1921.

WESTERN AUSTRALIA.

REPORT

OF

THE FORESTS DEPARTMENT

FOR THE

YEAR ENDED 30TH JUNE, 1921.

Presented to both Houses of Parliament by His Excellency's Command.

[FIRST SESSION OF THE ELEVENTH PARLIAMENT.]

PERTH:

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1921.

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Forests Department,

Perth, 26th September, 1921.

The Hon. Minister for Forests.

Sir,

I have the honour to transmit herewith my Report on the operations of this Department for the year ended 30th June, 1921.

I have the honour to be,

Sir,

Your obedient servant,

C. E. LANE-POOLE,

Conservator of Forests.

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REPORT OF THE FORESTS DEPARTMENT FOR THE YEAR ENDED 30th JUNE, 1921.

1.—FOREST RESERVATION.

The area of State forests dedicated for all time to the object of growing timber is now 45,028 acres. This area must, in the light of our requirements and in comparison with the reservations made in the chief timber States in Eastern Australia, be regarded as very disappointing. Here are the figures:—

	acres.
New South Wales	6,831,119
Queensland	3,934,704
Victoria	4,162,573
Western Australia	45,028

As explained in previous annual reports, the greatest possible care has been taken to ascertain all the information available before recommending the dedication of State forests. To avoid any possibility of the inclusion of land capable of growing field crops to better advantage than timber, a close classification has been made of the whole of the jarrah belt. This work has been carried out by combined parties of Lands Department surveyors and foresters. The Lands officers have recorded all information necessary in order to enable that department to establish the quality of the land from an agricultural point of view, and the forester has recorded to every 10 acres the quantity of marketable timber standing, the quantity that has been removed, and the number of trees to the acre below standard size that will be ready for the axe in the course of the next 15 to 20 years. The foresters also recorded the state of the regrowth and the poles and piles. To make assurance doubly sure, each department plotted its own information on plans, so that there exists to-day a complete land classification of the whole jarrah belt, and a complete forest classification of the same area, both recorded on large scale maps. These two sets of plans have been carefully compared by officers of each department, and the areas which should be excised from the forests for land settlement purposes have been marked. Finally, the maps have been compared by the Surveyor General and by the writer, and agreement has been reached as to the boundaries of the proposed State forests. It is now two and a-half years since this classification was completed, and it is to be hoped that the final dedication of the forests will not be delayed very much longer.

The classification of the karri country has been continued, and the bulk of this belt has been finished. There remains only the strip of land to the East of the Shannon River to the Deep River and the country to the North of Nornalup Estuary and East of the Bow River. It is probable that a close forest classification of the Nornalup country will prove unnecessary, as a committee consisting of the Surveyor General, the President of the Town Planning Association, the Superintendent of Land Settlement in the South-West, and the writer, acting under instructions from the Hon. the Premier, reported on this area and recommended that practically the whole of the country which carries timber be reserved as a National Park.

Revocation of State Forests or Permanent Forest Reserves.—With the exception of the revocation of a permanent reserve for timber for settlers' requirements near Kumminin, no State forests of a permanent character were revoked. This particular reserve was much prized by the local residents, as it was the only source of timber for agricultural purposes for the future, and it was a matter of great regret to them that it was cancelled for settlement purposes. From a saw-milling standpoint the reserve was of small value, but from a general forestry standpoint it was of great significance, being one of the few remaining reserves in a very large area of cleared country. There is no doubt that as time goes on the shortage of timber for settlers' requirements, and even of firewood, in the wheat belt will be very pronounced, and it will probably be necessary for the people soon to make provision for their future timber supplies and for shade and shelter from the desiccating winds by creating large reserves and planting them with the very species that have been destroyed. Unless steps are taken there is a grave danger of the history of Mesopotamia, Algiers, large parts of China, and other once fertile agricultural lands being repeated in this State.

Excisions of Land from Timber Reserves.—Excisions of land from timber reserves for settlement purposes have continued, but in very few instances have they been carried out against the recommendations of the writer. In one case, land carrying timber to the value of £2,280 was alienated. It is true that the farmer cannot sell the timber to his own profit, but it is difficult to see how he is to farm the land without destroying the timber. In any case the alienation of purely forest country is quite contrary to the forest policy which has been laid down and accepted.

The practice of surveying land within timber reserves prior to the inspection by forest officers has been continued. It must be obvious that such a system results in loss of money, as much of the land surveyed is purely forest country and will be permanently reserved, and the boundaries of the State forest will rarely coincide with the rectangular surveys as carried out by the surveyors, so that the survey work is in large measure wasted.

Another result of the practice which, while not so apparent as the obvious loss of time and money, yet, equally undesirable, is the effect that it has on the officers concerned, who see their work wasted and, without analysing the cause, blame this department. The findings of the Royal Commission on Forestry regarding this particular aspect of forestry are as pertinent to-day as in 1903, when its report was published. They are as follows:—

> It is true that throughout the forests there are valleys containing rich pockets suitable for fruit culture upon which the orchardist may cast covetous eyes, and which doubtless might in time be granted for this purpose. But the Commissioner is strongly of the opinion that those lands should be dealt with only by the future

forest administrator, and not by the Lands Department, it being manifestly important that the Forests Department should first establish its working plans, providing the best lines of access to the forests for all time, without any hindrance through the prior alienation of lands.

