David Ernest Hutchins remarked amusingly in a letter from 1890 that ‘there is a twinkle in old [Dietrich] Brandis’s eye when he talks of the forest officers at the Cape who have never seen a regular forest!’

Dietrich Brandis’s description of Cape forestry, though somewhat exaggerated, nevertheless reflected an environmental reality. Southern Africa, and much of the former Cape Colony, was ‘wonderfully devoid of trees’, in the words of the Scottish-born botanist T. R. Sim. Today, closed-canopy forests cover less than 0.3 per cent of South Africa’s land surface, a figure that probably approximates the size of these forests in the late nineteenth century. Nor did the Cape’s indigenous species prove easy to propagate. Valuable Yellowwood (Afrocarpus falcatus and Podocarpus latifolius), Black Stinkwood (Ocotea bullata), Black Ironwood (Olea capensis) and Sneezewood (Ptaeroxylon obliquum) are slow-growing species difficult to raise in the nursery and establish in the field, and regenerate only under ideal conditions, as was well known at the time.

Foresters in the Cape responded to these ecological conditions, and to their inherent economic consequences, by embarking on the then unprecedented course of using introduced species of tree for domestic forest production.

---

1 Dietrich Brandis was the former Inspector General of Forests of India. He is considered the ‘father’ of forestry in India by many. Hutchins to Fourcade, 10 July 1890, Fourcade Bequest BC246, C5, University of Cape Town Archives (UCT).
3 L. Mucina and M. C. Rutherford (eds), The Vegetation of South Africa, Lesotho and Swaziland (Pretoria: South African National Biodiversity Institute, 2006), 32.
4 See T. R. Sim, Tree Planting in Natal (Pietermaritzburg: P. David and Son, 1905), xviii, 48, 278.
The inevitable landscape change, speculation and dispute about the consequence
to water supplies and climate, and the price of this change, caused the emergence
of the scientific search for evidence to resolve this conflict.

To support its population and economy, the colony had to import far more
timber than was produced at home, at great cost. The imperative to plant forests
forced them to seek new ways of growing exotic trees successfully and cost-
effectively. Many of the first plantations failed. Yet failure, together with the
motivating force of some early successes, compelled Cape foresters to devise
methods for selecting and experimenting with exotic trees. This chapter argues
that during the 1880s to 1900s, Cape foresters initiated a coherent and globally
unique research program that sought to select and then grow climatically suitable
genera and species in timber plantations. Hutchins, a leader of this movement,
summarised this view succinctly in his favourite phrase: ‘fit the tree to the
climate’. Research that began in the Cape later spread to other South African
colonies after the conclusion of the South African War in 1902. South Africa’s
first forestry school focused on training foresters in this unique Cape method
of forest development (Chapter 3). Foresters who trained and worked within
this tradition reshaped South Africa’s landscapes, economies, and cultures by
planting trees throughout suitable and less suitable areas of the country.

Foresters working in the Cape Colony during the 1880s and 1890s faced some
of the most difficult conditions in the world, similar to conditions in South
Australia, the Punjab, Algeria, Tunisia, and Morocco. Attempts to grow exotic
trees suffered many setbacks throughout the colony, most especially in the vast
arid Karoo. Attempts at propagating trees of the indigenous forests to expand
timber resources proved futile. The Cape’s Parliament was penurious and the
Minister for Agriculture worried about unrestrained spending. Many rural
residents looked with scepticism on the propagandistic claims of how trees
could improve the climate and push back the arid Great Karoo. White settlers
and indigenous Africans contested the boundaries and meanings of Crown
land.5 There was a shortage of labour during the first decades of the Forestry
Department’s existence. Yet with a belief in the rightness of their duty, colonial
foresters set about their tasks with diligence and perseverance.

In its tenets and practices, the ‘Cape model’ of forestry that evolved in the
colony diverged knowingly from core northern European forestry. Foresters in
the Cape chose to rely on planting exotic trees from all over the world, and had

5 Throughout this work, we use the term ‘Crown land’ to refer to land held by the state when writing
about the period of Crown colonies, but ‘state land’ for the period after Union in 1910, even though the term
‘Crown land’ continued as a statutory category until South Africa left the Commonwealth in 1961. The same
applies to ‘Crown forest’ and ‘state forest’. The situation with state land and state forests is complicated
after the 1936 Native Trust and Lands Act, when a category of land generally termed ‘Trust land’ emerged
(also ‘Trust forests’). Where necessary, we distinguish this category of state asset.
little use for European forestry theories, which failed to explain how to select and manage exotic trees for extra-tropical climates. They had to learn how to domesticate and cultivate species of tree that were entirely novel to their discipline. Once they established a coherent plantation program that clearly deviated from European orthodoxy, foresters began to draw criticism from imperial foresters and botanists in Britain. Not for the last time would South African forestry methods draw disapproval from foresters overseas.

The unique set of conditions that shaped foresters during the late nineteenth century must be understood within the wider history of the Cape Colony, dating back to the foundations of Cape Town in 1652. European colonists introduced a new biotic regime to the south-western Cape region, bringing with them what Crosby described as a ‘portmanteau biota’, including livestock, plants, pests, and diseases. Environmental constraints, including aridity, recurrent wildfire, and a highly diverse but largely treeless shrub-dominated indigenous Cape flora, meant that settlers were constantly seeking new sources of timber, first from sites near Cape Town, and later in forests further away as well as in plantations. Yet numerous problems hindered the success of plantations and forest conservation during the eighteenth century and the first three quarters of the nineteenth century. It was these historical and contemporary constraints that compelled the first generation of professional foresters to find innovative ways of selecting and acclimatising exotic trees.

The environmental and colonial context of post-1652 botanical introductions

Southern Africa has for millions of years been a relatively forest-less landscape. Paradoxically, the subcontinent also has climatic and soil conditions that could theoretically have allowed for the growth of trees. A variety of evolutionary, edaphic, and climatic conditions led to the development of a number of forest-free biomes. South Africa’s two largest biomes—grassland (27.9 per cent of South Africa’s surface area) and savanna (32.5 per cent)—are ‘fire-driven’ ecosystems where trees are kept in check by recurring grass fires that kill trees before they can crowd out grasses. Fynbos (6.6 per cent), the dominant biome of the south-western Cape, where the Dutch first settled in 1652, characterised by the heath,

---

6 We use the term ‘forest’ in this text to mean the indigenous, evergreen, closed-canopy forest, mostly of the Afrotemperate Mistbelt, Coastal and Scarp types, as in Mucina and Rutherford, *The Vegetation of South Africa, Lesotho and Swaziland*, 587.
7 Ibid., 37.
proteoid, and restoid growth forms, lacks trees, is also fire-dependent and deficient in mineral nutrients. Trees are scarce also in the neighbouring Nama-Karoo and Succulent Karoo biomes, where aridity is a limiting factor.

The introduction of trees was part of the onset of a new biotic regime that began in 1652 with the Dutch settlement in Cape Town. Chosen for its strategic location, the natural environment of the Cape presented many difficulties to early settlers, among which was the scantiness of wood. The south-western and southern Cape is relatively devoid of forests except for occasional small patches on south-facing mountain slopes, and in sheltered valleys. From its initial settlement, the Vereenigde Oost-Indische Compagnie—the VOC—passed laws regulating the cutting of indigenous timber at the Cape. Resource scarcity, especially timber shortages, remained a pressing issue in the Cape for the next three centuries.

To overcome the Cape’s natural timber deficiency, Jan van Riebeeck (Commander, 1652–1662) and Simon van der Stel (Commander, 1679–1691; Governor, 1691–1699) required settlers to plant trees. Though settlers used some indigenous species, such as the Keurboom (Virgilia oroboides) and Wild Almond (Brabejum stellatfolium), most species planted were imported from Europe (such as oak, Quercus robur) and Asia (camphor, Cinnamomum camphora). Introduction of the stone pine (Pinus pinea) and cluster pine (Pinus pinaster) probably accompanied the arrival of Huguenots in the 1680s. Settlers planted trees in cities, alongside roads and around homesteads (van der Stel required this by law). Thus, exotic trees always followed close behind (and in some cases advanced ahead of) the steady expansion of European settlement and Christian missions into the interior of Southern Africa.

