



Environment & Society Portal



The White Horse Press

Full citation:

Tyrrell, Ian. "Acclimatisation and Environmental Renovation: Australian Perspectives on George Perkins Marsh." *Environment and History* 10, no. 2, "The Nature of G. P. Marsh: Tradition and Historical Judgement" special issue (May 2004): 153–67.
<http://www.environmentandsociety.org/node/3193>.

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Acclimatisation and Environmental Renovation: Australian Perspectives on George Perkins Marsh

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ABSTRACT

This article explores the global dimensions of the thought of George Perkins Marsh and his *Man and Nature* (1864). It argues that Marsh was not simply influenced by American versus European contrasts in environmental change, nor was his work based only on conservation ideas, being influenced also by the examples of acclimatisation movements within the British empire settlement colonies. He incorporated material on acclimatisation from Australia into his major work, and his acceptance, with reservations, of aspects of acclimatisation practice, for example global eucalyptus plant transfers, was a key factor making his work influential within those settlement colonies after publication of *Man and Nature*. This global context reinforces the sense of Marsh as a thinker of his times, embedded in a larger and older discourse over the fate of forests and other natural resources. Marsh's attempts to promote balance in humans' relations with nature led him to explore a renovationist and improvement oriented ethic as much as a restorationist or preservationist one. Though widely regarded as the father of conservation, his legacy is more ambiguous and more complex, and his influence reflects changing perceptions of European colonial impacts in the nineteenth century.

KEYWORDS

Environmental renovation; acclimatisation; George Perkins Marsh

In the voluminous discussion of American diplomat and pioneer conservationist thinker George Perkins Marsh, two interrelated ideas remain largely undetected. Best known as the author of the seminal text, *Man and Nature* (1864), Marsh was a product of global rather than purely American conditions and an advocate not of environmental preservation but of environmental renovation. Marsh's work

reflected European as well as American influences. His interests and impact were shaped by the world of European expansion not only to the Americas but to places as far flung as the Pacific. Evidence for this global context is found in the incorporation by Marsh of Australian examples and, in turn, through Marsh's influence in Australia, a society shaped in the nineteenth century by acclimatising impulses in environmental matters. Marsh, though in some respects innovative, was indirectly connected to this transnational acclimatising tradition that spread his impact as well as influenced his thought. These contexts implicate Marsh in concepts of environmental renovation.

'For all the novelty of Marsh's insights', wrote David Lowenthal, his central themes were 'characteristically American'.¹ Marsh has been interpreted as an American trying to stop through preservationist strategies the environmental degradation that he observed in Europe from occurring in the United States. For Lowenthal, Marsh's experience of environmental damage during his travels and residence in Europe confirmed impressions made in his youth, and stimulated the writing of *Man and Nature*. But Michel Girard went further. By charting European influences on early American conservationist thought, Girard called into question the originality and 'Americanness' of Marsh's thought.² Similarly, Richard Grove viewed Marsh's thought in terms of a wider European imperial collision with the colonial world that took shape long before Marsh wrote. Here, Marsh seems even less innovative.³ Recently, Marcus Hall has shown the impact of Italy upon Marsh through the concept of environmental restoration: Marsh spoke of the need to restore lost environmental harmonies. Though Marsh is well-known as one who urged the preservation of forests in the US, he understood that in most situations, the impact of humankind was such that only restoration was possible. The introduction of the idea of environmental restoration is an important one, but as Hall notes, much remains to be done in teasing out the different meanings of 'restoration'. In Hall's account, it is Marsh's experience of the unique American environment that produces his heightened interest in and understanding of European environmental change. Hall in effect sees Marsh as preservationist for the United States, and restorationist for Europe. 'He showed that while the New World must seek ways to preserve resources, the Old World must seek to restore them.'⁴

Building upon these insights, I seek to show that the key to Marsh was his position as a generalist and a synthesiser whose voracious reading and broad interests enabled him to see environmental change on a world-wide, not just a trans-Atlantic scale. He absorbed existing environmental traditions such as that offered by German geographer Alexander von Humboldt and his disciples, but was more eclectic and less subservient to any particular system than many of his contemporaries. Marsh's approach was empirical and historical, drawing examples from a wide range of sources, balancing negative and positive consequences of human impacts while putting the emphasis firmly upon the human transformation of the earth rather than on environmental determinism.

Partly he could do this because of his long-range historical interests that included ancient civilisations. Moreover, he was an American living in Europe, at a time when Europe was continuing its economic expansion towards world dominance and extending its lines of communication globally. Never before had there been so much knowledge about so many diverse places. Marsh was ideally placed to synthesise this store of empirical detail, and to put the case for both preservation and restoration, which he saw not as alternatives but as complementary strategies in principles of environmental accounting that had to be both global and regional. European imperial communications networks of power and knowledge likewise aided immeasurably in the extension of the influence of these ideas.

