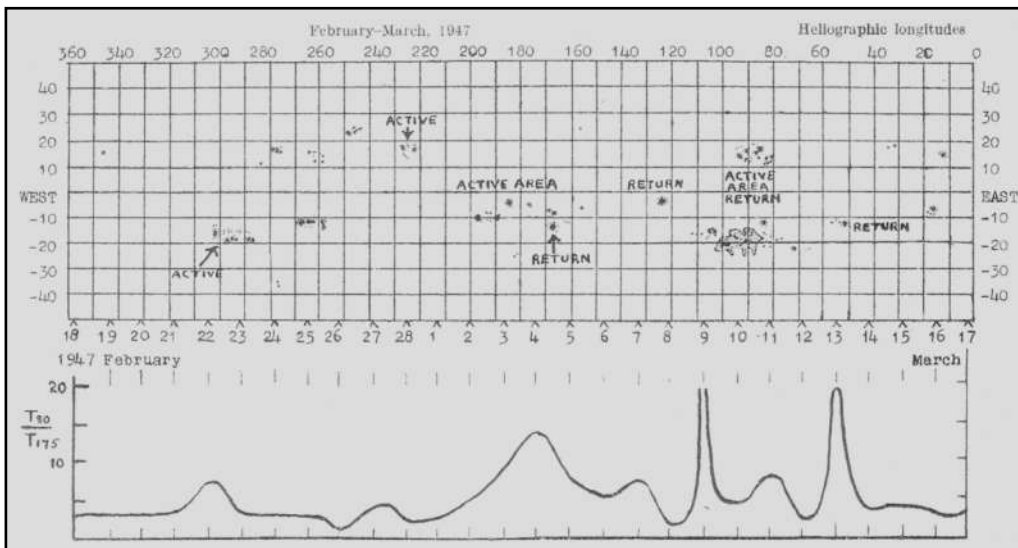


Figure 3: A wartime photograph of the Whangaroa Radar Station (Site 3 in Figure 2, showing the 200 MHz broadside array and associated technical building (photograph: Orchiston Collection).



Figure 4: Alan Maxwell during his Manchester University PhD graduation ceremony (photograph courtesy: Susan Maxwell Skinner).





**Figure 5:** A plot of solar radio emission in February-March 1947 and associated photospheric features (after Thomsen, 1948: 135).

Radar Station	Date (April 1945)														Detect -ion Days
	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
Norfolk Island			⊙	●	⊙	●	●	●	●	●	⊙	⊙	●	⊙	5
North Cape		⊙	●	⊙	●	●	●	●							2
Whangaroa			●	●	⊙	⊙	⊙	⊙							5
Maunganui Bluff		●	⊙	●	⊙	⊙	⊙	⊙							5
Piha	●	●	●	⊙	●	●	●	●	⊙	⊙					3
Monitoring Stations	1	3	5	5	5	5	5	5	3	2	1	1	1	1	
Station Detections	0	1	2	2	3	2	2	2	2	1	1	1	0	1	

Table 1: Days when solar monitoring took place (●) and when solar radio emission was detected (⊙) at the different RNZAF radar stations.

## Lockyer Sun

*Mike Frost*

In the underpass at Rugby Station, an interesting and novel work of art is currently on display. “The Rugby Colour Palette” by Stacey Barnfield and the people of Rugby is a series of monochromatic panels. Each colour is associated with the town in some way, and each colour is identified by the C, M, Y, & K values required to create it on your computer screen. Stacey Barnfield is a Birmingham-based artist who is interested in the history and heritage of his home region. He has worked previously on colour palettes for Warwick and for Royal Leamington Spa. The artist worked with Rugby council and Avanti West Coast and held a series of workshops to choose Rugby’s palette of colours.

The panels are divided into three sets. “History and Heritage” features colours such as Tripontium Terracotta, named for the Roman settlement on the A5, and Butterfield Brick, named after William Butterfield, the architect who built Rugby School. “Creativity and

Culture” features Gilbert Leather, to commemorate the Rugby company who make rugby balls, and Hologram Pastel, to celebrate Dennis Gabor, the Hungarian refugee who developed holograms (for which he won the Nobel prize) in Rugby in the 1950s.

