

# *Enduring Contact: Australian Perspectives on Environmental and Social Change*

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**ABSTRACT:** Studies of the historical contacts between indigenous Australians and non-Aboriginal peoples in Australia are diverse, involving historians, indigenous voices, archaeologists, art scholars, historical anthropologists, and geographers. Taken together, the last four decades of scholarship have provided a broad knowledge base on these various and diverse cross-cultural contacts, societal and economic changes, and regional variations. Given an overriding focus on continuities, as required, for example, by native title determinations, there has been less interdisciplinary attention to how environmental change was a factor in culture contact, despite debates regarding the impacts of the cessation of indigenous fire management practices (termed “fire stick farming”). A review of the evidence for environmental change and cross-cultural contact reveals potentials for landscape-level studies that encompass social landscapes and the environment, with implications for land managers and for perceptions of cultural and natural heritage. From a consideration of “comparative Wests,” similarities exist in both Australia and North America regarding (1) contemporary understandings of the breadth of indigenous land management by foraging peoples and (2) the implications for contemporary land management and the place for indigenous knowledge and practice.

CULTURE CONTACT BETWEEN VARIOUS INDIGENOUS PEOPLES AROUND THE GLOBE and colonizing Europeans is a well-established field of study that has tended to focus on the social, political, and economic aspects of cross-cultural entanglements. In this essay I consider issues of how indigenous land management at contact is being studied and the implications of this information for (1) our understanding of historical processes of culture contacts and (2) contemporary land and heritage management. The essay reveals that an understanding of culture contact must also take into account how environments and land management changed following European colonization. Although my topic is Australia, my findings appear to be relevant to similar historical processes in North America (particularly with the recognition of the use of anthropogenic fire by Native Americans)<sup>1</sup> and to the analysis of nonindigenous perceptions of indigenous peoples and their practices.<sup>2</sup>

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The study of the historical contacts between indigenous Australians and nonindigenous peoples in Australia by archaeologists in Australia has largely focused on events after the arrival of British colonists in 1788. However, indigenous Australians were already in contact with outsiders—parts of northern Australia were visited by Southeast Asians (commonly termed Macassans) and there was contact across the islands of Torres Strait with Papua New Guinea.<sup>3</sup> The eventual arrival of Europeans signaled momentous changes for many Aboriginal societies across the continent. The contacts that ensued between indigenous Australians and Europeans began in the early 1600s and intensified exponentially with the arrival of the British after 1788. By the early nineteenth century British settlement cores existed in modern Sydney, Tasmania, Adelaide, Perth, Melbourne, and southern Queensland—all were linked by sea, forming an archipelago of colonies at the margins of a “continent of hunter-gatherers.”<sup>4</sup>

By the turn of the twentieth century white settlement had occurred across most of Australia, much of it driven by the pastoral frontier and other colonial industries based on extractive processes (such as whaling, sealing, and logging). A demographic split between urban Australia—where the majority of whites lived—and regional Australia was already clear. In terms of culture contact this meant a minority of whites were in contact with much of indigenous Australia across a majority of the continental landmass and its offshore islands. For colonial administrators, maintaining a sense of this vast frontier was always logistically difficult. While issues of race relations were sometimes recognized as important by the wider society, much of Australia was remote from colonial authority. For indigenous societies the timing and consequences of contact thus varied. As a rule, most Aboriginal communities lost unrestricted access to traditional country, suffered from violence, and were faced with diseases, some of which incurred high rates of mortality. Indigenous lifeways were disrupted and in many instances terminated—thus, the landscape of contact reflects changes that may have resulted from the cessation or disruption of indigenous land management practices.

By the turn of the twenty-first century Australia still faced issues related to differences between indigenous Australians and the wider population. Issues of Australian history are still being actively questioned. In recent years we have seen the prime minister make a formal apology to indigenous Australians from the Australian Federal Parliament.<sup>5</sup> In 2011 the City of Sydney

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<sup>1</sup> See the essay by Frank Lake in this volume; see also Stephen J. Pyne, *Fire in America: A Cultural History of Wildland and Rural Fire* (Seattle: University of Washington Press, 1997).

<sup>2</sup> See William Cronin, *Changes in the Land: Indians, Colonists, and the Ecology of New England*, rev. ed. (New York: Hill and Wang, 2003).

<sup>3</sup> Anne Clarke, “The ‘Moorman’s Trowers’: Macassan and Aboriginal Interactions and the Changing Fabric of Indigenous Social Life,” *Modern Quaternary Research in Southeast Asia* 16 (2000): 315–35; M. J. Morwood and D. R. Hobbs, “The Asian Connection: Preliminary Report on Indonesian Trepang Sites on the Kimberley Coast, N.W. Australia,” *Archaeology in Oceania* 32, no. 3 (1997): 197–206.

<sup>4</sup> This is the title of a book by Harry Lourandos: *Continent of Hunter-Gatherers: New Perspectives in Australian Prehistory* (Melbourne: Cambridge University Press, 1997).

<sup>5</sup> Prime Minister Kevin Rudd, MP, “Apology to Australia’s Indigenous Peoples” (2008), <http://australia.gov.au/about-australia/our-country/our-people/apology-to-australias-indigenous-peoples> (last accessed on December 4, 2012).

controversially changed the wording in its planning documents from “colonisation” to “invasion.”<sup>6</sup> These examples of modern interpretation are reminders of shifting contemporary perspectives on our local and continental histories.

Unsurprisingly, a critical issue for contemporary Australia is the environment, including at global levels (debate in Australia questions whether climate change is human induced),<sup>7</sup> regional levels (e.g., water management of trans-state riverine systems, national parks, species threats and extinctions, world heritage, impacts of mining and gas extraction), and local levels (e.g., management of local environment by landowners and leaseholders such as pastoralists and miners, bushfires, indigenous land management, impacts of population growth on coasts, land degradation, water futures, species diversity, farming futures, land productivity, and salinization). Agencies and researchers responsible for and interested in land and sea environments are informed by studies conducted by physical scientists, geographers, marine scientists, and others. Attempts to understand ecology in the relatively fine-grained temporal setting of the last few centuries are driven by many of these issues, as it is clear that the impacts of the arrival of Europeans are a significant part of the changes and challenges that confront Australian environments. In fact “invaders” is an appropriate term given that colonists introduced many Old World plant and animal species that in turn invaded Australia, leading to species extinction and ecological and landscape changes. Thus, the environment too is part of the story of culture contact.

How much do we know about what Australia was like before the arrival of Europeans? Many may have once suggested that the environment was in a “natural state.” However, the idea of Aboriginal people living in nature and not affecting it has long been challenged, particularly by the recognition of the ways in which fire was used as a tool—like a farmer’s spade—to modify the landscape. For archaeologists the antiquity of such practices is open to inquiry. Recently, as detailed below, historical ecologists have begun to provide the types of fine-grained climate information required to understand the relationships between humans and plant and animal species over time. For Australia, these studies promise more nuanced understanding of how humans and ecosystems were related. This raises critical questions for land managers: what is “natural,” and when we “conserve” the environment, is what we conserve actually natural?<sup>8</sup> What role is there for rethinking the natural world through the lens of historical ecology?

