

JOURNAL *of* NORTHERN STUDIES



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The *Journal of Northern Studies* is a peer-reviewed academic publication issued twice a year. The journal has a specific focus on human activities in northern spaces, and articles concentrate on people as cultural beings, people in society and the interaction between people and the northern environment. In many cases, the contributions represent exciting interdisciplinary and multidisciplinary approaches. Apart from scholarly articles, the journal contains a review section, and a section with reports and information on issues relevant for Northern Studies.

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RUTH A. MORGAN

The Continent Without a Cryo- history?

Deep Time and Water Scarcity in Arid
Settler Australia

ABSTRACT Australia is a continent seemingly without a cryohistory. But take a closer look. Its cryohistory differs dramatically from that of the northern hemisphere—a contrast that long baffled Victorian geologists seeking evidence of glaciation in the Great South Land. Just as historians have sought to redress the image of a static Arctic through a new attention to its cryohistory, so too historians of Australia have sought to recover a continent that is anything but a “timeless land.” Its long geological history—its cryohistory—framed Aboriginal lifeways across the continent, which in turn, shaped colonial encounters in the aftermath of British invasion in 1788. Guiding this historical project have been the moral challenges of the settler nation’s legacy of Indigenous dispossession and displacement, and the unfolding planetary crisis of the Anthropocene and its implications for critically understanding deep time. This article examines the colonial hydrology of water scarcity in the goldfields of arid Western Australia in the late nineteenth century. It shows how access to freshwater became a flashpoint for relations between Indigenous and non-Indigenous peoples on an extractive frontier. At the turn of the twentieth century, water was the means by which to improve health, hygiene and cleanliness, without which the privileges of white civilisation could not be afforded. Although such

conditions also developed elsewhere in settler Australia, the limited water availability on the eastern goldfields made the circumstances that emerged there especially dire. Accordingly, the material conditions of the arid inland—the product of Australia’s Pleistocene—came to bear on the nature of the encounters between Indigenous and non-Indigenous peoples from the mid-nineteenth century. The very absence of ice in Australia’s cryohistory left its mark on the peoples of the eastern goldfields.

KEYWORDS environmental history, the Anthropocene, water history, settler colonialism, Australian history

Every two years, the Australian Academy of Science awards the Mawson Medal for outstanding contributions to earth science in Australia, which commemorates the work of the late geologist and Antarctic explorer, Sir Douglas Mawson. In 1996, the geologist and environmental scholar, George Seddon, received the honour and delivered the Mawson Lecture to the Geological Society of Australia. There, he mused on the use of geological knowledge for making sense of Australia’s human history. Among his provocations was a question he recommended posing to the globe’s continents, that is, “Did you have a good Pleistocene?” (Seddon 1996: 488). More than most, Australia had not: its soils old and bereft of nutrients for want of those “great soil makers”—glaciers and continental ice sheets. The continent and its first peoples had instead experienced an arid, cold and windy Pleistocene—a dirt age, rather than an ice age, as historian Kirsty Douglas (2010: 30) has suggested.

In short, Australia is a continent seemingly without a cryohistory. But take a closer look. Its cryohistory differs dramatically from that of the northern hemisphere—a contrast that long baffled Victorian geologists seeking evidence of glaciation in the Great South Land (Sörlin 2015; Douglas 2010). Just as historians have sought to redress the image of a static Arctic through a new attention to its cryohistory, so too historians of Australia have sought to recover a continent that is anything but a “timeless land” (Seddon 2007; Griffiths 2016: 16–41). Its long geological history—its cryohistory—framed Aboriginal lifeways across the continent, which in turn, shaped colonial encounters in the aftermath of British invasion in 1788. Guiding this historical project have been the moral challenges of the settler nation’s legacy of Indigenous dispossession and displacement, and the unfolding planetary crisis of the Anthropocene and its implications for critically understanding deep time. Attending to the racial and colonial politics of geology, deep time and the Anthropocene is to acknowledge what geographer Kathryn Yusoff (2019) calls their “subjugations,” that is, “the racialised inequalities that are

bound up in social geologies” of extractivism. Asserting an Australian cryo-history locates the lasting subjugations of mineral extraction there in a wider global history of colonial and post-colonial resource development in the cryosphere that accelerated from the mid-nineteenth century. After all, as geographer Klaus Dodds (2018: 7) notes, “making sense of ice and snow means being attentive to multiple temporalities and spaces.”

Reflecting a resolve to transcend the exclusionary implications of the settler nation’s post-1788 history, historians have found in Australia’s deep time—its own cryohistory—cultural parables for resilience and adaptation in a warming world (Griffiths 2019: 68; Nunn 2018). Among these parables are the stories of perseverance from the Australian arid zone, the largest area of desert in the southern hemisphere. Far from the continent’s “dead heart,” as nineteenth century European explorers claimed, these deserts are now known to have been peopled from at least 35,000 years ago. Such a long human history places the desert’s occupants amid the transformations of the late Pleistocene, during which conditions in the continent’s drylands became drier, windier and colder, as they expanded almost to the coast (McConnochie 2002: 27–28). Archaeological evidence indicates that these peoples developed highly mobile lifeways to survive these challenging times, which took some 10,000 years to abate. Crucial to their survival was water. As archaeologist Mike Smith explains,

[T]he human history of the desert is more a story of critical resources than transformed landscapes: a history of water with a small “w.” It is the fluctuating fortunes of wells and soakages, claypan waters and ephemeral lakes that determine access to the country for foragers. These waters are stepping stones through the country. Remove them and access to country and its sparse resources is more limited. (Smith 2005: 182)

Once European explorers undertook to discover the continent’s inland, with pastoralists and their stock—those “shock troops of empire”—following in their wake, these scarce water resources became contested ground from the mid-nineteenth century (Griffiths 2002: 228). Rather than presenting places for cooperation, the continent’s waterways became sites of competition and conflict between the colonisers and colonised (eg. Gammage 1983; Clark 1995; Connor 2017). The shortage of freshwater also became a source of settler anxiety that encouraged the exploitation of Indigenous knowledge and the extraction of freshwater resources from both near and far (Clarke 2013). The transformations that ensued were the result of what historian Rohan d’Souza calls a “colonial hydrology,” such that colonial interventions altered both the fluvial and social worlds of the arid interior and its semi-arid fringes (d’Souza 2006; see also Beattie & Morgan 2017).