In the eighteenth century, the VOC established some timber plantations across the Cape Flats and at Silvermine, Tokai, and Cecilia, but the extent and effectiveness of these plantations is unknown. The well-watered locations at Tokai and Cecilia (located on the south side of Table Mountain, which receives up to 2,270 mm of precipitation annually) later became sites of larger plantations in the last half of the nineteenth century. It is probable that plantations suffered

---

8 Ibid., 37, 79.
10 This is widely referenced in historical literature, with no attributable source. One of the early descriptions of this introduction date comes from Edinburgh Philosophical Society Journal, 9 (1830), 401.
greatly from illegal extraction of timber by burghers because of the high costs of imported timber. The plantations were not enough to compensate for the continued destruction of indigenous forests in the south-western Cape given the expanding frontier of timber harvesting, which by the late eighteenth century stretched all the way east to Knysna.

The geopolitical upheaval during the Napoleonic Wars led to the Cape finally being ceded to the British in 1814, a formal recognition of Britain’s *de facto* rule of the Cape dating back to 1806. This official transfer encouraged new flows of people, plants, and ideas between the Cape and British colonies. British rule led to Lord Grey’s 1820s settlement of British and, later, German immigrants in what is now the Eastern Cape. The banning of slavery in 1833 by the British caused more conservative farmers to trek into the interior in 1835–1836 in search of new lands where they could farm, live in self-rulled Boer republics, and follow the rules of Calvinism. Frontier wars, initially between Boers and Xhosa in the last 20 years of the eighteenth century, intensified with British settlements as settlers and British military forces came into conflict with African groups east of the Great Fish River, a colonial boundary that up to the 1820s and 1830s had demarcated the end of European settlement and the beginning of numerous Bantu African settlements. Trekkers skirmished to the north and east with the Matabele and Zulu, as well as Sotho-speaking polities. To counter the Boer expansion, the British annexed the Boer Natalia Republic, established in 1839, and re-christened it Natal Colony in 1843. This led most trekkers to move further into the interior where they settled in what became the Orange Free State and South African Republic (ZAR).

The new areas that European immigrants settled after 1820, as a general rule, lacked closed-canopy forests. The extensive highveld grasslands of the Free State and ZAR had few trees. The trees that dotted South Africa’s different types of savanna in ZAR and Natal could be used as firewood and some for house construction and furnishing, but the varied quality and low quantity of timber made it unsuitable for large-scale industry. Exceptions included forests of the Eastern Cape Frontier and Transkei, along the kloofs of Natal, and some

---

parts of eastern and north-eastern Transvaal, such as the Woodbush forest.\textsuperscript{14} Given the finite forests and their slow growth, the expanding population of Europeans, coupled with current and prior wood use by indigenous Africans, led to the depletion of their stocks of large trees and the loss of some forests. This destruction increased rapidly in all forests after the discovery of diamonds in Kimberley in the late 1860s, and gold in the east of the ZAR and on the Witwatersrand in 1886, which sparked a gold rush in Johannesburg. As a result, woodcutters harvested indigenous timber at unsustainable levels given the slow growth rate of indigenous trees, the small size of the forests and the great demands for timber for mines and industry.

\textbf{Introductions of new tree species in nineteenth-century Southern Africa}

The paucity of tree cover in Southern Africa provided the environmental context for a comprehensive tree-planting campaign during the second half of the nineteenth century. One of the peculiar facets of nineteenth-century colonialism, especially in settler colonies, was that economic, cultural, and scientific views merged together into a powerful impulse to plant trees. European settlers, in Southern Africa as elsewhere, put their faith in the belief that trees would ‘improve’ climates, beautify landscapes, increase productivity, mark boundaries, and aid colonisation.\textsuperscript{15} Settlers planted exotic trees for timber, for shelter from the sun and wind, and because they supposed that trees increased rainfall in dry environments.\textsuperscript{16} Little was known about the climate and meteorology of the subcontinent of Africa. As a result, South Africa’s aridity, heat, strong seasonal contrasts, and tropical diseases were all attributed at one time or another to the country’s lack of forest cover. This was predicated on eighteenth-century ideas about the morality of climates (e.g. that tropics led to degradation) and built on nineteenth-century ideas of desiccation popularised by Alexander von Humboldt and a cadre of prominent German and French foresters and botanists, as well as George Perkins Marsh in the USA.\textsuperscript{17}


\textsuperscript{15} The first professionally trained forester in the Cape, the Comte de Vasselot de Regné, made this clear when he argued that with forestry ‘the development of colonization will be powerfully helped forward’. Cape of Good Hope, \textit{Report of the Superintendent of Woods and Forests} (Cape Town, 1882), 45. Hutchins discussed using eucalypt trees with wire fencing in the Eastern Cape to denote boundaries. Cape of Good Hope, \textit{Report of the Superintendent of Woods and Forests for the Year 1886} (Cape Town, 1887), 32.


\textsuperscript{17} Grove, \textit{Green Imperialism}, 366; Barton, \textit{Empire Forestry}, 15–7.
Tree planting served different purposes and employed various species. Before the second half of the nineteenth century, settlers planted trees for homestead utility using a few proven species such as Grey Poplar (*Populus canescens*), Common Oak (*Quercus robur*), and to the north-east, syringa (*Melia azedarach*), although amateur and professional botanists, in certain instances, did facilitate certain exchanges of new species into the region. For instance, the first known introduction of Australian *Acacia longifolia* probably came in 1827 when James Bowie, a plant collector for Kew Gardens, arrived in the Cape with seeds from England.\(^\text{18}\) Settlers planted whatever seed they could get their hands on, or, in the case of the Grey Poplar, possibly the most popular homestead tree, vegetative truncheons. A series of complex familial, commercial, and state networks developed that exchanged seeds from different parts of the world. Many exchanges occurred when people brought seeds from one colony to another. *Eucalyptus globulus* (Blue Gum) was probably introduced into the Cape in 1828 when Sir Galbraith Lowry Cole, the new governor, brought the species with him from Mauritius.\(^\text{19}\) Settlers in remote regions worked through word of mouth and read print materials to find out what seeds were working in Southern Africa and elsewhere in the world.

The successes and failure of Australian trees, especially *Eucalyptus*, in South Africa illustrate the blend of myth, pragmatic and widespread trial, and later, systematic scientific enquiry, which finally led to successful acclimatisation of exotic trees. Initially, a potent brew of uncertainty and hope led to the rise of much hearsay regarding the properties of certain species and genera. For a period, eucalypts and other Australian trees become the wonder of the tropical and subtropical settler world. The popularity of Australian trees soared among Cape colonists in the 1860s after botanical enthusiasts in Australia and France peddled grandiose claims about their properties, especially those of the genus *Eucalyptus*. The Australian botanist Ferdinand von Mueller boasted that the timber of *E. globulus* rivalled the world’s most valuable timbers. Mueller and other botanists also argued that eucalypts helped to prevent malaria and other tropical diseases, both by draining swamps due to their vigorous growth and through the secretion of their scented, powerful oils, which subscribers to the miasmic theory of disease believed would kill malaria.\(^\text{20}\)

---


\(^{19}\) See Zahn and Neethling, ‘Notes on the Exotic Trees in the Cape Peninsula’; J. Noble, *History, Productions, and Resources of the Cape of Good Hope* (Cape Town: W. A. Richards and Sons, 1886), 150.

The Victorian belief that the location of Australia and Southern Africa in the southern hemisphere made them geographically and botanically related further justified interest in planting Australian trees. The botanist Joseph Hooker, who noted similarities amongst the floras on different continents and islands across the entire southern hemisphere, hypothesised that Australia and Southern Africa might have been linked as part of a large ancient southern continent.\textsuperscript{21} The popular and prolific naturalist, Alfred Russel Wallace, argued that the southern hemisphere was characterised by ‘detached areas, in which rich floras have developed … but [which are] comparatively impotent and inferior beyond their own domain’.\textsuperscript{22} The only exception to this rule was Australia’s forest flora, which naturalised in the southern hemisphere on sites outside of its original geographic range, such as the Cape.\textsuperscript{23} Scientists in the Cape Colony expressed similar beliefs. At least one Cape Colony forester, Hutchins, noted the dominance of the Australian flora over the Cape’s when arguing for the importation of Australian trees into Southern Africa.\textsuperscript{24} This survival-of-the-fittest mentality fitted well with the popular fallacies of Darwinian natural selection when they were applied to explain why some floras and species seemed more ‘aggressive’ and others ‘impotent’.

