

Prehistory of Southern African Forestry: From Vegetable Garden to Tree Plantation

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ABSTRACT

Desiccationist discourses and fears dominated official concern in nineteenth and early twentieth century southern Africa grassland ecosystems. When scientific forestry arrived in Cape Town, government bureaucracies changed and Africa's first forestry department was created. Yet there were few trees in southern African grassland ecosystems requiring a forest service. Tree planting was advocated. The introduction of alien trees and their spread from coast to interior preceded that of the concept of forestry. The earliest source of tree planting materials was Cape Town's Dutch East India Company's garden, established in 1652. Gardens as the primary source of trees and planting information was formalised in the nineteenth century with the rise of botanical gardens. Missionaries and settlers planted fruit and fuel trees for subsistence, and ornamentals for aesthetics while defining new frontiers. Despite officially sponsored tree planting competitions, it was private plantations of eucalyptus and acacia trees to supply the needs of mines, industry and the wattle bark export market, and not afforestation campaigns, that led to significant tree cover. Tree introductions did change southern African hydrologies, but not in the way imagined by anti-desiccationist campaigners: streams dried up and water tables dropped. Tree planting was regulated as a threat to South African water supplies in the late twentieth century, and plans were made to 'deforest' the landscape to enhance water storage.

KEYWORDS

Botanic gardens, eucalyptus, forestry, fruit trees, Southern Africa, tree plantation, acacia, wattle

INTRODUCTION

In southern African history, it is important to separate the forests from the trees. While forest history has been told from the perspective of Scientific Forestry, forest regulation and government bureaucracies, the history of trees has largely been neglected. South Africa's forest history relates not to the management of indigenous vegetation, but rather to the massive planting of alien tree species. Trees' use and propagation pre-dated the idea of forestry and covered more land than indigenous forests. While closed-canopy forests existed in some places along the coast of Cape Colony (modern South Africa's Western and Eastern Cape Provinces) and that of Natal Colony (modern South Africa's Zulu Natal Province), most of southern Africa's coast and interior were predominantly grassland or herbaceous species ecosystems. Trees grew only in sheltered locations that were relatively enriched with water – their use and protection by indigenous people is beyond the scope of this paper.

The first Europeans to settle in southern Africa – Dutch East India Company representatives – arrived at modern Cape Town in 1652 with notions of tree production and propagation materials for domestically important trees from northern hemisphere humid temperate landscapes. While chopping down indigenous trees growing in the larger landscape for construction and other domestic needs, they planted alien species in domestic spaces for fruit, fuel and shade. As the European population increased, the amount of land claimed expanded, and the area planted to trees increased. Dutch East India Company rule at Cape Town was replaced by Dutch government structures, which were, in turn, replaced by the British Cape Colony government. The Colony of Natal, established later, was initially ruled as an extension of Cape Colony, then received its own (British) colonial government. The subject of this paper is the arrival and spread of alien tree genera and species in southern Africa (modern South Africa, Lesotho and Botswana), with primary emphasis on their arrival points – the Cape and Natal Colonies.

When the concept of forestry arrived with British rule in 1806, it was concerned with formalising the regulation of indigenous tree use and the designation and protection of forest land.¹ In parallel (and understudied), alien species continued to arrive and travel inland with settlers. This tree planting was formally supported and encouraged by government botanical gardens, and informally by missionary networks. Trees were first planted as a crop for domestic self-sufficiency, then on farms for marketable products, and finally in large plantations to supply industrial needs.² This paper will trace the history of trees as southern African crops, rather than forests, concentrating on the importation, propagation and distribution of alien species in the seventeenth–nineteenth centuries. Attention will be given to the specific histories of the dominant imports: fruit trees, acacia (wattle), pine and eucalyptus. Finally, the paper will comment upon the mid-

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nineteenth-century desiccationist justification for tree planting in light of late twentieth-century campaigns for alien species removal for water conservation.

TREE CUTTING AND TREE PLANTING

Southern Africa's Cape Colony, on the Atlantic Ocean, has Mediterranean moisture regimes on the coast and semi-arid to arid interior regimes inland. Grasses and shrubs – not trees – were the dominant indigenous vegetation. The dry sub-humid upland regions of the Natal Colony, although moister than most of the Cape Colony, were still predominantly grassland ecosystems. Trees only grew in sheltered locations with relatively wetter soils, such as hillsides or mountain 'kloofs' (ravines).³ In these colonies, forests were not cleared to create agricultural landscapes⁴ – isolated patches of trees were harvested to meet settler needs. Wood use habits developed in temperate forested land prevailed among European settlers, despite the scarcity of trees.

The Cape's first settlers were representatives of the Dutch East India Company (*Vereenigde Oost-indische Compagnie*, or VOC). Sent under the leadership of Jan van Riebeeck in 1652, their mandate was supplying fresh water and food to company ships travelling in the spice trade between the Netherlands and Dutch East Indies (modern Indonesia). By 1657 the original VOC plans for minimal settlement had proven inadequate; grants were given to nine men to farm inland from Cape Town settlement along the Liesbeek River,⁵ and Leendert Conelison was granted the right to fell trees. Fifty years later the census listed 1,779 settlers,⁶ all of whom needed fuel and wood for construction. According to Jan van Riebeeck's journals, the forest patches on Table Mountain were the first to be cut. By 1660 forests close to the original Cape Town settlement had been cleared, and by 1679 there was little accessible timber within 300 kilometres.⁷ The resulting timber shortage was barely offset by imported wood in 1699.⁸ This pattern of use exceeding reproduction was replicated as European settlement expanded eastward and northward from Cape Town. Although locally important, more significant long-term environmental consequences resulted from the introduction of trees to a largely treeless landscape.

European tree planting predates both the well-documented desiccation discourse and its need for remediation, and the arrival of Scientific Forestry.⁹ Because the role of fruit and vegetables in maintaining sailors' health was well understood, one of Jan van Riebeeck's first official acts was to create a company garden from seed and planting stock he had brought with him from the Netherlands. Accordingly, R.H. Compton¹⁰ claimed that 'the history of Europeans in South Africa began with a garden'. Van Riebeeck's journals in the 1650s document variety trials of a range of fruit tree species and grape vine varieties,¹¹ but intensive tree planting did not begin until the arrival of the Huguenot refugees in 1687/88.¹² After being allocated poor soils in the Drak-

enstein area, they requested, and were granted, better land in the Berg River Valley northeast of Cape Town.¹³ The first farm in the valley was allocated to Heinrich Müller from Basel, Switzerland in 1692; two years later nine French Huguenot families were granted adjacent farmland by Governor Simon van der Stel. The French refugees planted fruit trees and grape vines on their farms and developed a trade first in fruit and then in wine with the growing port of Cape Town.¹⁴ By 1713 the region was known as 'de france hoek' (*Fransche Hoek*), which became modern Franschhoek in 1805.¹⁵ During the eighteenth century fruit trees spread to the interior with missionaries and Protestant settlement.¹⁶ In 1792, when missionaries reached Baviaan's Kloof (modern Genadendal¹⁷), the site of Moravian Brother Georg Schmidt's 1737–1744 attempt to convert the Khoi, all that remained was a very large pear tree.¹⁸

Non-fruit trees continued to arrive and spread as a separate settler economy developed. Reports from the 1550s had described the Cape as having limited woodland, and thus being unable to supply European wood requirements for construction and fuel. Van Riebeeck's ship, therefore, had a cargo of Norwegian and Swedish planks and beams as well as seed of alder (*Alnus glutinosa*).¹⁹ In contrast to the successful fruit orchards, almost a decade of failed attempts at propagation preceded success, when *Alnus* seeds were imported in soil containing the nitrogen-fixing bacteria essential for their survival. Van Riebeeck also introduced Norway spruce (*Picea abies*), Scots pine (*Pinus sylvestris*), ash (*Fraxinus excelsior*) and oak (*Quercus robur*).²⁰ Both VOC and Netherlands government (the United Provinces, Lords XVII) urged Cape officials to plant trees to prevent or reduce timber shortages.²¹ Commander, then Governor Simon van der Stel (1679–1699) claimed to have planted 28,987 oak, 459 alder and 81 ash trees by 1694, as well as having a policy of compulsory tree planting by colonists. His son, Willern Adriaan, who succeeded him, was responsible for planting 30,000 oaks in the Company's plantation and sending 20,000 inland to Stellenbosch and Drakenstein, as well as experimenting with Norway spruce, Scots pine, lime trees, black poplar and elm²². But there was no bureaucracy for enforcing either tree protection or planting.²³ Two species of pine, *Pinus pinaster* (maritime pine, native of the Mediterranean basin) and *Pinus pinea* (stone pine, native to Iberian peninsula/southern Europe) reached the Cape in the late seventeenth century. Possibly introduced by the Huguenots, they were not mentioned in the 1914 report by François Valentijn, the Dutch East India Company's church minister and botanist.^{24,25} *Pinus sylvestris* (Scots pine, the only pine native to Britain) was also reported in Cape Peninsula gardens at this time. During the 154 years of Dutch rule, fruit, fuel and ornamental trees were introduced from Europe and Australia for planting in corporate gardens and municipal and domestic spaces. Van Riebeeck and subsequent Dutch administrators sought to regulate cutting indigenous trees in an attempt to manage wood and fuel supplies, but did not have mechanisms for enforcement.²⁶ The elaboration of forestry concepts, institutionalisation of the idea of alien tree importation,

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and the promotion of tree planting in this largely grassland ecosystem developed under British rule.

