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# *The Limits of Art History: Towards an Ecological History of Landscape Art*

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An ecological art history primarily concerns the relationship between the aesthetic and representational functions of landscape art, the environment it depicts and the ecology of this environment. Such investigation should enable us to determine whether particular aesthetic sensibilities or styles are more or less conducive to providing accurate ecological (i.e. scientific) information, and what the limits of this information might be. An ecological art history would therefore, of necessity, engage with the science of ecology. Hence it requires an alliance with environmental and ecological historians as well as appropriate scientists. There are few examples of scholars drawing connections between the two, and none on the systematic basis that is needed for an ecological art history. The paper discusses the uses of an ecological art history and the difficulties of developing such a history within current models of the art history discipline and landscape art criticism. The authors argue that the development of Western landscape art may be seen by future art historians as a sign of a dawning eco-consciousness, and the avatar of future eco-cultural practices. Rather than just signalling the colonising vision of humanist ideology, landscape painting might also be a symptom of the opposite: the growing realisation that humans are subject to a natural history.

KEY WORDS  
Art History  
Landscape Art  
Ecology

*You cannot solve a problem with the same consciousness that created it*  
Albert Einstein

## WHAT IS ECOLOGICAL ART HISTORY?

LIKE ALL INVENTIONS of the industrial and bourgeois revolutions of nineteenth-century Europe, an environmental impact study was not undertaken on the discipline of art history before it was released. It comes as no surprise then that, like the car, art history is unlikely to ever have a net ecological benefit: its discourses are too tightly entwined in the humanist project and the glorification of human subjectivity over nature. Art historians have always defined art against nature. However, whatever the purpose of art is today, its origins must have served some evolutionary purpose, and since it first appeared on rock walls, visual art has been a register of human attitudes to the environment.

We are proposing an ecological use for art, or at least for that art which most transparently depicts the environment: landscape art. We call this project an 'ecological art history', and ask in this essay what such a project might mean for the discipline of art history and the way it conceives art practice. The answer we move towards is that the project cannot be undertaken within the discipline

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as it is currently conceived and practised, and that it requires an alliance with environmental and ecological historians. This is partly a conceit of the authors, one being an art historian and the other an environmental historian. But it is also a reaction to the limits of art history as a discipline, and not only its general failure to develop an ecological art history, but also its apparent indifference to the project.

Our motive is obvious: the need for disciplines to be relevant. Ecology is currently the big issue and will remain so for the rest of the century. We are in the midst of the sixth great extinction on planet Earth and ecological systems are facing increasing localised and global challenges. A recent *New Scientist* editorial (26 April 2005) warned that we are on 'the edge of the abyss', 'only a decade or so away' from catastrophic 'tipping points that could trigger irreversible global changes'. So compelling is the evidence that the controversy is more cultural than scientific; that is, we face a crisis of ideology and political will rather than widespread scientific disagreement.

This sense of ideological crisis should, in itself, interest art historians. Since the rise of 'new art history' in the 1970s, art historians have been acutely attracted to the ideological role of art and, along with contemporary art practice, have become very issue-based and crisis-orientated. Yet the art world has shown little interest in ecology. If we are to believe Edward Lucie-Smith, ecology didn't even make it as an issue in the issue-based art of postmodernism. While this is not entirely true, so peripheral is ecology to art history that the author didn't notice it as an issue. The big issues for artists and art critics in the previous 25 years were feminism, sexuality, race and identity. Lucie-Smith's broad assessment is representative of attitudes and practices across the art world, and whatever interest contemporary artists have shown in ecology is isolated and barely visible. What Cheryl Glotfelty said of 'literary studies in our postmodern age' is also true of art and art criticism: 'If your knowledge of the outside world were limited to what you could infer from the major publications of the literary profession, you would quickly discern that race, class, and gender were the hot topics . . . but you would never suspect that the earth's life support systems were under stress' (Glotfelty, 1996, pp xv-xvi).