Agricultural Bank Blocks and Forest Country.—As a result of the faulty system of selection of land for settlement purposes in the past, a curious position has arisen in regard to the blocks on which the Agricultural Bank has made advances. The bank has advanced sums to settlers who have taken up blocks of land which in certain cases consist largely, and in some cases entirely, of forest land; the settlers having failed to turn such land to agricultural profit have abandoned the blocks. The Bank's advances are, of course, made against improvements, which generally take the form of a fence, and of the ringbarking and partial clearing on a small portion of the land of what in most cases is the only crop the land is capable of producing. In such cases it is out of the question for the Bank to expect to see its advances repaid, and the only way to recoup itself is by the sale of the timber. An arrangement has accordingly been arrived at under which the Forests Department takes over such a block and the mortgage, either paying off the whole advance if the mature timber is sufficiently accessible to be readily marketable, or guaranteeing the interest until the timber is sold. It is a curious situation, for the Forests Department is obviously paying for something which is called an "improvement" under the Land Act, but which in reality lowers the value of the asset from a forestry standpoint.

Timber Reserves in the Goldfields.—Large areas of land in the goldfields have been reserved in the past for the supply of mining timber and fuel for the use of the gold mines. Unfortunately, these reserves have been termed "State Forests," which, now that the Forests Act has been passed, is a misnomer. A State forest is a permanent reserve only revocable by Parliament, while these mining timber reserves are of a purely temporary nature. A recommendation for the alteration of the name from State Forest to Timber Reserve is under consideration.

2.—DESCRIPTION OF STATE FORESTS.

The following list of the State Forests shows their locality and area:—

State Forest	No. 1 ...	1,229	acres	Tuart
,, ,,	No. 2 ...	4,612	,,	,,
,, ,,	No. 3 ...	537	,,	Jarrah
,, ,,	No. 4 ...	37,950	,,	,,
,, ,,	No. 5 ...	700	,,	Karri and Jarrah
Total ...	...	45,028	,,	

State Forests Nos. 1 and 2 comprise the prime tuart belt between Capel and Wonnerup. The bulk of the area has been very heavily cut over in the past, mainly for the supply of wagon scantling for the construction of the rolling stock of the Government Railways. These two State forests are the subject of Working Plan No. 2.

State Forest No. 3 comprises a small area of jarrah which was alienated in error in the past and reverted to the Crown; it is situated in Collie district.

State Forest No. 4 comprises the whole of the Collie coalmining leases. It carries jarrah timber, and has been heavily cut over both by sleeper hewers and the coal mining companies for pit props. It is the subject of Working Plan No. 4, under which the forest is being converted into even-aged pole woods.

State Forest No. 5 comprises two Agricultural Bank blocks which were alienated but abandoned. One is purely forest country and the other contains agricultural land, and has been taken over for the purpose of a forest station.

Purchase of Forests.—The following areas of forest were purchased with a view to their being declared State Forests or Timber Reserves:—

A.—Sussex Locations 19, 25, and 64—75 acres, tuart forest.

B.—Murray Location 709—15,344 acres, jarrah forest.

A.—These blocks, carrying tuart timber, will be added to State Forest No. 2.

B.—The negotiations for the purchase of this location, which carries on its western half a valuable jarrah forest, were undertaken by the State Sawmills Department, which required the area as an addition to its sawmilling permit 79/11. The Government, however, decided that the land should be held by the Forests Department, and a permit issued to the State Sawmills Department for the right to cut timber when it was found necessary to do so. The purchase of this block absorbed £8,000 of the Loan money provided for the Department (see Appendix 1c).

3.—REVENUE AND EXPENDITURE.

The gross revenue (see Appendix 1a) amounted to £75,469, and the expenditure from Consolidated Revenue Funds (see Appendix 1b) to cover the cost of administration, together with interest on all loan moneys expended since the inception of the department in 1895, and all charges paid for services rendered by other departments of the State during the year amounted to £19,159, leaving a net revenue of £56,310. This sum, under Section 41 of the Act, was divided in the proportion of 2/5ths and 3/5ths between the Treasury and Forests Department. The sum available for forestry work, therefore, amounted to £33,786, in addition to £22,876 brought forward from last year's revenue, making a total of £56,662, while £22,524 went to the Treasury. In addition to the above, loan money to the extent of £11,742 was made available for the purchases of land and for the formation of pine plantations.

Analysing the revenue (see Appendix 1a), the largest amount was paid by holders of sawmilling and other permits, viz., £42,104. Next in importance was the revenue from sandalwood, £17,653, then rents paid by Millars' Timber and Trading Company for their timber leases, £7,200. Inspection fees supply £4,018, next licenses for cutting fuel and mining timber on the goldfields, £574, Millars' Timber and Trading Company again figure in the amount of £697 paid as rent on timber concessions. and, finally, miscellaneous revenue amounting to £3,223, make up the total of £75,469. These figures throw an interesting side light on the very disproportionate charges paid by holders of timber cutters' rights. Millars' Timber and Trading Company hold 590,314 acres of best forest country, and pay as lease rents for 215,081 acres £6,960, and as concession rents for 375,233 acres £697. while the bulk of sawmill permit holders hold 788,414 acres and paid £32,723, and the small sawmill permit holders have rights over 192,461 acres and paid £5,188.

Having in view the fact that from 1895 to 1918 the whole revenue of the department went into the Treasury, and no money whatever was spent on the jarrah and karri forests, there is a very great leeway to make up, and it will be necessary to increase the royalty charges considerably in the near future. Prices obtained by private owners have been everywhere in excess of the prescribed royalty charged by the department, and in some cases have been twenty times that royalty.

It will not be possible to raise the prescribed royalty to the level of private property timber, owing to the fact that the largest holder of timber rights from the Crown is under no obligation to pay royalty, but merely pays a nominal lease or concession rent. It will only be when these rights expire that the State will obtain the true value for its asset.

