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'No photons to capture': Electric Lighting and Visual Culture at Binoomea (Jenolan Caves)

Megan Nash

In the roof of an inner chamber of Australia's Binoomea (Jenolan Caves), there remains an old carbon filament lightbulb which casts a warmer glow than the contemporary installation of LEDs. The bulb speaks of the unlikely history of electrification and visual spectacle that belongs to these caves; despite their remote location in western New South Wales, they were lit by electricity only a year after Edison would patent his lightbulb in 1879. This article examines their history in order to think about how tourism at Jenolan was shaped by Victorian visual culture and, in particular, by the Victorian preoccupation with new optical technologies and popular entertainments. It contemplates the paradoxical nature of show caves; namely, the fact that a space where vision is, by nature, entirely precluded, is presented to visitors primarily as a visual spectacle. Keeping light, darkness, and this contradictory visuality in mind, it considers why these practices might not have been a perfect fit for Jenolan Caves, and how their history of electric lighting and photography participated in past and present processes of colonization. Thinking about ways that illumination can extend beyond visuality and sightseeing, it contemplates modes of engagement that, by disrupting visitor perception, might help to stimulate greater awareness of the intertwined histories of lighting and imperialism.

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I want to begin by acknowledging the Traditional Custodians of the land on which the World Heritage site of Binoomea (Jenolan Caves) lies: the Burra Burra people of the Gundungurra nation. I pay my respects to their elders, past, present, and emerging, and recognize those who have cared and continue to care for the caves through the knowledge embedded forever within the Aboriginal Custodianship of Country. Jenolan is a Gundungurra word, but it actually refers to a small peak located around thirteen kilometres away from the caves.[1] The caves themselves are called Binoomea. The following discussion of Binoomea examines a period when they became known to British colonizers and were developed into a popular tourist destination. With a focus on electric lighting, it unpacks the ways the site exemplified popular forms of Victorian visual culture and considers how this history of illumination has participated in past and present processes of colonization.

For visitors to Binoomea today, one of the guided tours on offer takes you through the Chifley Cave. Early in the tour, you come to rest for a brief demonstration in the first of its large chambers. The lights are turned off and, for several seconds, a group of strangers stands together in the dark.[2] It is an unusual moment of sensory deprivation and reset: visitors are reminded that they are in fact underground, standing in an ancient, dark place. Geologically, Binoomea are the oldest known karst caves in the world, with chambers dated at over 340 million years old.[3] They are also a place where sunlight has never entered. As David Culver and Tanja Pipan dramatically note in *The Biology of Caves and Other Subterranean Habitats*, caves like Jenolan would naturally contain

> a darkness that is darker than any darkness humans normally encounter, a darkness to which our eyes cannot acclimate, no matter how long one waits [...]. Eyes and the visual apparatus in general have no function there. There are no photons to capture.[4]

While this is true in the absence of humans, it is far less applicable to show caves such as Chifley, where the eyes of both Victorian and contemporary visitors have a lot of work to do.

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[1] Jim Smith, 'Illuminating the Cave Names of Gundungurra Country', in *Indigenous and Minority Placenames: Australian and International Perspectives*, ed. by Ian D. Clark, Luise Hercus, and Laura Kostanski (ANU Press, 2014), pp. 83–96 (p. 84).

[2] According to Julia Horne and Penny Davidson, this is a common interpretive practice of cave guides. See Julia Horne, *Jenolan Caves: When the Tourists Came* (Kingsclear Books, 1994), p. 14; and Penny Davidson, 'Voices from the Profession: Principles of Successful Guided Cave Interpretation', *Journal of Interpretation Research*, 12.2 (2007), pp. 25–43 (pp. 35–36), doi:10.1177/109258720701200203.

[3] R. A. L. Osborne and others, 'Carboniferous Clay Deposits from Jenolan Caves, New South Wales: Implications for Timing of Speleogenesis and Regional Geology', *Australian Journal of Earth Sciences*, 53.3 (2006), pp. 377–405, doi:10.1080/08120090500507362.

[4] David C. Culver and Tanja Pipan, *The Biology of Caves and Other Subterranean Habitats* (Oxford University Press, 2009), pp. 2–3.

As the tour proceeds, after the brief moment of darkness, the guide switches on a lone carbon filament light bulb that casts a warm yellow glow from the roof of the Chifley Cave (*Fig. 1*). This light, in its form, mount, and wiring, speaks to an unlikely history of the nineteenth-century electrification of these caves, which were first illuminated in 1880, only a year after Edison patented his incandescent lightbulb.[5] The electric light was used to take photographs, and the images were displayed in the New South Wales exhibit of the 1880 Melbourne World Fair (*Figs. 2, 3*). The experiment was led by E. C. Cracknell — superintendent of telegraphs and president of the Electric Club of Sydney — and photographer Ludovico Hart.[6] With the success of these photographs, and the increasing popularity of electricity, electric light became a permanent fixture of Binoomea's first two show caves by 1887, seventeen years before Sydney would install electric streetlamps.[7]

Contemporary visitors are not left to bask in the ambience of the carbon-filament globe for long before it is switched to a display of multicoloured lights that tint some of

Fig. 1: The Margareta Chamber of the Chifley Cave in incandescent light (left) and in colour (right), Jenolan Caves, New South Wales (August 2022). Photograph by the author.