Formal botanical exchanges between Australia and Southern Africa increased in intensity from the 1850s to the 1890s as a result of the creation of new botanical gardens in Australia and Southern Africa.\textsuperscript{25} Gardens opened in Cape Town, Melbourne, Adelaide, Durban, Pietermaritzburg, King William’s Town, Graaff-Reinet, Perth, and Grahamstown in the 1850s to 1870s. Botanical gardens in Natal and the Cape Colony prominently featured Australian trees. Founded in 1881, the Cape Colony’s Department of Agriculture pursued the largest institutional program of tree planting in Southern Africa in the 1880s and 1890s. One estimate suggested that its Forestry Division sent out 300 million wattle (Australian \textit{Acacia}) seeds alone to Cape colonists from 1882 to 1893.\textsuperscript{26} It is doubtful that

\textsuperscript{21} See the introductory essays in J. D. Hooker, \textit{Flora Novae Zeelandiae} (London: Lovell Reeve, 1853) and \textit{Flora Tasmaniae} (London: Lovell Reeve, 1860).
\textsuperscript{22} A. R. Wallace, \textit{Island Life} (London: Macmillan, 1880), 495.
\textsuperscript{23} Ibid., 496.
very many of these seeds ever grew into mature, seed-producing trees, but even a small percentage of successful results would have led to substantial ecological changes.

From the 1850s onward, Australian botanists worked closely with Cape and Natal correspondents to encourage the acclimatisation of Australian trees in the two colonies. Ferdinand von Mueller, the government botanist for Victoria from 1853 to 1896, sent seeds and provided advice to botanists, farmers, and foresters there for over 40 years.27 When Mueller’s life ended, Joseph Maiden, director of the Sydney Botanic Gardens and Herbarium from 1896 to 1924, became the leading Australian botanist who corresponded with Cape and Natal botanists.28 Maiden worked as the official seed collector for the Cape Colony from 1896, when the Agriculture Department, at the request of Hutchins, established a direct relationship with him.29

Seed introductions in the Free State and the South African Republic occurred primarily through private, not state, networks. Richard Wills Adlam was one of the few people in the Transvaal to pursue transnational botanical exchange with scientists.30 The Fichardt family established an extensive plantation of various eucalypts near Bloemfontein in the 1860s, while Charles Newberry, a British immigrant to the Orange Free State, employed a forester and horticulturist to plant a large number of trees on his Prynnsberg estate, in the Orange Free State near the border of then Basutoland, beginning in the summer of 1881–1882.31 The lack of state action did not seem to slow the exchange of species between continents and colonies. Peer-to-peer networks and wealthy landowners who sometimes hired horticulturists brought in the seeds available in the Cape.

---

31 Arthur Emmanuel Fichardt, President of the Bloemfontein Chamber of Commerce, to the Dominions Royal Commission, Royal Commission on the Natural Resources, Trade, and Legislation of Certain Portions of His Majesty’s Dominions, Minutes of Evidence Taken in the Union of South Africa in 1914, Part I (London: HMSO, 1914), 290; Charles Newberry, in a letter in 1887 to the Christian Express, reported having planted 350,000 trees (of which just 200,000 to 250,000 had survived, many species proving unsuited to this site), including 40 species of eucalypt, ‘many’ species of pine including Pinus radiata (found to be ‘the best’), Italian poplars, and willows. See Forestry News, 3/78 (September 1978), 4–5.
People hoped trees that grew in the Cape would grow in other places, such as the Transvaal, which needed timber for the gold mines. In 1893, Sammy Marks, a wealthy Jewish financier and industrialist, appointed a German horticulturist, Otto Brandmuller, to begin the afforestation of his estate Maccauvlei, south of Johannesburg on the Vaal River. Brandmuller started by planting 100,000 common oak trees, but the plantation eventually grew to nearly 2,000 hectares, with Pinus radiata and P. pinaster the main species. Newberry, too, used species proven in the Cape. Hutchins noted that as late as 1890, ‘we were positively assured that all the trees that grow at the Cape would succeed at Johannesburg’.

Many exotic species introductions succeeded. This reshaped urban and rural landscapes. By the late nineteenth century, eucalypts, wattle, willow, poplar, and syringa punctuated Southern Africa’s landscape as far north as Rhodesia. In 1897, James Bryce described the entire countryside of Southern Africa as being dotted by exotic trees:

[One] finds them now everywhere, mostly in rows or groups round a house or a hamlet, but sometimes also in regular plantations. They have become a conspicuous feature in the landscape of the veldt plateau, especially in those places where there was no wood, or the little that existed has been destroyed. Kimberley, for instance, and Pretoria are beginning to be embowered in groves of eucalyptus; Bulawayo is following suit; and all over Matabililand and Mashonaland one discovers in the distance the site of a farm-steading or a store by the waving tops of the gum-trees.

The trees Bryce and other travellers noted were used primarily for domestic purposes, such as shade, firewood, and other non-commercial uses.

Successful nineteenth-century acclimatisation happened as a matter of chance as well as experience with a small set of species easily propagated, rather than from a methodical, rigorous selection process that identified species and characteristics that would be best suited to different regions in Southern Africa. There was widespread global interest in planting exotic trees, especially those from Australia. Southern Africa just happened to be one of the few places where they seemed to grow freely, while elsewhere, with a few exceptions, people found Eucalyptus difficult to propagate. The reason why some Australian

36 Ibid.
species acclimatised in Southern Africa was because the two regions share similar climatic ranges. Settlers vaguely understood that both regions shared similar climatic qualities, but they had little knowledge about how to select species from one comparable climate and introduce it into another similar climate. This lack of knowledge led to many unsuccessful introductions and caused great frustration.

The need for timber in Southern Africa: The minerals revolution

The opening up of diamond fields near Kimberley in the early 1870s sparked a minerals revolution that transformed ‘a slow-growing and impoverished section of the world’ into a modern industrialised state. It was the minerals revolution that thrust forestry into the foreground of the rural economy, driving and forming a forestry distinct in its history from forest histories elsewhere. The consequences of the mineral revolution to forestry was profound. The colonial forestry sector, which was characterised by a negative balance of trade and unsustainable harvesting of indigenous forests, was gradually replaced by a modern forestry sector that produced large volumes of plantation-grown timber for the domestic economy and, eventually, for export markets.

The early years of diamond mining gave advance warning of the long reach of minerals into South Africa’s forests. Not only did developments in Kimberley rapidly deplete the timber in the surrounding arid savanna, but its demands for structural and energy timber, the knock-on demand for wagon woods, and the later demand for sleepers and fuel as the railways extended to serve the mines, stimulated the activities of the woodcutters in the Knysna forests and elsewhere. The demand for wood from Kimberley ‘caused these forests to be worked out to such an extent that in 1876 the forests west of the Kaaimans River, a few miles east of George, were declared closed to all workings and remained closed until 1925’.

