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The white labour forest settlement programme in South Africa, 1917-1938

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of whom became particularly interested in the forests of certain parts of the world. For instance, D.E. Hutchins pursued an interest in the pine species of Mexico and the Caribbean and was responsible for their introduction into South Africa. The performance of the Eucalypti was assessed by K.A. Carlson and T.R. Sims who carried out their own research at plantations in the areas for which they were responsible. The results obtained by these and other foresters were communicated to the head of the Department of Forestry, the Chief Conservator of Forests, in monthly and annual reports.[26]

Given that individual foresters had a broad empirical understanding of the tree species which could grow in their areas, the question arises as to how they applied it when judging the suitability of a site for afforestation. In all instances, the first problem facing the Department was the availability of land broadly suitable for afforestation. This was because, by 1923-24, there was insufficient suitable Crown Land to support the proposed planting programme of approximately six to seven thousand hectares annually. Although the area of unused Crown Land was at this time still quite large, much of it was either in areas too small to warrant planting or made up of unsuitable land such as the slopes

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26. See: South Africa, Central Archives Depot (CAD), Records of the Department of Forestry (FOR) 204, A331/3 "Conservator's Monthly Progress Reports - Natal." Also the series of bound typed reports in the Directorate's Central Library. Department of Forestry, "Department of Forestry, Annual Reports" (Pretoria, Central Forestry Library, typed and bound mss).

of the Drakensberg mountains.[27] Therefore, at the start of the programme and increasingly so as the years passed, much of the land suitable for afforestation was under private ownership and consisted of "farms" which had to be purchased.

The policy of successive governments of South Africa was not to expropriate land for afforestation but to wait until it came on the market. Although this sounds like a negative policy likely to restrict the rate of afforestation, such was not the case. Non-operating veld farms were continually being offered for sale during the 1920s and 1930s and, finding no buyers, were offered to the government. As a result, forest officers spent an appreciable amount of their working time inspecting land that had been offered to the Department as being ideal for afforestation.

The result of these circumstances was that though the foresters were often able to pick and choose from a number of farms, price and time of sale was not under their control. Planning, in other words, was difficult and the foresters generally had to put up with the fact that the most available and cheapest farms were also the most inaccessible. The suddenness with which land was purchased and the general remoteness of the sites were the most difficult factors that had to be overcome by forestry officers in the field.

During the years the settlement programme was in operation, there is the strong impression that foresters thought

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27. Department of Forestry, "Report of the Conservator of Forests, Natal Conservancy, 1921" (Pretoria, Directorate of Forestry, Central Forestry Library, bound typed mss, 1922), 19-20; _____, "Transvaal and Orange Free State Conservancy, 1928;" _____, "Annual Report for the Year Ending 31 March, 1930," 1-2; CAD FOR 262, FA453/10 "Unemployment Problem, Solution of by Means of Forestry Development," "Memorandum on Afforestation and on Development of Wood Industries," 27 September, 1933.

themselves pushed to get an afforestation project or a settlement started on a site as soon as possible after it came available to them. This fixed idea had a tremendous negative effect on the ability of the Department to plan its projects properly according to its own standards. What, if any, long term impact this had is hard to say. It certainly affected the forestry officers in charge of the settlements as they had continual calls made upon the time they should have spent mapping and planning their plantations by the need for close supervision of their gangs of untrained white labourers.[28]

Conclusions

This chapter has discussed the environment of South Africa in which the White Labour Forestry Settlement programme was established. It was shown that South Africa has a viable forest

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28. See: Department of Forestry, "Midland Conservancy Annual Report" (Pretoria, Central Forestry Library, typed and bound mss, 1918), vi; _____, "Annual Report, Transvaal Conservancy, 1920-21" (Pretoria, Central Forestry Library, typed and bound mss, 1921), 3-4; _____, "Report of the Conservator of Forests, Natal Conservancy" (Pretoria, Central Forestry Library, typed and bound mss, 921), 19-20; _____, "Annual Report of the Department of Forestry for the Year ending 31st March, 1922" (Pretoria, Central Forestry Library, typed and bound mss, 1922), 1-2, 19; _____, "Annual Report of the Department of Forestry for the Year Ending 31st March, 1923" (Pretoria, Central Forestry Library, typed and bound mss, 1923), 2; "Natal Conservancy" (Pretoria, Central Forestry Library, typed and bound mss, 1923), 8; _____, "Annual Report, Natal Conservancy" (Pretoria, Central Forestry Library, typed and bound mss, 1924), 1-2; _____, "Annual Report for the Year Ending 31 March, 1930" (Pretoria, Central Forestry Library, typed and bound mss, 1930), 1-2; _____, "Sabie Forestal District" (Pretoria, Central Forestry Library, typed and bound mss, 1932), 1; _____, Abridged Annual Report for the Forest Department (Pretoria: Government Printer, 1920), 3.

industry based, almost completely, upon plantation forestry. This industry would not have existed were it not for the lessons learned during the First World War about the unreliability of imports and the fact that the Department of Forestry's afforestation programme of the 1920s and 1930s demonstrated that plantations were an economic alternative.