[5] John R. Dunkley, *Jenolan Caves: As They Were in the Nineteenth Century* (Speleological Research Council for Jenolan Caves Historical and Preservation Society, 1986), p. 29.

[6] Martha Rutledge and J. L. Affleck, 'Edward Charles Cracknell (1831–1893)', *Australian Dictionary of Biography* (National Centre of Biography, Australian National University, 1969, pub. online 2006) <https://adb.anu.edu.au/biography/cracknell-edward-charles-3283/text4985> [accessed 8 September 2025].

[7] George Wilkenfeld and Peter Spearritt, *Electrifying Sydney: 100 Years of EnergyAustralia* (EnergyAustralia, 2004), p. 19. The electric lights at Jenolan were initially fed by a wood-powered dynamo, and then, within half a decade, by the first small-scale hydroelectric power installation in Australia. See 'Flashing its Brilliant Rays!', The History of Jenolan Caves <https://www.jenolancaves.org.au/hydroelectric> [accessed 8 September 2022].

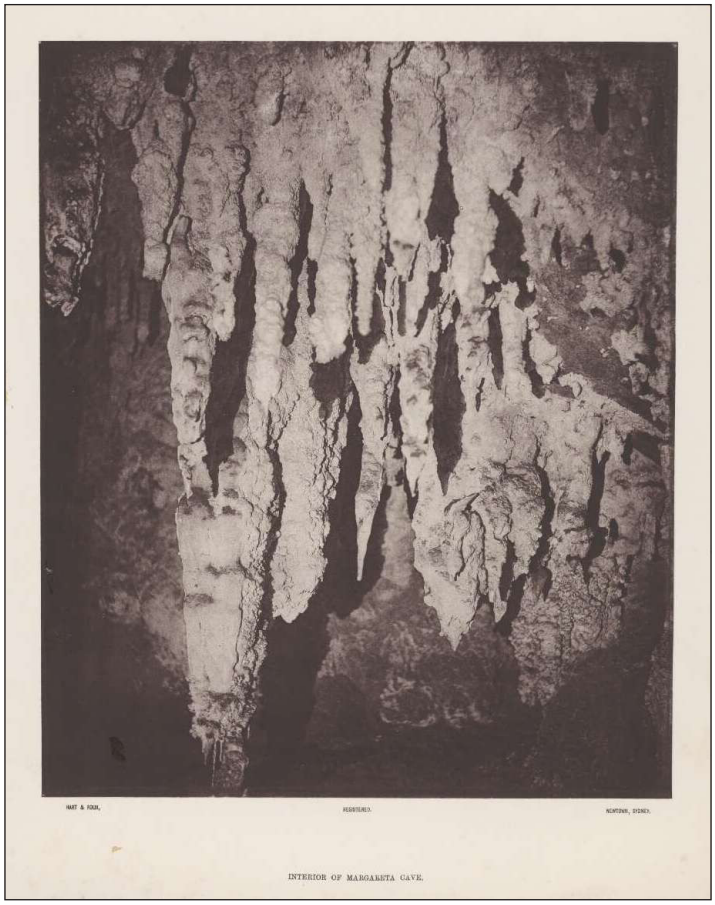

Fig. 2: Ludovico Hart and Ferdinand Roux, *Interior of Margareta Cave, Fish River Caves, New South Wales* (*c.* 1880). National Library of Australia.

the intricate limestone formations at the back of the chamber (see *Fig. 1*, right). As with the carbon-filament incandescent, this display also gestures back to a nineteenth-century experiment when, in 1893, coloured lights were set up to celebrate the official visit of the governor of New South Wales. While coloured lights remained in use for many decades at Jenolan, they fell out of fashion and favour in the late twentieth century, reportedly 'derided by those seeking a more naturalistic cave setting'.[8] In the context of a cave, however, aesthetic appeals to naturalism are a questionable rationale for deriding coloured lights. While the contemporary lighting design is certainly a well-intentioned effort to respect the environmental values of Binoomea, there is of course no kind of light in these dark spaces that could be considered 'natural' at all. Every source is artificial, whether it is yellow, white, pink, or green.[9]

[8] 'Flashing its Brilliant Rays!'.

[9] Commenting on the use of coloured lights in the caves, Julia Horne asserts that it is 'all too easy for purists to sneer at until they remember that all light in subterranean caves is artificial' (*Jenolan Caves*, p. 56).