The final set of panels is for “Industry and Innovation”. Webb Ellis Bronze and Whittle Silver honour two Rugbeians who, I hope, are known to you all – William Webb Ellis, who “picked up the ball and ran with it”, inventing rugby football, and Frank Whittle, inventor of the jet engine. But my eye was drawn to the final colour on the palette, Lockyer Sun. Here is the citation:

*Born in Sheep Street in Rugby in 1836 astronomer Sir Norman Lockyer is credited with discovering the gas helium. He found the previously unknown element in the Sun's atmosphere in 1868 and named it after Helios, the Greek name for the sun and the sun god.*

I have a slight quibble with the claim that Lockyer is credited with the discovery. Jules Janssen in France made similar observations at the same time and there's recent evidence that Norman Pogson in Madras did too. But, in general, the citation gets it right. Norman Lockyer observed the light of the Sun through a spectroscope and saw that one line in the spectrum, an orangey line classified as “D3” couldn't be re-created in his laboratory. He surmised, correctly, that it was a new element, which he called helium. It was 1895 before William Ramsay discovered a noble gas, a trace constituent of natural gas, which displayed the same spectral line seen on the Sun.

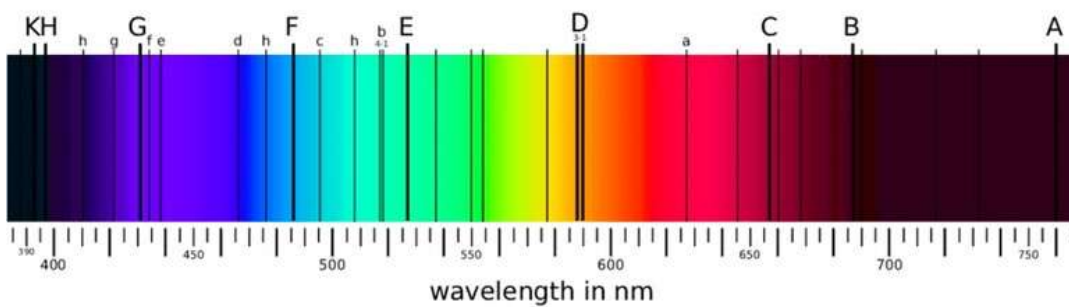
Helium is rare on Earth. It doesn't react with anything chemically and it's so light that it floats straight to the top of the atmosphere and off into space. But it was formed in huge quantities during the Big Bang. One in every ten atoms in the known universe is helium, given its name by an astronomer born in Sheep Street, Rugby. The majority of the remaining atoms are hydrogen, named by Antoine Lavoisier in France, so Sheep Street, Rugby, has to take second place behind Lavoisier's birthplace in Paris. But second place isn't bad!

I think the colour Lockyer Sun is designed to be close to the colour of the D3 line at 587.56 nm, corresponding to helium. To the eye, the palette colour is a little higher in wavelength, maybe closer to 600 nm. Of course, the CMYK mix C=0 M=67 Y=100 K=0 isn't a pure spectrum colour.

But it is good to see a Rugby astronomer receiving due credit, in the town of his birth.

Thanks to Carolyn Bedwell for pointing out the artwork to me.

<https://www.heartcommunityrail.org.uk/home/rugby-colour-palette-project>



# Shuckburgh Hall

*Mike Frost*

Many years ago, my local astronomy society, Coventry and Warwickshire AS, hosted a talk by the RAS librarian Peter Hingley (now deceased) titled something like “The English Equatorial mounting”. During this talk, Peter told us about an important historical observatory at Shuckburgh Hall, less than ten miles from my house. This was an observatory which I hadn’t known existed! Peter had visited the nearby village of Lower Shuckburgh, but Shuckburgh Hall was not open the day he was there.

It has taken me more years than I might have wished, but I have finally been able to pick up the baton and visit the site of the observatory. Shuckburgh Hall is on the Warwickshire / Northamptonshire border, between Southam and Daventry. It’s only open a few days a year, so a visit has to be planned, but it’s well worth the effort. The estate is in beautiful rolling hills, just inside Warwickshire. The main road to the hall runs through a deer park and past an ornamental lake. To the south of the hall, on the back road to the house, lies the family church of St John the Baptist in the Wilderness. At the rear of the house is a tennis lawn, a summer house, and a collection of cannons, captured in Crimea, standing ready to bombard the neighbouring village of Napton. The hall has been in the possession of the Shuckburgh family for nine hundred years and has been remodelled and extended many times.