In the remainder of this essay I will explore ecological and archaeological studies where culture contact is deployed to critique dominant norms of what the environment has been understood to mean, with implications for the way it is managed—as it inevitably is—by humans; we are now global ecosystem managers with the past to guide us. I begin with a review of indigenous land management, then consider European colonization and its consequences, and then explore some detailed examples before presenting some concluding points. This essay does not pretend to provide substantive answers but raises a number of points that deserve further exploration.

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<sup>6</sup> City of Sydney, Community Strategic Plan, [http://www.cityofsydney.nsw.gov.au/council/documents/IntegratedPlanningReporting/1\\_CSP\\_IntroductionCityVision.pdf](http://www.cityofsydney.nsw.gov.au/council/documents/IntegratedPlanningReporting/1_CSP_IntroductionCityVision.pdf) (last accessed on December 4, 2012).

<sup>7</sup> The debate has been sharpened in popular fora with the publication of Tim Flannery’s *The Future Eaters: An Ecological History of the Australasian Lands and People* (Chatswood, NSW: Reed Books, 1994).

<sup>8</sup> Rhys Jones, “Fire Stick Farming,” *Australian Natural History* 16 (1968): 224–28.

## INDIGENOUS MANAGEMENT OF ENVIRONMENTS AND LANDSCAPES

European outsiders encountering Australia in the seventeenth century, then beginning to colonize in the late eighteenth century, engaged with a diverse cultural and social landscape with truly ancient traditions of use. A dominant theme in European writing of this time was informed by philosophical ideas of indigenous people either as *noble savages* living in a natural state or as representing an earlier stage of humanity whose values had been degraded by civil societies.<sup>9</sup> However, the alternate notion that Aboriginal actions had impacts upon the Australian environment is present in some early historical observations and has become widely accepted and increasingly studied. The key aspects of landscape modification debated to date by archaeologists are (1) species extinction and (2) the “fire stick farming” hypothesis as a key element of broader landscape management and anthropogenic impact.

Archaeological evidence suggests that Australia was colonized by the modern-human ancestors of indigenous Australians around fifty thousand years ago.<sup>10</sup> As these were people traveling over maritime settings and probably adapted to coastal economies, we expect the earliest evidence of their presence to be in Sahul (the name of the continent that extended from southern Tasmania to Papua New Guinea due to the lower sea levels during the Pleistocene) and to have been submerged by the rising Holocene seas. The Australian continent is an ancient landscape, largely characterized by ancient, poor soils except where there are volcanic soils. Geographical isolation and intracontinental regionalism over millennia have resulted in unique species unevenly distributed across the continent.

The lifeways of indigenous Australians’ ancestors were diverse, given the vastly different regions across Sahul and the long time scale of human occupation that saw great changes in the climate, particularly in the Pleistocene but also in recent millennia. Even in the relatively stable Holocene, it appears that the first half of the Holocene was drier and less variable than the last few thousand years have been.<sup>11</sup> As the climate warmed, there were changes in geography such as coastal inundation and island formation. Throughout this long period Australians were foragers, relying on collected foods and animals. Much of our understanding of indigenous lifeways has been generated through European observations; however, when Europeans arrived, they had specific ideas of what characterized nonfarming peoples, and we must approach their historical accounts with such biases in mind.

The development of archaeology in Australia led to a radical new understanding of the antiquity and character of the Australian continent and its indigenous peoples. What has also become clear is that indigenous Australians changed their environment to some degree, although the extent to which they did so is disputed. The main issues are impacts on faunal species, use of anthropogenic fire and other landscape modifications, and what data are appropriate to help us comprehend how culture contact in historical periods is useful to our understanding of these issues.

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<sup>9</sup> One can see concepts such as those of Rousseau reflected in the extraordinary eighteenth-century explorer Captain James Cook’s writing, for instance.

<sup>10</sup> Jane Balme, Iain Davidson, Jo McDonald, Nicky Stern, and Peter Veth, “Symbolic Behaviour and the Peopling of the Southern Arc Route to Australia,” *Quaternary International* 202 (2009): 59–68.

<sup>11</sup> Lesley Head, “Landscapes Socialised by Fire: Post Contact Changes in Aboriginal Fire Use in Northern Australia, and Implications for Prehistory,” *Archaeology in Oceania* 29, no. 3 (1994): 179. See also Lesley Head, “Prehistoric Aboriginal Impacts on Australian Vegetation: An Assessment of the Evidence,” *Australian Geographer* 20, no. 1 (1989): 37–46; Lesley Head, *Second Nature: The History and Implications of Australia as Aboriginal Landscape* (Syracuse, NY: Syracuse University Press, 2000).

As in the Americas, when Sahul was first colonized by humans certain animal species suffered population collapse or extinction. In Sahul many animals termed “megafauna”—here Australians borrowed the term directly from its American usage—appear to have become extinct in the Pleistocene. The role of humans in these extinctions is debated. While some have advocated that the arrival of humans led rapidly to the extinction of several species (with the demise of large foragers affecting the vegetation), there is no strong evidence to support this hypothesis.<sup>12</sup> There is no direct evidence for human hunting of these animals, such as butchered bones in campsites. The key site of Cuddie Springs in western New South Wales contains a horizon with redeposited megafauna and stone tools, although the relationship between these remains is unconvincing. The dating of sites that contain megafauna does not support a rapid extinction event, and in fact the excavator of Cuddie Springs states that “there is little evidence to suggest that more than a few species of megafauna overlap with human occupation of the continent. Some megafaunal extinctions appear to have preceded humans in Australia, so the link to humans is weak.”<sup>13</sup> When Europeans arrived there were few large native fauna, and European-introduced species—particularly camels, horses, cows, sheep, goats, dogs, cats, rabbits, and foxes—changed the Australian environment dramatically after 1788, resulting in the decline and extinction of many endemic mammalian fauna.

A key issue raised by the “megafauna debate” relates to our changing perceptions of indigenous impacts on Australian ecosystems. In the past, indigenous Australians were viewed as having no measurable impacts (treading lightly on the earth), being largely confined by the environment and the perceived limitations of hunter-foraging lifeways. Part of this idea originates from a biased view in which farmers manipulate environments while hunter-foragers do not. This two-category model has become defunct, and the complexity of human interactions with ecosystems is increasingly known. The distinction between farming and foraging has become blurred.<sup>14</sup> We now think of indigenous Australians as being active agents in the manipulation of the environment, which leads to questions about the history of anthropogenically transformed landscapes and to studies of social landscapes.

At contact, Aboriginal subsistence relied on diverse hunted animals and foraged foods. Ian Keen’s “Aboriginal Economy and Society at the Threshold of Colonisation: A Comparative Study” provides an overview based on his major comparative study of Aboriginal people in seven regions of Australia from the southwest of Western Australia to Cape York in far northern Queensland.<sup>15</sup> The environments in these studies vary greatly, as do the diversity of plants and

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<sup>12</sup> See the argument in Peter Hiscock, *The Archaeology of Ancient Australia* (London: Routledge, 2008).