This article examines the colonial hydrology of water scarcity in the goldfields of arid Western Australia in the late nineteenth century. It shows how access to freshwater became not only a flashpoint for relations between Indigenous and non-Indigenous peoples on an extractive frontier, but also the means by which to construct and uphold what historian Gyan Prakash (1999: 132) described in British India as a “discriminatory sanitary order” that demarcated certain bodies and environments as healthier and more civilised than others. At the turn of the twentieth century, water was the means by which to improve health, hygiene and cleanliness, without which the privileges of white civilisation could not be afforded. Although such conditions also developed elsewhere in settler Australia, the limited water availability on the eastern goldfields made the circumstances that emerged there especially dire (Morgan 2015). Accordingly, the material conditions of the arid inland—the product of Australia’s Pleistocene—came to bear on the nature of the encounters between Indigenous and non-Indigenous peoples from the mid-nineteenth century. The very absence of ice in Australia’s cryo-history left its mark on the peoples of the eastern goldfields.

Water, People and Gold in an Australian Cryohistory

With the discovery of gold in the eastern fringes of the colony of Western Australia in the early 1890s, thousands of treasure seekers established settlements in the area that would become known as the Eastern Goldfields. Situated on the edges of the desert, water there was in especially short supply. In this boom-bust climate, rainfall in the area is very variable, evaporation is high, and there are limited sources of potable surface and underground water. Like gold, then, water was precious on the eastern goldfields. Besides its importance to sanitation and health, it was vital for the mines where it was necessary for processing ore, and for the transportation of people, stock and goods to and from the fields, whether by foot, hoof or rail. Such is the scarcity of surface water there that the colonial government of Western Australia built a pipeline to supply water to the goldfields. Extending some 600 kilometres—about the distance between Paris and Zurich—the pipeline was completed in 1903, and remains in service today.

Whereas local Aboriginal peoples had long moved to water, the newcomers now made water move to them. Where water had once been ephemeral, water became permanent. What had been a sophisticated means of survival was now primitive. Within several decades of occupation, Anglo-Europeans worked to render a cultural landscape of deep history into one of the “last blank spaces” (Kennedy 2013). These tensions between the material geographies of Indigenous and non-Indigenous water cultures suggest the need to reconcile the colonial rejection of Indigenous mobility or no-

madism, with the forces of mobility so central to the spread of empire (see Ballantyne 2014). The settler association of water with health, hygiene, and prosperity spoke to a prevailing environmental orientalism: an historicist impulse drawing on prevailing ideas of evolutionary hierarchies that demanded improvement of wanting lands and peoples (Chakrabarty 2000; Davis 2011). As such, historian Lorenzo Verancini argues:

Civilisation is not only about fixity, but also about movement—the movement forward through different stages of history, and upward towards “development,” “progress” and “advancement.” [...] Indigenous directionless wandering could be read as static and “backward,” ultimately a changeless *lack* of movement. (Verancini 2015: 297–298)

In the eastern goldfields, material questions of water availability were necessarily cultural questions.

Situating these colonial encounters in deep time seeks to redress the views of European contemporaries, who held that Australian Indigenous peoples were primitive relics of the Stone Age—a people without history. As historian Tom Griffiths notes, “the European settlers of Australia denied Aboriginal people both modernity and antiquity, sandwiching them into a timeless, rootless nomadism that justified their dispossession” (Griffiths 2001: 20). This logic points to an enduring preoccupation with Western notions of linear time that the recent temporal turn might help to decenter through the recognition of other epistemologies and their temporalities (see Antonello & Carey 2017; Khatun 2018). This temporal project is especially potent in Australia, where the timescale of the continent’s human history has undergone a revolution during the past century, soaring from just a couple of thousand years to over seventy thousand years since the arrival of the first humans (Griffiths 2018). For Tom Griffiths, such a deep history complicates arguments that problematically associate “civilisation” with agriculture (a European conceit), and suggest 50,000 years is a possible horizon for modern humanity (Griffiths 2015: 172; see Smal 2008). These northern historical frameworks would elide the southern continent’s rich cultural history; Australia would be again rendered a timeless land.

Yet this temporal turn is not without its challenges in settler Australia. For many Aboriginal people, notions of deep history as *past* conflict with their sense of identity and belonging “deriving from a multi-generational ongoing association” with country (McGrath 2015: 4). Further still, the teleological orientation of deep history contradicts Indigenous temporalities that understand the present as “behind,” having come *after* their ancestors (Rose 2004: 152). For others, the depth of Australia’s deep history—of the “oldest continuing cultures in human history”—implies stasis and timeless-

ness (Griffiths 2018: 7). The rejection of this implication by Indigenous and non-Indigenous Australians alike has inspired renewed efforts to popularise understandings of pre-contact Aboriginal land management, whether using fire or “agriculture” (Gammage 2011; Pascoe 2014). Although the latter’s privileging of Western notions of progress (from foragers to farmers) is not unproblematic, the salience of Bunurong writer Bruce Pascoe’s argument for making “the hallmark of (cultural) success sustainability and longevity” should not be understated (Pascoe 2018: 236; Griffiths & Russell 2018: 41).