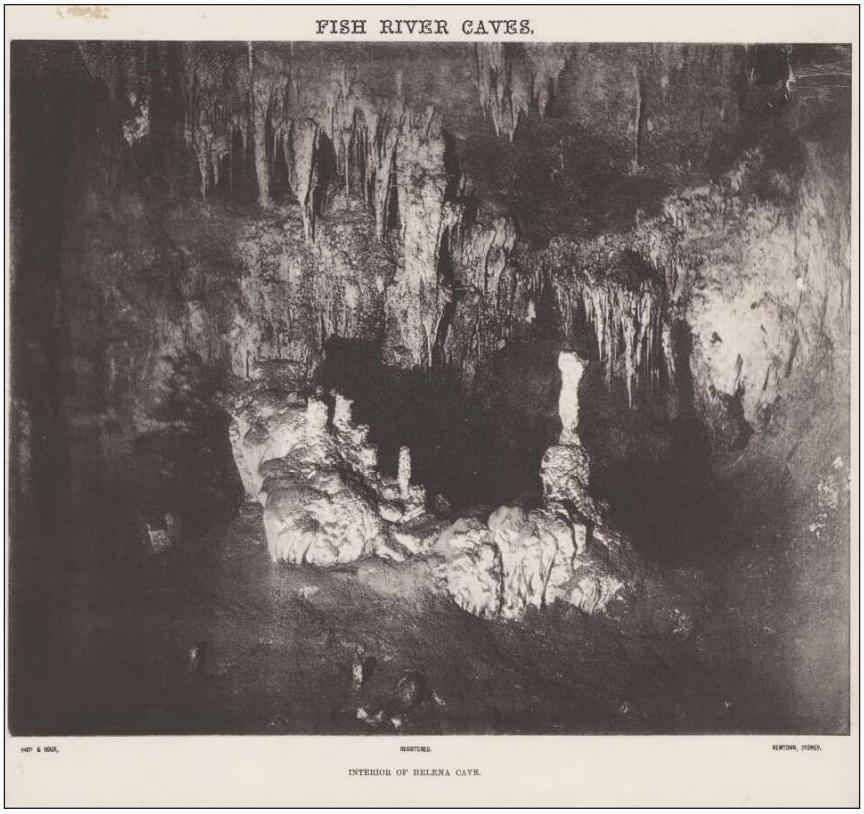

Fig. 3: Ludovico Hart and Ferdinand Roux, *Interior of Helena Cave, Fish River Caves, New South Wales* (*c.* 1880). National Library of Australia.

This point about colour gestures at a broader paradox concerning show caves in general, and the history of electric lighting and tourism at Binoomea in particular: namely, that a space where vision is, by nature, entirely precluded, has been presented to visitors primarily as a visual spectacle. This is neither surprising nor coincidental given the site's development as a tourist destination in the Victorian era, for this period had a special fascination for all things visual. Scholars such as Jonathan Crary, Martin Willis, Chris Otter, and Mary Warner Marien have documented its preoccupation with a range of new optical technologies, attractions, and cultural practices, from the stereoscope to electric light to the photographic camera.[10] And, as Kate Flint observes, the period was 'characterised not just by the accelerated expansion of diverse opportunities for differing sorts of spectatorship, but by a growing concern with the very practice of looking'.[11] Tourism itself was a

[10] Jonathan Crary, *Techniques of the Observer: On Vision and Modernity in the Nineteenth Century* (MIT Press, 1990); Martin Willis, *Vision, Science, and Literature, 1870–1920: Ocular Horizons* (University of Pittsburgh Press, 2016); Chris Otter, *The Victorian Eye: A Political History of Light and Vision in Britain, 1800–1910* (University of Chicago Press, 2008); and Mary Warner Marien, *Photography and Its Critics: A Cultural History, 1839–1900* (Cambridge University Press, 1997).

[11] Kate Flint, *The Victorians and the Visual Imagination* (Cambridge University Press, 2000), p. 2.

key component of this sight-based culture, as exemplified by John Urry's widely discussed concept of 'the tourist gaze'. Urry's gaze is one that involves 'a much greater sensitivity to visual elements of landscape or townscape than is usually found in everyday life', and that is 'then normally visually objectified or captured through photographs, postcards, [...] and so on'.[12] The 1880 experiment at Jenolan Caves combines these tourist practices with the optical technologies of electric light and photography, and thus brings together a group of attractions that are both peculiarly visual and peculiarly Victorian.

Here, I unpack how this Victorian visuality manifested in the caves' culturally and geologically distinct setting. Keeping light, darkness, and the paradoxical visuality of show caves in mind, I explore why these practices might not have been a perfect fit in this context and think about the ways that visitor experiences at Jenolan could extend beyond visuality and sightseeing. Given the relentless illumination we now encounter in contemporary life, the caves' natural and utter darkness may (somewhat counter-intuitively) be one of their most special and revelatory features.

'All that variety that can please the eye'

By the time British colonizers became aware of Binoomea in the late 1830s, following the explorations of a local farmer and landowner,[13] there was already a well-established and fashionable tourism practice surrounding caves in Britain, with those in the Peak District (such as Poole's Hole and Peak Cavern) sustaining a robust tourist trade.[14] Early visitors' accounts of Jenolan thus tended to be framed in terms of imported discourses of tourism, travel, and exploration. For instance, Julia Horne notes that Australian nature tourism — including visits to Jenolan — often adopted the aesthetic discourses of 'the sublime' and 'the picturesque'.[15] But in addition to these conventions, accounts and mediations of the caves also drew on visual technologies and entertainments that were popular in Victorian Britain at the time.

For instance, George Rawson's written account of his 1882 trip to Binoomea makes sense of the limestone formations, not through prior experience of caves or

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[12] John Urry, *The Tourist Gaze*, 2nd edn (SAGE, 2002), pp. 1, 3.

[13] Dunkley, p. 10. In a popular version of the story related by Oliver Trickett in his *Guide to the Jenolan Caves* (1899), it was suggested that the landowner, Charles Whalan, learned about the caves from the escaped convict James McKeown, who used them as a hideout. See O. Trickett, *Guide to the Jenolan Caves, New South Wales*, 2nd edn (Govt Print, 1905), p. 22.

