Notes

1 Origins of Environmental Anxieties


21. Ranajit Guha, ‘Not at Home in Empire’, *Critical Inquiry*, 23, 3 (Spring, 1997): 483. I am indebted to Tony Ballantyne for sending me this article.


29. See, Winter, *Secure from Rash Assault*.


33. Williams, *Country and the City*.


42. A vast literature exists on Victorian passions and prejudices, fears and foibles. For an excellent survey of the way material improvement and industrialisation, as well as developments in geology, history and Darwinian theory contributed to fears about progress, see James Joll, *Europe since 1870: An International History*, fourth edition (London: Penguin, 1990), especially 78–112, 143–68.

43. Energised by evangelical fervour spreading through Britain, the Humanitarian movement of the 1830s sought to protect colonised subjects from the excesses of empire by introducing them to the Good Book and to the umbrella of empire. Denoon, Mein-Smith, Wyndham, 72–94.


45. Denoon and Mein-Smith, 87–8.


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56. Elliott, 20 February 1851, 639.

57. B. Ribbentrop, Forestry in British India (Calcutta: Government Printing, India, 1900), 39.

58. Otago Daily Times (ODT), 13 September 1869, 3.


62. Garden, Australia, New Zealand; Pawson and Brooking, Environmental Histories of New Zealand; Guha and Gadgil, This Fissured Land.

63. Beinart and Hughes, Environment and Empire.

64. Crosby, Ecological Imperialism; Garden, Australia, New Zealand.


69. Baber, 185–6.
73. Baber, 207–12.
74. Dionne and MacLeod, 172–9. India closed its Department of Agriculture in 1879. In 1880 each province had its own department, but owing to low funding and a lack of specialised staff most simply collected data and directed famine relief. See Deepak Kumar, ‘Science in Agriculture: A Study in Victorian India’, *Asian Agri-History*, 1, 2 (1997): 77–103.
75. MacLeod, ‘Scientific Advice’, 345.
83. Bennett, ‘Rethinking State and Professional Forestry in British India’ (unpublished MS), 11. As Benjamin Weil notes, from the 1920s the IFS became


85. Wright, 183.


96. *Te Wananga* 2, 5 (12 March, 1875): 47. See, also, the address of Renata Kawepo and 16 others against the damage done to streams on Maori land.
through water dams and logging. ‘Petition Relative to the Timber Floating Bill’, *Journals and Appendix to the Journals of the Legislative Council of New Zealand*, No. 8, 1873, no page.


105. Sir Henry Elliot (Secretary to the Government of India) to The Board of Administration for the affairs of the Punjab, handwritten, 20 February 1851, Camp Vah: IOR/H/M/761/645 (quote). For tree planting suggestions, see Sir Henry Elliot (Secretary to the Government of India) to The Board of Administration for the affairs of the Punjab, handwritten, 20 February 1851, Camp Vah: IOR/H/M/761/645. The latter was reproduced as ‘Minute by the Most Noble the Marquis of Dalhousie, K. G. Governor General of India’, 20 February 1851, read on 12 August 1851 and reprinted in *Select Papers of the Agri-Horticultural Society of the Punjab, from its commencement to 1862* (Lahore: Lahore Chronicle Press, 1868), 1–5.


112. H. Cleghorn, F. Royle, R. Baird-Smith and R. Strachey, ‘Report of the Committee appointed by the British Association to consider the probable
effects in an economic and physical point of view of the destruction of tropical forests’, *Report of the Proceedings of the British Association for the Advancement of Science* (London: John Murray, 1852), 79.


116. The great complexity of climatic circulations means that apparently related events, such as the simultaneous occurrence of El Niño and crop failure in Europe, need not be immediately connected. Volcanic eruptions, for instance, can disrupt climatic patterns. *El Niño – History and Crisis*. In New Zealand, for instance, major weather systems, such as anti-cyclones and depressions, affect New Zealand, accounting for the predominantly westerly winds which buffer its coasts and which through orographic effect bring higher rainfall to the west coast than the east.


### 2 Imperial Health Anxieties


3. I am indebted to Ondine Godtschalk for this observation.

Notes

Western Medicine: The Emergence of Tropical Medicine, 1500–1900 (Amsterdam: Rodopi, 1996); Roy MacLeod and Milton Lewis, eds, Disease, Medicine and Empire: Perspectives on Western Medicine and the Experience of European Expansion (London and New York: Routledge, 1988); Philip D. Curtin, Death by Migration: Europe’s Encounter with the Tropical World in the Nineteenth Century (Cambridge and New York: Cambridge University Press, 1989).

5. Note: Harrison, Climates and Constitutions; Arnold, The Tropics and the Travelling Gaze.

6. An exception is Anderson, Cultivation of Whiteness.


15. James Preece, ‘Missionary Papers. Documents which relate to James Preece, lay missionary in New Zealand’ (Place of publication unknown: unpublished MS: July 1999 and January 2000), 22. Thanks to Dr Marjan Lousburg for bringing this to my attention.