One explanation for the low profile of ecology within the art world lies in the deep division between the humanities and sciences that developed in the twentieth century. In recent years, interest in questions and projects that bridge the science-humanities divide has been growing, but not (for reasons we shall examine later) among art historians. Thus, while there have been significant investigations of landscape art, and of the ecologies of various regions, there are few examples of scholars drawing connections between the two, and none on the systematic basis that is needed for an ecological art history.

As we conceive it, an ecological art history primarily concerns the relationship between the aesthetic and representational functions of landscape art, the environment it depicts and the ecology of this environment. On the ideological front, it should involve more than investigating artists' attitudes to the environment<sup>1</sup> and their conscious intentions: it also includes the unconscious ways in which particular approaches to art marking (i.e. styles) resonate with ecological concerns<sup>2</sup>

whatever the intentions of the artists, and how the aesthetic faculty itself might contribute to an ecological sensibility. Such investigation should enable us to determine whether particular aesthetic sensibilities or styles are more or less conducive to providing accurate ecological (i.e. scientific) information, and what the limits of this information might be. An ecological art history would therefore, of necessity, engage with the science of ecology. Whilst the current trend within the humanities is to conflate science with ideology, an ecological art history needs to develop a relationship between the two that maintains a difference between them, but one that is not mutually exclusive or binary.

The need for an ecological art history thus arises not only from current awareness of the environmental crisis, but also a renewed interest in the relationship between nature and culture that derives its impetus in part from scientific developments. There is growing interest by social scientists (though not, to date, art historians) in Darwinist interpretations of cultural issues, including considerable debate on the possibility of a natural history of art. EO Wilson, for example, argues that aesthetic sensibility is epigenetic (Wilson, 1998, p 237). Ideas about art's ecological function range from Darwin's belief that aesthetic sensibility was a function of sexual rather than natural selection (Darwin, 1909, p 141; pp 600–613) to the long-held commonplace that aesthetic sensibility serves an important cognitive function by intuitively apprehending the underlying mathematical behaviour of phenomena (Kirwan, 1999, pp 54–57). While an ecological history cannot solve this riddle of the origins of aesthetic behaviour, it should bring the discipline of art history into the orbit of such research and conjecture by testing the extent to which art and natural histories mutually inform each other.

At a more general level, there has also been interest in what art historian John Onians called a 'natural history of art' (Onians, 1996, pp 206–209), but its field is the biological origins of art, not an ecological art history. Another example is Gilles Deleuze and Félix Guattari's *A Thousand Plateaus*, which developed (in highly theoretical ways) the philosophical implications of the nineteenth-century discovery that the physical and chemical processes of the inanimate and animate worlds are dynamic, non-linear, historically formed systems. Manuel de Landa's *A Thousand Years of Nonlinear History* is a direct application of Deleuze and Guattari's approach to cultural history. However, both of these books are primarily works of philosophy not art history. They might suggest a general theoretical approach for an ecological art history, but without close art historical analysis of artworks their theories remain speculative. Such speculations are encouraging as they situate our project in some of the most interesting contemporary thinking. However, the aim of an ecological art history, in its early stages at least, is not to develop an ecological theory of art along the lines of Deleuze, Guattari and de Landa (or for that matter Darwin), but more modestly to gather art historical and ecological data that will allow us to evaluate any congruencies between natural and cultural histories.

There is a very practical reason why an ecological art history has not been possible to date: only in very recent times has knowledge of past ecologies been detailed

enough to be useful to historians. The few art histories that have considered the effects of ecological factors on the production of art have been limited by this lack of data. The pioneering ecological art history (of 1951) by Millard Meiss on the Italian Renaissance argued that the severe drought of 1347, the repeat failure of crops the next year due to 'exceptionally heavy hailstorms' (Meiss, 1978, p 64) and the devastating bubonic plague of 1348 that followed, had a profound impact on Sieneese and Florentine art styles and the subsequent development of European art. Meiss believed that this, along with the economic, social and political consequences of the plague, initiated the culture of crisis that has characterised western art since. However, his thesis has not been tested with the new range and depth of ecological data available today. Furthermore, it has had negligible impact on the consensus view of the Renaissance (it flies in the face of the idea that the Renaissance represents the triumph of humanism), and it did not inaugurate a new environmental genre of art history.

