

Mary Proctor and the Cawthron observatory project: a lost history of the Mount Stromlo Observatory

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Between 1912 and 1914, the Anglo-American popularizer of astronomy, Mary Proctor, undertook a tour of Australia and New Zealand in order to promote a solar observatory project that would ultimately be realized as the Mount Stromlo Observatory in Australia. Proctor came at the request of Walter Geoffrey Duffield, who would go on to be the first Director of the Mt Stromlo Observatory and who saw the need to raise funds and public support for the project. Proctor's tour was high-profile and nearly saw the realization of a solar observatory as part of the Cawthron Institute at Nelson, New Zealand. Despite this, Proctor's tour is absent from histories of Mount Stromlo and, until recently, had also been overlooked in New Zealand. I argue that this historical lacuna speaks to a number of historiographical biases: for success over failure; against the role of public activities in scientific work; and downplaying the contribution of women. Mary Proctor was a significant transitional figure in the history of early twentieth-century science-communication who should be more widely recognised.

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Introduction

There are many historical details to fill in for Mary Proctor's 1912–14 tour of Australia and New Zealand. The Anglo-American popularizer of astronomy lectured in all mainland states of Australia and both islands of New Zealand in promotion of a Commonwealth Solar Observatory, later realised as the Mount Stromlo Observatory. Proctor (1862–1957) was invited by Walter Geoffrey Duffield, chief advocate for, and eventual inaugural director of, that observatory. Yet major histories of the institution overlook Proctor's tour, both its successes and its failures. Nor is there much account of the complex political environment in which the Mount Stromlo project—indeed, all of Australian institutional astronomy—was caught at the time.

Limited records and memories of Proctor's tour speak to historiographical biases. One is that for positive results over negative ones, actualities over potentialities. By the time Proctor toured, the commonwealth government had given in principle support to a solar observatory and a site near Canberra had been successfully surveyed. The Mount Stromlo Observatory would be built in the 1920s. What would become Proctor's pet project—a Cawthron observatory in Nelson, New Zealand—was not built. Yet that observatory came within a whisker of realization as a part of the Cawthron Institute, thanks to the advocacy of Proctor and the reputation of her astronomer father (Richard A. Proctor). Had it done so, the future of Mount Stromlo would surely have been different.

It has long been understood that remembrance of triumphs more than mistakes, firsts over lasts, celebrities before others, distorts the record of science and this needs to be attended to by historians (and

other meta-researchers) of science. Proctor's tour was high-profile and very nearly produced a different institutional arrangement for astronomy in Australia and New Zealand. But the success of Mount Stromlo has been celebrated and unrealized alternatives relegated. This paper offers a history of Mount Stromlo as a project that was hanging in the balance.

Another relevant bias downplays the role of popularization in the activities of scientific institutes. Recent cultural histories of science demonstrate that scientific activities never stop at the laboratory door.¹ The use of popularization has been explicit within astronomy.² Duffield clearly considered a public relation's campaign as central to the effort to establish the Mount Stromlo Observatory. Yet, as will be described in more detail below, existing histories of the Mount Stromlo Observatory or astronomy in Australia are largely internal in character, focussing on the efforts of Duffield himself, other directors, and scientists' actions within the walls of Mount Stromlo.³

The Cawthron Institute has been more fortunate in how it has been remembered. Mackay's history is a beautifully crafted work including successes and failures.⁴ With a double-page spread on Proctor's tour, this is one of the most extended treatments to date. This draws on earlier, unpublished research; previous books on the Cawthron Institute shared the silence about Proctor that is still maintained in Australia.

A third—more prominent—bias is that against women in science in this period.⁵ I have elsewhere described Proctor's career.⁶ In brief, she was the eldest daughter of Richard Proctor, the most famous astronomical popularizer of the 1870s and 1880s.⁷ I argue

¹ Golinski (1998).

² For example, Nall (2019). Lightman (2009). Bigg (2010).

³ Frame, Faulkner and Bessell (2003). Lojkin (1957). Bhatal, Sutherland and Butcher (2013). Haynes and others (1996).

⁴ MacKay (2011).

⁵ Shteir and Gates (1997).

⁶ Bush (2021).

⁷ Nall (2019). Lightman (2009).

there that we can view Mary Proctor a transitional figure between the entrepreneurial science popularizers of the nineteenth century and the professional science communicators of the twentieth, drawing on the resources provided by her father yet going beyond them in new circumstances. My argument here is similar. As a prominent female popularizer, Proctor was an ideal resource for Duffield's campaign to build public and political support. Yet she would also be someone who was easy to forget.

Richard Proctor had himself undertaken a triumphant tour of Australia and New Zealand in 1880. This tour would be long remembered for many reasons,⁸ and not least by Thomas Cawthron. Immediately after this tour, Proctor moved his family to St Joseph, Missouri, the hometown of his second wife.⁹ Mary Proctor entered St Joseph society and then, unexpectedly, took to science popularization herself after the unexpected death of her father in 1889. Following a breakthrough public lecture at the Chicago Worlds' Fair in 1895, Mary wrote for a number of publications and released a first book before becoming one of the *New York Times* first science journalists under editor Carr Van Anda.¹⁰ This aspect of Proctor's career—as one of the first of the twentieth century's science journalists—is perhaps the most remarkable.

A solar observatory in Australia had been in the planning for some years

By 1912, Proctor was one of the most famous astronomical popularizers in the United States. Figure 1 shows Proctor aged about 40, during her early career in New York. Proctor had always considered herself British and had maintained connections in the United Kingdom. In a 1906 article, Proctor wrote about her visit to Sir Robert Ball, the unquestioned successor to Richard Proctor as the anglosphere's most famous public astronomer.¹¹ It was likely this meeting that led Ball to recommend Proctor to Duffield as an appropriate lecturer to tour Australia. In late 1911, Duffield had initially approached Ball to see if he would tour,¹² but Ball declined on the grounds of age and ill health. He was then over seventy years old and, indeed, would die in November 1913, while Proctor was still on tour.