17. Harrison, Climates and Constitutions, 11–18.

19. Sir Henry Rawlinson, *Hansard*, 26 February 1867, vol. 185: 1049. He also pointed out that Indian troops would not have expected to serve overseas. Indian troops had already served in China among other places.


25. ‘Malaria and the value of the Eucalyptus’: 337.


41. Dilke, 182.
49. Pradhan, 55.
50. Pradhan, 49.
52. Muter, vol 1, 131, 133–5.
53. Meadows, 16.


63. Ian Tyrrell, True Gardens of the Gods: Californian-Australian Environmental Reform, 1860–1930 (Berkeley, California: University of California Press, 1999), endnote 18 from page 23, referenced on 69–70; see also Thompson, ‘Trees as a Theme’: 524. Its anti-malarial properties generally went unchallenged until the late 1890s, when the importance of the host, the Anopheles mosquito, in transferring malaria was discovered. Michael Warboys, ‘Germs, Malaria and the Invention of Mansonial Tropical Medicine: From ‘Diseases in the Tropics’ to ‘Tropical Diseases’, in David Arnold, ed., Warm Climates and Western Medicine: The Emergence of Tropical Medicine, 1500–1900 (Amsterdam: Rodopi, 1996), 186–98.

64. ‘Arboriculture in its relation to Climate’: 151.


71. O’Connor: 124.


82. O’Connor, ‘Cultivation of “Eucalyptus Globulus”’: 120–35.


84. Brandis, ‘On the Cultivation of the different species’, 141.


89. Doughty, 129.

90. Cleghorn, 339; O’Connor, 131 complained at the ‘heavy charges’ incurred from importing Australian seeds.

91. Laird, for instance, recounted examples of successful drainage and health improvements in Algeria and southern France. Laird: 166–8.


95. Captain Hall, Royal Engineers, ‘Sub-surface Moisture in connection with the question of the deterioration of Culturable Soil …’, IF, 7, 2 (October, 1881): 131–50.


97. ‘Arboriculture’: 150.


100. Muter, vol. 1, 165; 135.
101. Thousands of Europeans similarly migrated from Britain to North America, South Africa and Australasia in the belief that this would improve their health. Note: Curtin, *Death by Migration*.

102. F. Napier Broome to Viceroy of India, Government House, Perth, 11 December, 1885, *Despatches on the subject of a Sanitarium in Western Australia for the British Troops Serving in India*, no. 22, presented to the Legislative Council by His Excellency's Command (Perth: Government Printer, 1886), 4.


104. J. Stirling, *Observations on the Climate and Geographical Position of Western Australia, and on its adaptation to the purposes of a Sanatorium for the Indian Army in a Letter Addressed to J. R. Martin, Esq* (London: J. C. Bridgewater, 1859). Many ex-EIC officers appear to have migrated to Western Australia. On which, see H. Compton to Secretary of State for India, 5 June 1883, Adelaide, British Library, India Office, IOR/L/PJ/6/102/ 1176.


112. All quotes in this paragraph from Thomson, ‘Climate of New Zealand’, 55.

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114. All quotes from Thomson, New Zealand Government Gazette, 52.


119. Lyttelton Times, 29 April 1854, 7.


121. Appendices to the Journal of the House of Representatives (AJHR), 22 July 1868, 24.

122. The files often provide only minimal information, meaning it is likely that many who served in India did not mention it. Returns filed by surviving servicemen or their wives provide an indicative figure of some of the Indian servicemen who took advantage of this. Of 18 who applied in Nelson Province, six had served in India; in Canterbury, the figure was six out of 29. Military Land Claims, Nelson, 1259–75: LS 66, Record 15, NA, Wellington; Military Land Claims, Canterbury, 1285A–94B: LS 66, Record 17, NA, Wellington.

123. This figure is drawn from James Belich, The New Zealand Wars and the Victorian Interpretation of Racial Conflict (Auckland: Penguin, 1986), 59.


126. On nearing Calcutta, Muter noted that: ‘From the yellow grass of the Canterbury plains the change for a time is charming; but the clear bracing atmosphere of New Zealand, its snow-covered mountains and blue streams, are soon missed.’ Muter, Travels and Adventures of an Officer’s Wife in New Zealand (Christchurch: Kiwi Publishers, 1997 [1864]), 313.

127. Andrew Sinclair, Letters and Journals, March 1860, MS 1947, ATL.

129. ‘Timber in New Zealand’, IF, 12, 6 (June, 1886): 284.


136. Dilke, 87.


140. Wilson, Diary/Recollections, 6.


142. *West Australian* (WA), 19 October 1885: 3.


146. Inglis, *Summer in the Hills*.


151. ‘The Sanitary Condition of New Zealand’, *Intercolonial Medical Congress of Australasia* (Melbourne: Stilwell, 1889), 446.


156. ‘Such draining, covering, filling-up, or cleaning from vegetable growth’, it noted, would ‘be at the expense of, or recoverable from, the landowner or his agent.’ 15, 26 (9 July, 1867): 104–7.


