

Agriculture in the natural world: progressivism, conservation and the state. The case of the Cape Colony in the late 19th and early 20th centuries

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Introduction

At the turn of the twentieth century agriculture constituted an important sector of the Cape economy. Despite the significant contribution made by diamonds to the national export figures, the Colony also traded in a considerable amount of natural fibres, produced mainly in the stock rearing areas of the Midlands and Eastern Cape. The Cape was the world's largest supplier of ostrich feathers, successfully challenged Turkey for primacy on the European mohair markets and competed with Australia and New Zealand for a share of the merino wool trade. Collectively the revenues that accrued from overseas commerce in these goods amounted to around £3,500,000 in the years preceding the South African War (1899-1902) and rose to over £5,700,000 prior to Union in May 1910.¹ In the more fertile Western Cape some horticulturists began to take advantage of developments in marine refrigeration as well as the European demand for fresh fruit throughout the year, by cultivating orchards on a commercial basis (see below).

However, despite this growing export trade in certain agricultural products, the Cape had to import a large amount of basic foodstuffs such as meat, dairy products, eggs, flour, wine and preserves. The Colony also lacked sufficient timber to fulfil the needs of the mining, railway, construction or paper industries. After the South African War several politicians, leading farmers and official scientists argued that the Colony should attain self-sufficiency in these vital resources, in order to meet the demands of an expanding urban population.²

Achieving this goal entailed a more scientific and regulatory approach to rural land management. In particular this was because of the numerous environmental disadvantages with which farmers had to contend. Livestock producers not only faced diseases that were known in Europe, but also confronted a number of tick-borne infections such as redwater and heartwater, which could decimate whole flocks and herds. Fruit, wine and cereal cultivators experienced the presence of injurious insects and fungi that destroyed crops or reduced yields. Soils were poor in many parts of the country and unable to sustain either intensive agriculture or

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1. Figures taken from the *Statistical Register of the Cape of Good Hope*. As a point of comparison, revenues from Kimberley diamonds varied from around £4,500,000 to nearly £9,000,000 during the first decade of the twentieth century.
 2. See for example the debate in the House of Assembly on the economy, in which the East Griqualand members, Charles Tod and Louis Zietsman, complained about the £5,000,000 paid annually for food imports, *Cape Hansard* (hereafter *CH*), 26 April 1904, 354-366. The issue was also the subject of the *Select Committee into the Cost of Living, Cape Parliamentary Papers* (hereafter *CPP*), C1-1905.

stock rearing. The appetites of wild carnivora, especially jackals, together with the proliferation of weeds further restricted pastoral output. Rainfall was often sparse and unpredictable, whilst limited tree cover exacerbated the potential for severe erosion and limited the possibilities of developing a secure timber industry.

These environmental challenges had been instrumental in bringing about the creation of a professional scientific bureaucracy in the Cape. Since the 1870s the state had gradually recruited a range of experts including veterinary scientists, forest conservators and hydraulic engineers to find ways of overcoming these ecological problems. Support for these initiatives came primarily from the self-styled 'progressive' farmers who although constituting a rural minority, formed an important voice in Cape politics in the late nineteenth and early twentieth centuries. Broadly speaking, this group was largely, but not exclusively made up of anglophone settlers from the Eastern Cape who were engaged in stock production. In the Western Cape, there were nonetheless, some vociferous Afrikaner farmers, especially viticulturists and horticulturists who also promoted themselves as 'progressive' and worked with anglophone farmers to lobby for agricultural change. To some degree, progressivism constituted a form of class and cultural identity that traversed Afrikaner and anglophone ethnic divides. The progressives formed a rural élite in terms of their level of education, their utilisation of local and national political networks and because they had sufficient revenue to reinvest in the land. Dependent upon income generated from agricultural yields, they were nonetheless vulnerable to environmental as well as market pressures.

Progressive farmers did not have a monolithic approach to development and debated amongst themselves how best to promote economic growth. The annual meetings of Farmers Congress attended by Eastern Cape stock farmers, as well as the more geographically and agriculturally encompassing Agricultural Union provided the stage for these discussions. Members drew up resolutions, which represented a consensus of opinion and which were presented to Parliament as recommendations for government policy. Despite some divergence in views, what united the progressives was the fact that to varying degrees they were prepared to adopt a more scientific approach to husbandry and they looked to the state to introduce legislation to regulate the rural economy, thereby protecting their assets and enhancing their yields. They were often critical of farmers who remained dubious, either for cultural or economic reasons, about these new approaches to agriculture. The so-called 'unenlightened' or 'regressive' backveld farmer, often of Afrikaner origin, became the scapegoat for all perceptions of tardiness in agricultural reform or economic growth. Amongst African communities in the Eastern Cape, these ideas particularly influenced the Christian educated and more prosperous agriculturists who formed their own associations to promote rural improvements. Concerns about unscientific husbandry, erosion and a shortage of timber also featured in the annual debates of the Bunga.³

3. The Bunga or the Transkei Territories General Council originated with the Glen Grey Act of 1894. This was the annual meeting of resident magistrates and African representatives from the local district councils that were formed in the Eastern Cape as part of a move towards separate government for blacks. The Bunga had some tax raising powers and could involve itself in the management of the rural economy. For a discussion of African Agricultural Societies, see A. Odendaal, 'African Political Mobilization in the Eastern Cape, 1880-1910' (University of Cambridge, Ph.D. thesis, 1984).

Three environmental and agricultural issues that were of great concern to both progressive farmers and Cape governments during this period were the problem of noxious insects, measures to encourage significant steps forward in irrigation and strategies to increase timber yields. The remainder of this paper will focus on the themes of entomology, irrigation and silviculture - subjects that have been rather overlooked in the rural historiography of the Cape. Much of the revisionist literature of the 1980s and early 1990s concentrated on the origins and nature of the drive towards agricultural intensification and capitalist accumulation with its incumbent effects of African dispossession and the emergence of a 'poor white' class.⁴ Literature on post-South African War Reconstruction has focused on Alfred Milner's policies in the Transvaal and the Orange River Colony to the neglect of the Cape and Natal.⁵ Published discussions on ideologies of development have tended to cover the rise and waning of Cape liberalism rather than progressivism.⁶ In terms of specific scientific and organisational narratives on the rural economy, historians have primarily explored factors affecting the more profitable pastoral sector. In particular, work has been done on the growth of the Cape Veterinary Department, public reaction to regulatory stock measures such as the Scab Acts, as well as the deleterious effect jackals and weeds had on both animal production and the veld.⁷ Recent studies have begun to explore the role insects, especially ticks played in the spread of diseases, but there remains a lack of research into the effects other species had on the growth of the arable sector.⁸ There is also a paucity of published accounts on the importance of natural resources, such as timber and water, to the settler economy. Coverage of colonial concerns about deforestation and degradation have dealt with this question from the perspective of foreign critics, commenting upon their often sentimentalist and moralist reactions to what they assumed was a dissipated African landscape, rather than considering the economic consequences of erosion and aridity to the colonial economy.⁹ Further publications

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4. For example, C. Bundy, *The Rise and Fall of the South African Peasantry* (London: Heinemann, 1979); W. Beinart, P. Delius, S. Trapido, eds., *Putting a Plough to the Ground: Accumulation and Dispossession in Rural South Africa, 1850-1930* (Johannesburg: Ravan Press, 1986); P. Scully, *The Bouquet of Freedom: Social and Economic Relations in the Stellenbosch District South Africa circa 1870-1900* (Cape Town: African Studies Centre, University of Cape Town, 1990); T. Keegan, *Colonial South Africa and the Origins of the Racial Order* (Cape Town: David Philip, 1996).
 5. For example, S. Marks and S. Trapido, 'Lord Milner and the South African State', *History Workshop Journal*, vol. 8, 1979; T. Keegan, *Rural Transformations in Industrialising South Africa: The Southern Highveld to 1914* (Basingstoke, 1987); J. Krikler, *Revolution from Above; Rebellion from Below: The Agrarian Transvaal at the Turn of the Century* (Oxford: Clarendon Press, 1993).
 6. Bundy, *Rise and Fall*; P. Lewsen, 'The Cape Liberal Tradition - Myth or Reality', *Race*, vol. 13(1), 1971; S. Trapido, 'The Friends of the Natives: Merchants, Peasants and the Political and Ideological Structure of Liberalism in the Cape, 1854-1910', in S. Marks and A. Atmore, eds., *Economy and Society in Pre-Industrial South Africa* (London and New York: Longman, 1980); R. Parry, "'In a sense Citizens, but not altogether Citizens...': Rhodes, Race and the Ideology of Segregation in the Cape in the Late Nineteenth Century', *Canadian Journal of African Studies*, vol. 17(3), 1983; K. Brown, 'Progressivism, Agriculture and Conservation in the Cape Colony, c.1902-1908' (University of Oxford, D. Phil thesis, 2002).
 7. For example, W. Beinart, 'Vets, Viruses and Environmentalism: The Cape in the 1870s and 1880's', *Paideuma*, vol. 43, 1997; D. Gilfoyle, 'Veterinary Science and Public Policy at the Cape 1877-1910' (University of Oxford, D. Phil thesis, 2002); M. Tamarkin, *Cecil Rhodes and the Cape Afrikaners: The Imperial Colossus and the Colonial Parish Pump* (Johannesburg: Jonathon Ball, 1996); W. Beinart, 'The Night of the Jackal: Sheep, Pastures and Predators in the Cape', *Past and Present*, vol. 158, February 1998; L. van Sittert, "'Keeping the Enemy at Bay": The Extermination of Wild Carnivora in the Cape Colony, 1889-1910', *Environmental History*, vol. 3(3), July 1998 and "'The Seed Blows About in Every Breeze": Noxious Weed Eradication in the Cape Colony, 1860-1909', *Journal of Southern African Studies* (hereafter JSAS), vol. 26(4), December 2000; S. Archer, 'Technology and Ecology in the Karoo: a Century of Windmills, Wire and Changing Farming Practice', JSAS, vol. 26(4), December 2000.
 8. Gilfoyle, 'Veterinary Science', and his contribution to this edition.
 9. R. Grove, 'Scottish Missionaries, Evangelical Discourse and the Origins of Conservation Thinking in South Africa, 1820-1900', JSAS, vol. 15(2), January 1989.

on forestry have tackled general concepts of imperial silviculture, rather than the specifics of the Cape. Alternatively, historians have looked at instances of resistance to state forest policies as opposed to closely analysing the fiscal and scientific context that generated this opposition.¹⁰

Yet entomology, irrigation and silviculture were as vital for the development of certain sectors of the rural economy as were the discoveries and policies pursued by veterinary scientists. Attempts to improve both arable and pastoral output were at times thwarted by the presence of both indigenous and alien insects. The appointment of the Cape's, and indeed Africa's, first professionally trained applied entomologist, Charles Lounsbury in 1895, was therefore a significant event in the agricultural history of the Colony. The nature of his research, together with the technological and regulatory measures he introduced, had far-reaching effects on the development of the rural economy. The intensification of agriculture also required the conservation of the country's scarce water supplies, together with strategies to curb the extent of erosion. Ideologically, the language surrounding land reclamation revealed an underlying conviction on the part of some optimists about the potential for science and technology to transform environments from the sterile to the fecund. Finally, the establishment of a Department of Forestry in the 1880s was born out of a materialistic as opposed to a sentimentalist attitude towards natural resources. Its function was primarily to increase timber yields, rather than prevent desertification, although this did at times remain an ideological justification for reforestation. The creation of a Forestry Department also indicated the extent to which the state was prepared to directly intervene in the management of the environment as well as control the activities of woodland inhabitants.