PIONEERING TREES

The first half of the nineteenth century was dominated by European exploration – and increasing domination – of Africa’s southern tip. The British took control of the region around Cape Town from the Dutch in 1806, creating the Cape [of Good Hope] Colony. European settlement expanded to the east of Cape Town along the coast and inland as Dutch settlers fled British rule. They travelled across landscapes covered with mimosa trees and shrubs like oak, aloe, cacti and many kinds of *Euphorbia*.^{27,28} Settler farms with limited water supplies could only support small vegetable gardens and wheat fields for self-sufficiency, but towns such as Graaf-Reinet, situated on river banks, had irrigated tree-lined streets and fruit-filled gardens.²⁹

With an increasing settler population, demand for wood products grew, exceeding local supplies. By 1810 pine boards and beams were being imported from the United States of America³⁰. Although pines had first taken root in the seventeenth century, it was not until 1825–1830 that the first commercial plantation of *P. pinaster* was established at Genandendal.³¹ A representative of the *Eucalyptus* genus, *E. Globulus* (Blue Gum), which became widespread later in the century, arrived at the Cape in 1828.³²

Trees moved further inland from the Atlantic Coast with missionaries ahead of European settlement. Three French Paris Evangelical Mission Society (Protestant) missionaries travelled for three months in 1833 – first by boat from Cape Town to Port Elizabeth, and then inland by ox-drawn wagon and horse to a blank spot on their map bought in Paris labelled ‘sandy’ and ‘desert plains’.³³ Like van Riebeeck before them, they carried into an unknown landscape seeds and planting stock for vegetables, grape vines and fruit trees, including orange, fig, apple, stone fruits, pomegranate and almond, as well as pines and acacias.³⁴ What they found was the mountainous Kingdom of Lesotho (British Protectorate of Basutoland from 1868–1966), a landscape both colder and wetter than that at the coast. This grassland’s sparse trees grew along river banks, in ravines, and in sheltered and wetter spots on lower mountain slopes. Within 30 years most of these trees had been harvested ‘for the glory of God’ to build mission stations.³⁵ Introductions such as orange, pomegranate and almond ultimately failed, but apples and the stone fruits – particularly peach – succeeded, and were rapidly adopted by the local inhabitants, the Basotho³⁶.

Tree planting reached southern Africa’s warm, dry subhumid eastern Indian Ocean coast (Natal Colony) later than the colder and drier Atlantic coast (Cape Colony). Although a place called *Tevia Natalis* (later Port Natal) had served as a refreshment station for Portuguese ships sailing the Indian Ocean since 1497,

and the Dutch had attempted to establish settlements there in 1688 and 1721, Port Natal (modern Durban) only became a European settlement point after the British obtained a concession from Shaka, Chief of the Zulus, in 1824.³⁷ Large-scale settlement in the interior began when Dutch settlers (*voortrekkers*) escaping British rule crossed the mountains from the Cape Colony between 1835–1837. The Free Dutch Republic was proclaimed in 1840 (with modern Pietermaritzburg its capital), but it was annexed as a district or province of the Cape Colony three years later.³⁸ By 1846 ‘gums’ and acacias were reportedly growing in the town of Howick.³⁹ Between 1848 and 1850, 35 immigrant ships with passengers largely of British origin arrived at Port Natal; in 1848 ‘native locations’ were defined, and substantial European land acquisition began.⁴⁰ As in the Cape Colony, alien trees followed settlers.

SEPARATING FORESTS FROM TREES

The seventeenth- and eighteenth-century Dutch rulers at the Cape were aware of European environmental degradation debates related to tree cutting, and eventually established ‘highly restrictive land-use regulations and early forms of conservation and forest laws’.⁴¹ They considered agriculture to be potentially destructive of both soils and forests, but they did not link forests and trees to rainfall or climate change, as had the French and the English.⁴² With British rule in 1806 came a government bureaucracy that included a Superintendent of Government Lands and Woods.⁴³ By the middle of the century Rangers and Conservators were to ensure the Superintendent’s mandate to protect indigenous trees, but their duties were broadly defined in terms of preventing ‘needless destruction’ of existing trees and issuing licenses for their harvest. Tropp⁴⁴ records growing official concern about, and attempts to control, the activities of independent woodcutters in the true, closed-canopy forest – near Knysna, along the Cape Colony coast between the towns of George and Port Elizabeth (modern Transkei, Eastern Cape Province). As late as the mid-nineteenth century there was no mention in reports filed by Cape Rangers and Conservators of the need for, or activities to accomplish, reclamation and reforestation of overexploited areas.⁴⁵ The similar lack of conservation of the trees in Natal’s indigenous forests was mentioned in an 1883 report of the Virginia Planter’s Association.⁴⁶

Forests were separated from trees in the Cape Colony when the government placed responsibilities for *forest protection* under the Superintendent of Lands and Woods while the work of *tree propagation and increase* rested with the botanic gardens. This process was codified in 1858 when the Colonial Botanist, rather than Superintendent of Lands and Woods, was responsible for the identification of new tree species with utilitarian potential. The separation was furthered when, with the achievement of the status of Responsible Government in 1872, the Cape Colony created the Commission of Crown Lands and Public Works

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with responsibilities not only for forests, but also for roads, bridges, harbour works, jetties, public buildings, lighthouses, railway works, telegraphs and public stores.⁴⁷ Forests were, thus, bureaucratically grouped with infrastructure development rather than the natural world, and understood as public resources to be managed by the state for public benefit. Initially they were to serve as a source of fuel wood and, later, to supply timber for public works.⁴⁸

This separation of forest from trees reduced the status of forestry and limited official function. John Croumbie Brown's proposal for the establishment of a school of forestry similar to those in Europe was officially rejected in 1877 by the Cape government.⁴⁹ Nevertheless, a Forest Department was created in 1881.⁵⁰ The Cape Forester in 1882 borrowed the English concept of 'forest land', as distinct from a 'forest'. But rather than referring to reserved hunting ground, in the Cape Colony 'forest land' referred to those places lacking trees where their growth would be useful to prevent erosion, such as 'denuded mountain slopes' and steep slopes.⁵¹ Thus the official area of forest in this grassland ecosystem had increased – but not the number of trees in need of protection. It is not surprising that the Conservator of Forests reportedly had little idea of his duties in 1883 beyond supervising woodcutting.⁵² Although the Cape Colony Forestry Act of 1888 demarcated forests,⁵³ within three years the post of Superintendent of Woods and Forests had been abolished, and Conservators were made directly responsible to the Commissioner on Lands and Public Works. Formalised efforts to introduce, propagate and distribute alien trees were not a function of the Superintendent of Lands and Woods under British rule. Rather, they remained a function of a garden, the newly proclaimed Botanic Garden.

TREES FROM GARDENS

Empires (Spanish, Dutch, French and British) were built on the harvest and sale of plant parts (roots, tubers, leaves, seeds, nuts, timber) for spices, perfumes, medicinal drugs, oils and dyes, as well as wood. The search for, and propagation of, economically useful plants was a major component of colonial exploration and colonisation. Knowledge of plants evolved from natural science to botany, and moved from the domain of medical doctors to botanists. In the seventeenth and eighteenth centuries botanists and their gardens flourished as empires developed territories. What is now called 'bioprospecting' was encouraged by exchanges of plant materials between individual explorers and botanical gardens and through networks of botanic gardens. By the end of the eighteenth century, Europeans had founded sixteen hundred botanical gardens.⁵⁴

In Cape Colony the post of Colonial Botanist was created in 1858 to 'determine the Cape Colony's economic resources and its future for the growth of exotic trees, as well as perfecting the knowledge of South African flora'.⁵⁵ When former missionary John Croumbie Brown was appointed to hold this

post in 1863, he brought with him desiccationism and a belief that millions of trees of any kind needed to be planted in order to change the South African climate.⁵⁶ Because of the general apathy towards tree planting, Brown argued that 'arboriculture was an enterprise of the future' that should be promoted by 'distributing seeds and seedlings of indigenous, Australian and European trees to civil commissioners, agricultural societies and the public'.⁵⁷ He further thought that indigenous trees should be studied for their suitability as crops, possibly as fuel supplies for railways and steam powered engines, and that revenues from sales could finance tree plantations.⁵⁸ However, the state should take care not to compete with private enterprise.

By the end of the 1850s, Cape Town's Botanic Garden⁵⁹ was well respected and understood to be a major advertiser for, and encourager of, tree introductions and tree planting, as well as a cheap and reliable source of seed and seedlings.⁶⁰ The Cape Town Botanic Garden issued a fruit tree catalogue in 1864.⁶¹ Although the post of Cape Botanist was terminated in 1866, ending both Brown's job and support for Cape Town's botanical garden,⁶² government-run botanical gardens flourished elsewhere in the Colony during the 1870s. Gardens established at Graham's Town (modern Grahamstown) and Graaf-Reinet were active in promoting tree planting by providing seeds and seedlings locally and to 'Frontier Districts'.⁶³

A botanical garden was established at Durban in 1851, six years after the Colony of Natal's government was formalised as a distinct entity under a Lieutenant-Governor (1845), and two years before municipal structures were created in both Durban and Pietermaritzburg (1853).⁶⁴ It began making exchanges with botanical gardens in the Cape as well as India and Australia. Tree seeds and seedlings were introduced by, and distributed from, this garden. Interest in planting trees, however, was largely confined to the upland interior areas dominated by grasslands, rather than the tree-covered coastal lowlands. In Natal, the Durban Botanic Garden advocated for a branch garden to be established in the upland town of Pietermaritzburg 'for the acclimatization of European fruit and other trees suited to the climate there'.⁶⁵ The Acclimatization Society of Pietermaritzburg, which cooperated with the Botanic Garden in Durban, carried out trials of new species and varieties to assess suitability for the cooler and less humid inland and upland areas during the 1860s. Seeds and seedlings were provided for free or at low cost to planters.⁶⁶ The Acclimatization Society became the Pietermaritzburg Botanic Garden in 1874, to serve as a research station that tested the viability of growing large trees such as magnolias, camphors, and swamp cypress. These two gardens together were subsequently referred to as the Natal Botanic Gardens.

During the 1860s the Graham's Town Botanic Garden (Eastern Cape) donated between 100 and 150 trees to 'those barren towns whose municipalities have not the opportunity or advantage of raising timber trees'.⁶⁷ The increasing number of visitors to the Durban Botanic Garden came for 'study, or instruction and

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recreation'.⁶⁸ Curators of the gardens actively sought new plants to introduce from Europe, other regions of southern Africa and other British colonies, promoting them to residents.⁶⁹ More species of eucalyptus and acacia reached the Durban garden in 1867.⁷⁰ In 1864 *Acacia mearnsii* (Black Wattle) was introduced to Natal for firewood.⁷¹ On one of his many trips to Pietermaritzburg, Roman Catholic missionary Father Lebihan acquired some to take back to Lesotho for the newly established Roman Catholic mission established in a foothills valley (modern Roma).⁷² Cold, snowy winters made the cultivation of fuel trees essential in Lesotho.