[14] Julia Horne, *The Pursuit of Wonder: How Australia's Landscape was Explored, Nature Discovered and Tourism Unleashed* (Miegunyah Press, 2005), p. 232.

[15] Ibid., pp. 35–51. See also, Simon Ryan, *The Cartographic Eye: How Explorers Saw Australia* (Cambridge University Press, 1996).

the natural world, but rather by reference to a magic lantern show.[16] Visiting Jenolan before the permanent installation of electric light, Rawson mentions Cracknell's electric experiment, pointing out its potential to 'turn [the caverns] into palaces the most dazzling' (p. 54). He seems to have been particularly interested in the way light played upon the formations, apparent in his description of a chamber he calls 'The Shawl Cave':

> [Our leader] turned the light upon the wall to our right, & we saw what appeared to be a shawl loosely pinned to the wall, falling in loose folds at first sight it appeared like a sheet for a magic lantern performance of which the Magnesian instrument with its reflector served well for a lantern, revealing afterwards the greater richness and the beautiful blending of the colors. (pp. 41–42)

In Rawson's magic lantern comparison, the thin, flat speleothems called shawls become the screen, while the guide's magnesium burner serves as the lantern.[17] His analogy effectively turns the impulse of this projection device back upon itself, with the natural formations figured as a rough simulacrum of the technological apparatus. While Rawson here draws on the long history of the magic lantern — invented in the seventeenth century and remaining a popular form of entertainment throughout the eighteenth and nineteenth — the Binoomea caves are increasingly interpreted via a suite of visual technologies and attractions that are even more distinctly Victorian.[18]

Rawson's next description, for instance, draws on the nineteenth-century visual spectacle of the world fair. Taking his lead from the name of the large chamber called 'The Exhibition', Rawson notes that

> scattered around were rocks standing in the gloom like statues. […] By the aid of the extra light […] we could see more clearly these curiously shaped statues one having the appearance of a great man sitting in an easy posture, it was large and seemed roughly carved. (p. 42)

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[16] Rawson's travelogue remained unpublished until 2013. However, he did produce a bound, handwritten copy for the man who would become his adopted father-in-law, George Cardinal. See Bruce R. Welch and John R. Dunkley, 'Foreword to the Account of a Visit to Jenolan Caves', in George H. Rawson, *Guide to and Description of the Fish River Caves: An Early Account of a Visit to Jenolan Caves (circa 1882)*, ed. by Welch and Dunkley (Jenolan Caves Historical and Preservation Society, 2013), p. 5.

[17] Magnesium wire burners were used in addition to candles, with the considerably greater brightness of the former employed to illuminate larger chambers for short periods. Magnesium is the same element burned in powder form in early flash photography.

[18] Martyn Jolly, 'The Magic Lantern at Work: Witnessing, Persuading, Experiencing and Connecting', in *The Magic Lantern at Work: Witnessing, Persuading, Experiencing and Connecting*, ed. by Martyn Jolly and Elisa deCourcy (Routledge, 2020), pp. 1–13.

His description evokes the sculpture-lined arcades of the Crystal Palace of the Great Exhibition or, looking closer to home, Melbourne's International Exhibition of 1880, held just two years before Rawson's trip to Binoomea. With a tidy symmetry that speaks to the prevalence of these cultural forms, the Melbourne exhibition was also where the electrically lit photographs of the caves were first displayed, and their photographer — Ludovico Hart — went on to take images of the event later that same year. If we compare the photographs Hart took of the cave to those of the Melbourne exhibition, it becomes clear that he, too, was struck by the equivalence between the stalagmites and classical sculptural forms (*Fig. 4*). Just as the exhibition provided figurative imagery for depicting the caves, the caves in turn provided images for display at the exhibition. Records and mediations of Jenolan were thus both shaped by and fed back into popular forms of visual culture in nineteenth-century Australia.[19]

Fig. 4: Ludovico Hart and Ferdinand Roux, *Madonna in the Helena Cave, Fish River Caves, New South Wales*, (*c*. 1880). National Library of Australia (left); Ludovico Hart, 'Italian Court Melbourne International Exhibition' (1880). State Library of Victoria (right).

[19] Photography was not the only way the caves were mediated beyond Jenolan. In one noteworthy instance, they also appeared onstage as a setting in the theatrical melodrama *The Squatter's Daughter; or, The Land of the Wattle*, written by Bert Bailey and Edmund Duggan, and premiered at the Melbourne Theatre Royal in 1907. Patricia Smyth explores *The Squatter's Daughter* in her study of spectacular set design on the Australian stage. She notes that while the reviewer from *The Bulletin* condemned the play as 'imported bellowdrama', they were still roundly impressed by the lighting and set design, with its 'faithfulness' to 'localized settings', singling out a scene that mimicked sunset in a eucalyptus gorge. See Patricia Smyth, 'Landscape and Identity in Australian Melodrama', *Journal of Victorian Culture*, 21.3 (2016), pp. 363–86 (pp. 367, 368), doi:10.1080/13555502.2016.1197687. Reflecting on the popular appeal of this kind of spectacular set design in Australia, Smyth posits that it 'should be considered in relation to the particular significance of landscape to emergent notions of Australian national identity', a place where 'landscape was a key site for the development of a colonial identity, as distinct from Englishness or Britishness' (p. 365).