The intent of the project was to establish a solar observatory in the Pacific region, thus completing a chain of observatories around the world that would allow the Sun—in principle at least—to be under continuous observation.¹³ At this time, solar physics was a growing and an increasingly internationally co-ordinated field.¹⁴ Norman Lockyer had established a solar observatory in South Kensington, London in the 1870s. By the early twentieth century

there were also dedicated sites in Koldaikanal, India, under John Evershed, and at Mt Wilson, California, under George Ellery Hale.¹⁵ However, the longitude difference between Mt Wilson and Koldaikanal meant that there were several hours each day when the Sun could not be studied by a dedicated observatory. If an important solar event happened in these hours, it would be lost to science, so there was a strong desire for a solar telescope to be placed in the geography in-between.

It was into this space that Duffield threw himself. He had obtained a BA from Trinity College, Cambridge, in 1902 and completed a Nobel research studentship at the National Physical Laboratory in 1903.¹⁶ The following year, he attended the second meeting of the International Union for Cooperation in Solar Research conference in Oxford, and saw the chance for an Australian contribution, immediately dedicating himself to the cause. Through lobbying of Lockyer, and others, Duffield ensured that a motion of support for an Australian observatory was passed at the next international meeting, in Paris, in 1907. This was followed by independent expressions of support for the project by the Royal Society of London, in February 1908, and, later, the British Association for the Advancement of Science, in September 1908.¹⁷ By this time, Duffield had also earned a DSc based on his work at the University of Manchester on an astrophysics-related subject.

The institutions of astronomy in Australia at the time were in flux

With these resolutions Duffield turned his attention to the Australian government and in early 1908 sent a letter to Prime Minister Alfred Deakin. This letter arrived at a time when the institutional arrangements of astronomy in Australia were in flux. Ever since federation in 1901, the states and the commonwealth had been in dispute over the responsibility for astronomical observations and the continued funding of existing observatories. Frame and Faulkner's history of Mount Stromlo asserts that 'it was generally felt that the federal government would eventually provide for an astronomical observatory' due to its constitutional responsibility for 'astronomical and meteorological observations'.¹⁸ This underplays the constitutional, the political and the scientific issues at stake. Of course, none of those were the focus of Frame and Faulkner's study. That the Australian constitution gave the commonwealth government the power to take over astronomical observatories did not require that they do so—as the commonwealth government clearly understood. Whether they would do so was very much in question.

⁸ See Bush (2017) for a description of the major controversies of this tour.

⁹ Proctor's first wife died in 1879.

¹⁰ Unus (2018).

¹¹ Proctor (1906).

¹² Anonymous (1913).

¹³ Poor weather conditions can, of course, obscure observations. The clear skies available at inland locations in Australia, compared with the poor conditions at the existing observatory in South Kensington, London, was a rhetorical point much used by both Duffield and Proctor. See, for example, Duffield's claim of 'almost perpetual sunshine' in Australia in *The Solar Physics Committee of The Australasian Association for the Advancement of Science* (1909), 6.

¹⁴ Bigg (2010). DeVorkin (2018).

¹⁵ There were also other solar observatories in Europe, notably that of Pierre Janssen in Meudon, France.

¹⁶ Allen (1981).

¹⁷ Frame and others (2003) p. 16.

¹⁸ Frame and others (2003) p. 17.



Fig. 1. Carte de visite of Mary Proctor, circa 1900. Private collection.

The issue of ‘federalizing the Australian Observatories’ had been raised—by Deakin—as early as 1902.¹⁹ Indeed, Deakin had a particular interest in astronomical work as a member of the Melbourne Observatory’s Board of Visitors from 1893 until his death in 1919. At this time, the board decided against federalization, preferring to remain under state control.²⁰ This opinion was not uniform: ‘some Observatories wished to be brought under

Federal Control; but others did not’. The South Australian government was particularly keen to jettison their observatory.²¹ The Western Australian government was, at this stage, keen to support its astronomer. Over the next decade, the New South Wales government would blow hot and cold on the Sydney Observatory. Despite the Melbourne Observatory’s position, against federalization, the government of Victoria was ambivalent about its future.

¹⁹ Melbourne Observatory Board of Visitors, Minutes, 17/7/1902, Public Records Office of Victoria 000783/P/0000 000002.

²⁰ Melbourne Observatory Board of Visitors, Minutes, 17/7/1902, Public Records Office of Victoria 000783/P/0000 000002.

²¹ Frame and others (2003) p. 17.

Already by 1902 they had started winding down funding to the observatory.²²

The issue of new funding for astrophysics versus continued funding for positional astronomy had multiple dimensions. The pragmatic issue of limited funding was especially salient for a small astronomical community in Australia. On the eve of Proctor's tour, the grandee of Australian astronomy John Tebbutt, then 78, wrote a letter to a newspaper in which he warned that funding for a solar observatory posed the 'great danger of fundamental astronomy being neglected in the all-absorbing attention given to the new astronomy'.²³ While Tebbutt's influence within Australian astronomy had long since peaked, his position was hardly unique. It would also prove to be prescient. These disputes over resources were also part of a broader disciplinary split in which, as Bigg describes, astrophysics would distinguish itself from positional astronomy, the 'new astronomy' attempted to assert its distinction from—and advantages over—the old, fundamental practices'.²⁴ In this respect, the story of the Mount Stromlo Observatory is consistent with histories describing that particular split, while the particular constitutional wrangling between these traditions gives it a very Australian flavour.