Both the Cape and Natal Colonies expanded in the 1870s, and their botanical gardens were instrumental in promoting tree planting and supplying both propagation materials and instruction. The Graham's Town garden provided 1800 trees for free to 'Public Institutions in Frontier districts' and to individuals.⁷³ Half the seeds and seedlings received from Europe in 1837 were conifers.⁷⁴ The Durban Botanic Garden continued to supply inland planters with 'any seeds on hand useful for timber, firewood or ornament', including four species of eucalyptus and thirteen of acacia. A range of fruit trees had also been successfully introduced, including varieties of apple, cherry, pear, plum, and apricot.⁷⁵ Acacia species central to the creation of Natal's wattle bark industry were received by the Durban Botanic Garden in the 1870s.

The problems noted earlier that farmers encountered when attempting to grow trees from seed in the Cape Colony were addressed by the Natal Botanic Gardens in the 1880s. The Curator suggested that someone be hired for the 'special purposes of raising from seed and potting out' trees of the 'most approved varieties for plantations'.⁷⁶ When the botanist at the Pietermaritzburg garden proposed formal testing of exotic species that had been introduced (such as acacia and eucalyptus) for their value as timber in 1891, the Conservator of forests supported the proposal.⁷⁷

Despite the availability of trees at botanical gardens, there was a widespread belief that trees did not grow well, especially in the Cape Colony. Reasons cited for not planting trees included the difficulty of raising them from seed, the retardation of root penetration by dense clays close to soil surfaces, the stunting effects of drought, the potential of wind to uproot or snap tree trunks, and the destructiveness of both goats and fire.⁷⁸ Increasing tree cultivation beyond planting by 'tree enthusiasts' would require promotion.

Tree planting was encouraged through mechanisms such as subsidies and competitions. The Cape Government's Act No. 4 of 1876 provided towns with matching funds to plant trees along streets and on the grounds of official buildings. Rewards were also given to individuals who successfully cultivated trees.⁷⁹ The Natal Colony's Native Affairs Department proposed rewards to any African 'who can show 500 healthy trees of 12 month growth'⁸⁰ in 1890. During the first decade of the twentieth century, the Transvaal government contributed funds to municipal and roadside tree planting.⁸¹ The Cape government led the way

in stimulating interest through competitions. In 1895 the Cape of Good Hope government announced prizes for the planting of 'forest' trees to be awarded in 1901.⁸² Colonial government promotion of tree planting was not restricted to the Cape and Natal Colonies' governments. Anticipating the annexation of the Protectorate of Bechuanaland (modern Botswana) to the north, Cape legislation encouraging tree planting there was passed in 1895.⁸³ In British Basutoland, on the Cape Colony's northeastern border, the Cape Governor's Agent, Col. Griffiths, similarly instituted prizes for tree cultivation.⁸⁴ It was civil society that led government in organising tree planting competitions for settlers in Natal. The Maritzburg Agricultural Society cooperated with the Maritzburg⁸⁵ Botanic Society to launch tree planting competitions in 1895.⁸⁶

COMMERCIAL TREES

Despite the existence of official proclamations and promotions, actual tree planting was stimulated not by official concerns about inducing climate change, but by the growing demand for wood products: supports for mines, fuel for steam-driven machinery, timber for railroad construction, and bark for tanning. There had been great difficulty in propagating indigenous species suitable for timber,⁸⁷ and demand for wood soon eclipsed supplies possible from limited indigenous forest patches and groves. Fast, strong and straight-growing alien species were seen as the solution – but planted as a crop. Initially, mass tree production was a government endeavour because it was thought to be uneconomic for individual farmers.^{88,89} State intervention was soon abandoned and trees became a commercial crop planted on farms.

Nonetheless, the forestry establishment insisted that mass tree growing was a forestry activity because it employed 'silviculture', which had a 'technical meaning', and asserted that 'the supposed connection between Agriculture and Forestry is a popular error confined to persons who are ignorant of the latter. The two have little in common. Most of their principles differ, and all of their practices are widely divergent'.⁹⁰ Forester E. Hutchins' derisive statement that Agriculture departments – 'in America and the British Colonies are usually loose collections of experts with advisory functions which no doubt have a value, especially in young countries'⁹¹ actually characterised what was required for the introduction and successful establishment of trees on private – or public – land in the Cape Colony. Little knowledge existed about tree cultivation in southern Africa, and the suitability of alien species was unknown. There was, therefore, a need for identification and testing of alien species for suitability in the wide range of climate and soils in the different colonies. The botanical gardens, with their mandates for plant exploration and introduction, networks of regional and intercontinental exchange of plant materials and information about cultivation and use, not the Forest Department, were best suited to this work.

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Around the world, the latter half of the nineteenth century saw the internationalisation of the French and German concepts of Scientific Forestry and tree management through silviculture. This was accompanied by the creation of government departments of forests and forestry and the expansion of forest regulation and legislation.⁹² These events coincided, in South Africa, with the European discovery of diamonds in the northern Cape Colony (1867), the declaration of the Transvaal's Witwatersrand as a gold mining area (1886), and the attendant development of mining and industrial centres and crop-based economies linked by railways. There was a need for energy and construction materials as rural and urban infrastructure and production expanded. South Africa's relatively treeless landscape presented a major problem. Indigenous forests were soon unable to supply fuel for steam-powered machinery (from sugar cane refineries to railway engines), props for mine shafts, sleepers (ties) for railroad tracks, and boards and beams for bridges and buildings. Imported wood was increasingly expensive, and the properties of the existing introduced alien species were unknown.

As a wood shortage became obvious,⁹³ landowners with mature trees on their property saw opportunities for sales, and offered samples to the Cape government for testing.⁹⁴ Merchant companies began to invest in forestry, sawmills and forest products.⁹⁵ In neighbouring Basutoland, British Magistrate Emille Rolland imagined that the production of trees would be a way to increase the territory's wealth.⁹⁶ John Croumbie Brown's proposed aboriculture was in its infancy. The fundamental role of botanic gardens and waning interventions of governments in tree cultivation can be seen in the overlapping histories of fruit and non-fruit trees (the genera *Eucalyptus* and *Acacia*) in the context of a growing demand for fuel, construction and the emergence of four commercial uses of tree products (fruits for export, poles for mine shafts, beams for railway sleepers, and bark for tanning leather). The cultivation of trees proliferated. Fruit production expanded from subsistence to commercial scales, and eucalyptus and acacia became cash crops.

Tracing –and writing about – these tree histories can be linguistically complicated. While botanists were concerned about species and varietal differences, the planting public (official and unofficial) knew trees largely by common names or their function (fruit tree, timber tree, forest tree). Common names could be as confusing for planters, officials and botanists as they are for historians centuries later. Fruit trees were known by the type of fruit (peach, apple, orange), rather than the variety, which would have indicated such traits as seasonality, environmental requirements, disease susceptibility and yield.

Both the genera *Eucalyptus* and *Acacia* have large numbers of species, some similar in appearance, and some with similar function, all of which had been given common names. In the following discussion, the names provided in different documents will be retained, even if contradictions or confusion arise. Not only will original nomenclature allow the paper to remain true to its sources,

but it will also exemplify the confusion that persisted – and persists – about species identities, as well as the complexities facing historical researchers in tracing tree movements.

a. Fruit trees

As discussed above, fruit trees arrived with settlers in the seventeenth century, and botanical gardens provided seeds and seedlings, as well as catalogues, for promotion. The expanding frontier was represented in the kinds of trees supplied by botanical gardens. While the Cape Town garden reported minimal interest from the public in fruit tree planting materials in 1871,⁹⁷ the Graham's Town garden was having difficulty in meeting demand, as they were supplying not only 'all parts of the Province', but also the diamond fields near Kimberly. A major constraint was skilled labour.⁹⁸ The garden was expanded in 1873 to accommodate increased fruit tree production⁹⁹. That year, in addition to meeting requests for 'forest and ornamental' trees, the garden supplied 'about 500 grafted orange and naartje trees, most of them in a bearing state, not less than 1,000 apple trees, and about 2,500 peaches, apricots, plums, pears &c'.¹⁰⁰ There was no botanical garden in Basutoland; missionaries continued to fulfil a tree distribution role. Missionary Maeder reportedly handed out 400 fruit trees as well as poplar and willow in 1877.¹⁰¹ The rush to produce and distribute trees resulted in varietal identities becoming confused, if not lost completely. At the end of 1870s the curator at the Graaf-Reinet gardens requested fresh planting materials from Europe because the 'fruit trees of the Colony [are] so mixed up that no one can depend on supplying trees true to their names'.¹⁰²

Fruit trees became associated with Transvaal railway lines in the 1890s, when their cultivation around worker's cottages and train stations was seen as a way to enhance the quality of workers' lives as well as the appearance of railway stations.¹⁰³ With the advent of railways, Natal fruit growers, who already had markets for dried and processed fruits, began to find markets for fresh fruit. A single mature orange tree was worth two pounds in 1893, and profits were beginning to be found from growing pineapples and bananas. Fruit marketers exerted pressure to ensure refrigeration on steam ships for exports to Britain.¹⁰⁴

Cape farmers paid minimal attention to the quality of the fruit they produced, other than grapes for wine. So poor was the condition of the Cape Colony's fruit trees that the Department of Agriculture had to ask the Curator of the Cape Government Herbarium to prepare a 'Manual of Orchard-Culture'.¹⁰⁵ It was the botanical gardens that promoted fruit tree growing and conducted variety trials, and it was botanical gardens that supplied the planting materials. When advice was required for farmers, it was the botanical garden, and not the Departments of Agriculture or Forests that was expected to provide it. But then, fruit trees are not annual row crops, and scientific forestry did not consider orchards to be forests.