The sections on entomology, irrigation and silviculture introduce both the rhetoric and concerns surrounding the establishment of particular government departments and provide some insights into the action taken by farmers, politicians and scientists to pursue their objectives. Based on the available sources, in particular the *Agricultural Journal of the Cape of Good Hope*, the reports of scientific advisors and testimonies before specially convened Select Committees, the ideology expressed is that of progressive farmers and their scientific advisors. How less publicly articulate members of the rural community, in particular Afrikaner farmers as well as Africans who were largely denied a political voice, envisaged agricultural development or the management of natural resources is less easy to access. So too is the extent to which they participated in this scientific, commercially orientated production drive as their attitudes are only recorded in terms of opposition to state regulations, or in the castigations of their self-conscious and often self-opinionated progressive neighbours.

10. S.R. Rajan, 'Imperial Environmentalism: The Agendas and Ideologies of Natural Resource Management in British Colonial Forestry 1800-1950' (University of Oxford, D. Phil. thesis, 1994); J. Tropp, 'Displaced People, Replaced Narratives: Forest Conflicts and Historical Perspectives in the Tsolo District, Transkei,' *JSAS*, vol. 29(1), March 2003.

Entomology

Whatever essential part they play in the great scheme of nature as a whole ... insect pests and plant diseases are in some respects factors that may become of considerable profit to many farmers, individually or collectively. By means of these troubles, either through their absence or by his successful treatment of them, the farmer often holds or secures a decided advantage over his competitors ... The harder the conditions for success become, the more will the thrifty 'practically scientific' farmer prosper at the expense of the unskilled haphazard one.¹¹

The appointment of Charles Lounsbury in 1895 reflected growing concerns on the part of progressive farmers about the injurious effects insects had on rural production. From the 1870s Eastern Cape stock farmers publicly revealed their consternation about the role they believed ticks played in spreading a variety of bovine and ovine diseases.¹² However, it was effective lobbying on the part of viticulturists and horticulturists from the Western Cape that managed to persuade Cecil Rhodes' government to employ an applied, or economic, entomologist. In his reminiscences, Lounsbury specifically attributed his position to the political influence of the Fruit Growers Association.¹³ Tackling insects that undermined fruit and crop production immediately became one of the most important aspects of an entomologist's professional remit in the Cape. This remained the case after Lounsbury's retirement as head of the South African Entomology Division in 1927 when research into vector-borne animal diseases was entirely transferred to the Veterinary Department. (For the Cape's contribution to tick research, see Dan Gilfoyle's article in this journal issue).

In the 1890s horticulturists sought the services of an entomologist due to recent developments in the fruit industry, which were partly in response to new market opportunities and partly a consequence of a move towards arable diversification in the wake of the destruction wrought by the parasite *Phylloxera vastatrix*. Since 1886 this insect had swept its way through the vineyards of the Western Cape. The official response to this problem indicated the need for an entomologist who understood how to examine the life history of injurious species and had a specialised knowledge of technical means of controlling them. Based on the advice of the insect taxonomist, Louis Peringuey, the government ordered the burning of all infected vineyards. By 1896 eight million vines, primarily in the districts of Stellenbosch and Paarl, had been destroyed. Compensation was inadequate and many poorer farmers who could not afford to invest in *Phylloxera* resistant vines from America, or else branch out into other forms of agriculture, faced foreclosure.¹⁴ Some abandoned their farms, which were purchased by indi-

11. C.P. Lounsbury, 'Reflections on Pests in General', *Agricultural Journal of the Cape of Good Hope* (hereafter *AJCGH*), vol. 16, 18 January 1900, 94-95.

12. For example in their testimonies before the *Commission on Diseases in Cattle and Sheep in this Colony*, CPP, G3-1877.

13. C.P. Lounsbury, 'The Pioneer Period of Economic Entomology in South Africa', *Journal of the Entomological Society of South Africa*, vol. 3, 30 September 1940, 14. This organisation became the Western Board of Horticulture in 1895.

14. Scully, *The Bouquet of Freedom*, chapter 2.

viduals with capital (often acquired from the diamond and gold mines) such as the politician John Xavier Merriman and Charles Kohler, who later founded the KWV wine cooperative.¹⁵ Other investors included larger commercial enterprises backed by British capital, such as Percy Malleson's Cape Orchard Company as well as the Rhodes Fruit Farms, ultimately funded by the eponymous trust.¹⁶ These new property owners, along with some established Afrikaner families, intended to manage their farms on a profitable commercial basis and accepted the necessity of investing in technical expertise. Preventing any repeat of a pyrogenic solution to insect infestation was an important reason for seeking the services of an applied entomologist.

The cultivation of deciduous and citrus fruit trees facilitated the introduction of exotic insects through plant imports and enabled the proliferation of various indigenous species, which took advantage of greater food supplies. Codling moth, scale insects such as dorthesia and (peach) fruit fly were culturally and economically constructed as the greatest enemies of the fruit grower. Petrus Cillie, a prosperous and influential farmer from Wellington who founded the Fruit Growers Association, advised a parliamentary committee in 1895 that: 'The insect pests are spreading very rapidly and they are getting worse and worse nearly every year.' He argued that it was the duty of the state to fund scientific investigations and to encourage farmers to adopt modern methods.¹⁷ His political connections with Merriman, as well as support for agricultural development from Rhodes, ensured that parliament acceded to this request. The government approached the American Bureau of Entomology for such a scientist because of a lack of such expertise within the British Empire and because the United States was the most advanced country in terms of entomological research and procedures.

On his arrival in the Cape, Lounsbury immediately began to identify and record the distribution of the Colony's major fruit pests as well as experimenting with methods of control, which he had learnt at Amherst College, Massachusetts. He was convinced that many of these noxious species were not indigenous to the Cape, noting how imported trees were often crawling with 'pernicious scale'. He assumed that these insects had been able to propagate successfully due to the lack of both predators and competitors for food. Human agency, demonstrated through cultivation, he argued had destroyed nature's equilibrium; it was the role of the entomologist to discover and demonstrate ways of resurrecting it. Lounsbury conceptualised a 'balance of nature' in purely anthropomorphic and economic terms: manipulating biodiversity in the interests of capitalist production.¹⁸

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15. Merriman had been active in politics since the 1870s and played a key role in drawing up irrigation legislation in that decade. He was Secretary of Agriculture in 1892 and Prime Minister from 1908-1910. P. Lewsen, *John X. Merriman: Paradoxical South African Statesman* (Johannesburg: A.D. Donker, 1982); A. Joelson, *The Memoirs of Kohler of the KWV* (London: Hurst and Blackett, 1946).
 16. On the Rhodes Fruit Farms, see F. MacDermott, 'Rural Cape Colony - The District of Paarl', *AJCGH*, vol. 24, March 1904 and S. Playne, *Cape Colony, Its History, Commerce, Industries and Resources* (London: Foreign and Colonial Comiling and Publishing, Juta, 1911); C. Aucamp, 'The Establishment and development of the Cape Fresh Fruit Industry, 1886-1910', *South African Journal of Economic History* (hereafter *SAJEH*), vol. 2(1), March 1987 and 'The Cape Orchard Company', *SAJEH*, vol. 4(2), September 1989.
 17. Testimony of P. Cillie, Report of the *Select Committee on the Department of Agriculture*, *CPP*, C2-1895, 55-60. The quotation appears on page 59.
 18. *CPP, Report of the Government Entomologist* (hereafter *RGE*), G25-1896, 20-24. Lounsbury, 'The Pioneer Period', 23.

Such materialistic sentiments resonated with the agenda of commercial fruit farmers. Working with prominent viticulturists and horticulturists such as Petrus Cillie and Charles Kohler, Lounsbury was convinced that nature's equilibrium could be restored through a combination of biological and chemical controls. The former method, involving the ecological transfer of selected species from one country to another to combat a particular pest, had been tried with some success in the United States and Australia.¹⁹ Lounsbury and his associates hoped for similar results against frugivorous insects in the Cape, especially since this appeared to be the cheapest method of control over the longer term. Corresponding with entomologists in America as well as Australia, Lounsbury acquired and distributed a range of insects such as *Vedalia cardinalis* to combat dorthesia, a scale insect that reduced fruit yields by destroying the bark and foliage of trees, as well as the *Hippodamia* ladybird to tackle the apple-loving woolly aphis. However, none of the multiple introductions was really successful. Lounsbury attributed this to the fact that the imported colonies were too small to reproduce rapidly enough to create a sustainable population either capable of reducing indigenous pests, or resisting local predators.²⁰ Biological warfare was consequently abandoned as a strategy for fabricating a commercially advantageous 'balance of nature' and superseded by more costly chemical controls.

In the United States insecticides had already emerged as a successful and potent symbol of progress by the late nineteenth century.²¹ In the Cape Lounsbury and his colleague Charles Mally tested the performance of American insecticides on colonial insects and monitored the effects of these compounds on Cape vegetation, altering the formula where necessary. Many of the pesticides contained arsenic, the recommended toxicant being arsenate of lead. Mixed with sugar, this preparation was very effective against some species, allegedly reducing fruit fly infestation on treated peach trees in the Eastern Cape from 50 per cent to 1 per cent between 1908 and 1909.²²

Colonial fruit was often also blighted by varieties of fungus, such as *Fusicladium dendriticum* (popularly known as apple scab), as well as *Plasmopara viticola* that contaminated grapes. Normally a mycologist would have carried out investigations of this kind, but a lack of state funding meant this work was entrusted to the Entomology Department. Treating fungi effectively also involved a chemical approach, usually a copper sulphate and lime solution.²³ Farmers therefore had to be able to identify the specific pests that infested their orchards and also needed sufficient capital to procure a variety of chemicals as well as to hire the labour to carry out multiple sprayings. The use of pesticides increased the complexity of horticultural practices in a bid to improve yields.

19. I. Tyrell, *True Gardens of the Gods: Californian-Australian Environmental Policy, 1860-1930* (California: University of California Press, 1999).