Sir George Augustus William Shuckburgh-Evelyn, the sixth baronet, was born in 1751. He attended Rugby School and then Balliol College Oxford. Shortly after George graduated in 1772, his uncle, the fifth baronet, died, and George moved into Shuckburgh Hall after completing his “Grand Tour” of Europe. He was the member of Parliament for Warwickshire from 1780 until his death in 1804. He married twice; in 1782 to Sarah Johanna Darker, who died two years later; and in 1785 to Julia Anabella Evelyn, with whom he had a daughter, Julia Evelyn Medley Shuckburgh.

He made astronomical observations from 1774 through to 1794, published in a series of volumes. He carried out measurements of lunar features, and a lunar crater is named for him. He became a fellow of the Royal Society in 1774; as well as astronomy, he carried out research in metrology; for example, measuring the boiling point of water at different pressures. In 1798 he was jointly awarded (along with Charles Hatchett) the Royal Society’s Copley Medal “For his various communications in the Society’s Transactions”.

In 1781, he ordered a telescope from Jesse Ramsden, a leading instrument maker of the day. It was however 10 years before it was delivered to Shuckburgh Hall. The telescope is of English Equatorial design, with the telescope rotating within a circular scale, mounted between two bearings on a polar axis. It stood in a dedicated observatory on the roof of the hall. Shuckburgh also ordered an astronomical clock by John Arnold & son; unusually it displayed angle of Right Ascension rather than sidereal time. A very solid looking meridian marker was built 2970ft (990yd, 905m) south of the observatory.

Today, not much trace remains of Sir George’s astronomical activities. On the roof, only the deck where the observatory stood still remains. The Ramsden ‘scope went to the Greenwich Observatory when Sir George died, and then to the Science Museum in London. The clock also went to the Science Museum but is now on loan to the National Maritime Museum at Greenwich. There is a small telescope on display in the hall, with an

inscription from Callaghan of New Bond St, London. There's a memorial plaque to Sir George in the family church, which mentions his astronomy. However, I had written ahead to ask if they had anything to show me, and the family very kindly put on display one of his observing books, for the period 1791-94. There are page after page of observations, all neatly written down, with occasional sketches of the planets, and regular notes on the calibration of the telescope.

For the first year of observations, Sir George seems to be concentrating on the Sun, with many measurements of its apparent width as it crossed the meridian – I assume this was to try to calculate shape of the Earth's orbit around the Sun. He then moves on to meridional measurements of stars (that is to say, the exact times and altitudes at which they were due south). There is an extended gap in measurements in 1793, where the observing log says he was away in London, Sussex and Surrey. There is an entry for the solar eclipse of September 5<sup>th</sup>, 1793, annular over the Shetlands and southern Norway, although the observing log states that he was interrupted by visitors. What I didn't see, but was expecting, was lunar observations; presumably he specialised in these earlier in his observing career.

A profitable day. And one which suggested more lines of research. Heaven!

The Shuckburgh estate website (which lists the days the hall is open) is at:

<https://www.shuckburghestate.co.uk/>

You can download a guide to and history of the hall from this website.

Shuckburgh Hall was the location for the 2020 ghost movie "An English Haunting" for which Sir James and Lady Shuckburgh are named as executive producers.

[https://www.imdb.com/title/tt9612368/?ref=vp\\_close](https://www.imdb.com/title/tt9612368/?ref=vp_close)

The Science Museum entry for the Shuckburgh telescope is at

<https://collection.sciencemuseumgroup.org.uk/objects/co8864242/refracting-telescope-on-equatorial-mounting-telescope-refracting-equatorial-instrument>

After Peter Hingley's sudden and untimely death in 2012, his friend Francoise Launay completed a paper by him:

"The Shuckburghs of Shuckburgh, Isaac Fletcher, and the history of the English Mounting", Peter D. Hingley, *The Antiquarian Astronomer*, 7 (2013), pp 17-41.