Electric lighting became another key visual attraction for Binoomea in the nineteenth century. The electric telegraph had arrived in Australia in 1854, but electric light technology was still in its infancy.[20] As guides like to tell visitors today (with only a slight sense of hyperbole) people would visit Jenolan, not to see the caves, but to see the light bulbs. Electricity was, indeed, synonymous with the new and the marvellous, or, to use the technology's own lexicon, with excitement, charge, and attraction.[21] As Kate Flint observes, this was most evident when manifested in the visual phenomenon of light:

> Electricity became one of the most notable elements in [the] late nineteenth-century category of wonder, alongside bridges, skyscrapers, railroad engineering, and factories. It was used to enhance natural features, as with the Niagara Falls illuminations that helped dissolve any clear distinction between natural and artificial sites; its lighting was 'a visual representation of the new force' that powered factories, communication systems, and urban living, and it featured prominently in the great expositions of the late nineteenth and early twentieth centuries, where again lines between nature and technology were deliberately blurred.[22]

Pointing to electricity's association with the affective 'category of wonder', Flint's reference to its function at Niagara Falls — 'enhanc[ing] natural features' and 'dissolv[ing] any clear distinction between natural and artificial sites' — is equally applicable to Binoomea.[23] There is a clear reciprocity at work in such pairings, where the spectacle of the caves lends itself to the spectacle of electric light and vice versa, and, in the process, both elements are shown to advantage. Flint's description also notes the association between electricity and world fairs, one that is exemplified, again, by the display of the electrically lit cave images at the Melbourne exhibition.

Given electricity's power to connote industrial and technological development — Flint aligns it with skyscrapers, railroads, and factories — it also becomes a kind of visible marker used for fashioning aspirational narratives of Australian modernity. For instance, when electric streetlights were installed in the western New South Wales rural town of Tamworth in 1888 the *Sydney Morning Herald* reported that the town had

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[20] Ann Moyal, *Clear across Australia: A History of Telecommunications* (Thomas Nelson Australia, 1984).

[21] Tanja Winther and Harold Wilhite, 'Tentacles of Modernity: Why Electricity Needs Anthropology', *Cultural Anthropology*, 30.4 (2015), pp. 569–77 (pp. 570–71) <https://www.jstor.org/stable/48579429> [accessed 8 September 2025].

[22] Kate Flint, *Flash!: Photography, Writing & Surprising Illumination* (Oxford University Press, 2017), p. 54.

[23] In line with Flint's chosen affective category, Horne specifies 'a passion for wonder' as the 'immense driving force' behind much of nineteenth-century Australian tourism, including the attraction to these caves (*Pursuit of Wonder*, p. 20). So central was this to travel and tourism in the colony, that Horne even takes it as the title of her book.

'outstripped all competition in the race for colonial progress'.[24] Cracknell's electrical experiment in the caves mobilized a similar narrative logic. Binoomea is around two hundred kilometres from Sydney, and visiting in 1880 involved a five-hour train journey across the Blue Mountains, an eight-hour overland trip from the last station, and a vertiginous final descent into the valley itself.[25] The experiment also required eighteen 40-kilogram batteries to be hauled up and down the steep and winding passages of the caves and loaded with battery acid *in situ*, which reportedly produced so much noxious gas that, at one point, emergency evacuation became necessary.[26] These enormous practical impediments suggest that the underlying motivations for the experiment were perhaps more figurative than they were functional.

While electric light in this remote setting seems to disrupt some of the spatial relationships between centre and periphery that often govern technological development — fulfilling in unexpected ways Marshall McLuhan's assertion that 'electricity does not centralise, but decentralises' — the lighting of Binoomea more explicitly obeys other spatial logics of colonization.[27] Cracknell's experiment is, after all, a very audacious and literal attempt to illuminate one of the dark places at the edge of Empire. In this respect, it conforms to a paradigmatic historical narrative that, as Chris Otter puts it, 'depicts "Western modernity" in terms of the relentless expansion of illumination'.[28] This conformation is only exacerbated if we think of the conventional association of colonized territory with the female body and of caves with female genitalia.[29] With these connotations in view, the illumination of Jenolan starts to exemplify the colonizer's false dream of penetrating and enlightening deep, 'virgin passages'.[30]

A similar impulse is evident in the way photography is deployed in rendering the caves visible. Underground spaces were a significant experimental frontier for

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[24] Wilkenfeld and Spearritt, p. 2.

[25] Dunkley, p. 12.

[26] 'Flashing its Brilliant Rays!'.

[27] Marshall McLuhan, *Understanding Media: The Extensions of Man* (Gingko Press, 2013), p. 32. McLuhan is theorizing the effect of large-scale, interconnected electric power grids, rather than the kind of onsite generation taking place at Binoomea. However, the latter example still enacts a form of decentralization, challenging the dynamics of centre–periphery that often govern technological development. For further incisive discussion on how electricity effects the dynamics of centre–periphery in the Australian context, see Brigid Rooney, *Suburban Space, the Novel and Australian Modernity* (Anthem Press, 2018), pp. 105–06.

[28] Otter, p. 2. While this is a paradigm Otter takes issue with in an important effort to create a more nuanced understanding of nineteenth-century light and vision, it is difficult to refute that it has some applicability in the case of Binoomea.