158. Believing that ozone formed closest to the surface, health seekers maximised their exposure to it by staying as close to the surface of the sea as possible. Lena Lencek and Gideon Bosker, *The Beach: The History of Paradise on Earth* (London: Secker & Warburg, 1999), 113–38; Wood, *Dirt*; Petrow, *Sanatorium of the South?*

159. NZCJ, 1, 2 (2 April 1877): 82. For similar arguments, see also, ‘Sanitary Influence of Trees’, *North New Zealand Settler*, 1, 4 (November, 1882): 69;


162. These included ‘the various varieties of Poplar, the Maples, Planes, Elms, &c’, the Tasmanian Wattle, Stringy-bark gum and ‘the Willow-leaved gum and the Peppermint gum’, but also included native beeches and Ribbonwoods. Armstrong, ‘Planting’: 50–3.

163. John Dixon Marmaduke, Personal Correspondence, 1886–1900, Box 3, Folder 16, item 97, no date, Canterbury Museum.


175. Armstrong, 50.


177. Both typhus and typhoid were commonly associated with swamps and cities. Typhus ‘occurred irregularly in great epidemics’, sweeping aside great swathes of the urban population whereas typhoid often broke out sporadically but with some regularity mostly in late summer and autumn. The variable prevalence and occurrence of typhus, most physicians held, broke out because of ‘the prevailing epidemic constitution of the atmosphere’. Wilson, ‘Fever’s, 400–6 (quotation, 400). Most physicians also believed, as Hokitika’s Surgeon Superintendent did, that it was ‘a fever generated and propagated by poverty, filth, and over-crowding’. ‘Report of the Hokitika Hospital, by the Surgeon Superintendent for the 12 months ending 30th April, 1869’, County of Westland Gazette, 13 (7 June 1869): 77.


181. Melbourne University’s medical researchers engaged in laboratory research and favoured germ theory. Anderson, Cultivation.

182. Linda Bryder notes, for example, that Australia and New Zealand public health care went through four distinctive phases, with national power only really coming into play after World War II. Linda Bryder, ‘A New World? Two Hundred Years of Public Health in Australia and New Zealand’, in Dorothy Porter, ed., The History of Public Health and the Modern State (Atlanta: Rodopi, 1994), 313–34.


194. Bashford, “‘Is White Australia possible?’”

195. ‘Malaria and the value of the Eucalyptus’: 337.


199. In response to its semi-tropical climate Brisbane’s wealthy lived on hills while the poor below received the sewage from the wealthier. Lewis and MacLeod, ‘A Workingman’s Paradise?” 394–5.


207. In 1888, for instance, H. P. Higginson still upheld miasma as the cause of Wellington’s high death rate. According to him, Wellington’s ‘sewage-mud festered’ foreshore ‘generates foul gases, which force their way upwards through the drains to the higher levels of the city’. Higginson, ‘Sanitary Sewerage’, TPNZI, 22 (1889): 369–78 (quotation, 369–70).
210. Anderson, Cultivation Whiteness, 55.
211. Lange, May the People Live.

3 Colonial Aesthetic Anxieties

1. ‘Spare the Mount’, New Zealand Herald (NZH), 28 March 1877, 3.
8. Don Garden, Australia, New Zealand and the Pacific: An Environmental History (Santa Barbara: ABC-Clio, 2005), 91.


29. Mrs. Charles Meredith, *Notes and Sketches of New South Wales, during A Residence in that colony from 1839 to 1844* (London: John Murray, 1844), 56.
34. Blackley, 16, 18.
37. For reasons of consistency, I spell his name with the ‘e’, even when Sharpe did not.
42. Clark, 85–90 (quote, 85).


47. Quoted in Chitty, 105.

48. ‘Spare the Mount’, NZH, 28 March 1877, 3.


51. Quoted in Landow, 64.


53. The work first appeared as a series of articles in the New Zealand Herald and was later republished in 1890 in the Newcastle Morning Herald and Miners’ Advocate. ‘Hints for Landscape Students in Watercolour’ is reprinted in full in Blackley, 131–41. Unless referred to otherwise, when I quote from ‘Hints’ I use the transcription found in the above pages. Quote from ‘Hints’, 141.


56. NZH, 26 April 1884, 6.

57. ‘Water Colours at the Exhibition’, NZH, 21 April 1883, 6.

58. Blackley, 68.


60. Thomas, 65 and Bell, Colonial Constructs.

61. Sharpe exhibited Burial Place of Hone Heke alongside two other works in April 1883 at the Auckland Society of Arts: Entrance to the Stalactite Caverns of Waiomio and View from Shoal Bay, Auckland. See Blackley, 62–3.

62. Quoted in Blackley, 116. This image is reproduced in Blackley’s book on 107.

63. Cattle, it should be noted, were a popular and common feature, both as staffage and symbols of the introduction of European ‘civilisation’ into wild lands.


67. ‘Water Colours at the Exhibition’, 6. On artistic criticism of Sharpe’s style in Burial Place and other works, see Blackley, 57–64.