20. For details see *CPP, RGE*, G25-1896; G45-1897; G18-1901; G29-1902; G70-1903; G31-1909.

21. P. Palladino, *Entomology, Ecology and Agriculture: The Making of Scientific Careers in North America, 1885-1985* (Amsterdam, 1996), chapter 1.

22. *CPP, RGE*, G25-1896, 25-26. Lounsbury, 'The Pioneer Period', 14; 'Mally's Fruit Fly Remedy', *AJCGH*, vol. 35, November 1909, 578-581. Mally was recruited as entomologist for the Eastern Cape in 1899.

23. C. Lounsbury, 'The Fusicladium Disease of the Pear and Apple', *AJCGH*, vol. 33, July 1908, 16-32; C. Mally, 'Spraying for Apple Scab or Black Spot: *Fusicladium dendriticum*', *AJCGH*, vol. 35, August 1909, 202-212.



Figures 1 and 2: These reproductions from photographs, which appeared in the *Agricultural Journal of the Cape of Good Hope* in November 1909, show the 'Complete Equipment for Mally Fruit Fly Remedy Work' and its application. Charles Mally was the government entomologist for the Eastern Cape where the fruit fly was a particular nuisance for peach growers. Arsenic was a common insecticide used to tackle both fruit and livestock pests. In this case the arsenic derivative, arsenate of lead, was mixed with sugar and water in a barrel and applied with a syringe-squirter. One syringe-full, sprayed with a series of squirts, could treat a fair sized tree. Some farmers feared that the arsenic might be harmful to human beings and were initially reluctant to use it. Figure 2 shows an African labourer applying the solution without any protective clothing. No records were kept of human mortality. However it was effective against the Fruit Fly and heavily promoted by official entomologists and horticulturalists as well as by agricultural associations.



Although willingly adopted by the prominent farmers that sat on the Western and Eastern Boards of Horticulture, not all agriculturists were prepared to apply these compounds. Some believed that cyanide, for instance, required for the fumigation of imported fruit, plants and orchards was detrimental to human health especially since protective covers, as used in California, were not widely available in South Africa.²⁴ Lounsbury's early reports revealed exasperation over the overall reluctance of farmers to introduce these new methods.²⁵ Yet tardiness could be attributed to more than innate conservatism. The cost of imported insecticides and accessories was prohibitive for many smaller farmers.²⁶ Scientific developments were thus in practice, if not in theory, geared to meet the needs of a comparatively wealthy élite. Nonetheless, as the first decade of the twentieth century progressed, official reports and personal accounts indicated that more producers were prepared to use insecticides. P.S. du Toit, secretary of Graaff Reinet Fruit Growers Association suggested that:

In Graaff Reinet - where never much value has been set on the theories and direction of government experts, their theories sometimes seeming to be so mountain high and of such a spendthrift nature that they have no attraction for these men who have seen the better times of old - they have obtained good results by bringing into practice the theory of Mr Mally by making experiments in the spraying of peach trees with arsenate of lead and black sugar against the peach fly.²⁷

The overall failure of acclimatisation projects meant that chemicals appeared to be the only effective means of mitigating the ravages of injurious insects. Local fruit growers' associations promoted their usage and organised demonstrations, whilst publicised success stories persuaded some sceptics that this approach was the best way of manipulating the environment to economic advantage.²⁸

As well as promoting the use of chemicals, Lounsbury believed in the necessity of legislation to protect orchard owners. Backed by the influential lobby groups, the Western and Eastern Boards of Horticulture, Lounsbury persistently recommended the introduction of import restrictions on foreign plants and measures to facilitate the mandatory fumigation of nurseries.²⁹ However, prior to 1904 successive governments had shunned these suggestions on the basis of costs and the possibility of arousing considerable public hostility. The question as to whether the state had the right to intervene in the management of a private property was a highly debated and contested issue during this period, previously illustrated in the controversy over the 1894 Scab Act and the failure of legislation to promote the national eradication of scheduled weeds, such as burrweed.³⁰

24. Lounsbury, 'The Pioneer Period', 15.

25. See for example his reports: G25-1896, 30-31; G45-1897, 15; G49-1899, 2.

26. *CPP, RGE*, G25-1896, 30-31, 41-46.

27. 'Mally's Fruit Fly Remedy: A Brilliant Success', *AJCGH*, vol. 36, February 1910, 146-147.

28. *Ibid.*

29. *CPP, RGE*, G25-1896, 14-16; G45-1897, 23-28. The Western Board of Horticulture's general support for these measures was covered in reports of their meeting in the *AJCGH*, vol. 26, 26 April 1900, 563-564 and vol. 18, 14 March 1901, 365. The Eastern Province Fruit Congress gave similar endorsements at their 1905 conference, *AJCGH*, vol. 26 January 1905, 69.

30. Tamarkin, *Cecil Rhodes and the Cape Afrikaners*, 200-210; van Sittert, 'The Seed Blows About in Every Breeze'.

Nevertheless, from 1904 Jameson's government (1904-1908) agreed to introduce statutes to protect the interests of progressive horticulturists because of the significant intensification in orchard production and the growth in trade this was generating. After the South African War, there was a great boom in plant imports, primarily from the United States and Australia.³¹ The censuses of 1891 and 1904 also demonstrated a huge increase in the cultivation of certain fruits. Figures indicated that orange production had grown from over 24 million pieces of fruit in 1891 to over 34 million in 1904; apples from 12 million to over 20 million and apricots from about 9 million to over 33 million.³² In terms of trade the number of boxes of produce exported had risen from 7,706 in 1894 to 34,723 ten years later, representing an increment in value from £1,837 to £7,771.³³

To stimulate further developments in this industry, Parliament passed a bill in September 1904 to curb the proliferation of insects and parasites through imported plants, by restricting introductions to 'uncommon trees not procurable in the country and not related to native or cultivated trees of importance.'³⁴ The following year the government introduced the Nursery Inspection and Quarantine Act aimed specifically at protecting 'progressive fruit growers' by prohibiting sales of stock from infested nurseries. The efficacy of chemicals such as hydrocyanic acid gas to fumigate fruit trees had been proven, and this statute endorsed the chemical control of the environment by making its usage obligatory.³⁵

Neither law was universally welcomed. The import restrictions, intended to protect the interests of the consumer as well as the environment, were unpopular with those who profited from introducing cheap plant stocks at the end of the European growing season.³⁶ The Nursery Act, which empowered government officials to inspect private premises, was the subject of particular opprobrium. Lounsbury accused 'regressive' and predominantly Afrikaner farmers of obstructing these measures and standing in the way of progress, because they were afraid that the cost of cleansing the nurseries, run as a sideline occupation, would destroy their fragile businesses.³⁷ Once again entomological measures primarily protected the interests of larger producers. Ideological, political and scientific social engineering increasingly facilitated the capitalisation and consolidation of fewer farms on the assumption that that was the optimal way of furthering agricultural growth.

As a consequence of these statutes, Lounsbury emerged as an ardent enforcer of regulations, generating a copious amount of correspondence and subjecting every nursery in the colony to an annual inspection by one of his assistants. Only if the report were favourable would nurserymen be licensed to trade; otherwise individuals had to meet the bill for quarantines and fumigation. Satisfactory nurseries appeared in the Government Gazette; those that were not listed were, by implication, purveyors of unhealthy stock and the survival of such enterprises

31. 'Farm and Veld', *AJCGH*, vol. 21, September 1902, 209-210.

32. Figures taken from 1904 Census. *CPP*, G19-1905, clxxxiv.

33. Figures from C. Aucamp, 'Cape Fresh Fruit Industry', 87.

34. Cape Archives (hereafter CA), Entomology Department (ENC) 1/4/1, Government circular 1 February 1907.

35. Details of Lounsbury's fumigation experiments can be found for example in *CPP*, *RGE*, G45-1897, 14-17.

36. Lounsbury, 'The Pioneer Period', 23.

37. Lounsbury, 'The Pioneer Period', 21. Afrikaner farmers had also been the primary opponents of compulsory small stock dipping to deal with scab, see Tamarkin.

came under threat.³⁸ This suggests that personalities played an important role in determining the function of the Cape state. In spite of underlying structural weaknesses, tenacious officials such as Lounsbury seem to have had some success in enforcing their recommendations.³⁹

The extent to which entomological research and regulation alone contributed to a growth in the fruit industry is difficult to gauge, but what is clear is that between 1904 and 1911 there was an exponential growth in horticultural yields. The increase in insecticide usage during the first decade of the twentieth century indicated that many farmers perceived the important contribution that technology could make to overall production. Particular advances were made in peach output from around 22 million in 1904 to over 176 million seven years later. Oranges too increased to 70 million, apples to 74 million and apricots to 84 million. Again this was mirrored in an upturn in export returns, which reached 201,871 crates of fruit in 1910 and with it the creation of £34,798 worth of business.⁴⁰ By 1910 horticulture had developed from a nascent industry into a small, but rapidly expanding contributor to the national economy.

Apart from dealing with fruit pests, Lounsbury and his colleagues were also involved in research into ticks and insects that affected cereal crops as well as locust control. In some respects dealing with tick-borne diseases mirrored efforts to ameliorate the horticultural sector. Lounsbury endorsed a chemical approach to tick eradication through arsenical dipping and also backed legislation such as the permissive Cattle Diseases Act (1908) to encourage the adoption of this procedure. However, chemical prophylaxis, backed by some form of legislation did not always become the favoured, or practicable methods of insect control. This is clearly shown in the investigations and debates surrounding the treatment of the mealie stalk borer and the anti-locust campaigns.

The mealie stalk borer (*Sesamia fusca*) was a particular problem to maize cultivators residing in the summer rainfall areas of the Eastern Cape, as well as to farmers in neighbouring Natal and on the Highveld. The decline in maize yields during the 1890s was partly attributable to this pest, given that soon after his arrival in the Colony, Lounsbury identified this insect as a particularly urgent and exciting area of research. The recruitment of Charles Mally, son of an Iowa maize farmer, as entomologist for the Eastern Cape in 1899, further demonstrates the importance attributed to this cereal pest, given that he was specifically qualified and instructed to investigate this insect.⁴¹ The borer continued to cause considerable loss in the early twentieth century, with farmers reporting the destruction of 25 to 50 per cent of their maize crops between 1903 and 1905.⁴²

As a precursor to planning their elimination, Mally studied the life history of the insects, which revealed that this moth laid two broods per year. The larvae,

38. Correspondence pertaining to the Nursery Act can be found at CA, ENC 1/1/1-14.

39. Van Sittert, 'The Seed Blows About in Every Breeze', has discussed the weakness of the Cape administration to enforce weed eradication, for instance.

40. Census details from CPP, G19-1905, clxxxiv and the Union Census of 1911, UG32-1912, 1304-1305. Trade details from Aucamp, 'Cape Fresh Fruit Industry' 1886-1910', 87.