Marsh was indeed an advocate for restoration of what he understood to be nature's harmony, but in order to restore balance, in many instances it was necessary to mimic damaged nature by introducing new species, or old species and land management practices in different forms and combinations. That implicates Marsh in a concept to which he is rarely connected, environmental renovation: the reworking of the land to achieve a new kind of equilibrium, adding new concepts of cultural landscape and new layers of land management. Marsh's renovationist side in turn links him to a discredited but influential movement, nineteenth-century acclimatisation, a movement widely held responsible for upsetting rather than restoring ecological balance. He was, however, more cautious in following acclimatisation than some who claimed to be his followers.⁵

Marsh was aware that the European transfer of plants and animals to the Americas was not the first, nor the last such transfer between regions. He reached back into the history of the ancient Middle East and even Asia for examples. Thus 'the introduction and successful breeding of fish of foreign species appear to have been long practiced in China and was not unknown to the Greeks and Romans'.⁶ He explained how the introduction of domesticated animals to many places in Europe and the Middle East had led to greater degradation of the landscape, especially denuded vegetation.⁷ 'I am convinced that forests would soon cover many parts of the Arabian and African deserts, if man and domestic animals, especially the goat and the camel, were banished from them', he wrote.⁸

Marsh's examples are taken mainly from Europe and North America, but all regions were grist to his mill. This is apparent from the footnotes that, as Lowenthal observes, convey the 'unique scope and flavour of the volume'.⁹ Enhancing the global dimension to the larger environmental discourse in the nineteenth century was the spread of European settlement to the last major 'undisturbed' continent, Australia. There, flora and fauna had been isolated for millions of years and Aboriginal hunter-gatherer cultures had not been transformed by the revolution of domesticated animals and plants. Australia plays a very minor part in Marsh's overall analysis. But even though Marsh's brief references to Australia, mainly occurring in the later editions of his book, do not alter its main themes, they did strengthen or modify certain opinions that he had developed. These notes

reinforce our sense of Marsh's omnivorous intellectual appetite and the global span of his curiosity, but also address the issue of acclimatisation.

Marsh mentioned the example of Australia when considering whether the human/natural balance had been maintained. As part of his view of environmental accounting, he wished to determine 'how far one set of effects is neutralised by another, or compensated by unknown agencies'.¹⁰ The Australian colonies and, he later added, New Zealand were 'perhaps, the countries from which we have a right to expect the fuller elucidation of these difficult and disputable problems'. Marsh explained that Australia was important because of the timing of its European discovery and settlement, and that in this respect it was even more interesting an example than his native America. As for Australia and New Zealand, 'Their colonization did not commence until the physical sciences had become matter [sic] of almost universal attention ...'¹¹ This interest was heightened by the economic development of Australia in the wake of the gold rushes that provided wealth and leisure for observation. As one would expect, he directed attention to the forests: 'large tracts of virgin forest and natural meadow are rapidly passing under the control of civilized man. Here, then, exist greater facilities and stronger motives for the careful study of the topics in question than have ever been found combined in any other theatre of European colonization.'

Apart from the light they could shed on common global problems, Marsh recognised that 'the peculiarities' of Australian and New Zealand 'fauna, their flora, and their geology' had 'excited ... the liveliest interest of the votaries of natural sciences'. Congruent with his interest in water conservation and irrigation, Marsh was also interested in another peculiarity of Australia, 'the subterranean waters of the earth considered as stationary reservoirs, as flowing currents, and as filtrating fluids'. He speculated from this evidence that the ways that 'the earth drinks in moisture' was 'by currents flowing into caves'.¹²

Marsh became aware by the 1870s of the example Australia was giving as to the dangers of animal transfers, and this was incorporated in changes in the later editions of his book. As a general principle, Marsh now observed in a statement foreshadowing concepts of ecological imperialism that 'The reproductive powers of animals, as well as of plants, seem to be sometimes stimulated in an extraordinary way by transfer to a foreign clime.' His first example was Portuguese Madeira, where 'the common warren rabbit' had increased to such an extent as to 'threaten the extirpation of vegetation' on the island.¹³ But, he added, in Australia the wild rabbit was also 'a very serious evil' leading to employment of professional rabbit hunters.¹⁴ Marsh also noted that Australia as well as the US owed the sheep, goat and other damaging cloven-hoofed animals to European colonisation.¹⁵

On the other hand, Marsh viewed the renovation of forest through the transfer of plant species more positively as a result of the impact of Australia's most significant species export, the eucalypt. In the 1864 edition of *Man and Nature*, he argued that tree plantations could not compete economically with natural

forests; therefore it was altogether better to preserve America's forests so as not to make the mistake of the European experience. This verdict was based partly on Jules Clavé's estimate of the costs of what Marsh called 'artificial' forest, or forests aided by human cultivation. Marsh quoted Clavé that for 'artificial' forest, 'in general, the value of its timber will not return the capital expenditure and the interest accrued'.¹⁶ But he also stated that nevertheless 'both the preservation of existing woods, and the far more costly extension of them where they have been unduly reduced, are among the most obvious of the duties which this age owes to those that are to come after it'.¹⁷ In 1864, he came close to arguing that, for the United States, no more forest be cut and that existing forest be maintained or preserved.

