
TABLE OF CONTENTS

Introduction James Beattie	1
Scoping Yeotopia: Tom Brooking and the making of rural New Zealand Graeme Wynn	5
Tom Brooking: A people's historian Seán Brosnahan	25
The farmer's cutting edge in southern New Zealand, 1864–1914 Peter Holland and Sherry Olson	29
Into the Anthropocene: Environmental history and the morality of climate change Eric Pawson	57
Fashioning a future. Part I: Settlement, improvement and conservation in the European colonisation of Otago, 1840–60 James Beattie	75
On the edge of Canterbury settlement, 1854–58 Paul Star	103
Practice in place in empire forestry: Owen Jones in Ceylon, Australia and New Zealand, 1911–55 Michael Roche	113

INTRODUCTION

JAMES BEATTIE

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This issue is dedicated to Professor Emeritus Thomas Warden Hastings Brooking—Tom to everyone who knows him—who retired in 2017 after over 40 years working in the Department of History, at the University of Otago. Tom is well-known internationally as one of the co-founders, with Professor Emeritus Eric Pawson, of environmental history in Aotearoa New Zealand. Some of the articles produced here are drawn from a symposium, held at the Hocken Library, University of Otago, and organised by the Department of History, in honour of Tom, held in November 2018.

International readers who access this journal are probably unaware that Tom also has a stellar career as one of New Zealand's leading historians whose works span economic history, ethnic and gender studies, biography and general history. In **'Scoping Yeotopia: Tom Brooking and the making of rural New Zealand'**, long-time friend and collaborator Graeme Wynn draws out the warp and weft of Tom's academic life. Graeme's article is an exercise in reflection on Tom's career as much as it is in assessing Tom's lifelong project, a history of rural New Zealand.

As Curator of History at New Zealand's leading social history museum, Toitū Otago Settlers Museum, Seán Brosnahan demonstrates Tom's exceptionally important contribution to public history. Fittingly titled **'Tom Brooking: A people's historian'**, Seán's elegant article traces Tom's public engagement through his scholarship as well as his work with genealogists, as a public lecturer and in promoting New Zealand history through his work with various museums. It's apposite to note here that Tom's long lobbying, along with others, to have the subject of New Zealand history inserted into the national curriculum for secondary schools has finally been achieved by the present New Zealand Labour-Coalition Government.

Tom's facility for friendship comes out strongly in this special issue. Contributions come from former colleagues and students, one of whom is sadly no longer with us. One of the great losses to environmental history has been the passing of Emeritus Professor Peter Holland. A biogeographer by training, Peter turned increasingly to historical research due to an inability to work long periods in the field. It's a measure of the environmental history community that Tom and Eric fostered that he and his work were welcomed with open arms.

With Sherry Olsen, Peter's jointly written posthumous article, **'The farmer's cutting edge in southern New Zealand, 1864–1914'**, interrogates the key role of technology in New Zealand's environmental transformation. Sherry and Peter chart the constant experimentation and information flow that developed between New Zealand and overseas manufacturers in the refinement of the plough for the particular environments of southern New Zealand. Their work is part of a broader engagement with the rural environmental history of Aotearoa that has examined farming networks, financial institutions and environmental learning.

Tom's long-time collaborator, Eric Pawson, explores Tom, his and others' work in the context of the Anthropocene. **'Into the Anthropocene: Environmental history and the morality of climate change'** interrogates the legacy of environmental modernism—also understood in light of their joint project on grasslands—in our own age of uncertainty. Eric examines some possibilities of promoting what he terms 'an empathetic recognition of humanity as an intergenerational project', notably, through place-based projects drawing on Māori land- and water-based schemes as well as a broader questioning of the emphasis on solely productivist landscapes.

The next article, **'Fashioning a future. Part I: Settlement, improvement and conservation in the European colonisation of Otago, 1840–60'**, is in many respects a homage to Tom, for it draws on and expands my original 1999 dissertation that Tom supervised. The article examines environmental attitudes and actions amongst the first generation of settlers in Otago, New Zealand, and argues for historians to take seriously the complexity of responses, emotional and environmental, cultural and material, amongst that group. What Tom probably doesn't know is that the work was deeply personal to me. When I was 11 years old, my family left New Zealand for the United Kingdom. I returned 8 years later to a New Zealand that I really didn't know, having left a country in which I was always a foreigner. Studying how settlers made sense of and fashioned a new life in the environments of southern New Zealand helped reduce my sense of 'double foreignness', of belonging to neither one country nor the other. In the process, it helped guide me towards finding a sense of home in the country of my birth.

The next article is from Tom's first student in environmental history, Paul Star. Tom worked with Paul on both his Masters—on early conservationist Thomas Potts, whose biography by Paul has just been published by Otago University Press (*Thomas Potts of Canterbury: Colonist and conservationist*)—and his PhD dissertation, examining the currents of settler environmentalist thinking in New Zealand. They also collaborated together on his and Eric's grasslands project. In his article **'On the edge of Canterbury settlement, 1854–58'**, Paul fittingly focuses on Potts, examining the role of the personal narrative in the construction of Potts' ideas about the environment.

Long-time Tom collaborator, historical geographer Mike Roche provides a fascinating analysis of imperial forestry, through an examination of forester Owen Jones, who worked in Sri Lanka, Australia and New Zealand. **‘Practice in place in empire forestry: Owen Jones in Ceylon, Australia and New Zealand, 1911–55’** provides a justification for the importance of transnational historical geography/environmental history. As Mike notes, Jones’ career reveals the different cultural and political contexts in which Jones deployed his skills across the British Empire, from broader professional advice in British India to a more narrowly defined set of roles in Victoria, in silviculture and afforestation, to working for New Zealand Perpetual Forests, in afforestation.

Finally, I’d like to thank Tom for the spark he helped ignite in me for environmental history. More than that and much more importantly, I’d like to thank him for his friendship, support and guidance over the last few decades.

Submission details

See inside cover.

Call for papers

I particularly encourage submissions on topics related to history and energy, the atmosphere and water, especially in relation to Africa, South America and Asia. Please also contact me if you are interested in guest editing a special issue.

Acknowledgements

I am indebted to the support of so many in making this publication possible. *International Review of Environmental History* is published with the support of funding provided by The Centre for Science in Society, Victoria University of Wellington. The journal is also supported through the Centre for Environmental History and The Australian National University. Its former Director, Professor Emeritus Tom Griffiths, has enthusiastically backed this venture from the outset. In 2013, Professor Bruce Clarkson, formerly Director of the Environmental Research Institute, University of Waikato, granted me the time to devote to planning and preparing the journal by giving me teaching buy-out. I am especially grateful to the journal’s Associate Editors and supportive and active Editorial Board for permitting me to test ideas and share material with them. Finally, I acknowledge the assiduous copy-editing of Dr Austin Gee.

James Beattie, Editor,
Dunedin, November 2020

SCOPING YEOTOPIA: TOM BROOKING AND THE MAKING OF RURAL NEW ZEALAND¹

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Abstract

Prompted by the retirement of Professor Thomas Warden Hastings Brooking from the Department of History at the University of Otago, and his expressed interest in writing a new book on the making of rural New Zealand, this article is the product of a particular moment. Attempting to weigh the contributions of a busy scholarly life that is still actively unfolding, these pages look backward in hope of boosting onward momentum. They triangulate and reflect, too briefly, upon Professor Brooking's wide-ranging and productive career as a New Zealand historian, consider some of the challenges involved in creating a new synthesis of rural history in that country, and suggest a small handful of possibly pertinent themes for further consideration in this endeavour.

Keywords: rural history, New Zealand, environmental history, Tom Brooking

Making is an arresting and familiar term. It suggests **action** and **accomplishment**. No wonder it appears so frequently on bookshelves and in library catalogues. So we might choose *The Making of ... The Middle Ages*; *Urban America*; *Modern Tibet*; *New World Slavery*; or *The Roman Army*. If ideas appeal more than times, places and institutions, we might linger over *The Making of ... The English Middle Class*; *Middlebrow Culture*; *An American Philosopher*; or *The Creeds*. Then we find *Making ... Musical Apps*; *An Extraordinary School*; *Strategic Spatial Plans*; and *Table Wine at Home*. Who would not want to be part of this?

¹ This reflection was prepared to mark the retirement of Professor T. W. H. Brooking from the University of Otago in 2018. My thanks to Professor Tony Ballantyne for the invitation to participate, Associate Professor James Beattie for his interest in publishing the paper, Eric Leinberger of UBC Geography for reworking the diagrams, and Tom and Trish Brooking for their hospitality. Permit me then a personal recollection. Trolling the web in search of inspiration for what I might say, I found a promising link: 'A life lived to the full, Tom Brooking', *New Zealand Books: Pukapuka Aotearoa. A Quarterly*, 1 December 2006, nzbooks.org.nz/2006/non-fiction/a-life-lived-to-the-full-tom-brooking, accessed 21 January 2020. Sadly, this turned out to be a Brooking review of a Beaglehole biography, rather than a pre-packaged encomium for the 2018 retiree.



Figure 1: Budding historians at the feet of the master: Thomas Warden Hastings Brooking.

Source: blogs.otago.ac.nz/crocc/tag/tom-brooking/.

But here's the thing. All these works use 'making' as a verbal noun. The word has no subject. None of these titles identifies the agents or performers of the action. Adding 'Tom Brooking', as I have to my title, might seem to address this problem. But it implies that Tom has single-handedly created the New Zealand countryside. This is too much to ask of any one man—though we might well imagine the mighty Tom, tramping boots firmly laced, golf clubs in hand, warden of all he surveys, hasting on his way and brooking no restraint in his mission to beat back the bracken, stamp out thistles, herd the sheep, turn tussock into pasture grass, and carry the economy on his back.



Figure 2: Thomas Warden Hastings Brooking.

Source: The author.

Enormous energy has gone into the making of rural New Zealand, poured forth in the lives and labours of hundreds of thousands of men and women, young and old, over the generations, as well as through the straining labour of horses, the harnessing of kinetic and potential energy, and the conversion of radiant, thermal and chemical sources of power to human ends. Māori, sealers, gold diggers, small-time settlers, run-holders and their workers, male and female, poured sweat and tears into creating a foothold, and more, where none had existed before. Some were sufficiently mindful of the challenges they faced to offer a record of the progress to which they contributed in making a new land. A few—such as Herbert Guthrie-Smith on Tutira—were particularly aware of the transformative effects of their endeavours, and assumed undue responsibility for their consequences.²

There was much to write about. Half a millennium of Māori settlement, fire, hunting and horticulture left their considerable marks on the land, but they pale by comparison with the imprints made by Europeans in the last 2 centuries. Kenneth Cumberland, one of New Zealand's first professional geographers, put it succinctly in 1940 when he declared that in subjugating nature to human purposes over 100 years, New Zealanders had matched the work of 20 centuries in Europe and 4 in North America. In a simpler, later iteration of this point, Cumberland insisted that the story of humans as makers and shapers of the landscape was simply 'more apparent, more flagrant in New Zealand than in other parts of the world'. Here the impact of people upon land had been 'violent and disruptive', 'ruthless and profound'.³

Cumberland and several other scholars of his ilk did much to document this profound change. Broadly they saw the physical environment as a stage on which humans performed, changing the props and backdrops by 'moulding and fashioning nature's diversity of habitats' to fit their own evolving 'needs and purposes'.⁴ They described the development of New Zealand's landscapes in vivid, compelling ways. But these authors were less interested in people than places, and their work was shunted aside by new approaches to thinking about and writing history in the latter part of the twentieth century.

In the 1960s, some historians of North America declared their interest in the study of human interactions with nature. Grounded in the traditions and steeped in the practice of history, they framed these interactions in more dialectical or reciprocal terms than most historical geographers had done. Some described this new approach

2 W. H. Guthrie-Smith, *Tutira: The Story of a New Zealand Sheep Station*, 3rd ed. (Edinburgh: Blackwood and Sons, 1953), first published 1921; Graeme Wynn, 'Remapping Tutira: Contours in the Environmental History of New Zealand', *Journal of Historical Geography* 23, no. 4 (1997): 418–46, doi.org/10.1006/jhge.1997.0061.

3 Kenneth B. Cumberland, 'A Century's Change: Natural to Cultural Vegetation in New Zealand', *Geographical Review* 31, no. 4 (1941): 529–54, doi.org/10.2307/210498; Kenneth B. Cumberland, 'Canterbury Landscapes: A Study of New Zealand Geography', *Geographical Review* 30, no. 1 (1940): 19–40, doi.org/10.2307/210448; Kenneth B. Cumberland, *Landmarks* (Surry Hills, NSW: Reader's Digest Association, 1981), 6.

4 Cumberland, *Landmarks*, 6.

as giving agency to nature (or ‘the environment’)—acknowledging that it was more than a stage shaped by and for humans. With their disciplinary inclination to focus on ‘change over time, causality, context, complexity, and contingency’, these new ‘environmental historians’ were also, generally, more alert than historical geographers to the complexities of contexts and the relationships between context and agency.⁵

At much the same time, new foci of inquiry became fashionable. Class, race, ethnicity, disability and gender were, perhaps, the most urgently pursued; recognising that people often occupied more than one of these ‘social positions’, a new generation of scholars emphasised the importance of intersectional analysis to tease out the impact of intertwining systems of power on those consigned to the margins of society. Concurrently, history and the humanities were roiled by questions about how the past should be studied, about what can be known of it, and about peoples’ relations with it. Soon, self-described postmodernists were asserting that ‘there is nothing in the past to be found’.⁶ All of this produced a good deal of introspection—as well as a dazzling array of innovative work. It also massively complicated the task of writing history in the twenty-first century—and made any attempt, such as this, to summarise recent trends in 2 paragraphs quite absurd.

But onward we must press. Although I cast doubt above on Tom Brooking’s power to make rural New Zealand with his clubs and boots, we do know that he has been thinking for a very long time about wielding his pen to the same end. Indeed, a couple of years ago he framed a book prospectus, in which he envisaged ‘pulling ... a lifetime’s research’ together into a big book on the making of rural New Zealand under the title ‘Mud, Sweat and Dreams’.⁷

Before we get to this, we need to recognise that Brooking’s oeuvre is extensive and diverse, and his ‘lifetime’ of research on rural affairs has been fitted in around many other things. Two graphics help to establish these points succinctly. The first (Figure 3) presents a sample (i.e. an incomplete) enumeration of the journals in which he has published (in black italics); edited collections to which he has contributed chapters (blue); and books that he has authored, edited, co-authored or co-edited (in red capitals).

5 Thomas Andrews and Flannery Burke, ‘What does it mean to think historically?’, *Perspectives on History*, 1 January 2007, www.historians.org/publications-and-directories/perspectives-on-history/january-2007/what-does-it-mean-to-think-historically, accessed 21 January 2020.

6 Hayden White, ‘The burden of history’, *History and Theory* 5, no. 2 (1966): 111–34, doi.org/10.2307/2504510; Hayden White, *The Content of the Form* (Baltimore, MD: Johns Hopkins University Press, 1987). For an assessment of White’s contributions, see Herman Paul, *Hayden White* (London: Polity Press, 2011). Keith Jenkins was perhaps the most vigorous advocate of postmodern history in the wake of White. His books are usefully reviewed in Alexander Macfie, ‘Keith Jenkins Retrospective’, *Reviews in History* 1266, www.history.ac.uk/reviews/review/1266, accessed 21 January 2020.

7 T. W. H. Brooking, Draft proposal for a book on ‘The Making of Rural New Zealand’ (potentially ‘New Zealand’s’) provisionally entitled ‘Mud, Sweat and Dreams’ (typescript), 18 March 2016. Copy provided by Brooking in possession of author.

Palgrave Dictionary of Transnational History NZ-Australia relations: Moving together or drifting apart?

The Historical Atlas of New Zealand *Immigrants and Minorities*

THE HISTORY OF NEW ZEALAND Making our place: Exploring land-use tensions in Aotearoa New Zealand

New Zealand Geographer Edward Gibbon Wakefield and the Colonial Dream: A Reconsideration

MILESTONES: TURNING POINTS IN NEW ZEALAND HISTORY *Environment and History*

Essays in the History of Rural Education in Australia and New Zealand **A HISTORY OF DENTISTRY IN NEW ZEALAND**

Oxford Dictionary of National Biography *Journal of New Zealand Studies*

Agricultural History Going Public: The Changing Face of New Zealand History

Environmental History *Journal of New Zealand and Pacific Studies* **RICHARD SEDDON: KING OF GOD'S OWN**

Rural Canterbury: Celebrating its history Encyclopedia of World Environmental History

Rushing for Gold *Journal of Imperial and Commonwealth History* *Wild Heart* *Social History*

Storia della Nuova Zelanda **MAKING A NEW LAND:** **MASSEY: ITS EARLY YEARS**

AND CAPTAIN OF THEIR SOULS: *History Now* The Cyclopedia of Otago and Scotland

LANDS FOR THE PEOPLE? *Journal of Military and Veterans' Health* **UNPACKING THE KISTS: THE SCOTS IN NEW ZEALAND**

New Worlds: The Comparative History of New Zealand and the United States

British Review of New Zealand Studies **THE HEATHER AND THE FERN...** *Historical News* Heartlands

ENVIRONMENTAL HISTORIES OF NEW ZEALAND Sites of Gender: Women, Men and Modernity in Southern Dunedin, 1890-1939

New Zealand Journal of History The Oxford Companion to Scottish History

Journal of Irish and Scottish Studies The Dictionary of New Zealand Biography

Immigration and National Identity in New Zealand: One People, Two Peoples, Many Peoples?

A global clan: Scottish migrant networks and identities since the eighteenth century

Figure 3: Brooking diversity: Titles of some of the journals carrying Brooking's articles, edited collections in which Brooking has chapters, and books edited and authored by Brooking.

Source: The author.

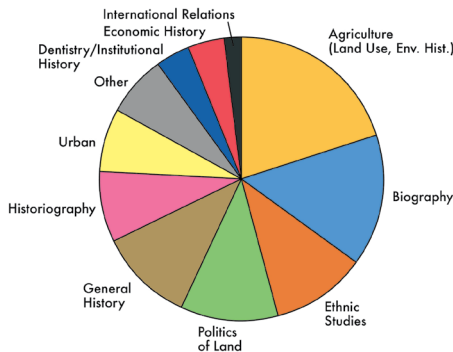


Figure 4: Schematic proportional representation of Brooking's scholarly interests.

Source: The author.

The second (Figure 4) attempts to represent the relevant importance (by the simple metric of approximate page counts) of topics upon which he has published with some frequency (subject to all the necessary disclaimers about the perils of pigeonholing).

The sheer, not to say overwhelming, variety of endeavour portrayed in these 2 figures reminds us, first, of the breadth and richness of Brooking's grasp of New Zealand history; second, of the difficulty of summarising, adequately, his contributions to the literature on rural New Zealand; and third, the challenges involved in bringing such expansive accomplishment to coherent and compelling expression within the covers of a single book. Seeking to engage the second and third of these issues—the difficulty and challenges—against the backdrop of the first, I proceed as follows: I begin by 'Scoping "Yeotopia"'. Here I scan a good deal of Brooking's writing and the larger projects in which he has been involved, to sketch something of his, and 'our', understanding of rural New Zealand. This is, I suppose, a sort of *Country Calendar* approach to becoming aware, offering a series of vignettes, but falling far short of any systematic and comprehensive analysis.⁸ Then I turn, very briefly, to an early draft of the 'Mud, Sweat and Dreams' prospectus to think, with Brooking, about what a history of rural New Zealand might entail. Finally, in a section called 'A view from Erewhon', I draw upon my own incomplete understanding of rural things, in New Zealand and elsewhere, to suggest that there may yet be new 'themes to explore, concepts to develop, and resources to use' in discussing the making of rural New Zealand.⁹

Scoping 'Yeotopia'

Yeotopia is a term with Greek roots, broadly associated with the tilling of the earth. Brooking has adapted and adopted it in some of his more recent reflections on the making of rural New Zealand. I use it here as a catch-basin to bring together a few observations about Brooking's forays into this topic. They began many decades ago, when a sprightly 20-something Brooking compared the rural societies of late nineteenth-century England and New Zealand in a paper titled 'Larkrise to Waitahuna'. Years later, he would again signal an interest in Flora Thompson's account of late nineteenth-century life in her Oxfordshire hamlet, but this time he coupled her birthplace not with an obscure Otago hamlet but with 'Littledene', the small town otherwise known as Oxford in North Canterbury that was the focus of Crawford Somerset's ground-breaking sociological study published in 1938.¹⁰

8 *Country Calendar* is a New Zealand documentary television series. Since March 1966, it has examined aspects of rural life in New Zealand and is the country's longest-running television series. Something of the nature of the program can be gleaned from the 40th anniversary episode (2005): www.nzonscreen.com/title/40-years-of-country-calendar-2005, accessed 21 January 2020. Episodes from the 2013 season to the present are available to watch online, at www.tvnz.co.nz/shows.

9 The quoted phrase is from Eric Pawson and Tom Brooking, eds, *Environmental Histories of New Zealand* (Melbourne: Oxford University Press, 2002), 13.

10 Flora Thompson, *Lark Rise to Candleford* (Oxford: Oxford University Press, 1945)—a trilogy of earlier, semi-autobiographical novels about the Oxfordshire/Buckinghamshire countryside in the late nineteenth century, published by Oxford University Press as *Lark Rise* (1939), *Over to Candleford* (1941) and *Candleford Green* (1943). H. C. D. Somerset, *Littledene: A New Zealand Rural Community* (Auckland: Whitcombe and Tombs, 1938). *Lark Rise* was paired with Waitahuna in a paper Brooking delivered to the annual conference of New Zealand historians in 1977 and with 'Littledene' in the prospectus for 'Mud, Sweat and Dreams' (2016).

Between these 2 intriguing pairings, suggesting a transnational, comparative and experiential engagement with places literally half a world and time apart, Brooking invoked the notion of Yeotopia.¹¹ As I see it, the term signifies 2 things: one the *idea* that New Zealand took shape as an improved, southern version of rural Britain, a land of milk and honey offering a quiet, happy home for smallholders; and, second, the late nineteenth-century *reality* that most of the family farmers in New Zealand worked someone else's land. In 1890, fewer than 600 individuals and companies owned almost 60 per cent of New Zealand's freehold land.¹²

Closer settlement and cultural transfer

This tension undergirds Brooking's work on the Minister of Lands John Mackenzie, who did much to reform the land system in the late nineteenth century. In Brooking's summation, Mackenzie was responsible for opening up '1.3 million acres of land ... for closer settlement. Some 7,000 farmers and their families moved onto these properties, revitalised the countryside and accelerated New Zealand's move away from a "plantation" type of agriculture to family farming'.¹³ Politics was central to change. But so were social and cultural influences. *Lands for the People?*, Brooking's 1996 biography of Mackenzie, roots the politician's dislike of landlordism firmly in his childhood encounters with the misery inflicted upon people by the Highland clearances, and his deep-seated desire for independence. Here perhaps we see a new North British variant of the transnational, comparative impulse that coupled Lark Rise with Littledene. My Canadian colleague Donald Akenson, who knows more than a thing or two about ethnic group relocations, praised *Lands for the People?* as 'an unusually shrewd reading of the influence of Old World cultural patterns on New World behavior'.¹⁴

11 Brooking readily acknowledges his borrowing of the term from Paul Star, his sometime PhD student and long-time research collaborator.

12 'Yeotopia' appears in "'Yeotopia' Revisited: Ruminations on How the Vibrancy of an Ideal Hid the Relatively Early Industrialization of New Zealand Agriculture', paper delivered at the Agricultural History Association Conference, Little Rock, Arkansas, June 2009, and 'Yeotopia Gained: New Zealand 1840–1914', paper delivered at the 'Colonial Worlds, Elemental Histories' symposium, Dunedin, 31 October 2014. This paragraph also draws from various sections of T. W. H. Brooking, *The History of New Zealand* (Westport, CT: Greenwood, 2004).

13 Tom Brooking, 'McKenzie, John', *Dictionary of New Zealand Biography*, first published in 1993. *Te Ara—the Encyclopedia of New Zealand*, teara.govt.nz/en/biographies/2m17/mckenzie-john, accessed 13 October 2018. For more on this theme, see Tom Brooking and Terry Hearn, 'Breaking up the great estates', plate 59 in *The Historical Atlas of New Zealand*, ed. Malcolm McKinnon (Auckland: David Bateman in association with the Historical Branch of the Department of Internal Affairs, 1997); Tom Brooking, 'Use it or lose it: Unravelling the land debate in late nineteenth-century New Zealand', *New Zealand Journal of History* 30, no. 2 (1996): 141–62; and Tom Brooking, "'Busting Up" the Greatest Estate of All: Liberal Maori Land Policy, 1891–1911', *New Zealand Journal of History* 26, no. 1 (1992): 78–98.

14 T. W. H. Brooking, *Lands for the People? The Highland Clearances and the Colonisation of New Zealand. A Biography of John McKenzie* (Dunedin: Otago University Press, 1996); Donald H. Akenson, comment noted in T. W. H. Brooking curriculum vitae.

Unpacking the Kists dives much deeper into the question of cultural transfer, and owes a particular debt to Brooking's long-term interest in the Scots in New Zealand.¹⁵ A systematic and analytical collaborative enterprise, a decade or more in the making, this volume is near seamless in its presentation of the work of several researchers. In that part of the story authored by Brooking, we find a heterogeneous group of practical, industrious, economic migrants making concerted efforts 'to banish the alien and recreate the landscapes, spatial layouts, and economic systems of home'. Unpacking this formulation reveals the newcomers' roles in naming and surveying the land and in constructing farming landscapes. Those who toiled hard 'improving God's creation' sometimes clashed with their conservation-minded brethren, because no group of such size was ever of one mind on all things. Particular breeds of cattle and stone walls aside, perhaps, there was little to distinguish the cultural landscapes of Scottish Otago from those created by English migrants in the North Island bush. Fired by the spirit of improvement, Scots acquired smallholdings, became runholders, worked as shepherds and labourers, and engaged in off-farm sectors of the farming economy as nurserymen, seed merchants, agricultural implement manufacturers, and so on. Others of course found their ways into a variety of urban occupations. This is a valuable story, effectively, even lovingly, told, but, like a Merchant Ivory film, it comes to rest in ambiguity and contradiction. Scots, about 20 per cent of New Zealand's nineteenth-century immigrants, played major parts in the remaking of New Zealand, but they differed in their appraisals of the land and their attitudes towards it and were not markedly distinct from other groups. Moreover, many of those whose ideas are most fully recorded were not even consistent in their views. They were men and women of their time and place: the age of progress and the raw edge of empire. For all that, 'subtle [but important] Scottish influences' shaped New Zealand politics, law, religion and education—and the writings of Robbie Burns offered moral justification for the closer settlement movement.¹⁶

15 Brad Patterson, Tom Brooking and Jim McAloon, *Unpacking the Kists: The Scots in New Zealand* (Montreal: McGill–Queens University Press; Dunedin: Otago University Press, 2013). Brooking was responsible for chapters 6 and 10. The 2 quotations that follow are from 144 and 150. For more by Brooking on this broad theme, see Tom Brooking, 'Weaving the Tartan into the Flax: Networks, Identities and Scottish Migration to Nineteenth Century Otago, New Zealand', in *The Global Clan: Scottish Migrant Networks and Identities Since the Eighteenth Century*, ed. Angela McCarthy (London and New York: I. B. Tauris, 2006), 183–202; Tom Brooking and Jennie Coleman, eds, *The Heather and the Fern: Scottish Migration and the Settlement of New Zealand* (Dunedin: University of Otago Press, 2003); Tom Brooking, "'Tam McCannay and Kitty Clydeside": The Scots in New Zealand', in *The Scots Abroad: Labour, Capital, Enterprise*, ed. R. A. Cage (London: Croom Helm, 1985), 156–90; and Tom Brooking, 'Green Scots and Golden Irish: The Environmental Impact of Scottish and Irish Settlers in New Zealand—Some Preliminary Ruminations', *Journal of Irish and Scottish Studies* 3, no. 1 (March 2010): 49–67.

16 Patterson, Brooking and McAloon, *Unpacking the Kists*, 122–5.

Making environmental histories¹⁷

One of the aims of *Environmental Histories of New Zealand* when it appeared in 2002 was to push back against a ‘pernicious form’ of presentism that tended ‘to portray landscapes as if they “are” rather than as having histories by which they have come to be’.¹⁸ With 18 chapters by 21 authors, the book offered multiple, wide-ranging and complementary narratives that encompassed many disciplinary perspectives. The editors Eric Pawson and Tom Brooking worked to achieve thematic and chronological coherence and made the book more than a disparate set of essays. The volume has 5 sections: Encounters; Colonising; Special Environments; Modernising; and Perspectives. Its opening chapter, ‘A Fragile Plenty’, treats the environments of Aotearoa before the arrival of Europeans. Its last, dealing with the early twenty-first century, is titled ‘Losing ground?’ Along the way, essays consider some of the big themes of environmental transformation, reflect on their disruptive ecological and cultural consequences, and mark the effects of the impulse to improvement. When a revised edition of the book appeared, with half a dozen new chapters, in 2013, it was appropriately called *Making a New Land*. This title, and the book’s pedigree in *Environmental Histories*, rightly mark the collection’s debt to the work of an earlier generation of historical geographers—and its distance from it.

Seeds of Empire is the joint product of 8 authors, all of whom have been closely associated with the universities of Otago and Canterbury.¹⁹ It is a model of what the ‘output’ of team projects in the humanities and social sciences should be. Truly collaborative and integrative, it benefits from the diverse disciplinary affiliations of its contributors. In stark summary, the book addresses 3 major questions: who or what were the local drivers of change, and when, where, and why did these changes take place; how did global contexts impinge on the transformation of New Zealand landscape; and are there new insights to be found in the patterns of biotic (and other) flows—of grass seeds, fertilisers, wool, meat, butter and cheese (and knowledge)? Perhaps a better way of understanding the approach and emphases of *Seeds of Empire* is through the authors’ own diagrammatic representation of its key themes and questions (Figure 5).

17 Here I coalesce the titles of Pawson and Brooking, *Environmental Histories*, and Eric Pawson and Tom Brooking, eds, *Making a New Land: Environmental Histories of New Zealand* (Dunedin: University of Otago Press, 2013).

18 Pawson and Brooking, *Environmental Histories*, xii (Preface).

19 Tom Brooking and Eric Pawson, eds, *Seeds of Empire: The Environmental Transformation of New Zealand* (London: I. B. Tauris, 2010).

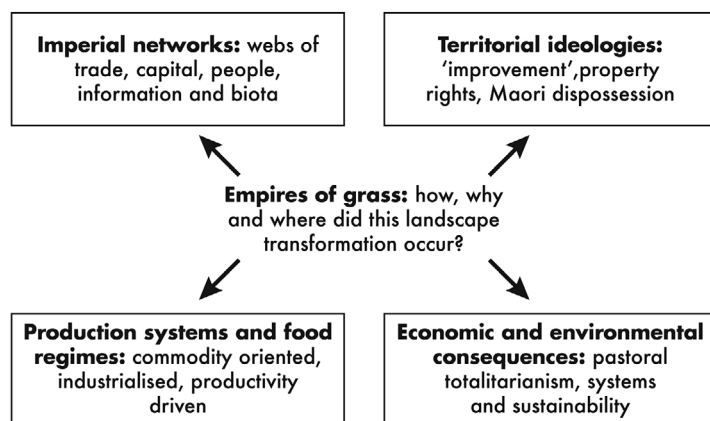


Figure 5: Key themes and questions of *Seeds of Empire*.

Source: The author.

All of this breaks new ground, yet it is at the local level that this book excels. How did newcomers, buoyed by stories of beautiful scenery, ‘Italian’ skies, a mild climate and prospects of wealth for all, adapt to the howling wilderness of the Canterbury Plains and other locales? Chapters 3, 4 and 5 work ingeniously at the microscale to show practical people—experimenters, innovators and inventors—learning and coping in a variety of ways, mixing grasses and broadleaved herbs, liming sour soils, using fire judiciously, adopting sheep breeds to suit different environments, and so on. To my knowledge at least, there are few discussions of these processes at such scales of resolution in the literature, anywhere.

Seeds of Empire offers thorough, well-grounded and thoughtful accounts of early land clearing and the shifting dynamics of rural transformation in the twentieth century as science, technology and distant demand honed the discourse of ‘improvement’ into an ideology of production for (and substantial dependence on) overseas markets. It revises established views of New Zealand history by demonstrating the contingent and (unintentionally) deleterious character of many of the economic and environmental choices made by New Zealand settlers, politicians and even scientific experts. And it casts new light on the links between policy and environment. Finally, it rejects the core–periphery model of colonial development to see New Zealand as a node on a network of diverse multidirectional flows (of everything from information to guano). The book’s concluding lines comment on the Marcus King painting of the 1950s reproduced on its cover: ‘Other than the mountains, everything portrayed in this painting is artificial, and gains its existence and meaning only in relation to the wider networks into which the activities portrayed are connected.’²⁰ Here rural New Zealand seems fully ‘made’. Even this cursory scoping of yeotopia prompts the question: What more is there to write?

20 Brooking and Pawson, *Seeds of Empire*, 210.

Mud, Sweat and Dreams

Tom knows. There is deep time to engage, and the dairy boom to reckon with, and many other things to be said about everything in between. His 40-page prospectus for *Mud, Sweat and Dreams* (MS&D) overflows with ideas and a cornucopia of sources.²¹ It is nothing if not ambitious. Organised thematically, to respond to the ‘absence of a substantive, national overview’ of New Zealand’s rural past, MS&D would aim to unfold a coherent chronological synthesis in 11 chapters ranging in length from 3,000 to 15,000 words. It would be richly illustrated and treat ‘economic, social, ideological, cultural, political and environmental aspects ... from a range of perspectives’. Race, class, gender, power and environment would receive their due. The book would necessarily emphasise both change and continuity: there can be no doubt, insists Brooking, that ‘farming will look very different in two generations but its survival ... depends on building on what we have done well in the past and avoiding repetition of unnecessary mistakes by learning more about that past’.

Encompassing the *longue durée*, this account would begin in physical geography, to question the widespread view that Aotearoa was ‘designed by nature as a farm’. It would consider the environmental impact, between the thirteenth and eighteenth centuries, of the Eastern Polynesians who eventually became Māori, before summarising 2 centuries of agricultural change and idealisations of rural life in Britain after 1700. With these foundations laid, the focus would turn to the contributions of sealers and whalers to the development of farming in New Zealand. Then pairs of chapters would tell the stories of high country sheep farming, downland subsistence and crop farming, and the triumph of the family farm between 1846 and 1990. A final chapter would attend to the diversification, and the shift to industrial (dairy) farming, of the last quarter-century.

This story would be set apart from other forays into this territory by its ‘farmer-centric’ focus. In Brooking’s prospectus, it would ‘concentrate on farmers [themselves a rather heterogeneous bunch], their wives and children’, and all the other people, both Māori and Pākehā, with whom they were connected. Inescapable in all of this would be the close examination of farmers’ relations with labourers, contractors and the people of small towns, as well as consideration of the ‘often fraught relationship with government officials, both local and national, agricultural scientists and politicians’. Nor, of course, could this work neglect ‘farmers’ daily encounters with their crops and animals and the broader environment’. Beyond this, comparisons would show the extent to which New Zealand farmers defied Marxist dialectics, the determinations of hard capitalist processes, and the limitations of powerful environmental and ecological realities.

21 Brooking, Draft proposal for a book on ‘The Making of Rural New Zealand’. The quotes that follow are drawn from this proposal. The next 3 paragraphs are a stark précis of the proposal, and quotes are drawn therefrom.

MS&D is, clearly, an ambitious venture. We should not forget for a moment, though, that this rendering of it is a précis of a preliminary prospectus. Brooking acknowledges that there is work to be done. Hard thinking and difficult choices lie ahead in framing the central argument that will emerge, he anticipates, in the process of writing, as he reconsiders old orthodoxies and interrogates new materials. In that sense, the prospectus is an initial assemblage, a gathering together of ingredients before they are sieved and diced and measured out in appropriate quantities, to be stirred and kneaded and seasoned and baked into a satisfying repast. Brooking has demonstrated (as the first, ‘yeotopian’, part of this article shows) that he has the tools and the experience to work in this metaphorical kitchen. But success, in culinary practice as well as academic life, lies always in the ability to adapt, to adjust recipes to circumstances, or narratives and analyses to sources and lacunae. Good cooks, like good historians, are forever asking questions, appraising new possibilities and going beyond the orthodox. In this spirit, I offer my view from Erewhon.

A view from Erewhon

Why ‘Erewhon’? By comparison with Brooking’s wide, deep and detailed local knowledge, my own perspective on rural New Zealand comes from a position very much akin to Gilles Deleuze’s reading of Samuel Butler’s *Erewhon*, as a place that is ‘not only a disguised *no-where* but a rearranged *now-here*’.²² I come to these concluding remarks from nowhere in particular, but now that we are here, I hope to challenge, nudge and provoke. I do this to raise a caveat or two about Brooking’s preliminary design for a history of the making of rural New Zealand, to suggest a few notions that might be helpful in framing that work, and to recognise the value of the enterprise on which Brooking is embarked.

Much as I admire ambition, I worry about implementation. Writing history always entails selection. But make the scope too broad, try to cover too much ground in a limited space, and the specifics—that make the past real and give historical writing its allure—slip away. A history of everything is akin to a history of nothing. I fear an overstuffed portmanteau. Large generalisations slip easily into the banal. Preoccupation with detail descends quickly into triviality. These concerns are real but they are comments on risk, rather than universal truths, or specific references to Brooking’s MS&D proposal.

22 Gilles Deleuze, *Difference and Repetition* (New York: Columbia University Press, 1994), 333, n. 7; Samuel Butler, *Erewhon, or, Over the Range* (London: Trübner & Co., 1872), doi.org/10.5479/sil.1036699.39088016476525.

The broad-stroke implications of my apprehensions are quickly qualified, if not contradicted, by a scan of my bookshelves. Attuned to our concerns here, my eyes alight on Pamela Horn's *The Rural World, 1780–1850*.²³ The book is ambitious, fascinating, vivid and successful. But Horn's rural world comes down to a discussion of social change in the English countryside. Her interest is in what country life was like for English villagers—agricultural labourers, craftsmen and farmers—through 70 years. She paints local detail to illuminate larger themes—poor relief, village institutions, crime and punishment—and captures change and continuity by bookend chapters describing the rural community at the beginning and end of her time span. Her focus is 'farmer-centric' but it is also narrow and resolute. Politics and protectionism—essentially the debate over the Corn Laws—figure in the story, but with a tight focus on farmers' views of the proposed changes. Horn feels no compunction to recount the political machinations in Westminster, or the changing patterns of world geopolitics. Nor does she feel a need to begin at the beginning or end in the present.

This observation brings to mind a long-ago but pertinent article about a Canadian public intellectual that opens with the question 'Was Donald Creighton a narrative historian?'²⁴ In response, the author of that piece distinguishes between the historian's ordering of the past and the 'real' order of the past as recorded in the archive. In this view, narrative is 'an order of telling that honours certain proprieties of temporal sequence, interconnectedness and closure'.²⁵ It is neither 'found' nor 'necessary'. Historians are free to select a particular form of telling, but it must be appropriate to 'the questions they ask, the interpretations they reach, and the aspect of the past they seek to recount'. This is to say that the historian's choice of form is 'neither arbitrary nor entirely free'. So is Tom Brooking a narrative historian? I would say yes. But I would also say that essaying a big synthesis requires a deal of reflexive awareness of an author. Narrative forms differ. Broadly, however, they all seek to construct an ensemble of relationships that reveal 'the narrator's comprehension of things together'. Furthermore, authors must 'attempt to represent the past as contemporaries witnessed and experienced it' even as they understand that 'their interpretations depend on their own knowledge of how things turned out'.²⁶ These are issues with which Brooking will have to grapple in realising the potential of his *Mud, Sweat and Dreams* prospectus.

23 Pamela Horn, *The Rural World, 1780–1850: Social Change in the English Countryside* (London: Hutchinson, 1980).

24 Kenneth Dewar, 'Where to Begin and How: Narrative Openings in Donald Creighton's Historiography', *Canadian Historical Review* 72, no. 3 (September 1991): 348–69, doi.org/10.3138/CHR-072-03-03.