41. The 1904 census shows a decline in maize production during the 1890s. In 1891 the stated yield was 543,080 muids. Production reached its lowest point in 1896 at 216,394 muids but had recovered to 424,583 muids by 1904, G19-1905, clxxxi. CPP, RGE, G25-1896, 2 and G36-1900, 6.

42. C. Mally, 'The Mealie Stalk Borer', *AJCGH*, vol. 27, August 1905, 159-168.

which hatched during the spring and summer months burrowed through the stalks and into the cob. Once they had devoured the heart of one plant they moved onto the next, potentially destroying huge swathes of crops. The number of eggs laid largely depended on climatic conditions; warm, moist summers being particularly favourable. In Natal the entomologist Claude Fuller had already tried to kill the insects with insecticides and failed. Working with several progressive farmers in the Collingwood Valley near Grahamstown, Mally repeated these experiments and also found that the chemicals were ineffective because the moths were so well protected by the sheathes of the plant. As a result he sought a cultural solution. Research showed that the winter brood hibernated in the remains of harvested stalks between July and September. Mally therefore recommended that farmers burnt this residue in late August thereby eradicating the second brood, or alternatively, they could reap the stalks for ensilage. What was important was what Mally referred to as 'clean culture' and the removal of all possible habitats. In addition, he suggested that cultivators plant trap maize earlier than the rest of crop to encourage any surviving moths to nest there, so they could be destroyed before the field was sown.

Agriculturists in the Collingwood Valley who followed these recommendations noted a marked decline in the number of moths in subsequent seasons. These methods hardly altered over the next twenty years. Farmers in the important maize producing Highveld, where the borer was a particularly significant economic nuisance, readily adopted these measures. This cultural approach indicated that there could be no blanket method of insect control. Procedures had to be attuned to the habits of particular species and chemicals were not necessarily the simple panacea many entomologists hoped they might be.⁴³

In other parts of what became the Union of South Africa in 1910, the locust as well as the borer, was a major threat to crop production. The Cape suffered less than its neighbours from the depredations of the red and brown locusts, but nonetheless the latter species periodically caused localised devastation of plants and veld during the first decade of the twentieth century. The brown locust originated in the arid regions of German South West Africa and migrated southwards, invading the northern Cape and Karoo in 1903-04, 1906-07 and 1909-10. Farmers devised their own means of dealing with these predators, such as inventing ingenious traps to capture *voetgangers* (hoppers). Such methods were superseded on some properties by an arsenic and sugar solution, pioneered in Natal and promoted by Lounsbury.⁴⁴

Lounsbury believed that the government should do more than provide free insecticides and sprays. Inspired by his success at pushing for horticultural regulations, he hoped that he could persuade parliament to pass a law making the chemi-

43. Details of Mally's experiments appeared in *CPP, RGE*, G6-1904 and G62-1905 and his article 'The Mealie Stalk Borer'. In 1920 Mally produced a bulletin for the South African Department of Agriculture with similar recommendations, although the life history of the insect was far better understood. His work was referred to in R. Wardle, *The Problems of Applied Entomology* (Manchester, 1929).

44. C. Fuller 'Locust Destruction in Natal', *AJCGH*, vol. 16, 10th May 1900, 613-616; 'Locusts in the Colony: Collated Report by the Agricultural Department', *AJCGH*, vol. 26, February 1905, 257; C.W. Mally, 'The Destruction of Locusts', *AJCGH*, vol. 26, March 1905, 406-420; C.P. Lounsbury, 'The Locust Plague' *AJCGH*, vol. 31, August 1907, 168-169; C.W. Howard, 'Locust Destruction in South Africa', (*American Journal of Economic Entomology*, vol. 3, June 1910, 260-272.

cal eradication of locusts compulsory on all infested farms, as it was in the Orange River Colony. In the Cape elimination largely depended on the ability of farmers to co-operate with each other to deal with swarms. Sceptical about the likelihood of neighbours voluntarily achieving this, and claiming to speak on behalf of progressive farmers, Lounsbury argued:

The feeling amongst progressive farmers in many parts of the affected areas seems very strongly in favour of a compulsory measure inasmuch as the neglect of any one farmer to kill the swarm that hatches in his place generally causes more loss to others than to himself. The cost to the farmer need be trifling only, for one or two hours work will suffice for spraying that will be sure death to an average swarm.⁴⁵

However, on this occasion he was not successful in getting his proposed legislation endorsed by parliament. The intermittent and localised nature of locust infestations, when compared with the prevalence of other agricultural pests such as frugivorous insects, ticks, acari mites and weeds, diminished the extent of their deleterious importance in the eyes of many producers. When the question of compulsory eradication was debated in the Legislative Council in 1907, the Agricultural Minister, Charles Crewe commented: 'The farmer was not sufficiently acquainted with the pest for legislation of the sort suggested to be brought into force.'⁴⁶ Some pastoral producers opposed any prescriptive measures as they feared the arsenic would poison the veld and thereby their stock.⁴⁷ The fact that the cereal and fruit producing regions of the Western Cape were spared of locusts, as Lounsbury later acknowledged, deterred the government from facing the opposition that this regulatory and costly approach was likely to entail.⁴⁸

Although the *Agricultural Journal* reveals that there was some support in the Northern and Eastern Cape for obligatory eradication,⁴⁹ Lounsbury was unable to get the overall backing of the progressive community, as expressed through Farmers Congress and the Agricultural Union. Neither of these organisations passed resolutions demanding the destruction of locusts. This situation illustrates limitations to the authority that a scientific expert could command in both political and farming circles. Lounsbury succeeded in getting his horticultural regulations through Parliament because he had the endorsement of the major fruit growers associations and because these crops had the potential to contribute considerable sums to the colonial economy. He perhaps overestimated the amount of support he had amongst agriculturists, many of whom in reality could not see any financial rationale for an overarching anti-locust campaign. As a consequence, Lounsbury lacked the capacity to influence government policy. The issue of locusts also in-

45. *CPP, RGE*, G23-1908, 51-52. Lounsbury had also advocated compulsory extirpation in his report G6-1904, 7-9.

46. *CH*, 13 August 1907, 186.

47. *CPP, RGE*, G23-1908, 57.

48. Lounsbury, 'The Pioneer Period', 24.

49. 'Another Plea For Locust Destruction', *AJCGH*, vol. 26, February 1905, 271; A. Forbes, 'Locust Destruction', *AJCGH*, vol. 32, February 1908, 238.

dicates that although progressive farmers often advocated a statist and regulatory approach to the agricultural industry, this was not automatic and was contingent upon their perceptions as to what constituted the most immediate environmental problems.

Irrigation

In the minds of progressives, ameliorating production entailed more than the technological or, at times, the regulatory ability to deal with noxious insects. According to Walter Rubidge, a prize - winning merino and angora breeder from Graaff Reinet, increasing output depended upon more land being placed under irrigation. 'I am still damming,' he told his local farmers' association, and 'I maintain to this day if you want to save South Africa you must dam it.'⁵⁰

Irrigation was necessary because the Cape suffered from periodic droughts and even in good years, reliable and sufficient precipitation was normally restricted to the Cape Peninsula and the coastal escarpments. At the turn of the twentieth century irrigation for crops was largely limited to the District of Oudtshoorn, where ostrich farmers had pioneered the cultivation of lucerne, as well as the wine and fruit producing regions of Worcester and Robertson fed by the perennial Breede River.⁵¹ In the interior, in the Karoo and the northwest, farmers had tried to tap subterranean sources through experimental boring. However, the amount of water that could be pumped up by windmills was usually only capable of sustaining stock and could not usually guarantee the quantities needed to irrigate crops. Rainfall, when it fell on the hinterland, often descended in torrents, potentially causing severe erosion and the loss of valuable topsoils, especially in areas where the earth had been trampled by trekking livestock. Consequently, debates about water conservation and the condition of the veld were closely intertwined in the Cape.

However, the viability of hydraulic engineering could be precluded by factors other than erratic rainfall and difficult terrain. Farmers also faced deficient soils, the prospect of litigation over the distribution of water, as well as the prohibitive cost of materials, labour and expertise needed to develop schemes that might ultimately fail to provide a remunerative yield or even cover the costs of the initial outlay. Foreign hydraulic engineers often expressed surprise at the lack of irrigation in the Colony. In 1904, the American, C. Braine, commented that '[i]rrigation in this part of the world is in an embryonic state,'⁵² whilst Francis Kanthack (Director of Irrigation 1907-1910), who had worked on hydraulic projects in India, disdainfully attributed this to the fact that 'I have never met with, or heard of any white race who have less ambition to improve their material conditions for the benefit of themselves or future generations than the average backveld pastoral farmer of South Africa.'⁵³

50. Annual meeting of Zwart Ruggens Farmers Association reported in *Eastern Province Herald*, 30 January 1904.

51. *CPP, Report of the Director of Irrigation* (hereafter *RDI*), Webster Gordon, G41-1906, 16. Gordon estimated the following acreage was under irrigation in 1905: Oudtshoorn 23,264 acres; Worcester 14,459 acres; Robertson 9,068 acres. The 1911 census of Union of South Africa reported the same ranking.

52. C. Braine, 'Possibilities of Irrigation in South Africa', *AJCGH*, vol. 24, January 1904, 54.

53. F. Kanthack, 'Irrigation Development in the Cape Colony: Past Present and Future', *AJCGH*, vol. 34, June 1909, 647.

Nevertheless, the ideal of being able to scientifically transform barren landscapes into fertile fields and grassy pastures emerged as a powerful rhetorical image in the Cape towards the end of the nineteenth century, just as it did in the United States and Australia.⁵⁴ Progressive farmers expressed the need to conserve both soils and water by dispensing with deleterious agricultural practices and they consciously tried to distance themselves from those they labelled ‘unenlightened’ backveld farmers who failed to appreciate the vulnerability of the environment. Attention to the ecological effects of commercial farming became an apperception of progressive identity. To arouse awareness spokesmen used graphic and moralising expressions such as the ‘evils’ of sluiting, and the ‘ravages’ of desiccation. It was a language of catastrophe and crisis. Yet, concurrently, there lay a message of hope: the land could be revived through changes in farming practice and attention to scientific methods.