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b. Eucalyptus ('Gum')

The arrival and spread of the genus *Eucalyptus* is only sketchily documented and, thus, less easily traced than fruit trees. The name Blue Gum was originally associated with *E. globulus*, but eventually 'gum' became the generic common name for any eucalyptus tree. There is a record of the species *E. globulus* (Blue Gum) reaching the Cape Colony in 1828, of 'gums' growing near the town of Howick, in Natal in 1846,¹⁰⁶ and of eucalyptus seeds having been sent to missionary H.M. Dyke in Lesotho by Sir George Grey, Governor of Cape Colony in 1858.¹⁰⁷ But the beginning of large-scale spread of eucalyptus trees – particularly *E. globulus* – was in the 1860s. Cape Botanist John Croumbie Brown noted having seen 'blue gums' growing at farmsteads 'with greater or less luxuriance' in 1863, which 'had not been the case when I made the tour of the Colony in 1847'.¹⁰⁸

The sudden proliferation of eucalyptus could have been the result of the international spread of this species as a drainage device and malaria control. In 1856 Dr. Ferdinand von Mueller, the Government Botanist for Victoria and Director of the Melbourne Botanic Garden introduced a M. Ramel from France to the properties of *E. Globulus* ('blue gum' of Tasmania), and provided him with seed. Further supplies of seed sent to Paris in 1856, 1857 and 1860 were distributed throughout southern Europe, North Africa and other parts of the world 'for its power of destroying miasmatic influence of marshy districts',¹⁰⁹ thus earning *E. globulus* the name 'fever destroying tree'. In the era before either the existence of the germ theory or knowledge of mosquito's ability to transmit disease were known, debate existed as to whether the tree's power rose from its drainage capacity or its 'camphoraceous, stimulating odor'. Eucalypts were widely believed to be able to take up ten times their weight in water, so that 'masses of such trees' had 'enormous suction-power'. 'Where thickly planted in marshy places 'the subsoil is drained in a little while as though by extensive piping'.¹¹⁰ This property was used in the Cape Colony where, a few years after planting, the 'climatic condition' of the 'unhealthy parts of the Colony' had changed.¹¹¹ Even after the mosquito connection was well understood, eucalyptus were recommended by Transvaal Forester Charles C. Legat to control malaria around the Komatiopoort railway station because the trees would provide cooling filtered shade while preventing thick vegetation underneath in which mosquitoes could live.¹¹² Witt¹¹³ also mentions the use of this genus to dry land in South Africa.

Botanical gardens in both the Cape and Natal colonies provided seed and seedlings to individuals and organisations throughout the 1860s and 1870s.¹¹⁴ The British representative in Basutoland, Col. Griffiths, urged Basotho to plant *E. globulus* when offering tree planting prizes in 1876.¹¹⁵ That year the Durban Botanic Garden 'supplied 600 trees in pots to the Durban Corporation, 3,000 Blue Gums, 800 others and 700 parcels of seeds to subscribers and other applicants', and three years later reportedly distributed 3,900 '*E. globulus* and others' plus 2,100 other shrubs and trees.¹¹⁶ Some species of eucalyptus spread

inland to the drier and colder Orange Free State (modern Free State Province of South Africa); by 1889 the town of Cloclolan had more than 40 species.¹¹⁷

The quality of eucalyptus wood was unknown at first. In 1860 James McGibbon of the Cape Town Botanic Garden requested that four 'Blue Gums – *Eucalyptus diversifolia*' measuring 'at the thick end about 6 feet in circumference, in length 12–20 feet' be accepted for testing 'by experiment' to determine their suitability for use in construction and manufacturing;¹¹⁸ alien species remained untested in Natal as late as 1891. Because of prejudice against locally grown wood, timber and sawn boards were imported by both the Cape and Natal Colonies.¹¹⁹ Despite official and commercial lack of interest, in the 1880s Eucalyptus was being grown on farms throughout the Cape and Natal Colonies, and Natal farmers used it as the primary source of wood for 'everything for which timber is applicable'. Eucalyptus was considered to be superior to pine 'in tenacity for holding bolts'.¹²⁰ Although 'manufactured wood' and wood for furniture was still imported for commercial use a decade later, 'colonial wood' had begun to be used for railway sleepers.¹²¹

With the expansion of the railway within and between colonies, the demand for railway sleepers increased dramatically. The mature eucalyptus on many farms seemed a ready supply. But, in 1891, when locally grown timber was cut for sleepers, it was found to be inferior to that being imported from the Baltic region. The imports had been treated with creosote, and there were no creosoting facilities in the Cape or Natal Colonies.¹²² This did not stop speculation that the estimated 10,000 mature Eucalyptus on farms in Natal could supply a local railway sleeper industry.¹²³

Mines, rather than the railways, emerged as the major market for eucalyptus, and stimulated increased planting in the twentieth century.¹²⁴ Mine shafts need supports. At first mining companies cleared their land and used indigenous wood to make props. When this was depleted, the Cape government provided timber from its plantations at Kluitjeskraal. These forests were able to supply the needs of the relatively surficial diamond diggings from 1897.¹²⁵ In contrast, the rapidly expanding and deep shafts of the Transvaal Republic's Witwatersrand gold mines required more wood than the mine land could provide, and the Transvaal government had no forests to exploit. To secure their own supplies, mine companies began to plant trees. The first company-owned plantation was established near Braamfontein, on the Witwatersrand, in the 1880s.¹²⁶ As the mines expanded, mine-owned plantations spread from the Transvaal, where tree-growing was marginal, to Natal, and the straight, strong, rapidly growing eucalyptus was the tree of choice. Large-scale tree plantations were firmly established as a matter of private enterprise rather than government service, and the gold mining industry became known as the 'tree-growing sector'.¹²⁷

Despite the fact that most species of Eucalyptus could not be grown in Natal's many ecosystems,¹²⁸ the genera of eucalyptus and acacias dominated tree plantations in that colony. In the late nineteenth century four private tree

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nurseries reportedly supplied between 200,000 and 300,000 trees a year, mostly eucalyptus and wattle.¹²⁹

c. Acacia ('Wattle')

The genus *Acacia* has many species which can cluster around similar traits that have ended up with the same common name – but there are also different common names for the same species. Imported with the trees from Australia were common names, many of which contained the word 'wattle'.¹³⁰ *Acacia dealbata* was referred to as either Silver Wattle or Mimosa, and *A. decurrens* could be Green Wattle or Black Wattle. *A. mollissima* was also called Black Wattle, as was *A. mearnsii*. According to the Royal Botanic Garden at Kew, *Acacia mearnsii de Wild*, *A. decurrens var Mullis* and *A. mollissima* are synonyms.^{131,132} In Afrikaans Black Wattle is *Swartwattel* and in Zulu it is *Uwatela*. Just as 'gums' came to denote any *Eucalyptus*, 'wattle' was used for any species of *Acacia*.

Acacia mearnsii was introduced into Natal from Australia for firewood in 1864,¹³³ and unspecified species of acacia were among the seeds sent by the Durban Botanic Garden to upland settlers for timber, firewood and ornament in 1871.¹³⁴ Its value as a source of wood was investigated in 1889 when acacia samples were sent to London for evaluation, and to two Natal firms as samples for making planks and ox yokes. While there was no reply from London, the manufactured products were exhibited at the Maritzburg Agriculture Show in 1890. By 1892, a 'substantial amount' of acacia wood was used to construct farm implements such as wheel barrows and wagons, but none was sold as boards or beams, and railway sleeper production continued to be constrained by lack of creosoting facilities.¹³⁵ Africans requesting seed to produce wood for 'building' and 'other uses' in 1894 were sent packets of black and silver wattle.¹³⁶ So common was tree planting that when a tree planting scheme was proposed for Africans in 1908, it was thought that there was no need of instruction because they had learned these skills while working on white farms.¹³⁷

The importance of acacia trees changed in 1888 when the tanning properties of wattle bark were recognised. Some varieties of acacias have significant levels of tannins in their bark which can be used in tanning hides. According to Durban Botanic Garden reports, *Acacia decurrens T.* and *A. mollissima* arrived from their native Australia in 1875 and 1879, respectively.¹³⁸ The first experiments in a Natal tannery were in Dec. 1884 when Mr. Hallon at Lyle's tannery bought samples of a mixture of *A. mollissima* and *A. dealbata* bark from Geo. Sutton – a mixture Mr. Hallon had used in Australia. After further trials in 1885 and 1886, he concluded that *A. dealbata* was inferior, and subsequently wanted only *A. mollissima*. The hides that he tanned, as well as bark samples, were exhibited at an Agricultural show in Maritzburg; bundles were also sent to London for display at the Colonial and Indian Exhibition in 1886.¹³⁹ Considerable interest in the production of black wattle bark was created in Natal – but not to sup-

ply the local tanning industry. Because the regional leather market was small, production would be for export to Britain. The price paid in Natal for Black Wattle bark (called 'Mimosa bark' in London) rose as the international trade developed, stimulating large-scale plantings of *A. mollissima*.¹⁴⁰

Sutton's pamphlet 'Wattle bark: A Paying Industry' was published in 1888 as a handbook for growers when commercial interest began. Four years later, when it was reprinted, his conclusion stated that 'the growing of wattle trees for the sake of their bark is now an ordinary business risk'.¹⁴¹ Requests for Sutton's publication and information about the wattle bark industry reached Natal forest officials from the Cape Colony in 1894, and from the Orange Free State in 1898.¹⁴² The importance of acacias to Natal farmers – and of the botanical gardens to the wattle industry – is revealed in the financial report of the Maritzburg Botanic Society in 1895: wattle and wood sales accounted for three quarters of the garden's sales.¹⁴³ In 1902 there were 34,574 acres of wattle in Natal (European settlers) and 1,1075 acres in Zululand (land allocated to the Africans); few other genera had been planted on such a large scale.¹⁴⁴

TREE PLANTING AND CLIMATE CHANGE

If the narrative about the relationship between trees and climate did not reach the Cape of Good Hope with the London Missionary Society preacher Robert Moffat in 1830, he was its first promoter.¹⁴⁵ These ideas were institutionalised when fellow missionary John Croumbie Brown was appointed as the second Colonial Botanist by the British Cape of Good Hope government in 1863.¹⁴⁶

It was the missionary community, rather than foresters, who substantially shaped opinion about the significance of trees and urged their large-scale planting to produce climate change. The attitude and influence of the London Missionary Society's Robert Moffat have been discussed elsewhere in detail,¹⁴⁷ as has been the incorporation into government policy of climate concerns with the appointment of fellow missionary John Croumbie Brown as Cape Colonial Botanist. Observations of drought in the early 1820s and late 1840s were fused with beliefs about a god of retribution who used environmental destruction to punish deviants. The dry (and damned) landscape could and should be revived by planting trees to increase rainfall.¹⁴⁸

Despite forests having a bureaucratic presence in the form of a department, trees were to be planted by individuals and civic organisations to induce climate change and improve aesthetics. Desiccationist concerns remained, and underlay the promotion of tree planting throughout the nineteenth century. For example, the Orange River on the hot and dry northern border of the Cape Colony was identified as being in need of tree planting to 'cool and moisten the winds'.¹⁴⁹ A report to the Virginia Planter's Association in Natal expressed fears that climate

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could not be changed through voluntary measures because of popular lack of interest in tree planting, so compulsion would be required.¹⁵⁰

The late nineteenth century commercial and industrial demand for tree products obviated the need for tree planting campaigns. Tree cultivation spread from 'tree enthusiasts' to commercial interests, and was embraced by the forestry establishment in the twentieth century.¹⁵¹ However, as trees spread, they came to be seen as a detraction, rather than enhancement, of the landscape.