25 Dewar, 'Where to Begin and How', 351.

26 Ibid., 364, 357.

Let me, then, offer a few specific observations as signposts along the way. First, with *Lark Rise* and *Kists* in mind, I recall that years ago Andrew Clark (of *The Invasion of New Zealand by People, Plants, and Animals* fame), sought to make the transfer of agricultural practices from old world to new by different ethnic groups the mainstay of historical geographical research.²⁷ Ultimately, this program foundered on its inclination to social and spatial aggregation. How robust are correlations of ethnic group presence and different combinations of crops and livestock at the county or precinct level? Does a simple plurality of one or the other make a census district Scottish or Irish? Are Scots or Irish (or any other such designations) actually homogeneous? What of the influence of climate, soil, terrain, transport and markets on farming practices? There is much at stake here, but John Mannion did much to clarify the issues almost half a century back.²⁸ By comparing the retention of material culture and traditional practices among 3 groups of Irish settlers in eastern Canada, Mannion demonstrated that cultural discard was more rapid and more complete the closer settlers and their practices were to the market. Subsistence farmers might persist in planting with dibble sticks, but those who aimed to sell their oats quickly adopted the plough; elements of material culture, dialect terms and the like lingered around the family hearth, but soon gave way, beyond, to general forms and phrases, although the clustering of people from particular localities enhanced retention. Broadly we might anticipate similar but less diverse patterns in New Zealand.

After the attention already lavished on the making of the New Zealand countryside by the 'Cumberland school', a farmer-centric account of social change in rural New Zealand is certainly needed. But it would be unfortunate to jettison an interest in the look of the land, especially as much early work on New Zealand and other landscapes suffered from a version of the verbal noun problem. Authors described transformations of the land, but paid less attention to who drove the changes and how they did so.

Typically, efforts to identify the motor of modification invoked *deus ex machina* forces. So years ago, the scholarly and talented American geographer David Lowenthal identified particular American predispositions to explain the American landscape.²⁹ Others put it all down to capitalism. There is a beguiling assurance about such claims. But as Anthony Giddens once put it, 'the only moving objects

27 Andrew H. Clark, *The Invasion of New Zealand by People Plants and Animals: The South Island* (New Brunswick, NJ: Rutgers University Press, 1949). For more on Clark's program, see Graeme Wynn, 'W. F. Ganong, A. H. Clark and the Historical Geography of Maritime Canada', *Acadiensis* 10, no. 2 (1981): 5–28; Michael Roche, 'A. H. Clark's Framing of Geographical Change', *Historical Geography* 41 (2013): 191–206; and James R. Gibson, ed., *European Settlement and Development in North America* (Toronto: University of Toronto Press, 1978), doi.org/10.3138/9781487595814.

28 John J. Mannion, *Irish Settlements in Eastern Canada: A Study of Cultural Transfer and Adaptation* (Toronto: University of Toronto Press, 1974).

29 David Lowenthal, 'The American Scene', *Geographical Review* 58, no. 1 (January 1968): 61–88, doi.org/10.2307/212832.

in human social relations are individual agents, who employ resources to make things happen intentionally or otherwise'.³⁰ People make places. We know that Capability Brown authored Chatsworth Park and that Chicago reflects the work of Daniel Burnham. The French historian Michel de Certeau further insisted that the 'real authors' of space are those who live and work and move through it every day.³¹ So 'the landscape, tells—or rather is—a story, a chronicle of life and dwelling [that] unfolds the lives and times of [those] who, over the generations, have moved around in it and played their part in its formation'.³² Environments are 'pregnant with the past' and thus, perhaps, especially worthy of consideration in studies of rural settings. There is scope here yet for the illuminating combination of historical and geographical, social and landscape, analytical and descriptive perspectives, even in a farmer-centric study to broach important questions about the connections between people and place, society and environment.

The role of plant and animal introductions in making a 'neo-European' landscape of New Zealand has been of enduring interest.³³ It is, of course, a substantial thread in *Seeds of Empire*, and it remains pertinent to further thinking and writing about rural New Zealand.³⁴ Scholars in other parts of the world have also turned to study the place of biotic introductions in the histories of their own territories. Among recent contributions in this vein I note *Fruits and Plains*, Philip Pauly's study of American horticulture. Reading culture as 'an umbrella term for efforts at biotic improvement' including everything from manuring to plant breeding, Pauly details the introduction, naturalisation, discovery and propagation of (certain) plants in the United States.³⁵ Ultimately, his account turns on the ways in which relatively well-placed and well-informed Americans related discussions about the foreignness and nativity of plants to questions of American identity, but his capacious, interdisciplinary approach opens windows on many other perspectives. How, and how strongly, we might ask, did ordinary rural (and other) New Zealanders come to

30 Anthony Giddens, *The Constitution of Society* (Cambridge: Polity Press, 1984), 181.

31 This discussion draws upon Jan Kolen and Johannes Renes, 'Landscape Biographies: Key Issues', in *Landscape Biographies. Geographical, Historical and Archeological Perspectives on the Production and Transmission of Landscapes*, ed. Jan Kolen, Johannes Renes and Rita Hermans (Amsterdam: Amsterdam University Press, 2015), 21–47 (and especially 32–5), doi.org/10.1515/9789048517800-003. See also Michel de Certeau, *The Practice of Everyday Life* (Berkeley, CA: University of California Press, 1984).

32 Tim Ingold, *The Perception of the Environment: Essays on Livelihood, Dwelling and Skill* (London: Routledge, 2000), 189 and 199, cited by Kolen and Renes, 'Landscape Biographies', 39–40.

33 As for example in G. M. Thompson, *The Naturalisation of Animals and Plants in New Zealand* (Cambridge: Cambridge University Press, 1922); Guthrie-Smith, *Tutira*; and Clark, *The Invasion*.

34 Including Tom Brooking, 'Acclimatisation in New Zealand', in *Palgrave Dictionary of Transnational History*, ed. Pierre-Yves Sunier and Akira Iriye (New York: Palgrave, 2009), 8–10; Eric Pawson, 'Plants, Mobilities and Landscapes: Environmental Histories of Botanical Exchange', *Geography Compass* 2, no. 5 (September 2008): 1464–77, doi.org/10.1111/j.1749-8198.2008.00153.x. See also Doug Munro, Eric Pawson, Ian Tyrrell, John McNeill and Judith Bennett, 'Natives and Exotics' [review forum], *Journal of Pacific History* 46, no. 1 (2011): 117–131, doi.org/10.1080/00223344.2011.573641.

35 Philip Pauly, *Fruits and Plains: The Horticultural Transformation of America* (Cambridge, MA and London: Harvard University Press, 2008), 6.

regard the native biota as inferior? What did the majority of countryfolk think of the work of acclimatisation societies, and their frequent enthusiasm for the wildly exotic? How did **they** respond to the teachings and initiatives of ‘agricultural improvers’? Certainly early nineteenth-century efforts to promote agricultural improvement in British North America were greeted with a certain, almost cynical, opportunism, or were disdained, by many settler farmers. Although some of these issues are touched on in *Seeds of Empire*, there is more to be said, and strategic probing may throw light on larger themes in New Zealand history.

Ever since Kate Brown told readers of the *American Historical Review* ‘why Kazakhstan and Montana Are Nearly the Same Place’ I have dreamed of a paper pairing Idaho and Canterbury in similar vein.³⁶ This reverie is rooted, of course, in Mark Fiege’s demonstration, in *Irrigated Eden* (1999), of the ways in which irrigation systems and other technologies wrought dramatic changes in the ecology of southern Idaho, and his strong argument that this created a hybrid landscape in which ecological processes complicated and confounded human designs for the territory. There are surely parallels on the plains. In the last 2 decades, much North American work has extended and refined Fiege’s use of hybridity to understand landscapes vastly different from his irrigated tracts. In New Zealand too trees and forests, seeds and pastures have been remade by science, management and technology. Other studies have illuminated the politics as well as the history of hybrids, and reminded us that people (especially in positions of power) have naturalised technology and technologised nature in efforts to depoliticise and legitimate development projects. In a further extension of these arguments, Michelle Murphy has shown that single objects ‘can concretely be many things at once’—they can simultaneously ‘have multiple meanings [and] be embedded within multiple worlds’.³⁷ All of this seems to me to offer a set of useful pointers for understanding debates and clarifying conflict (over the use to which ‘the environment’ might be put, or between different versions of ideal and reality) in rural New Zealand.

Finally, much is said and written these days about various supranational approaches to history: world history; the history of the British world; the Atlantic world; the world as a network or a web with connection and mobility its defining characteristics. These approaches incline, collectively, to emphasise themes of cross-cultural social

36 Kate Brown, ‘Gridded Lives: Why Kazakhstan and Montana are Nearly the Same Place’, *American Historical Review* 106, no. 1 (2001): 17–48, doi.org/10.2307/2652223.

37 This discussion of hybridity and multiplicity draws heavily upon Sara B. Pritchard, ‘Toward an Environmental History of Technology’, in *The Oxford Handbook of Environmental History*, ed. Andrew C. Isenberg (Oxford: Oxford University Press, 2014), 239–42. The felicitous phrase ‘naturalized technology and technologized nature’ essentially follows Pritchard. Works cited here and in Pritchard are: Mark Fiege, *Irrigated Eden: The Making of an Agricultural Landscape in the American West* (Seattle, WA: University of Washington Press, 1999); Gregg Mitman, *Breathing Space: How Allergies Shape our Lives and Landscapes* (New Haven, CT: Yale University Press, 2008); Michelle Murphy, *Sick Building Syndrome and the Problem of Uncertainty: Environmental Politics, Technoscience and Women Workers* (Durham, NC: Duke University Press, 2006), 12, doi.org/10.1215/9780822387831, for ‘many things at once’.

and environmental interaction across oceans, between continents and through national borders. By and large, they tend to favour cultural over economic and material interpretations, although the last remain important, and have become sufficiently common that Tony Ballantyne has identified

a new consensus amongst many, if not all, historians of empire that reconstructing the movement of plants and animals, people, capital, commodities, information, and ideas is fundamental to understanding how the empire developed and how it operated on a day to day basis.³⁸

There can be no gainsaying the importance of such connections in the remaking of New Zealand in the nineteenth and twentieth centuries. But a modicum of caution would seem appropriate here, in considering the prospects for and practicalities of a farmer-centric history of rural New Zealand. Historians of empire, interested in the workings of that conceptual entity, may well find great value in conceiving of their spatially extensive, multi-tentacled subject 'as a set of shifting, uneven, and often unstable inter-regional and global connections'.³⁹ For those interested in life on the land in a particular territory, some adjustment of focus would seem necessary. Common characterisations of New Zealand as the Britain of the South Seas must be taken with the proverbial grain of salt. Imperial connections there were, but the question, for students of New Zealand rural history, per se, is what happened in situ. For all the introductions of British people, English songbirds, the contents of Scottish kists, and the imperial careers of colonial officials, Aotearoa New Zealand developed as a place *sui generis*.⁴⁰ A unique combination of physiography, climate and soils; a distinctive flora and fauna; the effects of relocation on peoples' emotional and psychological states; the mixing of individuals from different traditions (or cultures); the inescapable corollaries of (continuing) changes in the ratios between land and labour; the increasing global swirl of people and ideas through time; and other factors combined to present unique opportunities and challenges that shaped an emergent society in particular and distinctive ways.⁴¹

38 Tony Ballantyne, 'The Changing Shape of the Modern British Empire and its Historiography', *Historical Journal* 53, no. 2 (2010): 429–52, doi.org/10.1017/S0018246X10000117. The point is also made in Brooking and Pawson, *Seeds of Empire*, 4, when they write that these approaches are used 'to analyse everything from the movement of ideas and information, to capital, technologies, and ... plant and animal materials'.

39 Ballantyne, 'The Changing Shape of the Modern British Empire', 451.

40 David Lambert and Alan Lester, eds, *Colonial Lives Across the British Empire: Imperial Careering in the Long Nineteenth Century* (Cambridge: Cambridge University Press, 2006).

41 For a general, somewhat abstracted discussion of the effects of changing relations between the costs of land and labour, see Cole Harris, 'The Simplification of Europe Overseas', *Annals of the Association of American Geographers* 67, no. 4 (1977): 469–83, doi.org/10.1111/j.1467-8306.1977.tb01156.x.

None of this is to deny that networks—economic, familial or personal—played parts in shaping the lives and fortunes of many a New Zealand runholder or small farmer.⁴² So we might recall that Guthrie-Smith came to New Zealand in 1880 to work on Peel Forest Station (then in the hands of his uncle) before he acquired Tutira in partnership with Arthur Cunningham, a friend from Rugby School. Years later, looking back on changes in the land during his tenure, he wondered whether his actions had been steered by the siren calls of his ancestors, ‘tenacious Scots and temperamental Irish Celts’. But this was speculative rhetoric. In truth, as he knew, he had been drawn ‘like water into the whirlpool’ to act as he did;⁴³ he had followed the stream of local tendency, itself the complex product of a thousand circumstances, from established systems of land tenure, through the slender attachment of newcomers to their acres, to late nineteenth-century settler capitalism’s worship of profit, progress and material improvement.

There are many paths to a history of rural life in New Zealand. Some have the landscape at their core; they variously emphasise (changing) patterns on the land (patterns of settlement, boundary surveys, farm shapes and sizes, the arrangement of fields, land use arrangements); the interpretation (functional, cultural, symbolic) of basic elements of material culture (houses and barns); or the processes of landscape transformation. Some trace the ‘social’ dimensions of farm life—exploring such topics as the demography of the rural population; the ethnic, class and occupational backgrounds of farmers; questions of isolation and sociability (were, as Miles Fairburn argued, community structures ‘few and weak [and] the forces of social isolation ... many and powerful’, to the point that ‘bondlessness was central to colonial life?’).⁴⁴ Some see economics and the hand of the marketplace as the key to understanding: Edward Gibbon Wakefield’s ‘sufficient price’ shaped early thinking about the organisation of settlements, shifting domestic and overseas demand shaped the patterns and profitability of farm enterprise, and the cultivation of markets was integral to successful cultivation of the land. Some make power and politics the signposts of their passage; closer settlement was a government initiative. Others see technology as the most significant driver of change; rural life was transformed by the railway, by refrigeration, by the tractor. Yet others would argue the importance of ideas—from notions about the ideal form of society to the science of soils and cross-breeding—to grasping the real shape of things. Other routes to understanding have also had their advocates. Each and all encompass alluring avenues, stunning vistas and potential pitfalls. Here and there they come together, to reflect and reveal

42 By way of provocative comparison one might consider here Douglas J. Hamilton, *Scotland, the Caribbean and the Atlantic World, 1750–1820* (Manchester: Manchester University Press, 2005), which points to the familial and economic networks of Scots in the Caribbean to account for various aspects of their lives, including an oft-remarked-upon clannishness.

43 Guthrie-Smith, *Tutira*, 320.

44 Miles Fairburn, *The Ideal Society and its Enemies: The Foundations of Modern New Zealand Society, 1850–1900* (Auckland: Auckland University Press, 1989), 12.

the intricate interdigitated complexities of life on the land. Any attempt to traverse this terrain is sure to encounter figurative and literal mountains of mud, sweat and (unrequited) dreams.

Synthesis is never simple. Selection—and thus omission and exclusion—is essential to the success of any effort to fuse disparate elements into a coherent story or interpretation. Those who embark on such a venture need to be both bold and deeply knowledgeable about the ground they aim to cover. They must also be resolute in identifying the last to which they will shape their product—and sticking to it. Brooking is right to recognise the value of and need for a compelling integrated historical account of rural New Zealand. He is also ideally placed at this stage in a productive career to identify the pivotal themes necessary to define the parameters of and realise such a work. I cannot but admire his ambition, hold faith in his demonstrated talent, and look forward to reading Tom Brooking on the making of rural New Zealand.

TOM BROOKING: A PEOPLE'S HISTORIAN

SEÁN BROSNAHAN

Toitū Otago Settlers Museum, Dunedin

When I started working at Toitū Otago Settlers Museum in 1988, it was still called the Otago Early Settlers Museum and Tom had just published *Milestones: Turning Points in New Zealand History*.¹ It was one of those still relatively rare publications, an academic historian reaching out to a popular audience with an easy-to-read and well-illustrated overview of key events in our past. It followed from his previous effort, the superbly readable biographical essay on Captain William Cargill, *And Captain of Their Souls*, published locally by George Griffith's Otago Heritage Books.² I remember listening to Tom being interviewed on National Radio (now Radio New Zealand National) about *Milestones*, having just secured my job but before moving to Dunedin. I wondered whether we might end up having something to do with each other as I knew that he was married to one of my cousins, a branch of the family I was looking forward to connecting with once I moved south.

It didn't take long for the family link to blossom: Tom's mother-in-law, the late Peg Cadigan (a Brosnahan through her grandfather 'Hughie the Pub'), quickly became one of my favourite people, and a delightful supporter of my work at the museum and in public talks. I became her second-favourite Dunedin historian, with Tom in prime position and not to be dislodged, but both of us sharing the warmth of Peg's enthusiasm for all of our public endeavours. Tom proved equally generous, encouraging my engagement with Otago history and my efforts to add an Irish strand to the established historiography. We presented together at the 1989 New Zealand Society of Genealogists national conference, held in Dunedin and titled 'The Tartan and The Gold'. Tom set out an overview of Scottish migration to southern New Zealand, while I did something similar with the Irish. It was the first of numerous conferences where we would add to public perceptions of Celtic connections in the south.

I mention these aspects of Tom's work because they are an important reminder of his commitment to public history and to sharing the fruits of his research and writing with wide popular audiences. He was not alone in this—Erik Olssen, Dot Page and Barbara Brookes also spring to mind as Otago faculty members of that

1 Tom Brooking and Paul Enright, *Milestones: Turning Points in New Zealand History* (Lower Hutt: Mills, 1988).

2 Tom Brooking, *And Captain of Their Souls: An Interpretative Essay on the Life and Times of Captain William Cargill* (Dunedin: Otago Heritage Books, 1994).

era committed to a similar type of public engagement—but he was particularly enthusiastic about taking his work beyond the academy. Not every university historian at that time shared Tom's appreciation for genealogists, for example, but Tom perceived the benefits that might accrue from raising the standard of family history research and aligning academic and popular approaches to migration history in particular. It made him a regular speaker at public talks that brought no advantage to his professional career but were simply motivated by his desire to share his insights more widely.

Tom was also a great supporter of the museum, particularly as it segued from its old 'early settler' focus to a more inclusive role as the social history museum for all the people of Otago. He was always a willing participant in our public programs and an expert 'talking head' in more recent times for our documentary work as audiovisual interpretation became a key part of the Toitū display environment. Tom's popularity as a teacher also became clear as his students undertook internships at the museum as winners of the Otago Settlers Association's History Prize (for the best second-year history student at Otago) and routinely described him as their favourite lecturer. Generations of history graduates passed through Tom's courses and absorbed the passion and enthusiasm he had for the local as well as the international, the micro story as well as the big picture.

That dual focus led of course to some excellent biographical studies of key figures in New Zealand's history. I've already mentioned his Cargill biography, a marvellous exploration of pioneer Dunedin that restored the old Captain, a hitherto curiously overlooked figure, to his central place in the story of the Otago settlement. It was a long haul before his next effort, the John McKenzie biography,³ hit the presses, its long gestation a running joke among Tom's friends as I recall, but it was well worth the wait when it arrived. More recently, Tom tackled the challenging figure of King Dick Seddon, his masterful 'rebunking' of the myths surrounding New Zealand's longest serving prime minister, an appropriate bookend to his academic resumé: the popular historian's take on the populist politician.⁴ That Tom nearly replicated his subject's fate when he collapsed with a heart attack shortly after his retirement—more of a shock with the trim and dapper Dunedin historian than the oversized Lancastrian—gave all his friends pause.

The final aspect of Tom's character that I want to touch on is his personal warmth and charm. How many visiting lecturers to Otago must have benefited from Tom's presence in their audiences? He always seemed to have a handle on the historiography of their specialist topic and be able to serve up some erudite questions at the end

3 Tom Brooking, *Lands for the People? The Highland Clearances and the Colonisation of New Zealand: A Biography of John McKenzie* (Dunedin: University of Otago Press, 1996).

4 Tom Brooking, *Richard Seddon: King of God's Own. The Life and Times of New Zealand's Longest-serving Prime Minister* (Auckland: Penguin, 2014).

to enliven sometimes dull and dreary presentations. Tom's contributions always tempered my disappointment with the more disappointing guest lectures and heightened my appreciation for those who had genuinely given us something worth hearing. But in either case, it was a relief to have Tom in the audience, a sure-fire source of 'questions' to break the uncomfortable silence when no one else had anything to say. Likewise, his kindness and encouragement to all those 'average' students whose dissertations he supervised over the years, as well as the budding academics whose potential he fostered.

So, as it turned out, I did get to have quite a bit to do with Tom Brooking. That shared whakapapa link, Tom's entanglement with my South Island Irish-Catholic clan's sprawling network of descendants, always seemed to give him particular joy as a counterbalance to his own North Island Protestant settler heritage. He was always happy to claim me as family anyway. I'm currently engaged on a project to enliven our interpretation of settler origins at Toitū, with a special focus on the Scottish backgrounds of Otago's pioneers. This is, of course, Tom's core territory and, naturally, he is again one of the 'talking heads' we have called on to add some academic rigour to the enterprise. As usual, he brings enthusiasm and erudition to the project, sharing our commitment to make the stories of ordinary people of the past more accessible. His health restored, I hope Tom enjoys a long and happy retirement and I look forward to many more years of shared endeavour.

THE FARMER'S CUTTING EDGE IN SOUTHERN NEW ZEALAND, 1864–1914¹

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Abstract

As a local node in an expanding global network, the agricultural implement makers Reid & Gray played a pivotal role in collaborations between 2 sets of actors: farmers and iron workers. Order books and correspondence identify suppliers of the Dunedin foundry and their strategies for adapting the horse-drawn plough to the requirements of a farming frontier. Between the colonial frontier and metropolitan centres, the firm relayed observations of ploughmen, landowners, blacksmiths, moulders and mechanical engineers. The flow of information back and forth across this network was essential to the rapid increase of agro-pastoral productivity in the region. The environmental challenge stimulated innovations that accelerated irreversible changes in the landscape.

Keywords: ploughs, agricultural machinery, tool steel, tacit know-how, southern New Zealand, innovation, technology transfer

To ‘speed the plough’—the urgent objective of landowners in the low hill country of southern Canterbury, Otago and Southland—it would be necessary for enterprises elsewhere to speed the melt and the chisel, to increase the flow of air in the furnace and the heat sustained on the machinist’s bench. These were not wholly independent suites of innovations, and the records of a Dunedin foundry provide evidence of continual interplay among several hundred specialised actors at locations remote from one another. As ‘tacit’ know-how was adapted to meet new demands, interaction between the 2 streams of innovation—in husbandry and metallurgy—sustained rising productivity over the half-century Vaclav Smil has called ‘the great technical watershed of human history’.²

1 The authors wish to thank George Davis and Bill Smith for editorial suggestions, and to acknowledge the support of their university departments, the personnel of the Hocken Collections of the University of Otago Library, Papers Past, Wikipedia, Grace’s Guide and several hundred smaller nodes on the internet, where volunteers in local museums, archives and communities of craft and conservation have shared their resources.

2 Vaclav Smil, *Creating the Twentieth Century: Technical Innovations of 1867–1914 and their Lasting Impact* (Oxford: Oxford University Press, 2005), 1.

In 1868 Robert Reid and James Gray, having arrived in the colony 5 years earlier, formed a partnership for the importation, manufacture and assembly of agricultural implements. They immediately advertised a double-furrow plough based on Reid's own patent registered in New Zealand in 1867, with additional patents and imports from the factory of Gray's father in Uddingston, Lanarkshire. With the ambition of displacing the imported models, they opened a foundry and cart-making shop in Oamaru, South Canterbury, where grain cultivation was advancing rapidly, but after a fire in July 1872 moved to Dunedin where port facilities were more promising. The firm grew rapidly and stabilised at about 200 employees. Reid died in 1879, and Gray managed the enterprise until 1922,³ maintaining always a high priority for their premier product—the horse-drawn double-furrow plough—which ensured that it was valued by the occupants of family farms in the region.

The functioning of this modest industrial node will demonstrate the variety of intermediaries between makers and users of an implement, as they manoeuvred to respond to new markets, new technical options and severe competition. Interpretation of the archival documents will draw us into a conversation launched by Joseph Schumpeter when he credited 'the intrusion of novelty' to the industrial entrepreneur and coined the term 'creative destruction' for the dynamic of the capitalist economy.⁴ Analysis of engineering and machine tools as centres for the diffusion of new techniques to other manufacturing sectors inspired the interpretation of innovation as a learning process for both parties: 'Tool builder and tool user were not just supplier and customer but creative students of one another's methods'.⁵ Observing the same kind of creative exchange among eighteenth-century developers of textile machinery, Maxine Berg and Kristine Bruland have paid close attention to the tacit know-how shared by the makers and users of a tool: 'Technology is a culture'.⁶

That culture—the skills and sensitivities of wheelwright or blacksmith—was never static. Mastery of 'tradition' began with patient apprenticeship of gestures and sensory cues and demanded lifelong learning in response to the variability of materials, scarcities, failures and demands of individual customers.⁷ The need for

3 In 1912 Miss Reid, a daughter, sold out her interest to Gray, the partnership was formally dissolved and a limited corporation framed (*Otago Witness*, 1 May 1912, 36).

4 Joseph A. Schumpeter, *Capitalism, Socialism and Democracy*, 3rd ed. (New York: Harper, 1950), 83. See also Joseph A. Schumpeter, 'The Creative Response in Economic History', *Journal of Economic History* 7, no. 2 (November 1947): 152f.; Thomas K. McCraw, 'Schumpeter's Business Cycles as Business History', *Business History* 80, no. 2 (Summer 2006): 231–61; Nathan Rosenberg, 'Technological Innovation and Long Waves', in *Exploring the Black Box: Technology, Economics, and History* (Cambridge: Cambridge University Press, 1994), 62–84.

5 W. Paul Strassmann, 'Discussion', *Journal of Economic History* 23, no. 4 (December 1963): 444, summarising his agreement with Nathan Rosenberg, 'Technological Change in the Machine Tool Industry, 1840–1910', *Journal of Economic History* 23, no. 4 (December 1963): 414–43.

6 Maxine Berg and Kristine Bruland, eds, *Technological Revolutions in Europe: Historical Perspectives* (Cheltenham: Edward Elgar, 1998), 14 and 141.

7 E. D. Mackerness, ed., *Journals of George Sturt 1890–1927* (Cambridge: Cambridge University Press, 1967).

the face-to-face transmission of unwritten routines has led analysts to insist on geographical proximity and urban agglomeration as factors in the local capacity for innovation.⁸ In stark contrast is the Dunedin foundry, whose clients were scattered on agrarian frontiers and whose suppliers—makers of bolts and springs and blades—were lodged in little clusters on 4 continents. Over distances as great as 10,000 nautical miles (18,500 km), the entrepreneur in New Zealand exploited innovations in telegraphy, and the operation of the Dunedin firm offers a model of the way novelty ripples through the global information network.⁹

Attention to the plough is a necessary complement to the story of the reaper, which dominates schoolbook accounts of the mechanisation of agriculture. To the popular account of harvest drama and heroic inventor, Zvi Griliches in the 1950s brought important correctives: evidence that a wide array of intermediate goods purchased by farmers embodies innovation, that the size of the farm enterprise affects the uptake of an invention, and that adaptations emerge in specific small regions.¹⁰ 'In agriculture, the specific is often location-specific, indeed specific to a conjunction of resources of soil and atmosphere.'¹¹ The South Island case study therefore features the landscape-specific. On a frontier of 'land-breaking', the plough was the prime transformative tool, and landowners demanded tougher equipment to handle the rigours of first-ploughing, rough roads, masses of buried roots, and swampy and hilly terrain. The distinctiveness of the region, and the variation within it, made it a laboratory for the world's mechanical expertise.

8 For example, Nathan Rosenberg, 'Economic Development and the Transfer of Technology: Some Historical Perspectives', *Technology and Culture* 11, no. 4 (October 1970): 570; in contrast, Richard Shearmur, 'Far from the Madding Crowd: Slow Innovators, Information Value, and the Geography of Innovation', *Growth and Change* 46 (2015): 424–42.

9 David R. Meyer, *Networked Machinists: High-Technology Industries in Antebellum America* (Baltimore, MD: Johns Hopkins University Press, 2008); Gillian Cookson, *The Age of Machinery: Engineering the Industrial Revolution, 1770–1850* (Woodbridge: Boydell, 2008); Christine MacLeod, 'Strategies for Innovation: The Diffusion of New Technology in Nineteenth-century British Industry', *Economic History Review* 45 (1992): 300; Ian Hunter, 'Commodity Chains and Networks in Emerging Markets: New Zealand, 1880–1891', *Business History Review* 79 (2005): 275–304; Gordon M. Winder, *The American Reaper: Harvesting Networks and Technology, 1830–1910* (Farnham: Ashgate, 2012).

10 Zvi Griliches, 'Hybrid Corn: An Exploration in the Economics of Technological Change', *Econometrica* 25 (1957): 512; Zvi Griliches and Frank Lichtenberg, 'Interindustry Technology Flows and Productivity Growth: A Re-examination', *Review of Economics and Statistics* 66 (1984): 325–29. On the effects of farm size, for the case of the reaper, see Paul A. David, *Technical Choice, Innovation and Economic Growth* (Cambridge: Cambridge University Press, 1975), 240. The McCormick story is further deflated by Daniel P. Ott, 'Producing a Past: McCormick Harvester and Producer Populists in the 1890s', *Agricultural History* 88 (2014): 87–119. For a recent, more nuanced history of the plough, see Peter Dewey, *Iron Harvests of the Field: The Making of Farm Machinery in Britain since 1800* (Lancaster: Carnegie, 2008).

11 Paraphrase of Griliches, in Nathan Rosenberg, ed., *Perspectives on Technology* (Cambridge: Cambridge University Press, 1976), 78; echoed in Rosenberg, 'Economic Development', 571; for examples, see Leslie Curry, 'Regional Variation in the Seasonal Programming of Livestock Farms in New Zealand', *Economic Geography* 39 (1963): 95–118; Graeme Wynn, 'Remapping Tutira: Contours in the environmental history of New Zealand', *Journal of Historical Geography* 23, no. 4 (1997): 418–46.

Farming is a problem-solving activity, and every piece of land, distinct in location and resources, presents a new challenge, inviting adaptation of the available implement.¹² In agro-pastoral production, this view of the incremental innovation process suggests the benefits of recasting the full range of innovations as responses to environmental challenges; that is, the provocation of novelty through the extension of landscape frontiers.

This interpretation is grounded in 2 rich archives. Order books and correspondence in the Reid & Gray archive in Dunedin identify suppliers and provide evidence of the marketing strategies of the firm,¹³ and from the digital archive Papers Past we obtain news coverage for the region where the firm made most of its sales.¹⁴ We rely primarily on the *Otago Witness*, published weekly in Dunedin and posted to farmers, runholders, miners and shopkeepers beyond the reach of the daily mail service in Otago, Southland and South Canterbury. In addition to advertising and the biographical details of the actors, we extracted for 1864–1914 two annual series: column-length accounts of local ploughing contests and full-page reports of implement displays at agricultural and pastoral (A & P) shows (county fairs) in the 3 provinces.

This article is organised in 3 stages. To trace our way through the network, we first examine reports from local ploughing matches, to show the practices of experiment among farmers and their interactions with plough-makers. Second, published details of the A & P shows document the way manufacturers promoted their products. Like the winter ploughing matches, the summer farm shows were significant social events that encoded the channels of information flow into which manufacturers inserted themselves as essential relays. In the third section we mine Reid & Gray's order books to investigate its global supply lines for machines, materials and parts. In both the nearby and remote portions of the network, the firm was nourishing conversations between toolmakers and tool users.

Notwithstanding its small size, New Zealand at the end of the nineteenth century was a world leader in terms of inventiveness and economic growth per capita. Spectacular expansion of pastoral exports—wool, hides, frozen meat, butter and

12 Rosenberg, *Perspectives*, 108.

13 Reid & Gray Limited archive. MS-1165. Hocken Collections, University of Otago, Dunedin.

14 A full run of the *Otago Witness* is accessible as a searchable internet resource at paperspast.natlib.govt.nz (National Library of New Zealand). Keyword searches (for 'plough', 'ploughing match' and 'agricultural and pastoral show') were followed by searches for missing events by dates. To test the coverage of the *Witness* we searched also 5 small-town newspapers founded in the 1860s: *Southland Times* (Invercargill), *Bruce Herald* (Milton), *Timaru Herald*, *Lake Wakatipu Mail* (Queenstown) and *Clutha Leader* (Balclutha). For shipping news we had recourse to the *North Otago Times* (Oamaru) and *Otago Daily Times* (Dunedin), the last a partner of the weekly *Otago Witness*.

cheese—was generating average incomes higher than in the United States.¹⁵ In the region under analysis in the span of a generation (1881–1911), the number of farms doubled and acreage under cultivation tripled without a marked increase in the rural population.¹⁶ Farms proposed as profitable for family enterprise—300 to 1,000 acres—were small in comparison with the better-known sheep runs and great estates, but they were decidedly larger than European peasant farms or homestead grants in the United States (the 160-acre quarter-section).¹⁷

By centring attention on family-sized holdings reliant on horse-drawn equipment, are we to assume these operations were old-fashioned? Correspondents of the *Otago Witness* and the well-capitalised high achievers they interviewed often expressed impatience with their small farmers as resistant to change: ‘In plain Anglo Saxon we call them “yokels”’.¹⁸ Over the half-century, however, the family-sized farm emerged as a political and social goal of the colony. As early as 1881, closer settlement, with a better balance of cropping and pastoral activities, was argued as more efficient, and the same writer was urging a mix of products: ‘in fairly fertile land where wheat, barley, grass seed, butter and cheese, beef and mutton are all to be raised, his fortune rests with himself’. By 1911, the family-size farms amounted to only 13 per cent of the area under cultivation or improved pasture, but their numbers had doubled; they attained high levels of quality control and accounted for the expanding dairy production.

The South Island frontier differed from the classic portrayal of the vast and level wheat lands of the Great Plains of North America or Australia. From the late 1860s, as first-generation settlers consolidated their holdings, their offspring and immigrants were already moving onto second-choice land. At Waikaia, for example, in northern Southland, Joseph H. Davidson, who arrived seeking gold in 1863, invested 15 years in the development of his 500-acre farm, represented in the *Otago Witness* in 1880 as a model.¹⁹ In 1914 his successors were still clearing remnant patches of bush, tall shrubs and tussock grasses; they were still in need of a cutting

15 Rebecca William and Les Oxley, ‘The Geography of Inventiveness in the Primary Sector: Some Initial Results for New Zealand, 1880–1895’, *Australian Economic History Review* 56 (2016): 151–73; J. B. Condliffe, ‘The External Trade of New Zealand’, annexed to *New Zealand Official Year-book, 1915* (Wellington: Government Printer, 1915), www3.stats.govt.nz/New_Zealand_Official_Yearbooks/1915/NZOYB_1915.html, accessed 30 October 2019; Michael Roche, ‘International Food Regimes: New Zealand’s Place in the International Frozen Meat Trade, 1870–1935’, *Historical Geography* 27 (1999): 129–51.

16 John E. Martin, ‘Whither the Rural Working Class in Nineteenth-century New Zealand?’, *New Zealand Journal of History* 17 (1983): 21–32. Statistics reported by provincial district (Canterbury, Otago and Southland) include portions of high country and the relatively level wheat lands of North Canterbury, beyond our target region.

17 For references to studies of the large sheep runs and wheat estates, see John E. Martin, *The Forgotten Worker* (Wellington: Allen & Unwin, 1990); James Belich, *Replenishing the Earth: The Settler Revolution and the Rise of the Anglo-World, 1783–1939* (Oxford: Oxford University Press, 2009).

18 ‘Yorick’, George Jacksons, Mount Hyde, first prize essay, ‘Small Farming in Otago’, *Otago Witness*, 19 March 1881, 6.

19 ‘Chats’, *Otago Witness*, 25 September 1880, 6; Joseph Davidson diaries. ARC-0724. Hocken Collections.

edge for strenuous first-ploughing and the demanding mole-work of drainage. A frontier persisted over the entire span, fragmented and spotty, certainly not the moving line of settlement that fired popular imagination in North America.²⁰

Much of the low, hilly land brought under the plough in this half-century in Otago and Southland proved very productive, but the development of these acreages had been postponed because their cultivation required more years of labour, longer-term financing, collective works of drainage, public investment in railways and—the focus of this article—more effective equipment. The tempo of landscape change varied in response to the eager investments of Scots capital in the 1870s, a long depression in 1880–94, renewed investments in the mid-1890s and a briefer trough in 1908.²¹ From the late 1870s, start-up farms coexisted cheek by jowl with well-established estates, run-down or weed-infested properties, speculations and burnt-over land.

Pressure for both new land and new techniques for managing it were responses to the demand for meat and dairy products in the fast-growing industrial centres of Great Britain. The new settler might catch a crop of grain, sow enough oats to nourish the team and turnips enough to secure some cattle and sheep through a dry or cold season of scanty pasture, but much of the initial investment in ploughing was to ‘lay down grass’—that is, to replace the native vegetation with palatable, fast-growing ‘English grasses’, a task that would require renewal after 6 to 10 years. This marked a distinctive stage in what was later called ‘the grasslands revolution in New Zealand’.²²

In the annual routine, ploughing was interrupted only by extremes of cold or wet weather and by the compelling demands of the harvest (January and February), lambing (August) or shearing (November). At the Reid & Gray foundry, demand for harvesting equipment (reapers, binders, threshers) controlled the calendar of production, as is shown in Figure 1. In the off seasons, the firm manufactured iron fencing standards and tighteners, and stocked and sold wire for fencing. The same seasonal pressures governed flows of cash and credit on the farmers’ books, their scramble for information and the sociability they enjoyed at the ploughing match or the fair.

20 Frederick J. Turner, *The Frontier in American History* (New York: Henry Holt, 1921). The applicability of such a model is doubtful even for the US grasslands; for regional nuances see Donald W. Meinig, ‘Colonization of Wheatlands: Some Australian and American Comparisons’, *Australian Geographer* 7 (1959): 205–13; James C. Malin, *Winter Wheat in the Golden Belt of Kansas: A Study in Adaptation to Subhumid Geographical Environment* (Lawrence, KS: University of Kansas Press, 1944); Kenneth M. Sylvester, ‘Ecological Frontiers on the Grasslands of Kansas: Changes in Farm Scale and Crop Diversity’, *Journal of Economic History* 69 (2009): 1041–160.

21 For export volumes and prices, public investment and borrowing, see Condliffe, ‘External Trade’.

22 Tom Brooking and Eric Pawson, eds, *Seeds of Empire: The Environmental Transformation of New Zealand* (London: I. B. Taurus, 2011).

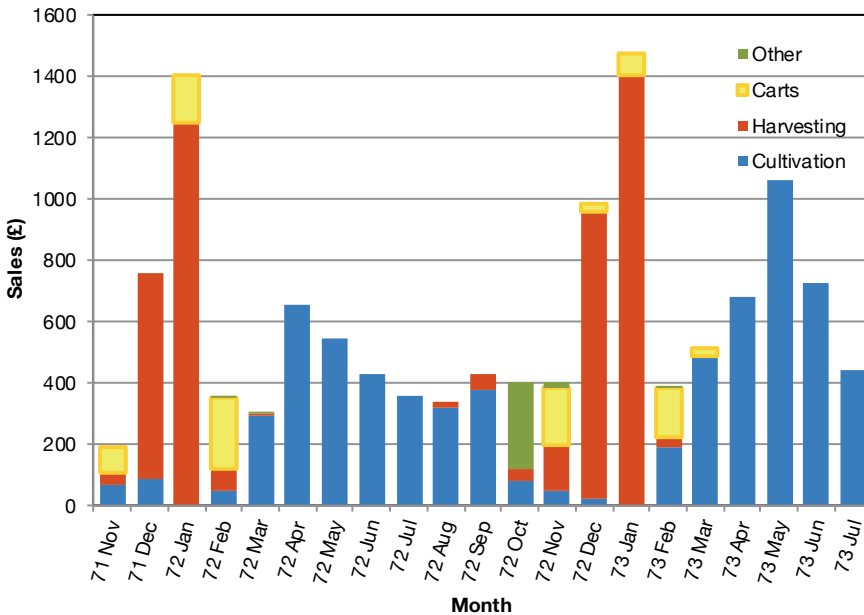


Figure 1: Reid & Gray sales (£ per month) 1871–73, by type of equipment.

Source: Reid & Gray Archive, Correspondence. Hocken Collections Uare Taoka o Hākena MS-1165/021.

The purpose of the ploughing match

‘The avowed and ostensible object’, asserted a commentator in 1865, ‘is to train a superior class of ploughmen and to encourage them to put mind into their work’.²³ The competition satisfied the additional needs of the community for sociability, the transmission of tradition and the evaluation of novelty. An excursion to the ploughing match will acquaint us with the capillaries of rural communications and the experimental approach required in a new world.