In the case of the eastern goldfields in Western Australia, what the Anglo-European prospectors perceived as scarce, the Indigenous peoples had long found sufficient. Theirs was a country of rich resources, created by the ancestral beings of the Dreaming. For the Wangkatha, on whose country the mining towns of Coolgardie, Kalgoorlie, Leonora, Menzies and Laverton were erected, ancestors crafted and embodied the landscape during the *Tjukurra* (Dreaming) (Poirier 2005: 60–62; Muller 2014). Anthropologist Silvie Poirier observes of such Western Desert peoples that owing to the irregularity of water resources, “sites of great mythological significance are, more often than not, the water points” (Poirier 2005: 86). To the west are the lands of the Kaprun and then the Noongar, through which non-Indigenous peoples journeyed from the more populated temperate coastal areas to reach the goldfields.¹ Noongar understand their *Boodjar* (Country) as the creation of the Wargal (Rainbow Serpent), which carved out rivers, streams, brooks and waterholes as it moved across the land (Wooltorton, Collard & Horwitz 2017). Although there are scant written sources that reveal the particular cosmology of the Kaprun, the centrality of water to other Australian Indigenous cultures might suggest that theirs too shares a sacred geography of water (Rose 2005; Judd 2019).

Archaeological evidence also shows how water scarcity had long been a driver of human movement in these drylands, such that territories or country was much larger there than in the better-watered areas closer to the coast (Rose 2005). Archaeologists describe this “highly mobile and opportunistic” strategy as optimising access to rainfall by “rain chasing” (Smith 2013: 498; O’Connor & Veth 1996: 48). As anthropologist Laurent Dousset explains:

The unpredictability of the amount and location of rainfall is one of the reasons for the specific social and territorial organisation in the Western Desert, where rights of access to, and responsibilities towards, sites and areas in the landscape are acquired throughout life. (Dousset 2016: 136)

Locating *kapi* (water) was a vital skill for survival in the arid inland, and demanded the development and persistence of particular biocultural knowl-

edge (Judd 2019; Douglas 1988). With invasion, those patterns of movement for *kapi* collided with the impulses of settler mobility, driven by the twin urges for land and resource extraction. These colonial patterns largely elided those existing mobilities that had shaped particular geographies of these regions such that they had been perceived as neither hydrologically nor culturally wanting by local peoples. It was water that defined those geographies, and control of water became the means by which to deny them.

In Australia and elsewhere, historical studies of goldmining are increasingly turning to the wider and longer environmental footprints of this extractive industry and the violence inflicted on Indigenous peoples in its name (eg. Garden 2001; Jacobs 2003; Morse 2003; Isenberg 2005; Cahir 2012; Lawrence, Davies & Turnbull 2016). These are examples of the “edgier histories of gold” for which historian David Goodman (2001) has advocated in order to move the Australian historiography beyond its once triumphalist stance. Despite the significance of the eastern goldfields in Western Australia’s history, there have been few focussed studies of the effects of their development on the region’s first inhabitants. In many accounts, both firsthand and historical, the devastating consequences of goldmining on their traditional lands are depicted matter-of-factly as an unfortunate by-product of progress and prosperity (e.g. Marshall 1903; Whittington 1988; Webb 1993). Historian Neville Green’s (1988) contribution to this subject is an important exception, while geographer Leah Gibbs (2003) has more recently undertaken a post-colonial analysis of the region. Researchers seeking to remedy this imbalance face a significant problem, one that was identified by anthropologist Will Christensen in the early 1980s:

Few people, Aboriginal or non-Aboriginal, who experienced the early days of the goldrushes are alive today, and none that I have encountered has more than vague recollections of the early days of the mining industry. (Christensen 1981: 96–97)

Legion firsthand accounts of the eastern goldfields, published in newspapers, diaries and maps from the turn of the twentieth century, however, reveal the ways in which colonial interventions marginalised local Indigenous peoples and their water cultures.

It is to these Anglo-European sources that this article turns to make sense of the ways in which material and cultural worlds forged in deep time underwent the imposition of an extractivist colonial regime, dependent on the exploitation of scant water supplies. As historian Fred Cahir has written of the Victorian goldfields in the mid-nineteenth century, “auriferous areas did not cease to be Aboriginal cultural landscapes” (Cahir 2012: 5). Having charted the geological and cultural history of the Western Austral-

ian goldfields prior to invasion, this article turns to three phases of colonial incursion into the interior from the mid-nineteenth century. In doing so, I acknowledge the ethical predicament of Western historical knowledge and its universalising structures of linear temporality, an approach that philosopher Stephen Muecke describes as “history’s poison blanket” (Muecke 2004: 24; Porr & Matthews 2020: 3–31). The first section examines the European exploration of the lands west of the goldfields during the 1860s; the second, the rise of the eastern goldfields during the 1890s; and finally, the establishment of Christian missions on the outskirts of the goldfields in the early decades of the twentieth century. By doing so, the article adds a temporal dimension to the spatial mobilities paradigm that historian Samia Khatun has applied to the study of settler colonialism in inland Australia. As she argues, “[c]olonial settlements on Aboriginal land were conjunctures of spatial epistemologies, and archives generated at colonial encounters reveal with particular clarity that mobilities were structured by different knowledge traditions” (Khatun 2015: 83). By restricting Aboriginal access to land and water, as well as by altering, contaminating, and exhausting ephemeral water sources, the rise of goldmining in Western Australia’s eastern reaches radically affected the ways that local peoples had sustained themselves on country for thousands of years.