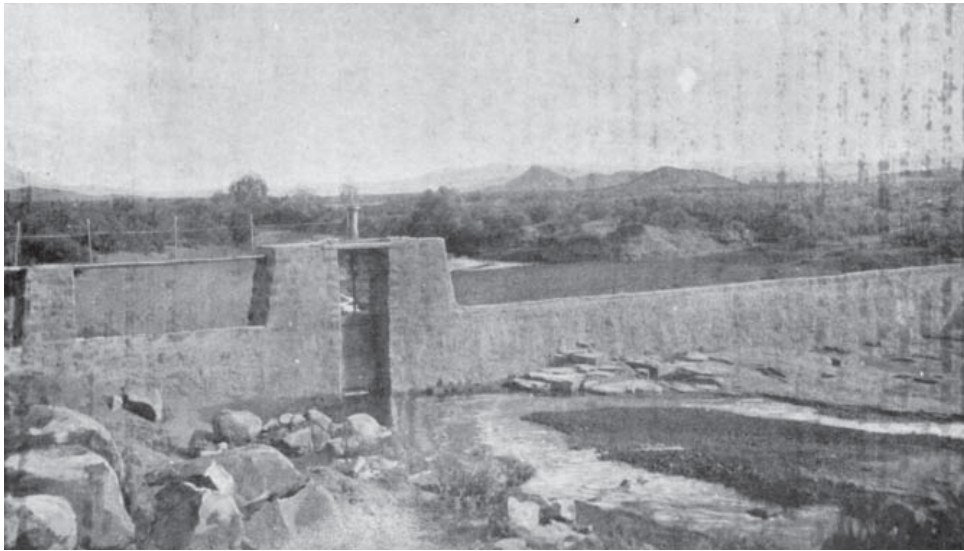
Such debates were not restricted to the settler press. In the Bunga African councillors discussed the ecological effects of the economic and social custom of cattle accumulation. Some criticised this practice as indicative of the continuation of backward, traditionalist pastoral practices in the Transkei, which had to be overcome through education. Councillor Veldtman from Butterworth, for instance, argued that stock constituted the main causal agent in the formation of sluits. ‘Men who were once rich are now poor through the destruction of their properties from this cause,’ he declared, and attitudes needed to change if the veld were to be sustained.⁵⁵

Further west, William Southey emerged as one of the most eloquent and well-publicised settler commentators in this vein. Based on his experiences at his Karoo farm of Varkenskap in the District of Middelburg, he told his audience of farmers at Cradock about his irrigation projects, using floodwaters from the Great Brak River to restore the veld. On the one hand, his lecture was an indictment of settler farming practices; yet, at the same time it spoke of ecological salvation. He described how his farm, purchased in 1871, once consisted of rich vlei capable of supporting much stock, yet over time the sheep had formed erosive tracks, which eventually became sluits, ever widening with each heavy fall of rain. Eventually the vlei disappeared and the land was reduced to a dry, desolate, donga. Thus was the state of the veld not only on his property, but also on many farms throughout the Midlands and the Eastern Cape. Such degradation was a consequence of ‘neglect, and nothing but neglect.’ If sluiting were to continue for another 100 years, ‘South Africa instead of being a country worth living in, will become a howling wilderness.’

Yet all was not lost: farmers could prescribe scientific and technological remedies to repair the land. At Varkenskap, he blocked up the sluits and trapped the seasonal floodwater from the Brak, which he channelled onto the land by a series of weirs and sluices. The freshet was used to inundate the ground, revitalising it both

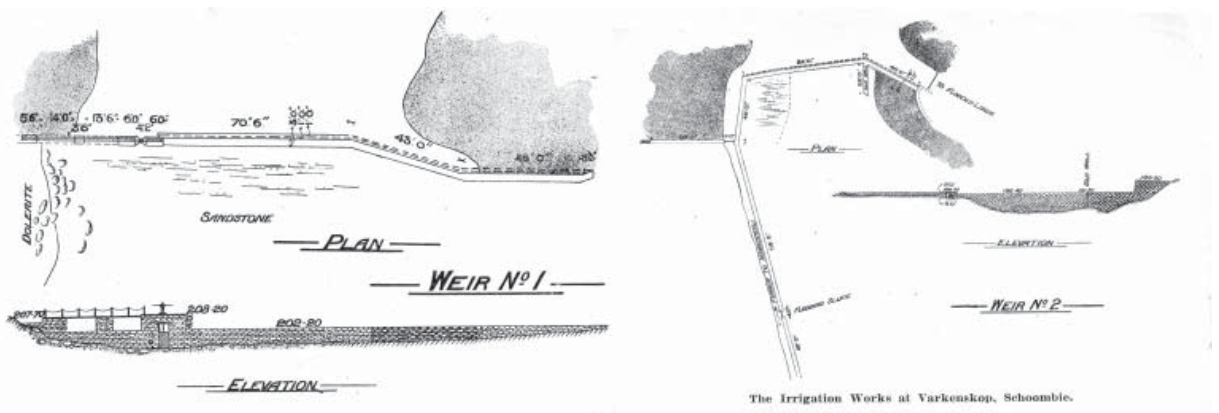
54. In the United States the government sponsored irrigation works in the western desert to create a ‘hydraulic society’, whilst in Australia closer settlements were founded along the Murray-Darling River Basin. D. Worster, *Rivers of Empire: Water Aridity and the Growth of the American West* (New York: Oxford University Press, 1985); Tyrell, *True Gardens of the Gods*.

55. *Report of Transkei Territories General Council* (hereafter *TTGC*), 1906, 5.



Figures 3 and 4: For William Southey irrigation epitomised progressive farming and the scientific taming of nature, preventing the country from becoming a ‘howling wilderness.’ Concerned that his farm Varkenskop (District of Middelburg, Eastern Cape) was becoming degraded, Southey constructed a series of weirs to reconstitute a former vlei and to provide water and soils for the cultivation of the fodder crop lucerne. The photograph and accompanying sketch of the first in these series of weirs (built in 1893) featured in an article on his irrigation plans that was published in the *Agricultural Journal* two years later.

(‘The Utilisation of Karoo Flood Water’, *Agricultural Journal of the Cape of Good Hope*, vol. 26, Jan. 1905)



in the deposition of silts and in the replenishment of the water table, thereby reconstructing the former vleis. Not only were the natural grasslands restored, but water was also used to secure fodder by providing irrigation for 120 acres of lucerne. Conserving floodwaters that would otherwise have flowed out to sea represented utilisation as opposed to waste, and the maximisation of available aquatic resources. Southey self-consciously promoted himself as the epitome of the progressive farmer and posed as an example to others as to what could be done to ameliorate the pastoral economy. His rationale was utilitarian and materialistic. 'Flooding the veld' he stated, 'means more grass, more stock, more money and prosperity to the country, bringing with it pleasure and comfort to those living in it.'⁵⁶

Some scientists also eulogised about the colony's potential. Bernard Ritso, the Chief Inspector of Boring, was a vociferous advocate of hydrologic mapping, urging the Cape government to follow the American example, since a hydrological survey there had 'given the most valuable assistance' to farmers and 'has assisted in no small degree in the triumphant progress and great prosperity of the country.'⁵⁷ He saw the future of the rural economy lying in the construction of thousands of boreholes, which were cheaper to build than catchment dams and being less reliant on the vagaries of rainfall, were more likely to prove successful in the long term. Enthused by the discovery of vast artesian wells in Australia, Ritso optimistically believed that a survey would reveal that the Karoo sat on top of a huge subterranean sea, water having for millions of years seeped through the porous upper layers of strata to be trapped by impervious rock hundreds of feet beneath the earth's surface.⁵⁸ Ritso expressed a romanticised belief in the beneficence of nature and the powers of human science to transform the colony into a second Eden:

no spectre of a withered and barren country need haunt the progress of the boring work of the Colony, nor should the fear of depleted reserves retard the exploration of deeper water levels, which if successful, may so change the arid and sunburnt Karroo as to transform it into the garden of South Africa.⁵⁹

Jameson's government did not respond by financing such a survey, but to some extent this ministry, like previous administrations tentatively supported the hydraulic ideal. In the 1880s the government acted upon the advice of the colony's first official irrigation engineer, John Gamble, who believed that the future lay in large dam works on a par with those in northern India.⁶⁰ Under Gamble's supervision, the first state dam at Brand Vlei, in Calvinia District was completed in the early 1880s, followed by irrigation settlements at Van Wyks Vlei and Douglas. These schemes were intended to transform the arid Northern Cape into wheat fields and provide a home for immiserated Afrikaner families, rendered landless by the

56. W. Southey, 'Flooding the Veld: A Remedy for the Ravages of Sluits', *AJCGH*, vol. 25, August 1904, 187-191.

57. B. Ritso, *Select Committee into the System of Deep Well Boring and the Development of Diamond Drills*, *CPP*, C1-1903, 27.

58. *Ibid.* and *CPP*, *Report of the Chief Inspector of Water Boring*, G69-1904, Annexure I.

59. *CPP*, *Report of the Chief Engineer of Water Boring*, G24-1907, Annexure C, 61.

60. *CPP*, *Report of the Hydraulic Engineer*, G12-1880, 3.

sub-division of some farms and the consolidation of others. However, twenty years later Merriman laconically opined that these settlements ‘can scarcely be said to have come up to the expectations of the founders.’⁶¹ In economic and environmental terms they had been a failure. Van Wyks Vlei, home to about 300 poor whites, became the subject of particular indictment. Inadequate drainage systems supporting the dam had rendered the soils brackish and made them totally unsuitable for most crops. Wheat monoculture had further exhausted the soils, whilst channels and furrows had silted up and water was wasted. Moreover the settlers were ignorant of modern farming methods and too poor to invest in fertilisers, new crops or even to pay for grazing licences. Disillusionment not only with Van Wyks Vlei, but also with Douglas, discouraged further investment in settlement schemes.⁶² The government cancelled two similar projects that had been proposed for the Northern Cape: the Thebus Dam near Steynsburg in 1905 and the Buchuberg Dam on the Orange River in 1907.⁶³ Hydraulic development in the Cape therefore proceeded on somewhat different lines to the United States and Australia, where state intervention was far more prominent.

The undertaking of irrigation projects was, in practice, primarily left to private individuals, the state playing the role of a facilitator of development rather than its planner. In 1877 Parliament passed the Colony’s first Irrigation Act, which was intended to help farmers improve their properties by providing cheap loans and enabling them to hire state-owned bore drills. In drawing up the legislation, Merriman had hoped that this would encourage farmers to pool resources and collectively construct large hydraulic schemes, capable of irrigating considerable areas of land. However, many farmers were reluctant to become indebted to the government, became exasperated by the long waiting list for a drill which they could only retain for 36 days, to dig a maximum of three holes, and they remained unconvinced about the viability of cooperative dam projects.⁶⁴

After the South African War, the failure of the 1877 Act to promote great strides forward in irrigation was a major concern of farmers and politicians who wished to accelerate the drive towards self-sufficiency. The appointment of the irrigation enthusiast Thomas Smartt to the position of Commissioner of Public Works in 1904 led to new administrative and legislative initiatives to try to overcome the inadequacies of the existing legislation. Smartt had already demonstrated his confidence in the benefits that irrigation could bring to an arid zone through the activities of his Syndicate in the Britstown District of the Northern Cape (see below). He was optimistic about the Colony’s economic future, informing parliament that ‘notwithstanding what some people had said, this country would yet become a larger exporter of produce through the building up of irrigation works.’⁶⁵

Smartt’s policies included creating a hydraulic sub-branch within the Department of Public Works. From 1904 the Colony had a permanent Director of

61. *CPP, Report of the Select Committee on Irrigation Settlements*, chaired by Merriman, A15-1906, iii. Merriman was a keen advocate of irrigation and had introduced the Colony’s first Irrigation Act in 1877.