By the later editions, he was using the example of Italian experimentation and California's importation of Australian eucalypts to modify this conclusion; he became more favourable to acclimatisation of trees and to *afforestation* as well as reforestation. The 1874 and 1885 editions had the word 'far' dropped from the 'far more costly' and a statement about the 'plainest dictates of self-interest' introduced. Moreover, reference to afforestation of areas where forests 'have never existed' had been added.¹⁸ From California and Australia had come reports of the enormous size and rapid growth of the eucalypts, reports which deeply interested Marsh. The news emanated from the work of German-Australian botanist, Baron Ferdinand von Mueller, the champion of the eucalypts as a tree of great size, beauty *and* utility, and a tree suitable for export all around the world.¹⁹

Eucalyptus trees had already been introduced to the Mediterranean by the 1850s and 1860s, but they did not excite attention in Marsh's first edition either as a timber tree through afforestation projects or as a form of malaria control. (He was relatively non-committal in the 1864 edition on the alleged 'sanitary' properties of *any* trees²⁰ and made no mention of eucalyptus as a 'fever' prophylactic, but gave these reports credence in later editions.²¹) By the 1870s, and in the light of evidence from California and Australia, his position changed. 'If we may credit late reports', he noted, 'the growth of the eucalyptus is so rapid' that 'the child is perhaps now born who will see the tallest sequoia overlapped by the new vegetable emigrant from Australia'.²² Marsh concluded that 'the modern improved methods of silviculture show vastly more favorable financial results' than had earlier been anticipated. To this was added 'the immense collateral advantages derived from the presence of the forest', in mitigating 'the terrible evils necessarily resulting from its destruction'.²³ Just before his death, he announced after a visit to the forestry station at Vallombrosa near Florence, that 'I am more than ever impressed with the superiority of the artificial forest, both in quantity and quality, as compared with that of the natural and spontaneous growth.'²⁴

Attention to the case of the eucalypts implicated Marsh in the concept of renovation not just for Europe but for anywhere, a shift due largely to the im-

part of the acclimatisation movement. This movement was a global one made possible by the extension of the British and French empires. Science followed largely imperial pathways and hence became an important source of information on global transfers that stimulated Marsh's thought.²⁵ Acclimatisation enthusiasts created a transnational network of societies that provided means for the dissemination of the messages of *Man and Nature*. Establishment of a French Acclimatisation Society in 1854 was followed by the British. Soon, the British colonies in New Zealand and Australia had such societies, including Victoria's, established in 1861.²⁶

Associating Marsh with acclimatisation is not common because *Man and Nature* treats the balance of nature disturbed by the impact of humans, and acclimatisation was one of the ways that this disturbance occurred. 'It is certain', he warned, 'that a desolation, like that which has overwhelmed many once beautiful and fertile regions of Europe, awaits an important part of the territory of the United States, and of other comparatively new countries over which European civilization is now extending its sway, unless prompt measures are taken to check the action of destructive causes already in operation.'²⁷ Marsh's published strictures on animal introductions, including sheep and goats, became stronger after the first edition, after the deleterious impact of the acclimatisation societies became clear. Marsh noted in the 1885 edition that the goat thrived in Italy and the United States, but added that it was doubtful if its economic value would outweigh 'the damage it would do to the woods'.²⁸

Marsh himself showed signs of acclimatisation thinking in the 1850s, several years before *Man and Nature* was published. In 1857, he reported to the Vermont legislature on the introduction of fish species, a subject which later became much extended by the United States Fish Commission that sponsored the spread of eastern and even foreign fish to the West Coast in the 1870s. Earlier still, Marsh wrote a report on the camel in 1855, erroneously predicting its possible American adaptation. Therein he favoured its use in the American Southwest 'where it finds the climate and the vegetable products best suited to its wants, and promises to become a very useful agent in the promotion of the special civilization for which those regions are adapted.'²⁹ In *Man and Nature*, Marsh further endorsed the widespread acclimatisation of the dromedary³⁰ and added that 'it is hoped' that 'success will attend the present efforts to introduce the South American alpaca into Europe'.³¹ He also suggested the introduction of a range of ornamental trees such as the European mountain ash and the silver poplar and cypresses, trees that could be introduced 'into the United States with great advantage to the landscape'.³² Even desultory weeds such as the scarlet poppy, an unplanned introduction to North America, he sanctioned as a thing of beauty.³³ Though he is remembered as favouring preservation of American forests, in fact he conceded that their composition might well be altered to advantage, thus signifying in part the principle of renovative land management. Though only Oregon might have more forest than needed—even this admission is a

significant one — ‘no doubt, a different distribution of the forests in all [states] might be highly advantageous’.³⁴