Competitions in this region were systematised in the 1860s under rules derived from Scottish and English matches promoted by late eighteenth-century ‘Improvers’. From 650 newspaper accounts we identified 50 communities for which the ‘fixture’ remained popular throughout the half-century, despite local lapses of several years. Each year the first challenge of the organising committee was to find a piece of land large enough for laying out 10 to 20 plots that constituted a comparable challenge, 50 on the Taieri, Otago, in 1871. They typically assigned a third of an acre (0.14 ha) to the entrant with a single-furrow plough drawn by 2 horses, twice that to the competitor with a double-furrow plough drawn by a 3-horse team, and all were

²³ *Bruce Herald*, 21 September 1865, 5.

expected to finish within a 6-hour limit. An 1865 advertisement for Pomahaka, south Otago, specified furrows 8½ inches (21.6 cm) wide and 4½ inches (11.4 cm) deep, 'and no help to be given after the first furrow'.²⁴

The Longbush Estate launched the Southland competition season in late June (the winter solstice), but most communities delayed several weeks to avoid interfering with ploughing their own farms. A timely start was often threatened by frost in the ground, leaving the crowd of onlookers restive to learn the results before dark and enjoy the celebratory dinner served by the local innkeeper. Even enthusiasts acknowledged 'the dull plodding routine',²⁵ and to distract from the tedium, informal races were 'extemporised'. 'Superior animals' were brought onto the ground for exhibition, and a nearby hunt club might be invited to set up jumps. A dance might follow the supper, but the ploughing match remained a very masculine activity and something of an initiation rite for sons.²⁶ The dinner began with 'the usual patriotic toasts' to the queen, the navy, the mayor and the society. The winners toasted the losers; the organisers toasted the judges. The best of the voices offered well-known songs, and the whole was 'full of good-humored banter and local allusions'.²⁷ Politics intruded, of course. 'Hints are sometimes dropped at the ploughing match which like seed corn, fall into some minds and bear fruit in after times'.²⁸ On the Taieri in 1876, Constable Clark collected a good many half-sovereigns owing for the dog tax; in 1909 the farmers of Timaru organised themselves on the spot to resist a manoeuvre of the threshers' union.

In addition to rewards for the skills displayed, there were prizes for the oldest participant and the youngest, or the award of a wedding cake to the handsomest contestant not yet married. In each province the champion match, with larger crowds and business sponsors from Christchurch, Dunedin or Invercargill, offered prizes 'such as to induce the presence of numerous ploughmen from remote agricultural districts, with whom it was almost impossible for local skill successfully to compete'.²⁹ The selection of judges from outside the district did not always succeed in restraining pride in place or family. In 1870 the Molyneux A & P Society in south Otago brought a court action against a contestant who, after he had been disqualified, 'detained' the Champion Belt with its silver buckle and engraved names.³⁰

24 *Bruce Herald*, 26 October 1865, 7.

25 *Lake Wakatipu Mail*, 11 September 1872, 3.

26 In the absence or disability of a husband, wives and daughters sometimes ploughed. At Timaru 2 prominent local farmers offered prizes for a ladies' competition, but the mothers of would-be contestants objected (*Timaru Herald*, 1 July 1913, 6). On associations of male privilege with plough agriculture, see Fred L. Pryor, 'The Invention of the Plow', *Comparative Studies in Society and History* 27 (1985): 727–43; Alesina Alberto, Paola Giuliano and Nathan Nunn, 'On the Origins of Gender Roles: Women and the Plough', *Quarterly Journal of Economics* 128 (2013): 469–530.

27 *Southland Times*, 1 June 1866, 2.

28 *Bruce Herald*, 21 September 1865, 5.

29 *Otago Witness*, 26 July 1867, 17.

30 *Bruce Herald*, 7 September 1870, 3.

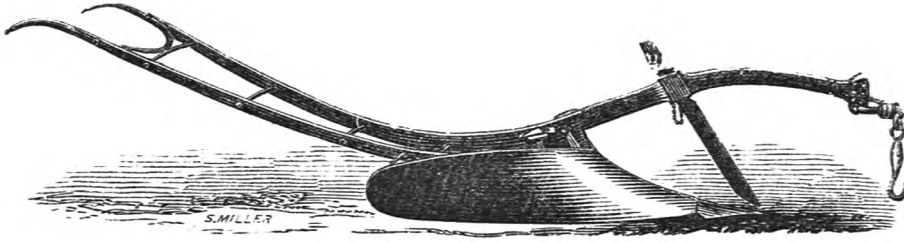


Figure 2: Single-furrow plough of 1862. The 2-horse plough displayed by John Gray of Uddingston in London, ‘strongly framed of wrought iron’, shows the knife-like coulter that made the vertical cut, the mouldboard curved to turn the slice, and at its tip the ploughshare that made the horizontal cut.

Source: The International Exhibition of 1862, 1:43. British Division, Class IX, No. 3: ‘can be used as a swing or wheel plough,—as swing plough, 95/-; as wheel plough, 102/6; with improved steel mouldboard, 7/6 extra’.

For his skill, a single individual might take several prizes: for his *fiering* (the setting of the first plough line), his masterly ins and outs, and his finish. The journalists competed in their critiques:

J. McRae’s *fiering* was rather too high. The angle of his work was not true, and the cut of his furrow was not clean, his coulter being set about two and a-half inches above the share. His furrows were well packed, but his last two were too high, and the last furrow was left too wide.³¹

Their judgements provoked responses from readers who proposed more elaborate regulations: ‘every man should enter the field with his coulter reversed, and not [be] allowed to touch a hammer until the signal is given for start’.³²

Awards for the best-matched or quietest team and the best-kept harness reflect the importance of the care and character of the horses. Southland took increasing pride in the breeding of Clydesdales for the world market, where the cavalryman and the urban street railway driver, like the frontier farmer, valued the ability of the horse to respond instantly to a variable load, its tolerance of uneven terrain and sharp turns, and its equine skill in negotiating obstacles. Compared with a yoke of bullocks or any of the available steam engines, draught horses were a farmer’s most mobile and manoeuvrable power source.³³

Conditions of weather, soils, drainage and terrain affected the competition. At Matura, Southland, in 1886 the junior class felt disadvantaged: ‘The young ploughmen had to wade through a bit of a swamp at the bottom of this dip, knee-deep

31 *Timaru Herald*, 10 August 1874, 3.

32 ‘A Ploughman’, *Bruce Herald*, 9 August 1866, 3.

33 Bullocks had gone from ploughing matches in the South Island by 1870. See Nigel E. Agar, *Behind the Plough: Agrarian Society in Nineteenth-century Hertfordshire* (Hatfield: University of Hertfordshire Press, 2005).

in water, and then ascend the face of a small but steep hill'.³⁴ Because the layout was intended to minimise such topographical variations and standardise the challenge, the outcome was a studied and artificial contest. From 1867 onward, objections were voiced: 'The ploughing that is done at many matches is not in accordance with every-day work, and is therefore not a fair criterion of the ploughman's skill'.³⁵ For some, the round and round 'plain ploughing' of ordinary farm work 'was thought of more highly than high cut or fancy ploughing by reason of the fact that with it there is no ridge left in the bottom of the furrow, and the soil is opened up to the influence of sun and air'.³⁶

The environmental variability that interfered with a match was in fact the source of problems in everyday practical ploughing as well, and the stubborn survival of the match is evidence of the lifelong learning process in which farming communities were engaged. The competition promoted attentive observation of the animal, the actor, the implement, the weather and the soil. For the farming entrepreneur who was selecting a piece of land, remaking a landscape, or trying to extract sufficient profit to pay off debt, these were vital habits.

Improving the plough

As an arena for competition among plough-makers, the match spurred innovation to make ploughing faster and less strenuous for ploughmen and horses alike. Local blacksmiths competed in matches of the 1860s and 1870s, and from their experience in repairs, adjustments and management of horses, made improvements; some took out patents, some purchased foreign rights, some ignored them. Reid and Gray formed their partnership at precisely the moment when, in the South Island as well as England and Scotland, foundries and small factories were taking over the role of producing the implement. Their promotion of the double-furrow model, their attention to its vexed licensing context, and their keen presence at ploughing matches were consistent with practices of the parent Uddingston firm that had made a speciality of setting ploughs for competitions.³⁷ At the 1872 match

34 *Southland Times*, 15 July 1886, 3.

35 'Agricola', *Otago Witness*, 15 March 1911, 6.

36 *Timaru Herald*, 26 August 1910, 6.

37 John Gray of Uddingston had been forced to compensate Thomas Pirie of Aberdeenshire for patent infringement and had claimed further improvements; see Heather Holmes, 'A Relationship to Deliver Agricultural Innovation in Scotland: Thomas Pirie, George Greig and John Fowler & Co., 1869–1884', *Scottish Business and Industrial History* 30 (2015): 42–72. The horse-drawn ploughs advertised by Gray in Scotland and by Reid & Gray in Oamaru were identically fitted that year with malleable steel shares and circular steel coulter: *North Otago Times*, 25 March 1870, 2, and 20 May 1870, 2. James Gray had reached the status of engineer in the Uddingston ironworks, where Reid also had gained experience. *North British Agriculturist*, 19 July 1893, as reprinted in the *Otago Witness*, 17 August 1893, 8.

in Oamaru, Reid & Gray had made all the ploughs in the double-furrow class, and 'as those gentlemen were on the ground examining the practical working of their implements, it may safely be inferred that other improvements will yet be effected'.³⁸

By 1874, many of the double-furrows entered in matches across the southern South Island carried the Reid & Gray label, while most of the single-furrow, wheeled ploughs were imports from George Ponton of Linlithgow, West Lothian, or assembled 'with a good few imitations and parts of local manufacture'. The trend in sales, as shown in Table 1, confirms their success in promoting an implement that would cut a broader swath. Replacing the single- with the double-furrow required double the initial outlay and a larger team to draw it, but by doubling the output of the driver saved its cost in 5 or 6 weeks.³⁹

Table 1: Numbers of ploughs sold by size and type 1911, 1914 and 1917.

	Numbers sold (n)			Percentage		
	1911	1914	1917	1911	1914	1917
Single-furrow	171	260	113	16.9	25.0	20.3
Double-furrow	476	422	180	47.1	40.7	32.3
Three-furrow	123	137	88	12.2	13.2	15.8
Four- or five-furrow	4	1	24	0.4	0.1	4.3
Hillside plough	61	74	26	6.0	7.1	4.7
Drill or swamp plough or subsoiler	90	68	45	8.9	6.6	8.1
Cultivator & other	86	76	82	8.5	7.3	14.7
Sum	1,011	1,038	558	100.0	100.0	100.0
Disc ploughs (included above)	94	84	29	9.3	8.1	5.2

Source: Reid & Gray Archive. Hocken Collections Uare Taoka o Hākena MS-1165/007.

The advantages of the wider plough would pay off only if the other 'desiderata' were achieved: greater strength and reliability of the implement, along with lighter weight and ease of manoeuvre. To marry these contradictory properties would require, as will be explained further, access by the manufacturer to improved materials. While the horse-drawn plough could last many years, it required frequent sharpening, repair and replacement of parts broken by stones and stumps, and the double-furrow was even more vulnerable. A 14-year-old ploughboy in 1906 described his latest trip to the blacksmith: 'About once a week I break the plough, I have just come back from Ranfurly to-night.'⁴⁰

³⁸ *North Otago Times*, 3 September 1872, 2.

³⁹ *North Otago Times*, 25 March 1870, 2, citing John Gray of Glasgow to a Oamaru correspondent, presumably Gray or Reid. Prices according to breadth (per 'furrow') at £10, £20 and £30 from Reid & Gray Day Book, 1871 to 1873. MS-1165/008. Hocken Collections. As in Britain, improvements in the strength and reliability of the plough were not accompanied by detectable increases in price. See Brunt, 'Mechanical Innovation'; Wray Vamplew, 'The Progress of Agricultural Mechanics: The Cost of Best Practice in the Mid Nineteenth Century', *Tools and Tillage* 3 (1980): 204–14.

⁴⁰ 'Oscar Wilde' (pseud.), 'Letters from Little Folk', *Otago Witness*, 24 October 1906, 74.

Competition with importers and local smiths demanded continual innovation. The partners maintained their licences for the Uddingston models and produced a stream of patents of their own. About 1880 they introduced the equalising chain yoke, decisive for working a team larger than 2, and in 1890 a new lever for control of depth of furrow.⁴¹ Over 30 years the firm registered 45 patents, including shares and points of ‘unbreakable steel’. They spent more on the patent process than any other enterprise in the colony.⁴²

Although the steam-powered plough was much discussed, it did not show up at the local matches.⁴³ The British-made Fowler No. 1, which resembled a system of 2 small locomotives, was steadily advertised in New Zealand from the 1850s, and several large landowners acquired it. Gray’s first assignment in New Zealand, in 1868, had been a contract on the Morton Mains estate, Southland, where he delivered and operated a steam plough whose assembly he had supervised in the Uddingston plant, according to Fowler’s patents, under contract with Fowler, and powered by a 20 hp Aveling & Porter engine.⁴⁴ By 1885 the ‘hissing monster’ at Morton Mains was rusting behind a screen of long grass, a ‘relic of a time when the wealth of the City of Glasgow was poured out over these plains with the lavishness of gold digging times’.⁴⁵ The £600 steam plough would exceed by 40 per cent a small farmer’s entire start-up lump estimated in Table 2. The plough scaled to the family farm was the Reid & Gray double-furrow, at £20.

41 B. L. Evans, *A History of Farm Implements and Implement Firms in New Zealand* (Feilding: privately published, 1956), 8; *The Press* (Christchurch), 10 November 1899, 9.

42 Matthew Gibbons, ‘Patenting in Nineteenth Century New Zealand: An Economic and Historical Analysis’ (MMS diss., University of Waikato, 2016), 101 and 103; ‘Annual Reports of the Registrar of Patents, 1880–1911’, in *Appendix to Journals of the House of Representatives*, series H–10, atojs.natlib.govt.nz, accessed 30 October 2019.

43 An exception, J. Withell exhibited a steam plough he had recently imported: *Timaru Herald*, 25 July 1910, 2. On the limitations of steam ploughing elsewhere, see Michael R. Lane, *The Story of the Steam Plough Works: Fowlers of Leeds* (London: Northgate, 1980); Annie Tindley and Andrew Wodehouse, ‘The Role of Social Networks in Agricultural Innovation: The Sutherland Reclamations and the Fowler Steam Plough, c.1855–c.1885’, *Rural History* 25 (2014): 203–22.

44 *Southland Times*, 12 May 1863, 2; 7 August 1864, 2; 26 December 1866, 2; 4 January 1867, 3; *Otago Daily Times*, 11 November 1868, 3. Holmes & Co. was one of 18 Scottish firms amalgamated as the New Zealand and Australian Land Company. For the simultaneity and logic of John Gray’s push into colonial markets for the horse-drawn double-furrow and Fowler’s push for the steam plough in foreign markets (France, Egypt and Algeria) see Holmes, ‘A Relationship’, 61.

45 *Southland Times*, 31 December 1872; *Otago Witness*, 16 November 1878, 4, and 10 September 1881, 7; *Otago Witness*, 20 June 1885, 12. See also Kevin Tennent, ‘Management and the Free-Standing Company: The New Zealand and Australia Land Company c. 1866–1900’, *Journal of Imperial and Commonwealth History* 41 (2013): 84.

Table 2: Estimates of start-up investment for a small farm, 1881.

Recommendation of	Murray	Agricola		Grigg	
	£	£	s	£	s
Double-furrow plough		18	0	18	
Set of swingle trees			15		
Harrows, 4 leaves			15	10	
Dray		8	0	20	
Bars – one for 4 leaves, one for 3 leaves			12		
Subtotal plough, harrows & dray	45	66	2	48	
Team of 3 horses	100*	120	0	90	
Harness for 3 horses, plough & cart		7	14	20	
Oaten chaff, 1 ton		2	10	15	
Chaffcutter	13			7	
Roller		5	0	20	
Horse-hoe with scarifier, drill, rake				45	15
Subtotal implements & team	158	211	6	245	15
Rent of land	40				
House and outbuildings	60				
Fencing material	45				
Sheep	25			7	10
Cows, pigs & poultry	20			125	
Seed	12			34	
Total capital	518	440	15	702	0

'Agricola' proposed his own design—'about the size and weight of a wheelbarrow'—for a wheeled plough with attachments for hoeing, grubbing and lifting potatoes.

* Harness included

Sources: J. U. Murray, 'Small Farms Prize Essays', *Otago Witness*, 26 April 1881, 6, and 'Agricola', *Otago Witness*, 23 and 30 April 1881, 7; 'Address of John Grigg', *Ashburton Herald*, 23 June 1880, 2.

In the mid-1890s, as more favourable commodity prices hastened the speculative subdivision of great estates into family-size enterprises, purchasers of land pressed for ploughs that could operate on steep hillsides, turn without bogging or capsizing, cut into matted wetland vegetation, or burrow through heavy clay.⁴⁶ Reid & Gray was already offering hillside ploughs and ploughs 'convertible into diggers', able to give the roots 'access to the whole strength of the soil'.⁴⁷ At Wairio in western Southland, the heavy work of ploughing drains had required a team of 18 horses, but farmers

46 J. D. Gould, 'Pasture formation and improvement in New Zealand, 1871–1911', *Australian Economic History Review* 16, no. 1 (March 1976): 1–22.

47 'Yorick', *Otago Witness*, 19 March 1881, 6.

reported in 1897 that the improvements had reduced that to 12: 'All the farmers go in for draining their land with it, and crops they were satisfied with before the drain plough came in, they would scarcely think worthwhile cutting now'.⁴⁸

None of those features was entirely new. The eighteenth-century improvers in England and Scotland had urged deeper ploughing, reshaped the mouldboard on physical principles and introduced the dynamometer to measure draught.⁴⁹ Each new type of plough had emerged in a different agricultural region—in response to the 'sticky soils of Essex', the 'stiff tenacious clays' of East Lothian, or the boulder-strewn slopes elsewhere in Scotland. Liam Brunt has documented a slow diffusion across Great Britain of improvements first adopted in local centres, and by the 1850s many models were available as off-the-shelf factory products both there and in North America.⁵⁰

Despite the increasing range of options, farmers on successive agricultural frontiers—the Shenandoah Valley in the 1820s, bottomlands along the Ohio and Mississippi Rivers in the 1850s and wetlands of the South Island of New Zealand in the 1870s—resisted the wider and heavier deep-cutting plough. Satisfied with a shallow first ploughing of the top 3 or 4 inches, they left it to the next generation to deepen the ploughed layer to 5 or 6 inches.⁵¹ Each advance of the technical frontier—stronger beam or lighter draught—opened more land to levelling, draining and cropping; each advance of the geographical frontier imposed a new test of the implement and another round of experiment and adaptation.

A manufacturer's pitch

How South Island manufacturers and importers promoted their wares provides evidence of feedback of economically important information to manufacturers. Reid & Gray, in addition to the competitions among ploughmen, arranged demonstrations with rival implements and 'trials in motion' at the annual A & P shows. Like so many of their customers in Otago and Southland, the 2 men were offspring of 'agricultural improvement' and 'industrial enlightenment' in their Scots

48 *Southland Times*, 1 August 1890, 3.

49 G. E. Fussell, *The Farmer's Tools, 1500–1900* (London: A. Melrose, 1952).

50 H. Stephens, 'The Yester Deep Land Culture', *Journal of Agriculture* (Edinburgh), new series 52 (July 1855): 1–16; Liam Brunt, 'Mechanical Innovation in the Industrial Revolution: The Case of Plough Design', *Economic History Review* 56 (2003): 444–77; J. A. Symon, *Scottish Farming, Past and Present* (Edinburgh: Oliver & Boyd, 1959); Heather Holmes, 'A Neglected Innovation: The Double-Furrow Plough in Scotland, Its Early Adoption and Use, 1867 to 1880', *Agricultural History Review* 64 (2016): 54–80; Heather Holmes, 'Agricultural Implement Makers in Scotland during the Late Nineteenth and Early Twentieth Centuries', *Folk Life* 51 (2013): 44–74.

51 Steven Stoll, *Larding the Earth: Soil and Society in Nineteenth-Century America* (New York: Hill and Wang, 2002); C. H. Danhof, 'The Tools and Implements of Agriculture', *Agricultural History* 46 (1972): 81–90; Leo Rogin, *The Introduction of Farm Machinery in its Relation to the Productivity of Labor in the Agriculture of the United States during the Nineteenth Century* (Berkeley, CA: University of California Press, 1931).

versions.⁵² Gray's grandfather in Uddingston had entered his implements in the highly rated display of the Highland and Agricultural Society of Scotland in 1803; James' father obtained a prize medal at the Crystal Palace exhibition of 1851 and displayed 9 machines at the International Exhibition of 1862 in London. These competitions were reported with handsome lithographs in the most prestigious farm journals. Although we consider only one class of implements and draw on the records of a single manufacturer, the selling points resonated with farmers across the South Island and were reported to British and US competitors by their commercial agents.

The marketing ploys apparent from regional news coverage of A & P shows were of 3 types. First, the year's new and improved plough was touted for its combination of greater strength and lighter weight—the properties so often mentioned by judges at matches. The second virtue on offer was reliability. Since each farmer wanted to minimise downtime (and the number of trips to Ranfurly or Ashburton), Reid & Gray cultivated a reputation for prompt replacements for worn or damaged parts, and 'for a few pounds' the company would rebuild an implement and install the latest features. British manufacturers had created the image of the durable tool that looked the part: brand name and trademarks, a rugged, heavy-duty machine, traditional in style and highly finished (see Figure 3). Reid & Gray imported implements and parts from reputable suppliers and, consistent with the practice of other firms, they contracted to place their own name on the imported item: 'Tyzack's knives to be branded Reid & Gray No 13T'. On an order for manganese steel plough points they specified: 'We want our initials, R & G as well as the letter M cast in'. To Bamford & Sons of Uttoxeter they wrote: 'Will only place order if company removes its name from all parts.'⁵³ In 1912, to give prominence to the name and stylishness of their prizewinning ploughs in their annual catalogues Gray contracted for electrotype printing blocks with the London engraver P. Naumann.⁵⁴

52 Joel Mokyr, *The Gifts of Athena* (Princeton, NJ: Princeton University Press, 2002), 51 and 34–7; Gwyn E. Jones, 'The Diffusion of Agricultural Innovations', *Journal of Agricultural Economics* 15 (1962): 387–409.

53 Reid & Gray archive, Order Book 1914–1915. MS-1165/003. Hocken Collections. They made a similar demand of Chicopee hillside ploughs (shipped 12 July 1912). To obtain the loyalty of its rural clients, the firm sought licences for other implements: Bamford's mowers, saw blades from Spear & Jackson, threshers, windmills, pumps, and Swedish separators, all with the Reid & Gray nameplate. The same practices are well documented in Winder, *American Reaper*, 37–63.

54 Peter W. Sinnema, *Dynamics of the Pictured Page: Representing the Nation in the Illustrated London News* (Brookfield, VA: Routledge, 1998).

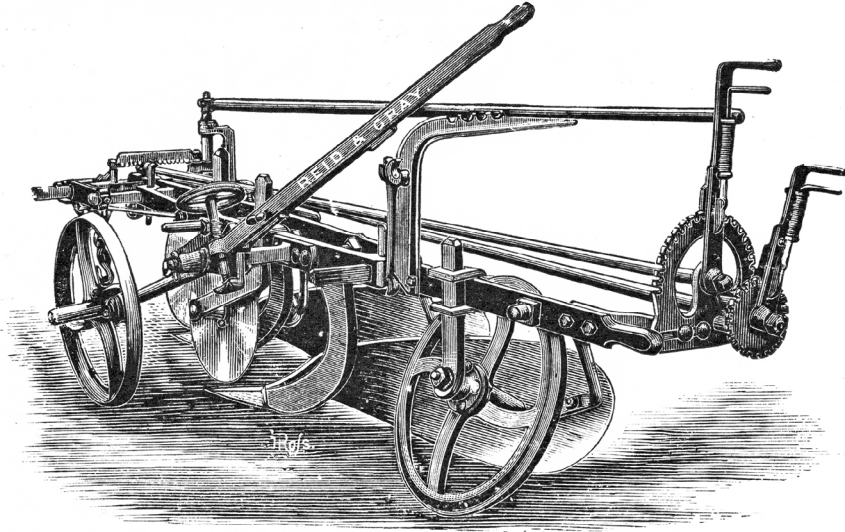


Figure 3: The Reid & Gray double-furrow plough. The 1901 catalogue featured the 'Champion' at £21, with circular coulter, 6 steel shares and Gray's patent steering gear: 'Simple, perfect, and easy to manipulate, it is just the plough that a ploughman who takes a pride in his work would like to handle.'

Source: Reid & Gray Limited 1901 catalogue. Hocken Collections Uare Taoka o Hākena MS-1164/045.

In contrast with the broad appeals of strength and reliability, the third advertising pitch was differentiated to assert a tailoring of the product to a particular market. From the first moment, Reid & Gray had framed their implements as right for New Zealand seasons and soils. In 1873, their 'colonial-made ploughs held their own' with the imported makes, and 5 years later they were still emphasising 'a strength suited for rough and new country'.⁵⁵ They reasserted the distinction into the 1920s, and indeed, Juan Homs, scouting for business opportunities for the US Department of Commerce at the end of the First World War, accepted the argument, reporting that New Zealand soils were 'not easy to plow'. New Zealand farmers, Homs was told, were willing to pay more for locally made implements, and the ploughs on sale were 'made to withstand very severe usage, with strength and simplicity, and no others in proportion to weight have so few parts'.⁵⁶

At the turn of the century, competing manufacturers were employing this strategy for a wider array of implements. In Invercargill, James Macalister advertised his swamp plough as 'made specially for the requirements of Southland',⁵⁷ and Marshall's, a British firm long reputed for its steam engines, emphasised its 'great

55 *The Press*, 14 November 1873, supplement, 5; *Otago Witness*, 23 November 1878, 21.

56 Juan Homs, *Agricultural Implements and Machinery in Australia and New Zealand* (Washington, DC: Government Printing Office, 1919), 177 and 179.

57 *The Press*, 10 November 1899, 9.

solicitude in studying colonial requirements' for tolerance of inferior fuels.⁵⁸ A Canadian manufacturer offered a knife harrow heavier than for its domestic market, and Osborne's of Auburn, New York, redesigned its disc harrow with sand-proof bearings and a flexible head that would permit the gangs to rise independently over stumps and stones.⁵⁹

Successful on frontier land, Reid & Gray at the same time proposed lighter models to work previously ploughed land already under lea or stubble. Bolt-on attachments adapted the implement for boring drains, and easy removal of the second share was advantageous for working a small team or a small field. The firm extended its offerings to suit any size of purse. In addition to the smaller start-up farms and the well-established estates able to undertake frequent upgrades of equipment, the company targeted a third clientele of increasing importance—the local contractor with a mobile outfit. By 1910, farmers such as Alec Davidson (Joseph's son) found it advantageous to hire an independent contractor for a few days a year. Such an outfit, with local clients, local workers, and a 10 hp steam engine, travelling within the radius of a county (15–25 km), could keep busy 7 to 9 months a year by ploughing in one season, harvesting and threshing in another.⁶⁰

The large and small landholders polarised politics and continue to orient historical accounts, but their activities were often complementary. Many holders of small properties went contracting or cropping for several years to finance their own land purchases, and corporate owners, as they moved toward subdivision and speculative resale, contracted to such enterprises the first-ploughing and laying down in grass. On the Morton Mains estate in the winter of 1878–79—a decade after the initial venture with Gray's steam plough—the New Zealand and Australian Land Company was again breaking up land to bring into cultivation 8,000 acres more, and all the ploughing was performed by contract teams with draught horses hauling double-furrows purchased from Reid & Gray.⁶¹

To reach so diverse a market, Reid & Gray proposed implements of all sizes and for all local preferences: for 3 subregions, 3 models of its popular double-furrow. 'A plough that suits a Southland farmer would not be given yardroom by a Canterbury man, and vice versa'.⁶² One size did not fit all; the implement had to be calibrated to local conditions, again and again redesigned and rebuilt.

58 *Otago Witness*, 3 December 1891, 16; 30 November 1899, 21; 5 December 1900, 16.

59 *Otago Witness*, 30 Nov 1904, 25; 29 November 1905, 26.

60 To power threshers and other barn equipment, Reid & Gray promoted Clayton & Shuttleworth steam engines made in Lincoln, England: 1 or 1½ hp for the small farm, 8 or 10 hp for a contractor. For examples of contract enterprise in several counties, see *Otago Witness*, 3 May 1911, 39. Martin, *The Forgotten Worker*, estimates the transition substantially reduced dependence on itinerant labour: 3f., 109, 136. On lifestyles in contract work, see Miles Fairburn, *Nearly Out of Heart & Home: The Puzzle of a Colonial Labourer's Diary* (Auckland: Auckland University Press, 1995), 74–91.

61 William Solter Davidson, *Notes Describing the Freehold Lands Offered for Sale by the New Zealand and Australian Land Company Limited* (Edinburgh: Muir and Paterson, 1880), 40 and 13–19.

62 *Otago Witness*, 23 November 1878, 21.

The incremental process involved many people at various stages of production. In each new situation, the need to test and tinker promoted talk along the production and marketing chain. In 1882, for instance, Reid & Gray adapted a double-furrow for planting potatoes and showed it off at Cave Valley (North Otago); the farmer who bought it made further alterations which Reid & Gray promptly introduced into its manufacture.⁶³ The same year, the foundry gave advice on preventing breakage of a connecting-rod via the 'Queries' column in the *Otago Witness* to a farmer in the Clutha Valley.⁶⁴ In July 1911, when Reid & Gray ploughs failed to take a single prize in a match held in Nelson Province, the local agent suggested the replacement of single-leaf with double-leaf springs. To the British engine manufacturer Burrell, the Dunedin manager wrote: 'We attach herewith copy of letter from our Ashburton manager re crank shafts and new main axle breaking. This district is in the centre of the Canterbury Plains and therefore no hills or rough country to negotiate. Can you give any cause for such breakages?'⁶⁵ Competitors of Reid & Gray were likewise providing feedback to their suppliers. In Christchurch, Andrews & Beaven, as agents for Blackstone, insisted that the British manufacturer reduce the weight of its portable engine to make it 'as handy as possible for getting about on the average New Zealand roads'.⁶⁶ Through close observation at trials, shows and matches, and person-to-person commentary, the farmers of southern New Zealand were making themselves heard.

The edge and the twist

Progressive substitution of iron for wood, steel for iron, and the development of tough edges for ploughshares required a half-century of experimentation with a wide range of metals. The critical innovations emerged from interactions in the network of agents and suppliers displayed in Figure 4 from order books of the firm. In a network of this kind, any transaction may reinforce, redirect or extend the dynamic structure, and the company's agents were surveying a worldwide array of possibilities. The pattern was nevertheless remarkably stable. The structure is derived from what appear to be complete entries for the years 1911–24, but import notices for 1871–74 and letter books for 1878–1910 confirm loyalty to many of the same suppliers from the start.⁶⁷

63 *Otago Witness*, 21 October 1882, 7.

64 *Otago Witness*, 25 March 1882, 17. This concerned a reaper made obsolete by Reid & Gray's new model.

65 Reid & Gray archive, Order for parts for 7 hp steam engine.

66 Andrews & Beaven, see *Progress*, 1 May 1908, 6; other competing foundries, P. & D. Duncan, *Oamaru Mail* 20 November 1879, 2; Haxton & Beattie, *Otago Witness*, 25 June 1881, 7; A. & T. Burt, *Otago Witness*, 26 April 1894, 35, and *Progress*, 1 February 1906, 10, and 1 November 1906, 10. Each occupied a distinctive manufacturing niche, acted as agent for a different array of imports, but depended on many of the same suppliers for the edge and the twist.

67 Among them Nettlefold for screws, Harper (Aberdeen) for keys and fence strainers, and Jackson & Turner (Glasgow) for spring steel. Order book for year beginning 20 March 1882. MS-1165/006. Hocken Collections.

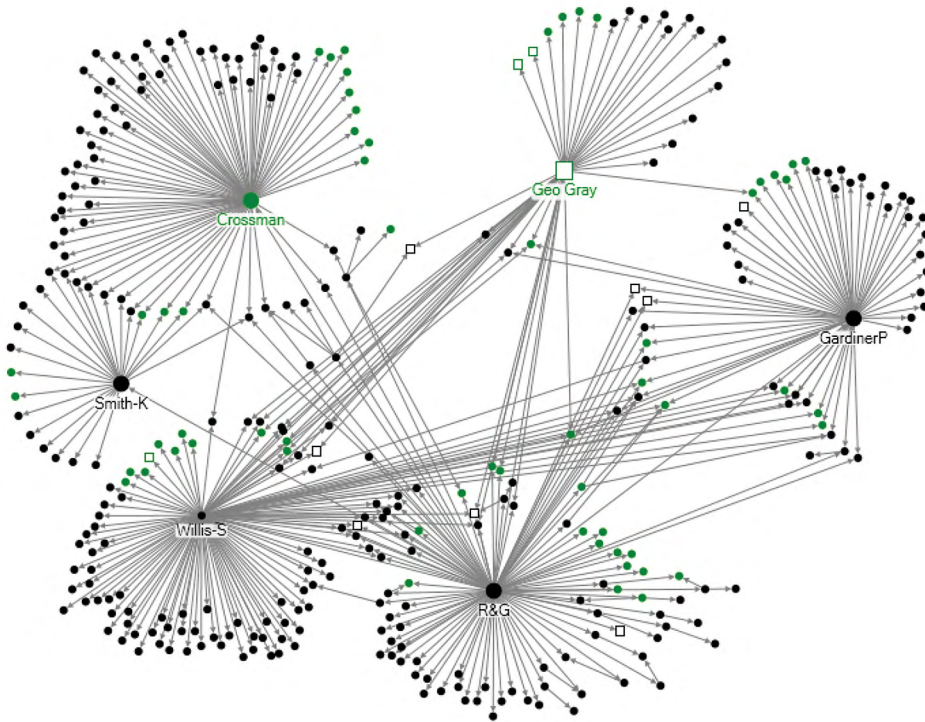


Figure 4: Reid & Gray addresses its supply network, 1911–14. Reid & Gray ordered directly from 30 firms and addressed 300 others through key agents. The open squares represent sites in Scotland. Shown in green are suppliers of edges and twists, most of them located in Sheffield.

Source: Reid & Gray Archive, Order books 1911 (last quarter) – 1914. Hocken Collections Uare Taoka o Hākena MS-1165/003. Created by the authors using NodeXL.

Table 3: Numbers of Reid & Gray orders by year and by geographical region.

	1912	1913	1914	1915	1916	1924	Sum (n)	Sum (%)
Australasia	1	1	3	7	1	8	21	1.7
England	127	125	154	133	50	151	740	60.3
Scotland	12	11	14	19	5	20	81	6.6
Europe	7	10	6	6	5	13	47	3.8
North America	35	43	45	38	25	39	225	18.3
Other	3	1		3	1	5	13	1.1
Unknown	17	21	16	19	8	20	101	8.2
Total	202	212	238	225	95	256	1228	100.0

Source: Reid & Gray Archive, Order books 1912–16 and 1924. Hocken Collections Uare Taoka o Hākena MS-1165/002–4.

Even during the First World War, the regional pattern of supply was maintained (Table 3). Correspondence indicates a wartime search for Canadian sources of steel, and for the set of tyres and inner tubes to suit Gray's own Crossley landau motor car: 'any make except German'. As late as 18 February 1916, letters to the London agent Patrick Gardiner anticipated a quick end to the war, but British suppliers were already caught up in the rising sense of urgency and conversion to a demanding and lucrative armaments industry,⁶⁸ and subsequent letters reflect further adjustments to a wartime 'stiffening of prices' and postwar inflation.

More important in terms of the intrusion of novelty into South Island farming were progressive shifts in the metallurgy. The technological changes can most easily be understood by distinguishing 3 types of purchases, each of which presented a distinct challenge to the company's business strategy: entire machines and engines, the supply of pig iron and bulk steel for castings, and—most demanding—critical parts made of high-quality, high-priced 'special steels'.

Entire machines

When first established, Reid & Gray imported entire machines as well as equipment for their own workshop. We have found no details of the initial financing, but they equipped and re-equipped the foundry with the best, imported mainly from Britain or made by themselves: a British-made cupola furnace for melting iron, a screw-cutting lathe, planing and slotting machines, and an American-made tilt hammer.⁶⁹ The initial investments, the patents they advertised and James Gray's reliance on his older brother George as a purchasing agent resident near Glasgow all point to traditional practices of Scottish and English family firms whose face-to-face information networks were so effective in a trading world of custom design and purchase on credit.⁷⁰ Throughout the half-century, the kinship network underpinned the financial security of the firm and its geographic reach. This was the model initiated by the banks, land and mortgage companies, and the stock and station agencies whose networks Simon Ville has described as stretching between Great Britain and Australasia.⁷¹ As brokers of wool and other farm products, the station agencies were also formidable competitors as importers of farm equipment, well positioned in the local sales network displayed in Figure 5.

68 Notably bayonet steel, and Vickers, producing Maxim guns.

69 The 1872 fire loss was estimated at £3,500 (*North Otago Times*, 22 October 1872, 2). For published accounts of the scale and equipment of the plant, see *Otago Witness*, 4 December 1875, 5; 3 August 1878, 3; 23 November 1878, 6; 18 May 1883, 6; 20 November 1878, 8; 25 January 1894, 18; *Otago Daily Times*, 9 January 1900, 12.

70 Robert J. Morris, *Men, Women and Property in England, 1780–1870: A Social and Economic History of Family Strategies Amongst the Leeds Middle Classes* (Cambridge: Cambridge University Press, 2005); Jim McAloon, 'Scots, Networks and the Colonial Economy: The Nineteenth-century Business relationships of Sanderson & Murray of Galashiels and Murray, Roberts & Co. of Dunedin', *Immigrants and Minorities* 29, no. 3 (2011): 243–63.

71 Simon Ville, *The Rural Entrepreneurs: A History of the Stock and Station Agent Industry* (Cambridge: Cambridge University Press, 2000); Simon Ville, "'Making Connections": Insights into Relationship Marketing from the Australian Stock and Station Industry', *Enterprise and Society* 10 (2009): 423–48.

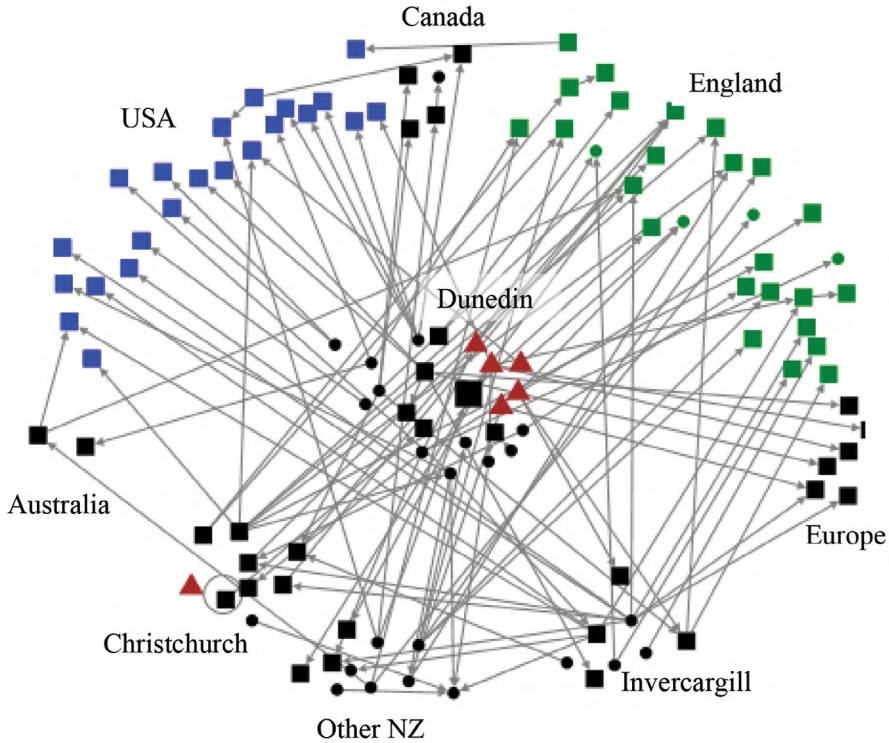


Figure 5: Network of firms competing with Reid & Gray in 1906. Shown are 112 relationships of agency authorised for import or representation of a manufacturer to landholders in the South Island for purchase of ploughs, reapers and other large machines. Red triangles identify the stock and station agencies, blue squares US manufacturers, green squares British manufacturers.

Sources: Advertisements and journalists' accounts of Agricultural & Pastoral Shows, from *Otago Witness*, *The Press* (Christchurch), and *Southland Times* (Invercargill).

Gardiner, an agent operating from London and Glasgow, brokered the purchases of Reid & Gray with the British engine manufacturers: Charles Burrell & Sons for steam traction engines, Clayton & Shuttleworth for threshing mills and Richard Hornsby & Sons for oil engines. In New York City, Crossman & Sielcken handled a wider array of transactions with select North American manufacturers of pumps, windmills and dairy equipment.