Tim Bonyhady is the first art historian to sense the need to rewrite Australian art history with reference to what he called an 'environmental aesthetic'. A little more than a decade ago, he began investigating such an aesthetic in nineteenth-century Australian art, and was surprised to find that a vast number of artists across the Old and New Worlds had taken up 'a wide array of environmental causes' (Bonyhady, 2000, p 1). 'As I soon realised,' he wrote, 'this Australian story was all the more significant because it was part of a much larger international story about the environmental aesthetic, which had rarely been explored except in the most piecemeal fashion.' In discovering a far greater concern for the environment amongst the colonists than had hitherto been realised, Bonyhady contradicted (and thus challenged) the prevailing view that the invaders were mindless spoilers of the bush.

An ecological art history will no doubt build on Bonyhady's insights, but it needs a more penetrating and systematic methodology. While scholars such as Bonyhady and Rebecca Bedell have produced valuable work at the intersection of art and environmental histories, they have placed reliance on a small number of artworks. In the end, Bonyhady did not write an ecological art history, but a history of environmental law and social attitudes that used artworks as examples to illustrate its argument. Such use of art as evidence is limited to questions of environmental perception and attitudes, rather than a more wide-ranging analysis of the relationships between ecologies, aesthetic sensibilities and art practices.

The cross-disciplinary nature of an ecological art history means that it should also have uses beyond art history. In particular, it will contribute to environmental history (which is concerned generally with past relations between land and people, ranging from changing environmental perceptions and ideologies to the role of the environment in historical change) and the related area of ecological history (which seeks to reconstruct past environments and historical change in those environments). Both environmental and ecological histories have the potential to make very real, pragmatic contributions to ecological restoration and/or management (Dovers,

2000),<sup>3</sup> yet they are often limited by the lack of relevant source materials. As Donald Worster has observed, environmental histories tend to focus on values and perceptions (for which conventional historical techniques and sources are quite adequate), rather than systematically pursuing more interdisciplinary, and perhaps challenging, questions of how ideas relate to actual environmental change (Worster, 1988). Artworks used as evidence in environmental histories are generally presented either as transparent representations of past environments or (more often) as evidence of a particular environmental consciousness, such as a colonial desire to order and subdue unruly nature, or a nationalist impulse to locate and celebrate beauty and distinctiveness in 'new' environments.<sup>4</sup> Environmental historians rarely consider artworks as indices of ecological knowledge. Within ecological history, research proceeds largely from techniques such as analysis of fossilised pollen grains and leaves (for 'deep' time); written contemporary accounts of explorers and settlers (for recent centuries); and oral histories and photographs (for recent decades). Artworks have been occasionally employed in ecological histories, for example, in debates over the level of vegetation cover in south-eastern Australia in the late eighteenth century.<sup>5</sup> However, while images have become increasingly important as sources in historical analysis, the use of artworks as evidence for ecological histories has never been systematically examined.

Urgently needed are several sustained studies that match artworks produced over an extended time period with environmental histories of the regions depicted in the works, in order to test the value of art as a record of environmental change. This will allow us to trace the ways in which shifts in representational practices might meet or impinge on the needs of environmental and ecological historians, enabling a more critical, nuanced and informed approach to the use of artworks in tracking, and perhaps explaining, historical environmental change, and facilitating the production of ecological art histories.