Water and the Inland

White explorers had first ventured inland and along the south coast of Western Australia in the 1830s seeking better pastures beyond the Avon Valley. By the mid-1860s, the likes of Henry Maxwell Lefroy and the Forrest brothers had reached the eastern districts of the Yilgarn region, just west of what would become the eastern goldfields. As the settlers’ diaries and the exploration journals of these adventurers reveal, however, these were not empty lands at all. Rather, they were the lands of the Noongar and further east, the Kaprun peoples. The further east the invaders travelled, the fewer sources of permanent water they found amongst the york gums, jam wattles, and native grasses. During an expedition with Surveyor-General John Septimus Roe in 1836, colonist George Fletcher Moore wryly observed:

I fear you will think I am only talking metaphorically when I say throughout the greater part of that vast space we did not see as much water at once as there is in your fishpond. (Moore 2006: 411)

The only sources of water there, these explorers learned, were to be found in the granite outcrops that dot the landscape. Some of these outcrops stand at over thirty metres like tors, while others sprawl flat against the ground.

These rocks had long provided water supplies for local Aboriginal peoples and served as important markers along trading routes (Stephens 2002).

To maximise the amount of water they could harvest from these granite outcrops, Aboriginal water managers had long made the most of natural processes. Weathered sections of granite could be scraped away to form rock or “gnamma” holes where water could accumulate (Bayly 1999). Moore was the first European to record and publish his impression of the Aboriginal name for these holes. In his *Descriptive Vocabulary of the Language in Common Use Amongst the Aborigines of Western Australia*, he described them as *amar* and *ngamar*, giving the meaning as “a hole or pool of water in a rock” (Moore 1842: 2, 89). Another way that Aboriginal peoples, and later colonists, formed holes or water channels was by lighting fires in cracks and using the heat to fracture the rock. Rainwater would also stream down the granite rock face and accumulate at the base of the outcrops. If a rock or clay basin lay beneath the surface, a soak would accumulate that would hold the water. In other dry areas, Aboriginal people reportedly scooped out holes in the clay to trap water. To prevent evaporation and pollution by animals and birds, they covered the holes and soaks with branches and soil (Bayly 1999).

The white explorers were heavily reliant on the knowledge of local Aboriginal peoples to find these precious reserves of water “hidden” in the landscape. As historians such as Shino Konishi (Konishi, Nugent & Shellam 2015; Konishi 2019) and Tiffany Shellam (Shellam *et al.* 2016) have shown in Western Australia and elsewhere, their dependence on Indigenous knowledge unsettles narratives of colonial domination of the environment and offers insights into the nature of the interactions between Indigenous and non-Indigenous peoples during the nineteenth century. For instance, a “native interpreter” and “three natives” accompanied explorer Augustus Gregory on his survey of the lands north of Perth in 1848 (Crawford & Crawford 2003). Later, on an expedition to the Yilgarn (Kaprun country), Barnard Clarkson, Charles Harper and Lionel Lukin took their guide Gyngich, who had previously assisted other explorers in the area. Clarkson reported on his return that,

We found the country in a very dry state, and although we had natives of the country with us, were at all times unable to find sufficient feed and water for our horses. (*Perth Gazette* 2 Sept. 1864: 2)

The establishment of watering points throughout these inland areas was important for the development of the region’s pastoral industry. Earlier in an 1854 expedition northeast of York, Assistant Surveyor Robert Austin had noted, “we depended upon the precarious supply of rain-water accumulated

in the hollows of rocks" (Austin 1856: 238). With the support of Governor John Hampton and the York Agricultural Society, surveyor Charles Cooke Hunt ventured further east in the mid-1860s. On several expeditions, Hunt relied on four Aboriginal guides—Mundal, Tommy Windich (Winditj), Jimmy and Cowitch. Hunt was amazed at the extent of their local knowledge: "they all seem to know the direction and names of these places" (Hunt 1866: 46). As his expedition continued, Hunt reported upon discovering evidence of Aboriginal people: "I am anxious to communicate with them, to ascertain their different watering places" (Hunt 1866: 60). He attached Aboriginal names to many of the watering holes he recorded, such as Youndegin, Dodolokine and Gnarlbine. Under Hunt's direction, convicts cleaned some of these waterholes out and lined them with stones to make them more permanent and accessible to (white) people and stock (WAWA 1991).

The accounts of such expeditions offer (mediated) insights into how local peoples negotiated the availability of freshwater. In his journals, for example, Hunt noted the westward movement of Aboriginal peoples, which he attributed to a growing scarcity of water as the weather grew warmer and drier in the east (*Inquirer and Commercial News* 12 Dec. 1866: 3). David Lindsey's chart of the Elder Scientific Exploring Expedition (1891–1892), which sought to explore the arid lands of western South Australia and into Western Australia, records sites where Indigenous people were observed to be "obtaining water from the mallee roots," as well as "numerous old native encampments" and "native wells" (Lindsey 1892). The practice of extracting root-water from mallee eucalypts had been recorded earlier by Eyre in 1840, and was observed by European explorers elsewhere in arid and semi-arid Australia (Noble & Kimber 1997). Botanist on the Elder Expedition, Richard Helms, reported: "The rockholes seem to be almost a special characteristic of this portion of Australia, and without them it would be impossible for the natives to exist" (Lindsey 1892: 253).

With gold discovered first at Southern Cross in 1887 and then at Coolgardie (1892) and Kalgoorlie (1893), the waterholes Hunt had mapped became the chief route for prospectors rushing to the eastern goldfields. Hunt's expeditions had cleared a track of 26 soaks, tanks and wells, based on Indigenous water sources. This trail would go on to sustain not only pastoralists, prospectors and cameleers, but the establishment of a telegraph line to the eastern goldfields, the construction of the first stage of the trans-continental railway, and the route of the Perth to Kalgoorlie water pipeline. Ensuring non-Indigenous access to water into the goldfields would facilitate the colony's modernity.