In this paper, Peter provides a comprehensive catalogue of telescopes with the English Equatorial mounting, of which Ramsden's telescope was the first, and the refractor at Armagh Observatory the second. Other telescopes with an English mounting include William Pearson's telescope at South Kilworth, the Northumberland telescope at Cambridge (which I have used), and the Hooker 100-inch telescope at Mount Wilson in California, with which Edwin Hubble discovered cosmological red shifts.

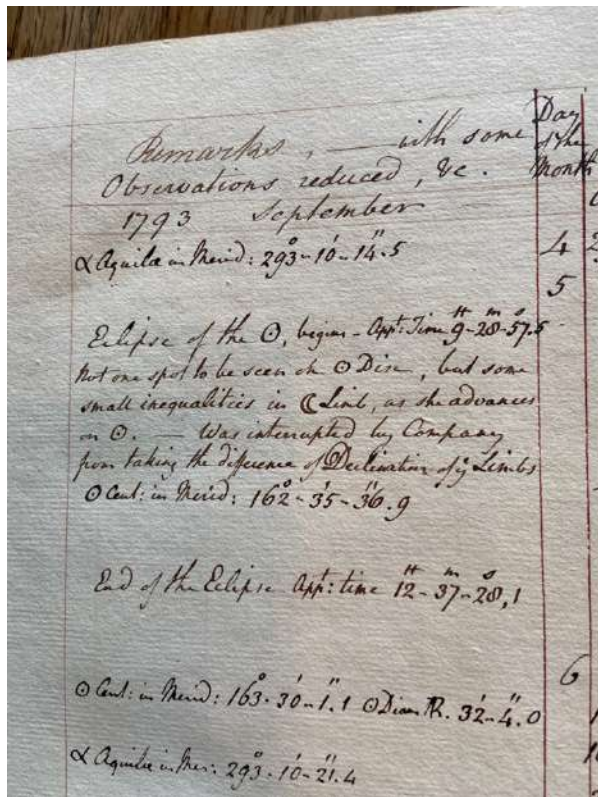
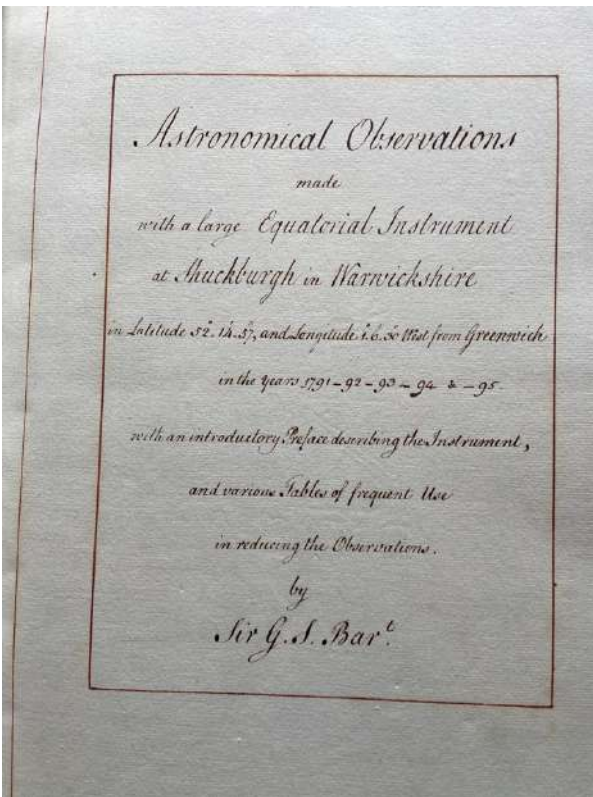




The Shuckburgh English Equatorial



Telescope Inscription



Two pages of observations





Sir George Augustus William Shuckburgh-Evelyn (1751-1804) & Shuckburgh Hall

\*\*\*

## **An ancient observation of T Coronae Borealis?**

Professor Graham Shipley, an ancient historian at the University of Leicester with an interest in the history of astronomy, has noticed that the 2nd-century BC astronomer Hipparchos is said to have observed a 'new star', which prompted him to compile his great star catalogue. Graham has been looking into the possibility that the star was T CrB, and in a short paper to appear in the *Journal* in April he hopes to present evidence that the probable periodicity of the variable star, as currently understood, makes it likely that an eruption took place during Hipparchos's active career.