---


39 F. S. Laughton, *The Sylviculture of the Indigenous Forests of the Union of South Africa with Special Reference to the Forests of the Knysna Region*, Forestry Series No. 7 (Pretoria: Department of Agriculture and Forestry, 1937), 22.
The growth of the goldfields of the Witwatersrand, following the discovery of the Main Reef in 1886, intensified the extraction of timber, transported by wagon 500 km from the Soutpansberg to the north, and nearly 1,200 km from Knysna. The Witwatersrand kindled demand for timber and railway development. Though railway construction created a demand for indigenous timbers for rail sleepers—Hutchins reports the sale of ‘100s of thousands’ of yellowwood sleepers from the Knysna forest⁴⁰—completion of the rail line between Kimberley and Johannesburg in 1892 allowed the delivery of imported timber at prices lower than road-delivered indigenous timber, and virtually eliminated the demand for wagon wood. Suddenly, the market for indigenous timber fell, and extraction from the forests of Woodbush and the Soutpansberg slowed to a halt (except for the last high-value sources in remoter enclaves).⁴¹

Knysna woodcutters, no longer able to sell the timber from the diverse species stipulated in their licences, switched to scarcer, high-value yellowwood and stinkwood for the smaller furniture and joinery market, undermining the Forestry Department’s carefully constructed management plans by further degrading the forests.⁴² The sudden surge in cheaper rail-borne timber imports created the opportunity for private enterprise, while at the same time aggravating the public concern about their effects on the country’s balance of payments, so that economic and financial factors weighed in with conservation motives to accelerate a shift toward the domestic production of timber from planted forests. The newly integrated Union rail system opened the Witwatersrand market to the wattle growers in Natal and the eastern Transvaal, as well as new eucalypt growers, stimulating further investment in plantations.

The mines, on the Reef as well as on the goldfields of Lydenburg and Barberton, demanded ‘spectacular’ quantities of timber, satisfied initially from an assortment of sources, including imports, timber from the indigenous forests, savanna trees such as Knobthorn (Acacia nigrescens, now Senegalia nigrescens), Leadwood (Combretum imberbe), and Marula (Sclerocarya birrea), as well as early yields from plantings of eucalypts of different species.⁴³ Between 1893 and 1898, mining expenditure on timber on the Witwatersrand more than doubled.

By 1911, the next year of record, expenditure was double that of the late 1890s, and by 1918 it had redoubled. During World War I, prices of imported timber rose to double the pre-war prices; by 1928 around 400,000 tonnes of timber poured down the mines annually on the Reef (see Figure 1).

Figure 1. Timber supports in a mine on the Reef, 1920s.

Plantations for local production sprang up at private initiative. H. A. Read cites the report of J. Klimke, State Mining Engineer of the South African Republic, for the year ending 31 December 1894: ‘Tree Planting for Mining Purposes’, in which he promotes plantation production as a substitute for timber imports:

As the mining industry is rapidly extending, the consumption of wood increases, sawn lumber for buildings and timbering of shafts is almost entirely imported from abroad … On this account the cultivation of trees is considered an important branch of agriculture, and in consequence plantations are laid out
in several places, as it is of importance for mining requirements the most useful and best trees should be planted ... [such] information ... best acquired from practical foresters.

Klimke’s document appends a report by G. Genth, a forester from Saxony employed to develop the ‘extensive plantations on the farm Braamfontein’, in the present Johannesburg, in which Genth summarises experience with the 850-acre project (see Figure 2).

The earliest plantings of *Eucalyptus grandis* for commerce appear to be those by Conrad Plange and Heinrich Schulte Altenroxel soon after they bought land near Tzaneen in 1893, followed after the South African War by trials by the Transvaal government. These were forerunners to major mining-timber enterprises such the investment by the Exchange Yard of Johannesburg, a warehousing subsidiary of Rand Mines, which processed substantial mining-timber volumes but soon included timber processing for the mines in its business. Afforestation with eucalypts to supply mine-support timber expanded in the later centre of sawtimber forestry, Sabie, from around 1910 and the volumes of mine-support timber consumed grew steadily to its peak of over 1 million tonnes per year a few decades later. Since the South African War, private plantations accounted for most of the rapid growth in area afforested for the following 90 years, and have always exceeded the state’s forests.


46 Transvaal Gold Mining Estates, the largest gold miner in the area, with 20,000 acres of land in its concessions, entered the timber industry around Sabie from the early 1900s, experimenting with small wattle plantations; by 1927 the company had 1,457 hectares under plantation, making a profit of 12,000 pounds sterling; by the 1930s, its area under plantation in the Pilgrim’s Rest district was 12,000 ha. See A. W. Greenstein, J. P. Kleynhans, and P. J. A. Loseby, ‘Timber Resources’, in *A Survey of the Resources and Development of the Southern Region of the Eastern Transvaal Lowveld* (Barberton: Lowveld Regional Development Association, 1954), 86–91; S. Schirmer, ‘Enterprise and Exploitation in the 20th Century’, in A. Delius (ed.), *Mpumalanga History and Heritage* (Pietermaritzburg: University of KwaZulu-Natal Press, 2007), 522, 291–347, 305–7.


48 The 1918 Agricultural Census showed 0.5 per cent of Mpumalanga under timber (c. 23,000 ha), and in 1993 11 per cent (515,000 ha), all other agricultural sectors having grown: Schirmer, ‘Enterprise and Exploitation in the 20th Century’, 292; D. Reekie, ‘The Wood from the Trees: *ex libri ad historiam pertinentes cognoscere*, *South African Journal of Economic History*, 19 (2004): 67–99.
The limits of acclimatisation

If Australian trees disproportionately shaped hopes regarding tree planting in the second half of the nineteenth century, they also helped to dispel the settlers’ naive idea that they could so easily change nature. Like many speculations of the late nineteenth century—railways to nowhere, grandiose agricultural schemes, and mining busts—Australian trees proved as much a mirage as a reality. They were the El Dorado of forestry in the late Victorian era, a dream of
convinced people trying to change the world. The failure and consequences of poorly selected trees led foresters in the Cape Colony to rethink the theoretical and practical basis of forestry in Southern Africa.

By the last decade of the nineteenth century, angry farmers were complaining bitterly about the advice given by botanists and state foresters. The trees that they had planted with great hope too frequently died young, did not produce usable timber, and often seemed to dry out natural springs, marshes, and streams. Of all species planted widely in the mid to late nineteenth century, none attracted as much initial enthusiasm followed by criticism as *Eucalyptus globulus*, the Blue Gum. Starting in the late 1820s, settlers planted the species across all of Southern Africa. The species was so widely planted in the nineteenth century that, despite not being planted for most of the twentieth century, many South Africans still call any species of *Eucalyptus* a ‘blue gum’ or ‘bloekomboom’. The species grows best in a narrow climatic range similar to its cooler native habitats in New South Wales, Victoria, and Tasmania, but in South Africa settlers planted it in the semi-desert Karoo, on mountains, and in the subtropical interior.

By the early 1900s, farmers were berating those who recommended the Blue Gum. One farmer, P. H. Pringle, told readers of the *Agricultural Journal of the Cape of Good Hope* (*AJCGH*) how he had planted numerous genera and species of exotic trees, but found that the ‘least satisfactory of the lot is the Bluegum’. People complained that their trunks twisted, rendering timber useless except for firewood.49 Trials of *E. globulus* sleepers found them to split and crack, ‘useless for railway purposes’.50 For a time, De Beers did not buy them for use as supports in the diamond mines because of the structurally unsound nature of the timber.51

A similar sense of frustration existed throughout Southern Africa. On the Highveld, the newly established plantations did not succeed in the long run, although they did supply mines with timber some of the time. Read records how ‘rigorous winters’52 required the choice of better adapted species, and how the outbreak of the bark-borer larvae of the beetle *Phorocantha semipunctata* and the snout beetle *Gonipterus scutellatus* caused growers to fell Highveld plantations

---

50  Sim, *Tree Planting in Natal*, 161, Sim summarises official and private concerns about *E. globulus* timber defects, pp. 156–61.
51  Farmer, ‘De Beers and Blue Gum Wood’, *AJCGH*, 22 (1903), 352.
prematurely, and this with the greater productivity from plantations in the humid subtropical regions of Natal and the eastern and northern Transvaal put paid to the Highveld schemes.

Figure 3. A plantation of *Eucalyptus globulus*, George, c. 1910.
While the early plantations at Tokai and Worcester are most often mentioned, initiatives between George and Knysna, Fort Cunningham, and elsewhere in favourable climates were equally successful.
Source: Department of Agriculture, Fisheries and Forestry; photographer unknown.