Water on the Goldfields

The discovery of gold in Coolgardie and Kalgoorlie in the early 1890s drew thousands of people seeking the latest El Dorado and precipitated an influx of wealth to the colony. Mirroring Victoria's mid-century gold fever, Western Australia's population almost trebled during the 1890s from less than 50,000 to nearly 180,000 people, as it drew many emigrants from the depressed eastern colonies across the Nullarbor (Appleyard 1981). Estimates of the colony's Aboriginal population are rough at best, but possibly numbered about 20,000, and likely excluded those "roaming to the East of the Goldfields," as the resident statistician reported in the state's 1902 Year Book (see Bolton 1981: 124; Briscoe 2003: 1–45; Fraser 1902: 210). Thousands of treasure seekers established permanent settlements in the area around Kalgoorlie and Coolgardie. By 1902, nearly 50,000 colonists could be counted in those towns alone, with another 10,000 or more scattered across the wider region (Mossenson 1955: 82).

After the discovery of gold, demands for permanent water supplies in the area waxed and waned with the seasons. Under these variable conditions, water was imported to the goldfields, first via camel trains and then, once the railway line had been extended to Coolgardie in 1896, via steam locomotives. Both modes of transportation required clean water supplies along their routes and the water trains were especially thirsty: they consumed at least half their load in the round trip (Powell 1998: 20). Another important source was the region's groundwater reserves but these were found to be extremely saline and were purified using condensers. These condensing plants consumed vast quantities of wood from the surrounding woodlands, and in many cases exhausted local bore and mine water reserves. Once the arid plains had been stripped bare to feed the condensers, dust choked the goldfields and even more water was required to keep it at bay (Gaynor 2005).

The government also constructed tanks to collect rainwater but the volatility of the seasons and high rates of evaporation diminished their effectiveness. Miners and prospectors made do with constructing small dams and exploiting the region's sparse water holes (Gaynor & Davis 2006: 18). That these waterholes were likely significant to the local Aboriginal peoples is evident in contemporary maps of the area. The explorer and prospector David Carnegie recorded numerous "Namma Holes," rockholes, soaks, "native camps," "native wells," and "traces of natives having broken mallee roots for water" in the area north of Coolgardie in 1895 (Carnegie 1895). Although references to "gnamma holes," granite rocks and soaks remain, the Aboriginal connection to them is not marked on subsequent maps issued locally and in Britain. Only the derogatory "Black Gin Rocks" and "Black Gin Soak"

remained (eg. Stanford 1896; Dept. of Mines 1898). Similarly, an 1895 map of the roads from York, Northam and Newcastle to the Yilgarn goldfields, which traced Hunt's earlier route, marked pastoral leases, but not Indigenous sites (Surveyor General's Office 1895). These maps cartographically erased traces of both Aboriginal knowledge and bodies from the landscape.

Aboriginal dispossession from watering points was not only symbolic: miners regularly denied them access to water holes, and some prospecting parties seemed to relish acts of violence towards Indigenous peoples (see Muller 2012). In one particularly bloody incident, miner Leslie Menzies laid explosives around a waterhole to deter attackers.² He later described the encounter in vivid detail:

Then the fun began. Spears began to come from all sides, then I heard the boom of buried dynamite. Dirt, shrubs and blacks went up in the air. I heard some agonised yells and mad scrambling among the rocks. I threw a few hand-grenades, but no more spears came whizzing about me. I had evidently given them a good scare. At daybreak I walked out to view the 10-minute battlefield. Fourteen dead natives. Blood trails led all over the place, but not a soul was in sight. (Menzies [1937] 2004: 91–92)

On another occasion further east, prospectors captured several young Aboriginal girls in revenge for the theft of their stores. When the local Aborigines tried to retaliate, the prospectors “arranged a counter attack and relentlessly massacred thirty warriors near a water hole” (Wilson 1973, cited in Christensen 1981: 96–97).

That the Aboriginal people of the goldfields were suffering was widely reported in newspapers both locally and in the colony's capital Perth in 1895. Although the *Coolgardie Miner* (16 Feb. 1895: 4) initially denied the “blacks are any worse off for water than they ever were before,” the editor later blamed the colonial government for its “true masterly indifference and neglect, not even securing to them a drink of water” (*Coolgardie Miner* 14 Dec. 1895: 2). The *Western Argus*, published in nearby Kalgoorlie was more sympathetic:

[W]e have pierced into the heart of this great continent, barren of almost all but the precious metal we have come to seek, we have driven the native owners of the soil further and further into the interior, we have appropriated their soaks and other natural supplies of water, we occupy the territory which by every right they should consider theirs, and yet in return for this, so far as any systematic aid is concerned, we allow them to starve or die of thirst. The last few days have afforded the pitiful sight of these poor savages wandering around the town begging for water. (*Western Argus* 24 Oct. 1895: 2)

The Catholic *WA Record* too found the cause of Indigenous plight lay with prospectors' avarice:

If it were not for the thirst for gold and the selfishness it begets, there was sufficient water to supply the natives' need until the end of time; but the digger has come by the thousand, bringing horses and camels, and they soon rendered it a thirsty land. (*WA Record* 23 Nov. 1895: 6)

Although in late 1895 wardens were instructed to ensure the "aboriginals have all the water they require," the issue had not been resolved (*Daily News* 23 Nov. 1895: 6). In December 1897, the *Kalgoorlie Miner* (16 Dec. 1897: 2) published a letter from a local man in which he detailed the conditions facing many Indigenous people on the eastern goldfields. The correspondent, Fred McGill, was a Noongar from the Esperance region, south of Kalgoorlie. Before goldmining transformed the area, McGill reported that the local people had obtained water from gnamma holes and the roots of certain trees. Food was not scarce as kangaroos and emus were caught as they drank from the watering holes. Now, he wrote, "[t]hey have a good deal of trouble in getting water." Prospectors, horses, cameleers and dray were quickly exhausting watering holes that had once sustained an Indigenous family for a week. Such constraints also disrupted their access to emu and kangaroo, which McGill explained had been hunted "when they came to drink" (*Kalgoorlie Miner* 16 Dec. 1897: 2). Prevented from accessing scarce water supplies and traditional food sources, many Aborigines were seemingly reduced to "supplicants," as one prospector later recalled (Stoddart 1930: 56).