62. *Ibid.*, Committee report, iii and the evidence of the Director of Irrigation, Webster Gordon, 1-16.

63. *CH*, 9 May 1905, 400; *CPP*, G34-1908, 26-27.

64. For example the testimony of Walter Rubidge before the *Select Committee on Water Boring*, *CPP*, A12-1904, 11-16.

65. *CH*, 15 June 1906, 156.

Irrigation, aided by a staff of regional engineers who carried out local surveys and advised farmers on prospective schemes. He hoped that proper scientific research, prior to any construction works, would make agriculturists feel more confident about such projects. Two years later, he introduced an Irrigation Act that had the backing of Farmers Congress and was intended to overcome agriculturists' criticisms about previous statutes, in particular with regard to issues of water distribution and the red-tape surrounding the acquisition of state loans.⁶⁶ Under this new law, farmers in a given district could form irrigation boards to plan hydraulic schemes, so long as they had the support of two-thirds of riparian landowners. They could also constitute river boards to control the allocation of water. The government established itinerant water courts to deal with disputes thus minimising the number of costly processes dealt with in the Supreme Court. The act was essentially permissive, leaving it up to local farmers and divisional councils to decide whether they wished to create these administrative structures in their area. The law also simplified access to loans. Advances were made to farmers and irrigation boards at a reduced rate of 3½ per cent interest and repayable over a period of 40 years. The surety for the loan was raised from 50 per cent of the value of the property to two-thirds of the enhanced value of the land. A customs rebate was offered on imported dam building materials as well as on oil used for steam pumped windmills. The government also abandoned the compulsory perusal of irrigation plans for requests under £500, since resentment at having to submit proposed schemes for official censure had constituted one of the main criticisms against the 1877 Act.⁶⁷

The response and outcome of this legislation was mixed. On the one hand, there were a greater number of applications for small loans so that farmers could independently buy or hire boring drills to supply water for their stock.⁶⁸ Between 1904 and 1911 agriculturists reportedly dug 5,384 boreholes, amounting to 7,513 in the Colony, and constructed 22,345 storage dams, making a total of 46,557. These figures represented a considerable escalation in the amount of land under irrigation when compared with the census of 1891. Between 1891 and 1911 the amount of land under irrigation rose from 146,085 morgen to 282,367. The largest increase in terms of morgen occurred between 1904 and 1911, when 85,967 were added to the latter total.⁶⁹ Some farmers had therefore improved the water supplies on their properties.

However, these developments did not meet the expectations entertained by irrigation enthusiasts who had hoped that far more agriculturists would wish to invest in irrigation. In 1908 Kanthack commented that the only real interest came from farmers in the Midlands and Eastern Cape who were planning to grow lucerne for their ostriches. He was critical of the apathy he found amongst people especially in the north, an area which, with better communications he believed, could become an important wheat producing area.⁷⁰ Farmers were also reluctant

66. Farmers Congress, *AJCGH*, vol. 30, April 1907, 537.

67. At the First Inter-Colonial Irrigation Conference at Robertson, J. Sauer provided an overview of the legislation and select committees that had reviewed hydraulic development between 1877 and 1909. *CPP, RDI*, G39-1909.

68. *CPP, RDI*, G37-1907, 9 and *CPP*, G36-1909, 9.

69. Figures from censuses of 1891, 1904 and 1911. G6-1892, 456; G19-1905, clxxxv; UG32-1912, 1254.

70. *CPP, RDI* G34-1908, 4-5.

to venture into co-operative schemes, as was clearly shown in the debates surrounding the proposed construction of the Ashton Canal near Montagu. Here some agriculturists hoped to take advantage of the region's fertile soils and the perennial waters of the Breede River in order to improve their vineyards and orchards and profit from the expanding internal and overseas fruit trade. Others wished to invest in lucerne and fodder crops to supply the pastoral sector. Initially 91 people expressed an interest in the Canal project. However, once Kanthack had drawn up his engineering plans in 1907, ten opted out because they were afraid of the cost and the fact that the redemption payments on the £500,000 loan would be passed on to the next generation. Twenty-five farmers refused to provide adequate security because they feared foreclosure. The project thus lacked the two-thirds majority needed to establish an irrigation board under the terms of the 1906 Act.⁷¹ The Cape government therefore had major problems in assuring many farmers, including those who were receptive to technological ideas, that the creation of irrigation boards was a secure proposition, even in regions where climatic, topographic and pedological conditions, together with access to potentially lucrative markets, appeared to favour this form of investment.

Nonetheless, there were a handful of farmers who were prepared to take the financial risk and engage in major schemes. In the Western Cape, one of the most enthusiastic proponents of hydraulic development was Hermanus van Zyl. Van Zyl was chairman of the Breede River Irrigation Board, the first to be set up in the Colony. Nineteen shareholders formed the Board in 1898 and obtained a state loan of £33,000 to construct the 21 mile Robertson Canal, together with a series of weirs and furrows, to draw water onto the riparian properties of the shareholders. Van Zyl advised his audience at the Robertson Irrigation Conference, that the average value of the land had risen from about £1 per morgen in the 1890s to £50 by 1909. This, together with the yields that emanated from the 2,500 morgen now under cultivation, he argued, would easily redeem the 40 year debt to the government. Van Zyl saw the future prosperity of the Colony as contingent upon the willingness of progressive farmers to renounce their tradition of individualism and to co-operate with their neighbours on similar schemes.⁷²

The largest irrigation project of that time in the Cape was funded entirely by private capital, and found in the District of Britstown, on the property of the Smartt Syndicate. Set up in 1895, the Syndicate owned four farms in the region, where Smartt engaged in breeding pedigree merino flocks and ostriches. The Syndicate provided him with the collateral to invest in irrigation so that he could diversify into lucerne production and horticulture. In 1899 the Houwater Dam, then the biggest in South Africa, was completed. Smartt's support for the political machinations of the mining magnate Cecil Rhodes secured his inclusion in the latter's will and enabled him to undertake more ambitious projects. By 1909 he had obtained over £100,000 in advances from the Rhodes Trust to build the

71. F. Kanthack, 'Report on the Proposed Ashton Canal Irrigation Project', *CPP*, G44-1907; 'Ashton Canal Bill', *Cape Times Weekly*, 24 November 1909.

72. 'Robertson Irrigation Scheme', *South African News*, 20 June 1906; *CPP*, *RDI*, G39-1909 Annexure F.

Ongers Dam/Smartt Reservoir.⁷³ Access to mining capital and Rhodes' imperial networks in London enabled the construction of substantial concrete dams, which would not have been possible in the Cape, had the Syndicate been reliant on state funding alone. The editor of the *Agricultural Journal*, Francis MacDermott, commented on the uniqueness of this project and reckoned that 'there are few schemes in this country to compare for magnitude and confidence with that of the Smartt Syndicate.'⁷⁴ Dam enthusiasts, such as MacDermott, saw the achievements of the Syndicate as a statement to others, demonstrating how an arid environment could be made productive through science and technology.

Overall, the belief that irrigation could precipitate a massive increase in arable production remained more of a modernising ideal than a general practice in the pre-Union Cape. Few farmers, even those who might call themselves progressive, had the capital or confidence to invest, on a grand scale, in these potentially risky and costly projects. The problems facing cultivators at the settlement of Van Wyks Vlei, in terms of salination and silting, served as a warning as to the potential limitations and problems incurred in large dam schemes. There were also highly publicised cases of hydraulic failure. The Rooiberg Dam, built near Kenhardt in the Northern Cape collapsed in 1900 just two months after completion. The local politician, Dirk Van Zyl, attributed this eventuality to the stupidity of foreign, state-employed contractors who were ignorant of the topography.⁷⁵ This incident must have shaken public confidence in the capability of scientists to successfully reclaim environments and might have made some farmers sceptical of the abilities of the new hydraulic sub-department. Nor had the state either sufficient revenues or, by the first decade of the twentieth century, the political will to finance catchment dams or to plan closer settlements. Lack of confidence at the top dissipated through the provinces and encouraged farmers to limit their irrigation designs to the creation of boreholes and smaller dams for utilisation on individual farms.

Silviculture

Unlike irrigation, which was largely left to individual farmers, the development of the Colony's natural and artificial woodlands fell under the aegis of the state. The ideology of conservation and landscape regeneration in this case came not so much from progressive farmers, although in general they endorsed official silviculture, but from the conservators who scientifically managed the forests.⁷⁶ The Department of Forestry, just like modernising agriculturists, wanted to improve yields, and in this case turn the woodland into sustainably maintained and profitable state-owned domains.

73. 'Agricultural Enterprise in the Arid Sections: The Smartt Syndicate Farms in the Britstown District', *AJCGH*, vol. 36, March 1910; 'Short History of the Smartt Syndicate 1884-1936', National Library of South Africa, Cape Town, Smartt Papers, MSB 473.3 (20); Alfred Milner Papers, Bodleian Library, Oxford, MSS Milner Dep. Reel 468.

74. 'Agricultural Enterprise in the Arid Sections', 322.

75. Van Zyl was Member of the Legislative Assembly for Clanwilliam. *CH*, 28 June 1903. The Rooiberg dam was also the subject of a critical report produced by a select committee in 1903 (*CPP*, A19-1903).

76. *Report and evidence before the Select Committee for Crown Forests*, *CPP*, A12-1906.