[29] Ralph Crane and Lisa Fletcher, *Cave: Nature and Culture* (Reaktion, 2015), pp. 14–15. On caves and female genitalia, see also Luce Irigaray's take on Plato's analogy of the cave in *Speculum of the Other Woman*, trans. by Gillian C. Gill (Cornell University Press, 1985).

[30] This phrase is borrowed from Crane and Fletcher, p. 13.

nineteenth-century photographers. As Flint notes in *Flash!*, 'the questions of how to take photographs in complete darkness — say, in a cave or coal mine — [...] raised a very different set of technical challenges' (p. 9). The photographs Hart produced in the Binoomea experiment were a notable improvement in quality on the handful of cave images taken at other sites around the world, because the electric lighting meant he did not have to worry about the obscuring haze of magnesium oxide that had marred earlier efforts (see *Figs 2, 3*).[31] Thus again, there is a reciprocity at work in bringing the camera into these caves. While the pictures promote the aesthetic qualities of Binoomea, the dark caves provided a site for the demonstration of technological prowess, showing how this light-based medium could even operate in places where there is no natural light.[32] Yet there seems to be more at stake than technical development in the capturing of these images. Reflecting on photography's imbrication with tourism, Peter Osborne outlines the medium's role in 'making things available (*disponible*), putting them at the disposal of the viewer'. He describes how this 'phenomenon made possible Victorian photography's primary imperial role of naturalising "the quality of *disponibilité*" by giving it "objective" visual form'.[33] Applying Osborne's logic to Hart's photographs, in rendering the caves visible, they also render them 'available'. The *taking* of the pictures could thus be said to repeat the *taking* of the land in which the caves lie. With this in mind, as contemporary visitors, we could perhaps start to relinquish some of our imperialist impulses to see and to know, by momentarily sitting with the caves' darkness, or at least giving over some of our insistence on illumination and photographic capture.

Feeding into this history of invasion at Binoomea was the way early written accounts often perpetuated the idea that Indigenous peoples of New South Wales were 'frightened by, and avoided' caves with significant dark zones.[34] In reality, as Andy Spate observes, the archaeological record suggests that karst landscapes were put to a range of different uses, with evidence of mortuary sites, art sites, and occasionally, occupation sites.[35] At Binoomea, Gundungurra peoples are reported to have visited the caves to access their subterranean water. The Gundungurra man Billy Lynch stated

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[31] Chris Howes, *To Photograph Darkness: The History of Underground and Flash Photography* (Southern Illinois University Press, 1989), p. 11.

[32] In addition to cave photography, the above ground variety also assumed an integral role in the visual culture of Binoomea, and by the mid-1890s, the photographer E. J. Cooke had set up a studio onsite (Horne, *Jenolan Caves*, p. 52).

[33] Peter D. Osborne, *Travelling Light: Photography, Travel and Visual Culture* (Manchester University Press, 2000), pp. 18, 19.

[34] Andy Spate, 'Karsting around for Bones: Aborigines and Karst Caves in Southeastern Australia', *Australian Archaeology*, 45 (1997), pp. 35–44 (p. 35), doi:10.1080/03122417.1997.11681598.

[35] Spate, pp. 36–43. At Binoomea specifically, Spate records 'a small number of surface sites [...] as well as a possible quartz flake [...] in one cave and an apparently painted anthropomorphic figure in a small karst rockshelter' (p. 42).

in an 1896 interview for the *Sydney Mail* that the water was thought to have curative properties, and sick people were brought there for bathing.[36] Binoomea is also a key site in the Gundungurra peoples' *gun-yunggalung*, which describes the formation of the Wollondilly and Cox's River region of the Blue Mountains.[37] It tells of a prolonged chase and contest that took place between Gurrangatch (part fish, part reptile) and Mirragan (a quoll or tiger cat), and which shaped some of the prominent features of the landscape. The caves are where Gurrangatch hid from Mirragan, taking a much needed rest in the course of this grand pursuit.[38]

The early intimations that Indigenous peoples avoided karst caves because they were 'afraid of the dark' carries a clear sense of infantilization and, as Juanita Feros Ruys notes, it served to perpetuate the foundational colonial myth of Australia as *terra nullius*, or 'land owned by no one'.[39] Exploring the racial and cultural connotations of dark and light as they pertain to the caves, Ruys posits that their darkness was often employed to signify those othered by British culture, a group in which she includes 'Indigenous people[s], bushrangers, convicts, even the Devil' (p. 183). Building on Ruys's list, we might also point to the nineteenth-century association of caves and grottoes with fairies and the occult, especially given the possible intimations of the coloured lights set up at Jenolan in 1893. This association can speak further to unresolved concerns around dispossession for, noting a connection between fairy tales and landscape in Australian literature, Lisa Fiander posits that 'writers are most likely to draw upon' the genre when dealing with 'a subject that generates anxiety in their culture', and with 'those things that they are afraid of — or are afraid of losing'.[40]

Where eyes 'have no function'

With this imperialist history of electric light and photography at Binoomea in mind, it may be useful to explore possible avenues through which visitor engagement with the

[36] Smith, 'Cave Names', p. 83. Today, the most accessible source of subterranean water at Binoomea is found in the River Cave.

[37] *Gun-yunggalung* refers to Gundungurra Dreaming, but the latter term is an approximation that does not necessarily convey the temporal, moral, and ecological complexity associated with *gun-yunggalung*.