These acclimatisation and renovatory leanings have attracted little attention. Marsh is not treated as an acclimatiser perhaps because the United States is not usually seen as the site of serious acclimatisation activity. Acclimatisation was, instead, associated with the British empire. The US had broken with empire in 1776, and this had involved a declaration of intellectual independence by the nineteenth century as well. Moreover, historians have widely interpreted acclimatisation Australasian style as motivated by the hunting agendas of the English upper class. Unsatisfied with Australia’s native wild life, the gentry introduced foxes, deer and rabbits for their gentlemanly pleasures. This was the origin, in the 1850s of the importation of the European wild rabbit to Victoria, from whence it spread all over temperate and sub-tropical Australia, with disastrous consequences still felt today. Hunting was more democratic in the United States, and the animals to be hunted such as deer, bears and cats were plentiful.³⁵ Moreover, the wild animals available were more easily assimilable to European standards of hunting, whereas Americans noted that Australia was especially deficient in quadrupeds. Possibly if the US had been so ‘deficient’, further introductions would have occurred. In the event, there was simply little need for such gratuitous animal acclimatisation for sport, though for ornamental reasons some birds such as sparrows and starlings were introduced as they were to Australia.³⁶ More common were economic and other imports before the period of self-conscious imperial botany in the nineteenth century specifically dedicated to acclimatisation. But this informal activity is not commonly thought of as part of the same movement. The word acclimatisation came from the French and in the 1830s involved a ‘deliberate and systematic policy’. There, ‘considerable state sponsorship’ of acclimatisation occurred.³⁷ The *laissez-faire* political economy of the United States was, allegedly, different from the government patronised and sponsored drives to acclimatisation in France, the British colonies, and elsewhere. For example, the importation of llamas into New South Wales was subsidised by the colonial government in the 1860s, though this introduction was a failure.³⁸

On a more informal level, however, acclimatisation was widely practised in the United States. Acclimatisation conceived as the deliberate introduction of plant or animal species, often through scientific exchanges on an international level, had existed in the young republic. Thomas Jefferson encouraged the introduction of the olive and upland rice to the south, and imported a large number of ornamental species. In justification, he stated that the ‘greatest service which can be rendered any country is, to add an useful plant to its culture’;³⁹ yet little has been done to trace the larger history of acclimatisation in America. This is not so different from Britain and Australia. It is a caricature to associate acclimatisation with large-scale government involvement, as the contrast drawn between acclimatisation in France and in Britain where a more *laissez-faire* policy

applied, suggests. Moreover, there were examples of government-sponsored acclimatisation in the United States, in the same period when acclimatisation societies flourished in the British colonies, but most of these examples concerned the territories and states acquired from Mexico in 1848.

Acclimatisation received a major boost from the European settlement of California. There the United States encountered a landscape already altered extensively by the introduction of sheep and cattle by Hispanics. Anglo immigrants from the eastern United States sought to alter this landscape to suit their aesthetic preferences for garden-like landscapes.⁴⁰ As they sought to introduce new plant species to improve California's vegetation balance, they became indirectly involved in the British empire's acclimatisation movement. They became interested in acclimatisation of plants in a circuit through California, Hawaii, New Zealand, and Australia.

In the policies of the California State Boards of Horticulture and Forestry, extensive state government sponsored acclimatisation work was done. This occurred particularly in the area of entomology for biological control in horticulture in the 1880s through to 1908, and in the introduction of new tree species, particularly eucalypts and acacias from Australia. Private societies similar to those operating in Australia were also founded. The work of Ellwood Cooper, President of the State Board of Horticulture, 1883-1907, has been extensively treated,⁴¹ but there were other individuals and groups involved. Dr. Francesco Franceschi started the Santa Barbara Acclimatizing Society in 1895, and reported that 'new recruits are coming in daily, and their naturalization appears to proceed satisfactorily'. Imports came not only from Australia but all over the Pacific.⁴² The work of Luther Burbank involved the importation of Australian wild-flowers as well as ornamentals from many countries for his hybridising work. Californian farmers and scientists, including Eugene Hilgard, Professor of Agriculture at the University of California and a noted authority on irrigation, introduced quantities of Australian salt-bush in the 1880s and 1890s, and declared a 'boom' in the demand for the product, which survived well in arid zones and provided food for cattle.⁴³