Throughout the history of the firm, Reid & Gray imported more (by value) than they manufactured; their own lines were carefully targeted, and important elements in the value added were selection, testing, the guarantee and service. Engines and farm implements could be imported from Britain and Victoria, Australia, free of duty, while the implement manufacturer in the colony was perennially threatened with a tariff (c. 15 per cent) on raw materials and parts. In July 1877, Reid & Gray mobilised a torchlight demonstration against the tariff by the 600 iron workers

of Dunedin.⁷² About 1886 the firm abandoned the manufacture of the American-style reaper–binder they had patented and shown with pride in 1878.⁷³ The tariff issue resurfaced in 1898 and 1906.⁷⁴

Raw materials

The need to import basic materials set limits to the import substitution strategy, and rendered the firm vulnerable to shifts in the scale, scope and control of steel making in Scotland, England and the United States.⁷⁵ Steelmakers in the British Midlands and the United States were developing processes for high-volume continuous production of bulk steel. The well-known coke-fuelled processes initiated in Britain in the 1860s (Bessemer and Siemens–Martin open-hearth) yielded a material of great strength (primarily in compression and tension), but variable and relatively brittle. It required 15 years of experimentation to obtain a reliably uniform product that would replace wrought iron. Control of the dosage of carbon was critical to the response to subsequent operations of heating and cooling, rolling or drawing.⁷⁶ British and German techniques were adapted in the United States through moves by workers and entrepreneurs, purchases of patent rights and experimentation with a wider range of ores and fuels, so that by 1900 the economies of scale of taller furnaces operating at higher temperatures had cut the cost of bulk steel by half and fostered the emergence of the powerful ‘Big Steel’ monopoly in markets for rolled steel, wire and nails.⁷⁷

72 *Otago Witness*, 21 July 1877, 1; *Thames Advertiser*, 6 August 1877, 3; *Otago Witness*, 11 August 1877, 5; *Otago Daily Times*, 27 August 1877, 2.

73 Early models in 1869 were ‘winning high encomium’ (*North Otago Times*, 26 February 1869, 2; 14 November 1871, 2); a reaper was heavily promoted in November 1874; the ‘extraordinary feat’ of matching the American combine was achieved with a reaper–binder, ‘every part of which was made in Dunedin’ (*Otago Daily Times*, 18 February 1878, 2; 1 March, 2; 27 August, 2). By 1881 they had sold 2,200 reapers, as well as 5,000 of the double-furrow ploughs. Reimposition of charges contributed to the firm’s abandonment of the manufacture of reapers in the mid-1880s, and subsequently of threshers; they became agents for Mercer in 1891 and for Deering in 1896. On the impact of the trust in Australasia, see *Progress*, 1 November 1905, 14; on the international context, see Winder, *The American Reaper*, 12.

74 The competing foundries were quick to collaborate on the tariff issue, wage policies and debt collection, but slow to negotiate trust agreements. The merger of McCormick and Deering stirred proposals for the amalgamation of local firms (*Lyttelton Times*, 7 February 1903, 7), and aggressive marketing by the North American harvester trust in 1905–6 coincided with the arbitration of moulders’ wages in Dunedin and Christchurch. On 23 September 1910, Booth MacDonald again proposed amalgamation to the 4 others; Reid & Gray rejected it (Reid & Gray correspondence. MS-1165/018. Hocken Collections).

75 Peter L. Payne, *Colvilles and the Scottish Steel Industry* (Oxford: Clarendon, 1979); T. S. Ashton, *Iron and Steel in the Industrial Revolution* (Manchester: Manchester University Press, 1924); Erickson, *British Industrialists*.

76 The qualities of steel are obtained from iron alloyed with 0.2 to 1.5 per cent carbon. For the lag in scientific understanding of what artisans were actually achieving, see C. S. Smith, ‘The Discovery of Carbon in Steel’, *Technology and Culture* 5 (1964): 149–75.

77 J. M. McFadden, ‘Monopoly in Barbed Wire: The Formation of the American Steel and Wire Company’, *Business History Review* 52 (1978): 465–89.



Figure 6: Reid & Gray plough seat, c. 1924. Castings such as this were made in Dunedin.

Source: Courtesy of Ozwrenches, 'New Zealand Showcase', ozwrenches.com.

Reid & Gray, from the outset, had imported pig iron, which they remelted in their own cupola furnace to produce iron castings in the shapes desired for a plough beam, mouldboard or plough seat, as shown in Figure 6.⁷⁸ For pig iron the firm gradually substituted bars of mild steel, which like pig iron had a very low carbon content (it is properly called iron) and was workable when cast.⁷⁹ Seeking always to keep 300 or 400 tons in stock, they favoured no single supplier, but relied on the month-to-month judgements of George Gray in Scotland and Willis, Sindall & Co., who specialised in the international iron trade, with headquarters in London and branch offices in New York City, Auckland, Melbourne and several Asian cities. Costs of shipping also fell by half over the period 1864–1914, but transport charges for material of such high unit weight encouraged recourse to the Tata smelter in Bengal from the moment it came into production in 1907.⁸⁰

78 Reports of the scale of operation are fragmentary: in 1877, 350 tons of pig iron per year (*Otago Witness*, 23 November 1878, 6); in 1894, 100 tons of cast chilled shares per year (*Otago Witness*, 25 January 1895, 18); in 1905, 400 tons of pig iron, 400 of bar iron and 100 of 'standard iron' (the last referring to iron for casting fencing standards).

79 Reid & Gray's order books employ a variety of terms, all referring to iron suitable for casting: Bessemer pig, hæmatite pig and Garstberrie pig, bevil iron, mild steel bars, and rolled steel bars.

80 E. A. V. Angier, *Fifty Year Freights* (London: Fairplay, 1920). Reid & Gray imports from Bengal were handled by Briscoe, an iron merchant with agencies in London, Wolverhampton, Melbourne, Sydney and Dunedin. Tata is now the world's largest steel company. Daniel R. Headrick, *The Tentacles of Progress: Technology Transfer in the Age of Imperialism, 1850–1940* (Oxford: Oxford University Press, 1988), 274–94.

Blades and bearings

Less obvious, but critical to the efficiency of the plough and central to the business trajectory of Reid & Gray, were smaller-volume suppliers of the higher-grade special steels that combined exceptional hardness with malleability. Every cutting edge needed at least a sheath or welded edge of hard metal: shares, coulter and points for the ploughs; knives and teeth for harrows and other instruments of cultivation. Like the ploughshares and knives, wearing parts subject to shear stress were liable to break: springs, hinges, pinions, spokes for wheels, axles and axle boxes, wire rope and crankshaft chains. It is this set of parts—the cutting edge and the twist—that best reflect the impact of international advances in steel making on the landscape of enterprise in the South Island.

In the early 1870s, Reid & Gray could recover in Oamaru or Dunedin scrap iron with the desired low carbon content and good uniformity, such that it could be reworked for ploughshares. They welded worn-out saw blades, for example, originally of wrought iron, to a core of softer iron for a hard-edged, self-scouring ploughshare. Demand soon exceeded the local supply of scrap, and because there were no sources in Australasia, Reid & Gray, like the American arsenals during their civil war (1861–65), ordered the edge and the twist from the Sheffield manufacturers shown in Table 4.

Table 4: Sheffield suppliers to Reid & Gray, 1912–24, by types of goods.

Supplier	Principal items	Agent	Orders (n)
S. Osborne & Co.	Spring steel, highspeed drills, reamers	Gray, Willis S.	39
Tyzack & Turner	Knives, discs, nails, screws, springs	Willis Sindall	30
Ransom Sims & Jefferies	Engine parts, cast iron plough shares	P. Gardener	29
Tempered Steel Co.	Spiral tubes, springs, shares	Willis Sindall	26
Spear & Jackson (Etna)	Saw blades, coulters, discs, springs	direct	22
Ellin Footprint Works	Wrenches, hammers, spanners	P. Gardiner	10
Hadfields Steel Foundry	Manganese steel bars, shares & points	G. Gray	5
Wardsend Steel & Co.	Steel mouldboards & plough plates	Willis Sindall	5
W. Cooke & Co.	Spoke iron & chilled plough shares	G. Gray	4
G. T. Skelton	Steel moulders shovels	Willis Sindall	3
J. Evans & Sons	Forged spanners	direct	3
Bury & Co.	Steel beater bars & plough plates	P. Gardiner	2
Eagle & Globe Steel Co.	Bastard files & drawn steel bars	Willis Sindall	2
J. H. Andrew	Bars of iron, mild steel, spring steel,	G. Gray	2
B. K. Morton	High speed steel	P. Gardiner	1
Bung & Co.	Beater bars	P. Gardiner	1
J. Shaw Ltd	Steel wire rope	P. Gardener	1

Supplier	Principal items	Agent	Orders (n)
Mottramite	Steel punches	direct	1
Total			186

From its founding in 1868 through to 1924, Reid & Gray continued to rely on Sheffield suppliers for parts demanding cutting-edge and shear stress.

Source: Reid & Gray Archive, Order books, covering 1911 (fourth quarter), 1912–16 and 1924. Hocken Collections Uare Taoka o Hākena MS-1165/002–4.

Initially small and narrowly specialised, the Sheffield suppliers were still operating in the 1860s as an intricate regional network of furnace owners and highly skilled artisans, linked by marriage, apprenticeship and a culture of trade secrecy, chronic indebtedness and absentee Mondays.⁸¹ To make small lots of steel in crucibles of clay or graphite, they imported low-carbon Swedish iron, and raised the carbon content by interlayering and fusing the iron bars with charcoal. Additional fastidious processes of remelting and remixing enhanced uniformity.⁸² Here, too, new techniques were emerging. Since ‘most bulk steel was useless without tougher steel to machine it’, demand for the special steels increased in due proportion.⁸³ Tool steel commanded 10 times the price of bulk steel. This continued into the 1920s, and the unflagging demand stimulated efforts to shorten the time in the furnace, increase the size of the pot and the size of the charge, and design machines to manufacture the pots—1,000 a day at Hadfield’s large River Don works.⁸⁴

The new blast furnaces that were making bulk steel cheaper and more uniform were re-engineered for the more elaborate steps required for manufacture of the higher-grade tool steels. Coke-fired furnaces and the regenerative chambers principle permitted yet higher temperatures and a more even heat over days or weeks, with less wear and breakage of the pots. The gas-fired furnace, by avoiding direct contact of the charge with the fuel, made possible tighter control of the carbon content. The successive substitutions of ores and fuels (in Scotland and the United States) compelled further rounds of experiment, resulting in greater control and acceleration of the process.

The select suppliers of Reid & Gray were participants in the stream of innovations. The critical processes for making high-quality tool steel still depended on the tacit know-how of their work force: the melter who at sight distinguished bright-red from cherry-red heat, the teemer who judged the readiness of the melt for pouring, and the pullers-out who, to face the heat, covered themselves with wet rags. As late

81 T. S. Ashton, *An Eighteenth-Century Industrialist: Peter Stubs of Warrington, 1756–1806* (New York: Barnes & Noble, 1961).

82 For the various recipes employed in Sheffield, see K. C. Barraclough, *Steelmaking before Bessemer*, vol. 1 *Blister Steel*; vol. 2 *Crucible Steel* (London: The Metals Society, 1984).

83 Geoffrey Tweedale, ‘Metallurgy and Technological Change: A Case Study of Sheffield Specialty Steel in America, 1830–1930’, *Technology and Culture* 27 (1986): 190.

84 Barraclough, *Steelmaking*, 2:39.

as 1918, some of the Sheffield pot makers trod the clay with their feet; the walls of moulds were coated with soot or local road dust; the melter stoppered the neck of the charging funnel with a ball of paper and ‘killed’ the process with a ‘pill’ of aluminium.⁸⁵

From the farmer’s perspective as an implement user, the innovations that did most to ease the strain on draught horses and increase the rate at which the team covered the ground were roller and ball bearings with thrust or twist collars. Beginning in the 1890s, ball bearings were applied to bicycles and sewing machines as well as ploughs and engines, and were improved by ever more ingenious lubrication systems and housings.⁸⁶ Surging demand for farm implements in the United States coincided with breakthroughs in manufacture to obtain greater precision, reliability and acceleration of the production line.

Meanwhile, the largest firms in Sheffield were maintaining their strong position in tool steels by systematic experimentation with alloys. As early as 1884, Hadfield’s manganese steel was being advertised in Southland as being as ‘tough as the hardest iron, and yet capable of holding the finest edge’. This was the edge Reid & Gray wanted initialled ‘M’ on the plough points.⁸⁷ By the turn of the century Hadfield’s had created a research laboratory in metallurgy, and Frederick Taylor, remembered for his stopwatch control of workers at Bethlehem Steel in Pennsylvania, had begun his experiments to accelerate the cutting of accurate screw threads by machining at red heat and high speed. This was possible only with machine tools made from the new Sheffield alloys of steel with manganese, tungsten and antimony.⁸⁸

How far could the Otago entrepreneur go toward tooling up for the local manufacture of blades and bearings? The Dunedin foundry of the 1870s was state of the art, with the best of British-made cutters, punches and lathes. In 1875, then employers of 70, the firm added an Oliver bolt-making machine with a skilled operator. In 1880, by then employers of 175, they installed reusable sand moulds for the production of chilled shares. Chilling—that is, the rapid cooling of hot iron in a carbon-rich mould—increased the carbon content in the surface layer, to give a harder, longer-wearing ‘steely’ edge. The factory grew in the 1890s to cover 4 times the area, with 4 times the steam power, the latest fast and rugged grindstones and a hydraulic machine for casting the chills in much larger batches, all of which raised the throughput and productivity of the labour force.⁸⁹

85 Tweedale, ‘Metallurgy’, 196–7; Barraclough, *Steelmaking*, 2:22–4, 32, 46–50, 170–2.

86 These were among the parts on which duty was contested by the South Island foundries in 1906–8.

87 *Southland Times*, 20 May 1884, 2; 18 August 1884, 2.

88 Frederick W. Taylor, *The Art of Cutting Metals* (New York: American Association of Mechanical Engineers, 1907).

89 The firm maintained low employee turnover, and faster shaping, boring and planing machines kept employee numbers in check: 230 reported in the *Otago Daily Times*, 18 May 1883, 6; 200 in the *Otago Daily Times*, 9 January 1900, 12. On the chilled steel mouldboard in the American Midwest, see Meinig, ‘Colonization’, 207.

But this was neither a steel mill nor a machine-tool factory. Reid & Gray did not produce the special steels required to machine steel,⁹⁰ and on the eve of the First World War the Dunedin plant was outclassed by manufacturers in Britain and the United States; even locally it lay in the shadow of the government railway workshops at Addington, Christchurch.⁹¹ The firm therefore continued to import ploughshares and points of manganese steel by the tens of thousands annually, for inspection, testing and reshipment to their many clients in Otago, Southland, Canterbury, Tasmania and New South Wales.⁹² Unable to achieve in full the ambition of import substitution they had entertained in 1868, Reid & Gray was nonetheless a success: they managed to survive, to grow and to maintain for a century a solid reputation for quality.

Of peculiar significance was the role the firm played in technology transfer. Textbook definitions of entrepreneurship as decision-making in conditions of uncertainty imply a thirst for information. In the circulation of know-how between frontier and centre, between one sector and another, James Gray, buttressed by tradition of family enterprise, took full advantage of the new information technologies. He used post, telegraph, undersea cable and telephone to forward 'the talk' in both directions. Despite the rate of change and the social rank conveyed by cigar and motor car, Gray maintained his familiarity with the tacit culture of the steely edge, the cherry-red heat and the furrow 'clean and square'.

Conclusion

The advance of horse and plough over the diverse landscapes of southern New Zealand was spurred on by market ambitions. In the 1870s Joseph Davidson walked behind his single-furrow plough; by 1880 he was seated on a treble-furrow, and in the 1890s his contractor son-in-law with a larger team and a steam traction engine served an entire neighbourhood. In fits and starts, Davidson's family and neighbours were advancing on a frontier of know-how, each in response to the challenges of a specific piece of land. Features initiated or readapted by local blacksmiths and foundries in Dunedin, Christchurch and Invercargill were adopted by implement manufacturers in Britain and North America. Adequate responses to demands on the frontier involved progressive application of the new metallurgy: the steel frame, standardised parts, techniques of chilling, high-precision bearings and, in the 15 years before the First World War, an array of steel alloys.

90 Geoffrey Tweedale, *Sheffield Steel and America: A Century of Commercial and Technological Interdependence, 1830–1930* (Cambridge: Cambridge University Press, 1987), xii; Sidney Pollard, *Three Centuries of Sheffield Steel: The Story of a Family Business* (Sheffield: privately published, 1954).

91 *Progress*, 1 October 1907, 444–6.

92 Reid & Gray archive, request of October 1915 for a trial shipment anticipating a guarantee of 20,000 shares yearly for 5 years. Hocken Collections.

The small size of the New Zealand market stymied local manufacture of the range of specialised tool steels for critical parts—the blades and bearings. This enabled the large operators based in Britain and North America to hold large shares of the Australasian market. Local entrepreneurs such as Reid & Gray, by selecting a manufacturing niche and grooming the image of reliability and response, maintained a competitive vigour, effective in nudging the British and North American implement makers to recognise the challenges of the landscape-specific.

The intrusion of novelty made the fancy ploughing of the local matches seem year by year more remote from the everyday realities of plain ploughing to sow grass seed. Yet the achievement in southern New Zealand of a landscape that met the demands of the world market depended on the intense circulation of information exemplified in the plodding routine that focused attention on the cutting edge.

By the end of the century, residents of the South Island were voicing concern over the implications of ‘creative destruction’: exhaustion of soils, diversion of trickling waters, invasions of rabbits and weeds, fragmentation of forest habitats of native birds, and elimination of wetland resources vital to the Māori economy. Yet the act of ploughing carried a powerful sense of entitlement,⁹³ and the annual agricultural & pastoral shows in each province continued to promote and celebrate the ‘great concourse of ploughs, harrows, harvesters, and everything that can break the skin of mother earth in any way’.⁹⁴

93 Episodes reported by South Island newspapers as ‘Maori ploughing’ expressed Māori claims against settler intrusion: *Otago Daily Times*, 28 May 1879, 3; *The Press*, 23 June 1879, 2; *Lyttelton Times*, 28 October 1879, 4; *Timaru Herald*, 3 August 1886, 2; 1 December 1897, 2.

94 ‘The Exhibition Show: Third Day’ [Canterbury A & P Show], *Otago Witness*, 14 November 1906, 20.

INTO THE ANTHROPOCENE: ENVIRONMENTAL HISTORY AND THE MORALITY OF CLIMATE CHANGE

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Abstract

This article argues that the nature of landscape 'improvement' as understood in the colonial period reflected a strong sense of common purpose and collective good, and the desire to use this as the basis of modern prosperity and growth. But these are not sentiments that have been uncritically accepted for some decades as the modernist conception of the rural landscape and resource use has come under increasing attack. The central questions posed here are then: what has happened to this moral commonality, and how might we rediscover some workable elements of collective value to guide us in today's much less certain and restless Anthropocene times? This applies particularly to the issue of climate change, which is often treated as a scientific or technical problem rather than one of moral urgency. The concept of terrestrial dwelling is offered as a means of exploring where we might now find a place to stand, on an Earth that is revealing itself to be both acutely vulnerable and inconveniently active. This article discusses some incipient examples of terrestrial dwelling in Aotearoa New Zealand.

Keywords: improvement, Anthropocene, landscape, morality, climate change, terrestrial dwelling

Introduction

In 1946, the *New Zealand Journal of Agriculture* carried a series of images on its monthly cover. Taken together, these told a story about where it imagined the country to be in a post-war world. The storyline was strongly moralising: New Zealand was a land of neat, productive agricultural landscapes, and its mission was to feed an exhausted motherland. The March cover showed a farmer extending a supporting hand across the oceans to a British worker; for April the shipping lines to Britain were mapped, alongside a picture of pallets of food being loaded on to a freighter in Wellington harbour; by May's issue they were being unloaded in the Port of London.

That this was seen as no romantic fantasy was revealed by the dramatic cover in July of the 4 horsemen of the apocalypse galloping through the sky above Britain, with the third (Famine) prominent beside those of Conquest, War and Death.

Perhaps the most memorable in the series is the one for September 1946 (Figure 1). It was this that Tom Brooking used as a poster to promote New Zealand's first environmental history course, at the University of Otago, in the late 1990s. It shows a young farmer ploughing on a tractor, in a well-kempt landscape of enclosed fields. His head is turned skywards, where above a line of distant mountains is an image of St Paul's in London, standing clear but ghostly amongst wartime ruins. It is a cover that says much: both for what it includes, as well as about what and whom it is silent. The artwork is typical of a tradition that at the time was used to promote New Zealand to itself and to others. When some years later we published the book from our 'Empires of grass' project,¹ the chosen cover was a not dissimilar reproduction from a large painting by Marcus King. King's painting, *Town and country landscape*, was produced about 1950, and is a centrepiece in the environmental history exhibition at the national museum in Wellington, Te Papa Tongawera.

Douglas Lloyd Jenkins has described King as creating 'images of great prospect and power that spoke of a modern agrarian nation lit by a determined sun and driven by the gentle hum of the milking shed or chug of the Massey Ferguson tractor'.² This description could equally well apply to the *Journal of Agriculture* covers. Such art encapsulated a progressive spirit, of a country building a national identity and forging a role in the world, atop its proud war record. It purveyed a strong sense of common purpose and collective good. The argument of this article is that this reflected the nature of landscape 'improvement' as understood in colonial New Zealand, and the desire to use this as the basis of modern prosperity and growth. But these are not sentiments that have been uncritically accepted for some decades, as the modernist conception of the farming landscape has come under increasing attack.³ The central questions to explore here are therefore: what has happened to this moral commonality, and how might we rediscover some workable elements of collective value to guide us in today's much less certain and restless Anthropocene times?

1 T. Brooking and E. Pawson, eds, *Seeds of Empire: Environmental Transformation in New Zealand* (London: I. B. Tauris, 2011; Bloomsbury, 2020).

2 D. Lloyd Jenkins, 'Foreword', in P. Alsop and W. Feeney, *Marcus King: Painting New Zealand for the World* (Nelson: Potton & Burton, 2015), 17.

3 H. Campbell, *Farming Inside Invisible Worlds: Modernist Agriculture and its Consequences* (London: Bloomsbury, 2020); C. D. Meurk and S. R. Swaffield, 'A landscape ecological framework for indigenous regeneration in rural New Zealand–Aotearoa', *Landscape and Urban Planning* 50 (2000): 129–44.



Figure 1: The front cover of the *New Zealand Journal of Agriculture*, September 1946.

Source: The author.

Empires of grass

The colonial ethic of ‘improvement’ is so pervasive as to be mentioned frequently in written texts in environmental history, yet rarely is it indexed. It expressed a foundational Pākehā (or European) perspective on the world that the right to property depended not on custom, but on human labour to remove land from a state of nature.⁴ It was as basic to the precepts of Edward Gibbon Wakefield, whose colonising schemes depended on the generation of value by such means, as to the practices of missionaries and farmers working day by day to bring indigenous peoples and ecologies in line. The elemental technologies of improvement, in settler colonies like New Zealand, as in Britain, were mapping and enclosure. The agent of these technologies was the surveyor, whose work enabled the capture and internalisation of new value through the imposed landscape geometry of individualised property.⁵ Within the boundaries of enclosure, agricultural ‘improvers’ would apply specific forms of land-use practice, such as the specialised form of husbandry that is the focus of ‘Empires of grass’. So specialised was it that by 1920 (more or less the end point for that project), over 90 per cent of New Zealand’s exports were in some way the product of introduced pastures.

The term ‘Empires of grass’⁶ reflects not only the national agricultural dominance by one crop, but also the single-mindedness with which farmers cleared and modified indigenous ecologies on the ground to accommodate introduced pasture plants. Their quest was actively supported by state actors, such as the Department of Agriculture, and policies like land-use intensification and the development of agricultural science.⁷ Bruce Levy, the head of the Grasslands Division of the Department of Scientific and Industrial Research in the middle of the twentieth century, proclaimed that ‘The glorious truth is [that] more and better grass, [and] more and more stock, [is] surely the country’s surest and soundest economic goal!’⁸ The resulting landscapes were the product of a transformation so rapid that they were, according to Peter Holland writing of the New Zealand province of Canterbury, ‘serious [and] wholly without frivolity’.⁹ Kenneth Cumberland, as a newly arrived

4 E. Pawson and A. A. Christensen, ‘Environmental history’, in *The International Encyclopedia of Geography*, ed. D. Richardson et al. (Chichester and Hoboken, NJ: John Wiley & Sons, 2017), doi.org/10.1002/9781118786352.wbieg0899.

5 A. A. Christensen, ‘Mastering the land: Mapping and metrologies in Aotearoa New Zealand’, in *Making a New Land: Environmental Histories of New Zealand*, ed. E. Pawson and T. Brooking (Dunedin: Otago University Press, 2013), 310–27.

6 ‘Empires of grass’ was Tom Brooking’s original and expressive name for the Marsden Fund project that he and I led from 2004 for some years. It resulted in a range of publications, notably a book under the title *Seeds of Empire* (2011, 2020). This title was the choice of a publisher who felt it would play better to an international audience.

7 T. Brooking, *Lands for the People? The Highland Clearances and the Colonisation of New Zealand. A Biography of John McKenzie* (Dunedin: University of Otago Press, 1996).

8 E. B. Levy, *Grasslands of New Zealand*, 3rd ed. (Wellington: Government Printer, 1970), xxx.

9 P. G. Holland, ‘Plants and lowland Canterbury landscapes’, in *Geography for the 1980s: Proceedings, Twelfth New Zealand Geography Conference, Christchurch, January, 1983* (Christchurch: New Zealand Geographical Society, 1984), 25.

geographer from the United Kingdom, observed in 1941 that ‘What in Europe took twenty centuries, and in North America four, has been accomplished in New Zealand within a single century’.¹⁰

Cumberland was as aware of some of the environmental costs of this ‘accomplishment’ as another pioneer in this country’s environmental history, Herbert Guthrie-Smith. Cumberland undertook a comprehensive assessment of soil erosion on New Zealand’s pastoral lands.¹¹ But it was Guthrie-Smith, the Hawke’s Bay sheep farmer and author, who shortly before his death agonised: ‘Have I then for sixty years desecrated God’s earth and dubbed it improvement?’¹² This conflict has deep-seated roots in the Pākehā mind, ‘the fundamental cleavage of human from other forms of life’—that is, between ourselves and the world—having emerged as early as the Hellenistic period.¹³ Writing of a later time, in *Man and the Natural World*, Keith Thomas refers to the ‘breathhtakingly anthropocentric spirit in which Tudor and Stuart preachers interpreted the biblical story’.¹⁴ In other words, although there have always been competing cultural stories, there is a consistency in the Western tradition that has reinforced belief in an Earth designed for human use, and in an insistent collective quest to ‘improve’ it for human ends.

Improvement therefore legitimised European colonisation as well as the thirst for cheap nature and cheap labour that characterised its worldwide domination.¹⁵ Territories occupied by people who were not improvers, such as Māori Aotearoa before European arrival, were readily deemed ‘waste’. Indeed, Wakefield viewed it as ‘a moral wilderness’ lacking virtuous users and uses of the land;¹⁶ in Otago, for example, his plan is said to have given colonists ‘the means of converting wilderness into garden’.¹⁷ The critical role of Māori in feeding early Pākehā settlements did not fit with the perspective of this mission and was quickly usurped. Nor a century later did the continued existence of Māori land in multiple ownership. As late as 1961, the notorious Hunn Report on the Department of Māori Affairs claimed

10 K. B. Cumberland, ‘A century’s change: Natural to cultural vegetation in New Zealand’, *Geographical Review* 31, no. 4 (1941): 529.

11 K. B. Cumberland, *Soil Erosion in New Zealand: A Geographic Reconnaissance* (Wellington: Soil Conservation and Rivers Control Council, 1944).

12 H. Guthrie-Smith, ‘Preface to third edition’ (1940), in *Tutira: The Story of a New Zealand Sheep Station*, new ed. (Auckland: Random House, 1999), xxiii.

13 C. J. Glacken, *Traces on the Rhodian Shore: Nature and Culture in Western Thought from Ancient Times to the End of the Eighteenth Century* (Berkeley, CA: University of California Press, 1967), 708.

14 K. Thomas, *Man and the Natural World: Changing Attitudes in England 1500–1800* (Harmondsworth: Penguin, 1984), 18.

15 R. Patel and J. W. Moore, *A History of the World in Seven Cheap Things* (Oakland, CA: University of California Press, 2017).

16 H. C. Evison, *The Ngai Tahu Deeds: A Window on New Zealand History*, revised ed. (Christchurch: Canterbury University Press, 2007), 38.

17 T. Brooking, ‘The great escape: Wakefield and the Scottish settlement of Otago’, in *Edward Gibbon Wakefield and the Colonial Dream: A Reconsideration*, ed. The Friends of the Turnbull Library (Wellington: GP Publications, 1997), 131.

that ‘Multiple ownership obstructs utilization, so Maori land quite commonly lies in the rough or grazes a few animals apathetically’. This inefficient use of resources, it continued, ‘opposes a serious bar to the proper use of land in the interests of the Maoris [sic] themselves, not to mention the national interest’.¹⁸ Even though the report was strongly contested at the time, it took aim at a situation that sat incongruously alongside Levy’s ‘glorious truth’ of the role of empires of grass.

Morally progressive landscapes of improvement have therefore been the basis of New Zealand’s modern prosperity and its commitment to growth. Internationally, the rise of growth as a policy objective is a post–Second World War phenomenon;¹⁹ as a social metaphor, however, it has been infused with the same sense of purposive value as ‘improvement’. Even though the environmental costs of growth have been questioned since at least the 1960s, it is hardly coincidental that New Zealand’s collection of environmental data is patchy and erratic compared to the devotion with which long-run economic time series have been constructed.²⁰ The political understanding of growth has been powerfully shaped by well-known narratives such as W. W. Rostow’s 5-stage model, with its emphasis on transition, take-off and mass consumption.²¹ Taken broadly, it captured an underlying sense of collective improvement in living standards through the trickle-down effect, described as ‘a rising tide lifts all boats’. In J. K. Galbraith’s retelling, ‘Production has eliminated the more acute tensions associated with inequality’, as ‘increasing aggregate output is an alternative to redistribution’.²² In this way, economic growth was—and still is—cast as part of the common good.

If growth, like ‘improvement’, is a modern morality tale, New Zealand—along with Australia—added an extra twist in the 1950s. This was the urge to enhance levels of primary production in order to ‘feed the world’ and stave off famine in war-torn Europe, and latterly in countries experiencing rapid population growth.²³ This was the justification for ongoing land clearance, supported by the state through the Lands and Survey Department, and the enthusiastic acceptance of chemical farming that was the subject of Rachel Carson’s *Silent Spring* in 1962.²⁴ That New Zealand still retains such global pretensions, employing all possible artificial

18 J. K. Hunn, *Report on Department of Maori Affairs, with Statistical Supplement* (Wellington: Government Printer, 1961), 52.

19 J. Tomlinson, ‘Inventing “decline”: The falling behind of the British economy in the postwar years’, *Economic History Review* 49, no. 4 (1997): 731–57.

20 Office of the Parliamentary Commissioner for the Environment, New Zealand, *Focusing Aotearoa New Zealand’s Environmental Reporting System* (Wellington: Parliamentary Commissioner for the Environment, 2019).

21 W. W. Rostow, *The Stages of Economic Growth: A Non-Communist Manifesto* (Cambridge: Cambridge University Press, 1960).

22 J. K. Galbraith, *The Affluent Society*, 2nd ed. (Harmondsworth: Penguin, 1970), 105.

23 C. Rosin, ‘Food security and the justification of productivism in New Zealand’, *Journal of Rural Studies* 29 (2013): 50–8; B. Wildblood-Crawford, ‘Grassland utopia and *Silent Spring*: Rereading the agrichemical revolution in New Zealand’, *New Zealand Geographer* 62, no. 1 (2006): 65–72.

24 R. Carson, *Silent Spring* (Boston: Houghton Mifflin, 1962).

enhancements to this end, is evidenced by Fonterra's business goal to be one of the world's largest dairy producers by volume, alongside an escalation in the pastoral use of nitrogenous fertilisers in the last 20 years that would make Levy proud. Over the same period, the tourism industry pursued ambitious growth targets, based quixotically on a '100% Pure New Zealand' campaign. By the time of the Covid-19 outbreak, tourism and dairy accounted for more than half the country's foreign exchange earnings, only recently finding their social licence to operate coming into question, as environmental and social effects intensified.²⁵ It is anxieties such as these that characterise a new era of environmental history, the Anthropocene.

Anthropocene disruptions

The term 'Anthropocene' has gained currency in the last decade, having been used by the atmospheric scientist Paul Crutzen in *Nature* in 2002 to denote the recent period of Earth's history in which humans have become the driving force of planetary change.²⁶ It stands in contrast to the 'Holocene' that geologists use to denote the last 10,000 years, during which Earth conditions have been appropriate and sufficiently consistent for human development.²⁷ As an idea, the Anthropocene has long since escaped the confines of earth science; instead, debate has raged over when it began or whether it should rather be called something like the 'Capitalocene', which some theorists consider better identifies causality.²⁸ Increasingly, however, analysis focuses on the global turning point represented by the 'Great Acceleration' of the 1950s and 1960s.²⁹ It was then that a wide range of measures of human impact on the Earth system, relating to resources, population, atmospheric emissions, nuclear fallout, and chemical and water use underwent an upwards step change, alongside measures of gross domestic product, or GDP.³⁰ From a global perspective, Rostow's 'take-off' into sustained growth was very much a reflection of what was happening at the time (Figure 2).

25 R. Le Heron, 'Dairying in question', in *The New Biological Economy: How New Zealanders are Creating Value from the Land*, E. Pawson and the Biological Economies Research Team (Auckland: Auckland University Press, 2018), 20–40; H. C. Perkins and C. Rosin, 'Tourism, landscapes and biological resources', in *The New Biological Economy*, Pawson et al., 137–56; Parliamentary Commissioner for the Environment, *Pristine, Popular ... Imperilled? The Environmental Consequences of Projected Tourism Growth* (Wellington: Parliamentary Commissioner for the Environment, 2019).

26 P. J. Crutzen, 'Geology of mankind', *Nature* 415, no. 6867 (2002): 23.

27 W. Steffen et al., 'Trajectories of the Earth System in the Anthropocene', *Proceedings of the National Academy of Sciences* 115, no. 33 (2018): 8252–9.

28 E. Ellis, *Anthropocene: A Very Short Introduction* (Oxford: Oxford University Press, 2018); Patel and Moore, *A History of the World*.

29 J. R. McNeill and P. Engelke, *The Great Acceleration: An Environmental History of the Anthropocene since 1945* (Cambridge, MA: Belknap Press, 2016); K. Trebeck and J. Williams, *The Economics of Arrival: Ideas for a Grown-up Economy* (Bristol: Policy Press, 2019).

30 W. Steffen et al., 'The Anthropocene: conceptual and historical perspectives', *Philosophical Transactions of the Royal Society A* 369 (2011): 842–67.

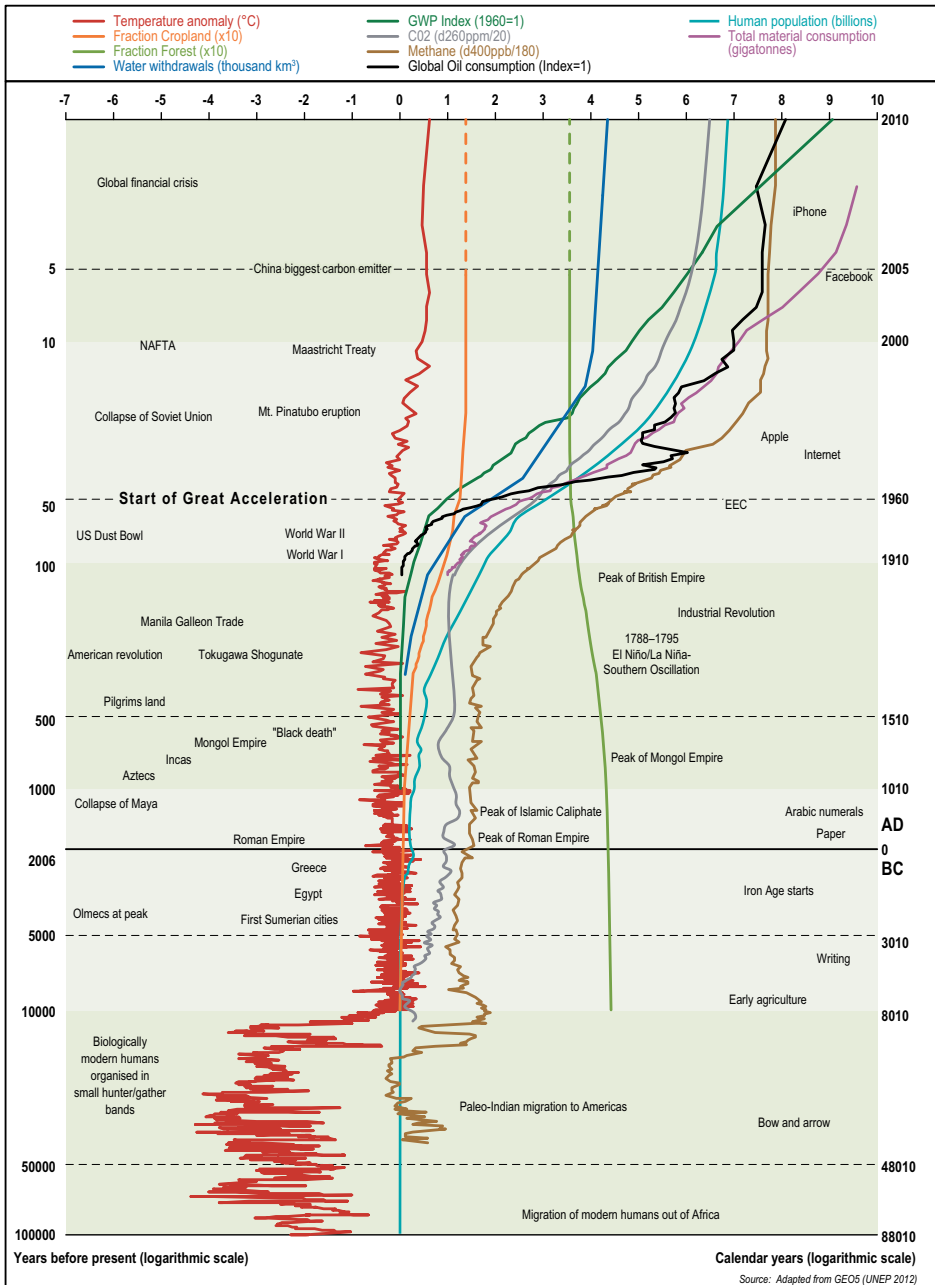


Figure 2: The Great Acceleration in historical context.

Source: Adapted from United Nations Environment Programme, *GEO 5, Global Environment Outlook* (2012), 22; and informed by R. Costanza et al., 'Sustainability or collapse: What can we learn from integrating the history of humans and the rest of nature?', *Ambio* 36, no. 7 (2007): 522-7, and W. Steffen et al., 'The trajectory of the Anthropocene: The Great Acceleration', *The Anthropocene Review* 2, no. 1 (2015): 81-98.

This is the wider context of the rising intensity of resource use in New Zealand's pastoral and pre-Covid tourism industries. But globally, measures of the intensity of Anthropocene environmental impact on the ground are astonishing. A consequence of the pervasiveness of enclosure is that the world's forests are now so fractured that 70 per cent of what remains is within 1 kilometre of a forest edge.³¹ The implications of this for biodiversity, ecosystem function and global climate are profound. The extent of New Zealand biodiversity loss, as the direct consequence of 2 centuries of 'improvement', is well known. The rapid growth in numbers of stock units this enabled was illustrated in a stark graph in *Seeds of Empire*;³² it has long been a traditional part of the national story that sheep many times outnumber people, even if now to a lesser extent. New Zealand is but an extreme case of an international phenomenon where 97 per cent of the total biomass of land vertebrates is made up of humans (32 per cent) and their domestic animals (65 per cent).³³ Creating grassland based on introduced pasture plants to accommodate these domestic animals destroys both carbon sinks and biodiversity, and current industrial systems of stock husbandry contribute significantly to the release of greenhouse gasses. In New Zealand's case, half its emissions are from agriculture, with much of the balance from motor vehicle use.³⁴

The impact of these changes on the Earth, its atmosphere and oceans, leads to the central characteristic of the Anthropocene: its disruptiveness. Of this, climate change and the growing incidence of extreme weather events are the obvious markers, with the risk of tipping points into abrupt and irreversible change more likely than once thought possible.³⁵ But the disruptiveness is not only of nature, but also of cultural assumptions about relations between the social and the natural, and ultimately of the practices of social life itself. It is doubly unsettling, with the Earth revealing itself as both acutely vulnerable and restlessly active.³⁶ We are leaving behind the relatively benign consistency of the Holocene. The morally secure narratives of improvement and growth will no longer enable the universe to be inhabited with certainty and meaning: in fact, they have paradoxically undermined both certainty and meaning. The climate crisis is also 'a crisis of culture, and thus of the imagination'.³⁷

31 N. M. Haddad et al., 'Habitat fragmentation and its lasting impact on Earth's ecosystems', *Science Advances* 1, no. 2 (2015).