The great success of the wattle industry was perceived as a threat by non-wattle farmers. In 1899 the Farmer's Club of Natal requested that government 'bring forward a measure restricting the formation of new wattle plantations within a certain distance of the boundaries of farms as the effect is to debar a considerable area of adjoining arable ground from cultivation'. Their concern was with the drying out of soil in fields adjacent to tree plantations. Although the motion was passed unanimously by club members, it was rejected by agricultural officials on the grounds that 'every land owner has ... the right to use his land as he sees fit'.¹⁵² Similar complaints about the effects of acacia plantations on neighbouring agricultural land were echoed by land owners near eucalyptus plantations.¹⁵³

The nineteenth century farmers' observations of a changed hydrology – drier soils and reduced (or eliminated) stream flow – have been confirmed by twentieth century hydrology research. By 1935 criticism of afforestation policy was so serious that the South African government asked that the British Empire Forestry Conference (to be held in South Africa that year) 'report on the effects of forests on climate, water conservation and erosion with special reference to South Africa'. The result was a recommendation, among other things, for scientific study of the effects of tree planting on water supplies in South Africa and internationally.¹⁵⁴ The South African Forestry Department responded by establishing five hydrological research stations, three of which (Jonkershoek, Cathedral Peak, Mokobulaan) were catchment-scale and had as their main purpose determining the effects of afforestation on water supplies.¹⁵⁵ South African forester Christiaan Lodewyk Wicht,¹⁵⁶ a pioneer in forest hydrological research, was responsible for setting up the Jonkershoek station. During the mid-twentieth century evidence from these and international research stations (particularly from the United States of America) showed that forests transpired more water than other forms of vegetation.¹⁵⁷ Jonkershoek and Cathedral Peak were the first experiments to show the effects of replacing natural scrub and grassland with tree plantations on stream flow.¹⁵⁸ This idea was not easily accepted, nor widely known. In 1967 J.S. Whitmore presented a paper to the South African Association for the Advancement of Science in which he stated 'we must accept the fact that forests, whether natural or planted, do use more water than either natural grass veld or fynbos', and that 'a small extra water usage may lead to quite considerable reduction in run-off to feed streams and rivers'.¹⁵⁹

The fact of alien tree planting changing South Africa's hydrologies, if not climate regimes, was finally addressed in the late twentieth century. Forestry was classed as a 'stream flow reduction activity' (SFRA) because a large number of introduced tree genera and species had been demonstrated to dry soil bodies, reducing or eliminating springs and wetlands, as well as stream flow.¹⁶⁰ Mass tree plantings were regulated and limited by permitting, while municipalities and districts made plans for mass alien tree removal campaigns and programs.¹⁶¹ Tree plantations were the only form of land use in twenty-first-century South Africa to have received a classification originally designed to regulate water-consuming industrial practices. Massive tree planting – particularly in the twentieth century¹⁶² – had, indeed, changed South African climates near and in the ground. However, rather than achieving nineteenth century dreams of wetter regimes for plant roots, alien trees were identified as being major contributors to landscape desiccation.

CONCLUSIONS

The Dutch East India Company can be credited with introducing the idea of tree planting as well as alien tree species to southern Africa. Trees had a utilitarian, rather than romantic or decorative significance. Although government policies were predicated on the belief that afforestation would induce a wetter climate, most trees were planted to provide food, fuel, timber and bark. Tree planting was undertaken in domestic and privately owned spaces akin to gardening and farming, rather than in the larger landscape to provide forest cover. South Africa's tree management ancestry is, thus, horticultural. When scientific forestry arrived, it affected bureaucracies more than the landscape or social order. Individual trees moved with missionaries as they pioneered the landscape looking for souls in need of salvation and civilisation, and with settlers to provide windbreaks, shade, wood, sustenance and aesthetics. Despite official rhetoric, the introduction, evaluation and promotion of exotic tree planting fell not to departments of forestry or agriculture, but to the descendants of the Dutch East India Company garden – the botanical gardens of Cape and Natal Colonies. The act of planting trees was left to individuals. It was 'tree enthusiasts' – on their farms, in municipalities, and on mission stations – who initially planted trees in southern Africa.

As nineteenth century European ideas of forestry were marginalised in southern Africa, trees became more central to the economy. The introduction of alien tree species and their planting increased largely beyond the confines and conceptions of a forest. Tree planting became industrialised as trees became plantation crops, proliferating in the locations best suited to tree growth – Natal. These plantations became South Africa's forest industry. But trees were also widely planted in municipalities and on non-corporate private land in other

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colonies and territories. They came to be valued by Southern African residents for their aesthetic as well as utilitarian functions. Residents of Lesotho, for example, embraced peach trees as a national symbol, and the citizens of Pretoria, South Africa the Brazilian jacaranda tree as part of their city's identity. By the end of the twentieth century, the concerns of the mid-nineteenth century missionaries and tree promoters had been realised. The hydrology of large areas of South Africa had, indeed, been changed by tree planting. But the opposite of the nineteenth century desires had been achieved: stream flow was reduced or eliminated, and the landscape was drier than it had been before trees were planted. A late twentieth-century water conservation measure called for national plans to remove alien tree species from the landscape. 'Denudation' of the landscape should be implemented to save it!

NOTES

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¹ Forest land was defined as land on which trees could or should be grown, as well as land covered with indigenous vegetation classified as trees. See discussion below for detail.

² These plantations expanded and became the modern South African Forest industry, discussion of which is beyond the scope of this paper.

³ Western Cape Archives and Records Service, Cape Town AGR 748, ref F 2058E, Hutchins, 'Conservator of Forests, Western Conservancy, Cape Town to Under-Secretary for Agriculture, 16 February 1897'.

⁴ Michael Williams, *Deforesting the Earth: From Pre-history to Global Crisis*. (Chicago: University of Chicago Press, 2003) describes the relationship between the spread of Christianity and deforestation for settlement and agricultural production in medieval Europe, and Richard Grove, *Green Imperialism: Colonial Expansion, Tropical Island Edens and the Origins of Environmentalism 1600–1860* (Cambridge: Cambridge University Press, 1995) discusses the systematic deforestation of tropical islands associated with the development of agricultural plantations that supported colonial expansion (British in particular).

⁵ Mary Gunn, L.E. Codd and L.E.W. Codd, *Botanical Exploration of Southern Africa: An Illustrated History* (Boca Raton: CRC Press, 1981).

⁶ Mia C. Karsten, *The Old Company's Garden at the Cape and its Superintendents* (Cape Town: Maskew Miller Ltd., 1951).

⁷ Karsten, *The Old Company's Garden at the Cape*.

⁸ For details of tree cutting, see Mikael Grut, 'Notes on the history of forestry in the Western Cape 1652–1872', *South African Forestry Journal* **100** (March 1977): 32–37 and Grove, *Green Imperialism*, 133–145.

⁹ Richard Grove, 'Scottish Missionaries, evangelical discourses and the origins of conservation thinking in southern Africa 1820–1900', *Journal of Southern African Studies* **15** (1989): 163–187; Georgina H. Endfield and David J. Nash, 'Drought, desiccation and

discourse: missionary correspondence and nineteenth-century climate change in central southern Africa', *The Geographical Journal* **168** no. 1 (2002): 33–47.

¹⁰ Compton, R.H., 'Forward'. In Mia C. Karsten, *The Old Company's Garden*: ix.

¹¹ Karsten, *The Old Company's Garden*.

¹² After the revocation of the Edict of Nantes, many Protestants fled Roman Catholic France for the Protestant Netherlands. The Dutch East India Company, aware of Huguenot renown in viticulture and winemaking, recruited 176 'to enrich the settlement at the Cape', A. Wilmot, *The Story of the Expansion of Southern Africa* (London: T. Fisher Unwin, 1894). See pp. 42–44 for detail.

¹³ Originally this valley was referred to as Oliphantshoek (the place of elephants) because it was home to wild animals such as elephants, hippos and rhinoceros, as well as the hunter-gatherer San and Khoi people (pejoratively referred to as 'Bushmen' and 'Hottentots').

¹⁴ In the mid-nineteenth century, South African wines were 'held in bad repute' in London: one of Cape Botanist John Croumbie Brown's first tasks was to address the problem of the quality of Cape wines (National Library of South Africa, Cape Town, John Croumbie Brown Collection, MSC5.2(2): Vines:MSS(2), John Croumbie Brown, 'Vines' (undated)). When the railway connected Franschoek to Cape Town in 1904, large scale international trade in fruit and wine became possible.

¹⁵ Gertenbach, Marianne, 'Round and About Franschoek. Huguenot Memorial Museum' (Franschoek: Franschoek Conservation Trust, undated).

¹⁶ Eugene Casalis, *My life in Basutoland: A story of Missionary Enterprise*, *Africana Collectanea* vol. XXXVIII, 1899. (Facsimilie Reprint, Cape Town: C. Struik (Pty), Ltd., 1971).

¹⁷ Baviann's Kloof (Ravine of the Baboons) was the first mission station in the Cape of Good Hope region. It was renamed Genadendal in 1806, and became the largest settlement in Cape Colony after Cape Town (Genadendal Mission Museum, undated. <http://museums.org.za/genadendal>).