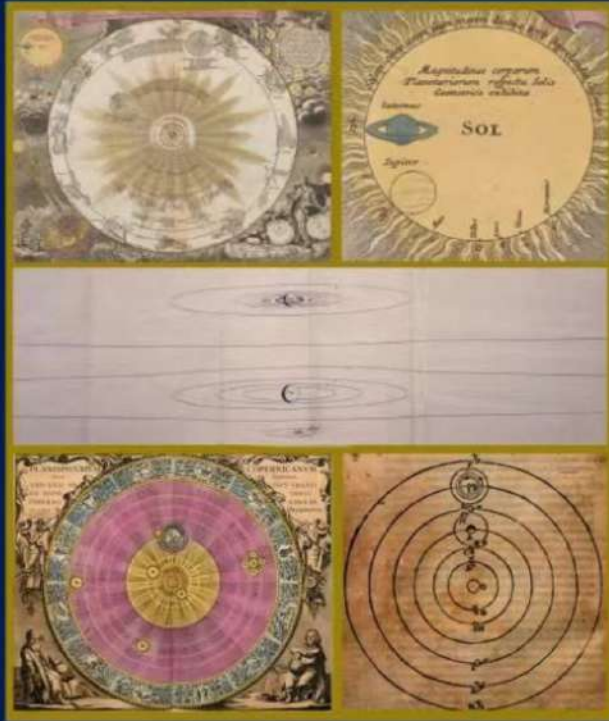
\*\*\*

## **Journal of Astronomical History and Heritage** *Wayne Orchiston*

The following are front covers and indexes to September and December 2024 JAAH's, if any of the titles interest you please contact Wayne ([wayne.orchiston@gmail.com](mailto:wayne.orchiston@gmail.com)) directly and he will send you a pdf of the paper.

# JOURNAL OF ASTRONOMICAL HISTORY AND HERITAGE

Published by the University of Science and Technology of China



Vol. 27 No.3

September 2024

**CONTENTS**

Research Papers	Page
The crucial first step in the discovery of millisecond pulsars <i>A.C.S. Readhead</i>	453
The discovery of millisecond pulsars: Don Backer and the response to the unexpected <i>P.B. Demorest and W.M. Goss</i>	465
The discovery of the first millisecond pulsar: personal recollections <i>S.R. Kulkarni</i>	482
The astronomical orientation of the Thai Phimai Temple <i>Cherdasak Saelee, Orapin Riyapairo, Korakamon Sriboonrueng, Siramas Komonjinda and Prissana Thamboon</i>	488
The astronomical meaning of some jade artifacts unearthed at the Lingjitan Site 2: The Jade Pigs <i>Shi Yunli</i>	503
Analysis of the horometer instrument in Peter Apian's <i>Instrument Buch</i> <i>Lars Glisén</i>	521
"A true and exact description of the Sun's palace": constructing the image of the Solar System in the seventeenth and eighteenth centuries <i>Pedro M.P. Ramos and Christopher M. Graney</i>	537
Jan Verh's paintings of Jacobus Kapteyn <i>Pieter C. van der Kruit</i>	559
New Zealand's contribution to international science: the role of the University of Canterbury's Rolleston Research Station <i>Jack Baggaley and Wayne Orchiston</i>	579
A unique application of the observation of stars in Indian astronomical texts <i>B.S. Shyfaia and B.S. Shubha</i>	595
Histories intertwined: tracing the evolution of the South African Astronomical Observatory Library and Information Service within the historical development of astronomy in South Africa <i>Theresa de Young and Jaya Raju</i>	605
The history of early low frequency radio astronomy in Australia. 11: The Shain Cross at Fleurs Field Station near Sydney <i>Harry Wendt and Wayne Orchiston</i>	635
The history of early low frequency radio astronomy in Australia. 12: Reber, Higgins and the mooted all-sky survey with the Shain Cross <i>Harry Wendt, Martin George and Wayne Orchiston</i>	655
What does Copernicus' tellurum owe to Galileo and his legacy? <i>Nelachs Fabbri</i>	674
On the dating of the Latin astrolabe of the Preaching Friars in the Musée des Arts Précieux in Toulouse <i>Eric Mercier</i>	685
<b>Letters to the Editors</b>	
On the earliest inscriptional records of Indian solar eclipses <i>B.S. Shyfaia</i>	691
"On the earliest inscriptional records of Indian solar eclipses": a response <i>R.C. Kapoor</i>	693
<b>Obituary</b>	
Obituary: Suzanne Virginie Débarbat (1928–2024) <i>James Lequeux and Wayne Orchiston</i>	695