Failure forced botanists to study the native biogeography and natural variation of species in order to understand the biology and ecology of valuable species. But the unique evolutionary history of Australia’s flora proved challenging even for the most seasoned botanists on the continent. *Eucalyptus* classifications proved particularly troublesome. Genetic variations and local environmental influences can cause two trees of the same species to produce different leaf shape and growth forms, leading to misidentification. Equally, the difficulties in distinguishing between many species similar in their morphologies made it difficult for botanists to trust the species determinations of their helpers. Australian collectors notoriously misclassified the species and provided poor geographical information on the regions from which they sourced seeds. Joseph Maiden discussed this problem candidly in a letter to the Agriculture Department of the Cape Colony: ‘I cannot place your order in the hands of nurserymen, as their collectors are not at present sufficiently educated in regard
to the difficult genus *Eucalyptus* to enable me to trust their naming’. In another letter, Maiden told Hutchins to tell him ‘[i]f any unusual proportion of the seeds fails to germinate, or if the seeds appear to be wrongly named, or to be under names different to those under which you have previously received them’.

Hutchins maintained a detailed correspondence with botanists in Australia, notably Maiden, who over a 10-year period offered him advice on what species to plant in the Cape Colony that matched the species’ native climates. In their first exchange, Maiden decided to include *Eucalyptus saligna* (later properly identified as *Eucalyptus grandis*) in the shipment of seeds to Hutchins: ‘It [*Eucalyptus saligna*] is not on your list, and you need not therefore pay for it unless you choose, but the expense is trifling’. Hutchins asked to continue receiving this species, and Maiden’s ‘trifling’ expense eventually became the most widely planted species of *Eucalyptus* in South Africa from the 1930s until today.

The same species planted in Southern Africa often looked different than it did in Australia, making many published botanical guides useless. ‘No Genus is so perplexing as *Eucalyptus* in the matter of discrimination of species’, the Cape Town botanist Peter MacOwan wrote, ‘especially when as here, they have grown in fresh woods and pastures new, different from their Australian home, and have taken on a new habit’. Questionable classifications led many settlers to call different species by the same name. MacOwan wrote an exasperated response to one settler who inquired about a specific species in 1894:

> The so-called popular names are the cause of endless wrangling and misunderstanding. Thus there are about twenty-five different White Gums, a dozen Blue Gums, several Black Wattles, several Golden Wattles, and every non-botanic grower vows that his particular blue or white or golden is the real one and the rest are bogus pretenders.

Another problem quickly became apparent. Settlers who planted seeds did so with little knowledge of whether the species they (supposedly) selected would actually grow in the regions where they planted them. This is because few settlers (and also few scientists) appreciated the fact that most plants can only grow in a finite range of climatic, geological, and ecological situations. This was compounded by the time it took to recognise when a species had been improperly selected for a site. Trees could grow for a decade or more before showing signs of disease or other deficiencies. Hutchins noted that, ‘[most] trees, unless they

---

53 Maiden to Undersecretary of Agriculture, 3 November 1896, F719, AGR 722, NASA-CT.
54 Maiden to Undersecretary of Agriculture, 13 August 1897, F719, AGR 722, NASA-CT.
55 Maiden to Undersecretary of Agriculture, 3 November 1896, F719, AGR 722, NASA-CT.
57 P. MacOwan, ‘Gum of *Eucalyptus*’, *AJCGH*, 6 (1893), 32.
are altogether unsuited to the climate and soil do well for a few years, perhaps the first 20 or 30 years’. 59 One example was Eucalyptus robusta, which settlers planted in the dry western districts of the Cape Colony. The seemingly healthy trees grew for a time, but ‘[t]hen came the inevitable failure. As a native of the damp semi-tropics of East Australia it was quite out of its place in the … climate of the Cape Peninsula or the dry Karoo’. 60 Insect pests, whether native to South Africa or having followed the eucalypts from Australia, aggravated the problem. Fichardt, speaking of experience with his plantation near Bloemfontein, reported persistent damage by a wood-boring insect that had switched from Acacia karroo, its native host, damaging eucalypt plantations, and complained of the lack of response from government officials to his reporting the problem. 61 Eucalyptus viminalis, widely planted on the Highveld of the interior plateau, around Johannesburg, as well as E. globulus, became infested by the defoliating Australian weevil, Gonipterus scutellatus, which, despite the success of later biocontrol, effectively eliminated E. viminalis and E. globulus as a commercial species in South Africa—an interesting case of fortuitous biological control, a companion to the natural biocontrol reported by Fichardt. 62

Although Eucalyptus species proved the most difficult to select, would-be planters faced the same problems with almost every species and genus. They had little advice that detailed the native climates of an exotic species, let alone matching them with corresponding climates in the Cape Colony.

Climate and experimentation in the Cape, 1881–1910

The creation of a forestry department 63 within the Cape Agriculture Ministry in 1881 significantly shaped the future of tree planting in the colony. A number of state-sponsored scientific programs began during the 1880s, including veterinary science, agricultural research, and irrigation. Historians have debated the effectiveness, extensiveness, and widespread degree of public interest in

---

60 Ibid.
61 Fichardt to the Dominions Royal Commission, 290.
63 The government entity for public forestry took different forms in this period: in 1876 the Cape government formed a separate Department of Plantations and Forests as a Division of Agriculture, from 1881 to 1891 the function formed part of the entity called the Commissioner for Crown Lands, Mines and Agriculture, and so on. We use the phrase ‘department of forestry’ or ‘forestry department’ to refer generically to any one of the forms the function took.
various scientific and technical programs during this period. What is clear is that, though many people agreed with the views of scientific experts, many members of the public, especially in rural areas, did not. Understandably, many people chafed at legislation and policies informed by scientists that mandated certain actions, such as to clear weeds, dip sheep, or plant trees. It was the wealthier farmers who tended to advocate ‘progressive’ scientific reforms, which often required extensive capital to implement successfully. However, in many instances, conservation laws did little to change people’s practices because the Agriculture Department was chronically understaffed and underfunded, a point that van Sittert argues is too often overlooked.

Forest policy encountered similar obstacles, and professional forestry faced a precarious existence in the Cape Colony during its first two decades. The forestry department’s finances were paltry considering the extent of Crown forest land and the requirements for afforestation. The department’s fate was put into the hands of the colony’s first Superintendent of Woods and Forests, Comte de Vasselot de Régné. Bringing the French aristocrat and his large family down to Cape Town in 1880 was one of the more flamboyant scientific hires in the British Empire during the second half of the nineteenth century. De Vasselot did not write in either English or Dutch, and had to have his reports and ideas on forest...
management translated into English. De Vasselot brought with him the stiff French forestry tradition: he wanted foresters to wear blue military uniforms as they did in France and he mentioned in an official report how collecting wood illegally in France could be punished by the ‘penalty of death’. De Vasselot made profuse and grand claims about forestry that he could never live up to. His position of Superintendent of Woods and Forests was not filled when he left in 1891 on the pretext of cost, a fate similar to that of the equally grandiose John Croumbie Brown. After leaving, one prominent forester suggested that de Vasselot served merely as a ‘figurehead’ of forestry, a statement that is hard to deny when examining his limited role in discussions of forestry even during his tenure. Nevertheless, de Vasselot left an important legacy in the form of the conservation system for indigenous forests.

De Vasselot hired a number of people to work under his direction during the 1880s. He was fortunate that they needed little guidance from him. He hired foresters who had studied forestry in Europe (Hutchins and James Rawbone), others who had gained Scottish botanical training (Thomas Sim and Charles Legat), one who studied surveying at the South African College (Henry Fourcade), another who had qualified in land surveying in India and learnt plantation forestry there (Joseph Storr Lister), and even a former chamberlain of the Emperor of Austria (Johan Baron de Fin); Captain Christopher Harison (appointed after leaving military service), and de Fin had managed forests in the Eastern Cape since 1856 and 1865, respectively. These people did the real work of forestry, with de Vasselot touring the conservancies, offering advice and maintaining an extensive correspondence (in French) with foresters in the four conservancies. He retained the services of A. W. Heywood to translate his documents, and Heywood developed a knowledge of forestry that led him in time to a role as Conservator of Forests.