32 Brooking and Pawson, *Seeds of Empire*, 10.

33 Y. Bar-on, R. Phillips and R. Milo, 'The biomass distribution on earth', *Proceedings of the National Academy of Sciences* 115, no. 25 (2018): 6506–11; C. Bonneuil and J.-B. Fressoz, *The Shock of the Anthropocene: The Earth, History and Us* (London: Verso, 2017).

34 New Zealand's unusual emissions profile is at: www.stats.govt.nz/indicators/new-zealands-greenhouse-gas-emissions.

35 T. M. Lenton et al., 'Climate tipping points: Too risky to bet against', *Nature* 575 (2019): 592–5; Steffen et al., 'Trajectories of the Earth System'.

36 R. Macfarlane, 'Should this valley have rights?', *Guardian Weekly* 201, no. 22 (2019): 40–4.

37 A. Ghosh, *The Great Derangement: Climate Change and the Unthinkable* (Chicago: University of Chicago Press, 2016), 9.

Two decades ago, Crutzen could argue that ‘The Earth currently operates in a state without previous analogy’.³⁸ It is becoming much clearer that its inhabitants now do as well.

For its human inhabitants, this is equivalent to ‘a traumatic loss of coordinates’.³⁹ Bruno Latour positions this historically in pointing to the obvious: ‘there is no Earth capable of containing [the modern ideals] of progress, emancipation, development’.⁴⁰ Simple ecological footprint calculations indicate that several planets are already required to maintain existing—let alone desired—levels of consumption. And the strains that such desires inflict on the only planet that we have are already manifest as crises that are recurrent and global in reach, rather than manageable, regional or local as in the past. Yet what Latour describes as ‘the vacuity of contemporary politics’⁴¹ is frequently organised to deny or escape these realities, in its continued commitment to the onwards-and-upwards thrust of growth and ‘improvement’.⁴² But if there is no longer a stable framework, an Earth that is indifferent to the consequences of human material desires, how or where are we to find a place to stand?

Traditionally, an answer might have come from cultural history. Although Anthropocene writers emphasise the ontological break ‘between the human being as *subject* of entitlement and the *object* of nature’,⁴³ it has long been argued that the history of people–nature relations is more complex and subtle. In contrast to a theology of ‘dominion’, there are recurrent threads of Arcadia as well as environmental stewardship that reflect more caring attitudes to the Earth.⁴⁴ At the height of enthusiasm for colonial improvement in the nineteenth century, George Perkins Marsh issued a warning about the costs of the exploitation of nature that was widely heard.⁴⁵ The Great Acceleration has seen a much broader upsurge in ecological and environmental awareness. Surely there is much to learn from such examples? Thomas long since exposed the difficulty here. In commenting on the conflict between ‘the new sensibilities and the material foundations of human

38 P. Crutzen and W. Steffen, ‘How long have we been in the Anthropocene era?’, *Climatic Change* 61, no. 23 (2003): 253.

39 T. Morton, *Hyperobjects: Philosophy and Ecology after the End of the World* (Minneapolis, MN: University of Minnesota Press, 2013), 22.

40 B. Latour, *Down to Earth: Politics in the New Climatic Regime* (Cambridge: Polity Press, 2018), 16.

41 Latour, *Down to Earth*, 44.

42 An American writer has said of Australia’s climate-denying politicians: ‘And so maybe Australia will find itself stuck in the climate spiral, clinging ever more tightly to coal as its towns and cities choke on the ash of a burning world’. R. Meyer, ‘Australia will lose to climate change’, *The Atlantic*, 4 January 2020.

43 Bonneuil and Fressoz, *The Shock of the Anthropocene*, 40.

44 Glacken, *Traces on the Rhodian Shore*; D. Worster, *Nature’s Economy: The Roots of Ecology* (San Francisco, CA: Sierra Club Books, 1977).

45 D. Lowenthal, ‘Nature and morality from George Perkins Marsh to the millennium’, *Journal of Historical Geography* 26, no. 1 (2000): 3–27.

society’ as manifest in early modern England, he observed that a ‘mixture of compromise and concealment has so far prevented this conflict from having to be fully resolved’.⁴⁶ We are now at the point where resolution is urgently required.

Searching for a new morality

If there is one characteristic of debates on climate change, it is that they tend to focus on the science and on technical solutions. But in this case, information is not power: rather it is often far too inconvenient, distancing or overwhelming for people who have become comfortable living with carbon.⁴⁷ It is nearly 30 years since the first Rio Earth Summit and a multilateral commitment to the Framework Convention on Climate Change. Not only have most governments failed to act since with sufficient urgency, but most consumers have looked resolutely the other way. How else to explain trends like the second-largest contributor to global greenhouse gas emissions in the last decade being the growth in numbers of SUVs?⁴⁸ In New Zealand, both SUV preferences and per capita car use are amongst the highest in the world, and road vehicle emissions have risen by over 80 per cent since 1990.⁴⁹ But neither in New Zealand nor globally have emissions statistics, or warming limits based on the science of climate change, gained much traction. Hence the argument that ‘the future of our species and planet depends on creating a mass social movement motivated by moral arguments, not statistics’.⁵⁰

This position is worth exploring, given the moral framing of ‘improvement’ and economic growth that has underwritten the Great Acceleration. Increasingly, there are calls for ‘a return to an ethically informed public conversation’,⁵¹ and for an expansion of a moral imagination that has atrophied over recent decades with the self-interestedness of consumerism and individual aspiration. Robert Reich describes the common good as a compact ‘not just with those who are alive today. It’s also with those who have come before us and those yet to be born’.⁵² His concern is for a rediscovery of shared commitments to the rule of law, democratic institutions,

46 Thomas, *Man and the Natural World*, 303.

47 B. Hayward, *Sea Change: Climate Politics and New Zealand* (Wellington: Bridget Williams Books, 2017); T. Morton, *Being Ecological* (Cambridge, MA: MIT Press, 2018).

48 L. Cozzi and A. Petropoulos, ‘Commentary’, 15 October 2019. International Energy Agency, www.iea.org/commentaries/growing-preference-for-suvs-challenges-emissions-reductions-in-passenger-car-market, accessed 27 January 2020.

49 R. Maetzig, ‘Two-thirds of New Zealand-new vehicles are SUVs or utes’, *Stuff*, 10 March 2019, www.stuff.co.nz/motoring/trends-in-suvs-and-vans/110999026/two-thirds-of-new-zealand-new-vehicles-are-suvs-or-utes, accessed 27 January 2020; New Zealand has around 800 light vehicles per 1,000 people (including children); in Otago and Canterbury, about 900: Ministry of Transport, *Annual Fleet Statistics 2017*, 7, www.transport.govt.nz/statistics-and-insights/fleet-statistics/sheet/vehicle-fleet, accessed 27 January 2020.

50 E. Beinhocker, ‘I am a carbon abolitionist’, *Democracy: A Journal of Ideas* (24 June 2019), 24, democracyjournal.org/arguments/i-am-a-carbon-abolitionist, accessed 27 January 2020.

51 T. Judt, *Ill Fares the Land* (New York: Penguin, 2010), 9.

52 R. B. Reich, *The Common Good* (New York: Alfred A. Knopf, 2018), 42.

truth, equal political rights and opportunity. But the compact applies as much to what Pope Francis has called caring for our common home, in a text that is repeatedly critical of the illusions of growth.⁵³ Marsh's warning famously identified the future generations argument in this context: people, he wrote in 1864, 'have for too long forgotten that the earth was given to [them] for usufruct alone, not for consumption, still less for profligate waste'.⁵⁴

There have been some valuable attempts to engage with the ethics of climate change,⁵⁵ and increasingly this is shaping popular and official discourse. One writer, of the reluctance of the Australian Government to discuss the subject in the face of a devastating 2019–20 bush fire season, said that 'I can't explain this to my children in a way that makes adults seem like sane, moral actors'.⁵⁶ But climate justice must also apply to those living in conditions of gross inequality, whose way of life currently or historically has contributed little to the problem, and who have few resources with which to adapt to it.⁵⁷ This is of growing concern not only to radical commentators but also to establishment agencies such as the World Bank, the International Monetary Fund,⁵⁸ and the Intergovernmental Panel on Climate Change. The last has identified the need for 'rapid, far-reaching and unprecedented changes in all aspects of society'.⁵⁹ Such changes, some argue, must move well beyond the position of 'the human being as *subject* of entitlement' to an empathetic recognition of humanity as an intergenerational project,⁶⁰ and of the existence of other living beings with whom we share a common home,⁶¹ as well as their inherent liveliness that is oblivious to any human interest.⁶²

How might such change be brought about, the more so when it cannot be left to individual conscience?⁶³ In outline, 3 embryonic elements can be identified: frameworks, precedents and transitions. Frameworks can situate individuals within

53 Pope Francis, *Encyclical Letter Laudato Si' of the Holy Father Francis on Care for Our Common Home* (2015), w2.vatican.va/content/francesco/en/encyclicals/documents/papa-francesco_20150524_enciclica-laudato-si.html, accessed 27 January 2020.

54 G. P. Marsh, *Man and Nature*, ed. D. Lowenthal (first published 1864) (Cambridge, MA: Belknap Press of Harvard University Press, 1965), 36.

55 J. Garvey, *The Ethics of Climate Change: Right and Wrong in a Warming World* (London: Continuum, 2008); R. Attfield, *Environmental Ethics: A Very Short Introduction* (Oxford: Oxford University Press, 2018); T. Ord, *The Precipice. Existential Risk and the Future of Humanity* (London: Bloomsbury, 2020).

56 In D. Cave, 'Australia burns again, and now its biggest city is choking', *New York Times*, 6 December 2019.

57 Latour, *Down to Earth*.

58 L. Elliott, 'Tackling climate crisis is what we should be doing, says new IMF boss', *The Observer*, 30 November 2019.

59 Intergovernmental Panel on Climate Change, 'Summary for Policymakers of IPCC Special Report on Global Warming of 1.5°C approved by governments' (2018), www.ipcc.ch/2018/10/08/summary-for-policymakers-of-ipcc-special-report-on-global-warming-of-1-5c-approved-by-governments, accessed 27 January 2020.

60 Ord, *The Precipice*.

61 M. Priest, 'Emotional ethics of warfare: how empathy can be used to strengthen protection of the natural environment' (MA diss., University of British Columbia, 2019).

62 R. Macfarlane and S. Donwood, *Ness* (London: Hamish Hamilton, 2018); Macfarlane, 'Should this valley have rights?'

63 Ghosh, *The Great Derangement*.

wider historical, political and policy commitments, and enable them to see meaning in their own actions, whilst providing accountability for all parties. New Zealand's *Zero Carbon Act 2019*, with its commitment to regularly audited national carbon budgets, modelled on the British precedent, is a potential example. In response to its passage, the Australian writer Richard Flanagan commented that 'one only has to look at the global standing of New Zealand to see the power of setting a moral and practical example'.⁶⁴ This overlooks the fact that its record to date is little better than Australia's, but was penned in exasperation borne of continued support of fossil fuel interests by many governments, including his own.

Precedents, like frameworks, can provide the means towards establishing some new coordinates. The success of the multilateral Montreal Protocol (1987) in containing CFC usage to protect the ozone layer is often mentioned, although the solution, being one of chemical substitution, was considerably easier than the dramatic behavioural changes required by climate change. Nonetheless, there are some successes in carbon management and available mechanisms, such as carbon pricing, carbon budgets and emissions trading schemes, are well known. These are ways to end the market failure aspect of climate change, where greenhouse gases are in effect externalities.⁶⁵ More than a decade ago, the Stern Review identified the economic opportunities that transitions to post-carbon futures will open up.⁶⁶ Although it is only recently that the concept of a new green deal has gained traction, this in itself is an appeal to historical precedent.

But perhaps the one thing that is necessary to underwrite transition is a new morality tale, or collective story. Many writers have urged that it is time to replace GDP as the metric of economic success, not least because access to material wealth is now so uneven.⁶⁷ Katherine Trebeck and Jeremy Williams propose that rather than envisaging human progress as an endless upward trajectory after 'take-off', it is time to consider the idea of 'arrival'. This recognises that we are in reality rooted in nature and in place, and cognisant of 'the wealth that an economy and society already has'.⁶⁸ Wealth in this context implies well-being: encompassing social, cultural and environmental—as well as economic—values and relationships. The argument echoes that of Latour, who writes of 'landing somewhere',⁶⁹ in the face of a modern system of coordinates that is caught between the attractions of globalisation that

64 R. Flanagan, 'Scott Morrison and the big lie about climate change: Does he think we're that stupid?', *The Guardian*, 24 November 2019.

65 J. Tirole, *Economics for the Common Good* (Princeton, NJ: Princeton University Press, 2017); Trebeck and Williams, *The Economics of Arrival*.

66 N. Stern, *The Economics of Climate Change: The Stern Review* (Cambridge: Cambridge University Press, 2007); High-Level Commission on Carbon Prices, *Report of the High-Level Commission on Carbon Prices* (Washington, DC: World Bank, 2017).

67 For example, T. Jackson, *Prosperity Without Growth: Foundations for the Economy of Tomorrow*, 2nd ed. (London: Routledge, 2017); K. Rowarth, *Doughnut Economics: Seven Ways to Think Like a 21st-Century Economist* (London: Random House, 2017).

68 Trebeck and Williams, *The Economics of Arrival*, 78.

69 Latour, *Down to Earth*, 7.

cannot be satisfied by one planet, and the rump of the local that has been left behind by modernisation. He proposes a third, *Earthbound* orientation, the ‘terrestrial’, reflecting what he deems the crucial choice, between ‘to modernize or to ecologize’.⁷⁰ How might we learn to live terrestrially, within the bounds of one earth? In this context, what might morally defensible dwelling look like? And how might it sit within or alongside New Zealand’s long tradition of empires of grass?

Terrestrial dwelling

The primary attribute of terrestrial dwelling is that it does not act as if emancipated from either earthly constraints or earthly liveliness. The Earth, in other words, is no longer merely a stage on which human affairs are conducted, as it was treated by colonising and modernising peoples throughout the Holocene. Nor is it any more an arena within which a Bruce Levy can dream of ‘butterfat performances and stocking densities hitherto considered impossible of attainment’.⁷¹ It is a new world, but ‘not a new *terra incognita* for explorers in colonial headgear’.⁷² Rather it is a world that we share in common with all non-human beings, whose dynamism is not predictable in preordained ways, and inside which we cohabit with those previously deemed fit only for ‘improvement’. And it is here, amongst the terrestrial adaptations of the indigenous, both people and nature, that some incipient new stories can be discerned.

One of the most remarkable is the emergence in Aotearoa New Zealand of the ‘taniwha economy’, a term used to recognise the extent of Māori-controlled economic activity.⁷³ The scale and range of forms of Māori land- and water-based enterprise puts the lie to the assumptions of generations of official policymaking, as highlighted by the Hunn Report, that full integration is a prerequisite to progress. Tribal ownership of resources has enabled the development of the multi-billion-dollar taniwha economy, but this has not occurred in traditional ways within Latour’s rump of the local. A good example is the integrated set of business activities built up by the Tuaropaki Trust, in which the regenerative principles of a circular economy⁷⁴ are to the fore. The Trust has extensive lands at Mokai, west of Taupo, in New Zealand’s central North Island, on which its geothermal station provides power for large glasshouses producing tomatoes and capsicums for the Japanese market. Biomass from the glasshouses feeds a worm farm, which in turn makes compost for beef and dairy pastures. Environmental variables for the whole operation are closely monitored, and it is run on long-term quadruple bottom-line principles. The social dividend comes in employment as well as returns for the landholders.

70 Ibid., 46.

71 Levy, *Grasslands of New Zealand*, xxix.

72 Latour, *Down to Earth*, 42.

73 R. Le Heron and M. Roche, ‘The taniwha economy’, in Pawson et al., *The New Biological Economy*, 157–76.

74 Rowarth, *Doughnut Economics*.

Despite being thoroughly contemporary examples of terrestrial dwelling, examples like this fly beneath the radar as they do not fit with the stories of the improvers. But they are also consistent with tribal cultural values. The emphasis that Ngāi Tahu, which has built one of the biggest corporations operating in the South Island, places on the recovery and fostering of mahinga kai food gathering places and practices illustrates this.⁷⁵ To do so is to be alert to both histories of place and natural rhythms and events, or as Libby Robin puts it in an Australian context: ‘detail is the new big picture’. She was referring to the need for ‘real “on the ground” detail’ to make sense of arid Australia, with its ‘variable microclimates, whose very biodiversity is dynamic and spatially unpredictable’.⁷⁶ In this context, traditional Aboriginal land management of what was wilderness to Europeans relied on controlled use of fire. People evolved a coordinated ‘mosaic pattern of low-level burns’, according to the specific requirements of particular areas.⁷⁷ The imposition of the mechanics of European enclosure on country greatly inhibited these practices, with consequences, exacerbated by the impacts of climate change, that have been all too apparent in the terrifying fire season of 2019–20.

Enclosed landscapes can however be redrawn.⁷⁸ This is already happening in some parts of rural New Zealand, now that the focus that Levy placed on productivism is less all-consuming. In places such as Banks Peninsula, Canterbury, the land is being managed in mosaics, aligned to conditions, with pastoral use intensifying in more usable areas such as valley floors. Meanwhile steep, less accessible valley sides are allowed to revert to what not long since would have been called ‘scrub’ (regenerating bush), but which is now valued for a range of ecosystem services. Increasingly, these include an intergenerational valuation of the indigenous, in the form of covenants in perpetuity registered with either the Queen Elizabeth II National Trust, or a local agency created by landholders for this purpose, the Banks Peninsula Conservation Trust. The result is the emergence of a form of ‘middle landscape’, integrating the garden and the wild.⁷⁹ Similar renegotiations of how to dwell on the land are occurring elsewhere: a quarter of New Zealand’s native vegetation cover is on sheep and beef farms, providing vital biodiversity and carbon sequestration functions.⁸⁰

75 M. J. Stevens, ‘Ngāi Tahu and the “nature” of Māori modernity’, in *Making a New Land*, ed. Pawson and Brooking, 293–309.

76 L. Robin, *How a Continent Created a Nation* (Sydney: UNSW Press, 2007), 121.

77 B. Pascoe, *Dark Emu: Aboriginal Australia and the Birth of Agriculture* (Broome, WA: Magabala Books, 2014), 116.

78 C. D. Meurk and S. R. Swaffield, ‘A landscape ecological framework for indigenous regeneration in rural New Zealand–Aotearoa’, *Landscape and Urban Planning* 50 (2000): 129–44.

79 E. Pawson and A. A. Christensen, ‘Landscapes of the Anthropocene: From dominion to dependence?’, in *Rethinking Invasion Ecologies from the Environmental Humanities*, ed. J. Frawley and I. McCalman (London: Routledge, 2014), 65–83.

80 D. Norton and J. Pannell, ‘Desk-top assessment of native vegetation on New Zealand sheep and beef farms’ (13 June 2018), beeflambnz.com/sites/default/files/FINAL%20Norton%20Vegetation%20occurrence%20sheep%20beef%20farms.pdf, accessed 27 January 2020.

The implications of such trends are potentially profound. First, they point towards ways to respond to the need to curb human enthusiasm for meat eating, in order to preserve carbon sinks and curtail greenhouse emissions from stock.⁸¹ This need not mean any loss to pastoral farmers, but rather could reposition meat as a high-value product, provenanced to the climate-proofing attributes of its place of production. Second, they provide options for managing New Zealand's response to climate change. Both New Zealand's Productivity Commission⁸² and Parliamentary Commissioner for the Environment⁸³ argue that this will require radical land use change over the medium term. Both imply the need for top-down reductionist planning, which runs the risk of supplementing empires of grass with serried empires of trees in conventional style. But emerging middle landscapes show the benefits of recognising local terrestrial initiatives, something that could well be extended from rural to city environments. Not only would this engage urban communities with tree planting and biodiversity management, which cities such as New York have already pioneered,⁸⁴ it would also extend the opportunity for everyone to land and to live as terrestrials, taking seriously the moral obligation of meeting climate change targets.

Conclusion

In the early years of environmental history teaching at the University of Otago, Tom Brooking won support to bring a succession of renowned overseas scholars to Dunedin for academic visits. One, William Cronon, known for his reflection on the value of stories, once suggested that 'the task of environmental history is to assert that stories about the past are better ... if they increase our attention to nature and to the place of people within it', and encourage us to look at these in new ways.⁸⁵ So how does environmental history help us to think about a future in the Anthropocene?

First, it shows that there are many precedents for caring for land, landscape and the Earth, and accounts that narrate nature in quite different ways to the paradigm of human domination and exploitation. In New Zealand, Guthrie-Smith and

81 H. Harwatt, 'Including animal to plant protein shifts in climate change mitigation policy: A proposed three-step strategy', *Climate Policy* 19 (2018): 533–41; M. Springmann et al., 'Options for keeping the food system within environmental limits', *Nature* 562 (2018): 519–25.

82 New Zealand Productivity Commission, *Low-emissions Economy: Final Report August 2018*, productivity.govt.nz/assets/Documents/4e01d69a83/Productivity-Commission_Low-emissions-economy_Final-Report.pdf, accessed 27 January 2020.

83 Parliamentary Commissioner for the Environment, *Farms, Forests and Fossil Fuels: The Next Great Landscape Transformation?* (Wellington: Parliamentary Commissioner for the Environment, 2019).

84 D. R. Fisher, E. S. Svendsen and J. J. T. Connolly, *Urban Environmental Stewardship and Civic Engagement: How Planting Trees Strengthens the Roots of Democracy* (London: Routledge, 2015).

85 W. Cronon, 'A place for stories: Nature, history, and narrative', *Journal of American History* 78 (1992): 1375.

Cumberland are 2 examples, the former a particularly potent figure for environmental historians—as Cronon himself⁸⁶ observed—not least because he lived to question whether ‘improvement’ should be reframed as ‘desecration’. More significant are those countless individuals and communities who see value in working with the indigenous, providing social opportunity for all who are willing to attempt to dwell terrestrially. Second, and surely the main historical insight, is that the heroic acts of ‘improvement’, such as clearing the bush and draining the swamp in order to create empires of grass, were understood as morally improving quests, as actions consistent with and reinforcing economic survival, social reproduction and cultural meaning. They were unquestioningly part of what was then seen as ‘the common good’.⁸⁷ That economic growth has been legitimated in the same way does much to explain the timing and vigour of the Great Acceleration. Negotiating a new sense of common good in risky and disconcerting Anthropocene times is therefore of insistent urgency if human potential is now to be safeguarded.⁸⁸

In one of the team meetings in the ‘Empires of grass’ project,⁸⁹ the question was raised of what environmental history can teach us about the future. I was then, as now, sceptical that it could teach much of immediate value to that end, but the question has stuck in my mind. This article has been a concerted attempt to engage with it. If there is an answer, it is that we now have little choice but to reimagine our collective interests as Earth inhabitants to take full account of those of future, as well as disadvantaged, generations, and those of non-human as well as the human species. This is a compelling moral issue, one that requires honesty, consistency and a willingness both to look *and* to see. Environmental historians would seem well equipped on each of these grounds. I am forever grateful for the generosity with which Tom has welcomed me into their number, since my first encounter with the poster from the *New Zealand Journal of Agriculture* cover in his departmental lift more than 20 years ago!

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86 W. Cronon, ‘Foreword: A passion for small things’, in Guthrie-Smith, *Tutira*, xi–xv.

87 Reich, *The Common Good*.

88 Ord, *The Precipice*.

89 Brooking and Pawson, *Seeds of Empire*.

FASHIONING A FUTURE. PART I: SETTLEMENT, IMPROVEMENT AND CONSERVATION IN THE EUROPEAN COLONISATION OF OTAGO, 1840–60¹

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Abstract

This article, split into 2 parts that will be published over 2 journal issues, examines environmental attitudes and actions amongst the first generation of settlers in Otago, New Zealand, between 1840 and 1860. Based on extensive analysis of diaries, letters, artworks and official documents, it argues for the need to recognise the complexity of European environmental responses and actions, including highlighting extensive official attempts at forest conservation from the late 1840s. Part I of this article examines the complexity of settler views by demonstrating the importance of the concept of improvement as a means by which colonists sought to Europeanise Otago through introductions of familiar plants and animals, and the establishment of farms. Part II is in 2 sections: Section 1 considers the impact of Romanticism on settler interpretations of Otago's environment, including the manner in which they framed and depicted its harbours and mountains in writing and art. Section 2 examines concerns over resource depletion and details official measures to protect forests, including through reservation, licensing of timber extraction and the appointment of forest guards.

Keywords: environmental history, colonisation, Otago, conservation, urban environmental history, forest history, garden history, acclimatisation, romanticism, history of energy

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‘... the scrub was cut with axes and billhooks, dragged into heaps and burned ... the trees were felled’.²

McLeod C. Orbell, undated

Europeans as agents of environmental destruction is a common theme in Aotearoa New Zealand’s environmental history.³ Nineteenth- and twentieth-century European settlers firmly regarded it as their Christian duty to make ‘untamed nature ... subservient to the use of men and do service to God’, as the Lutheran missionary Johan Wohlers, based on Ruapuke Island, forcefully wrote.⁴

Yet, in the clamour for what settlers called ‘improvement’—involving the introduction of plants and animals as well as farming systems and lifestyles from Europe—it is often easy for historians and geographers to overlook the complexity of settler responses to the environment, especially during the early decades of New Zealand’s colonisation from 1840. In the opinion of the historical geographer Alan Grey, for instance, ‘[t]he promise of profit provided sufficient moral warrant in an atmosphere where human self-interest determined morality and the natural physical order was not seen as deserving of any necessary respect’.⁵

This article disputes whether, as Grey argues, New Zealand’s early settlers were simply driven by self-interest, oblivious to moral considerations and disrespectful of the environment around them. It does so by examining settler environmental attitudes and actions in Otago between 1840 and 1860. Part 1 overviews environmental change and European settlement in Otago and demonstrates that by improvement settlers sought to Europeanise Otago through introductions of familiar plants and animals, as well as the establishment of farms from home. In Part II of the article, Section 1 considers the impact of Romanticism on settler interpretations of Otago’s environment, including the manner in which they depicted its harbours and mountains in writing and art. Section 2 examines settler attempts to conserve resources, mainly forests. In discussing European environmental beliefs and actions,

2 McLeod C. Orbell, ‘Reminiscences 1849–1870’ (typescript MS 46 Copy 86 OSM), 29, 53–58.

3 On which historiographical point, see James Beattie, ‘Wilderness Found, Lost and Restored: The Sublime and Picturesque in New Zealand, 1830s–2000s’, in *The Future of Wilderness in Aotearoa New Zealand*, ed. Richard Reeve and Mick Abbott (Dunedin: Otago University Press, 2011), 91–105.

4 J. F. H. Wohlers, *Memories of the Life of J. F. H. Wohlers: Missionary at Ruapuke New Zealand. An autobiography translated from the German by John Houghton* (Dunedin: Otago Daily Times & Witness Newspapers, 1895), 139.

5 Alan Grey, *Aotearoa and New Zealand: A historical geography* (Christchurch: Canterbury University Press, 1994), 23.

the article does not focus specifically on the Kāi Tahu / Ngāi Tahu (the Māori tribe which occupies the Te Wai Pounamu / South Island) experience of environment—this is examined in a number of other fascinating studies.⁶

What inspires the present study, in particular, is Paul Star's revisionist work on European environmental actions and attitudes in Dunedin, which focused on the period after 1868. Star's study revealed a richly complex and varied set of European attitudes and actions towards indigenous nature. In particular, his findings, while revealing environmental destruction, challenged characterisations of 'nineteenth-century Europeans in New Zealand ... as uncaring pioneers, who feared or hated the bush and who wrote off native species as biologically bound for extinction'.⁷ The second work to which this study responds is Neil Clayton's dissertation of 1998. This examined mismatches between European environmental assessment and policy, a tension that Clayton explored using early Otago land legislation.⁸ Clayton's work, as well as my own from 1999, touched on early forest conservation efforts.⁹ In this article, I hope to reveal something of the complexity of the first generation of European settlers and, in doing so, document earlier European environmental transformation and attitudes than Star examined. I also consider in greater depth than either Clayton or my earlier work, European attempts to conserve resources.

Environment, population and settlement

The Province of Otago, in New Zealand's South Island / Te Wai Pounamu (Figure 1), is a region of much geographical variation. A maritime climate prevails on the east coast, moderating temperatures. Inland, a 'semi-arid "continental" climate' gives considerable winter–summer temperature extremes.¹⁰ Whereas plentiful rain falls in coastal Otago, Central Otago lies in the rain shadow of Te Tiritiri-o-te-moana / the Southern Alps, a mountain range running along the middle of the South Island.

6 Khyla J. Russell, 'Landscape: Perceptions of Kai Tahu I Mua, Āianeī, Ā Muri Ake' (PhD diss., University of Otago, 2000); Atholl Anderson, *The Welcome of Strangers: An Ethnohistory of Southern Maori AD 1650–1850* (Dunedin: Otago University Press, 1998); Jonathan West, *The Face of Nature: An Environmental History of the Otago Peninsula* (Dunedin: Otago University Press, 2017); Michael J. Stevens, 'Kāi Tahu me te Hopu Titi ki Rakiura: An Exception to "Colonial Rule"?', *Journal of Pacific History* 41, no. 3 (December 2006): 273–91. On disease and public health: Pamela Wood, *Dirt: Filth and Decay in a New World Arcadia* (Dunedin: Otago University Press, 2005).

7 Paul Star, 'New Zealand's Changing Natural History. Evidence from Dunedin, 1868–1875', *New Zealand Journal of History* 32, no. 1 (1998): 69.

8 Neil Clayton, 'Settlers, Politicians and Scientists: Environmental Anxiety in a New Zealand Colony' (Post-Graduate Diploma in Arts diss., University of Otago, 1998).

9 James Beattie, 'Lusting after a Lost Arcadia: European Environmental Perception in the Otago Area, 1840–1860' (BA Hons Diss., University of Otago, 1999).

10 G. R. Macara, *The Climate and Weather of Otago*, 2nd ed. (NIWA Science and Technology Series Number 67, 2015), 7.



Figure 1: Index Map of the Ōtākou Settlement Middle Island New Zealand – Surveyed in the years 1846 and 1847, by C. H. Kettle [189 x 65 cm inside border, 1 mile to 1 inch].

Source: National Archives of New Zealand, R698465.

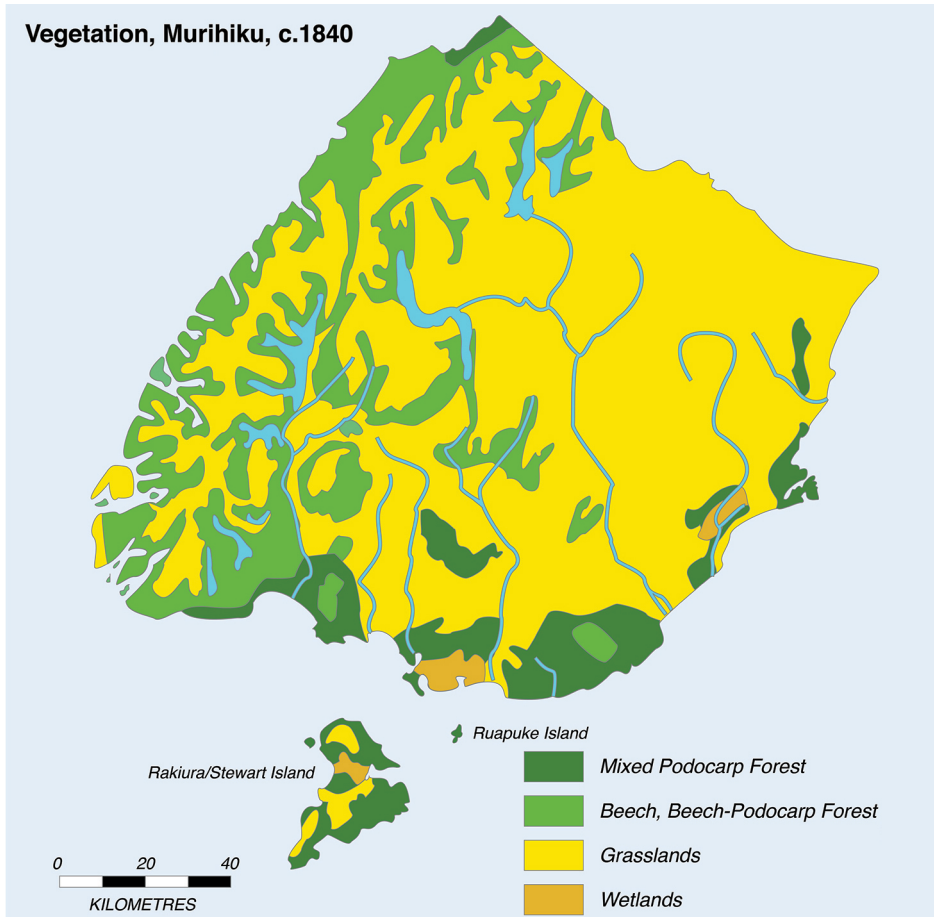


Figure 2: Forest distribution in Murihiku, c. 1840.

Source: Author's own, adapted and based on M. A. Bathgate, 'The Maori occupancy of Murihiku, 1000–1900 A.D.: A Geographic Study of Change' (MA diss., University of Otago, 1969), figure 7, 57.

The distribution of rainfall, vegetation and relief shaped the actions of 2 groups of peoples who made a home in these islands. Significantly, extensive forest clearance and its replacement with native grasses by Māori provided ideal conditions for the introduction of sheep consequent with European settlement. As the biogeographer and historical geographer Peter Holland notes, 'the widespread tussock grass, herbaceous, and low shrub communities [created by Māori burning] were a blessing as a source of palatable tissues for livestock and for shelter from the cold winds of winter and spring' (Figure 2).¹¹

11 Peter Holland, 'Room for All? European Settlers and Native Plants in the Southern New Zealand Lowlands: 1850–1920', in *Sharing Spaces: Essays in Honour of Sherry Olson*, ed. Robert Sweeney et al. (Ottawa: University of Ottawa Press, 2020), 43.

Table 1a: Otago's European population.

Year	1848	1849	1850	1851	1852	1853	1854	1855	1856	1857	1858	1859	1860
Otago population	620	1,215	1,482	1,776	1,740	2,391	2,557	2,852	3,796	4,631	6,944	9,010	12,691
Males	350	698	821	1,013	994	1,343	1,408	1,562	2,100	2,584	3,874	5,185	7,449
Females	270	517	661	763	746	1,048	1,149	1,290	1,696	2,047	3,070	3,825	5,242
Total population of New Zealand							32,554	37,192	48,193	52,155	59,328	73,343	83,919

Source: *Statistics for the Colony of New Zealand, 1848–61*.

Table 1b: Otago's Māori population, 1840s.

	1843–34 late winter/early spring (Shortland)	1844 summer (Selwyn)	1848 June (Kemp)	1848 October–November (Burns)	1848 December (Mantell)
Moeraki	200	100	185		84
Waikouaiti	101	96	135		121
Purākanui	32	32			45
Otakou (Otago Harbour)	160	100	100	111	
Taiari	19	19	10	27	
Rakiura / Stewart Island	85	62	10	28	

Source: Bathgate, 'The Maori occupancy of Murihiku', Table 16, 277; Table 17, 118.

Between 1840 and 1860 a permanent European presence on Kāi Tahu land in Otago grew considerably, following full-scale planned colonisation begun in 1848 by the New Zealand Company (NZC). The Ōtākou Block, of 400,000 acres, comprising the first Kāi Tahu sale to the NZC in 1844, expanded over the following 20 years to encompass almost all of Te Wai Pounamu by 1864.¹² And the handful of Europeans and other groups living there as whalers by 1840 steadily grew in number to some 590 by 1850, and over 12,000 by 1860 (Table 1a).¹³ Māori population and settlement in Otago also changed, in response to the effects of disease and their concentration on reserves (Tables 1b and 1c).

Table 1c: Otago's population, 1858.

Place	Male	Female	Total
New River & Oue	18	14	32
Jacob's River	40	36	76
Orakau	32	37	69
Moeraki	69	47	116
Waikouaiti	64	44	108
Otakou	46	41	87
Taieri	14	17	31
Other	2	4	6
Stewart / Rakiura & Ruapuke islands	110	90	200
Otago	395	330	725

Source: F. D. Fenton, *Observations on the State of the Aboriginal Population of New Zealand* (Auckland: New Zealand Government, 1859), www3.stats.govt.nz/historic_publications/fenton-observations-aboriginal-inhabitants-nz/fenton-observations-aboriginal-inhabitants-nz.html?_ga=2.38613157.767901607.1583957493-1608443533.1562128287, accessed 12 March 2019).

Environmental change and the improving ideals of the Otago Settlement

The Otago Settlement scheme of 1844–48 had a distinctly Scottish, Free Kirk flavour. As Tom Brooking writes, its founders, the Revd Thomas Burns (1796–1871) and William Cargill (1784–1860), shared a mutual loathing of urbanism and industrialisation and sought to keep Otago and its principal settlement Dunedin a concentrated community of family-orientated, small-farming Presbyterians of

¹² Harry C. Evison, *The Long Dispute: Maori land rights and European colonisation in southern New Zealand* (Christchurch: Canterbury University Press, 1997).

¹³ Peter Entwisle, *Behold the Moon: The European Occupation of the Dunedin District, 1770–1848* (Dunedin: Port Daniel Press, 1998), 79–106. There were 307 males and 283 females in Dunedin in 1850: *Otago Journal* 8 (March 1850): 111.

the Free Church.¹⁴ The settlement attempted to follow the precepts of the NZC, founded by the visionary Edward Gibbon Wakefield (1796–1862). Wakefield sought to create conditions for ordered and civilised colonisation by maintaining concentrated settlement through controlling the price and availability of land as well as ensuring a gender balance of migrants.¹⁵ Reality scuppered Wakefield's dreams and the intentions of Cargill and Burns. First, both the NZC and the Otago settlement struggled financially, the former relinquishing its charter in 1850. Nor did the ideals of closer settlement prevail, since Otago came to rely on the income produced by pastoralism. Finally, the significant presence of the 'Old Enemy'—that is, the English—threatened the religious exclusivity of the settlement, which was well and truly dissolved with the discovery of gold in 1861 and the influx of Irish and other groups.¹⁶

When Europeans arrived, the paramount Kāi Tahu settlement was at Ōtākou, located near Taiaoroa Head, at the entrance to Otago Harbour (Figure 3). Sizeable Māori settlements also existed northward from Dunedin, at Waikouaiti and Moeraki, in addition to smaller ones at Pūrakanui, Taieri Mouth and Maitapapa, inland on the Taieri Plains at the confluence of the Taieri and Waipori Rivers (Table 1b). Further south, significant settlements existed in the Te Ara a Kiwa / Foveaux Straits area, notably on Ruapuke Island (Table 1c).¹⁷

Although contact brought considerable opportunities to Māori, it also brought a devastating demographic collapse. Introduced diseases, such as measles and influenza, had major social, psychological and economic impacts. This only added to the major disruption to life caused by the conflict with Ngati Toa in the 1830s. As an example, introduced diseases reduced Ōtākou's population dramatically: from 160 in 1844 to 111 by 1848, and only 80 by 1861.¹⁸ Kāi Tahu leader Hone Tūhawaiki (c.1810–44) captured the devastating impacts of disease on his tribe in a speech of 1844 at Ohinetu hill, complaining of 'new plagues, unknown to our fathers', resulting in the disappearance of '[w]hole families'.¹⁹

14 Tom Brooking, 'The Great Escape: Wakefield and the Scottish Settlement of Otago', in *Edward Gibbon Wakefield and the Colonial Dream: A Reconsideration* (Wellington: Friends of the Turnbull Library, 1997), 127–30.

15 This of course is a simplification of Wakefield's ideas. See Patricia Burns, *Fatal Success: A History of the New Zealand Company* (Auckland: Heinemann Reed, 1989); the collection of essays of *Edward Gibbon Wakefield and the Colonial Dream*; Erik Olssen, 'Mr Wakefield and New Zealand as an Experiment in Post-Enlightenment Experimental Practice', *New Zealand Journal of History* 31, no. 2 (1997): 197–218.