- 451 -

Book Reviews	
<i>America's First Eclipse Chasers: Stories of Science, Planet Vulcan, Quicksand, and the Railroad Boom</i> , by Thomas Hockey <i>Cilford Cunningham</i>	697
<i>Italian Contributions to Planetary Astronomy: From the Discovery of Ceres to Pluto's Orbit</i> , edited by Ilana Chinnici <i>William Sheehan</i>	698
<i>Essays on Astronomical History and Heritage: A Tribute to Wayne Orchiston on His 80<sup>th</sup> Birthday</i> , edited by Steven Gullberg and Peter Robertson <i>Gerry Gilmore</i>	702
<i>Comet Madness: How the 1910 Return of Halley's Comet (Almost) Destroyed Civilization</i> , by Richard J. Goodrich <i>Cilford Cunningham</i>	703
<i>Medieval Comets European and Middle Eastern Perspective</i> , by Piero Sicoli, Roberto Gorelli, Maria José Martínez and Francisco J. Marco	705
<i>Catalog of Unconfirmed Comets – Volume 1, 1600–1899</i> , by Gary W. Kronk and Maik Meyer	705
<i>Catalog of Unconfirmed Comets – Volume 2, 1900 to the Present</i> , by Gary W. Kronk and Maik Meyer <i>Jacques Crovisier</i>	705
<i>Experimental Philosophy and the Origins of Empiricism</i> , by Peter R. Anstey and Alberto Vanzo <i>Cilford Cunningham</i>	708
<i>Walking with Christian Huygens: From Archimedes' Influence to Unsung Contributions in Modern Science</i> , by Tijmen Jan Moser and Eiders Anthony Robinson <i>James Lequeux</i>	710
<i>Ole Rømer's Triduum</i> (3 volumes), edited by Claus Fabricius, Niels Therkel Jørgensen and Chr. Gorm Tørtzen <i>Cilford Cunningham</i>	711
<i>Edmond Halley: The Many Discoveries of the Most Curious Astronomer Royal</i> , by David K. Love <i>Cilford Cunningham</i>	713
<i>The Life &amp; Work of James Bradley: The New Foundations of 18<sup>th</sup> Century Astronomy</i> , by John Fisher <i>Cilford Cunningham</i>	714
<i>The Big Bang Revolutionaries: The Untold Story of Three Scientists Who Re-enchaned Cosmology</i> , by Jean-Pierre Luminet <i>Simon Mitton</i>	716
<i>Natural Light: The Art of Adam Eisheimer and the Dawn of Modern Science</i> , by Julian Bell <i>Cilford Cunningham</i>	718
<i>The Square Kilometer Array: A Science Mega-Project in the Making, 1990–2012</i> , by Richard Schilizzi, Ronald Ekers, Peter Dewdney, and Philip Crosby <i>Kenneth Kellermann</i>	720
<i>The Perception of the Pleiades in Mesopotamian Culture</i> , by Maria Teresa Renzi-Sepe <i>Cilford Cunningham</i>	723
<i>Stonehenge: Sighting the Sun</i> , by Clive Ruggles and Amanda Chadburn <i>Cilford Cunningham</i>	725
<i>Astronomen, Akten und Affären. Vom Anfang zum Ende des Astrophysikalischen Observatoriums zu Potsdam. Berichte und Erinnerungen</i> , by Günther Rüdiger <i>Klaus Hentschel</i>	727
<i>The Globe: How the Earth Became Round</i> , by James Hannam	728
<i>Eratosthenes and the Measurement of the Earth's Circumference</i> , by Christopher A. Matthew <i>Cilford Cunningham</i>	728