In South Africa, the only suitable areas for economic plantation forestry are those with an annual rainfall in excess of eight hundred millimetres per annum. These areas are largely confined to the escarpment edges and hilly areas of the Cape, Natal and north eastern Transvaal. Despite the lack of accurate data about the natural environment of their land, South African foresters of the 1920s and 1930s were able to identify these areas of high rainfall and concentrated their planting programme upon them. Foresters of this era were also able to establish the suitability of different species for the environments found in the country. By the time of the White Labour Forestry programme, however, there was a lack of suitable state-owned land for economic afforestation. As a result, foresters had to rely on private lands being placed for sale. Interestingly, this did not hamper the progress of the programme. In fact it appears that so much undeveloped farm land was available for purchase that the foresters spent an appreciable amount of time assessing the suitability of areas offered to their Department for purchase.

Chapter Three

Working Conditions and the Process of Afforestation

Introduction

The objective of this chapter is to investigate the conditions of employment, the work environment and the work of the settlers. The establishment of thousands of hectares of plantations of introduced tree species represents a large-scale disturbance of the existing environment. Yet, strangely it is rarely considered as such. The methods of afforestation used in South Africa were developed and employed in Europe at a time when natural forests were being depleted extensively. Given this, afforestation in Europe has generally been viewed positively. Foresters, especially in Germany, have traditionally belonged to a profession with high prestige. Undoubtedly this was because their efforts were considered to be more of the nature of reafforestation---the re-establishment of forests destroyed as a result of human over-utilization. This positive attitude to the work has been carried to South Africa along with the methods used and, as a result, the degree of environmental disturbance is rarely questioned, or investigated. This chapter therefore serves

introduce the realities of afforestation in South Africa within the context of the White Labour Forest Settlement programme.

The chapter begins with a review of the conditions of employment to which the settler agreed when he joined the programme. This is followed by a section investigating the natural environment in which the settler worked and lived. As was noted earlier (Chapter Two), forestry in South Africa takes place in the areas of the country which have the highest rainfall. The damp working and living conditions were major influences upon the lives of the settlers and their families. The remaining sections of the chapter describe the different phases of work which went into the creation of a new forest. First, access roads were constructed and then the settlement. This was followed by many months of ground preparation culminating, during the wettest part of the year, in tree-planting. Immediately after an area was planted, gangs of men would be employed in maintaining it. Tasks here included replacing young trees which had died, weeding and fire prevention work. Because of the environment in which the trees were planted, the plantations were soon ready for thinning and, generally within twenty-five to thirty years, were ready for complete harvesting and the beginning of the next cycle.

Conditions of Employment

From the start of the programme in 1917 to the founding of the Department of Labour by the Pact government in August, 1924, settlers were recruited at employment offices operated by

the Department of White Labour division of the Department of Railways and Harbours. Prior to the 1922 Rand miners strike, recruitment was largely from the George and Knysna regions of the Cape although some settlers were from the Orange Free State and the Transvaal. One of the results of the strike was that a large number of settlers were recruited from the Witwatersrand. With the creation of the Department of Labour in 1924, recruitment was centralized through the network Employment Exchanges and Post Offices.

On recruitment, the settler signed a contract stipulating that he had read and understood the terms of employment. These required that he pass a medical examination, agree to stay in the settlement for at least a year and agree that the he was responsible for his and his family's "acceptable behaviour." The contract also stated that the levels of remuneration, hours of work and working conditions would be set by the Department. The settler was not allowed to own a car and was expected to behave in a sober fashion abstaining from excessive drinking.[1]

Prior to 1924, the hours of work and daily wages paid to settlers depended on the Conservancy in which the settlement was located. In that year, the Public Service Regulations were expanded to include the settlers. At the same time, the daily wage was set at six shillings and fourpence and it was decided the

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1. The first contract was drawn-up in 1916 and all subsequent contracts were copies with minor revisions. See CAD FOR 406 E230/8 White Labour Forestry Settlements, Privileges, Leave and Other, blank memorandum of agreement, March, 1916 and, FOR 186 A310/279/4 Unemployment Relief, memo, "Department of Labour, Conditions of Employment of Settlers on Forestry Settlements, circa 1925.

settlers would work an average of fifty hours a week unless they were on piece-work or task-work.[2] Holidays were given with pay according to schedule "F" of the Public Service regulations. Settlers accumulated sick leave at the rate of twenty days, on full pay, and twenty days on half pay for each three-year cycle they were employed by the Department.[3]

If they were working on daily wage, settlers were expected to start work early in the morning, usually at about 0500 hours. They worked nine-and-a-half hours per day, Monday to Friday, and usually Saturday mornings as well. Their day was broken into quarters with short intervals for rest and food between each quarter. If work had to stop for the day, due to rain for example, then the men were paid for the time they had worked up to the end of that quarter and were guaranteed a minimum of one quarter day's pay for "turning out." Towards the end of the programme, during the mid 1930s, suitable rainwear was issued to the settlers and it is assumed they were then required to work in the rain if at all possible. These general work and pay conditions lasted right through to the end of the study period and

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2. Piece-work and task-work are mirror images of each other. Piece-workers are paid a set rate for given amount of work; for example, so much per acre. Task-workers are paid a flat rate for the whole job. The difference is that piece-workers can earn more by working hard while task-workers just get extra time-off.