In any case, Duffield was committed to a new astronomy and intensified his lobbying with a trip to Australia, arriving on the last day of 1908 before returning to Britain in late 1910 to take up a professorship at the University College, Reading. In this year, Duffield met with Deakin—again prime minister—in Melbourne; attended the Australasian Association for the Advancement of Science meeting in Brisbane, at which a committee on the solar observatory project was formed; met with the minister for home affairs as part of that committee; and organised a public meeting at the Melbourne Town Hall, chaired by the governor-general of Australia, in support of the project.

Across this period, the federal government increased its support for the project but was reluctant to commit funds. Deakin's response to Duffield's original letter was to enquire whether solar work could be done at an existing state observatory. Victorian state astronomer, Pietro Baracchi, initially recommended Adelaide; the Western Australian Ernest Cooke was keen to claim Perth a suitable site.²⁵ Commonwealth meteorologist Henry Hunt, on a world tour in late 1908, was asked to enquire about the requirements for a solar observatory. He reported that 'all those engaged in and committed to this class of Observation' recommended an institution 'altogether apart and free from the present Astronomical institutions'.²⁶ Although Hunt's motivations for recommending a separate establishment may have been based on downplaying astronomy and ensuring pre-eminence for meteorology within the network of federal science, this specific advice was confirmed by the other main source of advice on scientific matters for the commonwealth

government, Government Statistician, George Knibbs, who was himself enthusiastic about the new astronomy, and would be part of the Australasian Association's committee.

Such advice persuaded Deakin to commit to a new astronomical observatory under commonwealth control, and within the new federal territory, which was then being planned. However, Deakin was unwilling to commit large sums of money to the project—he promised only annual maintenance costs, perhaps £1,500 per year, and would not commit to the initial building costs. This reflected the approach from all political parties at the time. The subsequent Minister for Home Affairs in the Fisher government, Hugh Mahon suggested the government might match funds privately raised. Former 'Free Trade' Prime Minister George Reid seconded the motion in support of the observatory at a Melbourne public meeting in 1909, but in so doing called on 'some man of wealth' to fund the project. In principle support for the project was welcome but this in itself would not build the observatory, or provide ongoing maintenance. This in-principle support also required maintenance. The solar observatory project was caught up in the churn of pre- and post-fusion governments.²⁷ Between 1908 and 1912 the ministry changed four times—and the minister responsible for the project, the minister for home affairs, changed on each occasion.²⁸

Nonetheless, commonwealth support for the project did continue to build. In 1910 the Deakin government authorised a preliminary survey of sites within the new Australian Capital Territory that recommended Mount Stromlo. Although this government was soon after replaced with the Fisher government, Victorian state astronomer Pietro Baracchi was still requested to continue the survey of the selected site with a fourteen-month series of observations, 1911–12, to determine its suitability for solar work. This report was entirely favourable: 'Probably no other regions in Australia, except perhaps the rainless areas in the far interior of the Continent, would in this respect compare advantageously with Mt. Stromlo'.²⁹

As well as its existence, the form of the Mount Stromlo project was also in flux. The original vision of a Canberra observatory articulated by Hunt was not of a single astrophysical observatory, but rather of a network of separate observatories. Hunt suggested that a site be found 'sufficiently large for the establishment of a number of observatories, the directors and staffs of which would form a consultative scientific community whose mutual interests and understanding would act as a safeguard against the facilities and fields of operations in one branch of investigation being unduly encroached upon by the others'.³⁰ The scientific fields to take part in such a site were meteorology, solar physics, astronomy and geodesy; with Hunt listing his own speciality in the first place. When Mount Stromlo was initially recommended by the preliminary survey committee, one

²² Melbourne Observatory Board of Visitors, Minutes, 11/7/1904, Public Records Office of Victoria 000783/P/0000 000002.

²³ Tebbutt (1912).

²⁴ See Bigg (2010) for a discussion of this disciplinary split and the role of popularization.

²⁵ Solar Photography, 28 February 1908, Public Records Office of Victoria 000780/P/0000 000001. Anonymous (1908).

²⁶ Copy of a letter received from Mr. H. A. Hunt, London, dated 24th October, 1908, Public Records Office of Victoria 000783/P/0000 000002.

²⁷ In 1908 the protectionists and free-traders joined together in a 'fusion' government against the Labor party, establishing the two-party system that has prevailed ever since.

²⁸ Joseph Keating (Deakin government) Jan 1907 – Nov 1908; Hugh Mahon (Fisher government) Nov 1908 – Jun 1909; George Fuller (Deakin government) Jun 1909 – Apr 1910; King O'Malley (Fisher government) Apr 1910 – Jun 1913.

²⁹ Baracchi, P. Progress Report of the Mount Stromlo Observatory, A1, 1918/6038, National Archives of Australia.

³⁰ Memorandum to the Minister for Home Affairs, 28 March 1911, A1, 1918/6038, National Archives of Australia.

reason was that ‘on the top of the range there is ample room for the location of several Observatories, which, while readily accessible from each other, thus securing that inter-communication between the members of the Scientific Staff that is eminently desirable, would be so situated that no one of them need interfere in any way with the others’.³¹ By contrast, the other site under consideration, Mugga Mugga, could not be recommended ‘mainly on account of the area at the summit being so limited as to prevent the suitable location of the several observatories’.³² Although Duffield’s campaign for an astrophysical observatory would be successful, the vision of a network of scientific observatories at Mount Stromlo would not be realised, showing that at least some elements of the original plan failed.