## THE (ECOLOGICAL) LIMITS OF ART HISTORY

The reason for the art world neglect of ecology goes deeper than an ignorance of, or disinterest in, the science of ecology. The popularity of the issues of race, class and gender reveal how anthropocentric the art world is. As a discipline and practice, art history descends from humanism, and since its formulation in the nineteenth century, it has mainly addressed questions of nationalism and identity that, in western art at least, presume a theory of the human subject that is no longer sustainable, either environmentally or scientifically. This has made art historians blind to whatever ecological concerns or potential there might be in art.

Despite claims of postmodernist theorists, the production and interpretation of art continues under the spell of Enlightenment and humanist ideals, and especially the transcendental subject – the individual self (be it the rational, ideological, unconscious or decentred self) – as the centre and reason of meaning. Few histories, let alone art histories, consider nature as a historical force, and most

art historians have great difficulty in seeing the relevance of ecology to art. In this respect, artists and art historians remain preoccupied with theoretical concerns that reflect anthropocentric social relations and ambitions.

By reducing art to 'a "collecting" structure for the representation of inner experience and as an ideological tool' (Adams and Robins, 2000), current art historical methodologies miss ecological factors that may also be at work. This is partly due to a deep-seated habit amongst art historians and others in the humanities of considering culture and nature as mutually exclusive concepts. Many in the sciences have little difficulty with the idea that culture is a natural artefact – mainly due to the pervasive influence of Darwin. It is a very different story in the humanities, where we are told that "nature" is the idea through which we conceptualise what is other to ourselves' (Soper, 1998, pp 15–16), and 'to be human at all is to sense a difference between ourselves and the rest of creation' (Mitchell, 1986, p 75).

But although much western art has been an expression of subjective states, it has also been an important means of knowing and relating to the world. It includes valuable documents in which we may read something of human attitudes to nature over time and specific ecologies at specific times. Potentially, art that deals with such topics, namely landscape art, should be a prime source for ecological art histories of attitudes to both nature and its ecological state. However, the study of landscape art has largely evaded such concerns. As with the study of other genres, landscape art histories invariably ignore natural histories, and focus on cultural and ideological perspectives that are singularly anthropocentric.

No matter how naturalistic and empirical landscape art became in the eighteenth and nineteenth centuries, to use it as a gloss for ecological knowledge goes against the grain of contemporary approaches to its study. Arguably, the greatest impediment to an ecological art history is the discipline of art history, especially those scholars interested in landscape art. They are more interested in interpreting landscape art as an expression of aristocratic desire, panoptic sensibilities and imperialism than pursuing an ecological engagement with the natural world. Such postmodernist and post-colonial criticism is not that different from foundational art historical attitudes to landscape, as evident in the work of the German art historian Max Friedlander. In 1949 he argued that the experience of landscape in terms of 'pure looking' made it the quintessential art of modern alienated 'man'. It produced a very historically specific subjectivity associated with the thirst for space (over form), painting (over sculpture) and the fragment (over the whole), which has been evident in western art since the fifteenth century. In an argument that recalls Heidegger, Friedlander predicated the development of western landscape art on a widespread desire for disinterested enjoyment that precludes the direct lived engagement with the world experienced by peasant, farmer and forest ranger. In short, the whole genre was symptomatic of a historically specific bourgeois subjectivity, which, in order to heal its alienation, transformed the world into pictures and thus nature into landscape (Friedlander, 1949).