¹⁸ Casalis, *My life in Basutoland*; Genadendal Mission Museum.

¹⁹ Grut, 'Notes on the history of forestry'; Grove, *Green Imperialism*.

²⁰ Grut, 'Notes on the history of forestry'.

²¹ Grut, 'Notes on the history of forestry'; Grove, *Green Imperialism*.

²² Names given in source material are repeated without assigning scientific names, since common names can refer to more than one species, or even to trees of different genera.

²³ Grut, 'Notes on the history of forestry'.

²⁴ François Valentijn was sent to the East Indies by the V.O.C as Minister of the Church in 1685 at the age of 19. During his 20 years in the region, he kept extensive journals, produced maps, and wrote books (Thomas Suárez, *Early Mapping of South East Asia* (Singapore: Periplus, 1999)). He visited the Cape of Good Hope five times (1685, 1695, 1705, 1714), and described it in the fifth and last part of his *Beschrijvinje van Oud ern Nieuw Oost-Indien*, published in Amsterdam in 1726 (Gunn et al., *Botanical exploration of Southern Africa*).

²⁵ R.J. Poynton, *Report of the South African Regional Commission for the Conservation and Utilization of the Soil (SARCCUS) on Tree Planting in Southern Africa, vol. 2. The Eucalypts*. (Pretoria: Department of Forestry, 1979).

²⁶ Grove, 'Scottish missionaries'; see Grove, *Green Imperialism*: 133–145 for detail.

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- ²⁷ Largest plant family, 300 general, 7,500 species, of which 870 regarded as succulents (International Euphorbia Society, undated. <http://www.euphorbia-international.org>).
- ²⁸ Casalis, *My life in Basutoland*.
- ²⁹ Casalis, *My life in Basutoland*.
- ³⁰ Western Cape Archives and Records Service, Cape Town. CO 3877, ref 240, Christopher Goldsbury, 'Petition of Christopher Goldsbury, American Brigade Maria for permission to sell boards and beams, Cape Town, Cape of Good Hope, 9th April 1810'.
- ³¹ R.J. Poynton, *Report of the South African Regional Commission for the Conservation and Utilization of the Soil (SARCCUS) on Tree Planting in Southern Africa, vol. 1. The Pines*. (Pretoria: Department of Forestry, undated).
- ³² Poynton, *Tree Planting in Southern Africa, vol. 2. The Eucalypts*.
- ³³ Casalis, *My life in Basutoland*.
- ³⁴ M. Gosselin, 'Extracts of a letter, 16 January 1837'. Station de Morija. *Journal des Missions Évangéliques*. (Paris: Société Missions Évangéliques, 1837); Elizabeth A. Eldredge, 'An economic history of Lesotho in the nineteenth century'. Unpublished PhD thesis. Madison: University of Wisconsin – Madison, 1986).
- ³⁵ See R.C. Germond, *Chronicles of Basutoland* (Morija: Morija Press, 1967) for missionary letters. See Kate B. Showers, 'Soil erosion in the Kingdom of Lesotho: origins and colonial response, 1830–1955'. *Journal of Southern African Studies* **15**,2 (1989): 263–286, 1989; Kate B. Showers *Imperial Gullies: Soil Erosion and Conservation in Lesotho* (Athens: Ohio University Press, 2005); Kate B. Showers, 'From forestry to soil conservation: British tree management in Lesotho's grassland ecosystem', *Conservation and Society* **4**,1 (2006): 1–35 for discussion of missionary tree planting in Lesotho (colonial Basutoland).
- ³⁶ Eldredge, 'An economic history of Lesotho'; Kate B. Showers, 'Crop or forest? Missionaries, Basotho and government tree planting', in Reginald Kline-Cole and David Kane (eds.), *Making and Remaking Africa: Travel, Environment, and Local Knowledge in a Continent of Movement* (London: Pluto Press; forthcoming).
- ³⁷ *Natal Official Handbook, Colonial and Indian Exhibition, 1886*. (London: William Clowes & Sons, Ltd., 1886).
- ³⁸ *Natal Official Handbook*.
- ³⁹ Harald Witt, 'The emergence of privately grown industrial tree plantations', in Stephen Dovers, Ruth Edgecombe and Bill Guest (eds.), *South Africa's Environmental History: Cases and Comparisons* (Athens: Ohio University Press, 2002): 90–111.
- ⁴⁰ *Natal Official Handbook*.
- ⁴¹ Grove, 'Scottish missionaries', 165.
- ⁴² Grove, 'Scottish missionaries'.
- ⁴³ J.C. Visagie, 'Introduction. A historical administrative development', in *Inventory to the Archives of the Conservator of Forests, Eastern Conservancy, King William's Town, 1882–1918. I/43:1–4* (Cape Town: Western Cape Archives and Records Service, 1965).
- ⁴⁴ Jacob Tropp, 'Displaced people, replaced narratives: forest conflicts and historical perspectives in the Tsolo District, Transkei', *Journal of Southern African Studies* **29** (2003): 207–33.
- ⁴⁵ Visagie, 'Introduction'.

⁴⁶ Pietermaritzburg Archives Repository. SGO III/1/50, ref. 646/83, A. Wilkinson, 'From Convenor of Committee. Enclosure with letter from Chairman, Victorian Planter's Association, Loutham, Blackbour to Major Hime R.E., Acting Colonial Secretary, Maritzburg, February 20, 1883'.

⁴⁷ Western Cape Archives and Records Service, Cape Town, I/68. ISBN 0 7970 0155 5, M. George, 'Introduction', *Inventory of the Archives of the Secretary for Public Works 1872–1911*.

⁴⁸ Western Cape Archives and Records Service, Cape Town: AGR48, ref f1110, Knysna Timber Depot, 'Control of Seasoning and Creosoting Timber, etc. To the Under-Secretary for Agriculture, 4 July 1895'.

⁴⁹ Western Cape Archives and Records Service, Cape Town. GH 23/24, ref 74:60, H.M.E. Frere, 'Governor, Graham's Town to Earl of Carnarvon, September 2, 1877'.

⁵⁰ First on the continent of Africa. For detailed discussion of Cape Colony Forestry see Karen Brown, 'Trees, forests and communities: some historiographical approaches to environmental history on Africa', *Area* 35,4 (2003): 343–356.

⁵¹ Pietermaritzburg Archives Repository. CSO 1181, ref 935/1888, Report of the Superintendent of Woods and Forests for the Year 1882 (Translation). Cape of Good Hope. Ministerial Department of Crown Lands and Public Works. 1882 (Cape Town: W.A. Richards & Sons, 1882).

⁵² Visagie, 'Introduction'.

⁵³ Karen Brown, 'Trees, forests and communities'.

⁵⁴ Londa Schiebinger, *Plants and Empire: Colonial Bioprospecting in the Atlantic World* (Cambridge MA: Harvard University Press, 2004). For review of the development of the field of botany, bioprospecting, and the relationships between plants, botanical gardens and empires and pertinent literature see 'Introduction', p. 1–12.

⁵⁵ John Croumbie Brown, 'Report of the Colonial Botanist for the Year 1863. Cape of Good Hope. Annual Report, 15th January 1864' (Cape Town: Saul Solomon & Co., 1864)

⁵⁶ Brown, J.C., 'On the conservation and extension of the forests as a means of counteracting disastrous consequences following the destruction of bush and herbage by fire'. Enclosure No. 1. Annual Report. Report of the Colonial Botanist for the Year 1863. Cape of Good Hope. (Cape Town: Saul Solomon and Co., 1863); Grove, 'Scottish missionaries'; Endfield and Nash, 'Drought, desiccation and discourse'.

⁵⁷ John Croumbie Brown, 'Report of the Colonial Botanist for the Year 1865. 15th January 1866. Cape of Good Hope' (Cape Town: Saul Solomon & Co., 1966); John Croumbie Brown, 'Letter to Dr. Mueller, Government Botanist and Director, Melbourne Botanical Gardens, relative to Shrubs and Trees used here for Fences, Avenues and Burying Grounds. Wynburg, 14th January 1866'. Annexure 12, p. 108–109. Report of the Colonial Botanist for the Year 1865. Cape of Good Hope. (Cape Town: Saul Solomon & Co., 1866).

⁵⁸ J.C. Brown, 'On the conservation and extension of the forests'.

⁵⁹ The 17th-century term 'botanic' has been mostly superseded by 'botanical'; it is retained in the official names of older institutions.

⁶⁰ J. C. Brown, 'On the Cape Botanic Garden'. Enclosure No. 111: 37–44. Annual Report. Report of the Colonial Botanist for the Year 1863. Cape of Good Hope (Cape Town: Saul Solomon & Co., 1863); John Croumbie Brown, 'Circular to residents of colony

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regarding relative irrigation facilities. 1 June 1866. Appended to report: Memoire on hydrology of South Africa. Abstract of memoir on Irrigation’.

⁶¹ National Library of South Africa, Cape Town: John Croumbie Brown Collection. MSC5, 3(5): J.M.McGibbon, ‘Catalogue’, James McGibbon, ‘Catalogue. Fruit-bearing trees & plants in the collection of the Botanic Garden, Cape Town’. (Cape Town: Saul Solomon & Co., 1864).

⁶² National Library of South Africa, John Croumbie Brown Collection, MSC5, 112(2): Forestry (gen)., John Croumbie Brown, ‘Memoire’; John Croumbie Brown, Report of the Colonial Botanist for the Year 1866. Cape of Good Hope. (Cape Town: Saul Solomon & Co., 1866).

⁶³ C.H.Huntley, ‘Report of the Committee of the Botanic Garden, Graham’s Town, for Nine Months of the Year 1872’. (Cape of Good Hope: Government Printer, 1873); C.H. Huntley, ‘Report of the Committee of the Botanic Garden, Graham’s Town for the Year 1871’. (Cape of Good Hope: Government Printer, 1872); ‘Report on the Graaf-Reinet Botanic Garden for the period ending 30th April 1874’. Cape of Good Hope, Graaf-Reinet, 30 April 1874. (Cape Town: Government Printer, 1874).