By the end of 1912, five years of campaigning had produced a lot of goodwill and some real progress but no concrete promises of a result. The British Association for the Advancement of Science was scheduled to hold its annual meeting in Australia in 1914—this itself being something of a coup for the local scientific community—and looked to be the perfect opportunity to finally secure a commitment for the observatory project from the government as well as to seek the philanthropic support that seemed to be required. It was in this context that Duffield—re-ensconced in Britain—saw the opportunity for a public relations and fundraising campaign led by a prominent astronomical lecturer and, on Ball’s recommendation, approached Mary Proctor.

Mary Proctor toured throughout eastern Australia

Mary Proctor at that time was resident in New York, engaged in writing science columns in the *New York Times* and delivering astronomical lectures across the country. Most of her astronomical education had come from her father, although she had taken a short course at Columbia University on descriptive astronomy and had expressed interest in undertaking further formal education.³³ As I describe in more detail elsewhere, Proctor was part of a tradition of women science writers that spanned the nineteenth century, from Jane Marcet to Agnes Mary Clerke, although Proctor’s position as a female scientific lecturer was more unusual.³⁴ A feature of her science communication work was the strong relationships she built with the astronomical research community.

At the conclusion of her lecturing season in May 1912, Proctor made her way across the United States of America, visiting Yerkes Observatory, to California, where Lick, Mount Wilson and Chabot Observatories were added to her itinerary. In Vancouver, she

boarded the steamer *Makura* to Melbourne, ‘laden with lantern slides, pamphlets, letters of introduction and no end of good wishes from all the astronomers and observatories I have visited’.³⁵ At some stage in this journey, Proctor acquired a copy of Mary Acworth Orr’s *An Easy Guide to the Southern Stars*, which apparently provided the source material for one of Proctor’s lectures.³⁶

Proctor arrived in Melbourne on 15 July 1912 and was met with immediate interest. After three weeks spent in Melbourne and Sydney acclimatising herself, meeting local scientists and dignitaries, and promoting her tour, Proctor commenced lecturing in Melbourne on 5 August at the Athenaeum Hall, where her father had lectured 32 years earlier. Over the next few months—with the exception of September, during which she was recovering from a bout of tonsillitis—Proctor engaged in a busy schedule of lecturing across the eastern states of Australia. A summary of this first season of her tour is provided in Figure 2.

Proctor’s repertoire consisted of five main lectures. Three of these—‘Other worlds than ours’, ‘Giant Sun and his family’, and ‘Comets and meteors’—were adaptations of Richard Proctor’s lectures, although rendered into Mary’s style. Indeed, *Giant Sun and His Family* was the title of Mary Proctor’s second book, published in 1906. Two were wholly different—‘Wonders of the southern skies’ and ‘Great telescopes and observatories’ and, as Proctor was famous for, a children’s lecture, ‘A trip to starland’.

Reports of these lectures were favourable and widespread. The suite of digitised newspapers in the online resource Trove reveal nearly a hundred articles published about Mary Proctor in July 1915 alone, and in all states of Australia.³⁷ Lecture audiences were uniformly described as large and enthusiastic; in Brisbane ‘the attendance was so large that a great many persons were unable to obtain seats’.³⁸ The *National Advocate* was somewhat hyperbolic about her talents: ‘Like her father, Miss Proctor is gifted with a poet’s imagination. Her diction is perfect, her utterance so clear, and her thoughts so inspiring that the brief hour she lectures seems like an enchanted quarter’.³⁹ The *Argus* was more restrained: ‘Miss Proctor has a pleasant voice and has her lectures by heart. She is alive to the romance of her subject but is not carried away by it into unscientific assertion’.⁴⁰ Most extended reports of her lectures included reference to her advocacy:

In the course of her address, Miss Proctor entered a plea for the establishment of a proper observatory in Australia, which she said was the one link in the chain that required forming to enable the observation of the sun throughout the full 24 hours.⁴¹

³¹ Preliminary report of the Committee appointed to select a site within the Federal Territory suitable for the location of Astronomical and other scientific observatories, A1, 1918/6038, National Archives of Australia.

³² Preliminary report of the Committee appointed to select a site within the Federal Territory suitable for the location of Astronomical and other scientific observatories, A1, 1918/6038, National Archives of Australia.

³³ Proctor, M. ‘Application for Astronomical Fellowship, 6 October, 1911’ Annie Jump Cannon Papers, HUGFP 125.12, Box 3, Harvard University Archives.

³⁴ Bush (2021).

³⁵ Letter, Mary Proctor to Ruth Standen, 4 June 1912, 4 June 1912, UA.036.Ser.01 Box 115, University of California Santa Cruz Special Collections.

³⁶ Richard Proctor had also produced a guidebook *The southern skies*, and Mary no doubt had some acquaintance with this work. However, as Mary Proctor would complain about several times, her stepmother had acquired Richard’s library after his death and Mary had to hunt out and purchase copies of his books for her own use. As late as 1937, *The Southern Skies* was not amongst the books that Mary owned.

³⁷ <https://trove.nla.gov.au/newspaper/>.

³⁸ Anonymous (1912j).

³⁹ Anonymous (1912a).

⁴⁰ Anonymous (1912d).

⁴¹ Anonymous (1912e).