[38] 'Gurrungatch and Mirrigan', Gundungurra Tribal Council Aboriginal Corporation, 2 December 2000 <https://webarchive.nla.gov.au/awa/20001201214000/http://www.hermes.net.au/gtc/gurrungatch.htm> [accessed 8 September 2025]. See also, Jim Smith, *Aboriginal Legends of the Blue Mountains* (Smith, 1992), pp. 7–10. Smith notes that the earliest written record of *gun-yunggalung* comes from 'the well-known amateur anthropologist R. H. Matthews around the turn of the century. His informants were part of a small community on Aboriginal Reserve No. 26 at Byrnes' Creek in the Burragorang Valley' (p. 7).

[39] Juanita Feros Ruys, 'The Devil's Coach House and Skeleton Cave: Colonial Tales, the Medieval Demonic, and the Absence of the Indigenous', *Preternature*, 5.2 (2016), pp. 159–88 (p. 176) <https://muse.jhu.edu/article/634829> [accessed 8 September 2025].

[40] Lisa M. Fiander, 'Writing in "A Fairy Story Landscape": Fairy Tales and Contemporary Australian Fiction', *Journal of the Association for the Study of Australian Literature*, 2 (2003), pp. 157–65 (p. 158) <https://openjournals.library.sydney.edu.au/JASAL/article/view/9668> [accessed 8 September 2025].

caves might be extended beyond visuality and sightseeing. Alice Barnaby's *Light Touches* is useful when thinking in this direction. Observing that light 'carries on its waves emotional as well as photonic pulses', Barnaby suggests that we should avoid simply 'equat[ing] light with sight', and instead also stay alert to how 'practices of lighting (and thus visuality) [generate] experiences of sensual and tactile engagement with, rather than separation from, the world'.[41] Her suggestion seems especially pertinent to any discussion of light at Binoomea. For while its recent history of illumination is, in large part, a history of visual spectacle and technology, its electric lighting has long been doing other things as well.

The contemporary lighting demonstration in Chifley Cave — that takes the visitor from darkness, to carbon-filament bulb, to coloured lights, to modern LED — builds a loose historical narrative that moves from the nineteenth century to the present day, framing the current ethos and emphasis on 'naturalism'. The chronology of the display also carries an implied teleology, one that suggests we have now arrived at the optimal lighting strategy.[42] With respect to environmental impact and energy efficiency, this is largely true, for artificial light can have many detrimental effects on sensitive cave environments. Before the introduction of electricity, candles shed wax and smoke, and magnesium burners gave off abundant fumes.[43] While incandescent electric bulbs produced less conspicuous pollutants, they still create heat and light, giving rise to 'lampenoflora', photosynthetic organisms that could not otherwise grow in a dark cave.[44] Modern LED counterparts are less productive of heat, but their brightness still disturbs an ecosystem finely tuned to darkness. The teleology thus envisages today's visitor to Jenolan as an environmentally responsible subject who will appreciate a lighting scheme that better respects the natural qualities of the caves. Regarding the cultural and aesthetic history of the site, the narrative is more open to debate, and we should remain aware of the potential erasures that a lighting ethos of 'naturalism' involves.

Indeed, an important subtext of the Chifley lighting display is the illustration of the *highly constructed* nature of the experience of light and vision at the caves. Interestingly, it is probably the use of darkness and coloured lights that speaks most loudly of this

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[41] Alice Barnaby, *Light Touches: Cultural Practices of Illumination, 1800–1900* (Routledge, 2016), pp. 108, 109. In thinking about the tactile affordances of light, Barnaby's approach is presumably informed by phenomenologist Maurice Merleau-Ponty who, in *The Visible and the Invisible*, describes vision in terms of a 'caress' or 'palpation of the eye'. Maurice Merleau-Ponty, *The Visible and the Invisible*, ed. by Claude Lefort, trans. by Alphonso Lingis (Northwestern University Press, 1968), pp. 76, 131.

[42] The contemporary LED system is described on the Jenolan Caves website as 'The Most Advanced Cave Lighting System in the World'. See 'Flashing its Brilliant Rays!'.

[43] Horne, *Jenolan Caves*, p. 10.

[44] David Shaw Gillieson, 'Management of Caves', in *Karst Management*, ed. by P. E. van Beynen (Springer Netherlands, 2011), pp. 141–58 (p. 147), doi:10.1007/978-94-007-1207-2_6.

constructedness. The potential of darkness is noted by Penny Davidson in her novel qualitative study of cave guiding and interpretation in Australia, which offers useful insight into the contemporary visitor experience at Binoomea. Davidson suggests that 'the absence of vision is a powerful component of the cave experience' (p. 38), and that guides can employ it as a means of redirecting visitor perception:

> The guide makes a conscious effort to move beyond a focus on visual engagement in order to stimulate other senses for the visitor. For example, the cave guide can ask the group to be silent and listen, they can control the light and take away vision, and by limiting other sensory stimuli they can introduce the visitor to the haptic (sense of touch) experience of constant temperature and enclosed spaces. (pp. 35–36)

Darkness is here deployed as a means of returning visitors to their other senses, of making them aware of their embodiment and the unique space they occupy. Davidson goes on to suggest that this practice in cave interpretation is part of a broader 'shift from a cognitive and visual emphasis to valuing the multi-sensual and emotional nature of the visitor experience', a move towards a wider recognition of the importance of 'the body in tourism' (pp. 39, 38).