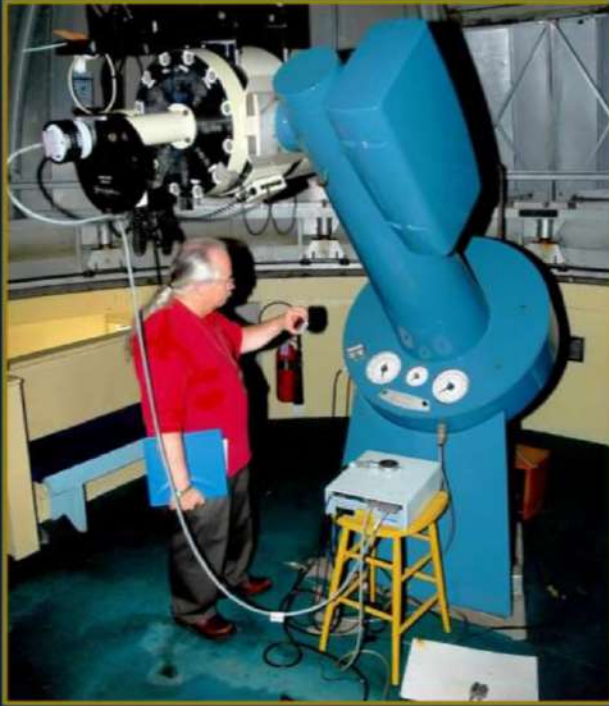
- 452 -

天文学历史与遗产期刊

ISSN: 1440-2807

# JOURNAL OF ASTRONOMICAL HISTORY AND HERITAGE

David DeVorkin 80<sup>th</sup> Birthday Issue



Vol. 27 No.4

December 2024



**CONTENTS**

	Page
<b>Research Papers: David DeVorkin 80<sup>th</sup> Birthday Issue</b>	
Introduction to the David H. DeVorkin Special Issue of <i>JAHH</i> <i>Steven J. Dick</i>	733
To David, with Thanks! <i>Kenneth Rumstay</i>	740
Joseph Henry and astronomy <i>Marc Rothenberg</i>	745
Beyond precision: astronomy in the long nineteenth century <i>Robert W. Smith</i>	754
At the dawn of American astronomical photography: the total solar eclipse of 1869 <i>Jennifer Lynn Bartlett</i>	770
The relationship between a transient scientific phenomenon and local journalism at the beginning of the gilded age <i>Thomas Hockey</i>	786
Vesto Slipher's observational discovery of the expansion of the Universe: the unpublished, paradigm-shattering manuscript road to the 1914 Evanston Meeting of the American Astronomical Society <i>Joseph N. Marcus, Lauren Amundson, Kevin S. Schindler and Brian A. Skiff</i>	796
Artificial comets and proving Maxwell right: radiation pressure in lab and sky <i>Matthew Stanley</i>	836
Antimatter in near space: an episode in the history of astrophysics and meteoritics <i>Helge Kragh</i>	847
'Dancing lights': the use of television cameras to measure and study aurorae <i>Samantha M. Thompson</i>	859
From Bickerton to Bateson: The challenge to establish astrophysics in Aotearoa / New Zealand <i>Wayne Orchiston and John B. Hearnshaw</i>	871
Speulunking decommissioned observatories with David DeVorkin: a case study <i>Sara J. Schechner</i>	907
Looking at traditional astronomies as if they were science <i>Stephen C. McCluskey</i>	917
Discovery and classification as problems in the philosophy of astronomy <i>Steven J. Dick</i>	931
<b>Obituary</b>	
Obituary: Alan Henry Batten (1933–2024) <i>Peter Broughton and Wayne Orchiston</i>	951
<b>Letter to the Editors</b>	
On the centennial of Friedmann's second cosmology paper <i>Philipp Hellwig</i>	957
<b>Book Reviews</b>	
<i>The Cosmic Microwave Background, Historical and Philosophical Lessons</i> , by Slobodan Perović and Milan M. Cirković <i>Steven J. Dick</i>	959
<i>Almagestum Novum: History of Astronomy</i> , by Giovanni Battista Riccioli <i>Clifford Cunningham</i>	961