⁶⁴ *Natal Official Handbook* 1886; Witt, ‘The emergence of privately grown industrial tree plantations’

⁶⁵ Killie Campbell Africana Library, University of KwaZulu-Natal, Durban. Memorandum Book 1865–1871. Durban Botanic Society, Book 1. KCM 43065, John Sanderson, ‘Report of the Natal Botanic gardens for the last six months of 1867 14th January 1868. Reports on the Natal Botanic Gardens for the years 1866 and 1867’; Killie Campbell Africana Library, University of KwaZulu-Natal, Durban. Memorandum Book 1865–1871. Durban Botanic Society, Book 1. KCM 43065, M.J. ‘To the Committee of the Natal Botanic Gardens. Reports on the Natal Botanic Gardens, for the Years 1866 and 1867’.

⁶⁶ Killie Campbell Africana Library, University of KwaZulu-Natal, Durban. Memorandum Book 1865–1871. Durban Botanic Society, Book 1. KCM 43065, M.J. M.J. McKen, ‘Curator to the Committee of the Natal Botanic gardens. Government Notice No. 191, 1872’.

⁶⁷ R.G. Stone, ‘Report of the Committee of the Botanic Garden, Graham’s Town, for the year 1865’. (Cape Town: Government Printer, 1866).

⁶⁸ Killie Campbell Africana Library, University of KwaZulu-Natal, Durban. Memorandum Book 1865–1871. Durban Botanic Society, Book 1. KCM 43065, M.J. McKen, ‘Report of the Natal Botanic Gardens for the first six months of 1867. July 1, 1867. Reports on the Natal Botanic Gardens for the years 1866 and 1867’.

⁶⁹ McKen, ‘Report of the Natal Botanic Gardens for the first six months of 1867’.

⁷⁰ McKen, ‘Report of the Natal Botanic Gardens for the first six months of 1867’.

⁷¹ Morija Museum and Archives, Morija, Lesotho, Sumitra Talukdar, ‘The spread of Australian species and their displacement of the indigenous flora of Lesotho’. Presented at XIII International Botanical Congress, Sydney, Australia, August 1891. Reprint, ‘Letter from Vicaire Apostolique, 3 May 1866’, *Missions de la Congrégation des Missionnaires Oblate de Marie Immaculée*, 6:214.

⁷² Y. Beaudoin, *Blessed Joseph Gerrard O.M.I., Apostate to the Basotho (1831–1914)*. (Rome: General Postulation O.M.I.).

⁷³ C.H. Huntley, ‘Report of the Committee of the Botanic Garden, Graham’s Town, for the Year 1871’. (Cape of Good Hope: Government Printer, 1872).

⁷⁴ Huntley, 'Report of the Committee of the Botanic Garden, Graham's Town, for Nine Months of the Year 1872'.

⁷⁵ Killie Campbell Africana Library, University of KwaZulu-Natal, Durban. Memorandum Book 1865–1871. Durban Botanic Society, Book 1. KCM 43065, M.J. McKen, 'Curator to the Committee of the Natal Botanic gardens'. Government Notice No. 191, 1872.

⁷⁶ Killie Campbell African Library, University of KwaZulu-Natal, Durban. Paper Cuttings. Natal Herbarium, 1882–. Durban Botanic Society, Book 4. KCM 43068, L. Acutt, 'Report on Tree Planting'. Minutes. Natal Botanic Gardens Committee Meeting 11 April 1883.

⁷⁷ Pietermaritzburg Archive Repository. CSO 1298, ref 2979/1891, F. Schoepflin, 'Conservator of Forests to Surveyor General, 1891.

⁷⁸ J. C. Brown, 'On the conservation and extension of the forests': 5–17.

⁷⁹ National Archives, Pretoria FOR 177, ref A310, J. Storr Lister, 'Practical Hints on Tree Planting in the Cape Colony', Forest Department (Cape Town: W.A. Richards & Sons., 1884).

⁸⁰ Pietermaritzburg Archives Repository. SNA I/1/135, ref 1890/1514, A.C. Shepstone, 'Secretary, Native Affairs to Supervisor of Locations, Inanda, Pietermaritzburg, 2nd September 1890, ref SNA 1031/90'.

⁸¹ National Archives, Pretoria PWD vol387.ref RB907/05, Assistant Engineer, 'From Assistant Engineer, Roads and Bridges, Northern Transvaal, Public Works Department, Pretoria to Chief Engineer, Roads and Bridges, 3rd May 1905'; National Archives, Pretoria. AGT vol 29, ref 1335/06, Department of Agriculture, 'Grants in Aid of Tree Planting'.

⁸² Western Cape Archives and Records Service, Cape Town. AGR 747, ref 1998, 'Regulations for Tree Planting Competition'. Order of Speaker 1895, Cape of Good Hope; Western Cape Archives and Records Service, Cape Town: AMPT PUBS CCP1/2/1/94, ref G62, E. Hutchins, 1894, 'Reports on the Subject of the Encouragement of An Extensive System of Tree Planting. I. Report of the Conservator of Forests, Western Conservancy, 18th October 1894'.

⁸³ Western Cape Archives and Records Service, Cape Town. AGR 741, ref F 1998, Assembly 24/7/95, 1895.

⁸⁴ J.M. Mohapeloa, *Tentative British Imperialism in Lesotho, 1884–1910. A Study in Basotho-Colonial Office Interaction and South Africa's Influence in it.* (Moirja: Morija Museum and Archives, 2002).

⁸⁵ Maritzburg and Pietermaritzburg are the same place; as with trees, the name used in the source will be retained in this text.

⁸⁶ Killie Campbell Africana Library, University of KwaZulu-Natal, Durban, Paper Cuttings. Natal Herbarium. Durban Botanical Society, 1896, Book 5. RCM 43069, 'Report of the Council for 1895 Annual Meeting. Maritzburg Botanic Society, 1896'; Witt, 'The emergence of privately grown industrial tree plantations'.

⁸⁷ Brown, J.C., 'On the conservation and extension of the forests'.

⁸⁸ Western Cape Archives and Records Service, Cape Town: AGR 748, ref F2701, E. Hutchins, 'Conservator of Forests, Western Conservancy, Cape Town to Under Secretary for Agriculture, 8th March 1897'.

⁸⁹ The first state-sponsored tree plantations in the Cape Colony were established near Cape Town in the 1870s to provide easily accessible wood for fuel and sleepers (K.

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Brown, 'Trees, forests and communities'. In Natal, state plantations appeared at the end of the 19th century (Witt, 'The emergence of privately grown industrial tree plantations').

⁹⁰ Hutchins, 'Conservator of Forests, Western Conservancy, Cape Town to Under Secretary for Agriculture, 8th March 1897'.

⁹¹ Hutchins, 'Conservator of Forests, Western Conservancy, Cape Town to Under Secretary for Agriculture, 8th March 1897'.

⁹² Brown, K., 'Trees, forests and communities'.

⁹³ Witt, 'The emergence of privately grown industrial tree plantations', claims that the phrase 'timber famine', which became common in the twentieth century, reached Natal in 1902 when forester T.R. Sim arrived from his post as Curator, King William's Town, Cape Colony Forest Department.

⁹⁴ Western Cape Archives and Records Service, Cape Town: CO 4116, ref 34, James McGibbon, 'Botanic Garden. Letter, 5th April 1860'.

⁹⁵ Brown, K., 'Trees, forests and communities'.

⁹⁶ Mohapeloa, *Tentative British Imperialism in Lesotho*.

⁹⁷ James McGibbon, 'Report of the Commissioners of the Botanic Garden, Cape Town, for the Year 1871'. Cape of Good Hope. 1872. (Cape Town: Government Printer, 1872).

⁹⁸ C.H. 1873. Chairman. 'Report of the Botanical Gardens, Graham's Town, for Nine months of the year 1872'. (Cape of Good Hope: Government Printer, 1873).

⁹⁹ Huntley, 'Report of the Botanical Gardens, Graham's Town, for Nine months of the year 1872'.

¹⁰⁰ C.H. Huntley, 'Report of the Committee of the Botanic Gardens, Graham's Town, for the year 1873'. (Cape of Good Hope. Government Printer: 1874).

¹⁰¹ Eldredge, 'An economic history of Lesotho'.

¹⁰² William Tuck, 'Report on the Graaf-Reinet Botanic Gardens for the Year 1878. Cape of Good Hope. Graaf-Reinet, 15 March 1879' (Cape Town: Government Printer 1879).

¹⁰³ Western Cape Archives and Records Service, Cape Town. AGR 228, ref 2096, 'From general Manager of Railways, 23 October 1894, Cape Town to Under Secretary of Agriculture. No g15914'.

¹⁰⁴ Rhodes House, Oxford University, Natal. Agriculture. 621.14r.19(3), Arthurs E. Cave (compiler), *The Book of Natal Industries 1893*, 1st edition (Durban: T.L.Cullingworth).

¹⁰⁵ F.C.S. MacOwan, 'Report of the Government Botanist and Curator of the Cape Government Herbarium for the year 1895'. Cape of Good Hope. Department of Agriculture. (Cape Town: W.R. Richards & Sons, 1896).

¹⁰⁶ Poynton, *Tree Planting in Southern Africa, vol. 2. The Eucalypts*; Witt, 'The emergence of privately grown industrial tree plantations'.

¹⁰⁷ Talukdar, 'The spread of Australian species'.

¹⁰⁸ Brown, J.C., 'On the conservation and extension of the forests'.

¹⁰⁹ Killie Campbell Africana Library, University of KwaZulu-Natal, Durban. Paper Cuttings. Natal Herbarium 1882-. Durban Botanic Society Book 4. KCM 43068, Professor Bentley, 'On the character, properties and use of the Eucalyptus globulus (The 'Blue Gum' of Tasmania) and other species of Eucalyptus'. Lecture to the Royal Botanic Society of London, March 14th 1874.

¹¹⁰ Bentley, 'On the character, properties and use of the Eucalyptus globulus'.