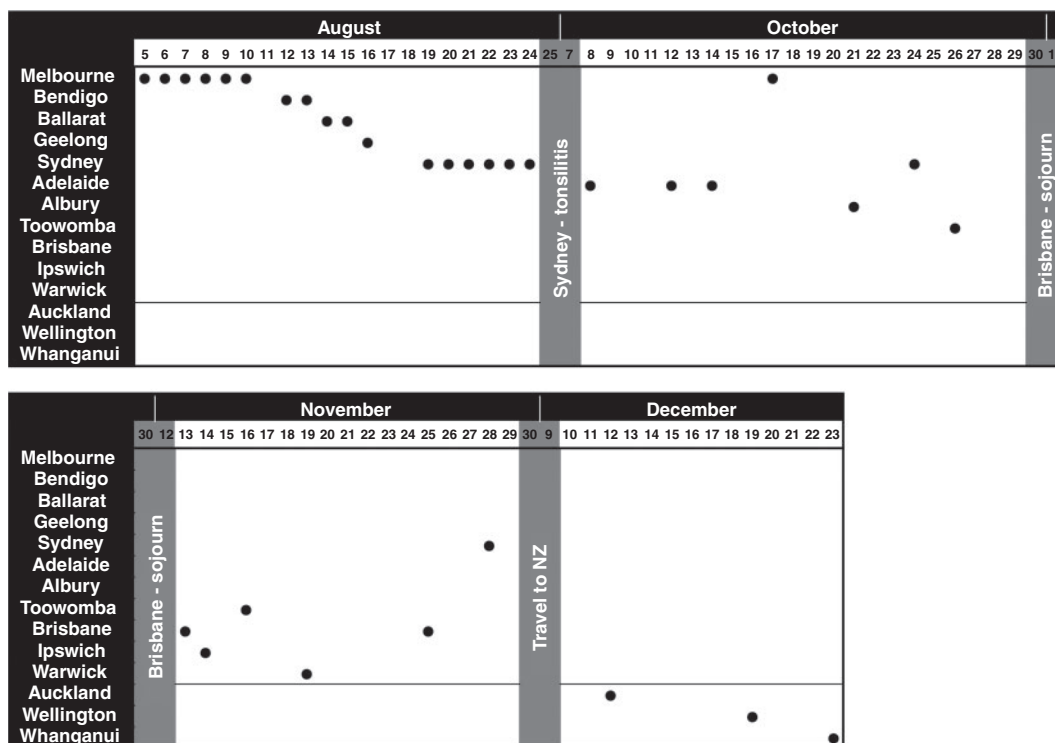


Fig. 2. Summary of Mary Proctor's 1912 lecture tour in Australia and New Zealand, as gleaned from newspaper reports in *Trove*.

She also wrote newspaper columns directly promoting the project.⁴² In terms of publicity, the tour was clearly a success.

As well as attention to her astronomical mission, Proctor was welcomed by women's groups and liberal organisations in Australia. In Sydney, she was entertained by the Women's Liberal Association, in Melbourne, hosted by the Swastika Club, a recently formed women's club with a strong literary focus, and in Adelaide had a reception with a group of female journalists.⁴³ In Brisbane she addressed the final meeting for 1912 of the National Council of Women.⁴⁴

Such hospitality was also provided by more conservative echelons of society. Indeed, raising funds from the British Empire League was a specific duty tasked to Proctor, and she met with members in Sydney.⁴⁵ She also received civic welcomes in Sydney and in Adelaide, dined at Government House before the governor attended Proctor's final lecture.⁴⁶ In Brisbane, the Governor of Queensland, William MacGregor, went further and not only 'hosted her at luncheon' but presided over Proctor's lectures personally, as well as giving his own speeches on the importance of a solar

observatory.⁴⁷ While detailed accounts of Proctor's fundraising are not available, in four lectures in Queensland in November 1912 she raised over £10, while in her subsequent 1913 season in New Zealand she raised £75.⁴⁸ Thus, it would seem likely that across all of her lectures and receptions in Australia and New Zealand she raised well over £100 and perhaps closer to £200.

In December 1912, Proctor travelled to New Zealand and delivered three lectures, in Auckland, Wellington and Whanganui, before returning to Australia to join the Australian Association for the Advancement of Science Congress in Melbourne in January 1913. Before the meeting had concluded, however, Proctor sailed to India to visit the Koldaikanal Solar Observatory and meet with its director, John Evershed, and his wife, Mary Acworth Evershed née Orr, author of the *Easy Guide to the Southern Stars*.⁴⁹ The two Marys formed a friendship, one indication of which being that Mary Orr dedicated her revised guidebook, *Stars of the Southern Skies*, to Mary Proctor.⁵⁰

On this journey, Proctor had cause to reconsider her approach to promotion of the solar observatory project. She was evidently struck

⁴² Proctor (1912).

⁴³ Anonymous (1912g). Anonymous (1912f).

⁴⁴ Anonymous (1912c).

⁴⁵ Anonymous (1912i).

⁴⁶ Anonymous (1912h). Anonymous (1912k).

⁴⁷ Anonymous (1912j).

⁴⁸ Anonymous (1912b). Letter, Mary Proctor to William Campbell, 12 November 1913, Lick Observatory Archives, UA 36 Ser. 1, Box 115, University of California Santa Cruz Special Collections and Archives.

⁴⁹ Mary Acworth Evershed was also the author of *Dante and the Early Astronomers*, what is probably still the most authoritative study of astronomical symbolism in Dante's work. For a biography, see Daugherty (2019).

⁵⁰ Orr (1915).

by the interest in astronomy shown in New Zealand, the other 'land of the southern cross', claiming that there were, in the Wellington Public Library 'more of her father's works than in any library she had seen in Australia'.⁵¹ Moreover, Proctor was dispirited by the official approach to astronomy in Australia. In a letter to George Ellery Hale of Mount Wilson Observatory, Proctor wrote that: 'After 7 months in Australia, I have learned that astronomy is at a pretty low ebb in this part of the world'.⁵² In contrast to Duffield's relentless enthusiasm, she had come to believe that the federal government did not intend to commit any significant funding. She also felt that the state astronomers of New South Wales and Victoria were actively holding the project back. Baracchi she felt was 'not much of an astronomer' and 'apparently opposed to Dr Duffield',⁵³ while Cooke—by now appointed to the New South Wales post—was 'but a figurehead'.⁵⁴ These reflections undoubtedly shaped her discussions with the Eversheds as well as her later actions.