68. On this note, Blackley, 89–93.
69. Blackley, 44.
70. Wheeler, 'Introduction', 3. For other artists who both painted in a naturalistic manner and advocated the necessity of knowing about the scientific forms of nature, see Andrews, 186–7.
71. See Jordan, Picturesque Pursuits; Bonyhady, Colonial Earth.
73. For instance, in the version of ‘Hints’ published in Australia, he changed ‘from a New Zealand standpoint’ to ‘from an Australasian standpoint’. ‘Hints’, NMH, 11 March 1890, 8.
74. ‘Hints: General Notes’, NMH, 8 April 1890, 6.
75. See, for instance, Mulligan and Hill, 53–71.
76. Sharpe, ‘Hints: General Notes’, NMH, 8 April 1890, 6.
77. Sharpe, ‘Newcastle Resources’, NMH, 21 March 1895, 3.
79. De Almeida and Gilpin, Indian Renaissance.
81. Blackley, 94.
83. On Ruskin’s abhorrence of ugliness, see Clark, Ruskin Today, 135.
86. NZH, 2 November 1880, 6.
88. James Winter, Secure from Rash Assault: Sustaining the Victorian Environment (Berkeley and Los Angeles, 1999), 189–208.
Environmental Histories of New Zealand (Melbourne: Oxford University Press, 2002), 119–35; see also, Star’s perceptive, ‘Native Forest and the Rise of Preservation’.


96. NZH, 1 June 1880, 6.

97. NZH, 21 May 1880, 6.

98. NZH, 2 August 1879, 5.


101. Fox, *Clearings*, 100–43.


104. ‘The Hill Reserve’, NMH, 27 August 1890 in ‘King Edward Park: Photographs and Paper Clippings’, Newcastle. These included the addition of 49 acres to the reserve in 1894 and the erection of a band rotunda, built sometime between 1891 and 1897; in the 1920s, the draining of the gully and changes to the flower gardens at their top; in the 1930s, a re-design of the roads to incorporate the motor car; and, in 1978, the beginning of significant landscaping of its north-western section and widespread tree planting. See Bagley and Trigger, 9–15. Sharpe also designed other parks in the Newcastle area. See, Beattie, ‘Environmental Anxiety in New Zealand, 1850–1920: Settlers, Climate, Conservation, Health, Environment’ (Ph.D. diss. University of Otago, 2005), 139–43.

105. These included the addition of 49 acres to the reserve in 1894 and the erection of a band rotunda, built sometime between 1891 and 1897; in the 1920s, the draining of the gully and changes to the flower gardens at their top; in the 1930s, a re-design of the roads to incorporate the motor car; and, in 1978, the beginning of significant landscaping of its north-western section and widespread tree planting. See Bagley and Trigger, 9–15. Sharpe also designed other parks in the Newcastle area. See, Beattie, ‘Environmental Anxiety in New Zealand, 1850–1920: Settlers, Climate, Conservation, Health, Environment’ (Ph.D. diss. University of Otago, 2005), 139–43.

106. NZH, 24 August 1876, 6.


110. Martin took odds with Sharpe’s emphasis on artistic naturalism and criticised him publicly for this. On this rather public and prolonged spat, see Blackley, 59–63.


112. NZH, 28 February 1885, 6.

113. OFL, 2 January 1886, 11.


115. Quoted in Blackley, 116.

4 Scottish-Trained Doctors, Environmental Anxieties and Imperial Development, 1780s–1870s


2. Not all of graduates at Scottish institutions, of course, were Scottish-born, hence I distinguish Scottish-trained rather than Scottish-born unlike Richard Grove. See, T. S. Pensabene, The Rise of the Medical Practitioner in Victoria (Canberra: Australian National University Press and Health Research Project, 1980), 64.


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10. See, ‘Medical Licences: Return to an Address of the Honourable The House of Commons dated 14 April 1856’, printed 17 July 1856 in ‘Papers of John Hutton Balfour, Dean of Faculty of Medicine’, Da 43, Volume 1, Special Collections, University of Edinburgh Library.


24. Michael Peter Belgrave, “Medical men” and “lady doctors”: The Making of a New Zealand Profession, 1867–1941’ (Ph.D. diss.: Victoria University of Wellington 1985), Table 3.2, 100.


27. See, Haynes, 130–56.

28. Harrison, Public Health in British India.

29. See endnote 4.


38. Das, 57.


43. Cleghorn to Government, 7 December 1858, in ‘Correspondence regarding kumari cultivation’, in *Forests and Gardens*, 126.


66. Wright-St Clair, *Thoroughly A Man*, 13, 156.


73. Stephen Legg, op. cit.


80. Emphasis in original. *The Place and Power of Natural History in Colonization; with Special Reference to Otago; Being Portions of a Lecture Prepared for, and at the Request of the ‘Young Men's Christian Association’ of Dunedin* (Dunedin: John Dick, 1862), 5, 7.


84. See, Warwick Brunton, ‘Our Endeavours have ever come too short of our desires’ (unpublished, draft MS). I thank the author for sharing his research on Lindsay.


86. *Testimonials in Favour of William Lauder Lindsay, MD ... As a Candidate for the Office of Conservator of the Museum of the Royal College of Surgeons* (Edinburgh: Murray & Gibb, 1853), 10.


