fore taking up the post, he visited the Observatory in March 1962 but became seriously ill and returned to Sydney, where he died of a cerebral tumour later that year.

This biography of Joe Pawsey is not for the faint hearted. The main text runs for well over 700 pages, followed by appendices that include a list of abbreviations, a timeline of key events, and thumbnail sketches of *dramatis personae*. The main reason for the length is that the book presents the most detailed account to date of the birth and growth of Australian radio astronomy over the years 1945–1962, the period when Joe was the undisputed leader of the group. As a result, in many of the 42 chapters Pawsey is only mentioned in passing.

This comprehensive biography draws on an extraordinarily large volume of international and institutional archival material, supplemented by multiple interviews and extensive discussions with astronomical colleagues of Pawsey. Undoubtedly the most important source of new material is the Joe and Lenore Pawsey Family Collection which contains copies of Joe’s extensive correspondence, diaries, family photos and a host of family memorabilia. Following the death of Lenore in 1974, the collection passed to her son Hastings and it remained almost unresearched until he was contacted by the authors.

The three authors are well qualified to write this biography. Miller Goss is a former Director of the Very Large Array in New Mexico and has authored two previous books on the history of Australian radio astronomy (he is also the recipient of a Pawsey Medal). Claire Hooker is a historian and sociologist in the School of Public Health in Sydney, and has written most of the sections on Pawsey’s personal and family history. Ron Ekers was appointed in 1988 as the inaugural Director of the Australia Telescope National Facility (ATNF), the modern equivalent of the Radio-physics Lab. As such, Ron is the leader of his generation of Australian radio astronomers, and a successor to Joe Pawsey.

Given the size and scope of the book, the cover price of €49.99 for the hardback edition is relatively good value. Better still, thanks to a generous publication grant from the ATNF, the publisher Springer has issued the book as Open Access. A PDF of the entire book can be downloaded free of charge from:

https://link.springer.com/book/10.1007/978-3-031-07916-0

The Pawsey book is a welcome addition to the extensive literature on the history of Australian radio astronomy, including the three recent books by Frater et al. (2017), Orchiston et al. (2021), and Robertson (2017)—see the reviews in JAH, 21(1), 96–98 (2018); 25(3), 596–597 (2022); and 20(3), 361–362 (2017), respectively.

Some years ago, Miller Goss published a detailed biography of the Australian radio astronomer Ruby Payne-Scott (Goss and McGee, 2009), and then followed it up with a shorter and less technical book aimed at a wider audience. My hope is that the authors of this Pawsey biography might do something similar. The remarkable life and career of Joe Pawsey deserves to be more widely known by the international astronomical community.

**References**


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In many ways this is an alternative history of American astronomy in the long nineteenth-century, but that is only because most of the topics covered here have been ignored or only briefly mentioned by other historians. The author is Gordon Fraser, a Presidential Fellow at the University of Manchester; as his degrees (including the Masters and PhD) are from the University of Connecticut, this is not a Brit writing about American astronomy.

Fraser takes the title of his book from an 1849 essay by Henry David Thoreau, and the
quote signals a pervasive theme that Fraser explores.

I know that there are many stars, I know that they are far enough off, steady enough in their orbits,—but what are they all worth? They are more waste land in the West,—star territory,—to be made Slave states, perchance, if we colonize them. (page 3).

Fraser focuses on three peoples of America: the Cherokee, African-Americans, and Hawaiians, each one subject to being treated as second-class citizens or slaves. These are the unexplored reservoirs of astronomy in Star Territory.

In these nineteenth-century roots, Fraser sees the origins of America’s fascination with space exploration:

Space power, as it is understood today, enables a nation-state to cultivate prestige, promote commerce, and project force. In the nineteenth-century agents of the United States lacked for this vocabulary, they did not lack for this insight. (page 3)

Much of the first half of the book deals with almanacs, both the home-grown variety widely used by the people, and the official American Ephemeris and Nautical Almanac used by mariners and astronomers. A key figure here was Andrew Ellicott, who printed a 36-page almanac in Baltimore in 1792: “Ellicott recognized the importance of printed, astronomical information to the project of nation building.” (page 25). He made this manifest in his own work, where his “…astronomical observations settled the border between the United States and Spanish Florida.” (page 24). Ellicott envisioned Washington DC as the site of a meridian to replace the one in Greenwich, and wrote to that effect to Thomas Jefferson. “Nationalists, Ellicott especially, hoped that the state might mediate between individuals and their sense of the universe.” (page 25). However, Ellicott and other almanac-writers were to be disappointed: “…the almanac’s subject matter was a bad fit for the project of a national literature.” (page 28).