Turning now to the expenditure, this is divided, as will be seen above, into three categories:—

A. *Administrative Expenditure.*—This is voted by Parliament with other departmental votes. The amount voted was £13,754, and the amount expended £16,129, excesses amounting to £2,375 having been authorised by the Treasurer. These excesses were due to the increases paid to officers and to the general heightened activity of the department due to the large increase in the timber trade. Three additional timber inspectors were appointed to meet the demands of the export trade.

B. *Forest Expenditure.*—The sum provided for this is arrived at by taking three-fifths of the net revenue, plus £22,876 brought forward from last year's revenue. With the exception of a small balance carried forward for next year, it was expended as shown in Appendix 1d. The scheme of expenditure was submitted to Parliament and approved, and the works undertaken, and the actual moneys were in accordance with the Forests Act, also submitted to and approved by the Hon. Minister for Forests.

It will be seen that the largest sum was spent in liquidating a part of the loan moneys which had been spent in the early days prior to the Forests Act. The sum liquidated was £15,000, leaving a balance of £34,064, on which the department must find interest and sinking fund as a first charge in the calculation of net revenue.

Working Plan No. 1 absorbed £9,864, which was expended mainly on roadmaking and firebelt cutting, the division of the area into compartments, and the establishment of a nursery.

Next in importance is the work undertaken in connection with Working Plan No. 2. A sum of £8,842 is now represented by the permanent asset of a small mill and buildings for dealing with the tuart, which, under the working plan and for sylvicultural reasons, must immediately be converted to the best use, viz., wagon scantling for the Government railway workshops. A description of this and the other working plans will be found in Section 7, Progress of Working Plans.

Working Plan No. 3 absorbed £1,588, which was expended on firebreak work, regeneration, clearing, and the sowing of pines.

Research work is an item of expenditure which absorbed £2,438, the largest item being the further work on the kiln drying of karri, on which £972 was spent. The Powell process investigations absorbed £200; botanical and entomological work £550.

The classification of the karri country between Nannup and Pemberton and to the east of the Jarnadup-Pemberton line absorbed £5,399. The propagation of sandalwood and investigations into the nature of the sandalwood trade cost £868.

C. *Loan Expenditure.*—Loan moneys were provided for two purposes, purchase of land and pine planting. The former absorbed £10,654 and the latter £1,087, or a total of £11,741. (See Appendix 1c.)

4.—EXISTING RIGHTS AND PRIVILEGES.

It will be seen from Appendices 3a to 3g and 3h that the right to remove forest produce is held under various tenures. During the year under report an additional area of 81,040 acres was granted under sawmill permit and 13 permits over 37,547 acres were cancelled. In addition, miscellaneous permits were granted, the largest issued being the right to remove sandalwood from the Gascoyne district for use solely in the distillation of sandalwood oil within the State. This covered 44,800,000 acres. Also 1,000,000 acres were granted for the removal of blackboy and 4,400,000 acres for tan barks.

The only alteration in connection with the timber leases was the surrender by the Timber Corporation of their lease near Greenbushes and the taking up of a permit in lieu of it, under Section 6 (b) ii. of the Forests Act. The surrender of this lease leaves Millars' Timber and Trading Co. the sole holders of all concessions and leases, covering an area of 590,314 acres.

The difficulty of administration owing to the various forms of tenure under which sawmill companies hold rights has been alluded to in the section of this report dealing with Revenue. To make the position clear, it must be explained that rent only is paid on concessions and leases, while permit holders pay a royalty on the actual timber they cut. The rent derived from concessions is a very small amount, viz., £697, for an area of 375,233 acres. The charge for timber leases is £20 per square mile, and totalled £7,995. The permit holders, under the Land Act (Appendix 3e), pay a royalty of 0.5d. per cubic foot on all timber cut and this may be raised at any time. The permits under the Forests Act are sold by tender or auction and, in spite of the fact that none have been granted except in cut-over country—for the small area of virgin forest still without any sawmilling encumbrance is being zealously reserved for the future—prices ranging up to 2d. per cubic foot were realised. While it is possible to raise the royalty paid by permit holders under the Land Act to the market value of the timber as ascertained by auction sales of other permits in the district, and there are very strong arguments for doing so, it is not possible to raise the rents on concessions and leases to the same level. The result is that, while it will be possible to raise the royalties on permits considerably, they cannot be raised beyond a figure which would place the holders in a competitively impossible position with the firm which holds all the concessions and leases. To add to the difficulties of administration, the department has not the same powers of regulating the cutting on concessions as it has on leases and as it has on permits. On concessions the power of making regulations is so restricted that no regulations of any importance can be passed. On leases it is possible to protect immature timber, but beyond that all important regulations would be *ultra vires*. On the permits there is complete power to make any regulations whatever. Just as in the case of the royalties, it is not possible to impose regulations on the permit holders to the extent that is necessary for the welfare of the forests, for to do so would be to

put them at a hopeless disadvantage with their more advantageously placed competitors. It will be seen, therefore, that, until the expiration of the bulk of the concessions and leases, it will not be possible either for the State to obtain the true value of its timber or for the department to carry out the necessary reforms in our present very wasteful system of exploitation, and these disabilities affect not only the concessions and leases but all other forest tenures. The seriousness of the situation was apparent to the writer very soon after his appointment to this State, and the only solution was to try and bring all forms of tenure to that governing permits under the Land Act. Accordingly, when drafting the Bill for a Forests Act, the writer saw to it that no clause was inserted that could by any means extend the rights held by concessionaries and leaseholders. Unfortunately the war gave the holders of these rights an apparent claim to special consideration, and, in consequence of this and through the pressure brought to bear by this very large vested interest, an amendment was brought down by the Minister in charge of the Bill, which gave the holders of the concessions and leases the chance of extensions. The amendment in its original form read—

The Governor may—

(a) extend the term of sawmill permits granted under the Land Act Amendment Act, 1904, so far as the operations thereunder have been temporarily discontinued in consequence of the present state of war; and

(b) so far as the operations under any existing timber concession or timber lease have been temporarily suspended in consequence of the present state of war,

(i) extend the term of such concession or lease subject to payment, during the period of such extension, in lieu of the rent thereby reserved, of a royalty on all timber acquired under permits, and to the regulations in force for the time being, subject to the proviso to section forty-one: Provided that the rent paid during the period of temporary suspension of operations shall be credited to the lessee and apportioned over the period of such extension.