3. CAD FOR 406 E230/8, memo, Chief Conservator to Secretary, Public Service Commission, 14 August, 1929.

were still in force in the 1940s.[4]

The Work Environment

As was noted in Chapter Two, at the beginning of the programme, South African foresters believed that most of the country would be suitable for commercial forestry. In fact, this conception was never tested. Right from the start, the settlement camps were located in areas of high rainfall. Foresters were aware that these areas were not necessarily the easiest for out-door manual labour especially as planting operations were planned to take place during the months of heaviest rainfall. In fact, whenever possible, the trees were planted while it was raining and, if the season was one of low rainfall, planting was often postponed untill the following year.[5] In the summer rainfall areas of South Africa, this meant that the trees were planted while they were in the process of growth. From the workers point of view, this policy of planting in the wet season meant days of

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4. CAD FOR 186 A310/279/4, memo, "Department of Labour, Conditions of Employment of Settlers on forestry Settlements," circa 1925; FOR 366 E200/1 Forestry Settlements, Representations by Labour Department as a Result of Visits by Superintendent of Welfare Work, memo, Assistant Director of Animal and Crop Production, to Director of Animal and Crop Production, "Week 13th-18th October, 1941, in Berlin and Coetzeestroom Forestry Settlements," circa, October, 1941, pp1-2; FOR 405 E230/5 White Labour Forestry Settlements, Trading Sites General, circular number 1/1939, "Administration of Forestry Settlements, General Instructions," 1 April, 1939.

5. See for example CAD FOR 205 A331/3 Conservator's Monthly Progress Reports: Natal, Report, Conservator of Forests, Natal to Chief Conservator of Forests, 26 February, 1929

working in the rain on muddy, slippery hillsides. The foresters were only too aware that these conditions were not salubrious and it was for this reason that the Department took care to ensure the settlers passed a medical examination before they were allowed to join a settlement.[6]

Besides being located in the zones of high rainfall, the physical geography of the areas being afforested was rugged. Steep slopes were common and in some parts of the country the vegetation was heavy. In the winter rainfall area of the Cape, for instance, the predominate vegetation was "fynbos," grasses, thorn trees and forest remnants. Acocks classified the area as belonging to his "Pondoland Coastal Plateau Sourveld" grouping and remarks that it is the "densest veld in South Africa."[7] In the summer rainfall areas of Natal, on the other hand, ground cover before afforestation is described by Acocks as belonging to his "Ngongni Veld" type while that of the eastern Transvaal belonged to his "Northeastern Mountain Sourveld" and "Lowveld Sour Bushveld" classifications.[8] The northeastern Transvaal may have

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6. This was a condition of employment. See CAD FOR 406 E230/8 White Labour Forestry Settlements, Privileges, Leave and Others, "Regulations Governing White Labour on Afforestation Schemes," March 1916; FOR 184 A310/279/2 Unemployment Relief, memo, S.J. Scholtz, Secretary, Departmental Unemployment Committee, to Chief Conservator, "Otterford Settlement," 8 June, 1922; FOR 186 A310/279/4 Unemployment Relief, Memo, Acting Secretary of Labour to Chief Conservator of Forests, 25 May, 1926; FOR 405 E230/5, White Labour Forestry Settlements, Trading Sites, General, "Code of Rules and Instructions for the Administration of Forestry Settlements," April, 1939, pp6-7.

7. J.P.H. Acocks, "Veld Types of South Africa," in: Union of South Africa, Memoirs of the Botanical Survey of South Africa 40(1975), 19-20. The research undertaken by Acocks for this work dates from the 1930s and hence the classifications are relevant to the situation before afforestation took place.

8. Acocks, "Veld Types", 21-22, 25-27.

been naturally forested at some time in the past. Remnants of the forest could still be found on ridge tops but more usually in valley and gully sides and floors or surviving on the open veld in patches of dense thicket. The relatively open areas between the thickets were covered with grasses and thorn trees. This contemporary vegetative cover undoubtedly reflected previous land use patterns, the use of fire to create grazing in particular.

Differences in ground cover required different methods of treatment in order to reach pre-planting goals. Although the ground cover and climatic environment of the afforestation areas varied, the objective was to achieve a common condition of ground preparation immediately before the trees were planted. This involved the complete cultivation of the upper layer of the soil. Under this regime all trees, shrubs and grasses were removed and the soil cultivated to a fine tilth. This practice was followed on slopes up to thirty percent incline. On steeper slopes, the threat of soil erosion was recognized and strips, at right angles to the slope, were prepared.[9]

Access Roads and Settlement Construction

Given that most of the afforestation areas were on isolated farms, the first job facing the forester and his gang of settlers, was to construct a road system. No details are

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9. CAD FOR 188 A310/286/15/1 Piece-work Rates of Pay, memo: Conservator of Forests, Eastern Conservancy, to Chief Conservator of Forests, 30 November, 1923.

available on the methods employed for road construction but a sense of the process can be gathered from published and unpublished annual reports as well as archival material. Roads were laid out by eye and efforts were made to follow hill contours and ridge tops as much as possible.[10] Often the terrain did not allow this and roads had to cross the valleys at the most convenient site. In addition, the speed at which the programme was inaugurated severely stretched the Department's trained manpower and proper surveys and plans of operation were abandoned.[11] Roads were built using hand-tools such as picks and shovels and simple "cut and fill" techniques. The objective was create a graded road over which a span of oxen or thirty-two donkeys could haul a wagon of ten thousand pounds (approximately four thousand five hundred kilograms) capacity (see list of equipment in Appendix 1). Much of the digging and soil removal would have been carried out by the labourers while horse or mule drawn dam scrapers levelled soil dumped into fill areas. Progress would have been slow especially when rock outcrops had to be hand drilled or steep slopes had to be side-cut. The quality and experience of the labourers was crucial and many foresters found that settlers considered road construction to be "make work" and

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10. See the paper by Keets on forest survey methods in CAD FOR 340 A1126 Departmental Conference of Forest Officers (1921), January, 1921.