- ¹¹¹ Bentley, 'On the character, properties and use of the Eucalyptus globulus'.
- ¹¹² National Archives, Pretoria. RRC 30, ref 33/05, Charles C. Legat, 'Conservator of Forests, Transvaal Department of Agriculture, 27 April 1905 to Director of Agriculture, Department of Agriculture, Pretoria.
- ¹¹³ Witt, 'The emergence of privately grown industrial tree plantations'.
- ¹¹⁴ Brown, J.C., 'Letter to Dr. Mueller'; H.Hudson, F. TeWater, C.Murray, Harry Bolus, 'Report on the Graaf-Reinet Botanic Garden, for the period ending 30th April 1874'. Cape of Good Hope. Graaf-Reinet. (Cape Town: Government Printer, 1874); Killie Campbell African Library, University of KwaZulu-Natal, Durban. Paper Cuttings. Natal Herbarium, 1882 –, Durban Botanic Society, Book 4. KCM 43068, William Keit, 'Curator's Report for 1875'. Natal Botanic Gardens. Government Notice No. 132, 1876; Killie Campbell African Library, University of KwaZulu-Natal, Durban. Paper Cuttings. Natal Herbarium, 1882 –. Durban Botanic Society, Book -4. KCM 43068, William Keit, 'Curator's Report. Natal Botanic Gardens. January 1st, 1878'.
- ¹¹⁵ Mohapeloa, *Tentative British Imperialism in Lesotho*.
- ¹¹⁶ Killie Campbell African Library, University of KwaZulu-Natal, Durban. Paper Cuttings. Natal Herbarium, 1882 –. Durban Botanic Society, Book 4. KCM 43068, William Keit, 'Curator's Report for 1875'. Natal Botanic Gardens. Government Notice No. 132, 1876; Killie Campbell African Library, University of KwaZulu-Natal, Durban. Paper Cuttings. Natal Herbarium, 1882 –. Durban Botanic Society, Book -4. KCM 43068, William Keit, Curator's Report. Natal Botanic Gardens. January 1st, 1878.
- ¹¹⁷ Poynton, *Tree Planting in Southern Africa, vol. 2. The Eucalypts*'.
- ¹¹⁸ Western Cape Archives and Records Service, Cape Town: CO 4116, ref 34, James Mc Gibbon, 'Botanic Garden. Letter, 5th April 1860'.
- ¹¹⁹ Pietermaritzburg Archives Repository CSO 1298 ref 2972/1891, E.W. Hannaford, 'Secretary, Pietermaritzburg Botanic Society to Colonial Secretary, Natal, 5th June 1891; Pietermaritzburg Archives Repository CSO 1298 ref 2979/1891, F.Schoepflin, 'Conservator of Forests to Surveyor General, 1891'.
- ¹²⁰ Pietermaritzburg Archives Repository. CSO 1180, ref 694/1888, Dr. Sutherland, 'To Colonial Secretary, Natal, 13 Feb 1888'.
- ¹²¹ Cave, *Book of Natal Industries*.
- ¹²² Sutton, *Wattle Bark*.
- ¹²³ Pietermaritzburg Archives Repository. CSO 1180, ref 694/1888, D. Sutherland, 'To Colonial Secretary, Natal, 13 Feb 1888'.
- ¹²⁴ See Witt, 'The emergence of privately grown industrial tree plantations', for detail.
- ¹²⁵ Witt, 'The emergence of privately grown industrial tree plantations'.
- ¹²⁶ Witt, 'The emergence of privately grown industrial tree plantations'.
- ¹²⁷ Witt, 'The emergence of privately grown industrial tree plantations'.
- ¹²⁸ See Witt, 'The emergence of privately grown industrial tree plantations', for discussion.
- ¹²⁹ Witt, 'The emergence of privately grown industrial tree plantations'.
- ¹³⁰ According to J.H. Maiden, curator of Technological Museum, Sydney, and quoted by Geo M. Sutton in 'Wattle Bark: A Paying Industry' (Pietermaritzburg: P. Davis & Sons, 1892:2), the name wattle is derived from the Anglo-Saxon *watel*, 'a hurdle covering, the verb is *watelen*, to *watel*, to twist together, strengthen with hurdles'. The common

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practice in Australia in the early days was to erect temporary structures of small trees, of Acacias as well as others. Here in Natal, the same thing was done, but there being no Acacias suitable other indigenous saplings were used. The name 'wattle and daub' for a house or hut made of hurdles and covered with mud is well known in Natal. Mr. Maiden says 'The Rev. Dr. Wools, however, assures me that the earliest application of the word wattle was not to an Acacia, but to *Calliconia serratifolia*, a small tree belonging to the *Saxifragae*, and which is generally found near watercourses. It was probably abundant along the course of the streams which flowed into Sydney Cove; and in the earliest records of 'daub and wattle' structures, the tough saplings of this species were alluded to. In Natal we had the word, but not the Acacias, and I think it is only fair to conclude that the reason why the word "wattle" became confined in everyday use in Australia to certain of the Acacia tribe is on account of their habit of seeding so freely, and growing thickly with straight stems, rendering them more easily available for wattling than many species. In Natal no one species of tree predominates to the extent Acacias do in Australia.'

¹³¹ Sutton, 'Wattle Bark', citing Maidern, stated that '*Acacia mollissima* is a synonym of *A. Decurrens*, var *mollissima*. It was called black wattle by the older New South Wales colonists. This name was used in Victoria and Tasmania, but called green wattle in New South Wales now.'

¹³² Royal Botanic Society. 2004. *Flora Zambesiaca*, Taxon detail *Acacia mearnsii*. <http://apps.kew.org/efloras/namedetail.do?flora=f2&taxon=2107&n> .

¹³³ Talukdar, 'The spread of Australian species'.

¹³⁴ McKen, 'Curator to the Committee of the Natal Botanic gardens'.

¹³⁵ Sutton, *Wattle Bark*.

¹³⁶ Western Cape Archives and Records Service, Cape Town . AGR 212, ref F 1626, W. Power, 'Resident Magistrate, Mount Ayliff, 8 January 1894. Supply of Silver Wattle and Black Wattle Seed. No. 9 GD/94. To Conservator of Forests, Umtata'; Western Cape Archives and Records Service, Cape Town. AGR 207, ref 1563, 'Office of the Secretary for Native Affairs. 1894. To Under Secretary for Agriculture, 11 May 1894'.

¹³⁷ Pietermaritzburg Archives Repository. SNA I/1/395, ref 1908/966, Charles Hayter, 'Supervisor, Swartkop to Under-Secretary of Native Affairs, 27/3/08'.

¹³⁸ Keit, 'Curator's Report for 1875'.

¹³⁹ Sutton, *Wattle Bark*.

¹⁴⁰ Sutton, *Wattle Bark*.

¹⁴¹ Sutton, *Wattle Bark*: 43

¹⁴² Pietermaritzburg Archives Repository. CSO 1578, ref 1898/6571, D.W. Denaar, 'Government Secretary, Bloemfontein, 1 September 1898 to Colonial Secretary, Pietermaritzburg' and responses on Minute Paper. I.9.98. Letter to Gov. Sec. 12.9.98.

Western Cape Archives and Records Service, Cape Town. AGR 219, ref 1798, Farmers' Association in Great Brak River, Paarl. 1891. 'Requests to government'.

¹⁴³ Report of the Council 1895.

¹⁴⁴ Witt, 'The emergence of privately grown industrial tree plantations'.

¹⁴⁵ Grove, 'Scottish missionaries'; Endfield and Nash, 'Drought, desiccation and discourse'.

¹⁴⁶ Grove, 'Scottish missionaries'

¹⁴⁷ Grove, 'Scottish missionaries'; Endfield and Nash, 'Drought, desiccation and discourse'

¹⁴⁸ Grove, 'Scottish missionaries'.

¹⁴⁹ 'Report of the Superintendent of Woods and Forests for the Year 1882'.

¹⁵⁰ Wilkinson, 'From Convenor of Committee'.

¹⁵¹ Discussion of the development of South Africa's forest industry is beyond the scope of this paper. It is of interest, perhaps, to note that the Food and Agriculture Organization of the United Nations (FAO) expanded its definition of forest in 2000 by 'adopt[ing] a threshold of 10% minimum crown cover. The definition includes both natural forest and forest plantations'. 'Executive Summary', *Global Forest Resources Assessment 2001*, Main Report. Rome: FAO, 2001. This definition justifies South Africa's claim to having extensive forests and a forest service, rather than large-scale tree crop production and an advice system for growers.

¹⁵² Pietermaritzburg Archives Repository. CSO 1635, ref 1899/3317, 'Farmers Club of Mid-Illovo, 14th January 1899'.

¹⁵³ Witt, 'The emergence of privately grown industrial tree plantations'.

¹⁵⁴ C.L. Wicht, 'Forest hydrology research in the South African Republic', in William E. Sopper and Howard W. Lull, *Forest Hydrology* (Oxford: Pergamon Press), 75–84.

¹⁵⁵ U.W. Nänni, U.W. 'Trees, water and perspective', *South African Forestry Journal* **75** (1970): 9–17.

¹⁵⁶ C.L. Wicht (1908–1978) was Research officer, Department of Forestry (1934–1950), rising to Chief of Forest Research (1947–1950); Forestry Professor, University of Stellenbosch (1950–1973) and, after retirement, consultant to the Forestry Department. Obituary, Dr. C.L. Wicht, *South African Forestry Journal* **106** (September 1978): 1.

¹⁵⁷ Nänni, 'Trees, water and perspective'; C.L. Wicht, 'Timber and water', *South African Forestry Journal* **85** (June 1973): 3–11.

¹⁵⁸ U.W. Nänni, 'The effect of afforestation in streamflow at Cathedral Peak: Report No. 1', *South African Forestry Journal* **74** (1970): 6–12.

¹⁵⁹ Ackerman, D.P., 'Some new directions in forestry policy', *South African Forestry Journal* **68** (1969): 1–4.

¹⁶⁰ Eucalyptus and pine.

¹⁶¹ Ilse Steyl, 'Strategic Environmental Assessment for streamflow reduction activities in South Africa', undated. Available at: http://www-dwaf.pwv.gov.za/sfra/Articles/Oxford_paper.pdf; J.M. Bosch and J.D. Hewlett 'A review of catchment experiments to determine the effect of vegetation changes on water yield and evapotranspiration', *Journal of Hydrology* **55**(1982): 3–22.

¹⁶² As documented by Witt, 'The emergence of privately grown industrial tree plantations'.