The writer opposed this amendment, as it is obviously detrimental to the interests of the State as a whole, as this particular firm is by no means the only interest within the State that has suffered through the war, and the repayment of lease rents is obviously a gift. The significance of that portion of the clause dealing with regulations was not clear at the time. Both the Crown Law Department and the Minister, who was also Attorney General, assured the writer that regulations could be passed to govern the cutting of timber on the concessions and leases. Merely for sake of crystallising the facts as to the powers of regulation, the right of regulating hewing operations on concessions and leases was made by the writer the test case, and he was assured that the Government had the power to regulate hewing. The Minister was evidently quite clear on this point, for in introducing the amendment that Millars' had asked for, he said—

It is proposed to renew them on the same terms as the permit holder. A concession expires, say, in 1924. It has not been used for two years owing to war conditions. The person who owns that concession will be entitled to come to the Government and the Government will be entitled to grant a further two years of that concession subject to the regulations and subject to a 2s. royalty in place of rent, or whatever the royalty is at that time.

In spite of the assurance regarding the regulations, an additional amendment was added at the instance of the writer, which read as an alternative to the first amendment:—

(ii) accept a surrender of any concession or lease, and issue, in lieu thereof, a permit under this Act of the same or other land at the prescribed royalty, the rent paid under the surrendered concession or lease during the period of temporary suspension of operations being credited to the permit holder and apportioned over the term of the permit.

In this way the forestry position was safeguarded, for the Interpretation Act, which was passed prior to the Forests Act, defines the word "may" as entirely discretionary, and not to be confounded with the mandatory "shall." The Government, therefore, had the opportunity of exercising powers either under sub-paragraph (i) or (ii), or refusing to do either, or doing one or the other with such additional safeguards as seemed necessary to protect the national asset represented by the forests of the State. The debate in Parliament on these two amendments was protracted, and the first alternative was amended by the deletion of the portions dealing with the repayment of lease rents, and the second alternative by the addition of a proviso, that advantage could only be taken of this sub-clause within twelve months of the termination of the war. It is an interesting fact that, since the documents relating to a peace treaty have not yet been interchanged between England and Turkey, the state of war still continues in a legal sense. The Minister introducing the Bill, in moving these amendments, laid the whole stress on the first alternative, hardly touching on the second, and this proved a very important part in the decision which the Government of to-day has taken, as will be shown presently. The section now reads—

The Governor may—

so far as the operations under any existing timber concession or timber lease have been temporarily suspended in consequence of the present state of war—

(i) extend the term of such concession or lease subject to payment, during the period of such extension, in lieu of the rent thereby reserved, of a royalty on all timber acquired at the prescribed rate of royalty under this Act for timber acquired under permits, and to the regulations in force for the time being, subject to the proviso to section forty-three; or

(ii) within twelve months of the termination of the war, accept a surrender of any concession or lease, and issue, in lieu thereof, a permit under this Act of the same or other land at the prescribed royalty, the rent paid under the surrendered concession or lease during the period of temporary suspension of operations being credited to the permit holder and apportioned over the term of the permit.

After the Forests Act was assented to, it was discovered the right to make regulations governing the cutting of timber on concessions and on leases was such that no regulations of any importance could be promulgated, and especially the regulation restricting hewing to timber unfit for milling was *ultra vires*. This being the case, it seemed clear that the second alternative was the only possible one if a forest policy was to be initiated and maintained. Accordingly sanction was obtained by the writer from the Government to lay the facts of the case before the directorate of Millars' Timber and Trading Company, in London, during his visit to England in July, 1920, where he represented, in company with Mr. Mackay, Conservator of Forests of Victoria, the Commonwealth Government on the occasion of the first Empire Forestry Conference. The negotiations with the directorate of the firm were

based on the assumption that the Government of Western Australia could not entertain the first alternative under Section 6, but that it would entertain the second alternative, and was most desirous of seeing this firm extend its life in the State, and would, in consequence, be prepared to grant a 10-years' permit on the same terms as other permit holders in exchange for the surrender of its present holdings. The negotiations proved satisfactory, as was shown by the speech of the Chairman at the annual meeting of shareholders in London in the same month. He, *inter alia,* said—

> Now the Government are taking the opposite line, and say that steps must be taken to preserve the forests in perpetuity, and that presents an exceedingly interesting problem. A very able and energetic gentleman, who is now Conservator of Forests in Western Australia, has had several interviews with us, and he suggested to us that in substance we should reduce our cutting and give up hewing timber as distinct from saw milling, and that we should only cut timber of standard sizes . . . . . Our position under the concessions is unassailable. Nobody says "We want to take your rights," but the suggestion made to us is, "We want you to help to conserve the forests of Western Australia, and we are endeavouring to convince you it is a better policy for you than to cut them out on the terms of your existing leases . . . ." Incidentally it is said that sleeper cutting, which is our principal trade, is conducted with great waste of timber. That is not the fact, but the Conservator of Forests argues—as his speeches have been made public there is no harm in referring to them—that better use can be found for jarrah than making railway sleepers . . . . I do not want the shareholders to be depressed by anything I say, because in my judgment we are still far from the point of finding it to be impossible to reconcile both the commercial interests of concession and leaseholders such as ourselves and the desire of the Western Australian Government for the conservation of its forests.