Thomas Cawthron promised to build a solar observatory in New Zealand

Mary Proctor returned to Australia from India in March 1913. On this occasion, she gave no lectures in Australia, but headed immediately to New Zealand. A little over a month later, she had secured a promise of full funding from a 'man of great wealth' for a solar observatory to be built in Nelson, New Zealand—or so she thought.

The most complete first-hand account of the rise and fall of the Cawthron solar observatory project comes from Frederick Giles Gibbs, a Nelson schoolteacher who acted as Cawthron's secretary for the last decade of his life. Gibbs wrote a diary of events at the time, provided a statement to Cawthron's trustees shortly after Cawthron's death, and wrote an autobiographical account of the project later in life. These three sources, written at different times, all provide a consistent account.⁵⁵ Mary Proctor herself gave a partial account of the proceedings in an article in *Popular Astronomy* and there is a report of her talk to the Royal Astronomical Society—about which more will be said—both of which corroborate Gibbs' version of the story.⁵⁶

Thomas Cawthron was a British migrant to New Zealand made wealthy through mining ventures, land speculation, and then, more substantially from the investments built off the back of these. He was, in later life, a noted philanthropist whose will bequeathed the bulk of his estate—the enormous sum of £231,000—to an educational institute and museum for Nelson, and in his lifetime had also paid for things like the renovation of a church in Nelson and other civic works. He disliked publicity for such benefactions, because it 'brought him such sheaves of begging letters for other objects that he always sought to postpone public notification.'

In February 1913, Cawthron read in the newspapers about Mary Proctor's lectures and her mission, and asked Gibbs 'what is meant by a Solar Observatory?' When so told, he expressed interest in funding such an institution if it were feasible, specifically drawing attention to 'the keen pleasure which he had derived' from the lectures of Mary's father Richard Proctor in Nelson in November 1880, as well as the 'high sunshine record' of the town. Just as Proctor was making her way to New Zealand, Gibbs travelled to Wellington to discuss the matter with Hamilton, museum curator, and Adams, government astronomer. The initial estimate reported to Cawthron was upwards of £20,000, but they would need Proctor's more expert judgement to establish a realistic figure.

Mary Proctor arrived in Nelson on 13 April in order to give a lecture the following day. She stayed with Gibbs' mother, and before the lecture visited Cawthron and provided an estimate of £10–12,000 funding required for an observatory. Cawthron agreed to this amount immediately on the condition that the gift be kept secret. However, Proctor and Gibbs pressured Cawthron to provide a letter containing his promise that could be announced at Proctor's last scheduled lecture in Wellington, on 1 May. In the meantime, Gibbs had written to several astronomers, including Evershed and Hale, and was dismayed to hear that a better estimate was £30–50,000. Proctor described in a letter to William Campbell, Director of the Lick Observatory, that her 'suggestion that £12,000 would be enough was a sad blunder'.⁵⁷ She had apparently not included any salaries in her estimate, expecting these to be otherwise met. In Gibbs' account 'Miss Proctor said that she had always thought that the staffs of the many observatories she had visited were men of means who required no salaries', a curious statement given that Proctor herself was acutely aware of financial pressures, had recently visited Evershed, and had engaged in extensive correspondence with secretarial staff at many such observatories. In any case, Cawthron was annoyed, but prepared to continue with the project.

John Evershed surveyed several sites in Nelson and found them suitable

The next step was to survey potential sites, and Evershed was invited to undertake this task. Permission for him to travel to New Zealand was a complicated affair, involving some correspondence with the India Office in London, but eventually Evershed was released from his duties for the month of January 1914 to visit Nelson to make measurements, at Cawthron's expense.

Mary Proctor met John and Mary Evershed on their arrival in Wellington and the three of them travelled to Nelson on 8 January 1914. Prior to this visit, Gibbs had identified a number of potential sites for the observatory, including Third House Peak, Wooded

⁵¹ Anonymous (1912f).

⁵² Letter, Mary Proctor to George Ellery Hale, 13 January 1913, George Ellery Hale Papers, Box 34, folder 2, California Institute of Technology Archives and Special Collections.

⁵³ Letter, Mary Proctor to George Ellery Hale, 13 January 1913, George Ellery Hale Papers, Box 34, folder 2, California Institute of Technology Archives and Special Collections.

⁵⁴ Letter, Mary Proctor to William Wesley, 23 January 1913, Letters 1833–1940, Royal Astronomical Society Archives.

⁵⁵ The semi-autobiographical account Notes on the history of astronomy in Nelson, New Zealand, New Zealand Archives, is the most complete of these. Quotes from Gibbs are drawn from this item, unless otherwise noted.

⁵⁶ Proctor (1914). Anonymous (1914c).

⁵⁷ Letter, Mary Proctor to William Campbell, 12 November 1913, Lick Observatory Archives, UA 36 Ser. 1, Box 115, University of California Santa Cruz Special Collections and Archives.

Peak, Dun Mountains, Grampian Mountains and Jenkin Hills. Over the course of the next three weeks, Evershed, Gibbs, and other observers assessed these for suitability of atmospheric seeing. Telescopes were set up at the different sites and images of the Sun projected onto white cardboard. Every half hour, the observers at the different sites needed to rate the definition of the Sun's image on a scale of 0–5, and at the end of the day these ratings were collected. By the conclusion of this trial, Evershed agreed that the main site suggested by Gibbs and Hector, the Fringed Hills had suitable conditions.⁵⁸

At the very end of January, after completing the survey of the higher-elevation sites, the Evershed party visited a lower site, the Port Hills, more accessible, but also more exposed to the ocean. It had generally been considered by all parties that the lower height and greater chance for wind would be unfavourable. To all of their surprise, however, Evershed determined that the site was sheltered from the prevailing wind and that seeing was generally good. [Figure 3](#) shows Evershed and the party at this site. His final report concluded that the more remote Fringed Hills was certainly suitable, but that the Port Hills site should be monitored further, and should the atmospheric conditions be stable, the greater accessibility definitely recommended it as a site. In Proctor's words, Evershed rated Nelson overall as 4½ out of 5. However, Evershed's report also provided an updated estimate of a minimum of £50,000 and a recommended £60–70,000 to establish an observatory. By this stage, Cawthron evidently felt that he was being gamed by the astronomers, and insisted that his promise was for £30,000 only, while indicating that he might be able to provide £50,000 or more.