16 Olssen, *A History of Otago*, 30–56.

17 Anderson, *Welcome of Strangers*, 186–204. See 'Census of Kaika in the Otago Block, February–March 1852', in W. B. D. Mantell, *Journal and Notebook, 1851–52*, Alexander Turnbull Library, MS 1528, reproduced in Peter Tremewan, *Selling Otago: A French Buyer, 1840, Maori Sellers, 1844* (Dunedin: Otago Heritage Books, 1994), 90–6.

18 West, *The Face of Nature*, 134.

19 George Clarke, *Notes on Early Life in New Zealand* (Hobart: Walch, 1903), 62–3, cited in Tremewan, *Selling Otago*, 38.

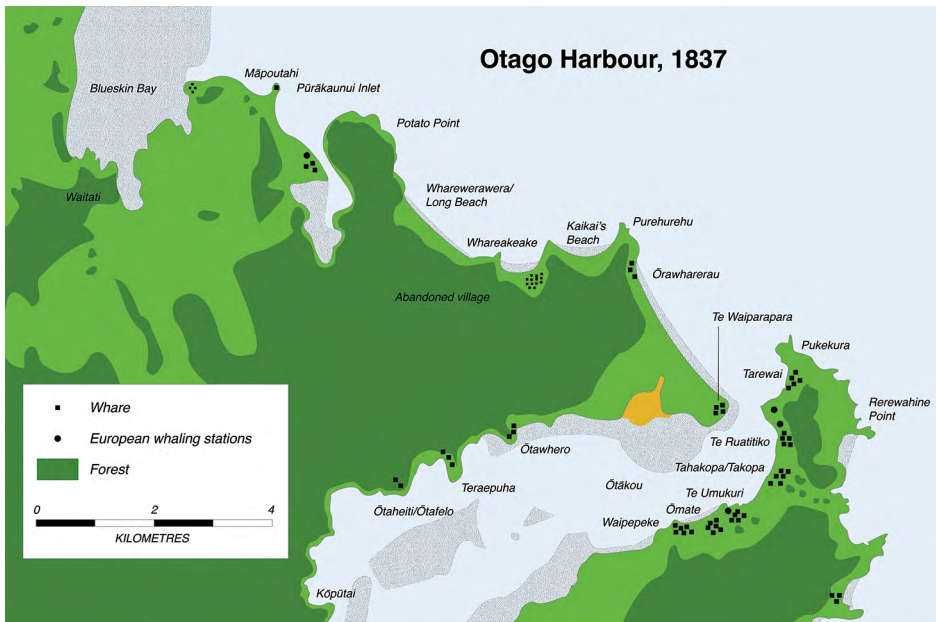


Figure 3: Māori settlements near Ōtakau, c. 1837.

Source: Adapted and based on information from Bathgate, 'The Maori occupancy of Murihiku, figure 22; Atholl Anderson, *The Welcome of Strangers: An Ethnohistory of Southern Maori A.D. 1650–1850* (Dunedin: Otago University Press, 1998), Peter Entwisle, *Behold the Moon: The European Occupation of the Dunedin District, 1770–1848* (Dunedin: Port Daniel Press, 1998), Khyla J. Russell, 'Landscape: Perceptions of Kai Tahu I Mua, Āianeī, Ā Muri Ake' (PhD diss., University of Otago, 2000); Peter Tremewan, *Selling Otago: A French Buyer, 1840, Maori Sellers, 1844* (Dunedin: Otago Heritage Books, 1994); and conversations with Matthew Campbell, Megan Potiki, Gerard O'Regan, Richard Walter.

In undertaking the arduous and dangerous journey to the other end of the world, regardless of their creed, Otago's settlers sought out their 'Promised Land'. In it, as Brooking has written, they hoped to re-establish 'the organic links between nature and community, and individual and community, which had been destroyed by unfettered capitalism'.²⁰ By nature and community, they resolutely meant European-style land use and settlement, rather than the unique southern Māori culture that had developed, based around shifting use of the resources of land and sea. Settlers instead aimed to plant a godly, pre-industrial European society in what they regarded as the rich and under-utilised soils of southern New Zealand.

Colonists introduced plants and animals familiar to them from Europe, even if many did not necessarily originate there.²¹ They established farms and towns. And they reproduced the institutions and ways of seeing and valuing resources from their homeland. Achieving the ideals of concentrated farming and pastoralism required

²⁰ Brooking, 'The Great Escape', 131.

²¹ James Beattie, 'Biota Barons, "Neo-Eurasias" and Indian-New Zealand Informal Eco-Cultural Networks, 1830s–1870s', *Global Environment* 13 (2020), 134–165.

bush clearance and other activities settlers regarded as landscape ‘improvements’, such as the drainage of wetlands and introduction of those grasses that sheep and cattle were used to feeding upon. A key motivation underpinning settlers’ vision of what the new colony would become was the notion of civilisation. To settlers, the ideals of civilisation meant fenced fields, productive agriculture and neat farmhouses. Civilisation gave such agricultural ‘improvers’ the confidence that what they were doing was not only worthwhile but also foreordained.

Almost all settlers interpreted the Genesis creation account, in which God gave Adam dominion over nature, as giving humans the duty to understand and manage the natural world for the benefit of themselves. Yet dominion did not entail either despoiling or destroying that inheritance.²² By introducing plants and animals, agricultural techniques and land systems from Europe, most settlers believed that they were enhancing, not destroying, the New Zealand environment. The *Otago Journal* in 1848, for example, urged local settlers to exercise dominion over Otago. Waxing lyrical about the province’s ‘vast tracts which are waiting for the reception of man’, the anonymous writer quoted from Genesis: ‘The injunction and blessing ... is yet in progress of fulfilment,—“Be fruitful and multiply and replenish the earth and subdue it”’.²³

The improving ideals of the Revd Thomas Burns, religious leader of the fledgling Otago settlement from 1848 to 1871, held sway over his flock. For Burns, God intended the colonists to make the land bring forth its bounty. In 1847, before he had even arrived in his Promised Land, Burns wandered with a ‘prophetic eye’ over the Otago of the future. Burns imagined:

the noble plains of Otago some generations hence to mark the future herds and flocks that cover the upland pastures far away to the ranges of the snowy mountains—whilst the lower lying valleys are waving with the yellow corn and the pursuits of rural husbandry the pretty farms, ‘the busy mile’ and the happy smiling cottages by the way side or nestling among the trees in some ‘bosky deiyle’ or sylvan dell—and all that a God fearing people—with a bold peasantry their country’s pride and an aristocracy whose highest honour it is that they are the disciples of Christ.²⁴

Most European settlers viewed New Zealand’s environment as just such a Promised Land, a land that was simply awaiting the improving hand of settlers to shape and cultivate it. Jane Bannerman (1835–1923), an early Otago settler and Clementina

22 See, James Beattie and John Stenhouse, ‘Empire, Environment and Religion: God and Nature in Nineteenth-century New Zealand’, *Environment and History* 13, no. 4 (November, 2007), 413–46.

23 *Otago Journal* 5 (1848): 66.

24 Revd Thomas Burns to Captain William Cargill, Portobello, 6 February 1847. MS 0076, Hocken Collections, University of Otago, Dunedin.

(1803–78) and Thomas Burns' second daughter, felt that God had brought Scottish Presbyterians 'into a good land' of plenty.²⁵ She quoted verses from Deuteronomy (8: 7–12) to describe her new home.²⁶

The landscape the colonists wished to fashion in Otago resembled the environment they knew from home. In Lowlands Scotland 'ordered fields and spaced-out farms' complemented the great houses, which 'projected the civilizing ideals of the classical world'. In urban areas, villages and the smaller towns of the area lay 'placidly and usefully where the roads and the hedges that defined them met'.²⁷ Bannerman nostalgically recalled the 'neat little cottages, each with a garden at the back, quiet and peaceful' of Kirkcaldy, Fife, the small Scottish town in which she grew up.²⁸

Images of tranquillity, however, were deceptive. The improving ideals of the Enlightenment were writ large across much of Scotland's physical and social landscape at the time of Bannerman's childhood; indeed, these same improving ideals would force her and many others to seek out a new home in Britain's far-flung colonies. Late eighteenth-century improving Scots landowners were experimenting with new systems of organising rural labour, new systems of tenancy and the newly refined practices of scientific agriculture. Improved crop species and crop rotation intensified agriculture, as did the privatisation of commons, but left many not only landless but also without work.²⁹

Acclimatising improvers

In a sad and ironic twist, the settlers who came to Otago to escape the landlessness and lack of opportunities of their homeland resulting from improvement imposed on Aotearoa the very same improving ideals with the very same results on Māori that they themselves had experienced.³⁰ Acclimatisation of familiar plants and animals was the key means by which settlers recreated their home environment in Otago. The replacement of native grasses for Europeans was widely welcomed. Wohlers introduced at the beginning of this article, reckoned that '[t]he wild-growing' native grasses were 'too coarse for sheep to thrive on'. They needed to be 'burnt away, and the soil sown with good European grasses and clover'.³¹ As Tom Brooking and Eric Pawson have shown, this is precisely what settlers did over the

25 Jane Bannerman, 'Reminiscences of her life to 1855', 48. Typescript in J. C. Wilson family papers. MS-0536-2, Hocken.

26 Bannerman, 'Reminiscences', 48.

27 Sydney Checkland and Olive Checkland, *Industry and Ethos: Scotland, 1832–1914* (London: Arnold, 1984), 56–7.

28 Bannerman, 'Reminiscences'.

29 Checkland and Checkland, *Industry and Ethos*, 57–60.

30 Tom Brooking, *Lands for the People? The Highland Clearances and the Colonisation of New Zealand: A biography of John McKenzie* (Dunedin: University of Otago Press, 1996).

31 Wohlers, *Memories*, 200.

nineteenth and twentieth centuries through the near-wholesale replacement of native grasses and forest with introduced grasslands.³² This increased stocking rates and set up New Zealand, for a time, to become one of the wealthiest countries in the world. Colonial statistics show the gradual expansion of cultivation in Otago, including the sowing of introduced pasture grasses (Table 2).

Table 2: Acreage and yield of European-produced crops, 1848–61.

Year	Wheat	Barley	Oats	Maize	Potatoes	Sown grass	Garden or orchard	Other crops	Total
1848	0	2	2		50				54
1849	43	9	25		122				199
1850	136	13	44		184				377
1851	338	28	267		237	169			870
1853	862	8	582		222	569			2,243
1854	1,077	9	728		277	712			2,803
1855	1,267	5	687		386	1,314	37		3,696
1856	1,930	21	805		355	1,718	117	76	5,022
1857	1,872	83	1,754		464		132	32	4,337
		Barley and oats							
1858	1,831	198			476	3,695			6,200
1859									
1860									
1861	5,065	187	4,859		838	8,426	609	370	20,354

Source: 1848–51: Bruce G. Hardie, *Statistics of New Zealand for the Crown Colony period, 1840–1852* (Auckland: Dept. of Economics, Auckland University College, 1954; 1853–56): No 52 'Comparative Table showing (as nearly as can be ascertained) the quantity of land (in acres) under Crop, and fenced, in the Colony of New Zealand', 1853–6, *Statistics of New Zealand for 1853, 1854, 1855, and 1856* (Auckland: Government Printer, 1858). Data unavailable for 1859 and 1860.

The importance of introducing new plants is apparent right from almost the very first activities of the NZC. Charles Henry Kettle (c. 1821–62), Chief Surveyor of Otago who oversaw the planning of Dunedin and the Otago area, established experimental plots of wheat and corn in 1846.³³ In the early years of settlement especially, an established and productive garden represented the difference between life and death. Just how much so is illustrated by Otago migrants' reliance on Kāi Tahu for their food supplies in the first years of settlement. Māori supplied settlers with both fish and potatoes.³⁴ Settlers also received supplies from John Jones' settlement of Matanaka. In this period, Māori engaged in a thriving export trade with Sydney. Putting down roots.

32 Tom Brooking and Eric Pawson, eds, *Seeds of Empire: The Environmental Transformation of New Zealand* (London: I. B. Tauris, 2010).

33 [Charles] Kettle to [Edward Gibbon] Wakefield, 4/46, 25 January 1847, Hocken.

34 West, *Face of Nature*, 179–80. On shifts in Kāi Tahu food production, see the comments by Horomona Pohio (c. 1825–81), reproduced in Tremewan, *Selling Otago*, 62.

Most colonists introduced plants familiar to themselves from their home into their gardens. Jane McGlashan's (1827–94) diary entry typifies many of the time. In 1853, she observed that '[w]e have many of the old home favourites here. Roses, Pansies, Carnations, daisies, hedges of Sweet Briar and the "bonny bonny broom"³⁵ which is perfectly glowing just now'.³⁶ Flower growing, rather than raising vegetables or keeping stock, exemplifies best the effort given over to purely matters of the heart, rather than to the needs of the belly. The effort expended in raising flowers from home demonstrates, at least in the early years of settlement, the challenge Europeans sometimes faced in having to shift their gaze and appreciation to native species.³⁷

In terms of garden seeds, Otago benefited from the later timing of its settlement in Australasia, which meant that settlers could obtain seeds and plants from other parts of the country and abroad.³⁸ As early as 16 June 1849 William Cutten's store as well as A. Anderson on Princes St were offering for sale vegetable seeds, and kitchen garden and flower seeds respectively.³⁹ A rival, James H. Stirling, also operated in Princes Street, and advertised 'well selected garden seeds' on 7 July 1849.⁴⁰ The relative scarcity of plants kept prices of some varieties high for a time. Sarah Low, Burns' daughter, in 1849 wrote that 100 strawberry plants cost £3.⁴¹ By the 1850s, Otago settlers could purchase a wider variety of plants locally, from several nursery firms.

In this respect, Dunedin was well served by gardeners. One of these, William Martin (1823–1905), set up business at nearby Fairfield, laying out 10 acres in garden.⁴² He advertised a variety of fruit trees for sale in July 1850: apples, pears, cherries as well as gooseberries and other currants.⁴³ Thereafter, Martin's business grew. Another early Dunedin nurseryman, George Matthews (1812–84), arrived in 1850, and established a nursery at Moray Place in the central city. Later, Matthews bought property at suburban Mornington on which he developed a shrub and tree nursery, named Hawthorn Hill (now Hawthorn Avenue).⁴⁴ Many, like Martin and Matthews, had been apprenticed on the larger Scottish and English estates, and so

35 Broom was later to become a curse to farmers because of its ability to spread owing to its dense root system and because it did not fix nitrogen.

36 Jane McGlashan, 8 October 1853. Journal of Voyage 'Rajah', 14 June 1853 – 3 December 1853. Typescript MS 35, Copy 67, Toitū Otago Settlers' Museum, Dunedin.

37 I am indebted to Paul Star for this observation.

38 Louise Shaw, *A History of the Dunedin Horticultural Society, 1851–2001* (Dunedin: Dunedin Horticultural Society, 2000).

39 *Otago News*, 7 July 1849.

40 Ibid.

41 Shaw, *Dunedin Horticultural Society*, 19.

42 William Martin, 'Early History of Fairfield', November 1963. Typescript in Martin DC-0320, Toitū.

43 *Otago News*, 20 July 1850.

44 Ruth A. Gow, 'George Matthews', in *The Advance Guard Series I*, ed. G. J. Griffiths (Dunedin: Otago Daily Times, 1973), 97–110.

brought considerable horticultural experience (as well as seeds) with them to Otago.⁴⁵ Several had also received a good education. Martin, for example, had taken courses in botany, mathematics, Hebrew, Greek and surveying at Edinburgh University.⁴⁶

Martin brought many plants with him from Britain and elsewhere. By 1861 his nursery had 'a wide variety of trees, shrubs, fruit trees, pines, hedge plants, and herbaceous plants, many of the importations coming from California'.⁴⁷ In addition to seeds, Matthews brought to Dunedin everything from fruit and ornamental trees to flowers, mosses and cacti.⁴⁸ Despite the later success of both Matthews and Martin, introducing plants from northern climes to southern ones represented a great challenge. Many plants failed to make it even half way around the globe. Erratic watering, extremes of heat and cold, and the ever-present danger of salt water served to destroy many a collection of living plants. Although chances tended to improve following the widespread adoption of the Wardian case—invented in the 1830s, and effectively a miniature glasshouse—and the reduction of voyage times with steamers, the shipment of living plants and seeds halfway around the world proved a chancy affair.⁴⁹

As well as obtaining plants locally, many settlers continued to receive seeds from friends, relatives and commercial nurseries in Britain and elsewhere. In respect to access to seeds, New Zealand settlers benefited from the boom in gardening that took hold in the British Isles from the 1840s. In Britain and, by dint of emigration, its colonies, gardening, along with natural history, became a marker of respectability and civility, especially among the burgeoning middle and working classes (Figure 4). Aside from publications, a large number of commercial firms catered to demand for plants from near and far.⁵⁰ As noted above, Dunedin nurserymen relied upon British firms to send them seeds. In the 1850s the politician John Larkins Cheese Richardson (1810–78), for example, developed extensive vegetable and flower gardens on his Willowmead estate, Inch Clutha, more than 70 km south of Dunedin. Richardson grew an astonishing number of flowers. One entry, for 2 February 1857, lists an order of 32 varieties of flowers from Sutton's Seeds. These ranged from geraniums and cowslips to dahlias and Forget-me-nots'.⁵¹ In 1857 he paid £8 18s 5d for considerable quantities of seeds from the UK nursery firm of Chatwood(?) and Cummins, sent through the wholesaler George W. Wheatley, London. Richardson received asparagus, peas, broccoli, cabbage, carrots, celery,

45 Shaw, *Dunedin Horticultural Society*.

46 'Mr William Martin, a Pioneer Horticulturist of Otago'. Manuscript notes by William Martin (his grandson), 3 February 1953. Martin DC-0320, Toitū.

47 Martin, 'Early History of Fairfield'.

48 Shaw, *Dunedin Horticultural Society*, 18.

49 James Beattie, "'The Empire of the Rhododendron': Reorienting New Zealand Garden history', in *Making a New Land: Environmental Histories of New Zealand*, ed. Tom Brooking and Eric Pawson (Dunedin: Otago University Press, 2013), 241–57, 365–7.

50 On which, see Beattie, "'The Empire of the Rhododendron'".

51 J. L. C. Richardson diary 1857–1860. AG-101, Toitū. He grew two varieties each of lettuce and cabbage. See entry for 4 October 1857, for example.

turnips, cucumber, spinach, red beet, Scotch kale, Windsor beans, Brussels sprouts, American cress, mustard, 'a collection of flower seeds', as well as '2 Bushels [of] mixed pasture grass'.⁵²



Figure 4: William Cargill was a keen plantsman, as evidenced from this photograph of his house, Hillside, in 1860, shortly before his death. Neat and well-tended, Cargill's garden contains many New Zealand native species, including *Phormium tenax* and Tī Kouka (*Cordyline australis*). Visible in the front left of the house is an extensive glasshouse.

Source: Reproduced with permission of Toitū Otago Settler's Museum. 'Photograph of "Hillside", Captain Cargill's Residence in 1860. The Captain is visible on the deck of the house', unknown photographer, 1860, 179 x 245 mm, CS.13803-1, Toitū.

Protecting the garden

While settlers enthusiastically set about establishing gardens, keeping them, as well as crops, free from unwanted grazing animals was a challenge in the early years of settlement. This concern was addressed by 2 ordinances, passed by the Otago Provincial Government in the 1850s. (In addition, lease conditions also stipulated improvements to property, including fencing.) The provincial government's Fencing Ordinance, 1855, reflected environmental realities in much of Otago, in which timber was in relatively short supply.⁵³ It replaced a New Zealand-wide ordinance.⁵⁴

52 'Invoices & Sundries, supplied by Geo. W. Wheatley of London' on the vessel *Southern Cross*, no date, but in 1857 Invoices. J. L. C. Richardson Invoices 1856–60. AG-101, Toitū.

53 'Fencing Ordinance, 1855', in *Ordinances of the Province of Otago, N.Z.*, session 1 to 14 inclusive (Dunedin: Otago Witness, 1862), 47A–48A.

54 'An Ordinance to Encourage the Fencing of Land, 1847', Session 8, in *Ordinances of the Province of Otago*, 283.

The Otago ordinance, as the environmental historian Michael Bagge notes, added a new section on live hedges, and legislated against ‘the destruction of well-trimmed live hedges’ and their replacement with a new wooden fence without an owner’s consent.⁵⁵

Settlers in relatively poorly timbered provinces, such as Otago and Canterbury, generally favoured live fences over ones constructed of timber.⁵⁶ The 1855 ordinance itself represented an awareness by the Otago authorities of environmental limits, in this case of the limitations of timber supply, in their region. Although, as noted, the immediate area around Dunedin was relatively well forested at the time of first European settlement, this was generally not the case for inland and northern areas (see Section 2 in Part II of this article).⁵⁷

The second measure enacted by the Otago authorities to deal with the problem of wandering stock was the Cattle Trespass Ordinance, 1858. Under its provisions, individuals whose cattle strayed within the town boundaries of Dunedin or nearby Port Chalmers could be liable for a fine of up to £5 and have their stock impounded.⁵⁸ This amended several earlier ordinances dating back to 1849. Not only did the ordinance of 1858 attempt to prevent damage to private property, but it also sought to minimise tensions within the community by providing a clear system of complaint and redress.

The problem of wandering cattle (and pigs) was not a new one. In the 1830s and 1840s, wandering cattle from stock introduced into the Otago Peninsula settlement of Ōtakou had formed wild herds.⁵⁹ But their effects magnified with more intensive settlement, increased agricultural activities, and greater numbers of stock. In late 1854 Captain Edmund Bellairs (1823–96) of Pelichet Bay (now Logan Park) sent ‘at the earnest request of many other aggrieved persons in this district’ a letter to the Superintendent of Otago complaining of the impact of wandering stock on property and persons:

The Evil complained of is this: that large droves of cattle are depastured on the streets of the Town—that they thereby cut up the pathways made at the expense of the Public, break down fencing and drainage bridges, fill up dykes and drains, and, stopping the flow of water along the last, soon render the roadway a perfect quagmire. Added to this the bulls are, naturally, a terror to women.

55 Michael L. S. Bagge, ‘Valuable ally or invading army? The ambivalence of gorse in New Zealand, 1835–1900’, *ENNZ: Environment and Nature in New Zealand* 9, no. 1 (February 2014): 135.

56 Ray Hargreaves, ‘Farm Fences in Pioneer New Zealand’, *New Zealand Geographer* 21, no. 2 (1965): 150. Although live fencing of this kind generally found favour in provinces like Otago and Canterbury with relatively scarce timber sources, some North Island settlers showed a preference for this method of fencing, such as hawthorn in the Waikato and native Manuka fencing in Katikati in the Bay of Plenty. *Ibid.*, 149.

57 See Neil Clayton, ‘Settlers, politicians and scientists: Environmental anxiety in a New Zealand colony’, *ENNZ: Environment and Nature in New Zealand* 9, no. 4 (2014): 26.

58 ‘Cattle Trespass Ordinance 1858’, in *Ordinances of the Province of Otago*, 103–4.

59 West, *Face of Nature*, 146.

That very morning, complained Bellairs, he had ‘had to drive twenty[-]three head of Cattle from the street leading to the east of the Town; Two of them huge Bulls in no playful mood’. Bellairs felt ‘that nothing will be done to remedy the lawless state of affairs I have been describing until some member of the Otago Executive feels the horns of a ferocious bull in some part of his proper person, which I hope will be a soft one’.⁶⁰

Of the surviving records from Dunedin, which date only from 1857, it would appear that cattle trespass remained a problem throughout that decade, despite a clear desire by authorities to enforce the ordinance. From the beginning of 1857 to March 1860, the magistrate made 166 convictions, garnering fines totalling more than £85. Convictions jumped markedly in the period January 1859 – March 1860, rising to 125. Previously they had been 21 (1857–58) or 20 (1858–59).⁶¹ This indicates a growing problem with wandering cattle, coincident with a higher number of settlers and stock (Table 3), in conjunction possibly with a magistrate more willing to prosecute settlers.

In 1840s Ōtākou there was only a handful of cattle, sheep and horses, in addition to many pigs. Protector of Aborigines for the Eastern Districts Edward Shortland (1812–93) enumerated 50 sheep and 12 cattle on the farm run by Octavius Harwood at the whaling station there.⁶² This was in contrast to the vast numbers of pigs roaming wild. At Ōtepoti—the future site of Dunedin—in the 1840s Shortland met Māori ‘who had just come up the harbour to look after their pigs, of which great numbers were running at large in the bush’.⁶³ Numbers of cattle and sheep increased markedly with the 1848 Otago settlement (Table 3). This reflected the dawning reality that in Otago, although ostensibly founded as a concentrated community of small farming Presbyterians, pastoralism would rapidly become the mainstay of its economy, much to Cargill’s chagrin.⁶⁴

60 E. Bellairs to Superintendent, requesting police to come and stop the nuisance of stray cattle, 11 December 1854. AAAC/D500/707/Box 126, record163, item b, Archives New Zealand, Dunedin branch.

61 ‘Return of the number of Convictions, and the Amount of Fines received[,] at the Resident Magistrate’s Court, Dunedin, for the last 3 years ending March 1860 under the Cattle Trespass Ordinance’, Papers and Returns—Return of convictions and fines for cattle trespass to the year ending March 1860 – 20 April 1860. AAACD500701 Box 6, 79g, Archives New Zealand, Dunedin branch.

62 West, *Face of Nature*, 146.

63 Edward Shortland, *The southern districts of New Zealand: A journal, with passing notices of the customs of the Aborigines* (London: Longman, Brown, Green & Longmans, 1851), 174–5.

64 Cargill chafed under the arrangement whereby W. B. D. Mantell as Commissioner of Crown Lands was able to dispose of land in the area outside of the Otakou Block. See Tom Brooking, *And Captain of their Souls: An interpretative essay on the life and times of Captain William Cargill* (Dunedin: Otago Heritage Books, 1994), 71–100; Clayton, ‘Settlers, Politicians and Scientists’ (1998) for perhaps the fullest treatment, see A. H. McLintock, *The History of Otago: The Origins and Growth of a Wakefield Class Settlement* (Dunedin: Otago Centennial Historical Publications, 1949), 239–97.

Table 3: Otago stock numbers.

Settlement or Province	Horses			Mules and asses			Cattle			Sheep			Goats			Pigs		
	1851	1858	1861	1851	1858	1861	1851	1858	1861	1851	1858	1861	1851	1858	1861	1851	1858	1861
Auckland	1,035	3,839	5,621	11	7	20	10,943	31,700	36,482	11,075	58,792	67,803	2,604	3,079	5,999	5,679	11,461	12,612
Taranaki	68	452	220	...	2	...	1,395	4,052	2,171	2,700	16,000	10,566	83	55	33	1,165	1,931	245
Wellington (including Hawke's Bay in 1851)	788	3,199	5,117	28	43	42	11,407	35,799	49,323	64,009	155,994	247,940	2,654	2,896	2,856	3,135	11,994	11,670
Hawke's Bay	...	727	1,782	...	8	9	...	4,492	8,320	...	180,320	312,459	...	880	974	...	1,555	1,693
Nelson (including Marlborough in 1851 and 1858)	532	2,266	2,360	13	11	17	5,838	19,435	11,110	92,014	393,041	181,367	5,842	3,820	419	2,609	5,628	2,985
Marlborough	...	...	1,519	...	...	17	...	...	8,474	...	...	368,836	...	...	1,099	...	...	1,452
Canterbury	224	2,749	6,049	7	46	29	2,043	20,739	33,576	28,416	495,580	877,369	356	724	625	1,255	6,680	9,586
Otago (including Southland in 1851 and 1858)	243	1,680	4,790	1	5	15	3,161	20,971	34,544	34,829	223,589	619,853	582	313	156	2,371	1,443	2,218
Southland	...	...	812	...	...	4	...	...	9,139	...	...	73,970	...	...	9	...	...	555
Stewart's Island	...	...	...	...	...	...	...	16	21	...	8	20	...	30	...	...	42	30
Total	2,890	14,912	28,270	60	122	153	34,787	137,204	193,150	233,043	1,523,324	2,760,183	12,121	11,797	12,170	16,214	40,634	43,046

Source: *Statistics of New Zealand, 1861*.

Figures indicate that Māori generally kept pigs and stock. Walter Mantell (1820–95), Crown Lands Commissioner for the Southern District of New Zealand and Province of Otago (1851–55), observed in 1854 that although some Kāi Tahu expressed a preference to invest in both horses and sheep, ‘the price of that description of Stock is now too high for [their] means’.⁶⁵ Prices of horses and sheep remained relatively high in Otago compared to other provinces (Table 4), and settlers continued to have to import livestock from other provinces or abroad.

Table 4: Livestock prices in Otago.

Year	Horses	Horned Cattle	Sheep	Goats	Pigs
1848	£25	£12 10s	£1	10s	£2
1849	£25	£16	18s	15s	£2
1850	£25	£13	17s	12s	£1 10s
1851	£22	£10 10s	17s	12s	£2
1852	£23	£11 10s	£1	12s 6d	£1 15s

Source: Hardie, *Statistics of New Zealand for the Crown Colony period*, table 58.

Animal energy

In keeping with this pre-industrial society, from the 1840s to the 1860s motive power for the settlement invariably came from energy derived from sun, wind and water. Just as the Roaring Forties propelled immigrant sailing vessels on the last leg of their often stomach-churning voyage to New Zealand, so water turbines powered mills turning timber into planks or wheat into flour. Human and animal muscle toiled to transform the land. This is the so-called biological old world in which photosynthesis lay at the basis of a series of energy transfers from plant to animal.⁶⁶

As the historian Nancy Swarbrick notes, in New Zealand ‘[m]ost domestic animals were either stock or working animals, providing food, fibre, transport and labour of various kinds. Many were destined to be slaughtered and eaten’.⁶⁷ Sheep provided mutton as well as wool. They spread over the larger runs of inland Otago—or ‘Hundreds’, as unsurveyed land was termed—environments already highly altered by Māori actions. Native grasslands proved palatable and useful fodder for sheep, until their gradual replacement with introduced pasture. Introduced pasture supported higher stocking numbers than native grasses. Horses—still expensive in

⁶⁵ W. B. D. Mantell to Colonial Secretary, 18 March 1854, Dunedin. Outwards Letterbook Crown Lands, Southern District of New Zealand and Province of Otago, Nov. 1851 to Dec. 1855 inclusive. Walter Mantell, Commissioner of Crown Lands. DAAK/D450/9331/3, Archives New Zealand Dunedin branch.

⁶⁶ On which, see J. R. McNeil, *Something New Under the Sun: An Environmental History of the Twentieth Century* (New York: W. W. Norton, 2000).

⁶⁷ Nancy Swarbrick, *Creature Comforts: New Zealanders and their Pets. An Illustrated History* (Dunedin: University of Otago Press, 2013), 46.

colonial Otago through the 1850s—reflected their value as modes of transportation, necessary for traversing the sometimes vast distances between settlements, especially in the general absence of unformed roads. They were also status symbols in both Māori and Pākehā worlds.⁶⁸ In contrast, working dogs were farmers' foot soldiers, corralling sheep and keeping order amongst flocks, their role all the more important in the early years of settlement because of the relative lack of shepherds, and fences, in Otago at this time.

Hoofed animals had a major ecological impact in an environment unaccustomed to animals. Animal manure and hooves altered soil composition. Grazing impacted plant composition, structure and regeneration.⁶⁹ Even on introduced pastures, cattle, while increasing nutrient cycling, also cause losses to nutrients and concentrate 'nutrients into small volumes of soil from which complete recovery by plant uptake is difficult'.⁷⁰ Overstocking, moreover, can lead to soil loss and erosion. Other introduced animals, especially rabbits, were to have devastating ecological impacts on the grasslands of the inland South Island, effects that present generations are still trying to mitigate. In forests, deer, pigs and cattle strip trees and undercover, while introduced cats and dogs, as well as unwanted introductions such as rats and possums, prey on native birds.⁷¹

As early as 1854, in the area from Mātaura to Aparima (Riverton), now in Southland, Mantell reported 'there is probably a far greater extent turned up by the myriads of wild pigs than cultivated by human beings and nearly as many wild cattle as tame'.⁷² Nor was it limited to wild cattle and pigs. In 1857 at Wairuna, near Popotunoa, South Otago, William Gordon Rich recorded the appearance of 'wild dogs' and registered his response—poison.⁷³

68 Carolyn Minchum, *The Horse in New Zealand: Attitude and Heart* (Auckland: David Bateman, 2011); Hazel Petrie, 'Satisfaction in a Horse: The Perception and Assimilation of an Exotic Animal into Maori Custom Law', in *Invasive and Introduced Plants and Animals: Human Perceptions, Attitudes and Approaches to the Environment*, ed. Ian D. Rotherham and Robert A. Lambert (London and Washington, DC: Earthscan, 2011), 313–26.

69 Susan M. Timmins, 'Impact of cattle on conservation land licensed for grazing in South Westland, New Zealand', *New Zealand Journal of Ecology* 26, no. 2 (2002): 107–20.

70 P. H. Williams and R. J. Haynes, 'Influence of Improved Pastures and Grazing Animals on Nutrient Cycling within New Zealand Soils', *New Zealand Journal of Ecology* 14 (1990): 54–5.

71 For the impact of these introductions, see Carolyn M. King, *Invasive Predators in New Zealand: Disaster on Four Small Paws* (Basingstoke: Palgrave Macmillan, 2019). Of the rabbit's impact, note Peter Holland and Guil Figgins, 'Environmental disturbance triggering infestations of gorse, rabbits, and thistles in southern New Zealand: 1850–1980', *International Review of Environmental History* 1 (2015): 41–79.

72 W. B. D. Mantell to Colonial Secretary, 18 March 1854. Dunedin, Outwards Letterbook Crown Lands, Southern District of New Zealand and Province of Otago, Nov. 1851 to Dec. 1855 inclusive. Walter Mantell, Commissioner of Crown Lands. DAAK/D450/9331/3, Archives New Zealand Dunedin branch.

73 21 March 1857, 24 March 1857, Diary of W. G. Rich, 17 May 1852 to 31 August 1852. Typescript, Misc MS 0943b, Toitū.

Typical of early settlers' introductions were those of Otago's patriarch, Burns. As well as introducing seeds from home, in 1847 Burns brought with him to Dunedin a 'Bull, Cow, Newfoundland' dog, as well as a cat.⁷⁴ The settler Rich listed the passengers on board the vessel on which he sailed to Dunedin in 1852. As well as the *Joseph Fletcher's* 120 human passengers, there were:

300 fowls
35 pigs
12 sheep
1 dog
1 cat.⁷⁵

Some of the wealthier settlers brought considerably more stock. Many, such as Rich and Charles Suisted (1810–60), also bought stock from other provinces (usually Canterbury).⁷⁶ Rich drove his newly bought sheep several hundred kilometres to his property at Wairuna, relying on their mutton for food as he progressed south.⁷⁷ Otago settlers continued to import considerable numbers of stock into the 1850s.

Cows provided valuable sources of milk and, as figures show for the 1850s, contributed a small percentage to exports from the province in the form of butter. Turnips provided them with winter food. Fowls gave meat and eggs, food supplemented by the many pigs roaming through the bush, as well as the native birds. The large native wood pigeons (kererū, *Hemiphaga novaeseelandiae*) roosting on the same tree were so tame in the 1840s, observed Shortland, that he could shoot one after another.⁷⁸ Near a lake or lagoon was the best place to hunt, noted McLeod Orbell, because there it 'literally teemed' with birds.⁷⁹

A combination of habitat loss through deforestation and the impact of introduced predators dramatically reduced Otago's birdlife. The loss of birdsong remained a constant refrain in settler reminiscences. Jane McGlashlan initially found the bush 'enlivened by the clear notes of a beautiful yellow bird,⁸⁰ and by those of the tui or parson bird (*Prosthemadera novaeseelandiae*)—a pretty creature, clothed in a suit of glossy green and black, with the singular tuft of white feather beneath its chin'.⁸¹ McGlashlan and Sarah Low, who came to Dunedin with her husband in 1849, were

74 Thomas Burns, 28 January 1847, Diary, 27 November 1847 – 15 April 1848. Typescript, in G. C. Thomson Papers, MS 440/18, Hocken.

75 Diary of W. G. Rich, 17 May 1852 to. Typescript copy of original held in private hands, Misc MS 0943b, Hocken.

76 Julie Bremner, 'Charles E. Suisted', in *The Advance Guard: series II*, ed. G. J. Griffiths (Dunedin: Otago Daily Times, 1974), 99–150.

77 See diary of W. G. Rich, *passim*.

78 Shortland, *The southern districts of New Zealand*, 10–11.

79 Orbell, 'Reminiscences 1849–1870', 37.

80 Presumable Mōhua (*Mohoua ochrocephala*).

81 McGlashlan, 8 October 1848.

struck by the tameness of the birds, which rapidly proved their undoing.⁸² Parakeets, fluttering ‘about in the sunshine’, and robins, ‘in their sober suits of black and brown’, would ‘stop within a few yards of you and even perch upon your shoulder’, said McGlashlan.⁸³ Looking back to the early years of settlement, Fraser regretted her own and her fellow colonists’ liking for bird meat. ‘What a pity’, she rued, ‘it was to destroy those beautiful birds, which are now so scarce.’⁸⁴ Like Wohlers, who later lamented the introduction of that ‘land plague’, rabbits, Fraser wrote her comments after the event.⁸⁵ Only from the 1860s did large-scale concerns emerge over the impact of rabbits, especially in the high country. In this decade, Holland has noted that disturbance, combined with weather patterns, created conditions ideal for the spread of rabbits in these areas. The impacts—environmentally, socially and economically—were devastating.⁸⁶

Measuring progress

The needs of survival gave clearing, building and enclosing especial urgency during the early years of establishing a colony.⁸⁷ No doubt most settler families would have appreciated Ellen Valpy’s (1827–1904) pencil drawing of Forbury Farm (Figure 5), on the edge of Dunedin, in 1857 a mere 9 years after the first migrant had arrived.⁸⁸ Ploughed land, well-established homestead and outbuildings, and fenced paddocks represented what most settlers aimed to achieve in New Zealand.

Settlers measured progress by the area of land under cultivation and the amount of bush removed. Walking deep into the forest of North East Valley, Dunedin, in 1859 the settler Alexander Begg (1839–1907) observed that ‘[t]he sound of the axe in the distance’ told of ‘how fast this wildness is being reclaimed’.⁸⁹ The backbreaking work of bush clearance appears vividly in Orbell’s reminiscences. In 1857, his family decided to build a homestead on their run near Hawksbury, some 30 km north of

82 Relatively little is known about the Lows other than that they were in Wellington by 1851. They possibly left for Australia after sometime later. Tania Connelly, op. cit., 1999.

83 McGlashlan, 8 October 1848; Sarah Low, ‘Larkins’, 6 November 1849. Typescript, Copy 61 (original MS unknown), Toitū.

84 Anne Black Fraser, *I Remember 1848–1866* (Dunedin and Wellington: no publisher, no date), 10.

85 Wohlers, *Memories*, 201.

86 Peter Holland, *A Home in the Howling Wilderness: Settlers and the Environment in Southern New Zealand* (Auckland: Auckland University Press, 2014).

87 See also William Gordon Rich, *Diary of a voyage to Auckland, New Zealand from England aboard the Joseph Fletcher* 17 May 1852 – 31 August 1852 and subsequent life, mainly in Otago, 26, 28 February 1855. MS 0943a, Hocken.

88 The eldest of the Valpy daughters, Ellen, married her eldest cousin, Henry Jeffreys, in 1852. The marriage, however, was not successful and Ellen fell on hard times, no doubt disappointed at her inability to earn a living through art. Jane Thomson, ed., *Southern People: A Dictionary of Otago Southland Biography* (Dunedin: Longacre in association with the Dunedin City Council, 1998), 526. Her sisters and mother were also gifted artists.

89 Alexander C. Begg, 16 December 1859, *Diary of Voyage from Glasgow to Dunedin* 8 June 1859 – 8 August 1860. Begg family papers, collected by Neil Begg. AG-497-01, Hocken.

Dunedin. First, they cleared the bush, an activity in which everyone helped. After ‘the scrub was cut with axes and billhooks, dragged into heaps and burned ... the trees were felled’ and heaped up. Next, settlers fenced the area, and, finally, ‘with adzes or grubbers’, removed logs and the remaining stumps. For the homestead, they felled suitable timber selected from the adjoining bush, rolled it on skids to the sawing site, measured, sawed and then dragged it to the construction site. To complete the run, the Orbells established a vegetable garden and built a 50-foot-long byre.⁹⁰



Figure 5: Ellen Penelope Valpy, *Forbury Farm*, circa 1857, pencil on paper, Valpy Box 3, Acc No: 1978/5684.

Source: Reproduced with permission from Toitū Otago Settlers' Museum.