Certain information was, however, required from Western Australia before a final decision could be arrived at. The negotiations were continued in Perth on the writer's return in September, 1920, and a hitch arose over the question of the royalty to be paid. Millars' Company desired a fixed royalty for 10 years, and the Act provides for the prescribed royalty as paid by permit holders, which, as has been already stated, may be varied at any time. On this point it was not possible for the Government to give way, with the result that negotiations ceased until after the general election of 1921. They were re-opened in April, 1921, by an application from the firm to the Minister for Forests for extension of all their holdings, except Jarrahdale Concession and Wellington Lease, under the first alternative of Section 6 of the Act. On the matter being referred to the writer for report, he pointed out the undesirableness of granting the application, and that he could only recommend it if regulations of a restrictive character to cover cutting on concessions and leases were promulgated and tested in a court of law, and, seeing that the first lease or concession only expired in 1924 and the last in 1929, that in any event the extensions should only be considered, say six months before the expiration of each, and that the course of extending *en bloc,* three to nine years before they were determined, was not one he could recommend. The Government, however, came to an opposite decision and ruled that in this case the discretionary "may," with which the section of the Act begins, in reality means the mandatory "shall," and this in spite of the Interpretation Act, for the reason that, in the first place, the trend of debate in Parliament showed that the first alternative was the one the House intended should be granted, and, secondly, "may" means "shall" because the second alternative requires the milling firm to make the offer of surrendering their holdings, and, since this offer had not been made, the Government can take no other course than to grant the firm's application. The question still to be determined is the period for which the concessions and leases will be extended, and this depends entirely on the time that operations were suspended on each lease and concession. The actual facts in regard to this had not been ascertained when the year closed.

The decision thus arrived at will have the effect of definitely postponing the inauguration of sound forestry methods until the expiration of the period of extension of the larger part of the leases, that is about 1931. At the present rate of cutting, and it will be clear from the above that it is not possible to regulate the cutting, there will be little or no virgin forest left in Western Australia by the time these rights expire. The export trade will be reduced to a minimum, if it has not already vanished, and the revenue derived from the forests will be so small that it will be entirely insignificant compared with the sum required, and which must be provided from the pocket of the general taxpayer of the day, to meet the enormous cost of repairing the damage done to the State forests by the concentrated timber mining encouraged by successive governments since the eighties. How near the State is to the exhaustion of her forests is shown by the results of the forest classification. There remains to-day only 350,000 acres of virgin jarrah forest, and practically all of it is already granted to sawmillers and will be cut out in ten years' time.

Small Permits.—While the system of tendering for new permits was generally followed, in certain instances, where the permit was not large and local competition was strong, the auction system was carried out with success. With the establishment of district forest officers there is no doubt that this system will become more general and will yield better results from a revenue standpoint, and also will decentralise the administration, and do away with the delays which are inseparable from a system which requires tenders to be forwarded to the head office at the capital.

Applications for permits to exploit the cypress pine (*callitris sp.*) forests said to occur in the Kimberleys between Wyndham and the South Australian border were received. Owing to the conflicting reports regarding these alleged forests, and the fact that they have not been inspected by an officer of the department, no application was entertained. If merchantable forests occur of even this class of timber, it is very necessary that no permit be granted until the department has laid down a working plan for the continuous cutting and continuous regeneration of the forests. In the meantime, the staff is so insufficient, and the need of forestry work in the South-West division is so great that it was not possible to arrange an inspection of the Kimberley country.

5. FOREST INDUSTRIES.

(a) *Timber.*—The total cut of sawn and hewn timber from Crown and private lands amounted to 11,469,000 cubic feet (see Appendix 2E) which, taking the value at 3s. a cube, represents £1,720,350. Of this, 9,816,250 cubic feet were exported (see

Appendix 2h) and the value declared to the Customs Department was £1,162,735. The average price paid for sleepers, as disclosed by the contracts made with South Africa, New Zealand and India, was 3s. 3d. per cube, while the average declared value per cube works out at 2s. 4d. Even so, the value of the export reached the highest point on record, while the actual amount of timber exported is 28 per cent. less than the record year, viz., 1913. The rise in the value of timber has resulted in a great increase in cutting on private property. Very little Crown land has been thrown open and then only forest which has been thoroughly cut over. This has had the effect of transferring the operations of hewers to private property. The conservation of Crown lands has also been aided by the decision of the Government to grant no new permits except for the cutting of timber for local requirements, the output to be sold at a price not to exceed 5d. per cubic foot over cutting costs, that is costs excluding overhead charges. With an export market offering up to 2s. 6d. per cube over cutting costs, it is natural that sleeper contractors and millers have turned their attention to privately owned forests where there were no Government restrictions. A curious situation has arisen in connection with the supply of sleepers for the maintenance of the Government railways. Taking the average life of a jarrah sleeper in the road at 15 years, the Railway department require 500,000 sleepers a year. Their own mill at Dwellingup cuts 200,000 at a cost of 1s. 6d. per cubic foot, and the balance, which a year or two back could be obtained from the sawmillers and hewers at an even lower cost, cannot be purchased to-day at much less than 3s. per cube. The Commissioner for Railways entrusted the writer with power to negotiate with the Sawmillers' Association, with a view to the reduction of the price to a fair profit over cutting costs up to a maximum of 2s. 5d. per cubic foot. The Government side of the question was explained and the proposal was made that every mill in the State cutting in Crown forests should co-operate by cutting a certain proportion of the 300,000 sleepers the Railway department required. The Sawmillers' Association, however, hold the view that this quantity should be supplied entirely by the State Sawmills department. It was pointed out that this department was a trading concern and was already supplying more than the quota that would be allotted to it were all sawmillers to co-operate in the supply of sleepers and could not well be asked to supply more. The Association then took up the attitude that the sawmillers should get the export price for sleepers supplied to the Railway department, and thus no finality was reached. The State now finds itself in the very extraordinary situation of having to watch the destruction of the small amount of virgin jarrah country by sawmillers for the supply of sleepers for overseas markets, a business which means the prostitution of one of the finest general purpose hardwoods to the most debased use, and at the same time the State is unable to obtain 300,000 sleepers to maintain her railway lines, except at a price which on the Railway department's own mill figures works out at a profit of 100 per cent.