Friedlander, and Bernard Smith after him, pioneered a way of thinking that has for nearly 30 years dominated discussions of landscape art (in the writing of art historians John Barrell, David Solkin, Michael Rosenthal, Ann Birmingham, Andrew Hemingway and Nigel Everett, and other cultural theorists such as Stephen Daniels, Denis Cosgrove, Renzo Dubbini and Edward Casey). While these discussions are evidence of a renewed interest in the relationship between nature and culture, they are primarily concerned with the ideological roles that natural histories have played in society and art making, rather than the scientific use of natural history in understanding the actual ecology of places (or indeed, any other relationships between ecology and art practice). In one of the most influential recent books on landscape art in this vein, WJT Mitchell suggests that 'landscape is a particular historical formation associated with European imperialism' (Mitchell, 1994, p 5), and its idea of 'nature' is a manifestation of 'an ideology associated with the rise of modern science and the emergence of capitalist economies in Western Europe in the last four hundred years'. (Mitchell, 1986, p 90). More recently, Catherine Nash has said that it was 'a way of naturalising historically and geographically specific hierarchies of race and gender', and more importantly, of shaping modern subjectivity: 'the development of a specifically male, upper-class white model of freedom and individualism upon which commercial capitalism depended' (Nash, 2000).

Even science, which many believed did provide a bridge to the world of nature, has been discredited in this new postmodern climate. Donna Haraway's history of science explores 'biology as an aspect of the reproduction of capitalist social relations'. In modern biologies, she argues, nature has been systematically constituted in terms of the capitalist machine and market. (Haraway, 1991, pp 44, 59). In the postmodernist scenario, even the 'objective' investigations of science disappear into discourse, and so into ideology. In such scenarios landscape art, and indeed any discourse about nature, reveals a cultural world only. While an ecological art history could make do with a history of ideologies about nature, it would be an impoverished history of little use to ecological historians and those who want to use these histories to develop strategies to effectively deal with environmental management problems.

Only very recently have a few art historians responded to environmentalist concerns, one being Malcolm Andrews in his *Landscape and Western Art*. Citing Denis Cosgrove's Heideggerian suggestion (which repeats Friedlander) that 'landscape' does not exist for those who work and live in it, Andrews dismisses classical landscape art as essentially the product of an alienated vision, what he called an 'outsider's perspective'. However, he argues that due to today's environmental crisis, 'it is difficult to escape the feeling that we are all "insiders" now'. Because 'landscape as a way of seeing from a distance is incompatible with this heightened sense of our relationship to Nature', he concludes that 'as a phase in the cultural life of the West, landscape [art as a genre] may already be over' (Andrews, 2000, p 22). In its place had emerged 'Earth Art' or 'Land Art', which implicitly critiques

nature's exploitation by western capitalism. Mirroring the aims of these artists, Andrews proposes a type of environmentalist history of landscape in which the land eventually triumphs over its subjugation by capitalism.

Simon Schama also attempts to open up a more ambivalent relationship between ideology and nature. On the one hand, he appears to come down decisively in favour of ideology: 'landscape is the work of the mind'; 'even the landscapes that we suppose to be most free of our culture may turn out, on closer inspection, to be its product' (Schama, 1996, pp 6-7; p 9). On the other hand, he admits that the very hope of escaping the pull of culture motivates most thinking about landscape - be it in the form of artworks from the past or critical analysis. He cites the environmental histories of Stephen Pyne, William Cronon and Donald Worster, which 'have accomplished the feat of making inanimate topographies into historical agents in their own right', and environmental artists such as Andy Goldsworthy and David Nash, who 'try to dissolve the artistic ego into the natural process' (Schama, 1996, pp 12-13).

These shifts in thinking remind us that the Enlightenment's (or humanism's) attitudes to nature have always been ambivalent. The Enlightenment is held responsible for alienating humans from nature. However, an absolute faith in Nature sustained the whole Enlightenment project at least since the seventeenth century. Even God fell from grace to become a cultural or human artefact, but not Nature - not, that is, until postmodern times. This is partly why we believe that nineteenth-century landscape art could prove a good hunting ground for ecological histories. Nevertheless, postmodernist critics do have a point about the discursive nature of all knowledge - or the distinction drawn between sensation and perception by philosophers. It is by no means obvious that fine art can be a reliable source of empirical, ecological or other data. The conventional impediment to using fine art as evidence for anything other than the artist's state of mind or ideological inclinations is its aesthetic function - for example, its inclination to flatter and prefer the picturesque. Art is second-hand information that is self-consciously representational, aesthetically organised, often expressionistic and inherently open to multiple interpretations (rather than being didactic). While to some extent this is true of all information, fine art, like fiction and poetry, makes a virtue of its artificiality and ambivalence.