Marsh was an influence on this Californian work. Ellwood Cooper cited Marsh in the introduction to *Forest Culture and Eucalyptus Trees*, Cooper's major published work, as did the State Board of Forestry reports. But the references were often to others, particularly, in the case of Cooper, to practical Australian seed merchants and botanists. The strongest influence on tree planting was not Marsh, but Ferdinand Mueller, who became the major intellectual influence on the acclimatisation of Australian trees and shrubs in the southwest. Eugene Hilgard, for example, struck up a friendship with his fellow German native with a correspondence occurring over many years. Hans Hermann Behr, another German, was also an import conduit for this acclimatisation influence. From a period in Victoria during the gold rushes, Behr became friendly with Mueller, and later emigrated from Germany to San Francisco where he became active

in Californian science, and a champion of Mueller's ideas. Behr publicised in the California State Horticulture Society's proceedings Mueller's *Select Extra-Tropical Plants*, an enthusiastic acclimatisation text.⁴⁴

Marsh's influence spread through complicated circuits, illustrated particularly in his Australian reception among Mueller and his friends in the Victorian Acclimatisation Society. These acclimatisers helped apply Marsh's ideas and translated them back to the American West coast through Cooper, Behr, Hilgard, and the work of the State Board of Horticulture. Though Marsh's ideas received a positive reception in Australia, as historical geographer Joseph Powell argued in a study published more than twenty years ago, Powell overestimated the direct influence of Marsh.⁴⁵

Marsh was absorbed within a larger discourse which is humbling to any attempt to regard him as effecting a turning point in colonial conservation thought and practice in Australia and New Zealand. The Victorian parliament's Select Committee report recommending the establishment of forest reserves in 1864 did not mention Marsh, though his work was, to be sure, beginning to be known in the colony.⁴⁶ In parliament and the Melbourne newspapers, Marsh's work was not often cited in the extensive debates in 1865 over forest destruction in Victoria, and when it was, it was slightly misquoted and the title was given as *Nature and Man*.⁴⁷ When mentioned or quoted, Marsh was not thought of, at least by Australian contemporaries, as advocating something new. In fact, it was Humboldt who was believed to be 'the first who clearly demonstrated the grave consequences of recklessness in removing the woods'.⁴⁸ Humboldt had done more than this. He had also visited the Americas, where he noted the kinds of damage that Marsh later reported, and he had initiated discussion on the acclimatisation of plants to different climatic zones. Through Mueller, who admired Humboldt and was in some respects a follower, Humboldt was clearly influential in Australia – prior to the publication of Marsh's book – in shaping debates over the removal of the forests.⁴⁹

Whatever Marsh's personal leanings, he was interpreted in Australia and in California within a discourse supportive of acclimatisation, environmental 'improvement' and renovation. Edward Wilson, Victorian Acclimatisation Society official, *Argus* newspaper proprietor and Marsh supporter urged planting to replace lost tree cover and to supplement farm land with tree belts.⁵⁰ The *Argus* advocated 'protecting the forest' to aid acclimatisation, thus mixing the motives of preservation and improvement. 'The introduction of foreign animals' was 'to be desired and should be encouraged; but if the places where they would find shelter and food be ruthlessly injured and made barren, the promoters of acclimatisation may hope in vain for success'.⁵¹ This attention to conservation involved 'protecting the forests on the mountains', but Wilson paralleled Marsh's concession that the balance of forest vegetation might be better if there were human intervention. '[W]e might clear', Wilson advised, 'the valleys and river basins between the coast and the main range so as to allow the cool sea-breezes

– moisture laden – to flow freely to the hills.’ The *Argus*’s competitor, David Syme’s *Melbourne Age* also extensively publicised arguments concerning trees and water supply to call for an official forestry programme to introduce exotic trees for commercial timber.⁵² ‘It must be our province to preserve the forests from wanton destruction, and to restore, as far as possible, an unfailling stimulant to national health and prosperity.’ Parliamentarians and editors argued that ‘If only for climatic purposes’ Victorians must begin ‘checking the lavish waste of our more valuable timber’. But the balance of opinion favoured environmental renovation: ‘it would be a waste of our resources to re-plant to any great extent the ranges, now nearly denuded, with scions of the native species’ because ‘a large proportion of the indigenous timber of the colony is unsuitable for commercial purposes’. Rather, the denuded land might be ‘re-cloth[ed]’ with imported trees.