One way out of the difficulty was recommended by the writer, viz., no concession in the way of extensions or other privileges should be granted to holders of timber rights unless the applicant be prepared to undertake to supply a percentage of his sleeper output to the Railway department at a cost not to exceed a certain fixed profit on cutting costs. The decision to extend Millars' concessions and leases, however, makes it somewhat difficult to give effect to this recommendation, as it will only be possible to apply the system to permit holders, who will, in consequence, suffer considerably owing to their having to compete with Millars. As an alternative course, the Commissioner for Railways is seriously considering the erection of another mill to cut sleepers for his own requirements, a step which is suicidal since the total area of forest which is reserved for railway purposes is inadequate to supply his requirements at the present rate of cutting for all time, and there are no areas of virgin forest not already in the hands of sawmillers that can be reserved for the Commissioner. It is to be sincerely hoped that another way out of the difficulty will be found, for even the saddling of the timber trade with an extra freight to meet the very high price the millers are demanding for the sleepers would be preferable to the erection of another timber butchery. In this connection, the percentage of recovery of large and small mills is of interest. In the month of April Millars' 20-load mill at Jarrahwood recovered 18,650 cubic feet of timber from 59,450 cubic feet of logs, or 31 per cent. During the same period a small mill in the neighbourhood recovered 8,650 cubic feet from 13,750 cubic feet of logs, or 63 per cent.

The sale of the State sawmills to a French timber company was definitely abandoned, the writer receiving instructions to notify the director of the company in Paris that it would not be advisable for them again to approach the Government with a view to the question being discussed by Parliament. It is to be hoped that some other way will be found to open the French market for Western Australian timbers. France is to-day one of the few countries which has not used jarrah for sleepers, and offers therefore some chance of a trade in this wood for higher grade purposes.

Inspection.—The inspection of timber for export was carried out under the superintendence of the Chief Timber Inspector, who reports that 3,933 250 cubic feet of timber and 20,954 lineal feet of beams, piles, and poles were inspected, at a cost of £2,595, while the inspection fees brought in a revenue of £4,018. The very great increase of sleeper cutting on scattered private property has made it necessary to appoint additional inspectors, and to meet the heightened cost of inspection, it will be necessary in the near future to raise the inspection fee which now stands at 0.25d. per cube. The most important alteration that has occurred under this heading has been the acceptance by South Africa, Ceylon, and Mauritius of final inspection in Western Australia on the Government specification for sleepers for export, which reads as follows:—

It shall be of good sound, strong timber, free from heart-wood, dry rot, knot holes; to be cut square; cut of winding and straight except that hewn sleepers may have camber to extent of half an inch.

Sleepers shall not be cut on full quarter and shall be cut with an allowance of a quarter of an inch in width and one-eighth of an inch in thickness to allow for shrinkage, and no further allowances shall be made.

But will allow slight variation in cutting, sound gum veins; gum pockets up to 6in. x ¾in.: surface sun shakes; end shakes up to 6in.; few pin holes but not in groups: sap or wane not to exceed 2in. on either face and not to come under rail seat; sound and firm knots up to 2in. in diameter.

Length specified shall be subject to a variation of one inch either way.

Under the very strict system of inspection that has been established, it is difficult for any timber to be shipped uninspected, and the acceptance by the above countries of final inspection at this end has done away with vexatious rejections at the port of discharge. During the year under report only one complaint was received, and this was in respect of certain sleepers which the South African Government Railways found to be faulty. The case has not been fully investigated, but the figures show that only one per cent. of the total shipment was rejected.

While a boom in the sleeper trade has occurred, there has been a falling off of business in smaller sizes of timber. During the war period and until last year there existed a profitable market for scantling in the Eastern States, and both jarrah and karri were sold in fairly large quantities in Adelaide and Melbourne. The reduction of freights and the increase of tonnage have resulted in the importation of very large supplies of oregon from the States and from British Columbia. The price at which this timber is landed in the Eastern States is so low as to make it impossible for jarrah and karri scantling to be sold at a profit in those markets. The result must be that sawmillers will again burn that portion of their output which cannot be sold.

The findings of the 1903 Royal Commission regarding land settlement in forest country have already been quoted. This is what that commission said regarding the too rapid growth of the export trade—

> Your Commission is of opinion that, in the interests of the State, it would be a wise policy to discourage any increase in the rate of timber cutting till the consumption of scantling is fairly apace with the export of larger sizes. State acquiescence in the destruction of good timber, only because the export trade demands it, is a crime against coming generations, and any attempts to increase the export in the interest of foreign companies, or with the object of inducing more men to join in timber getting at the expense of posterity, need wise resistance.