<sup>13</sup> J. Field, S. Wroe, C. N. Trueman, J. Garvey, and S. Wyatt-Spratt, “Looking for the Archaeological Signature in Australian Megafaunal Extinctions,” *Quaternary International*, <http://dx.doi.org/10.1016/j.quaint.2011.04.013>.

<sup>14</sup> This new view is advocated by many archaeologists working on the origins of food production. Beth Gott, for example, observes how the earth, replenished through fires, was turned over to encourage yam production, with the replanting of certain yams. This is the type of plant modification that in some instances may have led to domestication. See Beth Gott, “Fire-Making in Tasmania: Absence of Evidence Is Not Evidence of Absence,” *Current Anthropology* 43 (2002): 650–56. For fire, see also A. M. Gill, J. E. Williams, and R. A. Bradstock, *Flammable Australia: The Fire Regimes and Biodiversity of a Continent* (Cambridge: Cambridge University Press, 2002); and Stephen J. Pyne, *Burning Bush: A Fire History of Australia* (Seattle: University of Washington Press, 1998).

<sup>15</sup> Ian Keen, “Aboriginal Economy and Society at the Threshold of Colonisation: A Comparative Study,” *Before Farming* 3, no. 2 (2003): 1–24. Keen’s study includes (1) the Kunai people of Gippsland (Victoria); (2) the Yuwaaliyaay people neighboring the Darling/Barwon River in northern New South Wales; (3) the Pitjantjatjara people and their neighbors in the Western Desert; (4) the Wiil and Minong people of the south coast of Western

animals used. Importantly, Keen argues that people “managed resources through a number of means (using fire, for example), with profound short- and long-term effects, shaping Australian landscapes. People’s activities had effects on environments, not all of them intended, and these effects altered the conditions that enabled and constrained human activities.”<sup>16</sup> Calculations of the relative contributions of plants and meat to the Australian diet differ, and anyway, the diet would have varied according to season, climate, and environment. Historical observations indicate that hunting and foraging were gendered, with women most often responsible for acquiring most vegetable foods, small game, crustaceans, and other invertebrates.<sup>17</sup> Animal foods varied according to access to fish, game, and birds. Traps were used in inland and marine waters to collect fish and eels. In some Australian waterways reed and bark boats were used to forage for fish and bird products. In parts of northern Australia the dugout canoe was deployed in the hunt for animals in deeper waters (the dugout canoe has been suggested to be a recent innovation resulting from contact with Southeast Asians and Melanesians). Although it was once thought that the fishhook was introduced to Australia in the last five hundred years, it appears that people were deep-sea fishing in nearby Timor during the Pleistocene.<sup>18</sup>

Forms of human resource management included the use of fire; the promotion of desirable species; physical modifications such as canals to move resources or barriers to direct resources; sustainable use of resources through relocation of activities and timing. Other activities not considered here but of critical importance would be cultural responsibilities to land such as correct ceremonial actions and behavior, as these too constitute forms of appropriate management.

Let us consider fire, as it has been widely discussed. A key environmental and land management issue concerns anthropogenic fire in Australia, a continent characterized by fire-dependent and fire-resistant species.<sup>19</sup> The ways that fire was deployed by Aboriginal people are potentially evident in (1) historical accounts; (2) indigenous knowledge and practice; (3) the landscape today (specifically through the present distribution of animals and plants); and (4) archaeological and palaeoecological records. I consider each line of evidence briefly.

### ***Historical accounts***

The historical evidence for anthropogenic fire across Australia is increasingly known from surveys of historical accounts of fire and the different landscapes and environments across the continent at the time of European colonization.<sup>20</sup> Many of these accounts were made well before ethnographical work in Australia, which was initiated in the late 1800s with the seminal work of Spencer and Gillen and explorers such as Ernest Giles in the 1870s,<sup>21</sup> followed by more formal

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Australia; (5) the Sandbeach people of eastern Cape York Peninsula; (6) the Ngarinyin people and their neighbors in the eastern Kimberley; and (7) the Yolngu people of northeastern Arnhem Land (*ibid.*, 7).

<sup>16</sup> *Ibid.*, 21–22.

<sup>17</sup> *Ibid.*, 25.

<sup>18</sup> Sue O'Connor, Rintaro Ono, and Chris Clarkson, “Pelagic Fishing at 42,000 Years before the Present and the Maritime Skills of Modern Humans,” *Science* 334, no. 6059 (2011): 1117–21.

<sup>19</sup> It has been suggested that environmental records at Lake George indicate that the intensity of fires increased around 128,000 years ago and then following human colonization. However, these increases may have resulted from nonhuman factors, as summarized in Hiscock, *Archaeology of Ancient Australia*.

<sup>20</sup> Eric C. Rolls, *They All Ran Wild: The Story of Pests on the Land in Australia* (Sydney: Angus and Robertson, 1984); E. C. Rolls, *Visions of Australia: Impressions of the Landscape, 1640–1910* (Port Melbourne, Vic.: Lothian Books, 2002).

<sup>21</sup> Ernest Giles, *Australia Twice Traversed: The Romance of Exploration, Being a Narrative Compiled from the Journals of Five Exploring Expeditions into and through Central South Australia and Western Australia from 1872 to 1876* (London:

anthropological studies by others increasingly from the 1930s. However, historical sources such as written observations and images do provide important and unique insight into the Australian landscape and allow us to propose ideas of Aboriginal involvement in the environment that can be tested.

Significantly, historical observations describe the use of fire to improve the prospects of the environment for Aboriginal subsistence. For example, Thomas Mitchell described the use of fire in the area around Sydney, writing six decades after colonization: “Fire, grass, kangaroos, and human inhabitants, seem all dependent on each other for existence in Australia; for any of these being wanting, the others could no longer continue. Fire is necessary to burn the grass, and form these open forests. . . . But for this simple process, the Australian woods had probably continued as thick as a jungle as those of New Zealand or America.”<sup>22</sup> Edmund Curr was a keen observer of Aboriginal people in the earliest years of colonization in the southeast, and he used the terminology of farmers to describe Aboriginal resource management: “there was another instrument in the hands of these savages which must be credited with results which it would be difficult to over-estimate. I refer to the *fire-stick*. . . he tilled his land and cultivated his pastures with fire.”<sup>23</sup>

Historical observers inform us that the practice of clearing land with fire occurred across Australia. In Cape York (in the far north of Queensland) Oswald Brierly details how “observing that the grass had been burnt on portions of the flats the Blacks said that the rain that was coming on would make the young grass spring up and that would bring down the kangaroos and the Blacks [would] spear them from the scrub.”<sup>24</sup> Curr stated that “it may perhaps be doubted whether any section of the human race had exercised a greater influence on any large portion of the globe than the wandering savages of Australia.”<sup>25</sup> Even in desert regions, colonized by the British long after the initial settlements around the fringes of the landmass, fire was deployed and observed. A sheep station manager in the 1860s at Lake Eyre in central Australia wrote how Aboriginal people burned the longer grass threatening the newly built pastoralists’ infrastructure of water troughs, shepherds’ huts, and brush yards. Having built permanent structures, Europeans across Australia often described their concerns about the potential risk of property loss through fire.<sup>26</sup> Many European observers, such as those cited here, understood these practices, although they were also seen by some as acts of indigenous hostility toward settlers.