Some certainly found the bush a great trial. In 1849 Low declared that Otago's trees were too tall. '[T]hen there is the undergrowth of smaller Trees and Shrubs', which, with the supplejacks (*Ripogonum scandens*) are so close as to render 'it impossible to walk out of the Surveyors' Paths'.⁹¹ However, in the dozens of settler diaries, letters, reminiscences and official papers I have read, only one other colonist, an anonymous letter-writer quoted in John Cargill's published handbook for emigrants, wrote disparagingly of the bush around Otago. Unless emigrants liked the 'Sublime and beautiful', he wrote, they would be faced with only small areas of cleared forest,

90 McLeod C. Orbell, 'Reminiscences 1849–1870', 29, 53–8. Typescript, MS 46, Copy 85, Toitū.

91 Low, 6 November 1849, 1–2. 'Surveyors', punctuated.

with temporary huts set ‘amid the apparently interminable forests’.⁹² In other words, Otago’s particular landscape of forest and hills, appealing though it might be visually, was otherwise useless for agricultural pursuits.

The almost complete absence of a negative assessment of forests in Otago questions the validity of interpretations put forward by the historical geographer Paul Shepard, who claims that settlers had a generally unfavourable impression of New Zealand forests, which ‘evoked gloom except when seen from the outside’.⁹³ Perhaps the reason is that Shepard made New Zealand-wide generalisations of European environmental perception reliant on only 10 sources on the South Island.⁹⁴ Another factor may have been that Dunedin was not as densely forested as the North Island. As Richardson playfully observed in 1858, Nature’s ‘mischievous humours’ had meant that in the South Island ‘where timber is required for firing and fencing, it is generally wanting, and where not required, it is to be had in abundance’.⁹⁵ Richardson, a deep-thinking and far-sighted individual, also identified the need for the authorities to protect forest resources as well as to seek alternatives, such as hedging, to timber fences (see Part II, Section 2).

It would be wrong to think that settlers did not appreciate native species just because they were engaged in changing the environment. For all her pessimism, Low asked her husband to ‘shoot me down pieces’ of leaves from the treetops to see what they looked like.⁹⁶ Bannerman ‘took great pride in watching the development’ of the Burns family’s manse through bush clearance, yet she still appreciated native flora. Her brother, Arthur Burns, would row across Otago Harbour to collect native plants for introduction into the garden of their father’s property (Grant’s Braes) on Otago Peninsula.⁹⁷ As this article discusses in Part II, settler environmental change did not mean that Europeans failed to appreciate existing scenery, or that they rued its passing in the name of progress.

It may in fact have been through clearance that many colonists became interested in, and aware of, native flora. In the late 1850s, Frank Mathias (1842–?), for example, ‘worked at the bush all day and got down some rails & posts [and] found a curious plant at [sic] the bush, the seeds [of which] were in the top leaves’.⁹⁸ Likewise, John

92 ‘No. 1 – Letter from a Settler to the Colony to a Relative in *Britain*’, Dunedin, 24 January 1860, in John Cargill, *New Zealand: Information for the Guidance of Intending Emigrants* (Edinburgh: Bell and Bradfute, 1860), Appendix, 33.

93 Shepard, *English Reaction to the N.Z. Landscape Before 1850*, Pacific Viewpoint Monograph No. 4 (Wellington: Victoria University of Wellington, Department of Geography, 1969), 3.

94 Of 105 primary references to New Zealand, only 10 (including 3 from Dunedin) refer to the South Island. Thirteen were either non-New Zealand primary or secondary sources. See *ibid.*, 16–49.

95 *Otago Witness*, 10 July 1858, 6.

96 Low, 6 November 1849, 1–2. ‘Surveyors’ (correctly punctuated).

97 Bannerman, ‘Reminiscences’, 45.

98 *Ibid.*, 45; Frank Mathias, Journal of Frank Mathias 1 October 1859 – 30 September 1861, 21. Misc-MS 1560/1, Hocken.

McLay (1840–1916?), while working for the Burns family clearing bush, found native species ‘terrible stuff’ to clear, yet took great pleasure in their appearance.⁹⁹ This was an experience by no means limited to Otago. In 1858 the Taranaki settler Arthur Atkinson (1833–1902) ‘practised [the] Maori [language] & [tree] felling together’ while working with his Māori employee, Mohi. Indeed, Atkinson learnt much more about the natural world from Mohi, including the names of trees when felling them, and Māori practices and beliefs about deforestation and the behaviour of local birdlife.¹⁰⁰

In assessing the natural resources of the land, surveyors and settlers alike quickly appreciated the utility of timber. Rather than serving only as an impediment to pastoralism or agriculture, the remnant bush provided raw materials for building and fencing, and a livelihood for its suppliers. As Orbell observed, ‘Hawksbury Bush contained useful timber, either for sawing, fencing or shingles’. He and his brother received a contract from the entrepreneur Jones for some 200,000 shingles. Settlers, too, were aware of the scarcity of forests when selecting land. For example, in 1848, an anonymous landowner near Saddle Hill, about 18 km south of Dunedin, recognising the value of timber for fencing and building, made sure his property bounded a good area of forest.¹⁰¹ The Otago authorities protected timber to prevent its exhaustion (see Part II, Section 2).

Although highly idealised, a sense of the changes wrought in the area in and around Dunedin in the 10 years or so following initial settlement appears in 2 lithographs produced by Kettle, both designed to encourage further migration to the settlement.¹⁰² His depiction of Dunedin in 1849 (Figure 6) shows permanent-looking dwellings in neatly cleared, fenced fields. (In the middle distance in other versions of this lithograph, 2 cows stand in a field, a figure approaching them.) Figure 6 suggests progress through tree stumps in the foreground and bush retreating up the hill on the left-hand side of the picture. The message it conveys is that bush is there in sufficient quantity to provide timber, but not so much as to require large-scale clearance for migrants considering settlement in Dunedin. The inclusion of sailing ships in Otago Harbour implies regular access to the outside world and a well-established market.

99 *Waikouaiti and Dunedin in 1850: Reminiscences of John McLay, an early settler*, ed. Ross S. Gordon (Dunedin: The editor, 1998), 30–1, 54, 11.

100 A. S. Atkinson, 9 November 1858, in ‘Diary of Arthur S. Atkinson 20 May 1853 – 5 November 1855’. MSX 3040, Alexander Turnbull Library, Wellington.

101 Clayton, ‘Settlers, Politicians and Scientists’ (1998), 50–6; Orbell, ‘Reminiscences 1849–1870’, 27, 38; ‘Letter from a landowner’, *Otago Journal* 4 (26 September 1848): 58. See also Charles Kettle, 7 April 1846, in Letterbook, 2/46.

102 High-quality copies are found at Charles Henry Kettle, ‘Dunedin in 1848’ [sic] (Edinburgh: A. Banks and Son), tinted lithograph, 81 x 176 mm. Au K43 94/16, Neg: 1837/13A, Hocken Library; Charles Henry Kettle, ‘Dunedin in 1859’ (Edinburgh: A. Banks and Son), tinted lithograph on paper, 81 x 134 mm. Neg: 1837/12, Hocken Library.



Figure 6: Charles Kettle, 'Dunedin in 1849'.

Source: 'View of Part of Dunedin, and Upper Harbour, from Stafford Street' (1849). This was republished in John Cargill, *Otago, New Zealand: Information for the Guidance of Intending Emigrants* (Edinburgh: Bell and Bradfute, 1860), no page. Toitū Otago Settlers' Museum CS/2846 (reproduced with permission).



Figure 7: Charles Kettle, 'Dunedin in 1859'.

Source: Cargill, *Otago, New Zealand*.

A decade later, the change is striking (Figure 7). There are more permanent-looking houses. Roofs are shingled rather than thatched. The number of masts visible behind the jetty shows the manifold increase in shipping the town had enjoyed since its establishment. The message and contrast is clear: by working hard, the first settlers have brought prosperity through land clearance.

The message of these 2 images, if not the accuracy of the state of Dunedin in its early years, are borne out in descriptions contrasting its early settlement and later development, on the eve of the gold rush that began in 1861. Orbell, late in life, recalled Dunedin in 1849 as consisting of 'a few scattered and hastily erected dwellings'. Not even the town had been completed. A large area of Dunedin was still 'covered with a rank growth of grass, flax, scrub, Toi Toi [pukio, *Carex secta*] and spear grass'. It was, concluded Orbell, altogether an 'embryo Town' and not at all attractive. A decade later:

civilization had made some progress. I say some progress, because it is difficult to define where it begins or ends. At any rate Dunedin was growing and clearances made, where before bush, scrub, and ... [pukio, *Carex secta*] existed. The Northern route over Flag Staff Hill had been improved by the erection of stone cairns, also over Swampy Hill, and a horse track partially indicated by the traffic, people were no longer afraid to travel that country alone.

Conclusion

Whether they grasped it or not, Otago's first generation of European settlers came to a highly modified environment shaped by over 500 years of Māori actions. These later settlers benefited immeasurably from the change from forest to grassland over much of eastern New Zealand initiated by Māori firing, as well as, during the early years of settlement, by the produce grown by Māori, which helped keep Otago's first European colonists fed.

A mutual loathing of industrialisation, combined with the moral glue of Presbyterianism, and the promise of land ownership and independence, provided an intoxicatingly attractive lure to many Free Kirk Scots disillusioned with religious persecution, the impact of enclosure and the loss of rural industries. Although the ideal of a tight-knit, concentrated settlement of God-fearing Scots proved chimerical, the actions of the early immigrants attracted to the Otago Colony had lasting and, in many cases, irrevocable environmental and social effects.

Fired by the ideals of improvement, settlers to Otago set about hewing farms from forests, making gardens in what they perceived as a wilderness, and introducing a host of plants and animals for practical and aesthetic reasons. Alongside this, they introduced farming systems familiar to themselves from home. As this article has shown, the effects of these actions on soils, ecologies and lives were sometimes

profound, through loss of species and changes to soil composition, as well as removal of forests and an acceleration of erosion. Yet, despite such profound changes, settlers were indifferent neither to the environment around them, nor to the effects of their own actions on it.

As the second part of this article will show, one common way in which settlers encountered the Otago environment was shaped by Romanticism. This gave settlers a framework within which to place various parts of Otago's environment, whether the picturesque wooded sides of Otago Harbour or the Sublime, awe-inspiring scenery of the Southern Alps. The next part of this article will also show the existence of extensive, if sometimes contradictory, efforts to preserve forests both within the town of Dunedin and in the wider Otago Block. Diverse efforts at conservation provoked conflict between some Māori and authorities, as well as within colonial society itself.

Coda

In 1999 Tom Brooking supervised my BA Honours Long Essay, one of hundreds of Honours dissertations he has overseen, in addition to a staggering 100 masters and doctoral theses. I didn't realise it then, but Tom's influence over this dissertation—coupled with the fourth-year environmental history course on India run by Ruhi Grover and Judith Bennett's Pacific environmental history from the previous year—would put me on a course to becoming an environmental historian myself. I'd especially like to thank Tom for his support, guidance and friendship over the years.

ON THE EDGE OF CANTERBURY SETTLEMENT, 1854–58

PAUL STAR

Abstract

By reference to the 1850s diaries of Thomas Potts, an early European settler in Canterbury, New Zealand, this article illustrates how farm diaries might be used to extend our understanding not only of environmental but also of rural history. Potts lived in Canterbury from 1854 until his death in 1888 and was a 'well bred' and wealthy runholder, politician, writer and naturalist. My interest in Potts has always centred on his curiosity about New Zealand's native species, his thoughts on how they were affected by European settlement, and his efforts to protect them. Today, however, I will be looking at other observations he made, and from a different perspective, using his diary. Potts kept a diary from 1854 to 1858. He was then in his early 30s and living in the vicinity of Windwhistle—aptly named—in inland Canterbury. He and his young family lived there initially at Valehead, then on Rakaia Terrace, both within easy walking distance of Rockwood, which was his father-in-law's cattle and sheep station.

Keywords: Thomas Potts, Rockwood Station, Canterbury New Zealand, farm diary, environmental history, rural history, Peter Holland, Tom Brooking

Tom Brooking supervised my PhD on the attitudes of early European settlers to the New Zealand environment.¹ Then, like some others here, I got dragged into the 'Empires of Grass' project, which he and Eric Pawson led.² Since those heady days, when many of us first thought of ourselves as 'environmental historians', I have retreated more and more into a simple existence on the Otago Peninsula. I can claim, in fact, to lead a 'rural' life.

1 Paul Star, 'From Acclimatisation to Preservation: Colonists and the Natural World in Southern New Zealand, 1860-1894' (PhD diss., University of Otago, 1997).

2 See Tom Brooking and Eric Pawson, eds, *Seeds of Empire: The Environmental Transformation of New Zealand* (London and New York: I. B. Taurus, 2011).

Tom, meanwhile, has gone from strength to strength, writing his very fine biography of Richard Seddon,³ and now—supposedly in retirement—researching the making of rural New Zealand. I’ve never seen myself as a rural historian, but the present occasion⁴ encourages us all to bend our thoughts in this direction, and I’m pleased to have this chance.

My MA thesis was on ‘T. H. Potts and the Origins of Conservation in New Zealand (1850–1890)’.⁵ I began work on this in 1990, and since then have published articles on New Zealand’s changing environment in which Potts receives mention. Now, 30 years down the track, I finally have a book published about Potts.⁶ It includes reference to his first years in New Zealand, on the edge of Canterbury settlement. This article touches lightly on that edge, through the eyes of Potts and with regard to others who were there at the time.

Thomas Potts lived in Canterbury from 1854 until his death in 1888 and was a ‘well bred’ and wealthy runholder, politician, writer and naturalist. My interest in Potts has always centred on his curiosity about New Zealand’s native species, his thoughts on how they were affected by European settlement, and his efforts to protect them. Today, however, I will be looking at other observations he made, and from a different perspective.

Potts kept a diary from 1854 to 1858. He was then in his early 30s and living in the vicinity of Windwhistle—aptly named—in inland Canterbury. He and his young family lived there initially at Valehead, then on Rakaia Terrace, both within easy walking distance of Rockwood, which was his father-in-law’s cattle and sheep station.

We are fortunate to also have 3 other diaries from the same location and from the same period or slightly later. First, there is the parallel Rockwood Station diary for 1855 to 1857, mostly written by Potts’ father-in-law, Henry Phillips. Second, as I only learnt quite recently, there is another Rockwood diary, written by Henry’s son George, covering 1863 to 1869. Lastly, there is the diary for 1866 to 1871, mostly written by another son, Tom, who was based at ‘The Point’, the station next to Rockwood. None of these diaries have been published, and the Potts and George Phillips diaries remain in private hands.

3 Tom Brooking, *Richard Seddon: King of God’s Own: The Life and Times of New Zealand’s Longest-serving Prime Minister* (Auckland: Penguin Books, 2014).

4 An earlier version of this paper was presented at the symposium ‘Making Rural New Zealand: Environment, Economics and Politics’, held at Dunedin in 2018 to mark the retirement of Prof. Tom Brooking of the University of Otago.

5 Paul Star, ‘T. H. Potts and the Origins of Conservation in New Zealand, 1850–1890’ (MA diss., University of Otago, 1991).

6 Paul Star, *Thomas Potts of Canterbury: Colonist and Conservationist* (Dunedin: Otago University Press, 2020).

I think a close analysis of all these diaries, examined together, would be a great rural history project. Between them, in different ways and from different angles, they detail the beginning of one particular settlement, one example of rural New Zealand in the making.

I am also aware of 2 retrospective descriptions of the early homestead at Rockwood, which lay at the core of the Phillips' runs. Published in 1870 and 1882, both descriptions are sentimentalised, reflecting the rural ideal that their authors were brought up with in England.

First, Mary Anne, Lady Barker, described Rockwood as seen from above—from the hills that divided her husband's station from the Phillips'. 'Nothing', she said,

could be more effective than the white gable of the house standing out against the vast black birch forest which clothed the steep hill-side for miles—the contrast so picturesque between the little bit of civilization and culture and the great extent of wild, savage scenery around it.⁷

Second, Potts himself, in his old age, reminisced about Rockwood as he had known it 30 years before. He wrote of his father-in-law's house, 'nestling well up in a valley at the foot of a sombre beech-wood that covered rocky mountain slopes in the very heart of picturesque and romantic landscapes'.⁸

These are identifications both of settlement and of setting, which have as much to do with what the mind imagined as with what the eye saw. They are valuable, for they display what rural settlement *seemed* to have been about.

Diaries that were written at the time, and for the most part without much reflection, show better what it was *actually* about. Later, I will touch on the idea of a changing vision of rural New Zealand running alongside a changing reality, but I will begin with the reality that is recorded, albeit selectively, in diaries.

The problem with nearly all *station* diaries is the brevity of their entries and the narrowness of their focus. Often, the things you most want to know about are the things they leave out. What you get is a basic record of changes in the weather, stock movements, gardening, farming and visitors. I looked at a few Southland farm diaries when working on 'Empires of Grass' and found they were hard nuts to crack.⁹

7 [Mary Anne,] Lady Barker, *Station Life in New Zealand* (London: Macmillan, 1870), 91.

8 T. H. Potts, 'With the gun now—and then', *New Zealand Country Journal* 6, no. 3 (May 1882): 235–42.

9 Paul Star, 'On Southland farm diaries', unpublished paper (June 2004).

The first New Zealand scholar to try the 'diary approach' was the Canterbury geographer W. B. Johnston, in about 1960. He analysed the diaries (1874–1900) of one family who were carving a farm out of Taranaki bush land.¹⁰ He grouped the family's various daily agricultural activities and looked for changes in the ratio between these activities that might correlate with the process of environmental transformation.

But he found he had a problem with *silences*. In a revealing paragraph, he wrote:

The time devoted to livestock cannot be accurately measured as the daily task of milking cows is seldom indicated in the diaries ... These tasks were largely done before breakfast or before the main task of the morning, or following the main work for the afternoon. Moreover, the womenfolk and the youngsters frequently carried out these tasks.¹¹

Johnston's database, in other words, didn't regularly describe either the principal farming activity (it being a dairy farm) or the activity of over half of the labour force (it being a family farm).

Peter Holland and Ray Hargreaves, in about 1990, had another go at farm diaries. They chose to study the Point diary, by Potts' brother-in-law, Tom Phillips, which I have already mentioned. They found it 'remarkable for the picture it conveys of personalities, places and activities in frontier society' and said it 'hints at the rapid transformation of inland Canterbury's rural landscapes'.¹² Like Johnston before them, they put the activities described into different heaps, coming up with 5 broad categories.

The fifth category they called 'personal'. To some extent this reflected the nature of the diaries they worked on, but it also indicated that Holland and Hargreaves were prepared to consider more than just the agricultural activity that Johnston had analysed. This was explicit in the title of the article that resulted: 'The Trivial Round, The Common Task: Work and Leisure on a Canterbury Hill Country Run in the 1860s and 1870s'. They acknowledged that this fifth category was 'something of a catch-all, yet [they said] a seasonal pattern can be discerned in time spent in non-productive ways'.¹³ On the basis of some of the information in this category, they discussed how gold fever and alcoholism may have affected the rural community around Windwhistle.

10 W. B. Johnston, 'Pioneering the bushland of lowland Taranaki: A case study', *New Zealand Geographer* 19, no. 1 (April 1961): 1–18.

11 Ibid., 11.

12 P. G. Holland and R. P. Hargreaves, 'The Trivial Round, The Common Task: Work and Leisure on a Canterbury Hill Country Run in the 1860s and 1870s', *New Zealand Geographer* 47, no. 1 (1991): 19–25.

13 Ibid., 23.

This is the kind of thing that I would call ‘social history’, which must surely be an important component of any comprehensive ‘rural history’. I am struck by Katie Cooper’s notion of ‘the poignancy of individual experiences’ lending to the ‘fraught history of the land’.¹⁴

Personal narrative certainly yields enjoyable vignettes to supplement tight analysis, but I think it has the potential to be more than this. Social history captures material that is *not* well dealt with by agricultural or economic or environmental history. It therefore deserves to be an intrinsic part of rural community analysis, and not just illustration. The trouble is, of course, that the kind of material that informs social history is more often anecdotal than comparable. This is great for providing colour, but it is difficult evidence to tabulate.

Peter Holland, nevertheless, continued to demonstrate how farm diaries *can* yield comparable data. Not only did he show how they could inform agricultural history, he also used them to advance weather history¹⁵ and to progress environmental history in general in his book *Home in the Howling Wilderness*.¹⁶

What I would love to see is further analysis of farm diaries that will enlighten us about the *social* history of New Zealand’s rural areas, beyond both the agricultural and the environmental history. Chapter 7 of Peter’s book, which concerned ‘meetings, sales, competitions and exhibitions’, is an indication of what might be possible in this direction.

In the 2018 symposium at which the first version of this paper was read, Peter provided a meticulous and pioneering analysis of stock and station agents’ records, which showed how station supplies changed over the years and affected agricultural practice.¹⁷ Peter was in good form, delivering his findings with his usual clarity and enthusiasm. He died just a few weeks later, so this proved to be his final contribution to historical geography. It opens up the exciting prospect of future research, by other scholars, into another kind of archive that can shed light both on environmental and rural change.

The exceptional thing about Potts’ early diary, which Peter never had the opportunity to study, is the frequency with which Potts breaks free of the station diary mould, and gives us so much *more* ‘personal’ material.

14 Abstract to Katie Cooper, ‘Food and the transformation of rural New Zealand’, paper delivered at ‘Making Rural New Zealand: Environment, Economics and Politics’ symposium, Dunedin, 2018.

15 P. G. Holland, P. Dixon and V. Wood, ‘Learning about the weather in early colonial New Zealand’, *Weather and Climate* 29 (2009): 3–21.

16 Peter Holland, *Home in the Howling Wilderness: Settlers and the Environment in Southern New Zealand* (Auckland: Auckland University Press, 2013). See also my review of this book in *New Zealand Journal of History* 47, no. 2 (2013): 269–71.

17 Peter Holland, ‘Stock and station agency records and rural landscape change’, paper delivered at ‘Making Rural New Zealand: Environment, Economics and Politics’ symposium, Dunedin, 2018.

The diary's owner at first only let me view it for a few hours and under a watchful eye. For a long time I only had my hastily scribbled *extracts* from Potts' diaries to refer back to, all of which I had chosen for their 'environmental' content. One example of this kind of extract relates to 12 October 1855:

Set a Dorking hen on 15 eggs. Talking of eggs reminds me I ought to record the great number laid by the fowls here, quite surpassing my experience of their prolificacy in England ... Killed another weka this morning; it goes much against my inclination to wage exterminating war against these amusing and confident birds, but they are so partial to fowl's eggs and so persevering in their visits to the nesting places, that one is reduced to the alternatives of weka or eggs—we decide for the latter ... [Weka are] Good eating when stewed ... One that was tamed used to kill rats by securing them with its feet, and driving its wedge-like bill through its victim.

This is wonderful material for the environmental historian, since it shows not only the conflict of interest between a native species (the weka) and an introduced species (the hen), but also the ways in which both were adapting to changed circumstances—hens by laying more eggs, weka by learning to kill rats and eat hen's eggs. There was also adaptive behaviour on the part of the settler, who both added a new food to his diet, and tipped the scales in favour of the introduced by slaughtering the native species.

Since then, the owner of the Potts diary has sent me a complete copy. This means that I am now able to dwell on the rest of the material in it, which deals not with interactions between humans and their environment, but with interactions between humans and other humans.

One example of this was written by Potts, in a bad mood, on 2 October 1857, saying what he thought of the couple who help him and his wife with the farm and the children:

Jack and Maria ought to have the prize for dirt. I have to partake of the same food as they do, to share the same loaf, eat from the same dish, and anything more repulsive than their persons and habits I am at a loss to conceive; their squalid appearance from dirt and filth is disgusting. Jack never washes; I made him wash his hands today, which is an act I'm afraid he looks upon as arbitrary and tyrannical [sic], but as I have to cut my slice of bread off the loaf he uses, why, I hold myself excused under the circumstances. Maria rubs or washes her face and mouth and hair, and now and then disguises herself in a clean frock, but I suppose lest she should be accused of pride, suffers her neck, hands, arms and stockings to remain in status quo. Oh, for the largest engine of the London Fire Brigade [to hose them down].

This is far more vivid than what you find in most station diaries. Like the previous quotation, it concerns human adaptation (or the need for it) in a new environment, though here I am referring to a 'social' rather than a 'natural' environment.

A stated intention of the New Zealand Company in 1847 had been ‘to transplant English society with its various gradations in due proportions’.¹⁸ The reality in 1857 in Windwhistle, however, was an isolated rural community in which the demand for amenable or ‘good’ hired labour far outstripped its availability. Nor did rural Canterbury yet have the physical and social ‘fences’ that had so well separated and differentiated the classes in England. All parties had much to learn.

Another extract from Potts’ diary also finds him in a bad mood, on 10 November 1855:

The job of milking is most disgusting from the extreme filthiness of the yards, and which the weather has precluded any attempt at improving. Literally up to the knees in thick sticky muck, and as several of the milkers [cows] don’t condescend to enter the bails till they have been pursued round the yard half a dozen times with a long pole, their coyness is anathematised till every known curse is worn threadbare by constant repetition. What a contrast to old times at home [in England] where Charles, whose placidity was only equalled by his cows’, went through his lactatory duties innocent of bails and leg-ropes and took the foaming buckets to the dairy almost as clean himself as his spotless pails; where the petted favourites, when you strolled about the garden, followed you with wistful eyes in hopes of a treat of cabbage leaves; *here* go to see the cattle and most likely at first sight of you they trot off, change the pace for a gallop and go perhaps two or three miles, only stopping when quite out of breath, leaving you, if on foot, ample time to reflect on England where ‘The lowing herd winds slowly o’er the lea’.¹⁹

That last line is a quotation (slightly altered) from Thomas Gray’s ‘Elegy Written in a Country Churchyard’. The first few verses of this poem are a classic portrayal of the kind of English scene that Potts, as he remembered it, enjoyed while living in the Surrey countryside. It is what he wished to recreate in New Zealand in 1855, but it was not working. The weather was not English weather. There was no roofed milking shed. Potts’ money still had not come through from England and he no longer had a skilled worker to do the milking for him. The skittish cows ran away and there was no fence to contain them. And there was not much of a garden yet, either.

The making of rural New Zealand as a whole breaks down into a thousand pictures of individual settlers, struggling with limited resources to transform unfamiliar landscapes. The pity is that there were so few rural settlers like Potts who both participated in and commented on rural change as it occurred. Herbert Guthrie-Smith was a later settler who left an equally rewarding written record.²⁰

18 *Twenty-third Report of the Court of Directors of the New Zealand Company* (London, 1847), 2.

19 T. H. Potts, diary, 10 November 1855.

20 Herbert Guthrie-Smith, *Tutira: The Story of a New Zealand Sheep Station*, 4th ed. (Seattle, WA: University of Washington Press, 1999).

No doubt there were other observations from settlers in their letters ‘home’ to Britain, but few of these letters have survived. We are left with diaries, but also with thousands of columns of rural news and the like in regional newspapers. I suspect that these are the best of all remaining written primary sources, particularly since their digitisation has made them more accessible.

How can we best approach these various kinds of evidence? And, if I was researching the making of rural New Zealand, what would I expect to find? In historical research, it is often the case that you have some thoughts on your subject *whether or not* you want them, and the challenge then is to examine the evidence without prejudice.

One’s prejudices are perhaps strongest when looking into a so-called planned settlement like Canterbury, when maybe most early British settlers came with no real plan at all, only with the hope that life would be better for them in a new place. Nevertheless, I posit a basic sequence of developments as things turned out for the minority who did actually live, as the Phillips and the Potts lived, in a rural rather than an urban context.

First, there was a rural ideal (and sometimes actual rural experience) that emigrants had ‘in mind’ when they left Britain for New Zealand. Second, they were confronted with a New Zealand reality that they sought to change and mould into an approximation of that ideal. Third, to some extent they succeeded in transforming the one into the other, and to some extent they failed. Fourth, in the course of this there came not only ‘environmental learning’ but also ‘social learning’ or ‘social adjustment’. This resulted in a changed landscape, a changed way of life, different social interactions, and a pattern of rural settlement which had not been anticipated.

As emigrants became settlers, indigenous ecosystems became rural landscapes, primarily of managed pasture and scattered human settlements. Vision and substance continued to affect one another, and both were changed or adapted.

I suspect the language employed to describe rural settlement, and landscapes in general, will also have changed. A close look at individual examples of a word’s use over time—examples of ‘linguistic adjustment’—might be a way of gauging not only actual change in rural New Zealand, but also changes in perception. While an environmental historian could look at words like ‘forest’ and ‘bush’, a social historian could look at words like ‘village’ and ‘township’.

A rural history of Canterbury settlement, then, might profitably examine not only the archival evidence in station diaries, stock and station records, newspapers, photographs and maps to clarify the actual sequence of perceptions, events and adaptations—it could also look specifically at a changing landscape of language, which will hint at changes in the social landscape as much as the natural landscape.

But I am on uncertain ground here, presuming to reflect on research that has not been done—or at least not by me. Recording one day in 1856, Potts noted he had only ‘managed to fork up a piece of ground, but perhaps it would have been better let alone’. I have felt much the same, as an environmental historian, straining to turn over evidence more as a rural historian would. I can only hope, as Potts did, that ‘At any rate it will give it a sweetening’.²¹

21 T. H. Potts, diary, 30 July 1856.

PRACTICE IN PLACE IN EMPIRE FORESTRY: OWEN JONES IN CEYLON, AUSTRALIA AND NEW ZEALAND, 1911–55

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Abstract

This article traces the career of the forester Owen Jones from his training at Oxford University to his retirement in New Zealand. Taught by the eminent Empire forester Sir William Schlich, Jones joined the Ceylon Forest Department in 1911 and after the First World War was appointed Chair of the Victorian Forestry Commission. In 1925 he left to take charge of New Zealand Perpetual Forests' afforestation program and after the Second World War worked as an independent forestry consultant. Jones exemplified the Oxford Empire forester, but after successes in Ceylon he encountered unexpected opposition in Victoria, which prompted him to depart public sector forestry for a more restricted role in private sector afforestation in New Zealand.

Keywords: forestry, Australia, New Zealand

Introduction

It is possible to visualise Tom Brooking's publications as situated within a 'triangle' where environmental history, biography and urban social structure are at the corners, as represented by for instance the 'Empires of Grass' project, his biography of Richard Seddon and work undertaken as part of the Caversham project. Contained within the triangle is an array of other work, from a short history of Massey University and a single-volume history of New Zealand, to a history of dentistry in New Zealand, as well as interests in comparative environmental history.¹

¹ Tom Brooking, *Richard Seddon: King of God's Own* (Auckland: Penguin, 2014); Tom Brooking and Eric Pawson, eds, *Seeds of Empire: The Environmental Transformation of New Zealand* (London: I. B. Tauris, 2011); Tom Brooking, Dick Martin, David Thomson and Hamish B. James, 'The ties that bind: Persistence in a New World industrial suburb, 1902–1922', *Social History* 24 (1999): 55–73, doi.org/10.1080/03071029908568052; Tom Brooking, *The History of New Zealand* (Westport, CT: Greenwood, 2004); Tom Brooking, *Massey, its early years: A history of the development of Massey Agricultural College to 1943* (Palmerston North: Massey Alumni Association, 1977); Tom Brooking, *A history of dentistry in New Zealand* (Dunedin: New Zealand Dental Association, 1980).

The image of the triangle is invoked both to make a point about how my own work is situated with respect to Tom's and to provide a rationale for the substance of this article. Whereas Tom's biographies exemplify 'biography as subject', and for me his biography of Jock McKenzie is particularly significant, Seddon's interests in scenery preservation notwithstanding, my biographical work has been more in the vein of 'biography as method' less 'concerned with the internal components of subjectivity [biography as subject] than the external factors that shaped' a life.² Where Tom has written about closer land settlement, my attention has been focused on the timber industry (a still neglected aspect of rural life in New Zealand), early efforts at forest conservation and on discharged soldier settlement as a last pioneering phase of land development.³ Whereas Tom and Eric Pawson address the question of what came after the forest was cleared, my own attention has stayed on the forest cover, forest management and afforestation. And for the record, my own interest in the urban has been limited to some enquiries focused on the Workers Dwelling Act. Tom and I have worked largely in parallel planes, but not entirely occasionally we bump up against and sometimes have crossed common boundaries in biography, environmental history and, to a lesser extent, social structure. This article is written then from across the border, indeed across several borders (but not barriers) that surround Tom's academic interests (which also, it ought to be noted, includes a sensitivity to place, particularly, but not limited to, Otago).

The subject of this article is Owen Jones, an imperial forester in Ceylon (now Sri Lanka), Australia and New Zealand. Previously, I have written about Jones and forestry to illustrate ideas of imperial 'careerism' and mobilities, an approach developed by David Lambert and Alan Lester.⁴ My earlier work on Jones can also be positioned against an interest in the diffusion of scientific forestry ideas spreading around the British Empire, and indeed into North America.⁵ Elsewhere, the forester John Dargavel writes of 4 'contested forestries' in Australia involving local land department officers, British estate forestry, European and empire systems, and American, with their associated visions. He also notes that the European foresters' vision was 'more diverse than is commonly depicted in the English-language literatures'.⁶ The diffusionist interpretation was challenged by Indian environmental

2 Jake Hodder, 'On absence and abundance: Biography as method in archival research', *Area* 49 (2017): 455, doi.org/10.1111/area.12329.

3 Tom Brooking, "'Busting Up" the Greatest Estate of All: Liberal Maori Land Policy, 1891–1911', *New Zealand Journal of History* 26 (1992): 78–98; Tom Brooking, 'Use it or lose it: Unravelling the land debate in nineteenth-century New Zealand', *New Zealand Journal of History* 30 (1996): 141–62.

4 David Lambert and Alan Lester, 'Imperial Spaces, Imperial Subjects', in *Colonial Lives Across the British Empire: Imperial Careerism in the Long Nineteenth Century*, ed. David Lambert and Alan Lester (Cambridge: Cambridge University Press, 2006).

5 Gregory Barton, 'Empire forestry and the origins of environmentalism', *Journal of Historical Geography* 27 (2001): 529–52, doi.org/10.1006/jhge.2001.0353; Gregory Barton, *Empire Forestry and the Origins of Environmentalism* (Cambridge: Cambridge University Press 2002).

6 John Dargavel, 'Contested forestries, contested educations: A centenary reflection', *Australian Forester* 75 (2012): 16–21, doi.org/10.1080/00049158.2012.10676381.

historians, who reasserted the significance of place, particularly the importance in India of local conditions in modifying ideas of scientific state forestry.⁷ Some research by environmental historians and historical geographers has attempted a synthesis of training and place to argue that European forestry practices and their modification were important in specific places at particular times.⁸ Brief studies of the foresters Sir David Hutchins and Hugh Corbin support this position.⁹ This article continues in this vein; at its core are the interconnections between Jones' professional training and the impact of place on his forestry practice.

Brett Bennett argues that forestry in India became more 'British' after the establishment of forestry teaching at the Royal Indian Engineering College at Cooper's Hill in England in 1885.¹⁰ In 1905 the Imperial Forest School shifted from Cooper's Hill to Oxford University, where an Oxford degree, usually in Natural Sciences, became the prerequisite for the Diploma in Forestry. Owen Jones was an Oxford forestry graduate whose profession took him to Ceylon (1911–17), was interrupted by war service, then recommenced in Victoria, Australia (1920–25), and concluded in New Zealand (1925–55).¹¹ His 40-year career allows for a prolonged examination of the modifying impact of local conditions, particularly in Australia and New Zealand, on his forestry practices and on the persistence of ideas from his original forestry training at Oxford under Sir William Schlich.

7 K. Sivaramkrishnan, 'A limited forest conservancy in southwest Bengal, 1864–1912', *Journal of Asian Studies* 56 (1997): 75–112, doi.org/10.2307/2646344.

8 Brett Bennett, 'An Imperial, National and State Debate: The Rise and Near Fall of the Australian Forestry School, 1927–1945', *Environment and History* 15, no. 2 (2009): 217–44, doi.org/10.3197/096734009X437990; Brett Bennett, 'A Network Approach to the Origins of Forestry Education in India, 1855–1885', in *Science and Empire: Knowledge and Networks of Science across the British Empire, 1800–1970*, ed. Brett Bennett and Joseph Hodge (Basingstoke: Palgrave Macmillan, 2011), 68–88, doi.org/10.1057/9780230320826_4; Benjamin Weil, 'Conservation, exploitation, and cultural change in the Indian Forest Service, 1875–1927', *Environmental History* 11 (2006): 319–43, doi.org/10.1093/envhis/11.2.319; Michael Roche, 'Colonial Forestry at its Limits: The Latter Day Career of Sir David Hutchins in New Zealand 1915–1920', *Environment and History* 16 (2010): 431–54, doi.org/10.3197/096734010X531489; Michael Roche, 'Forestry as imperial career: New Zealand as the end and edge of empire in the 1920s–40s', *New Zealand Geographer* 68 (2012): 201–10, doi.org/10.1111/j.1745-7939.2012.01234.x.

9 Roche, 'Colonial Forestry at its Limits'; Michael Roche, 'H. Hugh Corbin at the University of Adelaide School of Forestry, 1912–1925', *Australian Forestry Journal* 76 (2013): 1–8, doi.org/10.1080/00049158.2013.776927.

10 Bennett, 'A Network Approach', 69.

11 I have retained 'Ceylon' in the text to signal that Jones was part of the British colonial era.

Owen Jones—The world and work of an empire forester

Owen Jones (1888–1955) was an archetypal Imperial forester: a public schoolboy and captain of the First XI and First XV who won a scholarship to study at Oxford University.¹² Jones completed a Natural Sciences degree in 1910, followed by a Diploma in Forestry in 1911 under Sir William Schlich.¹³ German-born and educated, Schlich was the preeminent figure in British imperial forestry; he had completed a forestry PhD at the University of Giessen in 1866. After joining the Indian Forest Service he rose to become Inspector General of Forests in India (1883–85) and later oversaw the education of imperial foresters as Professor of Forestry at Cooper's Hill (1885–1905) and subsequently Oxford University (1905–19).¹⁴

The cornerstone of Schlich's achievement was his 5-volume *Schlich's Manual of Forestry*, which was published in several editions from 1889 to the mid-1890s. Schlich authored the first 3 volumes, entitled *Introduction to Forestry*, the *Formation and Tending of Woods or Practical Sylviculture* and *Forest Management*. The last 2 volumes were completed by his Cooper's Hill assistant W. R. Fisher. Volume 4, *Forest Protection*, was adapted from *Der Forstschutz* by Dr Richard Hess (Professor of Forestry at the University of Giessen) and volume 5, *Forest Utilization*, was a translation of *Die Forstbenutzung* by Dr Karl Gayer (Professor of Forestry at the University of Munich) first published in 1863. It was recognised as the standard German work on utilisation. This set of canonical texts made available in English ideas derived from German forestry, tempered by Indian experience. Schlich considered, however, that 'the general principles of sylviculture hold good all over the world'.¹⁵ He situated forestry within a political economy whereby the state had particular responsibilities and duties, although there was also a place for privately owned forests. A primary object of forestry was 'the production of forest produce, and the realization of certain other effects' (the latter including climatic and amenity).¹⁶ This object was to be achieved by silvicultural techniques directed to the long-term maximisation of production of wood per acre, or of the annual monetary return, or of aesthetic or protection forestry ends. This would involve the creation of a 'normal forest' of even age classes for a complete rotation with harvests guided by

12 Sporting achievement was taken as an indicator of the necessary capacity for teamwork and adaptability to the rigours bush camp work.

13 Owen Jones CV [1932]. R3 04/1527/2. Archives New Zealand (ANZ), Wellington.

14 Anon., 'Sir William Schlich', *Journal of Forestry*, 25 (1927): 5–8.

15 William Schlich, *Schlich's Manual of Forestry*, vol. 1: *Introduction to Forestry* (London: Bradbury Agnew, 1896), 159.

16 Schlich, *Schlich's Manual of Forestry*, 1:59.

working plans enabled by the collection of growth rate data and calculation of yield tables. The principles contained in *Schlich's Manual* lay at the heart of the forestry education Jones received at Oxford.

Schlich's writings were situated within a forestry mentality that was governed by 4 assumptions, of 'scarcity', 'stability', 'certainty' and a 'closed economy', which were the product of the particular conditions, including wood shortages faced by German states in the early nineteenth century.¹⁷ In India, critical historical scholarship sees this 'scientific forestry' manifesto as the redefinition of property rights, demarcation of forests, changes to the composition of forest species, fire control and restrictions on customary use, all injurious to the needs of the local population.¹⁸ Neither did the 4 assumptions translate well to North America, where a preponderance of old-growth forests resulted in harvests exceeding growth in the process of converting them to 'normal forests', and again in the Depression years of the 1930s when the focus was on an even flow of timber products from the forest to provide socioeconomic stability in towns and communities dependent on forestry.¹⁹ In Australia and New Zealand, scientific forestry was also comparatively late to appear, lagging because of the efforts put into clearing forests for land settlement, and the political and economic importance of such endeavours.