By February 1914, the Eversheds and Proctor sailed together—first to Australia—and then onwards by the same boat, John and Mary Evershed back to India and Mary Proctor continuing on to Britain. They evidently felt their work had been a success. While briefly in Australia, both Evershed and Proctor made public statements encouraging the continued construction of an Australian observatory; both deplored the fact that funding was not forthcoming in the larger country.⁵⁹ In response, Tebbutt once more chimed in with a letter to the editor with the hardly forward-thinking suggestion that interest in the 'sublime science' could be kindled with a reintroduction of teaching 'the use of the globes' in schools.⁶⁰

The Cawthron observatory would not be built

The Cawthron observatory project started to go awry soon after Proctor and Evershed left New Zealand. The first developments were promising. Across the remainder of 1914, Gibbs continued to monitor the Port Hills site, as Evershed had recommended, with generally favourable results. By July 1914, Gibbs had managed to persuade Cawthron to sign a Deed of Trust for the observatory funding.

This had required overcoming some of Cawthron's pique at Proctor's behaviour back in Britain. Shortly after returning to what Proctor always considered 'home', she addressed the Royal Astronomical Society and gave an account of the proposed project. This

meeting must have been one of the highlights of Proctor's career. The Astronomer Royal, Frank Dyson, described it as 'an almost unique opportunity' for which they were all 'deeply indebted to Miss Proctor'. Duffield was present and also gave warm congratulations, while continuing to advocate for an Australian observatory as well: 'There is work for both observatories.' However, while Proctor was as self-deprecating as women in public life were required to be, she also tried to minimise her own mis-estimation of the required funding. In so doing she announced that Cawthron had promised £50,000. When reports of this got back to Nelson, Cawthron was incensed. He had only promised £30,000; any more would be at his discretion. Gibbs had to work hard to smooth over this difficulty.

Gibbs was also irritated by Proctor's keen interest in who would be director of the new observatory. Initially, she wanted Evershed to take the post, but it was soon clear that he had no interest in vacating his position at Koldaikanal. Her preference then switched to Joseph Baldwin, Baracchi's deputy in Melbourne, whom she regarded as far more competent. She implied in correspondence that Evershed had made this recommendation as well; Gibbs sent clarifying letters to the president of the Royal Astronomical Society, Edmond Grove-Hills.

There was, however, a more significant problem. Cawthron was reluctant to sign the Deed of Trust that would guarantee the funding. According to Gibbs, he received final approval from Cawthron for the deed on 24 July 1914 but was then absent from Nelson until the 4 August. 'On the way back to town I learned that the European War had broken out' and the day before the deed was to be signed, the United Kingdom entered the conflict. Under these changed circumstances, Cawthron refused to sign the deed, preferring to wait 'till the course of the War was known'. By November of that year, although still refusing to sign, Cawthron authorised Gibbs to purchase the proposed observatory site at the Port Hills (later called Cawthron Park). However, Cawthron now raised a new objection: some public roads had been declared (but not built) on the land and these would need to be transferred before the deed could be signed. According to Gibbs, Cawthron was extremely wary of such 'paper roads': 'Once a road, always a road'. Gibbs arranged for this to be done, and on 14 October 1915, the road removal was gazetted.⁶¹ But less than a week earlier, on 8 October, Cawthron had died, with the deed unsigned.

Gibbs continued to push for the observatory to be funded from the estate. Cawthron's will was vaguely worded and his estate complex. Indeed, there were several other claimants on the estate for projects that Cawthron had promised but not signed off on. The purchased land had been transferred half into Gibbs' name, giving him some standing, and the astronomical establishment of New Zealand was entirely supportive of Gibbs' attempts. All of these gave opportunities for bringing legal action, and indeed, several court cases ensued. However, they were to no avail. First, the trustees determined that they would adhere strictly to the terms of the bequest, and then in 1919 Justice Chapman of the Supreme

⁵⁸ This region and all localities mentioned are part of the Ngati Koata iwi; the colonial names as used by the protagonists will be used here.

⁵⁹ Anonymous (1914a). Anonymous (1914b).

⁶⁰ Tebbutt (1914). The 'use of the globes' was a mathematical approach to teaching physical geography and astronomy using a pair of globes—terrestrial and celestial—that could be manipulated as calculating devices to solve problems. Popular in 'accomplishments education' of the mid-nineteenth century, it waned at the end of the century under the influence of the 'new education' movement that emphasized direct student observations.

⁶¹ Anonymous (1915).



Fig. 3. John Evershed and team of assistants taking solar observations at Cawthron Park, January 1914. National Library of New Zealand 1/1-009995-G.

Court of New Zealand agreed: unsigned promises had no standing and Gibbs was directed to hand over the purchased land to the Trustees. The Cawthron observatory project was finished.