From the perspective of our more ecologically informed worldviews in the early twenty-first century, acclimatisation is rightly seen as a deleterious influence. As a recent critic puts the commonly accepted view, ‘acclimatization might have seemed like a good idea at the time, but biological exchange between long isolated ecosystems is now considered an unfolding disaster; introduced plants have become invasive pests’.⁵³ Few historians of Australia could be unaware of acclimatisation as environmental disaster in the light of the history not only of the rabbit and cane toad (*Bufo marinus*), but also of privet, Indian mynah, sparrow, *Lantana lamosa*, prickly pear, Patterson’s curse, and Bathurst burr, among other invasive species. Australian historians from the time of Eric Rolls’s popular book, *They All Ran Wild*, have documented the idiocies of acclimatisation *ad nauseam*. No continent has suffered more, but nowhere is acclimatisation more easily caricatured. As Thomas Dunlap has argued, the advantages of hindsight are many, and a different environmental sensibility now prevails. Acclimatisers need to be seen in the context of the time and their theories of natural history.⁵⁴

Colonial Australians and nineteenth-century Anglo-Californian settlers did not encounter a pristine world where biological exchanges could be entirely prevented. In Dunlap’s words, there was ‘no putting the genie back in the bottle’.⁵⁵ Marsh understood that plant and animal introductions must be carefully controlled if possible, but where things went wrong due to human impacts, further introductions were sometimes needed to bring about a new balance. In California, Cooper’s Board of Horticulture worked both for preservation of forests *and* the introduction of new ones, and for the introduction of biological controls to counter the damage done by unwitting importation of insect pests. The Board also introduced its own quarantine measures to prevent illegal and harmful imports long before the federal government did. Private Californian acclimatising agents similarly balanced renovation and preservation, seeking to use the former to restore lost balances. In Dr Franceschi’s Santa Barbara Acclimatization Society, the importation of trees was directly related to the fact that

most native oaks had been thoughtlessly removed. These 'magnificent evergreen oaks' were 'unfortunately' 'cut away', stated Franceschi. 'Hence, people soon became interested in trees suited to street and avenue planting' but 'with jealous care the native oaks [remaining] are being preserved'.⁵⁶ Preservation and renovation went hand in hand in the thinking and practice of these people.

The introduction of new plants such as eucalypts could restore balances in areas where flood control, soil erosion control, and wind-breaks were desirable, as champions of plant introduction argued. Far better would it have been to re-introduce native plants. But in some cases these did not regenerate as well or as quickly as imported species. Nor could native plants always rectify new problems such as salinisation. William S. Lyon, a California Board of Forestry State Forester, introduced Australian *casuarinas* for alkaline lands affected by irrigation for purpose of remediation in the 1880s.⁵⁷ Marsh understood such practical needs, and endorsed many examples of acclimatisation, but he was more cautious than Mueller in championing such changes, and more prepared to examine negative as well as positive consequences. This circumspection reflected Marsh's place as a more eclectic and historically oriented thinker, anticipating the development of ecology, than as a scientific one within the Humboldtian tradition that was a major source of acclimatisation. Nevertheless both Marsh and Mueller agreed that imported plants could add to the store of national wealth, and both worked within a tradition of environmental renovation rather than purely restoration.

The renovation that Marsh endorsed stemmed to a considerable degree from his extensive experience of Mediterranean societies. Here Marsh did not shirk from improvement of nature. Thus the building of reservoirs and other earth works for 'economizing and supplying water' was not only 'practicable'. It would produce 'a renovated fertility of soil', and a 'general physical improvement' that might be labelled not restoration but 'a new creation'.⁵⁸ Italy had undertaken, Marsh understood, such renovation over centuries through olive and fruit tree plantings; thus 'nature has provided Southern Europe with a partial compensation for the loss of the native forest'.⁵⁹ This 'partial compensation' represented Marsh's resignation to the loss of wild nature, but an aesthetic appreciation common to acclimatisation can also be found here. The ornamental plantings of cypress and pines were 'not merely conventional types of the Italian landscape. They are essential elements in a field of rural beauty which can be seen in perfection only in the basin of the Mediterranean'.⁶⁰ Marsh not only advocated this form of renovation for Europe, but also wherever necessary. This pragmatic approach is what made his work so appealing in so many different geographical and cultural situations. Marsh did not stress preservation alone, even for the United States, though he did often express a preference for the relatively undisturbed North American landscape and a nationalistic pride in its natural bounties and beauty.

The renovation concept was also linked to a social agenda. Marsh, like the acclimatisers, had a strong moral and social dimension to his thought, and did not divorce environmental considerations from human needs and the social distribution of resources. Marsh knew that capitalism and westward expansion prevented the relatively pristine state of much American nature from being viable indefinitely. He diagnosed Americans' economic and environmental problems as lying in the 'instability of American life' and proposed a solution through the introduction of a quasi-European concept of patrimony in the land, under the rubric of 'paternal acres'. This may be why he favoured irrigation in his special report to the Congress in 1874.⁶¹ Certainly, he argued that irrigation should be controlled by the American government so as to encourage small-scale holdings consonant with these ideals of environmental patrimony.⁶² This would require moral reform as much as environmental diagnosis, a theme which the acclimatisation societies and their supporters in California and Australia also took up in their crusade to renovate landscapes consonant with a garden aesthetic. There needed to be renovation in human attitudes, practices and class relationships if nature's supposed equilibrium were to be restored.