11. Forestry Library MSS "Annual Report, Transvaal Conservancy, 1920-21": 1-3; "Report of the Conservator of Forests, Natal Conservancy": 19-20; "Annual Report, Eastern Conservancy, 1922-23": 38; "Annual Report, Natal Conservancy, 1922-23": 8. South Africa, Annual Report of the Forest Department, Year Ended 31st March, 1923 (Pretoria: Government Printer, 1924), 1.

deliberately went slow.[12]

Once roads were constructed, the area to be planted was divided into compartments separated by fire breaks or "rides." Rides were generally one or two chains wide (one chain equals sixty-six feet or 20.117 metres). Graded slip and bridle paths were then made through the future site of the plantations. These were paths which would allow the inspection of the stands as they grew and, more importantly, allow thinnings to be easily removed. Construction of these paths was usually assigned to men working singly whereas wagon roads were constructed by gangs under the direction of a foreman. Because a settler could work on a stretch of path construction on his own, he was often paid at piece-work rates (average five pence per yard). At French Hoek, in the Cape, a good worker could construct sixteen yards of graded path per day while a poor worker averaged fourteen.[13] That these figures are relatively close together is probably a reflection of the popularity of the job. It was varied and required some individual skill and probably was not closely supervised as compared to the labour of wagon road construction.

At the same time as these preparations were going on, construction on the settlement proceeded apace. Generally it appears that, once a road into the settlement and plantation area

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12. For examples of reports on road making see: CAD FOR 184 A310/279/2 memo, Conservator of Forests, Natal to Chief Conservator, 4 May 1922; FOR 183 A310/279/1, memo, Chief Conservator to Chief Clerk, 11 March 1921; memo, A. de V. Brunt, Secretary for Public Health to Chief Medical Officer of Health, 19 November, 1920; FOR 204 A331/3, report, Conservator of Forests, Natal, to Chief Conservator of Forest, 11 May, 1922.

13. CAD FOR 188 A310/286/15/1, memo, Conservator of Forests, Western Conservancy, to Chief Conservator, "French Hoek White Labour Settlement: Piecework Rates of Pay," 6 October, 1922.

had been constructed, settlement construction received priority. Until the houses were finished, the gangs of men stayed in tents.[14] Sometimes, local African labour was used extensively for these early stages and the settlers did not appear on the scene until their houses were built. In the case of Tweefontein settlement, near the town of Sabie, the presence of African workers on the site after the arrival of the settlers caused problems. The settlers, who were largely workers from the alluvial diamond deposits in Namaqualand, complained that the Africans had slept in one of the settlers cottages during construction, thus contaminating it in some unspecified manner. In fact, investigation showed that the African labourers had used one of the partially constructed forester's quarters to sleep in and, apparently, this was considered all right.[15] Once the road network was completed, the settlement at least habitable and the plantation compartments roughly laid out, the work moved into its afforestation phase.

Ground Preparation

As noted above, afforestation involved major modifications to the environment of the area to be planted. The

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14. CAD FOR 183 A310/279/1 Unemployment Relief, memo Secretary for Lands to Chief Conservator, 16 November, 1920. Also, see the discussion on housing below.

15. CAD FOR 386 E230/E3/1 Tweefontein White Labour Forestry Settlement, General, memo Acting Conservator of Forests, Transvaal and Orange Free State to Chief Conservator, "Mr. L.J. Raubenheimer MPC Sabie: Complaints re Tweefontein and Ceylon," 5 April, 1930.

first job was to remove existing trees, shrubs and grass. Obviously, axes and saws were used to cut down the trees and shrubs (see Appendix 1). In some areas, the grass remaining on the land to be worked over was then burnt. If the land was flat enough and the soil suitable for ploughing, settlers grubbed out the stumps and a contract was then let for the area to be ploughed using spans of oxen.[16] Clearing the ground and removing the stumps (stubbing) were often let out at piece-work rates. The Department paid from ten shillings to three pounds, ten shillings per acre for the job. This allowed a labourer to earn from eight to sixteen pounds (average nine to ten pounds) per month. The remuneration from piecework compared favourably with what a labourer could earn on daily wage. If he worked the full twenty-five possible working days in a month, he earned seven pounds, eighteen shillings before deductions.[17] Piece-work rates for each job obviously took into account the density of the bush to be removed as well as the hardness of the ground. On the average, it took a white labourer from one and one-third to eight days to clear an acre of ground and prepare it for ploughing.[18]

Ploughing before planting was unusual. Generally, after the initial preparation, gangs of men used mattocks to break up

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16. CAD FOR 204 A331/3, report, Conservator of Forests, Natal, to Chief Conservator, 17 February, 1923, page 2; memo, Conservator of Forests, Natal, to Chief Conservator, re: "Piece Work rates of Pay," 1 August, 1923; memo, Conservator of Forests, Eastern Conservancy, to Chief Conservator of Forests re "Piecework Rates of Pay," 14 August, 1923. This last memo shows that, when the area was to be ploughed, even the roots of shrubs such as Protea spp and Widdringtonia spp were grubbed out before ploughing started.

17. CAD FOR 189 A310/286/15/2, South Africa, "Labour in Relation to Forestry," paper read to the Second Empire Forestry Conference, (1926): 3.