In 1903 there were 904,260 acres held under sawmilling tenure, and in 1913 1,537,559 acres. The export in 1903 was 154,969 loads, and by 1913 it rose to 272,397 loads. So much for wise resistance.

The industrial situation has not altered to any extent; the award quoted in last year's report still subsists so far as wages are concerned, though in the sleeper hewing business, owing to the high export price, considerably higher wages have been paid in many cases. In the matter of hours, the Federal Arbitration Court decided that the week's work shall consist of 44 hours for all weekly employees, which shall be worked within nine consecutive hours on days Monday to Friday, with one hour for meals, and on Saturdays between the hours of 7.15 a.m. and noon, or as may be agreed between the union and the employer, or approved by the Board of Reference.

The rates of wages, which are based on weekly payment, differ considerably according to the nature of the work on which the employee is engaged. These range from £3 18s. for labourers to £6 6s. for saw doctors.

The award provided for retrospective pay to adults, that is, persons of 19 years of age and over, on the basis of existing margins, *i.e.*, the margins and rates of pay fixed by the award of the Court of Arbitration of this State, bearing date the 28th day of September, 1917, for all work performed from the 3rd day of February, 1919, to the 1st day of August, 1920. Piece workers received retrospective pay at the rate of 25 per cent. on the piece work rates obtaining on the 3rd February, 1919, for all work done by them on piece work between the above date and the 1st August, 1920, while boys under the age of 19 years received an increase of 25 per cent. over and above the fixed rates for all services rendered by them over the same period.

(b) *Minor Timbers.*—The cutting of tuart and wandoo was practically restricted to the requirements of the Railway department, which uses these timbers for the construction of rolling stock. While on the subject of rolling stock, it is interesting to note that jarrah and banksia have been successfully used for the construction of a buffet car. Jarrah made up the main woodwork and banksia was used to sheath the car. The latter timber has been found so useful for sheathing not only railway coaches, but also tramcars, that it has been necessary to restrict the cutting by only granting permits for the supply of timber to the Railway Department. The Perth furniture trade has found this restriction rather irksome, but has managed to supply itself from private property. The cutting of sheoak has been fostered in Albany district. This valuable wood is coming more into use for the manufacture of barrel staves, particularly for beer barrels, in which use it is found to be better than oak.

Generally speaking, there has been a marked increase in the use of Western Australian timbers for purposes for which hitherto imported woods have been used, and especially is this the case in regard to furniture-making.

(c) *Poles and Piles.*—The embargo on the export of timber in the round was continued, with the result that, except for the operations of Millars' Timber and Trading Company, no round piles or poles were exported. The cutting of round timber from Crown forests for local requirements was also restricted to a minimum.

(d) *Sandalwood.*—The overcutting of sandalwood mentioned in the last annual report continued till towards the end of October, when the inevitable slump set in; with the result that, once more the market has become over supplied; large accumulations of stock are held both in China and Fremantle, the regular sandalwood worker has lost his employment. Sandalwood plants have become idle throughout the country, and the market price of sandalwood is so low that sandalwood is unsaleable. The sandalwood passed over Railways during the year was 6,953 tons.

On 5th March, 1920, the royalty on sandalwood was increased from 5s. per ton to £2 per ton, and the new rate was charged from that date, but on inquiry it was considered unfair to enforce the increased rate on wood already pulled but still in the bush, so it was decided to collect at the new rate all round, but to refund 35s. per ton to those who held wood obtained under license issued prior to 5th March. This resulted in considerable work, and during the year rebates amounting to over £4,000 were returned to sandalwooders.

Whilst the officer of the Department was travelling through the sandalwood districts going into the rebate claims, the opportunity was taken of ascertaining the true feelings of the sandalwooders them-

selves on the vexed question of how best to control the industry. It was found that the great majority of sandalwood workers (pullers, carters, and cleaners) wanted the Government to take steps to stabilise the industry so as to prevent the periodical occurrence of slumps which pressed so hardly on them. These slumps not only mean the loss of employment, but in many cases individuals are saddled with large plants (horses, camels, waggons, etc.), for which they cannot secure profitable employment. A deputation from the Roads Board Conference also waited on the Minister for Forests requesting the Government to handle the whole industry and run it somewhat similarly to the wheat pool.

It is most desirable that the industry be stabilised so that (1) continuity of employment at fair remuneration may be secured for the sandalwood workers; (2) the State may get the maximum benefit from a valuable forest product; (3) the cutting of the existing supply from Crown lands can be regulated, and the output restricted so as to insure our present source lasting for a sufficient number of years to enable us to hold the Chinese market till our future plantations are ready to be worked over.

To accomplish these most necessary aims it seemed that some form of State control was essential, and for this reason approval was obtained to send Mr. G. Drake-Brockman to China to inquire into all aspects of the trade. As the result of these inquiries it appears that the only satisfactory solution is to create a Government monopoly in sandalwood, the profits gained from monopoly being shared by sandalwooders and the State Government. With a monopoly all sandalwood would be sold through one agency; on 6,000 tons per annum this alone would mean a saving of 56,000 Hong Kong dollars., *i.e.*, at least £7,000 per annum. The profits to the Department would average at least £50,000 per annum, whilst the getters of sandalwood would obtain very much better returns, and the employment of the required number of sandalwooders would be continuous.