The "native question" was not the only concern for whites on the eastern goldfields; they also sought answers to the "Afghan question." Since the 1860s, Anglo-European exploration of the arid interior of Australia had been largely facilitated not only with the guidance of Indigenous peoples, but also with the assistance of camels and their handlers. The prevailing logic was that camels were better suited to the privations of desert conditions than horses, and that South Asians (whom contemporaries described as "Afghans") were best positioned to pilot these ships of the desert. Arriving on the eastern goldfields in the early 1890s, they together transported passengers, supplies, and water to the desert's edge, sinking wells and constructing water condensers for their use (Willis 1992: 43).

But it did not take long for resentment towards their presence to grow. Anti-Asian sentiment informed an aggressive exclusionary position, which argued in favour of protecting white workers from the competition of non-white labour (e.g. *Western Mail* 27 Aug. 1892: 32; *Daily News* 2 March 1895: 6). This hostility had earlier boiled over in the anti-Chinese riots on the

goldfields in the colonies of Victoria and New South Wales, which had encouraged the campaign restrict their presence on Western Australia's goldfields (Atkinson 1995). In addition to calls for the exclusion of South Asians from the diggings, Anglo-Europeans devised other means to deter them. These methods exploited the *haram* aspects of the Muslim faith of many South Asian camel owners and drivers, whereby pork was placed near water sources to discourage their access and demarcate areas for Anglo-European use alone (e.g. *Coolgardie Miner* 29 Dec. 1894: 3).

Hostile commentators framed both Asian bodies and Asian practices as contaminants on the diggings. One observer reported of conditions in Coolgardie in 1893,

The camels and Afghans are the filthiest lot that ever went near water. [...] Around some of the wells the ground is little short of a manure heap reeking with filth. You can find the Afghans washing their dirty linen on the edge of the well and the splashes of suds falling out of their buckets go into the well. (*Western Mail* 28 Jan. 1893: 40)

Frederick Vosper, the editor of the *Coolgardie Miner* and founder of the Anti-Asiatic League, declared in his newspaper that in light of the scarcity of water on the goldfields, such behavior "amounted to constructive and collective manslaughter" (*Coolgardie Miner* 27 April 1895: 3). With calls "to severely punish those Asiatics who so wantonly and systematically pollute the wells," the tensions over water on the goldfields boiled over (*Victorian Express* 20 Jan. 1893: 2). In late 1894, for example, an argument between a trio of Europeans and eight South Asians over the latter's use of a waterhole for *wudhu* (Islamic ablution) led to the shooting of two Muslims, killing one and seriously wounding the other (Willis 1992; Kabir 2009). In the subsequent trial, the jury found the Anglo-European shooter not guilty.

In the early 1900s, the Travelling Inspector for the Western Australian Aborigines Department, George Olivey, embarked on his bicycle across the eastern goldfields to report on the living and employment conditions of the region's Aboriginal people. In Kalgoorlie, he was informed that Aborigines were often stealing water from the non-Aboriginal residents of the area. Whether such "theft" arose from desperation, opportunism, sabotage, or economic engagement, is unclear from extant accounts (Konishi 2019; Russell 2015; Cahir 2012). Olivey suggested that this situation could be remedied by the provision of a condenser on the "outskirts of the town" to provide water for the Aboriginal people. After all, he noted, "[t]he public can hardly be expected to find it for them" (Olivey 1903: 29–30). Establishing a water supply away from the ostensibly European town would serve a similar role as the control of ration distribution; a means to control the movement of

Aboriginal peoples (Christensen 1979). These intentions found another expression in subsequent calls to establish a special reserve for their removal, and in 1936, the government declared Kalgoorlie a “prohibited area” to Aboriginal peoples without “lawful employment” (Christensen 1979: 129–130).

Prior to the goldrushes of the 1890s, prospecting expeditions had relied heavily on Aboriginal guides to mind their horses, to communicate with other Aborigines, and most importantly, to identify water holes in an arid landscape. Some local Indigenous people had even directed the prospectors to the region’s gold-bearing quartz reefs (Green 1988). In 1906 Aboriginal miner William Harris travelled to Perth, where he met with the Premier to convey his concerns regarding the condition of Indigenous peoples on the goldfields. There, the *West Australian* newspaper reported, “the natives were nearly starving on the fields, and they were forced to rely for assistance upon the people in the goldfields towns” (*West Australian* 9 Feb. 1906: 5). Sitting and former mayors of Leonora and Malcolm corroborated his account, attributing the “state of hunger and deprivation” to the “arrival of the white race,” which had “denuded” the country of food and water (*Daily News* 8 Feb. 1906: 10). Over the course of just a few decades, Anglo-Europeans had reconfigured the eastern goldfields from a country of plenty to a region of want.

Water beyond the Goldfields

The region’s goldmining industry had begun to decline after 1903, and this process continued with the outbreak of the Great War (Snooks 1981: 254–255). This change in fortunes brought with it an exodus of Anglo-Europeans from the eastern goldfields, abandoning many of the townships that had sprung up during the goldrushes (e.g. Layman 2012). By this time, the state government’s “protectionist” program of removing Aboriginal peoples to “native settlements” and other state institutions was well underway. Many Indigenous children from the goldfields were sent to the Moore River Native Settlement, about 100 kilometers north of Perth, while the growing pastoral industry saw in the remaining Aboriginal population a potential source of cheap labour (Christensen 1981: 103; Morgan 1986; Lewington, Roberts & Brownley 1997). With the establishment of the Australian Aboriginal Mission (later, United Aborigines Mission) in 1921 at Mt Margaret north of Kalgoorlie, came a campaign to civilise the Aboriginal peoples that remained on the goldfields as well as those in the surrounding areas (Marks 1960). Water, as well as work, was the means by which Mt Margaret’s missionaries sought to achieve their salvation.