The trustees had their own vision for a Cawthron Institute. At the inaugural lecture series held in association with the institute, the chairman of the trustees' board, William Sadlier, Anglican Bishop of Nelson, alluded to the unfunded promises and articulated this vision:

The central idea was to do one thing well and not spread effort over too large a field and thereby lose effectiveness. The one thing they had adhered to strictly was the investigation of biological and chemical problems bearing on the agricultural industries of New Zealand.⁶²

Mary Proctor's disappointment was immense. She would look back on this with bitterness in years to come, writing in 1929 to Algernon Charles Gifford, a science teacher and amateur astronomer who Proctor had met in New Zealand, how the trustees' decision meant 'vetoing the Observatory Plan, in favour of fruit'.⁶³

⁶² Anonymous (1920) p. 8.

⁶³ Letter, Mary Proctor to AC Gifford, 25 April 1929, AC Gifford – Inward Correspondence, MS-Papers-0259-019, National Library of New Zealand.

⁶⁴ Anonymous (1958).

In the aftermath, the Cawthron observatory project would be forgotten

Proctor had other, more immediate concerns in this period. The extended tour of Australia and New Zealand had been a stretch for her finances. The outbreak of war reduced the demand for popular lectures and so further affected her income. Proctor was able to get work with the censor's office during the war and also gave lectures to soldiers stationed in Britain and in France during and after the war as part of a program of such events organised by the British army. Although Proctor would make several return trips to the United States, she remained resident in London for the rest of her long life. Dying in 1957, aged 95, she outlived most of her contemporaries and memories of her had been obscured even in her own lifetime. There were only a few short notices of her death; nothing was reported in the Australian press.⁶⁴

Memory of the Cawthron observatory project fared little better. Allusion to it at the inaugural Cawthron Institute lecture is described above. In 1926, the lecture was on the subject of astronomy and delivered by astronomer Joseph Ward who explicitly described the project.⁶⁵ Beyond those mentions, the institute was keen to downplay this episode. A historical lecture was given in 1933 for Thomas Cawthron's centenary by the first director, Thomas Easterfield, and a published history was produced in 1945 for its silver jubilee.⁶⁶ In the late 1940s director Theodore Rigg would write historical articles for a range of journals.⁶⁷ None of these mention the observatory project. It would not be until Mackay's work in 2011 that this story would be told as part of the institute's history.

Nor were Stromlo historians interested in discussing Mary Proctor's involvement in the project. There is no evidence that Duffield ever referred to Proctor again after 1914, despite her having come to the Southern Hemisphere at his request. Proctor does not appear in Frame and Faulkner's work, nor an earlier history by Lojkine or in a later one by Bhatl.⁶⁸ Although the last of these does address the lobbying and public advocacy that was mounted on behalf of the project through this period, Bhatl concurs with Frame and Faulkner in describing the early history of Mount Stromlo as the actions of one great man, Duffield, with commonwealth support ultimately assuring the construction of the observatory. Similarly, Proctor's tour is absent from the account of Mount Stromlo in *Explorers of the Southern Skies*, the most comprehensive history of astronomy in Australia, despite its generally impressive inclusion of the cultural context of astronomical work.⁶⁹

A Cawthron Observatory would likely have changed the role of Mount Stromlo

The events described in this paper raise the question as to whether the inevitability of the Mount Stromlo Observatory was as certain as has been assumed. While a Cawthron observatory was a live proposal, Duffield was adamant that there was work for two observatories.

This question of whether two observatories in such close proximity to each other could be justified was considered salient by Australian politicians at the time. In meeting with the deputation regarding the project associated with the British Association for the Advancement of Science meeting in Australia in 1914, Jo Cook (who, having been prime minister for just a year was only days away from being replaced by Fisher in yet another change of administration) stated:

In my ignorance I was under the impression that New Zealand relieved us of further responsibility in this respect. For instance I saw a little diagram you had in which you show we are the only portion of the world not previously linked up, and I understand New Zealand has stepped up and linked us up quite as effectively from a Geographical point of view.⁷⁰

The deputation would persuade Cook against this view, but it raises the question of how strongly this position would have been maintained in the face of a successfully established observatory in Nelson. The First World War also set back the prospects for the Mount Stromlo project with the commonwealth government flatly refusing to commit any funds for the duration. It was not until 1923 that the Bruce government finally promised financial support and not until 1925 that there was a budgetary allocation by the Australian government. This means that had the Cawthron project been delivered, it would have been operating for at least half a decade by this point. It is impossible to know how scientifically useful or complete its operations would have been by then but it seems very likely that the scope at least of Mount Stromlo would have been significantly different in that circumstance.

Conclusion

Mary Proctor's tour of 1912–14 was by no means the most significant episode of the history of Mount Stromlo. There had been plenty of activity prior to the tour and significant lobbying afterwards. However, it was a high-profile public relations' campaign at a moment when the movement to build the observatory needed it. The near-complete erasure of this tour from the extant histories is curious. It speaks to idiosyncratic features of this episode, like Proctor's switch of support from Australia to New Zealand, but also to the historiographical biases described above, such as the lack of attention to the failure of a Cawthron observatory, even though the difference here between success and failure was so close. More generally, the role of politics, lobbying, organisational efforts and public activities as central to scientific work—as Duffield understood as much as anyone—has not been recognised in these histories as strongly as is warranted. Mary Proctor herself was a significant transitional figure in the history of early twentieth-century science communication who has only recently come out of the shadows of historical memory.

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Data availability statement

Data sharing is not applicable as no new data were generated or analysed during this study.

⁶⁵ Anonymous (1925) p. 3.

⁶⁶ Anonymous (1933). Anonymous (1945).

⁶⁷ For example Rigg (1949).

⁶⁸ Frame, Faulkner and Bessell (2003). Lojkine (1957). Bhatl, Sutherland and Butcher (2013).

⁶⁹ Haynes and others (1996).

⁷⁰ Transcript of notes of deputation which waited on the Prime Minister at the Commonwealth Offices, Melbourne, on Tuesday 18 August, 1914, A1, 1918/6038, National Archives of Australia.

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