The Cape was, and is, not a densely wooded country, less than 1% of it being naturally forested.⁷⁷ From the 1880s the government nationalised the major forests in the Colony, which eventually fell under the administration of four conservancies - Western, Midlands, Eastern and Transkei. Some of the largest areas of indigenous woodland were to be found along the south coast, in the Midlands Conservancy, incorporating the Knysna (Outeniqua) and Tsitsikamma Forests, but woodcutters had vigorously exploited this area since the mid-eighteenth century.⁷⁸ In the west timber was largely limited to the highly depleted, yet valuable, cedar stocks near Clanwilliam. The acquisition by the Department of the Forests of East Griqualand and Tembuland in 1890, together with those of Pondoland in 1903, gave it control of prospectively the best silvatic resources in the Colony, providing opportunities for 'an extensive and lucrative forest industry.'⁷⁹ By 1906 there were approximately 500,000 acres of demarcated forest within the entire Colony. Of this only 50 per cent was forested; yet this Department, pending future afforestation projects, controlled the remainder.⁸⁰

The Cape Department of Forestry managed the demarcated forests according to silvicultural practices that had been devised in France and Germany in the eighteenth century and which had already been tried out in India.⁸¹ These procedures involved restricting felling to rotational sections, the evaluation of the economic value of arboreal species together with the cultivation of plantations to supplement indigenous timber yields.⁸² Several of the leading conservators including Ernest Hutchins and Joseph Lister had previously worked in the Indian and Burmese forests, where they had acquired a very statist attitude towards land appropriation and management. Hutchins fervently believed it was necessary for governments to control forests, even when the nationalisation of land was contested because 'private forests are liable to be sold according to the necessities of the owner.'⁸³ Demarcated forests, he reasoned, needed to be preserved for the nation for all time to provide vital timber for future generations. Private arboriculture could not fulfil this function as individuals aspired to obtaining immediate profits, whereas the state could afford to conserve and sustain a continuity of supply over the longer term.⁸⁴

Although most of the major forests had fallen under the aegis of the state by the early twentieth century, scientific silviculture was still very much in its infancy in the Cape. There was no overall head of department or overarching agenda. The four conservancies operated almost independently of each other, regional policy being based on the whims of the individual conservator. By the twentieth century, the contents of many forests had yet to be assessed, the working of sections

77. T.R. Sim, *The Forests and Forest Flora of the Colony of the Cape of Good Hope* (Aberdeen: Taylor and Henderson, 1907), 1.

78. See for example W. Immelman, ed., *Our Green Heritage: The South African Book of Trees* (Pretoria, 1973), chapters 3 and 4.

79. *Report of the Conservator of the Transkei*, A.W. Heywood, *CPP*, G55-1903, 141.

80. *CPP*, A12-1906.

81. Rajan, 'Imperial Environmentalism'.

82. William Schlich, Professor of Forestry at Coopers Hill London, described these procedures in his *Manual of Forestry* (London, 1889-1896).

83. D.E. Hutchins, 'Extra Tropical Forestry', *AJCGH*, vol. 26, February 1905, 175.

84. *Ibid.*, 172-176.

was applied haphazardly, and the department was largely ineffective at enforcing regulations aimed at preventing unauthorised access to the forests.⁸⁵

After the South African War, Hutchins and Lister demanded administrative reforms in the name of national development, which were born in part out of an intense feeling of insecurity about the future sustainability of sylvan resources due to excessive and unregulated felling in the past. Joseph Lister warned:

The world timber supply is rapidly diminishing, and the time is approaching when we shall be confronted by a timber famine. At this juncture, possible in twenty-five years, the state will be compelled to take up the question of silviculture on a huge scale, and then the general regret will be that the step was so long delayed.⁸⁶

Hutchins extended the argument and advocated that the Cape should work towards self-sufficiency in timber production instead of spending over £500,000 a year on imports.⁸⁷ In order to achieve this, he suggested that the Forest Department had to be centralised under a single head to ensure effective national planning. Jameson's government concurred and to Hutchin's annoyance, appointed Lister to the position of Chief Conservator in 1905. The greater importance now attached to timber supplies was emphasised by the detachment of the Department of Forestry, from that of Agriculture, to create an independent administration in its own right. As Chief Conservator, Lister drew up national working plans to regulate timber extraction, persuaded the government to increase the budgetary allocation for reforestation and founded a school of forestry at Tokai near Cape Town, to ensure that scientific training was pertinent to the colony's own environment.⁸⁸

However, knowledge of regional botany, topography and meteorology encouraged not the regeneration of an imagined indigenous environment but led to attempts to create a new, efficient landscape, based on the idea that some of the world's most economically useful varieties of trees could be acclimatised to the Cape. Hutchins in particular enjoyed experimenting with exotics and planted a variety of seeds from many parts of the globe. He selected species because of their apparent adaptability to the country's climate and soils, because they were rapid growing or because they had specific timber qualities. The Cape Peninsula, for instance, with its mountains and winter rainfall was considered the best area to carry out acclimatisation experiments using pines, and plantations such as Tokai and Kluitjes Kraal were set up in the 1880s for that purpose.⁸⁹ Hutchins marvelled at this creation of, in his view, an improved landscape commenting that 'it is easy to imagine oneself in Germany as one walks for half a day over acre upon acre of young pines, stretching over the rolling flats as far as the eye can reach.'⁹⁰ At this

85. *CPP*, A12-1906.

86. CA, AGR (Department of Agriculture) 709: J.S. Lister to C. Currey, 27 February 1902.

87. *Report of the Conservator of the Western Cape*, D.E. Hutchins, *CPP*, G55-1903, 3.

88. CA, AGR 763: Correspondence between J. Henkel and J. Lister. Evidence of J. S. Lister, *CPP*, A12-1906. In 1906 Parliament awarded £82,000 towards afforestation.

89. *Report of the Superintendent of Woods and Forests*, *CPP*, G32-1895. Tokai was founded in 1882 and Kluitjes Kraal in 1884.

90. D.E. Hutchins, 'Cape National Forests', *South African Philosophical Society Transactions*, vol. 11, 1900-1902, 59.



Figures 5 and 6: Notions of ‘efficient’ landscapes formed part of the aesthetic of Cape progressivism. These images show ideas of landscape transformations from a silvicultural point of view. The first is a scene from Millwood Forest, Knysna, a natural forest that consisted of a variety of indigenous species such as yellowwood, ironwood and sneeze-wood. From 1888 only certain sections of the forest were opened up for licensed felling. The second, a reproduction of a photograph of Tokai Plantation near Cape Town, shows rows of *Eucalyptus saligna* and *Eucalyptus diversicolor*. Conservators such as Ernest Hutchins experimented with exotic species such as eucalypts because they were a useful and fast growing source of hardwood. Plantations encompassed a move towards monocropping and an orderly rearrangement of landscapes in rows, as opposed for example to the apparent haphazard biodiversity of Knysna’s indigenous forest. The images are taken from the *Agricultural Journal of the Cape of Good Hope* (vol 26, 27, 175).

stage there appears to have been no real critique of the effects of monocropping on biodiversity and no sense of national identity linked to the preservation and re-creation of indigenous woodlands.

In respect of the Transkei, the regional conservator Arthur Heywood explained, 'all plantations are to a greater or less extent wattle plantations.'⁹¹ The Forestry Department cultivated wattle (acacia) to provide cheap, fast growing materials for African huts and kraals. By supplying an alternative form of timber, Heywood hoped to preserve for the settler economy indigenous species such as ironwood and sneezewood, which had traditionally been used for the construction of homesteads. Silviculturists assumed the right to tell African communities what timber they could and could not use, and tried to justify the appropriation of the natural woodlands by claiming they were meeting the needs of the local population.

Contemporaries not only regarded forests as a repository of timber but also believed that they played an important role in determining rainfall patterns and as a corollary the very survival of the agricultural economy. Hence debates about the links between forests and climate fed into wider concerns about veld degradation. Some people argued that trees encouraged precipitation to provide further justification for afforestation. The farmer Augustus Adendorff, for instance, claimed that landowners in the Stockenstrom District of the Eastern Cape had observed a 50 per cent decline in rainfall in recent years, a fact that he attributed to the effects of deforestation on the Katberg Mountains and the failure of the government to reforest this catchment area.⁹² The Director of Irrigation, Francis Kanthack, was convinced that expanding woodlands could arrest the process of erosion and sluiting. He suggested that the crowns of tress and the humus layer on the ground reduced 'run-off' and encouraged the absorption of water and its eventual percolation into perennial and intermittent streams, whilst the roots of trees helped to hold the soils together, curbing the extent of denudation.⁹³ Ironically, however, some of the exotic species that Hutchins and others had introduced to the Colony, in particular the fast growing eucalypts brought over from Australia, were eventually found to have a deleterious effect on the water table and starved the soil of its nutrients. Although Hutchins insisted that trees should not be planted without proper environmental research, the cultivation of this useful hardwood for mining props and sleepers, continued.⁹⁴

Concerns about both the economic and climatic role of tress led not only to an acceleration in afforestation during the early twentieth century, amounting to 35,000 acres of plantations by 1910, but was also used by the conservators to try to justify stricter measures regarding public access to the woodlands. These regulations were especially significant because they had a direct impact on the communities who lived and worked in the forests and altered their economic and cultural relationship with the natural world. Restricting access to these resources was also

91. *Report of the Conservator of the Transkei, CPP, G55-1903, 147.*

92. Evidence of A. Adendorff, *CPP, A12-1906, 57.*

93. F. Kanthack, 'The Destruction of Mountain Vegetation: Its effects upon the Agricultural Conditions in the Valleys', *AJCGH*, vol. 33, August 1908, 194-204.

94. Hutchins, 'Cape National Forests', 53-66.

indicative of the growing powers of an undemocratic colonial government. Rural populations from the Atlantic to the Umzimkulu protested about incursions from the Forestry Department. From the perspective of an official scientist, Kanthack claimed:

The enlightenment of the forest officers is naturally in advance of that of the public, who look upon the Forest Department as an unsatiable [sic] ogre, which is ever seeking to grab more and more land, much of which is unsuitable for profitable tree growing.⁹⁵

Opposition to the Department of Forestry came from a number of farmers who resented the loss of grazing rights, and in particular from the predominantly Afrikaner and coloured communities who worked as small, self-employed woodcutters in the Knysna Forests as well as African societies further to the east. In 1903 several bushcutters from Knysna had the opportunity to vent their grievances before a select committee convened to discuss the lot of the so-called 'poor whites'. Fred Darmant complained that most people could no longer eke out a living in the Knysna Forests, which were the most regulated in the Colony. In the past people had chopped trees of their choice, but the new system of economic management, introduced in 1888, involved the division of the Knysna woodlands into sections, of which only two were opened for felling each year.⁹⁶ Bushcutters needed to have a licence to operate in the allocated sections. Most woodcutters were unable to afford these permits, so large trading companies such as Thesens, which had access to considerable capital, bought up the licences. Thesens employed some of the woodcutters, but others were deprived of their customary work.⁹⁷ Some supplemented forestry with transport riding or farming. A bushcutter-cum-farmer, Johannes Barnard, explained that it was impossible to survive without this extra income. According to Barnard, woodcutters wanted to be independent of the merchant companies to whom many were in debt. They regarded merchants as outsiders and as greedy speculators who deprived bona fide inhabitants of work by employing cheap labour such as unemployed fishermen from the coast.⁹⁸ The conservators displayed very little sympathy with the plight of the woodcutters and supported large-scale capitalist production, which conservation in the Cape indirectly facilitated. Lister stated, 'I don't see how they could earn more money from the forest, because I consider that the employment of modern machinery is bound to kill and entirely oust the small woodcutter.'⁹⁹

Africans too resented attempts to restructure the use of the rural environment. In the Eastern Cape and the Transkei exclusion from the demarcated woodlands was a very emotive issue. The forests had constituted a source of building materials, fuel, fruits, medicinal herbs as well as game, and provided pasturage for livestock. Traditionally ingress to the forest had been freely available to the local

95. Kanthack, 'The Destruction of Mountain Vegetation', 196.

96. Evidence of F. Darmant, *Report of the Select Committee on Woodcutters Relief, CPP, A18-1903*, 56-6.

97. *Ibid.* Further details on the management of the forest were provided by the Member of the Legislative Assembly for George, Hendrik van Huyssteen, 2-10.