During the course of the twentieth century many aspects of Aboriginal Australia that were familiar in the earlier phase of colonial Australia were overlooked and increasingly forgotten—the anthropologist W. E. H. Stanner described this national myopia as the “great Australian si-

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Sampson Low, Marston, Searle and Rivington, 1889). Early ethnographical work focused on central Australia: Baldwin Spencer, ed., *Report on the Work of the Horn Scientific Expedition to Central Australia*, 4 vols. (London: Dulau, 1896); and Baldwin Spencer and Francis J. Gillen, *Native Tribes of Central Australia* (London: Macmillan, 1899). Somewhat later, research was done in northern Australia.

<sup>22</sup> Bill Gammage, *The Biggest Estate on Earth: How Aborigines Made Australia* (Crows Nest, NSW: Allen and Unwin, 2011), vii.

<sup>23</sup> Edmund M. Curr, *Recollections of Squatting in Victoria, Then Called Port Phillip District (from 1841–1851)* (1883; repr., Melbourne: Melbourne University Press, 1965), 188–89; quoted in Gammage, *Biggest Estate on Earth*, 185.

<sup>24</sup> Gammage, *Biggest Estate on Earth*, vii.

<sup>25</sup> Curr, *Recollections of Squatting in Victoria*, 189–90; quoted in Gammage, *Biggest Estate on Earth*, 2.

<sup>26</sup> Station manager John Oastler at Strangways Springs Station, as detailed in Alistair Paterson, *The Lost Legions: Culture Contact in Colonial Australia* (Lanham, MD: AltaMira Press, 2008).

lence.”<sup>27</sup> Even as late as the 1990s, the historian Henry Reynolds could argue that work was still required to challenge “the still popular view that pioneering was the exclusive achievement of Europeans and that Aborigines contributed nothing to the colonisation of the continent.”<sup>28</sup> This revisionist work was conducted across many disciplines, accompanied by some research specifically relevant to understanding Aboriginal land management practices. For example, Sylvia Hallam explored how Aboriginal people in southwestern Australia used fire to alter vegetation patterns to create a mosaic of different resources.<sup>29</sup>

For a long time a notion of Aboriginal people living within the confines of the environment was widely held; this concept was echoed by the growing environmental movement, which claimed that a “natural” Australian environment had existed at contact. This was paralleled by calls for the protection of “wilderness,” which became more prominent in the 1970s, particularly for places such as the Tasmanian forests and the Great Barrier Reef.

### *Indigenous knowledge and practice*

Anthropogenic burning as a resource management tool was also clearly identified by archaeologist Rhys Jones (who coined the term “fire stick farming,” probably inspired by Curr’s observations, above).<sup>30</sup> In fact, in some parts of Australia anthropogenic fire regimes have been maintained or reintroduced. The hypothesis that burning was a deliberate indigenous strategy was tested and quantified, at least for semiarid Australia, in recent work using ethnographic observations of contemporary Aboriginal hunting and burning combined with satellite imagery of both anthropogenic and nonanthropogenic desert landscapes.<sup>31</sup> The results of this study, perhaps not surprisingly, support the hypothesis of the usefulness of this practice, in that burned landscapes have a greater diversity of various successions of vegetation stages—namely, they are more diverse. This creates a mosaic of habitats, some of clear use for human subsistence. For example, small burrowing prey such as lizards, commonly hunted by women, are more easily attained. The immediate rewards for using fire to hunt are that the resulting biodiversity provides beneficial resources for people, creating human-environmental relationships that collapsed when Aboriginal people were no longer present.

Contemporary burning raises questions about its appropriateness in the modern world and the degree to which it reflects traditional practices. In a 1994 article Lesley Head considered evidence from monsoonal northern Australia, where contemporary fire management involves multiple land users, unlike pre-European traditional contexts. On their vast leases pastoralists today sometimes remove fuel load early in the dry season, using incendiary payload from helicopters and other means. The public and government agencies (such as national parks and the fire ser-

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<sup>27</sup> In the Boyer Lectures for ABC Radio in 1968. See W. E. H. Stanner, *After the Dreaming* (Crows Nest, NSW: ABC Enterprises for the Australian Broadcasting Corp., ca. 1991).

<sup>28</sup> Henry Reynolds, *The Other Side of the Frontier: Aboriginal Resistance to the European Invasion of Australia* (Ringwood, Vic.: Penguin Books, 1990), 231.

<sup>29</sup> Sylvia J. Hallam, *Fire and Hearth: A Study of Aboriginal Usage and European Usurpation in South-western Australia* (Canberra: Australian Institute of Aboriginal Studies, 1975). See also P. K. Latz, *Bushfires and Bushtucker: Aboriginal Plant Use in Central Australia* (Alice Springs, NT: I.A.D. Press, 1995); Rolls, *Visions of Australia*; Jones, “Fire Stick Farming.”

<sup>30</sup> Jones, “Fire Stick Farming.”

<sup>31</sup> Rebecca Bliege Bird et al., “The ‘Fire Stick Farming’ Hypothesis: Australian Aboriginal Foraging Strategies, Biodiversity, and Anthropogenic Fire Mosaics,” *PNAS* 105, no. 39 (2008): 14796–801.

vice) have clear concerns and responsibilities regarding fire. And Aboriginal people too have a role. In some parts of northern Australia Aboriginal people have remained on traditional country since European arrival, but in most places there has been some disruption. However, Aboriginal people in Head's study still practice burning even in areas where contemporary life has changed greatly. Aboriginal people described how "burning grass" creates low-intensity fire that clears undergrowth and allows (1) access for cars and pedestrians; (2) visibility, particularly for snakes around children; (3) hunting for lizards and turtles; (4) cleaning up and looking after country; (5) producing ash to mix with tobacco.<sup>32</sup> In earlier colonial times the relationship between deliberate use of fire and pastoral station management was closer than today (I return to this in the case study from central Australia below). Then, in earlier "station times," when many Aboriginal people stayed on station territory, the use of regular fires did not conflict with raising stock, as suggested by a Miriwoong woman interviewed by Head: "When they [the whitefellas] bin want to go mustering cattle, they used to go burning grass, right down longa, all round the coast. . . . For cattle you know. . . . If we burnim now might be we get into trouble."<sup>33</sup> The people interviewed by Head felt that country with too much growth needed to be "cleaned up" and "looked after." Consequently, some fires were started at less-than-ideal times, such as the end of the dry season, in "corrective burning."<sup>34</sup> Aboriginal people visiting unburned areas today may discuss the need for the country to be managed through fire. Even today, fires allow collection of bushfoods (although most plant foods are now bought at the shop).<sup>35</sup>