Entering a cave has, indeed, always been an embodied, and not just a visual, act. While direct tactile engagement at Binoomea is now necessarily governed by prohibitions against touching the fragile speleothems (which used to be routinely snapped off and souvenired by tourists), there remains a notably haptic and kinetic dimension to the experience. Visitors do not stand and look at the caves from a distance, they stand inside them and move through them. In the process of this moving through, they must accommodate their body to the cave, crouching below formations, climbing or descending where required. Notwithstanding the Victorians' clear preoccupation with the visual, they seem to have understood something of this physical dimension, as suggested by the fact that the very first photograph taken in a natural cave was done in stereoscope. As one of the 'desired effects' of stereoscopy noted by Jonathan Crary was 'immediate, apparent *tangibility*' (pp. 122, 124, emphasis in original), this first stereo photo serves to acknowledge the fact that caves have *depth*. Today, this attempt at simulating depth is recalled in the delightfully kitsch holographic postcards of speleothems still on sale at the Jenolan Caves visitor centre.[45]

[45] Further pursuing this interest in depth images, as part of the Jenolan Tourist Caves Survey Project, David Martin has been carrying out a detailed mapping of the Chifley Cave and its associated passages, in order to produce a three-dimensional graphic for the use of both visitors and management. See Jenolan Caves Reserve Trust, *Jenolan Caves Annual Report 2020–2021*, p. 32. See also, Julia James and others, 'Cave Surveying for Management (Case Study The Jenolan Show Caves)', *Cave and Karst Management in Australasia XXII: Proceedings of the 22nd Australasian Conference on Cave and Karst Management* (2018), pp. 152–60 <https://library.dbca.wa.gov.au/FullTextFiles/072281.pdf> [accessed 22 September 2025].

As well as Binoomea's powerful darkness, its coloured lights have the potential to usefully unsettle visitor perception in the way Davidson describes. With a design that tints different formations in different colours, they are reminiscent of popular contemporary light festivals, such as Sydney's annual VIVID event. In Tim Edensor's examination of such festivals, he refutes the common criticism of their being substanceless, neoliberal spectacles, instead exploring their capacity for 're-enchantment'.[46] Edensor outlines their ability to 'stimulate critical awareness about the specificity of perception, promote interrogation of the normative uses and meanings of place, bring to mind forgotten histories and neglected spaces, and generate conviviality and playfulness in otherwise lackluster places' (p. 137). While I would not describe Binoomea as 'lackluster', it has had to contend with the side effects of long-term, mass tourism, and Horne acknowledges that it 'may have lost the freshness of novelty' for Australians.[47] The past two decades have seen a decline in international and overnight visitor numbers at Jenolan, a reduction that has only been exacerbated by multiple and prolonged shutdown periods due to floods, bushfires, and the global pandemic.[48] With these significant challenges in mind, lighting that promotes the kind of 're-enchantment' and 'playfulness' Edensor describes could be of value. Among the list of effects he attributes to light festivals, I would single out the capacity to 'promote interrogation of the normative uses and meanings of place, [and to] bring to mind forgotten histories', as being particularly relevant in the colonial context of Binoomea. Perhaps the play of darkness, light, and colour could help to shift visitors out of our perceptual complacency, encouraging us to reflect on what it has meant, and continues to mean, to stand in these caves.

When tourists descended on Binoomea in the nineteenth century, the site became enmeshed in a broader Victorian visual culture. This involved a complex interplay of nature and visual technologies, as devices like the electric light bulb and the camera mediated a widespread engagement with the caves. At the same time, these manifestations of visual culture clearly perpetuated processes of dispossession. Even though relinquishing visual authority would not alter the ongoing implications of colonization at the caves, by disrupting or challenging visitor perception, it might

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[46] Tim Edensor, *From Light to Dark: Daylight, Illumination, and Gloom* (University of Minnesota Press, 2017), p. 124. Edensor draws the concept of 're-enchantment' from the work of Jane Bennett.

[47] Horne, *Pursuit of Wonder*, p. 11. There are those for whom popular tourist attractions like the caves will always be freighted with connotations of 'vulgarity, repetition, and ignorance', to borrow some of the most derogatory descriptors cited by James Buzard in his study of mass tourism. See James Buzard, *The Beaten Track: European Tourism, Literature, and the Ways to Culture, 1800–1918* (Oxford University Press, 1993), p. 5.

[48] Jenolan Caves Reserve Trust, *Annual Report*, pp. 20, 10; Peter Austen and Alan Griffin, 'The Next Stage in the Evolution of Management Models at Jenolan Caves, NSW, Australia', *Cave and Karst Management in Australasia XVIII: Proceedings of the 18th Australasian Conference on Cave & Karst Management* (2009), pp. 96–101 (p. 99) <https://ackma.org/Proceedings/proceed/18/18pdf/18proceedings.pdf> [accessed 22 September 2025].

help to stimulate greater awareness of the intertwined histories of lighting and imperialism. While light and vision have historically dominated perceptions of the caves, it might now be the rarer experience of darkness and visual occlusion that proves most illuminating.

Competing Interests

The author has no competing interests to declare.