However, fine art also provides an enormous file of pictorial information from the past that, before the widespread use of photography, is not available (pictorially) anywhere else, and so its potential as a source of historical information is enormous. This is particularly the case with the western landscape genre because it was closely affiliated with the more didactic concerns of western art and science, and was closely aligned to the topographic tradition. Settler landscape art (for example, Australian, New Zealand, North American) is a prime example of this. As Tim Bonyhady wrote, 'it was largely through the detail of what Australians depicted, said and did that one could see how they occupied the land, both imaginatively and physically' (Bonyhady, 2000, p 2).

## CONCLUSION: WHY LANDSCAPE ART IS AN IDEAL FIELD FOR ECOLOGICAL ART HISTORIES

As a genre, landscape art is particularly suited to the sort of investigation we are proposing. The other fine art genres (history painting, portraiture, still life, *genre*) more knowingly and less ambivalently encounter their subjects as fully encoded cultural artefacts. They are transparently representations of representations. Even the anonymous nude, modelled more on Greek statuary than a human body, escapes its apparent naturalism – though this did not stop it being a valuable resource to anatomists and surgeons. Still life, which curiously parallels the historical development of the landscape genre, might appear to be an exception – but its setting (usually inside) and motif (arrangements of fruit, flowers, etc) are inescapably ‘cooked’ rather than ‘raw’. Landscape art does not escape these differences (if only because the nature it represents is invariably cultivated or ‘cooked’), but it does more readily trouble them. This is partly reflected in the origins of modern landscape theory, which developed as much from landscape gardening as painting. The principle sculptural expression of landscape art is not in the traditional sculptural media of bronze and marble, but landscape architecture. Here the ambiguity of the genre is even more apparent, for the artwork is simultaneously a living ecosystem. This ambiguity persists in contemporary eco-art, which often incorporates actual ecosystems. Here it becomes impossible to distinguish between art and nature, and aesthetic and natural histories.

In our minds, the tradition of landscape painting that came to the fore in the nineteenth century is particularly suited to ecological research. While Western cosmologies are generally renowned for their othering of nature, the nineteenth century is noteworthy for the accord or resemblances that artists and others sought between nature and culture. The landscape genre owes its once lowly place in the hierarchy of traditional Western art to its subject – nature – being considered inarticulate. However, by the nineteenth century, landscape art had eclipsed history painting and portraiture to become the most popular genre.

As high art, the prime function of nineteenth-century landscape art was to address cosmological issues. The so-called Enlightenment produced a fundamental shift in human consciousness in which nature became the principle site for cosmological speculation – of which the ascendancy of landscape painting was a symptom. By the seventeenth century, natural history had virtually usurped the position that theology previously enjoyed in cosmological speculation. Nineteenth-century landscape art thus reflects the demise of Christian theological and Classical cosmologies and the rise of new cosmologies in which nature and not the human subject is the touchstone of truth. Increasingly, European landscape painting showed a world shaped by the environmental interaction of natural things, forces and climates, rather than divine decree or human reason, as if a moral order could be discerned in nature itself. More than an expression of abstract visual metaphors and spatial paradigms, these paintings bear witness to the pivotal role that nature had in the European and colonial imagination. They are full of natural

rather than just spatial histories – they are anatomies of particular environments at particular times. As Bernard Smith realised more than 40 years ago, the standard art history accounts, organised according to the usual formula – of art movements, stylistic shifts, ideological and psychological demands and their linear historical development – are of little value in understanding ‘the conceptual underpinnings’ of nineteenth-century landscape art ‘by the dominating categories of the physical sciences (botany, zoology, geology, meteorology, anthropology, etc)’ (Smith, 1984, pp ix–x). In short, the originality of landscape art as a genre is that it inaugurates a critique of the subjectivity that founded it.