Head's clear conclusion is that even today fires lit by Aboriginal people create a landscape "socialised" by fire, as in traditional times, but not necessarily for exactly the same purposes. Differences prevail, particularly across ecologies such as "coastal and flood plains, sclerophyll woodland and open forest, dry rainforest and wet tropical rainforest."<sup>36</sup> Today fires perform a slightly different primary role than in the past, as they are not occurring for the provision of foods, which can be purchased at local stores—although bushfoods may be healthier and highly preferred. In summary Head found that where there has been continuous tenure, low-intensity fires are used frequently, protecting fire-sensitive species such as *Callitris* spp. Where there is less access and control today, country often needs "cleaning up." Such country may be deliberately subjected to higher intensity fires in the late dry season, with greater impacts on fire-sensitive species.<sup>37</sup> A clear implication is that in the past anthropogenic fire regimes in the north (with more frequent and less intense fires that favored the survival of fire-sensitive species) could be distinguished from a "natural" regime (with lightning strikes as primary ignition).<sup>38</sup>

### *The present landscape*

Despite practices described by Head and others for northern Australia, in other parts of Australia any extant indigenous fire regimes were ended following the arrival of Europeans. Nevertheless,

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<sup>32</sup> Head, "Landscapes Socialised by Fire," 175, citing discussions in northeast Northern Territory near the community at Marralam.

<sup>33</sup> Ibid., 176.

<sup>34</sup> Ibid., 177.

<sup>35</sup> Ibid.

<sup>36</sup> Ibid.

<sup>37</sup> Ibid., table 1.

<sup>38</sup> Ibid., 179.

in some landscapes there may still be evidence of these practices. In his book *The Biggest Estate on Earth: How Aborigines Made Australia*, Bill Gammage refines his provocative and substantial argument for Aboriginal land management.<sup>39</sup> He uses historical sources and images (photographs, paintings, and other artistic depictions) to re-create the appearance of various Australian landscapes at European settlement and how they changed over time as a result in part of the cessation of land management practices proposed to have been used by indigenous Australians. There are some weaknesses with his approach, particularly the use of historical sources alone, that invite a more holistic approach (discussed below). Nevertheless, it is worth exploring some aspects of this argument.

Like others, Gammage argues that the use of fire by Aboriginal people was deliberate and intended to incur consequences, mainly on vegetation, although animals could be driven to hunters by fire. Fire opened up country and was required to keep it open. Timed correctly with the seasons, fire could encourage the growth of plants used by people or favored by animals.

The open country and native grasses were used by European pastoralists for their stock. In 1818, exhorting Tasmania, William Kingdom Jr. wrote:

In this island . . . there is every diversity of soil. . . . Large tracts of land perfectly free from timber or underwood, and covered with the most luxuriant herbage, are to be found in all directions. . . . This sort of land is invariably of the very best description, and millions of acres still remain unappropriated, which are capable of being converted to all the purposes of husbandry. There the colonist has no expense to incur in cleaning his farm: he is not compelled to a great preliminary outlay of capital before he can expect a considerable return: he only has to set fire to the grass to prepare his land for the immediate reception of the ploughshare.<sup>40</sup>

The sequence of planned fires created diverse landscapes with mosaic-like characteristics over vast regions. These mosaics were designed to benefit people and covered many different environments. For example, Peter Latz details how in central Australian deserts a greater range of useful food species was promoted through burning.<sup>41</sup> In eastern Australia Beth Gott describes how burning greatly improved the quality and quantity of the subsequent harvest of various herbaceous perennial food plants.<sup>42</sup> In southwestern Australia David Ward uses historical accounts to reveal how the native-grass patches encouraged by fires sustained grazing animals—including the newly introduced sheep.<sup>43</sup> (This fascinating review reveals how pastoralists and colonial administrators were very aware of the benefits of burning to Aboriginal people.) Even in the much colder climate of Tasmania, button-grass plains were sustained and controlled through burning.

Gammage summarizes the main types of created landscapes as (1) grassy paddocks with forests, (2) grass plains clear of trees but with good soil, leaving trees on poor soil, (3) open forests with a clear understory, (4) edges between plains where animals ate and open forest where they sheltered, (5) belts of trees or scrub intersecting plains, and (6) copses as shelter and seed

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<sup>39</sup> Gammage, *Biggest Estate on Earth*.

<sup>40</sup> William Kingdom Jr., ca.1818, cited in Rolls, *Visions of Australia*, 64.

<sup>41</sup> Latz, *Bushfires and Bushtucker*; see also Neil D. Burrows et al. "Evidence of Altered Fire Regimes in the Western Desert Region of Australia," *Conservation Science Western Australia* 5, no. 3 (2006): 14–26.

<sup>42</sup> Beth Gott, "Indigenous Use of Plants in South-eastern Australia," *Telopea* 12, no. 2 (2008): 223.

<sup>43</sup> David Ward, *Fire, Flogging, Measles and Grass: Nineteenth Century Land Use Conflict in Southwestern Australia* (Perth: Western Australia Department of Conservation and Land Management, 1998).

stock.<sup>44</sup> Most fires created open country, encouraging native grasses and reducing undergrowth. Fire-tolerant species existed adjacent to fire-sensitive species: creating distinctive patterns. The open nature of many landscapes was observed by Europeans, who often described these landscapes as “parklands.” Here they were using “park” not in the US sense (as in national “parks”) but in the European sense of parklands as managed landscapes, such as on estates. Exploring with Captain Cook in 1770, Sydney Parkinson wrote: “The country looked very pleasant and fertile; and the trees, quite free from underwood, appeared like plantations in a gentleman’s park.”<sup>45</sup> An explorer of the hinterland of New South Wales in 1815 offered the following description: “Fine, dry, healthy hills, gravelly soil, and good grass, and so thinly timbered, that it resembled parks in England rather than a forest.” He then observes the pastures: “I never saw finer grass . . . and just in a fit state for mowing. . . . would make the most excellent grazing farms.”<sup>46</sup>

Along the eastern Australian coast early explorers and settlers observed open areas and wooded locations where there was little undergrowth. Some spoke of open areas as “lawns.” In many parts of Australia thick forest exists where once people could easily ride horses. In southwestern Western Australia the country that drovers easily ran stock through is now impenetrable coastal national park; this change occurred only in the twentieth century. Elsewhere in Australia, rainforest has moved into environments that were once open. Interestingly, at contact, offshore islands such as Kangaroo Island (SA) with no human presence were thickly wooded while the coast was open country.<sup>47</sup>

There were other surprises: often locations with good soils were bare of trees, as were some sides of hills or hilltops. Where there were rich soils, in some instances grasslands prevailed. Long passages through wooded landscape were created by chains of linear open areas. Human agency would in some instances explain these patterns: the hypotheses generated through the analysis of historical sources need to be tested through other means. There are also many factors that are part of this puzzle: overgrazing, for example, has transformed the landscape from how it was at European arrival. Many of the native species endemic to parts of Australia are extinct or reduced in numbers. New plant and animal species compete—for example, many of the native grasses have been replaced.