88. Lindsay stated that he arrived in Dunedin on 7 October 1861. Lindsay, *Contributions to New Zealand Botany* (London: Williams & Norgate, 1868), 10–11. However, the *Otago Witness* (OW) records ‘W. L. Lindsay’ as being a steerage passengers aboard the Robert Henderson. OW, 12 October 1861, 3.

89. Brunton, ‘Our Endeavours have ever come too short of our desires’.

90. Lindsay, *Contributions to New Zealand Botany*, 10–11.

91. Lindsay, *Place and Power*, 26, 28.


95. Displacement theory originated in the work of J. D. Hooker, Charles Darwin and A. R. Wallace. To these naturalists, and many others around the world, the displacement of native plants, animals and humans by European ones seemed common sense and inevitable. See, for instance, Paul Star, ‘From Acclimatisation to Preservation: Colonists and the Natural World in


97. Earlier, forestry departments had been created in 1874 and 1885, only for each to be disestablished after two years or less. See Roche, *Forest Policy in New Zealand: An Historical Geography 1840–1919* (Palmerston North: Dunmore Press, 1987), 67–121.

98. Lindsay, *Place and Power*, 6.


103. For background, see Beattie and Star, ‘State Forest Conservation’, 17–29.


106. ‘Enclosure 2 in No. 1: Extract from Dr Hector’s Memorandum, 18th November, 1868’, in AJHR, D22, 3. See also Roche, *Forest Policy in New Zealand*, 87–8.

107. ‘Papers relating to state forests, their conservation, planting, management, &c.’, in AJHR, H5, 35–6.

108. 34 out of a total of 78 members spoke. Roche, *History of Forestry*, 86.


111. See, for instance, Rolleston, NZPD, 4 August 1874, 404–5.


5 German Science and Imperial Forestry, 1840s–1900s


3. Thanks to Brett Bennett for this observation.


5. For sake of simplicity I refer throughout this period to Germany. Notwithstanding loose confederations of German states, which dated from 1815, most states only unified in 1871.

6. The meaning of *Naturwissenschaft* varied depending on the context of its use. In the sense described above, it would be useful to translate it as natural science. Thanks to James Braund for his comments on meaning. On the wider context of professionalisation, see Charles E. McClelland, *The German Experience of Professionalization: Modern Learned Professions and their Organization from the Early Nineteenth Century to the Hitler Era* (New York: Cambridge University Press, 1991), 34–5.


8. See, McClelland, *German Experience of Professionalization*. 
12. McClelland, *State, Society, and University*, 153–4; Pyenson and Sheets-Pyenson, *Servants of Nature*, 57–60. I am also indebted to James Braund for helping draw the fine distinctions in meaning and translation of these educational options.
16. For a sophisticated overview of the development and principles of Forstwirtschaft, see Rajan, *Modernizing Nature*, 35–44.
18. J. C. Brown, *Schools of Forestry in Germany, with Addenda Relative to a Desiderated British National School of Forestry* (Edinburgh: Oliver and Boyd, 1887).


26. In India in the 1830s, discussion of the geographical theory of plant distribution was dominated by the ideas of Humboldt and Joachim von Schouw (1789–1852), Professor of Botany at the University of Copenhagen and Director of the Royal Danish Botanic Garden at Copenhagen. Sangwan, ‘From Gentlemen Amateurs to Professionals: Reassessing the natural science tradition in colonial India, 1780–1840’, in Richard H. Grove, Vinita Damodaran and Satpal Sangwan, eds Nature and the Orient: The Environmental History of South and South East Asia (Delhi: Oxford University Press, 1998), 221. Some inspired by Humboldt to follow his botanical and geographical path include several who visited Australasia and/or India: J. D. Hooker, Ernst Dieffenbach, Ferdinand von Mueller, Richard Schomburgk and Ferdinand von Hochstetter.


29. See Cittadino, Nature as Laboratory, 144; McClelland, German Experience of Professionalization, 37; McClelland, State, Society, and University, 155.


32. Kirchberger, ‘German Scientists’.

33. B. Ribbentrop, Forestry in British India (Calcutta: Government Printing, India, 1900), 239, 233.


35. Ribbentrop, Forestry, 233.


38. Ribbentrop, Forestry, 79–81, 85, 93.


40. Brandis, Indian Forestry (Woking: Oriental University Institute, 1897), 33–4.

41. Brandis, ‘Progress of Forestry in India’, IF, 10, 10 (October, 1884): 458. This article appeared over several issues.


47. Ribbentrop, Forestry, 108–11.


53. Ramachandra Guha and Madhav Gadgil, This Fissured Land: An Ecological History of India (Delhi: Oxford University Press, 2003).

54. Ribbentrop, Forestry, 106.
59. Ribbentrop, *Forestry*, 57–8, 60 (quote).
60. Ribbentrop, *Forestry*, 50–3, 52 (quote).
70. See also, Thomas A. Darragh, ‘Ludwig Becker, a Scientific Dilettante: His Correspondence with J. J. Kaup and Others’, *Historical Records of Australian Science*, 11, 4 (December, 1997): 501–22; Gabrielle L. McMullen, ‘“An Able Practical and Scientific Man”: Gustav Adolph Hugo Thureau, German-trained
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72. I use the Anglicised spelling of Müller’s name, which Mueller later adopted in Australia.