In 1908, Jones had entered Oxford as a probationer for the forest service of India and Ceylon, opting for the archetypal imperial forestry career path. It was actually a time of change; Jones had been accepted as probationer prior to commencing university study, and as he left for Ceylon in 1911, Oxford lost its monopoly on providing foresters to the Indian Forest Service.²⁰ Edinburgh University from 1887 was also training foresters (offering a degree course from 1909), some of whom now found employment in India, while Cambridge also established a short-lived Forestry School in 1907.²¹

After graduating, Jones spent 9 months inspecting long-managed German forests. He prepared a working plan, the epitome of scientific forestry accomplishments, for 20 compartments, totalling 1,580 ha, of forest, in the Mitteldich Ranges near

17 Hugh Raup, 'Some problems in ecological theory and their relation to conservation', *Journal of Ecology* 52 (supplement) (1964): 19–28, doi.org/10.2307/2426.

18 Ramachandra Guha and Madhav Gadgil, 'State Forestry and Social Conflict in British India', *Past & Present* 123 (1989): 141–77, doi.org/10.1093/past/123.1.141; Kalyanakrishnan Sivaramakrishnan, 'The Politics of Fire and Forest Regeneration in Colonial Bengal', *Environment and History* 2 (1996): 145–94, doi.org/10.3197/096734096779522338.

19 Marion Clawson and Roger Sedjo, 'History of sustained-yield concept and its application to Developing countries', in *History of Sustained-Yield Forestry: A symposium*, ed. Harold K. Steen (Portland, OR: Forest History Society, 1983), 3–15.

20 J. Ritchie, 'Probationers of the Indian Forest Service', *Transactions of the Royal Scottish Arboricultural Society* 24 (1911): 212–13, doi.org/10.1080/18324460.1911.10439170.

21 Michael Roche, 'Charles Foweraker: Forestry and Ideas of sustainability at Canterbury University College (1925–1934)', *ENNZ: Environment and Nature in New Zealand* 11 (2018): 6–23.

Frankfurt. This document was commented on and signed off by the German forester in charge.²² Like his contemporaries, he could not read technical forestry material in German (in Jones' case his French was less polished).

Ceylon, 1911–17

Appointed as an assistant forester in 1911, Jones was part of the first cohort of professionally qualified officers in the Ceylon Forest Department. Ceylon remained 80 per cent forested, with virtually all the remainder used for agriculture. The forests included a wet, evergreen, tropical rainforest zone around the capital Colombo on the west coast and semi-evergreen monsoon forest on the drier eastern side.²³ Forests of merchantable quality comprised 3.1 million acres (1.2 million hectares), or 19 per cent of the land area, but less than 10 per cent of the forest by land area was either in, or proposed as, forest reserve.²⁴ None of it was under any sort of working plan. A new forest ordinance had been passed in 1907, but the extent of the railway sleeper extraction, along with the amount of firewood gathered and timber felled for public works, was of official concern. In 1909, 1,980 'forest offences' were reported.²⁵ These offences, which imperial foresters regarded as 'opposed to all the principles of forest management', included damage done by shifting cultivators and other local peoples denied traditional use rights by the demarcation of forest boundaries and restrictions on access imposed by forestry officials.²⁶ Forest offences were dealt with at length by *Schlich's Manual*, volume 4, under headings of damage, misappropriation and contraventions of forest police. Resource scarcity was also recognised for the first time in 1909, prompting a restriction on sleeper extraction to 50,000 annually.²⁷

Signalling a new beginning, in 1909 the Forest Department stated:

Forest exploitation has been directed towards the elimination of over-mature timber which retarded future regeneration of crops, and to the utilization of timber on areas to be alienated for sale, lease or irrigation purposes.²⁸

22 Owen Jones, Working Plan for 20 Compartments in the Mitteldich Ranges, 1911. Owen Jones Papers MB 954. Macmillan Brown Library, University of Canterbury, Christchurch.

23 Romas W. Szechowycz, 'Ceylon', in *A World Geography of Forest Resources*, ed. Stephen Haden-Guest, John K. Wright, and Eileen M. Teclaff (New York: American Geographical Society, 1956), 491–518.

24 Raphael Zon and William N. Sparhawk, *Forest Resources of the World* (New York: McGraw-Hill, 1923), 357; Arnold Wright, ed., *Twentieth Century Impressions of Ceylon: Its History, People, Commerce, Industries, and Resources* (London: Lloyds, 1907).

25 Anon., 'Administrative Report of Forest Commissioners in Ceylon for the year 1909', *Indian Forester* 36 (1910): 694–6.

26 Ibid., 696.

27 Colonial Office, *Accounts and Papers: Colonies and British Possessions. Colonial Reports (Annual) Ceylon* (London: H.M.S.O., 1909), 35.

28 Ibid., 35.

Such statements proposing active silviculture intervention, sustained yield management and the efficient extraction of standing timber from land to be dedicated to other uses were foundational forestry propositions of the time. Teak plantations were established at lower altitudes and on the higher, drier areas above 4,000 ft (1,230 m) plantations of Australian eucalypts and wattles were established on deforested land.²⁹ The work of another forester to end up in Australia, the Nancy-trained Charles Lane Poole, in Sierra Leone around the same time paralleled Jones' efforts.³⁰

Before 12 months had elapsed Jones was sent, on Schlich's recommendation, to Germany for advanced study of forest working plans, forestry statistics and silviculture. This included time at the noted Prussian Forest Statistical Bureau at Eberswalde.³¹ He returned in 1912, and by 1916 was in charge of the Colombo Division with 11 officers and 50 other staff. By 1917, 4,126 acres (1,669 ha) of forest had been planted.³² That year he enlisted, and served for the remainder of the war, in the Royal Flying Corps.

In Ceylon, equipped with the techniques and outlooks of imperial forestry, Jones had faced and responded to the 3 problems of reducing unsustainable levels of demand for railway sleepers and timber public works, of ongoing forest offences and of the difficulties of gazetted areas as forest reserves (requiring the investigation and extinguishing of complex land titles and use rights previously granted by the Dutch, Portuguese and Sinhalese).³³ Progress had been limited by the time of his departure. Ceylon posed challenges, but Schlich's training appeared to provide expert technical solutions.

The full extent of difficulties faced by Jones and his colleagues was identified at the 1923 British Empire Forestry Conference. From 1905, when all forests came under the sole administrative charge of the Forest Department, its role had been judged largely on its capacity to supply railway sleepers, timber and firewood to government departments, establishing local yards for timber and firewood sales, and its ability to operate on the basis of revenue obtained from the sale of timber licences. To 1914, little real effort had been made to balance harvests against annual growth increments. Indeed, many of the forest reserves contained little merchantable timber. Afforestation efforts were applauded. But major challenges remained. These ranged from combatting the issuing of 'bogus private removal permits to make away

29 Zon and Sparhawk, *Forest Resources of the World*.

30 John Dargavel, *The Zealous Conservator: A Life of Charles Lane Poole* (Crawley, WA: University of Western Australia Press, 2008).

31 Michael Roche, 'Owen Jones: Inaugural Chair of the Forests Commission of Victoria, 1919–1925', *Australian Forest History Society Newsletter* 74 (2018): 4–5.

32 Colonial Office, *Accounts and Papers Colonies and British Possessions Colonial Reports (Annual) Ceylon* (London: H.M.S.O., 1917), 10.

33 W. McNeill, 'State Forests in the Empire', *Empire Forestry Journal* 17 (1938): 195–200.

with timber' to crippling amounts of administrative work, to 'the frequent failure of natural regeneration to persist when found'.³⁴ Perhaps this situation was also a part of Jones' later decision to apply for a senior position in Victoria. But it also points to something more than individual decisions and choices: the universality of forestry principles that Schlich was so confident about were perhaps not so apparent on the ground, particularly in environments far removed from continental Europe where these ideas were developed from the seventeenth to the nineteenth centuries.

Victoria, 1920–25

With an eye to career advancement, Jones chose not to return to Ceylon after the war. Instead, in 1919, newly married, he secured at the young age of 31 a senior position in Australia as the foundation chairman of the 3-person Victorian Forest Commission (VFC). Victoria was only around 14 per cent forest-covered, approximately 8 million acres (3.2 million hectares), with only 5.3 per cent of it merchantable forest, and with 45 per cent of timber consumption, around 10 million cubic feet per annum (283,168 m³), being met by imported softwoods.³⁵ The VFC was intended to be 'a corporate and politically semi-independent' body maintained by a fixed annual grant of £40,000 from the Treasury.³⁶ Jones initially enthused that the legislation and the commission 'at one stroke' would remove the forest 'to a large extent from political influence' and represented a 'genuine attempt to place forestry control upon a more definite and scientific footing'.³⁷ Difficulties were encountered elsewhere in Australia: Lane Poole resigned as Conservator of Forests in Western Australia in 1921 over what he regarded as political interference.³⁸

Although applauding the intent to create working plans for all forests in Victoria, Jones was concerned that little provision was made for securing professionally trained forestry staff. He favoured creating an Australia-wide forestry school at the University of Sydney, which was consistent with the German model of linking forestry training with the university, whereas Lane Poole favoured a French-derived 'school in the forest' alternative to serve Australian needs.³⁹

Six months after arriving, Jones described his first impressions of Victorian forestry. He balanced his lament about the loss of the state's forest to axe and fire with the comment that he had no quarrel with the legitimate demands of land settlement.

34 J. D. Sargent, *Report of the Forest Authority for Ceylon prepared for the British Empire Forestry Conference, Ottawa, Canada 1923* (Colombo: Government Printer, 1923), 7, 20.

35 Zon and Sparhawk, *Forest Resources of the World*.

36 Owen Jones, 'Forestry in Victoria', *Empire Forestry Journal*, 5 (1926): 98.

37 Ibid., 98.

38 Dargavel, *The Zealous Conservator*.

39 Roche, 'H. Hugh Corbin', 1–8.

His overall thrust was forward-looking; he also carefully couched his call for an effective forest policy in such a way as to win the support of the rural development lobby, frequently the fiercest opponent of forestry in settler states:

Forests must be developed by roads, tramways or railways, they must be cultivated and improved so that their volume production reaches a higher standard, and above all, they must be so regulated as to produce constant and equal yield, so that local industries may be brought into being by the assurance of unfailing supplies. It is in this that lays the chief function of the forester.⁴⁰

This statement echoes that of the Ceylon Forest Department of 1909 and, more importantly, aligns with the 'stability' state forestry assumption noted earlier. Jones resorted to Continental European examples to make his point. Victoria's settler population, like that of Britain, he suggested, looked on foresters as 'little more than game keepers and policeman-rangers whereas the duty of the foresters in France, Germany and Switzerland was neither this nor tree planting' but responsibility for 'natural regeneration—that is to say on the growing up of seedlings'.⁴¹ This, he stressed, was cheaper than planting, but was a hugely skilled task and 'the highest test of the forester', a point he returned to much later in New Zealand.⁴² Afforestation he identified as a 'government concern because, owing to the slow growth of trees, individuals cannot be expected to do the work necessary'.⁴³ His initial assessment was that Victoria needed fire protection, improved road and rail infrastructure for timber extraction and a public education program so the proper nature of forestry could be explained.

Jones was energetic in endeavouring to educate the public. In helping launch a state-wide Tree Lovers' League in 1922, he began by referring to John Evelyn's famous treatise *Sylva* before paraphrasing Lord Novar's condemnation of British people's attitudes to forestry at the 1920 Empire Forestry Conference:

Owing to a general apathy in regard to our forefathers in Great Britain, an apathy which is not local or periodical, but is permanent and racial, and which has been intensified by the conditions prevalent in a new country, where forest land has of necessity to be cleared to permit of settlement and where in consequence the forest is frequently looked upon as an enemy to be fought in every possible way, there is much ignorance and misconception of the meaning and aims of forest conservation.⁴⁴

40 Owen Jones, 'Victoria's forests, some first impressions', *The Gum Tree* 5, no. 14 (1920): 7.

41 Ibid.

42 Ibid., 7–10; Owen Jones, 'Some Re-establishment Problem', *New Zealand Journal of Forestry* 5, no. 1 (1944): 9–19.

43 Jones, 'Victoria's forests', 7.

44 Owen Jones, 'Mr Owen Jones at the University Science Club', *Australian Forestry Journal* 4, no. 9 (1921): 270.

He positioned forestry as a business, drawing attention to the net revenue of over £1 million it had contributed to government revenues in India in each of the 5 years since 1918. Managed Continental European forests, he observed, yielded from 10s to £1 10s per acre per annum.

To the Melbourne University Science Club Jones delivered a lantern-slide lecture in which he laid down ‘the two principle [sic] functions’ of forestry as being ‘the provision of useful material and the conservation of water supply’.⁴⁵ Bush fires he recognised as a special danger, which in India and Germany had been alleviated by clearing up in the forest and through the use of firebreaks. He highlighted the revenue timber returned to the state in Prussia and Saxony, and furthermore observed ‘that in Europe the forests gave a useful employment to one man per 100 acres’.⁴⁶ He noted ‘one of the foresters’ principal objects was to provide for the future by ensuring the reproduction of forests’.⁴⁷ By implication this was to be through the regeneration of indigenous forest, though he did agree that in some localities exotic trees and eucalypts ought to be planted.

Speaking to the heads of the state forestry departments, few then being professionally qualified, and their respective ministers, at the 1922 Interstate Forestry Conference in Brisbane, he turned to the myth of inexhaustible forest resources. His vision of the future for Victoria now readjusted to local place-based realities, included sizable exotic plantations, along with managed natural regeneration. He repeated his argument about ‘racial’ apathy towards forestry, while emphasising that forestry and agriculture actually had shared interests: ‘timber is a crop capable of reproduction not a mine bound to be exhausted’.⁴⁸ Continuity he described as the ‘keystone of forestry’.⁴⁹ Arguably, he was conflating the classic assumption of ‘stability’ and ‘certainty’, but Victoria imported large amounts of timber and was anything but a closed economy.

Jones reached out to a wider audience at the Australasian Association for the Advancement of Science Congress in Melbourne in 1921. Addressing the relationship of forestry to engineering and architecture, he outlined forestry’s main function as ‘the tending and management of woodlots so as to produce a maximum and sustained yield on a sound continued basis’.⁵⁰ This restates the ‘stability’ assumption of a constant and regular flow of wood for the economy. Australia urgently required trained foresters to develop forest working plans, a need that in his view ought to have been met through the creation of a federal forestry school, a sensible but

45 Ibid., 269.

46 Ibid.

47 Ibid.

48 Owen Jones, ‘Forestry and National Welfare’, *Australian Forestry Journal* 5 (1922): 89.

49 Ibid.

50 Owen Jones, ‘Forestry in relation to engineering and architecture’, *Australian Forestry Journal* 4 (1921): 134.

fraught proposal.⁵¹ While Jones could quote an unnamed visiting French forester to the effect that Australian foresters were like ‘generals without officers’, itself a reflection of the authoritarian element of French forestry, he also paraphrased former US President William Howard Taft that ‘real conservation involves wise use, non wasteful use in the present generation, combined with every possible means of preservation for succeeding generations’.⁵²

The VFC Report for 1920 highlighted dual problems of political pressure for the alienation of forest lands for settlement, and public scepticism about the purpose of forestry. Adding to the challenge was the target set at the State Premiers’ Conference in 1920 of 24.5 million acres (9.9 million hectares) of forest reserves for all of Australia; Victoria’s quota was to be 5.5 million acres (2.2 million hectares), but at the time only 4.1 million acres (1.6 million hectares) were reserved.⁵³ The VFC stressed, and this was surely Jones’ phrasing, ‘Victoria has a useful asset in its forests, and it is only *just* to expect that they should be managed so as to produce a fair return’.⁵⁴ Forestry in the state faced 2 major silvicultural problems: ‘the large areas of mature or over-mature timber’ and a lack of natural regeneration in some of the drier forest areas, attributed to rabbits.⁵⁵ By ‘over-mature’ they meant that these forests comprised very old trees, so that net annual growth was low and hence the annual sustainable harvest would also be low if it had to equate with growth. By thinning and felling they would create a ‘normal’ forest of even age classes and be able to increase the sustainable harvest.⁵⁶ In other areas exotic plantations were growing well, but for their ‘economic working’ sufficient land needed to be available to plant ‘approximately equal amounts’ for the 20- to 30-year rotation.⁵⁷ Instances of over-cutting leading to localised resource exhaustion in 15 to 20 years were noted.⁵⁸

Increased revenue from VFC forestry operations was reported in 1921–22 and active ‘thinning and improvement’ of stands was carried out to promote regeneration and tree growth as well as in order to reduce the fire risk.⁵⁹ The first major effort to survey and inspect potential areas for forest reserves involving some 170,000 acres (68,795 ha) of hardwood forest was carried out in East Gippsland. Field inspections showed these areas to be of great forestry potential because of the amount of

51 Michael Roche and John Dargavel, “Imperial Ethos, Dominions Reality”: Forestry Education in New Zealand and Australia, 1910–1965’, *Environment and History* 14 (2008): 523–43, doi.org/10.3197/096734008X368420; Roche, ‘H. Hugh Corbin’, 1–8.

52 Owen Jones, ‘Forestry in relation to engineering and architecture’, 199. Ironically, then, it was Taft who dismissed Pinchot as head of the US Forest Service in 1910.

53 *Victorian Forestry Commission*, 1920, 8.

54 *Ibid.*, 18 (my emphasis).

55 *Ibid.*, 13.

56 David Demeritt, ‘Scientific forest conservation and the statistical picturing of nature’s limits in the Progressive-era United States’, *Environment and Planning D* 19 (2001): 431–59.

57 *Victorian Forestry Commission*, 1920, 12.

58 *Victorian Forestry Commission*, 1920–21, 6.

59 *Victorian Forestry Commission*, 1921–22.

regeneration, 'to a very unusual extent not over mature, there being extensive areas of nearly mature forest, semi mature, and also of vigorous young pole and spar timbers'.⁶⁰ The VFC immediately sought to have this area protected under the *Forests Act 1918*, but the lack of government action was recorded with concern. The absence of action over reserving forest in East Gippsland was returned to in 1922–23.⁶¹ The difficulty of securing adequately trained officers was also noted. Silvicultural treatment of 'mature and over-mature trees' continued and the example of Tunstall Reserve was cited, where thinning and clearing of debris at the cost of £528 had been offset by fuel wood sales from removals of £1,048.⁶² Deficiencies in the legislation were now apparent, notably a too-limited capacity to secure local assistance in forest fire-fighting, along with inadequate fines and a complicated process for securing prosecutions. Yet generic solutions to these problems were laid out in *Schlich's Manual*, though, as Jones was finding out, they were difficult to apply in Victoria.

In 1923 Jones represented Australia at the second Empire Forestry Conference, held in Ottawa. After forcefully presenting the report on Australia, he returned to the familiar theme of what he saw as weaknesses in the British population's attitude to forests. Drawing on his time in Ceylon, he contributed to a discussion on, as he saw it, the damage done by shifting cultivation to forests and the development of an empire-wide policy of exclusion. Here Jones actually adopted a more permissive attitude than some notable empire foresters, arguing that controlled shifting cultivation was possible and that, in conjunction with afforestation, forest cover could be restored, against the traditional colonial forestry insistence that shifting cultivators must be excluded from the forest.⁶³ He also seconded one of the formal motions of the conference on soft woods and was a member of several of the conference committees, including that on education, on the publication of technical and official information, on fire protection and on shifting cultivation.

The first major crisis Jones faced dated to early 1921 when the Victorian Minister of Lands sought to release areas for land settlement that the VFC deemed essential for forestry. The minister adopted an anti-forestry stance in directing that in the future Lands Department officials alone would judge if forest-covered land was to be selected for settlement.⁶⁴ In 1924 Jones faced another major challenge when the Victorian Lands Department announced plans to expand settlement into the

60 Ibid., 4.

61 *Victorian Forestry Commission*, 1922–23.

62 Ibid., 5.

63 S. Ravi Rajan, 'Foresters in the politics of colonial agroecology: The case of shifting cultivation and soil erosion, 1920–1950', *Studies in History*, n.s. 14 (1998): 217–36, doi.org/10.1177/025764309801400204. While in Ceylon, Jones had undertaken a special investigation of 'hill country fuel areas'—see Michael Roche, 'Owen Jones: Inaugural Chair of the Forests Commission of Victoria, 1919–1925', *Australian Forest History Society Newsletter* 74 (2018): 4.

64 *The Argus* (Melbourne), 20 October 1921, 7.

heavily forested Otway Ranges. The VFC lamented that the area of forest reserve in the state had not been meaningfully increased and, furthermore, still remained at 1.5 million acres (607,017 ha), well below the 5.5 million-acre (2.2 million-hectare) state target. With resignation they noted that ‘the only solution is to arrange for our own supplies by setting aside adequate areas and by making available the necessary funds for their development’.⁶⁵ Impetus came from data presented at the Empire Forestry Conference in Ottawa, which pointed to a looming global softwood shortage. Australia was considered to be one of the first countries likely to suffer ‘from a timber shortage’.⁶⁶ The VFC report thus noted, ‘It is imperative therefore, for us to provide against such a contingency both by conserving and developing our indigenous forests and by establishing plantations of softwoods on suitable areas’.⁶⁷ Perhaps a measure of the new vigilance compared to previous years was that there were 80 convictions for breaches of forest law in 1924.⁶⁸

In 1923 the VFC suggested that the climate of the state was excellent for Monterey pine (*Pinus radiata*) since it would grow on poorer-class non-settlement land and mature in an exceptionally fast 30 years. This new knowledge would later provide the stepping stone to a further phase of Jones’ career.

The VFC report for 1924–25 claimed that it had been a notable year in the ‘forest history of Victoria’; not only had forest revenues increased, but 179,600 acres (72,680 ha) of river red gum (*Eucalyptus camaldulensis*) and black box (*Eucalyptus largiflorens*) forest had been reserved along the Murray River. Even so, borrowing Lane Poole’s phrase, Jones suggested that ‘the desired “forest conscience” has yet to be generally awakened’.⁶⁹ Jones now turned to ongoing pressures on forest alienation, noting ‘this adverse influence culminated during the year in a determined effort to alienate from the Otway an area which would virtually have meant the extinction of the famous forest’.⁷⁰ In 1923 the Lands Department first proposed to alienate 21,000 acres (8,298 ha) of forest land in the Otways.⁷¹ In the press, Jones said it would ‘be a calamity’ if the area was excised from the larger Otway Forest Reserve and dismissed as ‘farcical’ the view that the area was unsuitable for forestry because the timber was over-mature and riddled with white ants: its real importance was that ‘the forest contains the most promising growth of blue gum saplings that is to be seen in the State’.⁷² By 1925 Jones, though not without difficulty, had persuaded the state cabinet to abandon what by this time was a plan for only 12,000 acres (4,856 ha) to be transferred from the VFC to the Lands Department.⁷³ In his report to the

65 *Victorian Forestry Commission*, 1923–24, 1.

66 *Ibid.*, 1.

67 *Ibid.*, 2.

68 *Ibid.*, 4.

69 *Victorian Forestry Commission*, 1924–25, 1.

70 *Ibid.*

71 *The Argus*, 4 May 1923, 5.

72 *Ibid.*, 8 April 1925, 26.

73 *Ibid.*, 6 May 1925, 17.

cabinet, Jones described the 12,000 acres as not only somewhat rugged country, by implication hardly suitable for settlement, but also comprised of ‘some of the most beautiful hardwoods of southern Australia ... much of which would give a yield of over 50,000 super feet to the acre’ (291.5 m³/ha).⁷⁴ Noting that forestry arguments eventually prevailed, but showing signs of wearying of the struggle, he lamented that the argument could be relitigated and that the land clearance lobby had ‘but once to win the day and the forest is destroyed for all time’.⁷⁵ These were prophetic words, for in 1929 the Lands Department, after a cabinet subcommittee decision in their favour, gained 7,000 acres (2,833 ha) of blue gum forest in the Otway Ranges for settlement purposes.⁷⁶

The immediate aftermath of ‘victory’ for the Otway forests in 1925 was personally distressing. Jones was harshly criticised by some state politicians, who also urged that his salary not be increased from £1,000 to £1,250 as proposed in the Forests Bill of 1924.⁷⁷ Jones, unhappy since 1922, now resigned, citing the hostility of the Lands Department to forestry. In his letter of resignation he noted, ‘the reception accorded to the Amending Forest Bill and to the proposal to increase the salaries of the Commissioners has, however, made it evident both that appreciation of forestry as a national question is confined largely to the abstract ideas, and also that I have personally little to expect in the way of advancement’.⁷⁸ The ministers closed ranks and defended the progress of the Forests Bill through parliament. The Minister of Lands ‘categorically denied’ Jones’ complaints, instead pointing to the ‘uncompromising’ attitude of the VFC with regard to exchanging crown land for forest lands. William Everard MLA, a special adversary, accused Jones of ‘quarrell[ing] with the Lands department, and when he could not get his own way he whined like a spoilt child’.⁷⁹

Jones enjoyed successes with the VFC, but he became disillusioned over the need to constantly battle to establish forestry in the state sector. Announcing his departure, the commission lauded his knowledge of conifers and the efforts he had made to advance afforestation work in the state, though the total area was only 2,239 acres (906 ha) across 24 plantations, but omitted mention of forest reserves and indigenous forest.⁸⁰ After leaving Victoria, Jones unburdened himself in writing about ‘bitter, protracted, and often unsuccessful struggles against ignorance, prejudice, greed and self-seeking’.⁸¹ He bemoaned the lack of a ‘forest conscience’ and he despaired of the ‘Australian prejudice against “imported” men and the sentiment in favour of

74 Ibid.

75 *Victorian Forestry Commission*, 1924–25, 2.

76 *The Argus*, 29 June 1929, 25.

77 Ibid., 30 October 1925, 13; *ibid.*, 5 November 1925, 11.

78 Jones to Minister of Forests, 21 September 1925. Resignation of Mr Owen Jones Chairman of the Forestry Commission. VPRO 11563 P0001 47/1403. Public Record Office, Melbourne.

79 *The Argus*, 6 November, 1925, 11.

80 *Victorian Forestry Commission*, 1925–26, 15.

81 Owen Jones, ‘Forestry in Victoria’, *Empire Forestry Journal* 5 (1926): 87.

appointing local men to local positions'.⁸² General principles of forestry science that he adhered to were also challenged in Victoria, ecologically where some forests were not regenerating naturally, and politically by the advocates and agents of land settlement. That said, Jones' faith in the canons of his forestry education remained. His efforts in Victoria had largely revolved around forest demarcation, with only preliminary silvicultural and afforestation work. Many of the approaches laid out in *Schlich's Manual* were impossible to impose in the polity of Victoria as a settler state. The deepest challenge was that politicians in Victoria were sceptical of the very idea of the forester as an independent supra-political natural resource manager and Jones by temperament seemed easily wounded by personal attacks from local MPs seeking to promote closer land settlement and the release of forests in their electorates.

New Zealand, 1925–55

In 1925 Jones inquired about a chair in Forestry advertised at Auckland University College, but did not make a formal application. Later that same year he travelled privately to New Zealand to inspect a large afforestation company, New Zealand Perpetual Forests. At a moment of defeat in Victoria, new forestry opportunities had emerged based on a new plantation forest species displaying rapid growth rates. On his return to Melbourne, Jones accepted a position as New Zealand Perpetual Forests Forestry Superintendent. Newspaper reports suggested he was doubling his £1,000 salary but that the real impetus for his departure lay in the unsympathetic political response to forestry and the 'mutilation' of the Forestry Bill then before the state parliament.⁸³ Before leaving Australia he gave a lecture to the Victorian Institution of Surveyors, at which he returned to an old theme but with an edge of bitterness: 'It is unfortunate that the British of all great nations had displayed the greatest apathy towards forestry, and in Australia that apathy was racial and permanent.'⁸⁴

New Zealand was 26 per cent forested (17 million acres or 6.9 million hectares) when Jones arrived.⁸⁵ William Sparhawk and Raphael Zon noted 35,344 acres (14,302 ha) of state exotic plantations were established to 1919, with more planned. Schlich, however, had expressed concern about the virtual abandonment of indigenous forest management in favour of dependence on exotic plantations for long-term timber supplies, as proposed by the Royal Commission on Forestry in 1913.⁸⁶ Rapid growth rates for exotic trees attracted the interest of private syndicates in the 1920s. New Zealand Perpetual Forests, established in 1923, was the largest of the 30 or so

82 Ibid., 100.

83 *The Argus*, 23 October 1925, 11; *ibid.*, 24 October 1925, 38.

84 *Ibid.*, 7 November 1925, 30.

85 Zon and Sparhawk, *Forest Resources of the World*.

86 William Schlich, 'Forestry in the Dominion of New Zealand', *Quarterly Journal of Forestry* 1 (1918): 1–28.

afforestation companies and had purchased large areas of open land in the central North Island. Then unsuited to pastoral farming because of an unrecognised cobalt deficiency that produced 'bush sickness' in sheep, it was suitable for tree planting. *Pinus radiata* could be grown to merchantable size in 25 years, even faster than in Victoria. As Forest Superintendent, Jones headed the afforestation program: in 1926 the company planted 30 million trees on 46,000 acres (18,615 ha) of land, which he claimed was a record for the British Empire.⁸⁷ As well as the economic benefits, he also believed the afforestation effort was converting wastelands into scenically attractive countryside. In the *Empire Forestry Journal* he described this afforestation effort as transformative: 'there is now every prospect that this vast area, hitherto abandoned almost entirely to the wild horse and the wild pig will blossom under the hand of the forester into an important tree-producing region'.⁸⁸

Jones noted that the company favoured *Pinus radiata* 'by reason of its remarkably rapid growth, its hardiness, its adaptability, and the general all round utility of its timber'.⁸⁹ His professional training recognised, however, monoculture vulnerability and that 'it is not desirable to have excessively large areas of one species only'.⁹⁰ Matching species and locality, the company planted some areas in the more frost-resistant Ponderosa pine, along with small areas in Douglas fir (*Pseudotsuga menziesii*), Coast redwood (*Sequoia sempervirens*), Weymouth pine (*Pinus strobus*), Maritime pine (*Pinus pinaster*), Corsican pine (*Pinus nigra* subspecies *laricio*), Monterey cypress (or *Macrocarpa*, *Cupressus macrocarpa*) and some poplar species. But in 1927 *Pinus radiata* by far dominated the company's planting, at 29.7 million or 70 per cent of their trees (eventually exceeding 80 per cent), with 18 per cent *Pinus ponderosa*, 7 per cent Douglas fir, and the remainder in Coast redwood, *Macrocarpa*, Weymouth pine and Maritime pine.⁹¹ In 1927 New Zealand Perpetual Forests also shifted from 8 x 8 feet to 9 x 9 feet planting in view of the *Pinus radiata* growth rates (10 to 12 feet in 3 years). In 1928, Jones approved the use of more time-efficient pitting and large-scale planting techniques, and adjusted the standard planting distances. Building on locally accumulated knowledge, these forests were created in far less time and in a less labour-intensive manner than *Schlich's Manual* outlined.

Jones also successfully managed the large labour force by encouraging extramural activities such as camp rugby competitions for the men. Patronisingly, Jones also commented:

87 Owen Jones, 'An Afforestation Company's Operations in New Zealand', *Empire Forestry Journal* 7, no. 1 (1928): 64–75.

88 Jones, 'An Afforestation Company's Operations', 66.

89 Ibid., 70.

90 Ibid., 71.

91 H. H. Corbin, Progress Report No 5 on the Forestry Operation of New Zealand Perpetual Forests Limited, 1927. F1 423 29/5/4 pt 2. ANZ, Wellington.

A considerable proportion of the labour force, particularly amongst the actual tree-planters, are Maoris. The Maoris take a real interest in tree-planting and provided they are properly handled and due attention is paid to their little peculiarities, which they have no less than the rest of mankind, they render satisfactory service. Being naturally of a musical disposition they experience little difficulty in amusing themselves during the evenings, no small factor in promoting contentment in camp life; they accept without undue grumblings the discomforts inevitable during cold, wet weather; their mercurial temperament is seldom downcast for long, and they can and do smile cheerfully under most circumstances.⁹²

As new planting was wound down in the mid-1930s his role in the company diminished. In 1938 he announced the introduction of a pruning program as part of the closer silvicultural management of the company forests and a return to core forestry principles, but this coincided with the directors' turning their attention to utilisation, with plans for their own sawmill and schemes for a pulp mill.⁹³

Jones had toyed with leaving New Zealand Perpetual Forests as early as 1932 when he was the preferred candidate for the position of Railways Department Forestry Officer, but the low salary and their refusal to let him engage in private consulting work in his own time led him to decline their offer.⁹⁴ In 1940, he volunteered for the 14th New Zealand Forestry Company, in which for a time he served as captain and commanding officer in Britain. Following his return, New Zealand Forest Products, now fully engaged in planning for pulp and paper manufacture and with little interest in silviculture, retained his services only as a consultant. He continued working as a forestry consultant, one of only a few in the country, until his death in 1955.

Jones remained dedicated to his profession. A respected figure, almost alone amongst the company foresters, he enjoyed a good working relationship with the State Forest Service in terms of purchasing seed and securing logs of various *Pinus* species from state plantations for testing, along with obtaining other scientific data.⁹⁵ One of the foundation members of the New Zealand Institute of Foresters in 1928, Jones later established a Rotorua Branch and in 1946–48 served as national president of the institute. His 1948 presidential address concluded by considering the long-standing question of whether the institute ought to be a professional society or one 'devoted primarily to narrow vocational interest'.⁹⁶ For Jones it was unreservedly the former, and he believed that the large plantation forest estate meant that the future was bright, though he saw a place for those engaged in production and utilisation of both

92 Jones, 'An Afforestation Company's Operations', 69.

93 New Zealand Forest Products 1940 Report AGM. BBAE 15470 986 1916/1950. ANZ, Auckland.

94 Jones to Acting Managing Director New Zealand Railways, 9 December 1932. R3 04/1527/2. ANZ, Wellington.

95 BAFK 1466 246c 29/5/32, F 1 487 29/5/103, F1 29/5/4 part 3 and part 4. ANZ, Auckland.

96 Owen Jones, 'Our Institute', *New Zealand Journal of Forestry* 5 (1948): 366.

indigenous and exotic forests and avowed that the institute should never become 'a mere departmental adjunct'.⁹⁷ Jones' own career after arriving in New Zealand had turned exclusively towards exotic forestry and the private sector, away from the stresses and dissension of the public sector that he had experienced in Victoria. By moving into the private sector, he no longer had to make politically unpopular decisions about resisting the spread of settlement. Instead, he now operated on a more restricted set of professional practices regarding afforestation activity. The work was technically challenging because of the scale of planting and the trials of working with a relatively unfamiliar species. But even here he was thwarted over the introduction of more advance silvicultural techniques.

A sign of his dedication and commitment to forestry was to be found in his signing off on Auckland forestry student Lindsay Poole's report on some New Zealand Perpetual plantations in 1929, replicating Jones' own experience in Germany in 1911.⁹⁸ An imperial forester to the end, Jones was remembered with an obituary in the *Empire Forestry Journal*. In his will he endowed money for a scholarship at his old school to fund a student to study forestry at Oxford.⁹⁹ Jones' forestry practice had evolved in response to the possibilities and limitations imposed by his employment in New Zealand Perpetual Forests and the successor company New Zealand Forest Products. Later, having weighed up the case for natural regeneration after clear felling with some degree of afforestation, he reached the view that 'despite difficulties natural regeneration should be the ultimate aim'.¹⁰⁰ This was a restatement of principles to be found in *Schlich's Manual of Forestry*.

Conclusion

Owen Jones, by education and early career, was a model imperial forester. He has a place in imperial forest history in Ceylon, where he was largely engaged in forest demarcation work and where, as in India, 'forest offences' tracked the resistance of local people to state efforts to exclude them from the forests. His ideas, based on Schlich's teaching, stressed the universality of silvicultural principles. In Ceylon, Jones was part of a cadre of imperial administrators. Forestry problems were to be solved by the top-down imposition of new regulations and practices taught at Oxford and contained in *Schlich's Manual of Forestry*. Ceylon offered a site where the full range of forestry principles could be applied (including plantations of Australian eucalypt species). Yet even here it was not simply a case of the application

97 Ibid., 367.

98 A. L. Poole, Diary of work during vacations—Xmas 1928 and May 1929—N.Z. Perpetual Forests Ltd, Putaruru and North Auckland Land Development Corporation Ltd, Keri Keri. Scion Library, Rotorua.

99 Jones, Owen. Rotorua Forester. BCDG 4421 25/ 85/1955. ANZ, Auckland.

100 Owen Jones, 'Some Re-establishment Problems', *New Zealand Journal of Forestry* 5, no. 1 (1944): 18.

of general principles: the number of prosecutions for 'forest offences' points to ongoing local resistance to forest demarcation, and some of the natural forests were not regenerating.

In Victoria and New Zealand the situation was more complicated. Victoria was a settler state with an Arcadian vision based on pastoral farming, but where suitable land, invariably forest-covered, was in short supply by the time Jones joined the VFC. State agencies such as the Lands Department clashed with the VFC, the former seeking to release land to settlement and the latter to demarcate areas as state forests. Settler politicians were vocal in their opposition to the efforts of the VFC, seeing it as blocking the legitimate needs of land settlement. The environmental and ecological conditions were also such that a lack of natural regeneration in some forests posed an additional management challenge. As chair of the VFC, Jones was neither as zealous as Lane Poole, nor as ebullient as Leon Ellis, Director of Forests (1920–1928) in New Zealand, and did not withstand harsh political criticism and pressure as well as either of his contemporaries. He emerges as perplexed, even a little naive, in his public statements when the logical case for forestry was not followed through on by the state government. If he had been less reasonable and more strident, stubborn and bloody-minded even, and played the political game more effectively, then perhaps he might have accomplished more in the public sector in Victoria. But this was not the imperial forestry tradition in which Jones was trained; he after all was the expert offering sound, dispassionate and detached advice above the hurly-burly of politics. His writings about forestry, although not voluminous, nevertheless display considerable depth and awareness of his professional canons.

In New Zealand there were strong parallels with the settler state in Victoria in the desire for continued closer land settlement on forested crown lands. More of the country, however, was under forest than in Victoria, and some senior political figures, notably Sir Francis Bell, supported state forestry. Political opposition to forestry was never as strident in New Zealand as in Victoria. The competition between the Lands Department and State Forest Service was never as strife-ridden. Besides which there was land unsuitable for settlement, in the form of the cobalt-deficient pumice lands of the central North Island, which was eminently suitable for afforestation by state and private companies. The rapidity of tree growth captured the attention not only of the state but also the commercial sector, which raised considerable sums in private investment. Jones came to a situation in New Zealand where there were considerable technical challenges pertaining to the scale of planting and environmental conditions, not to mention that *Pinus radiata* was not a proven plantation species. Accordingly, as a company forester he now drew on only part of his broader forestry training and over time enlarged his expertise with local experimentation in planting *Pinus radiata*. While not on display, his commitment to natural forest regeneration as a core principle remained.

Ceylon, Victoria and New Zealand, the places Jones' career played out over 4 decades, each brought different combinations—different facets of his professional training to the fore: broadly based British–Indian infused practices in the former; a somewhat reduced set of practices, mainly relating to state forest demarcation but with some limited silvicultural and afforestation work, in Victoria; and a much narrower suite of afforestation-related activities in New Zealand—reflective of his position in New Zealand Perpetual Forests. This narrowing of his forestry practices and shift to private-sector employment did, however, mean that there was no repetition of the personal vilification that Jones had suffered in the VFC. But were such excisions absolute and enduring? Jones' views as President of the New Zealand Institute of Foresters in the late 1940s suggest not—he remained true to core ideas about the natural regeneration of forests even though he was never able to implement them in the New Zealand environment.

Returning to the bigger question in environmental history of the diffusion of forestry practice versus its modification induced by local conditions, environmental and political, Jones' case would suggest that it was not a simple either/or situation. A broad-based suite of supposedly universal forestry practices gave Jones the capacity to work in both subtropical and temperate environments with familiar and unfamiliar tree species. But local conditions could only overwrite his forestry practice if there are some canonical principles to be overwritten. Neither his professional training nor the influence of the locations in which he practised as a forester can be ignored. This is hardly a profound summation of Jones' career against a significant debate in environmental history, but at a more conceptual level Jones' career provides an empirical trace that reinforces Ulf Strohmayer's questioning 'the validity, the desirability, and the feasibility' of a separation of time from space.¹⁰¹ Independently, *Seeds of Empire: The Environmental Transformation of New Zealand* already stands as an example of the fruits of such a combined endeavour.¹⁰²

101 Ulf Strohmayer, 'Historical Geographical Traditions', in *Key Concepts in Historical Geography*, ed. John Morrissey, David Nally, Ulf Strohmayer and Yvonne Whelen (London: Sage, 2014), 276.

102 Brooking and Pawson, *Seeds of Empire*.