- 731 -

Contents	September 2022
<i>The Astronomical System of Aristotle: An Interpretation</i> , by Gerardo Botteri and Roberto Casazza <i>Clifford Cunningham</i>	963
<i>Cosmology and Biology in Ancient Philosophy: From Thales to Avicenna</i> , edited by Ricardo Salles <i>Steven J. Dick</i>	965
<i>The Genius of their Age: Ibn Sina, Biruni, and the Lost Enlightenment</i> , by S. Frederick Starr <i>Marton Dobos</i>	967
<i>The Scientific Works of Robert Grosseteste, Volume 2: Mapping the Universe: Robert Grosseteste's De Sphaera—On the Sphere</i> , edited by Giles Gasper, Tom McLeish, Hannah Smithson and Sigbjørn Sennesyn <i>Clifford Cunningham</i>	970
<i>Der Briefwechsel Joseph von Utzschneiders</i> , by Rolf Riekher <i>Wolfgang Steinicke</i>	971
<i>Lunar: A History of the Moon in Myths, Maps, and Matter, incorporating the USGS/NASA Geologic Atlas, 1952-1974</i> , Consulting Editor Matthew Shindell <i>Steven J. Dick</i>	972
<i>Starwords: The Celestial Roots of Modern Language</i> , by Daniel Kunth and Elena Terlevich <i>Clifford Cunningham</i>	975
<i>Lyric Poetry &amp; Space Exploration</i> , by Margaret Greaves <i>Clifford Cunningham</i>	976
<i>The World of Visual Time Signals for Mariners: Time Balls, Time Guns, Time Lights and Other Signals</i> , edited by Roger Kinns <i>Steven J. Dick</i>	978
<b>Index (Volume 27, 2024)</b>	<b>982</b>



Published by The University of Science and Technology of China,  
96 Jinzhai Road, Hefei, Anhui 230026, China.

- 732 -

## Dates for your diary

SHA French Conference 2025, joint with the Société Astronomique de France, Paris, Saturday 29<sup>th</sup> March.

Communicating astronomy at historic observatories, RAS Discussion Meeting, Friday April 11<sup>th</sup> 2025, 10:30am to 3:35pm, Royal Irish Academy, 19 Dawson St., Dublin (also online?).

SHA Spring Conference, Birmingham & Midland Institute, Birmingham, Saturday 26<sup>th</sup> April.

SHA Summer Picnic, Jodrell Bank, Cheshire, Friday 27<sup>th</sup> June.

INSAP 2025, the 13<sup>th</sup> International Conference on the Inspiration of Astronomical Phenomena, Queen's University Belfast 8<sup>th</sup> – 13<sup>th</sup> June.

<https://insap.org/next-meeting/>

**Friday 28 March 2025 18:00-22:00**

**Peter Harrison Planetarium, Royal Observatory, Greenwich**

### **Pioneering Women at Observatories**

Discover more about the pioneering women who worked at observatories in the UK, US and Australia in the late 1800s, in this panel discussion and screening of the film *Hidden Figures*.

As new technologies and instruments transformed astronomy in the late 1800s, observatory directors around the world started to employ women as cheap labour to help assemble and process vast amounts of photographic glass plates for new star catalogues.

Some of these 'computers' only stayed for a few months or years, but others became experts in their own right and forged long-term careers in astronomy and associated sciences.

Hear from researchers presenting both in-person and online who have investigated women working at observatories in the UK, US and Australia. Who were these women? What did they do? What challenges did they face, and how did conditions vary between observatories?

Guest speakers:

- Toner Stevenson, Australia

Overview of the women astrographic computers in Australian observatories

- Dava Sobel, USA (by Zoom)

Overview of the women astronomical computers at Harvard College Observatory

- Louise Devoy, UK

Overview of the 'lady computers' at the Royal Observatory, Greenwich

More information and ticket details can be found here:

<https://www.rmg.co.uk/whats-on/royal-observatory/pioneering-women-observatories-1880-1930>