73. Ferdinand von Mueller, *Forest Culture in its relation to industrial pursuits. A lecture, delivered by Baron Ferd. von Mueller ... on 22nd June, 1871* (Melbourne, Mason, Firth, and McCutcheon, 1871), 3.


81. S. M. Legg, ‘Debating Forestry: An Historical Geography of Forest Policy in Victoria and South Australia, 1870 to 1939’ (Ph.D. diss.: Department of Geography and Environmental Science, Monash University, 1995), 123–70.


83. Legg, ‘Debating Forestry’, 123.


86. Schomburgk, *Influence of Forests on Climate* (Adelaide: Government Printer, 1873), 4–5. This paper was originally read before the Philosophical Society on 9 August 1870.


90. Mueller, in Royal Commission on Vegetable Products, 1887, 216.
96. On this connection, note: Dieffenbach to uncle, Berlin, 13 June, 1843, in MS-1564, Alexander Turnbull Library, Wellington, copy from City Archive Friedberg, Hessen.
100. Ferdinand von Hochstetter, New Zealand: Its Physical Geography, Geology and Natural History with special reference to the results of Government Expeditions in the Provinces of Auckland and Nelson, trans. by Edward Sauter (Stuttgart: J. G. Cotta, 1867), 254. This was originally published as Neu-Seeland (Stuttgart: J. G. Cotta, 1863).
101. Hochstetter, New Zealand, 255.
102. Hochstetter, New Zealand, 142.
103. Hochstetter, New Zealand, 142.
106. Humboldt’s observations appeared when O’Neill introduced his Conservation of Forests Bill of 1873. Similarly, Walker used Humboldt’s example of Lake Valencia in 1877; as did Frederick S. Peppercombe and Charles O’Neill. O’Neill, NZPD, 1 October 1873: 1545–6; Peppercombe, On


109. Hacket, ’Forest Culture’.


111. Postcards from the Königliche Forst-Akademie (Royal Forest Academy) at Tharandt, indicate earlier correspondence with German foresters or visits to this institution. Diplomatic and Consular Reports, No. 596 Miscellaneous Series, Foreign Office, September 1903. These references to previous Consular Reports on German include: Misc Series nos. 540, 561, 566, 572, 573, 591, 594, 595. McNab also possessed a copy of Dr Frederick Rose's (His Majesty's Consul at Stuttgart) ’Report on Instruction in Forestry and the Present Condition of Forest Economy in Germany’. The first postcard, one showing building of forest academy at Tharandt, Saxony, is dated 28 Sept. 1903; another of photograph of small town with labels pointing out buildings, including that of the Forst Akademie, dates from 1 Dec. 1903. A third, also dated 1 Dec. 1903, is from a trout hatchery from Saxony. All references are in McNab Papers, in Robert McNab: Papers relating to afforestation in New Zealand 1895–1908, HL, MS 0608.


114. For instance, for the production of his 1909 Report on the Sand Dunes of New Zealand (Wellington: Department of Lands, 1909), Cockayne acknowledged
the special overseas help he received from three colleagues in the United States and Professor L. Diels at the University of Marburg (2).


117. On the general influence of German-speaking scientists, note Braund, ‘German-speaking scientists in New Zealand’.

6 South Asian and Australasian Forestry Anxieties and Exchanges, 1870s–1920s


11. On his career in India, note ‘Biography Files from India and Colonial Office, “India Office Records”’, British Library, Dec. 2004, OIR 354.54; ‘Papers of
Sir John Cracroft Wilson (1808–81), Canterbury Museum, ARC1990. 7, Box 1, Folder 1.


18. In 1873, for instance, he introduced the Grasslands and Fires Prevention Bill modelled on legislation in the Australian colony of Victoria. Wilson, NZPD: 468.


21. OW, 22 November 1873, 2.

22. ‘Biographical File 15: East India Company/India Office and British Government of India’, Oriental and India Office Collections (OIOC), 920. 054, British Library.