There is much to be done in sorting out the various nuances in concepts of renovation versus restoration, but also in related ideas such as the 'resuscitation' of the land that acclimatisers in California and elsewhere sought. Rectification, a term used by Australian historian, Alan Gilbert⁶³ could be added to the list, but the principle is clear. The relevance of Marsh, Mueller, and the acclimatisers is that they were part of a renovatory tradition of moral environmentalism. We need to understand both its strengths and limitations, its cultural, religious and social as well as environmental and scientific roots, if we are to frame policies for the next century when only renovation, not preservation is possible.

NOTES

¹ David Lowenthal, 'Introduction', George Perkins Marsh, *Man and Nature*, ed. David Lowenthal (1864; New York: Belknap Press of Harvard University Press, 1964), xxvi, cited hereafter as *M & N*, 1864 ed.

² Michel F. Girard, 'Conservation and the Gospel of Efficiency: un modèle de gestion de l'environnement venu d'Europe?' *Histoire Sociale/ Social History* 23 (1990): 63–80.

³ Richard H. Grove, *Green Imperialism: Colonial Expansion, Tropical Island Edens and the Origins of Environmentalism, 1600–1860* (New York: Cambridge University Press, 1995), 2, 25, 199, 259. Grove tends to underestimate the issue of Marsh's eclecticism as a source of his original perspective compared to earlier writers, with their more rigorous scientific and Humboldtian stances.

⁴ Marcus Hall, 'Restoring the Countryside: George Perkins Marsh and the Italian Land Ethic (1861–1882)', *Environment and History* 4 (1998): 912–103 at 100.

⁵ On acclimatisation, see Michael A. Osborne, *Nature, the Exotic, and the Science of French Colonialism* (Bloomington: Indiana University Press, 1994); L. Gillbank, 'The

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Acclimatisation Society of Victoria', *Victorian Historical Society Journal* 51 (November 1980): 255–70; Warwick Anderson, 'Climates of Opinion: Acclimatization in Nineteenth-Century France and England', *Victorian Studies* 35 (no. 2, 1992): 135–57.

⁶ *M & N*, 1864 ed., 102.

⁷ George Perkins Marsh, *The Earth as Modified by Human Action* (New York: Charles Scribner's Sons, 1885) cited hereafter as *M & N*, 1885 ed., 149; also *M & N*, 1864 ed., 74–75.

⁸ *M & N*, 1885 ed., 149.

⁹ Lowenthal, 'Introduction', xxi.

¹⁰ *M & N*, 1885 ed., 50.

¹¹ *Ibid.*; see also *M & N*, 1864 ed., 49.

¹² *M & N*, 1885 ed., 454–5; see also George Perkins Marsh, *The Earth as Modified by Human Action: A New Edition of Man and Nature* (New York: Scribner, Armstrong and Co., 1874), hereafter cited as *M & N*, 1874 ed., 469, 481.

¹³ *M & N*, 1885 ed., 87.

¹⁴ *M & N*, 1874 ed., 89.

¹⁵ See *M & N*, 1864 ed., 274: 'no lover of American nature can have failed to observe a marked difference between a native wood from which cattle are excluded and one where they are permitted to browse.'

¹⁶ *Ibid.*, 278.

¹⁷ *M & N*, 1885 ed., 382–3, cf. *M & N*, 1864 ed., 279.

¹⁸ *M & N*, 1874 ed., 394; *M & N*, 1885 ed., 383.

¹⁹ Tim Bonyhady, *The Colonial Earth* (Melbourne: Miegunyah Press at Melbourne University Press, 2000), 252–54.

²⁰ *M & N*, 1864 ed., 134–6.

²¹ *M & N*, 1885 ed., 383–4; 1874 ed., 159.

²² *Ibid.*, 325; 1874 ed., 334.

²³ *M & N*, 1885 ed., 382.

²⁴ *Nation*, 17 Aug. 1882, 136.

²⁵ Lucile H. Brockway, *Science and Colonial Expansion: The Role of the British Royal Botanic Gardens* (New York: Cambridge University Press, 1979); Osborne, *Nature, the Exotic, and the Science of French Colonialism*.

²⁶ L. Gillbank, 'The Acclimatisation Society of Victoria', 255–70; Gillbank, 'The Origins of the Acclimatisation Society of Victoria in the Wake of the Gold Rushes', *Historical Records of Australian Science* 6 (Dec. 1986): 359–64.