98. *Ibid.*, Evidence of J. Barnard, 30-47.

99. *Ibid.*, Evidence of J.S. Lister, 53.

people who could extract produce according to their needs. With the arrival of the colonial foresters, silvatic resources that had customarily been viewed as the free gift of nature were transformed into commodities, which were granted a monetary value, and access to which was restricted by law.¹⁰⁰

Forests in the Eastern Cape and the Transkei consisted of both demarcated and undemarcated woodlands. In the latter areas, chiefs and headmen, rather than the Department of Forestry, were responsible for the allocation of resources from the commonage. Only the fear of rebellion on a par with that which broke out in neighbouring Natal in 1906 deterred the government from also nationalising the commonage.¹⁰¹ Yet even here Africans were not allowed to chop certain species that had been given a particular commercial value by the conservators.¹⁰² In the demarcated forests, on the other hand, although it was still possible to collect firewood from the scattered twigs and branches on the forest floor, the use of axes to fell trees was prohibited and people were forced to pay for any additional timber that they might require. In 1906 the tariffs imposed on wood extracted from the demarcated forests, ranged from three pence for a bundle of wattles to five shillings for a wagon-load of kraalwood.¹⁰³ The Department of Forestry also banned hunting in the woodlands, unless each participant had acquired a 10 shilling licence, and ordered Africans to apply for permits to graze stock within the confines of a demarcated forest. In most areas Africans were liable to pay an annual rate per beast, the usual levy in the Eastern Cape amounted to £12 per annum for a horse or head of cattle and 12 shillings for a sheep.¹⁰⁴

Collectively, these policies enacted by the Forestry Department were highly unpopular because they challenged the traditional economic relationship between African societies and their communal woodlands. Both men and women resisted the controlled use of the forest, revealing their individual determination to retain access to the resources for which they were traditionally responsible. A.G. Potter, the District Forest Officer at Butterworth, reported in 1908 how women, whose customary job it was to collect firewood, were prepared to defy the regulations and steal timber. He also claimed they retrieved and smuggled out of the woodlands branches that men had illicitly severed with an axe.¹⁰⁵

Africans also challenged the conservators by grazing their animals and continued to organise large hunting parties without obtaining the requisite permits. In the Eastern Conservancy alone, 12,311 cattle were impounded for 'trespass', between 1902 and 1906. In the Transkei, the number of (unspecified) forest offences rose from 552 in 1902 to 884 in 1903, an eventuality that Heywood attributed to the Department's incorporation of the Mpondo forests in 1903.¹⁰⁶ This indicated

100. For a regional study of the impact of forest policy over a longer time period, see J. Tropp, 'Displaced People'.

101. CA, AGR 707: W. Stanford to Secretary of Native Affairs 5 April 1905; *Report of the Chief Conservator of Forests, CPP*, G24-1910, 21.

102. These trees were scheduled in the Forest Act, number 28, 1888.

103. *Government Gazette*, March 1906, 504.

104. CA, Eastern Conservancy (FCE) 2/2/9: J. Lister to C. Currey, 4 April 1904. CA, FCE 3/1/50: P. Harran to J. Lister, 3 March 1906; CA, FCE 3/1/58: J. Lister to C. Currey, 20 November 1902.

105. CA, Transkei Conservancy (FCT), 1/2/1/3: Report of A.G. Potter for 1908.

106. *Reports of the Conservators of the Eastern Cape and Transkei, CPP*, G55-1903, G26-1904, G50-1906, G39-1907.

immediate resistance to colonial control of the woodlands in Pondoland as people resented the unnegotiated seizure of their assets. The Department of Forestry saw these incidences as undermining their authority and Lister attributed this situation to the fact that resident magistrates failed to prosecute offenders adequately.¹⁰⁷ For the magistrates their agenda of keeping the peace and retaining the support of local chiefs and headmen was more important than acquiring the gratitude of the Forestry Department. This illustrates the extent of public tension over silvatic policies and the fact that there were serious divisions within the administration over conservation matters. It also demonstrates that there were limitations to the actual authority of the Forestry Department on the ground. Although highly intrusive, the ideology of the conservators was not passively accepted nor were their enactments necessarily all pervasive.

Despite instances of confrontation, there were nonetheless some Africans who supported the methods of the Forestry Department and expressed this through the Bunga. In 1904 the Bunga resolved in favour of state control of the demarcated forests and also planned wattle plantations of their own to provide timber for fuel, huts and kraals. By 1906 they owned six such plantations and managed them at a profit. In a sense this suggests that the Transkei élite had adopted the European principle of conservation through plantation. It also meant that these African leaders were able to regain some control over natural resources as well as manage their distribution amongst rural communities.

Responses to the ideology of conservation and the expanding powers of the state were therefore not monolithic, whilst the ideas and debates surrounding timber conservation and development also provide some insights into how the natural world was valued. After the South African War, the government accepted the arguments about resource exhaustion as articulated by the leading silviculturists, and granted the Department of Forestry greater organisational autonomy and a larger slice of the budgetary cake. The conservators saw this official recognition as an endorsement of their beliefs and methods and used this to legitimise their assumption that they had the right to seize communal assets in the name of progress and in fulfilment of the long-term economic needs of the settler population as a whole. This attitude, unsurprisingly, created tensions between the centralising state and rural communities who wished to maintain a degree of cultural and economic control over their local environment.

After Union, the 1913 Forest Act tolled the death knell for the independent economic opportunities of Knysna's woodcutters as employment was from then on limited to a small number of licensed individuals.¹⁰⁸ In terms of profitability the maturation of plantations was a long-term enterprise. Pines from Tokai, planted in the 1880s, reached maturity during the First World War, when the demands of conflict ensured they attracted a remunerative return. Yet the continual inability of the state to supply the market was reflected in the expansion of private plantations

107. Evidence of J. Lister, *CPP*, A12-06, 17-18, 31.

108. Grundlingh, 'Poor White Woodcutters in the Southern Cape Forest Area, 1900-1930' in R. Morrell, ed., *White But Poor: Essays on the History of Poor Whites in Southern Africa, 1880-1940* (Pretoria: University of South Africa, 1992).

from the 1940s.¹⁰⁹ The cost of managing the natural and artificial woodlands, together with unfavourable geographical and climatic conditions meant that forestry in the Cape was restricted to the coastal zones. This precluded any chance of fulfilling Lister's fantasy that 25 per cent of the country could be rendered suitable for trees.¹¹⁰

Conclusion

Promoting the development of the rural economy became an important priority for successive governments in the closing decades of the nineteenth century. In this they were influenced by the organised lobbying of progressive farmers who played a vital role in determining the nature of agricultural policies. Farmers Congress and the Agricultural Union, as well as the Western and Eastern Boards of Horticulture acted at the interface between commercial farmers and politicians, and the resolutions they communicated expressed the agreed needs of the leading members of the rural settler élite. These farmers articulated a language of progress that formed part of their cultural identity. Some, such as William Southey, consciously posed as role models to the wider community. The desire on the part of progressive farmers to see the recruitment of scientific experts, and at times state regulation of resources and agricultural practices, was shared by politicians of all economic backgrounds and party persuasions because agriculture already made, and could make an even greater, contribution to the national economy. Politicians and progressive agriculturists were united in their wish to see an increase in export output as well as the ability to furnish the local market with all the basic victuals the land and climate could support.

From the late nineteenth century there was a gradual increase in the types of expertise that were incorporated into the expanding colonial state. Many of the early scientists came from abroad. They brought with them foreign ideas and methods and helped to create networks with practitioners in the United States and other parts of the British Empire, as in the case of the introduction of insecticides, the acclimatisation of insects and trees and the planning of closer settlements. The way in which bureaucratic enlargement took place revealed a broadening in agricultural priorities. The importance of wool and mohair production in the 1870s led to the appointment of the first veterinarians. This was followed in the 1880s by the recruitment of foresters and hydraulic engineers, as the conservation of natural resources became an identifiable prerequisite for agricultural growth. In the 1890s, when the possibilities of creating a lucrative fruit market became more apparent, the government employed an entomologist. These applied scientists stood as agents of modernity, and were eventually joined by other professionals with a knowledge of pedology (soils), viticulture and agronomy, suggesting that the arable sector began to play a more significant role in political thinking by the early twentieth century. The work of these scientists also illustrated the discriminatory

109. Immelman, ed., *Our Green Heritage*, chapter 4.

110. Evidence of J.S. Lister, *CPP*, A12-1906, 21.

nature of the Cape state over allocation of both resources and expertise. The Agriculture Department focused almost entirely on the settler economy and with the exception of establishing wattle plantations, did little if anything to directly help African producers ameliorate their yields.

The founding of an Entomology Department in 1895 highlighted growing concerns about injurious insects. Lounsbury, and later his colleague, Mally, ultimately advocated as far as possible a chemical approach to pest control. Lounsbury entertained an intrinsically statist approach to environmental regulation, as did the silviculturists, and when he had the support of influential farming lobbies he succeeded in getting restrictive measures passed, such as the statutes dealing with plant imports and the fumigation of nurseries. The state also introduced laws of a different kind to try to encourage farmers to invest in boreholes and dams and to work together to establish larger irrigation schemes to dramatically increase food production. The limited success of government funded big-dam projects, as well as the capital needed to further such schemes deterred many farmers from engaging in what seemed to be highly risky and speculative ventures. Farmers preferred to restrict their investments to ameliorating their own holdings and during the first decade of the twentieth century there was an increase in this approach to land improvement. The creation of a nucleus of a future hydraulic department in 1904, together with the greater autonomy afforded to the forestry division after 1905, emphasised the growing importance governments gave to natural resource conservation. The Forestry Department benefited from an increase in funding, the appropriation of land for forestation as well as greater control over access to silvatic supplies.

The three themes dealt with in this paper - entomology, irrigation and silviculture - collectively illustrate key aspects of the progressive ideal and practice. Together they indicate a growing involvement of the state in many aspects of the rural economy - be it in the recruitment of professional scientists, the supplying of free arsenic to destroy locusts, the implementation of regulations to protect forests and orchards or the provision of cheap loans to develop irrigation. Dealing with insects, constructing dams and boreholes and the regeneration of timber supplies all required changes in land management strategies, the adoption of modern technology and ideas and a greater awareness of the need to protect scarce resources. As a consequence of this more scientific and conservatory emphasis and approach, yields did improve and continued to do so after 1910.