18. Ibid.

the turf. This task was referred to as "picking" and was carried out twice. Quite often, the ground would be gone over a third time and the clods of earth further broken down. This was called "pulverising." Piece-work rates for "first picking" were six pounds ten shillings to eight pounds ten shillings per acre while "second picking" only paid half that rate and pulverizing less still. Roughly eighteen to twenty-three days were required for a labourer to first pick an acre of ground.[19] Without a doubt breaking the veld using mattocks was extremely hard work. A few, the top wage earners on this task, earned twenty-two to twenty-four pounds per month from their piece-work efforts. In order to do this, these men enlisted the assistance of other family members or worked late on moonlit nights.[20] Bent over, hacking at the ground with a heavy tool for hours on end, six days a week these men worked hard. As one forester said,

> From 4.30 am until nearly 7 pm, is a tremendous days work and I doubt whether the men will be able to keep it up...One thing is certain, if a man picks over an acre of ground at Weza he certainly earns [seven pounds, ten shillings]. Strong native men rarely pick more than an acre per month. I have been over a lot of the picking and there has been no scamping, but the ground has been well turned over...I must confess that I was very sceptical at first about white men being able to beat natives at picking, but

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19. Ibid; FOR 188 A310/286/15/1, memo, Conservator of Forests, Western Conservancy, to Chief Conservator re: "French Hoek, Piecework Rates of Pay," 6 October, 1922.

20. CAD FOR 188 A310/286/15/1, memo, Acting Chief Conservator of Forests to Conservator, Midland Conservancy, re: "Piecework Rates of Pay at White Labour Forestry Settlements," 17 October, 1920. In contrast, settlers working on daily wages worked an average of fifty hours per week. FOR 187 A310/286/2 memo, Chief Conservator of Forests to Conservators, Midland and Western Conservancy, re: "Hours of Work for Labourers at Unemployment Relief Settlements," 12 August, 1922.

21. CAD FOR 204 A331/3, "Progress Report: Natal Conservancy, November 1923," (14 December, 1923): 2.

such is the case at Weza.[21]

In order for picking or pulverizing to be carried out, the area was roughly measured off into plots and assigned to the settlers by lots drawn from a hat preferably in the forester's office with, if possible, representatives of management present as witnesses. It was the responsibility of a foreman to inspect each man's lot and assess the quality of the work. Foremen often had large numbers of men to supervise, up to one hundred at a time. This was a consequence of the growth of the programme which had resulted in a dearth of experienced white men employable as foremen. Once a plot, or part of it, had been approved by the foreman as being properly picked or pulverized, the area was carefully measured for payment. As can be appreciated, this meant that the foreman was in a position to directly affect the amount of money a settler could earn on piece-work in any given period. Thus, the position of foreman was not an enviable one. Foremen were permanent employees of the Department of Forestry and had better housing and other fringe benefits not given to the settlers. Even so, they generally came from the same social class as the settlers. Because of this, settlers were quick to grieve about any sign of favouritism or perceived excessive fussiness by their foremen. The case of G.R.J. van Jaarsveld, a foreman at Jonkersberg in 1927 is typical. The settlers accused van Jaarsveld, who hailed from the Knysna region, of showing favouritism while inspecting picked over plots. They claimed that if a settler came from Knysna, he enjoyed a laxer inspection than

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22. CAD FOR 378 E230/B2/1 Jonkersberg White Labour Forestry Settlement, memo, District Forester, George, to Conservator, Midlands Conservancy, re: "Petition by Labourers Against Foreman G.R.J. van Jaarsveld," 23 December, 1927.

if he did not.[22] Such complaints, as in this case, were only solved through careful mediation with the men involved. The local forester, and sometimes even the Conservator, would inspect the ground and hold meetings with the men concerned. Often there was no real, tangible solution; it all boiled down to persuading people to work and co-operate with one and another and to accept the fact that nobody was infallible. In the words of the Reverend van der Horst, Superintendent of Welfare Work,

> The handling of men, especially Europeans of this class, calls for a great deal of tact and commonsense and an inexhaustible supply of patience. All officials...are sometimes tried beyond endurance...by the men but again the men, very often embittered by life's hard knocks and suffering from some inferiority complex, should have every sympathy and consideration extended to them. Only along these lines can harmony be achieved and satisfactory work be performed.[23]

All the areas worked over by the settlers were measured using a Gunter's chain. When measurements on slopes were required the horizontal distance was used. This was arrived at by using the surveyor's technique known as "breaking chain." Obviously, using horizontal distances and areas would short-change the labourer working on a steep slope who thereby cleared a much greater, "real" area. An allowance table was therefore worked out for slopes between fourteen and thirty degrees which increased the amount payable to the worker. This method was used because the total area planted was based on the "map" area of the site and the foresters clearly wished to avoid making technical explanations to

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23. CAD FOR 388 E230/E3/2 Tweefontein White Labour Forestry Settlement, copy of memo, Superintendent of Welfare Work to Secretary, Department of Labour, 2 December, 1930, p2.

the uninitiated.[24] Despite this, the settlers themselves were convinced they were in fact being paid according to the horizontal or "aerial" area they had covered. [25] The Gunter's chain naturally stretched as a result of all the pulling it was subjected to so it was checked against a woven linen tape kept in the forester's office. Adjustments to the chain were made in the standard way, that is, by removing the small links provided for the purpose.[26]

This information tells us about the evolution of forestry methods in South Africa. As discussed earlier, all the methods used were developed in the Cape during the nineteenth century. With the creation of the Union in 1910, the foresters from the Cape who were assigned to serve in the new provinces, naturally took their "technology" with them. The degree of ground clearance used in the Cape begs the question as to why it was required. The answer seems to be that it was developed to overcome two factors. The first and most obvious is fire. Cape plantations were largely in the winter rainfall zone and susceptible to fire in dry summers. In the Transvaal and Natal, fire is more of a winter problem but the complete removal of ground cover before planting was just as effective at preventing the burning of young plantations in this region as it was in the

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24. CAD FOR 188 A310/286/2, memo, Conservator, Eastern Conservancy, to Chief Conservator, re: "Otterford White Labour Settlement, Maximum Allowances for Slope," 30 November, 1923.