At the turn of the twentieth century, the town of Mt Margaret had become the centre of the Mt Margaret Goldfield. Almost as soon as the site had been declared in 1897, it was abandoned (Layman 2012). Two decades

later, missionary Rodolphe (Rod) Schenk found in the commons northeast of the old townsite land suitable to establish a mission. As his daughter later recalled, “[h]e wanted Mount Margaret to be God’s ‘Honeypot’ to attract people away from a life of begging for food and selling their women” (Morgan 1986: 37). Among the challenges Schenk faced there was the region’s scarcity of water. He later recalled in 1933,

When the missionaries first went to Mt Margaret they had only well water to drink and it was slightly brackish. It was a milestone in the history of the mission when 18 months later, the first 200-gallon tank was erected. Today there are galvanized iron tanks with a capacity of nearly 20,000 gallons of rain water and cement tanks to hold 33,000 gallons. (*Daily News* 15 Aug. 1933: 3)

The availability of water there, Schenk and his missionaries believed, helped to attract his flock from the surrounding arid areas (Morgan 1986).

In his spread of the gospel to the area’s Aboriginal people, Schenk understood himself as on the frontline of “the conflict for the Lord out here” (cited in Smith 1933: 28). This conflict pitted his faith against the “wild and ignorant native,” whose resistance was the product of Satan’s hand (Smith 1933). Putting his charges to work was central to this mission to overcome the “superstition” by which “the natives here are bound hand and foot” (cited in Smith 1933: 73). Routine labour, such as cutting sandalwood or raffia weaving, was a feature of industrial missions such as Schenk’s, whereby employment would help civilise the Aboriginal “inmates,” while providing a vital income stream to the mission (Biskup 1973). In a 1933 report to the *Daily News*, he proudly declared:

Here they [the missionaries] had to mould into civilized character what was said to be the worst and laziest tribe in the State. The natives had been living without working around the big mining and wood cutters’ camps. They could not see any virtue in work. Turn over the pages of a few more years to today and we find an industrious aboriginal population of fixed habits. (*Daily News* 15 Aug. 1933: 3)

The “fixed habits” also concerned the sanitary condition of Schenk’s inmates and their dormitories. Schenk’s daughter recalled her mother’s frustrated attempts to wash the women’s hair, “[i]t meant lots of talking and explaining that the women must be clean before they started work” (Morgan 1986: 60). In 1930 A.O. Neville, the Chief Protector of Aborigines, publicly praised the Mt Margaret mission in a letter to the *Westralian*. Less than a decade ago, “[t]hese were a people whose contact with civilisation had brought them low indeed in the social scale,” he wrote.

And yet to-day the young men and women seem to be avoiding the evil phases of their time-honoured traditions and those acquired from the whites, and are accepting and practicing the ethics of Christianity. (cited in Smith 1933: 16)

Later, a visitor to the mission observed approvingly, “everything denotes care and cleanliness” (*Kalgoorlie Miner* 15 July 1933: 6). For sociologist Pat O’Malley, the mission’s focus on the civilizing roles of Anglo-European sanitary habits and labour structures was closely aligned with their evangelism:

The body, its performances, and adornments became the obsession of the missionaries, who identified the conversion of the inner souls with adoption of Western European (and especially English) cultural trappings. Yet such work could only be performed if the people were healthy. Souls could not be permitted to depart this earth before being dedicated to God. The government of the soul was thus a government of the body as a sign of the state of the soul. (O’Malley 1994: 56)

Conditioning Aboriginal bodies through work and sanitation relied, therefore, on the availability of water.

That Schenk’s mission had delivered such civilisation on the desert’s fringe was particularly significant. As a visiting missionary asked:

“Could a successful Mission station be established in such a place of rich soil and yet arid country?” [...] It seemed as though the “desert rejoiced and blossomed as the rose” (Cross 1937: 10)

The redemption of desert wastes and their people had emerged as a guiding principle for Christians during the first millennia, which reflected Old Testament ideas of desert ascetism and the improvement of nature. With the renewed incursion of Western Europeans into desert environments from the fifteenth century, these ideas came increasingly under the influence of environmental determinism and the desire to arrest environmental decline (Davis 2016). Throughout the arid world that Western Europeans occupied by the mid-nineteenth century, governments and missionaries sought to sedentarise nomads and pastoralists, whose lifeways were deemed responsible for the condition of the land. The mission at Mt Margaret was an expression of these ideals in the Western Australian interior.

By the mid-1930s relations between Schenk’s mission and the state government had begun to sour, as calls grew to investigate the conditions of Western Australia’s Aboriginal population. One of Schenk’s missionaries, Mary Bennett (a renowned feminist advocate for the welfare of Aboriginal people), had been a vocal critic of visiting anthropologists and pastoralists’

treatment of Aboriginal workers—views shared by Schenk (Biskup 1976: 133; Holland 2015). Among the ideological differences between the state and the mission was their divergent views on the future of the Aboriginal population: Neville was committed to the “absorption” of those of mixed descent into the white population, while the “full-blooded” would be left to die out. For his part, Schenk sought to continue his evangelism among both groups (O’Malley 1994). These positions clashed over the extent to which Schenk could extend his missionary activities into the Central Aboriginal Reserve, where Neville had planned for the demise of “full-blooded” peoples to occur (McGregor 2002).