Nineteenth-century painters from Constable to Monet sought truth in nature and not, as their predecessors had, in classical art. Even Cézanne, sometimes considered the father of twentieth-century abstraction, believed that truth and beauty were only to be found in nature.<sup>6</sup> The nineteenth century is the period when both the notions of ecology<sup>7</sup> and art as a purely aesthetic activity were developed. Hence it is reasonable to expect that the landscape art of this period will reflect both an ecological and aesthetic consciousness (essential ingredients of an ecological art history), and perhaps also reveal an immanent relationship between them. With this in mind, nineteenth-century landscape art should offer a significant resource for the production of environmental and ecological histories. It may well be that the development of landscape art in the previous 500 years will be seen by future art historians as a sign of a dawning eco-consciousness, and the avatar of future eco-cultural practices. Rather than just signalling the colonising vision of humanist ideology, landscape painting might also be a symptom of the opposite: the growing realisation that humans are subject to a natural history.

## NOTES

- 1 Many contemporary artists have worked directly with ecological issues (such as Joseph Beuys, Richard Long, John Wolseley, Helen Mayer and Newton Harrison, Hamish Fulton, Andy Goldsworthy), and many earlier artists have been committed environmentalists.
- 2 By ecological concerns we mean a regard for the processes and relations of nature in particular habitats, as well as wider environmental concerns including those relating to climate and the impact of human activities such as farming and urban development. We believe that ecological and environmental issues are intimately connected, thus, for the purposes of this project, we draw little distinction between strictly ecological concerns and wider environmental ones.
- 3 For an example of the pragmatic role of ecological history, see Tiffany Knott, Daniel Lunney, Dionne Coburn and John Calaghan, *An Ecological History of Koala Habitat in Port Stephens Shire and the Lower Hunter on the Central Coast of New South Wales, 1801–1998*, *Pacific Conservation Biology*, vol 4, pp 354–368.
- 4 See for example R.L. Heathcote, *The Visions of Australia 1770–1970*, in Amos Rapoport (ed), *Australia as Human Setting*, Sydney: Angus & Robertson, 1972, pp 77–98, William Lines, *Taming the Great South Land: A History of the Conquest of Nature in Australia*, Sydney: Allen & Unwin, 1991, figures 2–4, p 9; Thomas Dunlap, *Nature and the English Diaspora: Environment and History in the United States, Canada, Australia, and New Zealand*, Cambridge: Cambridge University Press, 1999, chapter 4.

- 5 See for example John Cary and Neil Barr, 'The semantics of forest cover: how green was Australia?' in *Agriculture, Environment and Society: Contemporary Issues for Australia*, Melbourne: Macmillan, 1992, pp 61–74.
- 6 Cézanne often commented in his letters on the need to study nature: 'painters must devote themselves entirely to nature . . . Talking about art is almost useless' (26 May 1904); 'beware of the literary spirit that so often causes the painter to deviate from his true path – the concrete study of nature' (12 May 1904); 'the strong feeling for nature . . . is the necessary basis for all artistic conception' (25 January 1904), Paul Cézanne, *Letters*, trans. John Rewald, New York: Hacker ArtBooks, 1976.
- 7 Ernst Haeckel, a German Darwinist, first coined the term in 1866. The idea of ecology emerged from earlier notions of a 'natural economy' that were derived from classical and biblical sources, Enlightenment ideas (especially Linnaeus), and a confluence of nineteenth-century scientific investigations ranging from Lyell's studies of geology, the natural histories of Humboldt, Darwin and others, and various biochemistry studies (see Donald Worster, *Nature's Economy*, Cambridge: Cambridge University Press, 1977).

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