25. See, FOR 185 A310/279/3, memo, Secretary, Departmental Unemployment Committee, to Chairman, Departmental Unemployment Committee, 4 October, 1923.

26. CAD FOR 189 A310/286/15/2, memo, Conservator, Eastern Conservancy, to Chief Conservator, re: "Mr D.J. Steyn: Complaints re Piecework Rates etc," 1 June, 1928. In this instance the chain had stretched five inches after fifteen months of use.

Cape. The second reason for removing all the vegetation in the area to be planted was the problem of weeds. Although nursery methods suitable for South Africa were developed in the Cape, large areas of forest were originally sown in-situ. Small seedlings are even more susceptible than young plants to being choked by weeds and grasses. Complete removal of all competing vegetation was thus a means of giving the new crop of trees a head start. It should also be borne in mind that virtually all the species planted in South Africa at this time were introduced from abroad. Tree seed was expensive and often hard to obtain and it therefore behoved the forester to take every precaution possible to ensure the success of his afforestation programme. Labour, especially African labour, was cheap and plentiful and used to breaking ground and tilling soil using hand tools. Hence, the use of mattocks at a time when foresters in England were attempting to find ways to mechanize their site preparation methods. South African forestry methodology therefore reflected the situation in which other industries in the country found themselves. Items required from overseas were expensive and hard to obtain and this resulted in the large-scale use of unskilled to semiskilled labour to compensate.

Nursery work and planting

Having gone over the area to be planted at least three times as part of the preliminary preparation of the site, the settlers worked it up once more before afforestation took place.

The method they used in this instance depended very much on whether seed was to be sown in-situ or the area planted with seedlings. If seed was to be directly sown, the settlers were employed preparing "lines" in which the seed was sown. That is, using their mattocks, each settler further worked up a strip of soil a few centimetres wide so that it was a suitable bed for seed; very fine tilth and totally free of weeds. They would use stretched strings or light chain to keep the line straight and probably could complete six hundred to one thousand metres in a day's work.[27] This was a method of direct sowing developed in Germany during the nineteenth century. It is of interest to note that, by the start of the First World War, this method had been largely mechanized.[28]

An alternative way of sowing seeds in-situ was to prepare "spots" and sow the seeds in them. This method was very close to that employed when trees were planted directly. A special measuring chain was used to lay out the locations of the spots. Stretched across the area to be planted, tags attached to it were used to ensure that the spots were spaced equidistant from each other.[29] Up to about 1928, the Department's policy was for

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27. CAD FOR 189 A310/286/15/2, South Africa, "Labour in Relation to Forestry," p3.

28. Phillip Sieber, "Uher Naturlicke Denjurgung," Forstwissenschaftlich Centralblatt (April, 1914): 181-195. Sim notes that Huguenots in the Cape used a similar method only they sowed the seed thickly in a furrow cut in the soil. This method resulted in a stand that required a lot of work to thin it out and was very susceptible to fire. Later practice of tilling the soil and planting in spots may have evolved from this experience. T.R. Sim, Treeplanting in South Africa (Pietermaritzburg: Natal Witness, 1927), 350-52.

29. For an example of the chain and a full description of its use, see Sim, Treeplanting, 357.

the initial spacing of trees to be five feet by five feet or less.[30] This was the, then, accepted practice for planting trees in Europe. It was thought that trees planted this close together grew straighter and faster. Further, there was less need for replacement of early deaths (see below) and that the multitude of shoots meant that the leader shoots of dominant trees would be somewhat protected from insect attacks. This method also required that the plantation be thinned several times before it was mature. In Europe, there was a good market for thin poles and the products that could be made from them. In contrast, the South African experience was that the thinnings were hard to sell. This policy changed in 1928 after I.J. Craib published the results of his research with Black wattle which showed that a much wider spacing was better than existing practice.[31] From this date on, the minimum spacing was six feet by six and fast growing species such as Eucalyptus were spaced at twelve by twelve feet.[32] Regardless of whether the spots were to have seeds sown in them or trees planted in them, each spot was prepared the same way. An area about two feet in diameter in the already picked over soil was dug out to a depth of about eighteen inches. The soil was then worked into a fine tilth and left beside the hole to "aerate." When it came time to sow the seeds, or plant the tree,

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30. D.G.M. Donald, "A Study of the History, Practice and Economics of Forest Nurseries in South Africa," Annals of the University of Stellenbosch 40 Series A1(1965): 15.

31. I.J. Craib, "The Place of Thinnings in Wattle Silviculture and its Bearing on the Management of Exotic Conifers," Zeitschrift for Weltforstwirtschaft 1 (1934): 77-108.