67 Le Comte de Vasselot de Régné, *Introduction of Systematic Treatment to the Crown Forests of the Cape Colony: Summary of Rules and Instructions* (Cape Town: W.A. Richards and Sons, 1885); Comte de Vasselot de Régne, *Selection and Seasoning of Wood* (Cape Town: W.A. Richards and Sons, 1885). All of Vasselot’s correspondence was in French. His manuscripts are maintained in Stellenbosch University’s library.


69 Instead of bringing in the £235,000 which de Vasselot predicted forestry could eventually make, forestry brought in a mere £7,680 of revenue in 1881. De Vasselot’s main accomplishments were the demarcation of Crown forests and the enhancement of the selection system for the management of indigenous forests, and he encouraged early plantation experiments, but had little understanding of climatic requirements of exotic trees. For instance, he wrote, ‘Forests ought to be a mine of gold to the Colony; while the plantations and re-foresting of mountains will, in conjunction with hydraulic works, turn to the best account, the rainfall of the country. Irrigation would then be easier, and agriculture a veritable mine of diamonds’: *Report of the Superintendent of Woods and Forests for the Year 1882* (Cape Town: W. A. Richards and Sons, 1882, 1883), 13.


71 Heywood’s daughter Lillian married J. D. M. Keet, later a major figure in South Africa’s afforestation program (see Chapter 4).
Forestry + Water Conservation in South Africa

The first decade of state forestry in the Cape was one of slow progress and hard-fought battles. A variety of people—ranging from poor woodcutters in Knysna, groups of sawyers in the frontier regions, settlers on the Cape Flats, leaseholders, to Africans in the eastern Cape—contested the demarcation and policing of forest boundaries. Foresters lived in remote regions, were poorly paid and housed, lacked adequate funds to pursue large projects, had a hard time starting plantings and complained frequently about how difficult it was to stop people from trespassing and taking wood illegally. Yet the demarcation of property with beacons and fences, and their protection by an increasing number of guards, did lead to a slow acquisition of forest land that foresters deemed valuable for economic or conservation purposes, accompanied by the enforcement of forest laws, often through jailing for up to three months’ hard labour. The Cape Forest Act (no. 28) in 1888, based on the Madras Forest Act of 1882, gave foresters the legislation required to reserve forest land. Forest reservation was part of an attempt to ‘wean’ Africans off indigenous forests and to force them to purchase timber from plantations (usually in the form of wattle) or to grow it themselves. State forestry alienated prior forest rights of indigenous Africans.

Tree planting was often promoted positively through ‘subsidies and competitions’, but legislation and policing made it mandatory for some people to plant trees. On the Cape Flats, lessees of Crown land were legally obligated to plant trees, usually provided free of charge, while many were fined for not doing so. Foresters dealt with a penurious agriculture minister and parliament by using convict labour.

Establishing plantations was the principal pillar of forest policy, along with the conservation of indigenous forests and catchment protection. From the outset, Joseph Storr Lister played the leading role in establishing state plantations in the Cape. He was born in Cape Town in 1852 and as a teenager went to work on a tea estate in Darjeeling, India, in 1870 before qualifying in land surveying and Hindustani and becoming forest sub-assistant on the plantation at Changa Manga in the Punjab, then the frontier of professional forestry in British India. He also worked in the hill forests of the Himalayas, and undertook a six-month exploration of the Hazar region of present-day Pakistan. Henry Baden Powell and Berthold Ribbentrop mentored his forestry assignments, preparing him for his unexpected future role in South African forestry. Lister left India for England in 1883, and on his return to Cape Town in 1888, he received the responsibility for state forestry.

---

73 For the quotation see Showers, ‘Prehistory of Southern African Forestry’, 303.
74 De Vasselot’s attention was given primarily to the management of indigenous forests, as seen in his publication on management and his forest reports. This is unsurprising given that plantations would take decades to grow, whereas indigenous forests already existed.
in 1874 for health reasons but was recruited by the Cape Colony government while there as the Superintendent for Plantations on the Cape Flats. After his return to the Cape he started by directing government drift-sand reclamation efforts at the Cape Flats in 1875.75

Lister founded many of the Cape’s largest state timber plantations in the early to mid-1880s. Most significantly, Lister founded the Tokai arboretum and plantation to the south of Cape Town in 1883.76 Tokai was the centre of experimental tree planting in Southern Africa from the mid-1880s to the 1900s—it had the largest number of tree species planted of any arboretum in Africa. Lister took care from an early period to disseminate knowledge to the farming and rural community. In 1884 the government published 3,000 copies of his Practical Hints on Tree-planting in the Cape Colony in Dutch and English for distribution throughout the colony.77 The book listed species for tree planting, but offered little advice about the climatic suitability of species.

Lister was able to make new large timber plantations, such as Kluitjes Kraal, Tokai, and Worcester, from yearly provisions voted by parliament based on estimates of expenditure rendered acceptably low by including convict labour and thus reducing costs.78 Convicts were required because of the Cape forestry department’s paltry budget. By 1886 there were 49 prisoners on an average day at the Kluitjes Kraal plantation.79 Foresters relied upon the use of convicts for some other plantations, such as at Fort Cunningham and Tokai.80 At Fort Cunningham, many of these labourers were probably people imprisoned with hard labour (for up to three months) for trespassing and stealing from forests.81 Foresters expressed little concern about using convict labour, because they saw the work as improving the colony’s environment and economy, and they believed it helped to teach labourers, many of them African, skills and work

76 Cape of Good Hope, Report of the Superintendent of Woods and Forests for the Year 1883 (Cape Town: W. A. Richards and Sons, 1884), 19.
77 See, for example, J. Storr Lister, Practical Hints on Tree Planting in the Cape Colony (Cape Town: W. A. Richards and Sons, 1884).
78 Cape of Good Hope, Report of the Superintendent of Woods and Forests for the Year 1884 (Cape Town, 1885), 7.
79 Cape of Good Hope, Report of the Superintendent of Woods and Forests for the Year 1886 (Cape Town, 1887), 13.
80 Ibid., 2–3; Sim, 8.
81 These convictions skewed towards Africans. Cape of Good Hope, Report of the Superintendent of Woods and Forests for the Year 1885 (Cape Town, 1886), 36. See the next year ‘The year has been marked by the great impetus given to forest work and tree-planting in employing convicts to afforest…’, Cape of Good Hope, Report of the Superintendent of Woods and Forests for the Year 1886, 28.
ethic. Forest law was drawn up irrespective of race, but prosecutions, especially in the eastern Cape, were almost entirely among the African population. In Knysna, prosecutions were generally of poor whites. On the Cape Flats, white settlers received fines for not planting trees.

De Vasselot and Lister established the earliest plantations sometimes without reference to the suitability of species to climate or site. One of their first plantations was at Beaufort West, a town located in the middle of the Great Karoo. Lister hoped that: ‘If it can be proved practically, that Plantations in the Karroo [sic] can be grown without the aid of irrigation, there would then be a prospect of converting that dreary desert into a smiling land’. This view was bolstered by de Vasselot’s firm belief that forests positively influenced climate. Lister received de Vasselot’s approval to make a plantation, and also tried encouraging local residents to plant trees. Residents at Beaufort West told a disappointed Lister that they had insufficient water for irrigation and could not be induced to plant trees. Despite the disagreement of locals, the department put money into establishing a plantation near the town in the early 1880s, but it proved to be an example that did little to encourage suspicious farmers. A drought in 1883 caused the town reservoir to dry up and the trees to die, and Lister decided reluctantly to abandon the experiment. This failure imparted a key lesson for foresters that they followed from then on: climatic considerations had to be taken into account when establishing plantations.