27. See ‘Climatic and Financial Aspect’.


33. Figure from Roche, History of Forestry, 93.
35. Indeed, five of the 1874 forestry papers that appeared in the AJHR originated in the research of Indian foresters on forest practices outside South Asia, such as Germany and Scotland. J. P. Grossmann, The Evils of Deforestation (Auckland: Brett Printing and Publishing Co., 1909), 5–6. Other published sources also referred to his work, illustrating his on-going significance for conservation. See, for instance, H. J. Matthews, Tree Culture in New Zealand (Wellington: Govt. Printer, 1905), 1; ‘The Passing of the Forest’, NZF, 26 September 1905: 770.
36. Outward Letterbook (Forests) December 1885–May 1889, LS 53, Box 17, National Archives (NZ), Wellington.
37. H. Calthrap to Minister of Crown Lands, Punjab, India, 25 July 1885, LS 53, Box 1 1881/15, NA.
38. After serving in New Zealand, he became Deputy, then, Conservator of Forests, Madras. In 1888, he was responsible for a forest area of some 6872.71 square miles (17,800 square km). Walker, ‘Progress Report of Forest Administration in the Southern Circle, Madras, for the year 1886–87’, in Annual Administration Reports of the Forest Department (Southern and Northern Circles), Madras Presidency, for the Official year 1886–87 (Madras: Government Press, Madras, 1888). Figure from 2.
41. T. H. Kirk to Commissioner of State Forests, 3 June 1887, ‘Telegrams of State Forest and Agriculture Department, 1886–1889’, qMS-1470, ATL.
42. T. Kirk to Edgar Spooner, Wellington, 25 June 1887, LS 53, Box 15, NA.
45. The article was only signed ‘Tau-Tha’ but was clearly written by someone at Dehra Dun (since his journey started from here on 5 July 1886). The author arrived in Auckland on 10 August 1886 and made his way to Wellington (22 August) via the Central North Island. He then departed for Christchurch
(23 August) and travelled to Dunedin, before leaving from Bluff on 27 August. ‘Three Months’ Privilege Leave to New Zealand’, IF 12 (December, 1886): 546.

46. Quotes from ‘Tau-Tha’: 554, 557, 560.
47. ‘Condition of Forestry in New Zealand’, IF, 18 (November, 1892): 416.
48. OW, 6 August 1886, 9.
55. Responsibility for forests shifted between Lands and Survey, the various mining and agricultural departments, and even the Botanic gardens.
56. The report is commented upon in *The Age*, 3 April 1895, 6. I have been unable to obtain a copy of the original report.
60. Ribbentrop, 5–8.
68. Peppercorne, *Rainfall and Water Conservation in New South Wales* (Sydney: John Sands, 1881), 12.


73. ‘Forwarding Report on Forest Branch Dept for 1884’, LS 53/ Box 1 1885/23, NA.


78. Powell, ‘Enterprise and Dependency’: 107.


81. OW, 10 January 1874, 1; *Taranaki Herald*, 7 January 1874, 2; *North Otago Times*, 27 February 1874, 4.

82. Walker to Commissioner of State Forests, State Forests Office, 8 September 1876, F 10, 76/2 September 1876, NA.

83. Wakefield, NZPD, 7 July 1885, 449–50.


89. *Debates in the Houses of Legislature*, 9 September 1874, 597.


91. William Rolleston, NZPD, 4 August 1874, 404–5.

92. ‘The Planting of Forest Trees Ordinance 1858’, *The Ordinances of the Province of Canterbury, Session 10*, October to December 1858.


94. NZPD, 15 September 1871, 459–62; 8 November 1871, 918–19.


106. For different interpretations of these developments, see Rajan, *Modernizing Nature*; Barton, *Empire Forestry*.


110. Roche and Dargavel, ‘Imperial Ethos’: 530.


115. See Appendix 1 in ‘Report of the Royal Commission on Forestry’, AJHR.


127. NZPD, 4 August 1874, 403. For a more thorough discussion, see Beattie, ‘Climate Change’.

128. Beattie, ‘Climate Change’.


7 Thwarting Imperial Agricultural Development: The Spectre of Drifting Sands, 1800s–1920s


29. WA, 11 September 1888, 4.
33. PGWAT, 10 April 1868, 3.
34. PGWAT, 10 April 1868, 3.
35. Henry Gray to Editor, PGWAT, 17 July 1868, 3
37. Mann, ‘Ecological Change in North India’.
41. ‘Papers on Agriculture Addressed to Zemindars’.
43. In 1876, Dietrich Brandis related a tree-planting experiment in Nasirabad, northern India, since discontinued, to arrest sand drift and suggested it could be resumed using eucalyptus. Brandis, ‘On the cultivation of the different species of Eucalyptus in Northern India’, IF, 2, 2 (October, 1876): 142.


52. WA, 9 August 1894, 3.


58. ‘Ocean Beach Domain Board’, 1/1, Dunedin City Council Archives (DCCA).


61. The voluntary nature of the committee is emphasised by the words of Tame Parata, who related how we ‘formed ourselves into an improvement society’. Parata, 28 September 1903, NZPD, 13.


63. WA, 11 September 1888, 4.

64. 30 November 1888, 412.


67. WA, 17 December 1888, 2; 19 December 1888, 3.


69. The provisions of the Act also extended to other towns. Rockingham, for instance, proclaimed a sand drift within its town in 1899. Note, for instance, WA, 24 July 1899, 4.

70. WA, 24 June 1891, 3.

71. WA, 12 June 1891, 4.


74. 25 August 1890, 140; 5 October 1891, ‘Newcastle City Minute Book’, 5 May 1890–30 November 1891, AB 756, Newcastle Region Library, 509.


76. Carroll, 28 September 1903, NZPD, 4.


78. Carroll, 28 September 1903, NZPD, 3.

79. Carroll, 4.

80. Field, 28 September 1903, NZPD, 11.

81. Fraser, 28 September 1903, NZPD, 6.

82. For instance, Fraser, 28 September 1903, NZPD, 6; Allen, 28 September 1903, NZPD, 7; Mander, 28 September 1903, NZPD, 8.