32. Donald, "History of Forest Nurseries in S.A.": 15; Sim Treeplanting, 357. An immediate result of this change in policy was a decrease in the number of seedlings needed to afforest an given area.

the soil was scooped back into the hole.[33]

The decision as to whether the area should be planted with seedlings or seeded was made in response to a variety of factors. If the area was near a forest nursery, had its own, or there was good transportation to one, then seedlings were most likely planted. This was because there was a much better chance of success with two to four year old plants than with sown seed.[34] If the area was isolated, however, or if the seed was very cheap and abundant, then seed would be sown in-situ. Fire breaks of local oak, poplar or wattle, for instance appear to have often been broadcast sown on roughly prepared land.

The vast majority of the area afforested by the scheme was planted with nursery grown seedlings. Most settlements had their own temporary nurseries established near the townsites. During the period 1920-39, the Forestry Department raised approximately 240 million seedlings for planting on its lands. Nursery techniques were very simple. To establish the nursery, a large number of five gallon paraffin tins were first longitudinally cut in half making two, tray-like containers. Holes were punched in the tray bottoms for water drainage. The tins were then laid out in rows, packed tight together, with some type of light netting erected over them at head-height to protect the seedlings from the full force of the sun. Locally procured soil mixed with well rotted manure was then shovelled into tins.

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33. CAD FOR 188 A310/286/15/1, memo, Conservator, Eastern Conservancy, to Chief Conservator, re: "Piecework Rates of Pay," 29 December, 1925; memo, Conservator, Midland Conservancy, to Chief Conservator, "Queries and Observations on Cash Account for February, 1926," 1 September, 1926.

34. Sim, Treeplanting, 352.

Next, the seed was broadcast sown over the tins and a mulch of fine sand and manure lightly spread on top.[35] After germination, the seedlings were thinned to twenty-five per container. The containers were carried out to the afforestation area when the plants were, usually, two years old.[36]

The young plants were carried in their containers right up to the prepared spots where they were planted by the settlers, using hand trowels, one plant per spot. This method of planting was slow and laborious. At 1200 trees per acre, foresters estimated it took some two days work for each planter to cover an acre.[37] This system of raising seedlings and transporting them to the planting site has several obvious disadvantages. It used large quantities of prepared soil which was lost during planting. The containers filled with soil were heavy and required well built wagons to carry them out to the field. Once in the field, each container had to be man-handled over slippery, rough terrain to the planting site. Its advantages, however, outweighed these disadvantages. In South Africa during the 1920s and 1930s, the containers must have been extremely easy to obtain, especially at isolated settlements where paraffin was used for lighting and perhaps cooking. The nursery itself required very little preparation to establish; any flat area with a convenient water supply would do. After tree-planting was over, the empty tins

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35. Sims, Treeplanting, 353-54.

36. D.G.M. Donald, "South African Nursery Practice - The State of the Art," South African Forestry Journal 139(December, 1986): 36-47; _____, "History of Forest Nurseries in S.A.": 15-17. Sim, Treeplanting, 354-4.

37. CAD FOR 189 A310/286/15/2 South Africa, "Labour in Relation to Forestry," p3.

were returned to the nursery for cleaning and re-use. Further, the system was extremely robust and gave the young plants total protection up to the time of planting. At planting, even though up to one-third of the root system of each seedling was lost in the process of using the trowel to remove it from the tin, the plant generally survived with no noticeable effect on its growth. Lastly, the system was independent of the weather and seedlings, still in their tins, could be left in the field for a considerable time without effect. In other words, the systems ruggedness, simplicity and success overcame its clumsiness and expense.[38] Like much of South Africa's forestry practice at this time, this method of raising trees was developed in the Cape. Joseph Storr Lister, appointed Chief Conservator at the time of Union, was the man responsible. The technique was developed by Lister at his home and first used in 1876 on land near Worcester in the Cape which the Colonial government wished to afforest.[39]

Labour in the nurseries was all paid at daily wages. So far as can be discovered, no nursery work was contracted out at piece-work rates. The reason for this was that the settlers chosen to work in the nurseries were those who, it was judged, either lacked the aptitude or were not strong enough for site preparation work at piece-work rates. When it came to planting, however, all the able-bodied men in the camp joined in the work and were usually paid at daily wage rates. Piece-work rates were available, however, and it was up to the forester in charge

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38. This system is still used to this day. See, Donald, "South African Nursery Practice": 38; Sim, Treeplanting, 355-58.

39. Donald, "History of Forest Nurseries in S.A.": 10.

whether or not he used this method of payment.[40] In fact, nursery work was just one of several types of task which could be reserved for the less strong. These tasks included road maintenance, important and highly necessary in regions of high rainfall, transport driving, brick making and assisting the foresters with his survey work. If a settler was skilled as a carpenter, or as a blacksmith, these positions were available and paid higher daily wages than the norm. Further, as the settlements dispensed with the use of African labour (except for some particularly filthy jobs---see below), semi-skilled workers often had fellow settlers assigned to them as assistants.

Tasks after planting

After planting had been completed, the afforested area needed considerable maintenance during the years before it became productive. For a start, not all the newly planted trees would survive. For two or three years following planting, the area would be gone over and the dead seedlings replaced. This operation was known as "blanking". Generally nursery stock was used but, if the seed was sown in-situ, then excess seedlings would be transplanted.[41] The new plantation also needed weeding

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40. CAD FOR 189 A310/286/15/2, memo, Conservator, Natal, to Chief Conservator, re: "Piece Work on White Labour Forestry Settlements," 17 June, 1929; FOR 189 A310/286/15/2, South Africa, "Labour in Relation to Forestry": 3.