Gammage present a range of historical sources to detail various Australian environments in the early historical period and the ways in which they potentially reflect past indigenous practices. To take an example, the pre-European landscape of Cooktown in northern Queensland was depicted in 1770 by Sydney Parkinson while repairs were being made to Captain Cook’s vessel, *Endeavour*. His painting *A View of the Endeavour River* (1770) shows distinct grassed lanes with forested margins. The hills were described as grassy or as barren and stony—today they are covered with forest.<sup>48</sup> Photographs taken in the 1890s of Uluru in central Australia reveal how refuges for large trees around the base of the rock have today been replaced by small scrubland spinifex and invasive Buffel grass.<sup>49</sup>

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<sup>44</sup> Gammage, *Biggest Estate on Earth*, chap. 7.

<sup>45</sup> Sydney Parkinson, April 27, 1770, cited in Gammage, *Biggest Estate on Earth*, 5.

<sup>46</sup> William Cox, 1815, cited in Rolls, *Visions of Australia*, 55.

<sup>47</sup> Gammage, *Biggest Estate on Earth*, 13.

<sup>48</sup> *Ibid.*, pl. 13.

<sup>49</sup> *Ibid.*, pls. 23 and 24.

Gammage moves the debate beyond the use of fire to consider the other ways that Aboriginal people modified the world around them, in part to make certain plants and animals flourish. I will summarize some interesting points arising from his review of historical sources. First, wide-scale changes have occurred to soil through soil compaction, erosion, changing plant regimes, and deforestation. Second, changes to hydrology occurred through changes to soil, plant regimes, greater demand for water, and water reduction from introduced animals. Third, across Australia grasses have shifted from native grasses (suited to fire, reshooting after fire) to introduced species (that die after fire and are less suited to drought). Fourth, Gammage's overview suggests that much of Australia was burned every one to five years, and thus any unburned areas would differ from areas burned more regularly. Fifth, past fire regimes may have reduced numbers of insects, including flies. This may have had an impact on insect-borne diseases and animal and human health. Sixth, Gammage finds that some sources suggest management to keep species apart, such as kangaroos from places where yams grew.<sup>50</sup> Seventh, management may have kept populations of some species in check: many animal plagues such as kangaroos postdate the cessation of indigenous land management practices.

### *The archaeological and palaeoecological records*

The final form of evidence comes from archaeology and palaeoecology. Archaeology provides much information about humans' interaction with their environments. Archaeological evidence includes the location of sites, the resources used, the timing of occupation, and responses to climate change. Additionally, evidence of social aspects of the past provides a sense of people and their territories and connections, with implications for a more holistic understanding of past peoples. To take an example, rock art studies provide the potential to understand how people used stylistic systems to create open and closed social networks and how these changed over time.<sup>51</sup> These social patterns can be added to environmental information to create an integrated understanding of humans, their societies, and the environment.

The main palaeoecological evidence in Australia useful for this essay consists of pollen records, typically obtained from sediments or from excavated archaeological sites, and charcoal records, where species and charcoal size are indicators of both past environments and fire intensity. A difficulty with pollen records may be the temporal resolution (not many sites have slow, constant deposition) and location (many swamp/lake deposits are not necessarily near where people were living). In southwestern Western Australia there are palaeoecological records from near the coast but not from inland settings, thus missing the range of nomadic peoples using both environments.<sup>52</sup> Additionally, if human fire regimes result in fewer hot fires, then less charcoal may have been produced.

One obvious approach is to conduct research projects with teams made up of palaeoecologists and archaeologists, for which there is a strong tradition in Australasia. Current research promises more detailed understanding of humans and the environment in the recent past. There are now solid studies providing environmental records for the last millennium from dendrochronology on *Callitris* spp. This level of dendrochronology has been elusive in Australia, unlike

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<sup>50</sup> *Ibid.*, 214.

<sup>51</sup> Jo McDonald, *Dreamtime Superhighway: An Analysis of Sydney Basin Rock Art and Prehistoric Information Exchange*, Terra Australis, vol. 27 (Canberra: ANU EPress, 2008).

<sup>52</sup> Associate Professor Joe Dortch, personal communication, January 16, 2012.

in North America. For example, these provide proxy rainfall records from the Perth region for the last four hundred years—which overlap with European arrivals.<sup>53</sup> Interestingly, early European arrivals, none of which led to colonization, occurred during very dry periods. The British explorers arrived in a wetter period, when the prospects for colonization may have seemed more promising. Other promising research attempts to date and measure the intensity of local fires by studying the impact of fires on trees. This has been done on eucalypts<sup>54</sup> and on grass trees (*Xanthorrhoea* spp.) in southwestern Jarrah forests.<sup>55</sup>

These types of studies are exciting and move beyond disciplinary boundaries to raise challenging questions of relevance to our understanding of not only the past but also the future.

### ARCHAEOLOGY OF POST-EUROPEAN CONTEXTS

This place would afford infinite entertainment. It is certainly a new world, a new creation. Every plant, every shell tree fish & animal, bird, insect different from the old. I believe it to be rich in minerals, especially iron, the ore of which is in immense quantities on the ground. . . . The grape vine thrives with the utmost luxuriance, & wine tolerably good is already produced. This will be the staple article of commerce. Possibly cooper & coal & fine wood might be carried to advantage to India. A ship is now loading with the latter. We are beginning today to distil the essential oil of peppermint from the leaves of a peppermint tree to send thither. (Thomas Fyshe Palmer, Port Jackson, 1795)<sup>56</sup>

This quotation captures how many European colonists viewed Australia. The arrival of the British colonists occurred first through the forced transportation of convicts and their overseers. Penal colonies in New South Wales and Van Diemen's Land (Tasmania) were followed by others in Morton Bay (southern Queensland) and outposts in the Northern Territory and Western Australia. Settlements in Victoria and South Australia followed. The confiscation of Aboriginal land also saw settlers inherit any transformed landscapes.

The study of European colonization has been the core subject of Australian historical archaeology. This has yielded a useful first generation of research, but, as I have argued elsewhere, archaeological research should be expanded to contribute to an understanding of the wider cultural and environmental aspects of colonization. The central transformation is from a continent of Aboriginal Australians to a settler society. The study of contact has been restricted to a subset of archaeology termed “contact archaeology.”<sup>57</sup> This work has been interested in (1) material evidence of historical Aboriginal activities, (2) critical linkages between historical sources often written from European perspectives, (3) the nature of frontier power differentials in Australian cross-cultural settings, and (4) dominance, resistance, and accommodation. Very little work,

<sup>53</sup> C. Sgherza, L. E. Cullen, and P. F. Grierson, “Climate Relationships with Tree-Ring Width and  $\delta^{13}\text{C}$  of Three *Callitris* Species from Semiarid Woodlands in South-western Australia,” *Australian Journal of Botany* 58 (2010): 175–87.

<sup>54</sup> J. C. G. Banks, “Trees, the Silent Fire Historians,” *Bogong* 18 (1997): 9–12.

<sup>55</sup> David Ward and Gerard Van Didden, *Reconstructing the Fire History of the Jarrah Forest of South-western Australia: A Report to Environment Australia* (Canberra, 1997).