Henry Fourcade, a Frenchman who had arrived with his mother in the Cape in 1880, soon demonstrated a particular interest in climate and tree planting. Fourcade grew to be a complex personality, described as ‘a legendary character’, but an ‘enigma’ with ‘a forbidding manner’, a ‘man of mystery’. He studied land surveying in Cape Town at the South African College, and although he made important innovations in land survey technique through his later career, he chose employment in forestry for his initial career, doing extensive field surveys for the demarcation of forests. In 1882, he joined the forestry department, working under the direction of de Vasselot. Fourcade spent much of his time at Knysna in the Midlands Conservancy, and was appointed the Conservator in 1885. In 1889, Fourcade was seconded by the Cape government to Natal to survey the forests of the colony there and to offer recommendations on the establishment of

82 De Vasselot seemed to know little about the importance of climate when planting trees. For instance, he recommended the Mediterranean stone pine (\textit{Pinus pinea}) be planted in the all-year rainfall region of Knysna. Cape of Good Hope, \textit{Report of the Superintendent of Woods and Forests} (Cape Town, 1882), 15. For his general recommendations on plantations see p. 41.
84 Ibid., 18.
a forest conservancy. After surveying the forests of the colony, he compiled his findings into a detailed report. In addition to recommending measures for the protection of indigenous forests and the development of plantations, he offered a remarkably sophisticated bioclimatic matching. He noted:

In introducing exotic, or even indigenous trees, in new regions, it is essential to choose species suited to the climate. The influence of climate, on trees, is much greater than that of soil, and many species which will thrive in almost any soil and with varying supplies of moisture, can only grow in a zone with certain definite conditions of temperature.

By analysing the climate of Natal and matching this analysis to the climates of other countries, he identified equivalent regions elsewhere. Careful, detailed accounting of the ecology and utility of the many tree species in matched climates of the southern and northern hemispheres yielded a list of candidate species for local trial in Natal. He mapped the expected annual temperatures across Natal’s hilly and mountainous terrain from the estimated changes with altitude, using the technique of mapping of isolines originating with Alexander von Humboldt. Fourcade argued: ‘When the climatic conditions are favourable, exotic trees may become acclimatised; that is to say if the species is not yet fully adapted to the climate and the soil, it produces a better fitted variety after a number of generations’. Fourcade’s report was the clearest early expression of the views that Cape foresters would espouse more frequently in the 1890s and 1900s.

---

89 Ibid., 79–83.
90 Ibid., Appendix VII.
Figure 4. H. G. Fourcade's climatic maps for Natal, with temperature isolines derived from topographic analysis.

Fourcade followed the climate mapping procedures developed by Humboldt, and had read William Ferrell's 1886 *Recent Advances in Meteorology* to inform his bioclimatic appraisal of source regions for trees in South Africa.

Fourcade’s recommendations for tree planting in Natal came to naught, as he decided not to stay in Natal because of its climate and its small white population relative to indigenous African residents.\textsuperscript{93} In 1891, the Natal Legislature brought out a German forester, Friedrich Schöpflin, who stayed for three years before leaving dissatisfied with his prospects in the colony.\textsuperscript{94} Schöpflin demarcated a number of Natal’s forests, which he entrusted to white district foresters and native guards. He did not focus on creating plantations of timber, although by that time the Midlands of Natal already had thousands of hectares of wattle planted on private land.\textsuperscript{95} At the end of his tenure, the Minister of Lands and Woods decided on the basis of an internal recommendation to transfer the district foresters to save costs, and to stop demarcating forests.\textsuperscript{96} Natal’s failed attempt to instil a conservancy indicates wider attitudes towards forestry in Southern Africa at the time.

Climate received greater attention with the arrival of Hutchins, an Englishman, in 1884. An individualistic forester, Hutchins blended European education with knowledge of Indian forestry while demonstrating considerable concern for the economic development of the Cape Colony during his tenure from 1884 to 1906. He had studied forestry at the L’Ecole Nationale des Eaux et Forêts, in Nancy, France, in the early 1870s before moving to India to work for the Indian Forest Service.\textsuperscript{97} He worked with Australian trees in plantations in 1881 in the southern highland town of Ootacamund in the Madras Presidency.\textsuperscript{98} He was mentored by Dietrich Brandis, the first Inspector General of Forests in India, and maintained a considerable interest in forest law, geography, climatology, and history. Hutchins took an active role in the Eastern Conservancy of the Cape when he arrived in King William’s Town in 1883. He quickly took to reforming the forest management in the Conservancy, arresting trespassers and calling for the government to take over forests on lands owned and controlled by Africans.\textsuperscript{99} In his second official report in 1886, Hutchins began recording meteorological observations, making observations on the climate of different regions of the Cape, and discussing a series of extensive trials of species.\textsuperscript{100}

\textsuperscript{93} Hutchins to Fourcade, 10 July 1890, Fourcade Bequest BC 246, C5, UCT.
\textsuperscript{94} SGO, NASA-PMZ.
\textsuperscript{95} Hutchins, ‘Forestry in South Africa’, 14: Hutchins estimated ‘not less than’ 5,000 acres of Black Wattle.
\textsuperscript{96} Minute Paper 6002/1893, SGO, NASA-PMZ.
\textsuperscript{99} Brown, ‘The Conservation and Utilisation of the Natural World’, 428; these convictions skewed towards Africans. Cape of Good Hope, \textit{Report of the Superintendent of Woods and Forests for the Year 1885}, 22–66. Hutchins was keen on forest law. He was instrumental in the drafting and lobbying the Cape Parliament to pass the Cape Colony’s 1888 \textit{Forest Act}, which was modelled on the 1882 \textit{Madras Forest Act}, a piece of legislation that was passed when Hutchins worked in Madras.
\textsuperscript{100} Cape of Good Hope, \textit{Report of the Superintendent of Woods and Forests for the Year 1886}, 35–40. Hutchins credited his relationship with MacOwan for much of his knowledge of botany.
Over time, Hutchins greatly strengthened the bioclimatic approach to afforestation, and adopted a straightforward mantra to direct plantation forestry: ‘fit the tree to the climate’. Hutchins read widely, drawing heavily from meteorologists and botanists (especially those in Australia). He argued passionately that climatology and species’ native climatic ranges were the most important subjects for foresters in the Cape to study, and ensured that the curriculum for higher education in forestry at Tokai included a course on climatology. Hutchins’s ideas on climate appeared in a multi-part essay, ‘Extra-Tropical Forestry’, published from 1905 to 1906 in successive issues of the AJCGH. This is probably the clearest expression of the ideas embodying the Cape model. Here, he argued that the Cape Colony had an ‘extra-tropical’ climate, meaning a climate of regions near, but not in, the tropics, and characterised by seasonal dryness, abundant sunshine, and variable annual rainfall. Cape colonists, Hutchins wrote, should select exotic trees from other extra-tropical regions. He noted specifically that there was a southern hemispheric extra-tropical zone, ‘the sea-level climate between about latitude 23˚ and latitude 43˚ which embraced southern Africa, Australia, Argentina, southern Brazil, Chile and northern New Zealand’. To pinpoint extra-tropical regions directly comparable to the Cape, he analysed rainfall averages and patterns, altitude, average temperatures, light, and humidity.

Cape foresters tried to convince members of the public about the importance of climatic fitness and species selection to improve their chances of growing trees. Lister, Hutchins, and C. B. McNaughton wrote public pamphlets on tree planting. Articles in the AJCGH by foresters and the government botanist, MacOwan, informed readers about how to select species, and what trials had succeeded and failed. Members of the public could write in to describe their own experiences in the AJCGH. Climatic considerations were paramount in these tracts. A 1904 booklet for farmers by McNaughton informed them: ‘Forest species may be grown far from their natural habitat provided that the local climate is similar to that to which they are naturally accustomed’. Hutchins also wrote a pamphlet and numerous articles in popular and official magazines to recommend what species should be planted in different regions throughout the Cape.
Cape silviculture, contrary to being ‘very much in its infancy at the turn of the century’, began to emerge as a recognisable discipline in the 1900s. By the early 1900s, foresters began to observe the results of experimental trials established in the 1880s and 1890s. The empirical information derived from successful species and sites provided foresters with a clear sense of how the climatic fitness and biology of specific species interacted with the climate and soil of particular sites in the Cape. By that time, Cape foresters had gathered detailed observations of rainfall patterns, temperature ranges, climatic cycles, and soil types of the colony. Hutchins was an active fellow of the Royal Meteorological Society. In 1888, he published a treatise that predicted climatic cycles based upon an analysis of sunspots and rainfall and temperature records. He reported that the Cape experienced 12-year climatic cycles of relatively high and relatively low rainfall. His assessment is surprisingly similar to current meteorological models of the Cape’s climatic cycle. Also useful was research by Frederic Juritz during the early to middle part of the 1890s that led to the publication of a complete soils analysis of the largest forest plantations in the Cape.