²⁷ *M & N*, 1864 ed., 201.

²⁸ *M & N*, 1885 ed., 87.

²⁹ *Ibid.*, 86; 1864 ed., 75.

³⁰ *M & N*, 1885 ed., 86.

³¹ *Ibid.*, 87.

³² *M & N*, 1864 ed., 264–5.

³³ *Ibid.*, 61; 1874 ed., 67.

³⁴ *M & N*, 1864 ed., 258; 1874 ed., 326.

³⁵ See Thomas Dunlap's *Nature and the English Diaspora: Environment and History in the United States, Canada, Australia, and New Zealand* (New York: Cambridge University Press, 1999).

³⁶ *Ibid.*, 53, 55.

³⁷ Anderson, 'Climates of Opinion: Acclimatization in Nineteenth-Century France and England', 137.

³⁸ Eric Rolls, *They All Ran Wild* (Sydney: Angus and Robertson, 1969).

³⁹ Quoted in Ian Tyrrell, *True Gardens of the Gods: Californian-Australian Environmental Reform, 1860–1930* (Berkeley: University of California Press, 1999), 23.

⁴⁰ *Ibid.*

⁴¹ *Ibid.*

⁴² *Rural Californian*, April 1895, 175.

⁴³ E.W. Hilgard to Mueller 20 Apr., 3 Dec. 1895, Hilgard Papers, vol. 20, Bancroft Library, University of California; W. O. Campbell, 'An Interview with Luther Burbank', *Agricultural Gazette of New South Wales* 16 (2 Nov. 1905), 1090–94.

⁴⁴ Robert T. Legge, 'Hans Herman [sic] Behr: German Doctor, California Professor and Academician, and 'Bohemian'', *California Historical Society Quarterly* 32 (Sept. 1953), 242–63. E.W. Hilgard, H.H. Behr and W.G. Klee, 'Report to the State Horticultural Society on Baron von Mueller's "Select Extra-Tropical Plants"', in E. W. Hilgard, T.C. Jones and R.W. Furnas, *Report on the Climatic and Agricultural Features and the Agricultural Practices and Needs of the Arid Regions of the Pacific Slope . . .* (Washington, D.C.: Government Printing Office, 1882); E.W. Hilgard to Mueller 16 July 1886, Hilgard Papers, Bancroft Library, University of California, on getting other Australian plants which will grow better than natives in their 'adaptation'.

⁴⁵ Joseph Powell, *Environmental Management in Australia, 1788–1914* (Melbourne: Oxford University Press, 1976), 59–64.

⁴⁶ *Melbourne Argus*, 8 Nov. 1865.

⁴⁷ *Melbourne Argus*, 13 Nov. 1865.

⁴⁸ *Ibid.*

⁴⁹ See for example, Stephen Jeffries, 'Alexander von Humboldt and Ferdinand von Mueller's Argument for the Scientific Botanic Garden', *Historical Records of Australian Science* 11 (June 1997): 302–6.

⁵⁰ Powell, *Environmental Management in Australia*, 59–63; quoted *Melbourne Argus*, 16 Oct. 1865.

⁵¹ *Melbourne Argus*, 16 Oct. 1865.

⁵² Powell, *Environmental Management in Australia*, 62; *Melbourne Age*, 3 Oct. 1865.

⁵³ Steven Stoll, rev. in *Journal of Interdisciplinary History* (no. 1, 2000), 133.

⁵⁴ Dunlap, *Nature and the English Diaspora*, 55. Recent works achieve this contextualisation and explanation. In addition to Dunlap's *Nature and the English Diaspora*, and my own study of Californian and Australian uses of the garden aesthetic in tree planting (*True Gardens*), see E. C. Spary, *Utopian Gardens: French Natural History from the Old Regime to the Revolution* (Chicago: University of Chicago Press, 2000), 152–3.

⁵⁵ Dunlap, *Nature and the English Diaspora*, 58.

⁵⁶ *Rural Californian*, Apr. 1895, 175.

⁵⁷ Tyrrell, *True Gardens*, 72.

⁵⁸ *M & N*, 1864 ed., 380, 381.

⁵⁹ *Ibid.*, 266.

⁶⁰ *Ibid.*, 268; 1874 ed., 342.

⁶¹ George Perkins Marsh, 'Irrigation: Its Evils, the Remedies, and the Compensations', 43rd Cong. 1 Sess., Sen. Misc. Docs 55, Feb. 10, 1874.

⁶² David Lowenthal, *George Perkins Marsh: Versatile Vermonter* (New York: Columbia University Press, 1958), 308.

⁶³ Alan Gilbert, 'The State and Nature in Australia', *Australian Cultural History*, 1 (1982): 9–28.