83. Steward, 28 September 1903, NZPD, 8; Houston, 28 September 1903, NZPD, 6; Field, 28 September 1903, NZPD, 10. Of the 14 MHRs who spoke during the debate, only the Caversham MHR, T. K. Sidey supported the Bill outright. Sidey, 28 September 1903, NZPD, 12.

84. McNab, 28 September 1903, NZPD, 8. Both Houston and F. Mander (Marsden) actually doubted whether the drift could be stopped at all. Houston, 28 September 1903, NZPD, 6; Mander, 28 September 1903, NZPD, 8.

85. Carncross, 20 October 1903, NZPD, 590.

86. Willis, 28 September 1903, NZPD, 12.

87. Willis, 28 September 1903, NZPD, 11.

88. Vile, 28 September 1903, NZPD, 13; Buchanan, 28 September 1903, NZPD, 10.

89. 22 October NZPD, 713.


91. The inclusion of sand dunes in popular literature also evinces how commonplace they were in New Zealand society. William Sylvester Walker’s *Zealandia’s Guerdon*, for instance, describes in detail the ecology of New Brighton sand dunes which in the novel provide a backdrop to some bad melodrama and the tragic disappearance of one of the picnic goers. William Sylvester Walker, *Zealandia’s Guerdon* (London: John Long, 1902), 275–6. Thanks to Dr Julian Kuzma for this reference.


94. Fraser, 28 September 1903, NZPD, 6–7.

96. J. Wood, Secretary of the Upper Clarke Fruitgrowers Association to Mayor, Cromwell, Lowburn 21 June 1915, in ‘Sand Dunes – Cromwell’.
97. Town Clerk to Minister for Public Works, Cromwell, 5 July 1915, in ‘Sand Dunes – Cromwell’.
99. ‘Report of Sub-Committee appointed to prepare a report and estimate of the cost of quelling the sand-drift from its source in the vicinity of Lowburn to the northern boundary of the Cromwell Town Belt’, in ‘Sand Dunes – Cromwell’.
100. Calculated from ‘Sand Dunes – Cromwell’.
101. Town Clerk, Borough of Cromwell, to Sir William Fraser, Cromwell, 2 July 1919, in ‘Sand Dunes – Cromwell’.
102. On these see R. W. Holmes, Public Works Department, Dunedin, code RWH/QD. 26 August 1919; G. C. Godfrey, memo, to District Engineer, Dunedin, 26 August 1920, in ‘Sand Dunes – Cromwell’.
103. Memo to Minister of Public Works, 23 November 1923, in ‘Sand Dunes – Cromwell’.
104. See remaining files in ‘Sand Dunes – Cromwell’.
109. Field, 5 August, NZPD, 1908, 137.

115. 2 November, NZPD, 1910, 256.

116. See, for instance, Department of Agriculture, Arbor Day, 1894 (Wellington: Government Print, 1894), 1, 6.

117. I have looked through all the records of the forestry department since its inception in 1897. The records are held at the National Archives, Wellington.

118. Superintendent Nurseryman, Tapanui, ‘Report on Tree growing operations for South Island nurseries and plantations, for August, 1911’, 8 September 1911, 1/44, 1270 in ‘Historical Records Volume 6, 1908–1913’, F1, 45/271/5, NA.

119. On the financial difficulties see, for instance: ‘[A]s the State Forests Act, 1885, simply does not allow any part of the State Forest expenditure to be chargeable to the Consolidated Fund, we shall be compelled to fall back upon a loan, which, by the above Act, the Minister is empowered to raise but not more than £10,000.’ Under Secretary for Crown Lands to H. J. Matthews, Chief Forester, 22 February 1907, Historical Records Volume 5, 1907, F1, 45/271/5, NA.


125. E. Benskin, Afforestation, 2–8, 8 (quote).

126. E. Benskin, Afforestation, 6.

127. Benskin, Afforestation, 12–18, 12 (first quote), 17 (second quote).


134. Royal Commission on Western Lands 1901 (no place: no publisher, 1901), vi.


144. T. C. Grant, History of Forestry in New South Wales, 1788–1988 (Erskineville, NSW: Star Printery, no date).
146. Sand Drift, 10 Geo V, No. 39; Sand Drift, No 51, 1919.
148. Francis N. Ratcliffe, Soil Drift in the Arid Pastoral Areas of South Australia (Melbourne: CSIRO, 1936).
149. Ratcliffe, Further Observations on Soil Erosion and Sand Drift, with Special Reference to South-Western Queensland (Melbourne: CSIRO, 1937), 21.
158. 13 July, NZPD, 1913, 430.
161. For instance, the plan to afforest an area of land on Kaipara Harbour was also deferred due to the costs of war. Under Secretary of Lands and Survey
274 Notes

to F. M. Dargaville, esq, Wellington, 20 April 1916, in ‘Sand Dunes – Auckland- Kaitaia’, 1915–16, F 1, 27/1/1, NA.
162. McKelvey, Sand Forests.

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