Criticisms of forestry in the Cape Colony

From the early 1880s, foresters in the Cape suffered from public and professional criticism about the methods they used to create new plantations. Attempts to create plantations in arid regions—such as the failed Beaufort West plantation—did little to help bolster rural regard for the competence of foresters. MacOwan may well have had this example in mind when he told a parliamentary committee in 1882, in relation to the appointment of a Minister of Agriculture, that ‘farmers are not very prone to take the advice of theoretical strangers. They ridicule the idea of experts from Europe being able to show them anything, and maintain that they [the experts] are practical failures’.

Many members of the public questioned the value of forestry. Private nurseries complained about community and state nurseries that subsidised seeds. People living near forests resented the imposition of the 1888 Forest Act, which limited access to forests. For the first 25 years of the existence of the colonial forest department, it faced questions about its contribution to the public good.

---

111 Botanic gardens competed with private nurseries, who protested that the state or city council gardens could charge below market rates. See Sim, *Tree Planting in Natal*, 18.
In 1906, Lister, then the Chief Conservator of the colony, noted in his report ‘the department is more and more able to vindicate its existence as being for the general welfare. Unfortunately, self-seeking interests still continue to predominate in some quarters’.  

A penny-pinching parliament and Department of Agriculture made it difficult for foresters to complete their program of work. In 1906, the department commenced to raise public loans directly through parliament in order to afford plantation work because parliamentary appropriations varied so much from year to year that many plantations failed or suffered otherwise for lack of sufficient funds. That decision came on the heels of a serious retrenchment in government in 1905. That year the Cape government decided to quit paying Joseph Maiden to send seeds from Australia in order to save money. Seemingly trivial purchases, such as specialised books, received intense scrutiny from James Currie, the Undersecretary of Agriculture, who approved expenditure requests. Hutchins constantly demanded books and seeds, something that frustrated Currie. In late 1897, Currie denied Hutchins’s request for three books on Australian meteorology. An impassioned Hutchins wrote back to Currie: ‘In South Africa with its variety of trees and climates, meteorology and the climate requirements of each tree are the most important study for foresters’. Currie begrudgingly ordered the books for Hutchins.

By the mid-1900s, foresters in Britain, Europe, and India became aware of the aggressive afforestation program then underway in the Cape. Many foresters knew about the Cape specifically because of the prolific writing of Hutchins. He famously wrote an article in Nature in 1902 arguing that Eucalyptus plantations could replace coal as a source for fuel. The world’s newspapers reported this work, no doubt reaching most professional foresters, who very likely scoffed at a plan that had no comparable example in the world at the time.

---

112 Cape of Good Hope, Chief Conservator of Forests for the Year Ending 30th September, 1906, including Report on Railway Sleeper Plantations for the Calender Year (G39/1907), 2.
113 Cape of Good Hope, Report of the Superintendent of Woods and Forests for the Year 1884, 7. This policy only changed in 1906. See Cape of Good Hope, Chief Conservator of Forests for the Year Ending 30th September, 1906, including Report on Railway Sleeper Plantations for the Calender Year, 1. As of 1906 the Forestry Department raised money by loans through government.
114 Joseph Maiden to Undersecretary of Agriculture, 3 November 1896, F719, AGR 722, NASA-CT; Undersecretary for Agriculture to Agent General for the Cape of Good Hope, 7 June 1905, F719, AGR 722, NASA-CT.
115 Hutchins to Undersecretary of Agriculture, 13 December 1897, B559/6, AGR 723, NASA-CT; Undersecretary of Agriculture to Hutchins, 8 January 1898, A27, AGR 723, NASA-CT; Hutchins to Undersecretary of Agriculture, 20 January 1898 (quotation in latter) B19/6/98, AGR 723, NASA-CT. He also promoted this view publicly; see Hutchins, ‘Extra-Tropical Forestry’, 521. Currie also quibbled about granting the leave that was outstanding to K. A. Carlson, who had requested leave to attend the forestry course at Cooper’s Hill; Carlson, having persisted in the hope of official approval, could eventually proceed to Cooper’s Hill when Schlich insisted on giving him a personal loan: K. A. Carlson, Transplanted: Being the Adventures of a Pioneer Forester in South Africa (Pretoria: Minerva Drukpers, 1947), 101–4.
Hutchins’s eccentric personality and prolific writings (which were sometimes seen as the work of a dilettante) did little to help the Cape’s wider reputation among empire foresters. Stories of Hutchins jumping into a stream in full clothes to cool off in the midday heat and of stopping passing trains to use their hot water to brew a pot of tea likely filtered their way around imperial forestry networks.

The idea of plantation forestry was often intensely contested, at least in respect of apparently unwarranted claims of its potential in the Southern African colonies. Certain foresters at Oxford mocked Hutchins. C. B. McNaughton, a former Cape forester who studied at Cooper’s Hill, reported that foresters at Oxford ‘ridiculed’ Hutchins and the Cape forestry department. ‘One man said the really only good thing we did that he knew was to free India of Hutchins’.117 McNaughton was highly critical of Hutchins and Lister, two foresters he felt peddled lies to people of the Cape about the prospects for growing trees in the colony. He told Fourcade in a letter: ‘I really regret I did not sever my continuation with the Forest Dept years ago when I saw that … the public could be kept duped and blinded with … impossible promises and statements’.118 He said that Natal would ‘regret her enormous speculation in wattle and the Cape her many … plantations’.119

McNaughton’s comments echoed similar concerns expressed by William Thiselton-Dyer, director of Kew Gardens, when he received a 10-tonne seed order from Hutchins. He wrote to the Secretary of Agriculture for the Cape that, ‘I am obliged to remark that the instructions have been drawn up with want of practical knowledge … some [species on the list] … are actually unknown’.120 This called into question, officially, Hutchins’s competence. Hutchins was not put off by these allegations. Hutchins wrote back to the Secretary of Agriculture: ‘the remarks of the Director need not cause surprise. The Kew establishment can have had but a limited experience of the supply of forest seeds. Of forestry proper they have no knowledge either theoretical or practical’.121 Hutchins explained the distrust of Cape forestry methods in his essay in the AJCGH by noting that:

Forest Meteorology in Northern Europe is without the practical importance that it possesses in the extra-tropical parts of the world, and its study has been neglected in Europe, with the result that after the failure of many unsuitable trees, all introduced trees have been decried.122

117 See C. B. McNaughton to Henry Fourcade, 9 December 1909, Fourcade Bequest BC 246, C7, UCT.
118 C. B. McNaughton to Fourcade, 9 December 1909, Fourcade Bequest BC 246, C7, UCT.
119 Ibid.
120 Agent General of the Cape of Good Hope to Secretary for Agriculture, 14 September 1896, enclosing W. C. Thiselton-Dyer to Sir David Tennant, 12 September 1896, No. 117, AGR 725, NASA-CT.
121 Hutchins to Undersecretary for Agriculture, 21 October 1896, B566, AGR 725, NASA-CT.
Establishment and spread of the Cape model

By the 1900s, Cape foresters had developed a program of afforestation that reflected local environmental considerations and originated out of widespread failures to introduce and grow exotic trees in Southern Africa. Unmoved by foreign criticisms, and increasingly able to dictate the terms on which they created plantations, foresters in the Cape continued to consolidate their research and experiments. The Cape model further expanded in 1902 and after, when foresters from the Cape Colony took positions as the heads of state forestry programs in Natal, the Transvaal, and the Orange Free State. In 1909, Colin C. Robertson, a Yale-educated forester then working in the Orange Free State, wrote in an article, ‘In the other branches of the science of Forestry, we [South Africans] can look to some other countries, and particularly to Germany … but the scientific naturalisation of exotic trees has so far received comparatively little attention in these countries’.123 Robertson, an expert on species selection and climatic comparisons, noted that, ‘probably more experimental planting of exotics has been carried out here than in any other part of the world’.124 How that model travelled to the Transvaal, Orange Free State, and Natal is the subject of the next chapter.

124 Ibid.