Quite expectedly, the most popular of the astronomical almanacs was Banneker’s, but “Most shockingly for readers of this almanac, Benjamin Banneker was a black man.” (page 29). He began publication in 1791, and while Banneker himself was responsible for the astronomical calculations, different regional publishers inserted their own essays, such as life on other worlds and warnings about comets that could collide with Earth, killing millions of people. In 1809 Thomas Jefferson took sour note of the popularity of the almanac (as opposed to any effort by the state), suspicious that Ellicott, who was Banneker’s neighbour, was partly responsible. “Attempting to trace Jefferson’s motive here is probably a fool’s errand …” writes Fraser (page 41). The efforts of the American Government to disseminate astronomical knowledge to the public was no better by 1823. President James Monroe, in a report to Congress, wrote the attempt to promote “…knowledge among our fellow citizens …” had largely proved a failure (page 46).

While that may have been true to the citizenry Monroe was referring to, “Astronomy was central to black education in the city of New York …” writes Fraser. The education of navigators for the Navy and other vessels was key to this, as nearly all of them were black men. It was even said that cooks on the ship were mathematically sophisticated. Fraser devotes an entire chapter to the publication of two black-owned newspapers in the 1820s. The poet George Horton, who was a slave, borrowed ideas about the solar system from a geography textbook by Jedidiah Morse. His poetry was published in the first black newspaper in the United States,
Freedom’s Journal. “He made astronomical observation central to the discourse of freedom...”, and further criticised modern astronomers for failing to account for the sublime (page 70). Having read American history all my life, I have never come across the fascinating description Fraser gives, and this goes double for his next chapter.

In this, Fraser writes:

Cherokee astronomical printing can be understood as an index for the continuity between the secular and the sacred, the universe as instrumental to state power and the universe as vast, changing, and alive. (page 81).

For example, the Cherokee poet Tso-le-oh-who wrote a poem about the comet of 1853 that “… invited consideration of fundamental questions about life in the universe.” (page 98). It was published in a newspaper, the Cherokee Advocate. National leaders of the tribe

... recognized the significance of science—especially star science—to preserving the sovereignty of the Cherokee people. (page 105).

No less interesting is his final chapter dealing with Hawaii. He concentrates on the last monarch, Queen Lili‘uokalani, who was the first to translate the Kumulipo, which “… functions as an account of the trajectory of the universe, an account that looks backward toward the beginning of time.” (page 142). The book was published in 1897, but was never made available to the public: Queen Lili printed very few copies as personal gifts. Fraser lists the archival locations of the 11 copies that still exist (the Library of Congress has two). Having lived in Hawaii, I never heard anyone mention this book that is so important to the history of astronomy. Her translation, writes Fraser,

... did not merely provide readers with a transparent window onto an ancient, Hawaiian-language cosmography. It framed and shaped that cosmography for readers unfamiliar with Hawaiian culture. (page 155).

In this, his first book, Fraser has explored the multiple paths by which American Astronomy was transmitted to the public in the print medium. To say it is essential reading would be to understate the importance of this study for astronomy in the United States.

There is one typo: “that that” on page 24.

As the subtitle of the book heralds, this is a wide-ranging study of the Moon in Classical times. The author, Karen ní Mheallaigh, is Professor of Greek at the University of Exeter. She has previously written a book on Lucian (125–180), who features prominently in this title.

The author positions this as “… the first sustained exploration of the Moon’s influence on the Graeco-Roman literary and scientific imagination.” (page 6). The text is divided into three rather loose Imaginations: mythic, scientific and fantastic. Each is governed by a cogent description she offers at the outset:

Before the encroachments of telescopic lenses, the Moon was a place of both unverifiable reality and unfalsifiable possibility. (page 3).

In this it bears an uncanny resemblance to the various aspects of exobiology discussed in Dr Dick’s book review in this issue of the JAHH. In some ways, we can see our future in the past, as elucidated by ní Mheallaigh.

There is a very ancient Greek myth, attested in Hesiod in the seventh century BCE, about the Moon goddess Selene and her love for the mortal Endymion. In reworking the myth to position Selene as the protagonist, ní Mheallaigh writes that “… Sappho had, for the first time, moved the Moon centre-stage in the optical power-games of Greek literature.” (page 24). Selene, she explains, embodies a

... uniquely optical nature as the supreme gazed-at-gazer, both universally visible and, in reverse, commanding a panoptic view of the Earth. (page 24).

This led one of us (Sheehan) to think of Piaget’s stages of cognitive development in children—the stage called Level 2 visual perspective-taking, that is, the understanding that others may see things in a different way,