<sup>56</sup> Palmer, cited in Rolls, *Visions of Australia*, 34.

<sup>57</sup> See Alistair Paterson, “The Archaeology of Historical Indigenous Australia,” in *The Handbook of Postcolonialism and Archaeology*, ed. Jane Lydon and Uzma Rizvi, World Archaeological Congress, Research Handbooks in Archaeology Series (Walnut Creek, CA: Left Coast Press, 2010), 165–84; and Alistair Paterson, *A Millennium of Cultural Contact* (Walnut Creek, CA: Left Coast Press, 2011).

mine included, has explicitly set out to explore historical ecology *equally* with cross-cultural aspects of Australian colonial settings.

Also often absent from archaeological studies of culture contacts is demography, particularly the effect of diseases.<sup>58</sup> This is part of the wider study of exposure to new fauna and flora, including introduced bacteria and viruses. The introduction of new fauna and flora is termed “ecological imperialism” by Crosby to describe how the environment is physically transformed as a result of colonialism—truly a “new world” is created.<sup>59</sup> Only a few, such as Peter Dowling, have factored in the impact of disease on Aboriginal practices.<sup>60</sup> For example, Dick Kimber suggests that distinct changes occurred in Aboriginal society and land management after devastating epidemics of smallpox swept the interior, much of which occurred beyond the knowledge of European observers.<sup>61</sup>

Some work has focused on how indigenous people contributed to colonial activities through their labor and knowledge. To take an example from my work, in central Australia I used a landscape-level approach to demonstrate the presence of Aboriginal people in early pastoral activities and the ways that the pastoral industry was built upon, or mimicked, indigenous knowledge of the environment. A process of “landscape learning” (using the term proposed by Marcy Rockman)<sup>62</sup> embedded in cross-cultural negotiations distinguished between Aboriginal people “inside” the pastoral domain and those “outside” (termed strangers). It took over two decades before Europeans created a new form of pastoral domain backed by industrialization.<sup>63</sup>

The pastoral domain—involving sheep and cattle stock raising—has been subjected to various forms of analysis. However, the ways that indigenous land management and knowledge of the timing and organization of resources fed into its inception are often overlooked.<sup>64</sup> There is still great potential for exploration of how indigenous knowledge of resources provided a “template” for early colonial activities. For example, Aboriginal people often provided knowledge of seasons, resources, and the ways the environment “worked” to pastoralists. Thus, new colonial landscapes resulting from European practices—from gardens to pastoral stations—deployed across Australian environments need to be studied in relation to the templates of Aboriginal land

<sup>58</sup> Henry F. Dobyns, “Disease Transfer at Contact,” *Annual Review of Anthropology* 22, no. 1 (1993): 273–91; and Ann F. Ramenofsky, *Vectors of Death: The Archaeology of European Contact* (Albuquerque: University of New Mexico Press, 1987).

<sup>59</sup> Albert W. Crosby, *Ecological Imperialism: The Biological Expansion of Europe, 900–1900* (Cambridge: Cambridge University Press, 1986).

<sup>60</sup> Peter J. Dowling, “Violent Epidemics: Disease, Conflict and Aboriginal Population Collapse as a Result of European Contact in the Riverland of South Australia” (master’s thesis, Department of Archaeology and Anthropology, Australian National University, Canberra, 1990); Peter J. Dowling, “‘A Great Deal of Sickness’: Introduced Diseases among the Aboriginal People of Colonial Southeast Australia, 1788–1900” (PhD diss., Australian National University, Canberra, 1997).

<sup>61</sup> Richard G. Kimber, “Smallpox in Central Australia: Evidence for Epidemics and Postulations about the Impact,” *Australian Archaeology* 27 (1988): 63–68. See also Judy Campbell, *Invisible Invaders: Smallpox and Other Diseases in Australia, 1780–1880* (Carlton South: Melbourne University Press, 2002).

<sup>62</sup> Marcy Rockman and James Steele, *Colonization of Unfamiliar Landscapes: The Archaeology of Adaptation* (London: Routledge, 2003).

<sup>63</sup> Alistair G. Paterson, “Early Pastoral Landscapes and Culture Contact in Central Australia,” *Historical Archaeology* 39, no. 3 (2005): 28–48. See also Lesley Head and Richard Fullagar, “Hunter-Gatherer Archaeology and Pastoral Contact: Perspectives from the Northwest Northern Territory, Australia,” *World Archaeology* 28 (1997): 418–28.

<sup>64</sup> A recent encompassing review of pastoral Australia did not consider how indigenous knowledge fed into this industry: Michael Pearson and Jane Lennon, *Pastoral Australia: Fortunes, Failures and Hard Yakka; A Historical Overview, 1788–1967* (Collingwood, Vic.: CSIRO Publishing, 2010).

management that they overlaid in a palimpsest. Another key aspect of these transitions involves new animals introduced by Europeans both intentionally (e.g., sheep, dogs, cattle, donkeys, camels) and not (mice, rabbits, foxes). Aboriginal people moved from shock at new animals to familiarity—and many became expert animal handlers within the first generation of contact. Understanding the role of stock animals in early colonial contacts is possible through studies of the pastoral sites, as well as indigenous perceptions of these animals, as revealed, for example, in rock art.<sup>65</sup>

## DISCUSSION

These studies and issues considered briefly here show different disciplines all attempting to address some basic questions: (a) what the Australian landscape was like and how it functioned around the time of European arrival, (b) how changes in practice reflect indigenous knowledge and practice, (c) what the results of these changes were, and (d) what this implies for the future management of the Australian landscape. I conclude this essay by making some brief points regarding these and related issues.

### *Comparative Wests*

There is real potential for comparisons between North America and Australia to be developed. There is clearly overlap in work that attempts to understand indigenous practices over time, the ways these were transformed in settler contexts, the specifics of archaeological and other (such as environmental) evidence in understanding these processes, the ways that attachment to place extends into the present, and the notion of “hidden” histories and indeed “hidden/lost landscapes.”

The ways that European thinking restricts our ability to understand indigenous worlds also need to be better recognized. Part of this is bound up in how farmers view (or fail to view) foraging lifeways. These lifeways are also linked to ideas of land tenure. William Cronin’s excellent study of New England in *Changes in the Land* invites many points of comparison with Australia:

- How extensive was the use of anthropogenic fire as a tool? How did it work and what happened with the cessation of its use? If it was a tool for land improvement, did it give people a right to land?
- How did European settlers understand land ownership? Did they view it as a civil or a natural right?
- Are past resource and management practices discernible today in landscape features or place-names?
- How did early European settlement mimic indigenous practices and are these borrowings remembered or recognized?<sup>66</sup>

### *Collaborations*

In both Australia and America issues of collaboration are relevant and have seen some promising recent advances. In Australia I have been impressed with the way that some land management agencies have robustly tried to work across boundaries between “nature” and indigenous land

<sup>65</sup> Alistair Paterson and Andrew Wilson, “Indigenous Perceptions of Contact at Inthanoona, Northwest Western Australia,” *Archaeology in Oceania* 44 (2009): 99–111.