41. For an example, see: CAD FOR 204 331/3, "Progress Report, Natal Conservancy: October, 1924," 18 November, 1924, p2.

despite the fact its original ground cover had been stripped. Weeding was at first done by cultivation using hoes as the young trees were very vulnerable to choking. As they grew, the weeds could be cut or "slashed" with hand tools. Gangs of men armed with sickles or short bladed scythes would move across the plantation carefully cutting the grass and brush competing with the trees. The speed at which these jobs could be accomplished was one to seven days per acre. Obviously, the density of the weeds influenced the care with which the job had to be done.[42] The young plantation would have grown above the height of most grasses after about five years. For the following five to ten years, depending on how fast the trees grew, very little work would have been required. Other tasks included removing double leaders from species with that tendency but not much else. Of course, the wagon roads, bridle paths and fire-breaks would all have been maintained.[43]

Within twenty years of being planted, most of the plantations created by the settlement programme were producing thinnings. Some plantations were actually productive within a decade of being planted. This surprising productivity was a result, not only of the high growth rate of the young trees, but also of the density with which they were planted. In order to assure that the stand could continue to grow at a fast rate and not choke on its own density, probably close to one half of the trees would have to be removed in the first thinning. In early

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42. CAD FOR 189 A310/286/15/2, South Africa, "Labour in Relation to Forestry," p3. I am also drawing on my own experience as a forestry worker engaged on similar tasks.

43. See various reports in CAD FOR 204 331/3.

thinnings, the objective would be to allow a reduced number of trees to continue to grow. Subsequent thinnings would remove proportionally fewer trees as the objective in thinning would be to allow the stronger trees to remain by removing the weaker trees. In Europe, where this method of silviculture was originally developed, there was a ready market for all the products of thinning. Even the thin poles from a first thinning could be used for a wide variety of purposes. This was not the case in South Africa. Probably the only use the products of early thinnings were used for were fence droppers and perhaps firewood. Thus, although considerable volumes were removed from the plantations in the process of thinning, the value of the products was very low.

Discussion and Conclusions

These details about the work required to prepare the ground for planting contain information about poor whites and Africans, as labourers, as well as about the development of afforestation techniques in South Africa. What is also of interest is how hard African labourers worked for wages much lower than their white counter parts. Most Africans worked for daily wages as, according to the foresters, they did not favour piece-work.[44] While the white settler was being paid six shillings and fourpence

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44. The whole issue is discussed in depth in file CAD FOR 364 E40/1 Employment of White Labour in Forestry. Economic Aspect: Output of White, Coloured and Native Man, and also publicly in: South Africa, First to Third Reports of the Select Committee on Public Accounts (Cape Town: Government Printer, 1925), 248-55.

for daily work, the African received one shilling and sixpence to three shillings and threepence, depending on the task for which he was hired. Yet, the data presented above shows that white labourers needed the goad of piece-work in order for them to equal or exceed the amount of work carried out in a month by an African on daily wage. For instance, supposing that the highest wage was paid to Africans "first picking" areas to be planted, and supposing it took an African twenty-five days to complete an acre, then the cost per acre would be four pounds, one shilling and threepence. This sum would be just over half the average cost of whites on piece-work for the same job. It is not surprising then that the foresters favoured African labour and that when the recruitment of white settlers started to fail in the late 1930s, they were happy to return to it.[45]

The various jobs carried out by the settlers, or Africans working on afforestation, says a lot for the strength of character of these labourers. Consider that each labourer did not "first pick" just one acre of ground in a year. In fact, he worked up several acres and could expect to go three or more times over the ground. The data that would enable a calculation to be made of how much ground each labourer prepared in a year, no longer exists. But, it can be guessed that each labourer prepared somewhere between three and ten acres annually. This is a lot of drudging labour when one considers each acre took close to a month and that men worked singly when on piece-work. Certainly, it is not work that one would expect to be successfully completed by poor whites if their character was as portrayed by middle and

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45. Ibid.

upper class whites who were anxious to upgrade the lower classes.

In the early days of the programme, during the First World War, little thought was given to the fate of the settlers after the planting programme was completed or to the jobs that would be available for them. In Legat's plan of 1922, he advocated the establishment of permanent settlements with residents who farmed as well as working in the forest (discussed later).[46] Legat expected that, for two or three years after planting, the young plantation would require a considerable amount of labour. Settlers' main tasks would be associated with replacing transplants that had died as well as weeding the plantation.[47] After this stage, the plantation would enter a phase during which the trees would require little work as they grew to an exploitable size. This period was expected to last sixteen to thirty years. The Department anticipated that a much reduced workforce, about twenty percent of that required to establish the plantation, would be engaged in such tasks as road and path maintenance and fire protection.[48] According to Legat's original proposal, the surplus workers would use this period to establish their smallholdings and would earn most of their income from its products or from jobs in nearby communities.[49]

In reality, these expectations were not fulfilled.

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46. CAD FOR 187 A310/286, memo, Chief Conservator to Minister of Agriculture, "Relief of Unemployment Resulting from the Strike: Afforestation Proposals," 25 February, 1925.

47. Ibid, pp4-5.

48. CAD FOR 185 A310/279/3, memo, Secretary, Departmental Unemployment Committee, to Chairman, Departmental Unemployment Committee, 4 October, 1923, p15.

49. CAD FOR 187 A310/286, "Afforestation Proposals," pp4-5.