In the midst of these tensions, the mission’s sanitary state became a subject of public debate between the two parties. In his 1935 Annual Report, Neville was critical of what he had observed at the mission:

In October last year I spent several days at Mt Margaret [...] the sanitation of the place left much to be desired. I was anxious lest an epidemic should break out in consequence. My words proved to be more prophetic than I knew, as in May this year it was reported that fifteen inmates were down with typhoid fever. (Neville 1936: 16)

Schenk had reported an “unusual amount of sickness” to the Aborigines Department, with two deaths arising from eighteen cases of typhoid among the mission’s children. Influenza and pneumonia had also struck Mt Margaret that year (cited in Neville 1936: 17). He attributed the typhoid outbreak to a polluted tank, and on the Department’s advice, the mission undertook to acquire an “engine pump and tank” to ameliorate the situation (*West Australian* 4 Dec. 1935: 7; Morgan 1986: 199).

That Mt Margaret should come under such scrutiny raised the ire of at least one of Schenk’s fellow missionaries. The Western Australian Secretary of the China Inland Mission wrote to the *West Australian* in Schenk’s defence, arguing that Mt Margaret had saved lives during the recent epidemic: “Had there been no mission station when the outbreak occurred, the whole of the natives must have been wiped out. The epidemic was contained, however, and only two deaths occurred” (*West Australian* 28 Nov. 1935: 11). The Minister publicly disputed this interpretation, retorting,

Had there been no mission station there, there would have been no natives on the site, nor would there have been defective drainage or an impure water supply to cause such an outbreak. (*West Australian* 4 Dec. 1935: 7)

In addition, he noted, his government had provided the mission with medicines and medical help from Kalgoorlie, further undermining the mission-

aries' claims to providing civilisation to the local Aboriginal population.

The findings of the 1935 Moseley Royal Commission into the conditions of the state's Aboriginal population did little to resolve the antagonism between Schenk and Neville. Moseley had dismissed Bennett's claims, and to remedy "an atmosphere of irritation" among nearby pastoralists, recommended the relocation of the mission "further East" (Moseley 1935: 18). For his part, Neville's powers grew as a result of Moseley's recommendations. Emboldened, he sought to curtail Schenk's influence in the region by reducing the mission's rations; limiting medical supplies; opening a government ration depot at Laverton; and preventing efforts to establish other missions (Haebich 2000: 267). As Schenk's daughter later noted, such measures "would have effectively moved people away from Mount Margaret" (Morgan 1986: 220). In 1938 the government introduced regulations requiring the licensing of missions to the Aborigines, which the local United Aborigines' Mission Council declared a "slur cast upon the governing bodies of the Missions and their workers" (Hogg 1938: 3). Neville's "final move," as Schenk's daughter later described it, was his acquisition of the pastoral property, Cosmo Newbery, northeast of Mt Margaret (Morgan 1986: 248). Despite Schenk's efforts to purchase the property for the mission, Neville negotiated its use for the government as a ration depot in 1940. He then ordered the mission's adults and children to relocate there, leaving behind only children of mixed descent (Morgan 1986: 249). Deprived of their flock, which was forced further east, the mission was unable to re-establish its former position of influence among the local Aboriginal population (Haebich 2000: 267). Schenk retired in 1954, and two decades later in 1976, the Aboriginal Movement for Outback Survival took responsibility for the community.

Conclusion

Seven years prior to the Australian Academy of Science's acknowledgement of George Seddon's career that opened this article, the geologist Jim Bowler was awarded the Mawson Medal. Back in the mid-1960s, Bowler had stumbled upon human remains while excavating the Willandra Lakes in arid south-western New South Wales. Those remains, he soon discovered, were over 40,000 years old—the oldest evidence of *Homo sapiens* outside Africa. In that moment, as Billy Griffiths (2018) writes, "the scale of Australian history changed." Reflecting on the ancient Australia on the eve of the nation's bicentenary, Bowler observed: "The [climate] fluctuations that occurred during the last 60,000 years shaped Australia's human history, because they spanned the colonisation of the continent." In the availability of water, these fluctuations were manifested such that, he argued, a "history of Australia could well centre on water resources" (Bowler 1987: 25).

This article has explored how such a history might be undertaken, focusing on the diverse cultural geographies of water that developed in the arid interior of Western Australia during and after the Pleistocene. Tracing how the availability of water in these climes shaped Indigenous and non-Indigenous mobility, and their subsequent encounters, recovers the central role of this scarce resource in the land's Anglo-European exploration, the extraction of its resources, and the dispossession of its Aboriginal peoples. Situating this particular colonial hydrology in deep time seeks to highlight the multiple temporalities at play in the settler configuration of the goldfields: the geological forces of environmental change, the time-scale of human occupation, the chrono-cultures of Indigenous and non-Indigenous peoples, and the prospective settler impulses of improvement, redemption and civilisation, among them. Recognising this temporal complexity in the making of settler Australia, and its ongoing legacy for Indigenous peoples, might allow for a wider understanding of the ways in which "we all live in deep time," as historian Greg Dening (2005: 269) observed.

Attending to the geological history of inland Australia, its cryohistory, offers fresh ground for exploring the materiality and cultures of (settler) colonialism and resource extraction across the cryosphere. Whether in the eastern goldfields of settler Australia, the North American Arctic (eg. Stuhl 2016; Bocking 2017), Scandinavia (e.g. Oslund 2011), or the Russian North (eg. Chu 2018; Bruno 2016), outside powers have sought to conquer and exploit these places and the peoples that reside there. These processes reconfigured these spaces as extractive frontiers for imperial enrichment and as wastes for redemption. Whether ice or desert, water and its absence shaped both the material and cultural cryohistories of Indigenous and non-Indigenous peoples, and the nature of their encounters.

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NOTES

- ¹ The language of the Kaprun people is Kaalamaya, which is denoted as Kalamaia on Norman Tindale's 1974 map of Aboriginal group boundaries.
- ² The town of Menzies, over 100 kilometres north of Kalgoorlie, was named after Leslie Menzies, who found gold there in 1894 in the company of Jimmy, an Indigenous guide, and Cumbra, an Afghan camel driver (see Cameron & Jaggard 1977: 126).

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