<sup>66</sup> Cronin, *Changes in the Land*.

management practice, although not all natural heritage agencies are equal in this regard. Some key work occurred earliest in New South Wales National Parks and Wildlife, particularly on the notion of “shared landscapes,” which raised theoretical issues, methodological challenges, and mapped out the pragmatics of collaborative site-based work.<sup>67</sup> An important attribute of this work was the use of maps to collate both environmental and cultural/historical knowledge in the same interpretive and management system. This type of spatial approach to Aboriginal postcontact heritage<sup>68</sup> has allowed for an integration of indigenous knowledge about resources into management practices<sup>69</sup> and assisted the practical incorporation of cultural landscapes into national parks.<sup>70</sup>

Despite that work, there are critical inadequacies with the integration of Aboriginal people and their knowledge into natural and heritage site management.<sup>71</sup> Some of this is a result of the challenges that face contemporary Aboriginal communities, challenges that in part are direct legacies of colonialism and the loss, through various means, of traditional lands. However, increasingly there are success stories highlighting Aboriginal peoples’ participation in management of natural landscapes, such as various “Aboriginal Ranger” programs.

### *Integrated social and environmental records of the past*

There is clear potential for more collaboration between disciplines and with indigenous knowledge holders to develop detailed “local histories” that include ecological history and historical anthropology. In such an approach, one could construct local histories in a series of comparative studies, much in the spirit and scope of Ian Keen’s Australian study. Keen, concluding his comparative study, observed, “It is possible that the particular character of Aboriginal economy and society in a given region helped to shape the course of relations on the frontier and beyond. Perhaps certain forms of social organisation and leadership made stronger resistance possible in some areas, or Europeans and others to become incorporated in Aboriginal exchange systems.”<sup>72</sup> We can add to this social approach another dimension with the ecological aspects of land management and environmental changes studied over the last four decades and summa-

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<sup>67</sup> Rodney Harrison, *Shared Landscapes: Archaeologies of Attachment and the Pastoral Industry in New South Wales* (Sydney: UNSW Press, 2004).

<sup>68</sup> Denis Byrne and Maria Nugent, *Mapping Attachment: A Spatial Approach to Aboriginal Post-contact Heritage* (Sydney: Department of Environment and Conservation, 2004); Denis Byrne, “Deep Nation: Australia’s Acquisition of an Indigenous Past,” *Aboriginal History* 20 (2004): 82–107; Denis Byrne, “The Ethos of Return: Erasure and Reinstatement of Aboriginal Visibility in the Australian Historical Landscape,” *Historical Archaeology* 37, no. 1 (2003): 73–86.

<sup>69</sup> Anthony English, “An Emu in the Hole: Exploring the Link between Biodiversity and Aboriginal Cultural Heritage in New South Wales, Australia,” *Parks* 10 (2000): 13; Anthony English, *The Sea and the Rock Gives Us a Feed: Mapping and Managing Gumbaingirr Wild Resource Use Places* (Sydney: NSW National Parks and Wildlife Service, 2002).

<sup>70</sup> Steve Brown, *Cultural Landscape: A Practical Guide for Park Management* (Sydney: Department of Environment, Climate Change, and Water, 2010); Steve Brown, “Documenting Pastoral Landscapes—Connecting Archeology, History, and Communities,” *Heritage and Society* 4, no. 1 (2011): 33–58. See also Ken Taylor and Jane Lennon, “Cultural Landscapes: A Bridge between Culture and Nature?,” *International Journal of Heritage Studies* 17, no. 6 (2011): 537–54; and Ken Taylor and Jane Lennon, *Managing Cultural Landscapes* (New York: Routledge, 2012).

<sup>71</sup> Anne Ross, *Indigenous Peoples and the Collaborative Stewardship of Nature: Knowledge Binds and Institutional Conflicts* (Walnut Creek, CA: Left Coast Press, 2011). See also Toni Bauman and Dermot Smyth, *Indigenous Partnerships in Protected Area Management in Australia: Three Case Studies* (Canberra: Australian Institute of Aboriginal and Torres Strait Islander Studies, 2007).

<sup>72</sup> Keen, “Aboriginal Economy and Society,” 20.

rized in Gammage's work. Together then, ecological histories and historical anthropologies may allow the generation of even more detailed understandings of regions within Australia. A recent successful example to try to integrate environmental and human histories is Mike Smith's *The Archaeology of Australia's Deserts*, which provides an account of studies of 50,000 years of human uses of Australia's vast system of inland deserts. Detailed environmental and climatic history is used, not solely causally, but rather as a critical frame to generate both new research questions and interpretations of the archaeological record.<sup>73</sup> A key component of such a combined approach is the value of concepts of *landscapes*—being cultural, social, natural, and historical. Landscape bridges disciplinary interests—we could think of “merged landscapes” to better accommodate such projects. Indeed, the determination of the antiquity of transformed (such as through fire) and social landscapes is central to most of the work cited here.

Landscapes then act as interpretive spaces to bring together various fields of study. From my own perspective as an archaeologist, the importance of archaeology is to explore the ways landscapes change over time and space. For example, archaeology can explore the extent to which past societies were bounded or open (i.e., through signaling strategies such as rock art) and the organization of landscapes (through the location of activities), as well as records of human uses and indeed impacts on landscapes. Equally, anthropological, environmental, and historical studies have spatial and temporal aspects that can be integrated into the broader frame that defines studies of human societies and their past uses of environments.

The potential of such collaborative research is to bridge past and present: to allow historically and culturally informed understanding of the environment to be used to address present and future challenges, such as those posed by determining appropriate management strategies in the face of, for example, species loss, environmental degradation, and climate change.

### *Cultural and natural aspects of heritage*

I intimated earlier in this essay that the core idea of “natural heritage” needs to be thoroughly reconceptualized. The idea of a nature free of people does not hold in either Australia or North America, and to maintain this concept directly ignores and hides indigenous peoples. There are clear implications for management today, as stated by Beth Gott for Victoria: “Since fire was regularly applied to significant parts of the landscape, there is no doubt that many of the patterns of biodiversity encountered by the European invaders were of Aboriginal creation. In setting high biodiversity as a goal of present-day management, this is not always acknowledged.”<sup>74</sup> The following are key questions: What was the environment like in the past? How did humans live in it, modify it, benefit from it, and understand it? What can this tell us about the right way to manage it? Is contemporary conservation within a given place conserving with no historical understanding?

As William Cronin stated, for the early settlers of New England, “in the beginning all the world was America.”<sup>75</sup> We could equally add Australia to this quotation. However, critical to this notion is that the contact landscapes—both environmental and social—that were created with the arrival of Europeans in both continents bear evidence of indigenous land management practices that were deep-time legacies. The abandonment of these ancient practices was observed by Europeans, but imperfectly and partially. A

<sup>73</sup> Mike Smith, *The Archaeology of Australia's Deserts* (Cambridge: Cambridge University Press, 2013).

<sup>74</sup> Gott, “Indigenous Use of Plants in South-eastern Australia,” 215.

<sup>75</sup> Cronin, *Changes in the Land*, 78.