In the Hong Kong Trade Returns for 1920, compiled by the Statistical Branch of Imports and Exports Department, the following paragraph *re* sandalwood appears:—

> Sandalwood is a conspicuous feature of Australia's export to Hong Kong. There is a great demand for this wood by Chinese for use in religious and other ceremonies, and Australia furnishes practically all the supply. The marked difference between the total import and total export values shows the trade to be a lucrative one for Hong Kong, the average export value declared for the year being no less than 29.42 per cent. above the value declared at time of importation.

The returns in this blue book show average value on importation at £44 for 1919 and £36 for 1920, whilst value on export to China, £50 for 1919 and £47 for 1920. These figures and remarks certainly show that the State is not making its fair share of profit on sandalwood, especially so when it is remembered that £15 f.o.b. Fremantle is considered a boom price.

(e) *Firewood.*—The control of the firewood cutting for the metropolitan market was thoroughly established by means of a system of permits to remove this minor produce. Whilst the revenue derived from this source is only sufficient to cover the cost of supervision, the control that has been obtained has resulted in a more systematic removal of dead and useless timber from areas under sylvicultural treatment. The control of the timber cutting for supply of firewood to the mines of the "Golden Mile" still remains in an unsatisfactory condition, owing to the fact that the firewood companies' rights are limited to the establishment of their tramways and the carrying of the fuel, while the cutters operate under license. Many instances have occurred where the company has been forced to take up its line and relay it into new forest before the old forest was entirely cut out. To remedy this situation it has been recommended that the permit system be extended to the goldfields and the companies be made responsible for the proper cutting out of the forests.

(f) *Mining Timber.*—The mines of the Golden Mile experienced no shortage of mining timber, though the distance of hauling is now so great that representations were made for the opening of reserves nearer to Kalgoorlie. Envious eyes have long been cast at the reserve along the Norseman-Widgiemooltha line, which is the last remaining reserve alongside the Government railways, but up to date the demands of the fuel and mining timber getters to have the area thrown open have been refused. It is highly important that this reserve should be kept intact to meet the possible emergency which may arise at any time through failure, from some cause or another, of the firewood companies to supply fuel and mining timber to the mines.

(g) *Tanbarks.*—The value of tanbark exported amounted to £23,073, an increase of £952 over that for last year.

(h) *Kingia Fibre.*—The kingia fibre industry has been a very bright one during the past year, one factory employing 11 workers in Perth, and four men cutting in the bush. It is gratifying to note that a use has been found for the cores of the kingia grass trees, which are being worked up into knife-boards, carpenters' sand-papering blocks, and such like articles, and sold locally.

The number of hands engaged in all the above forest industries amounted to 9,345, which, with wives and children, would make up a population of 28,000 souls. The total wealth which the forests yielded directly to the State for the year under review may be summarised as follows:—

	£
Timber sawn ... ... } Timber hewn ... ... }	1,835,000
Piles and poles	35,000
Sandalwood	181,801
Sandalwood Oil	10,107
Firewood	250,000
Tanbarks	23,073
Mining Fuel	300,000
Mining Timber	50,800
Total	2,685,781

Research into Forest Products.—In order to find uses for major and minor forest products, and so develop new secondary industries, a great deal of scientific research work must be undertaken. Up to recently there has been no institution capable of performing this work, but the establishment by the Council of Science and Industry of the Federal Forest Products Laboratory in Perth has made such investigations possible. This laboratory, while being a Federal institution, relies to a certain extent on funds being supplied by the various States requiring investigations to be carried out The research work most urgently required in this State is in regard to the following problems:—

1. Paper-making qualities of hardwoods.
2. Tannin investigations, particularly in connection with marri kino; a general tannin survey of all trees and shrubs.
3. Kiln drying of timber.
4. Preservation of timber.
5. By-products of such plants as blackboy and grass tree.
6. Timber physics generally.
7. Wood distillation.
8. Essential oils.
9. Utilisation of wood waste.
10. Wood technology, including wood turning, veneer cutting, etc.

Owing to lack of equipment and trained officers, it has not been possible to deal with more than the first four. During the year the Forest Products Laboratory has carried out some valuable work on paper-making from karri, and has demonstrated that the manufacture of good soda-pulp is practicable. This research is only part of a very much larger undertaking, viz., the paper-making possibilities of the timbers of all the States. While mountain ash and blackbutt from New South Wales and Victoria have proved a little more suitable than karri, the cost of raw material, transport, and quantities available make it very necessary that further investigations on a somewhat larger scale be undertaken. The principal newspapers of this State have in a very generous manner come to the assistance of the laboratory by giving the money required to purchase a paper machine capable of turning out a strip of paper four inches wide. This machine has been of very great assistance, for it has made it possible to make paper on a scale which enables comparison to be made with results that should be obtained from larger commercial plants. If the further investigations show that karri can be commercially turned into paper, the difficulties connected with the proper forest management of the forests of this species will be greatly reduced.

In regard to the problem of the utilisation of marri kino for tanning purposes, the researches carried out by Mr. Salt, leather chemist of the laboratory, have been of very great interest. He has discovered a process by which the kino can be readily rendered soluble. The difficulty of the colour, which has been a bar to its use, has also been investigated, and the colour has been reduced to a very great extent. The final solution of the problem is now in sight and should result in important commercial developments in connection not only with the use of this tannage by tanners throughout the Commonwealth, but also the establishment of tannin extract factories. The source of supply of raw material is very great since the marri tree is to be found growing over practically all the South-Western Division within the 25-inch rainfall belt. Also, and this is perhaps the most important point of all, the kino can be collected without killing the tree.

A tannin survey is in progress, and the laboratory has examined 80 samples of material (see Appendix 10). The work already done reveals the fact that there exists a wealth of tannin-bearing plants from which it should be practicable to extract tannins suitable for every possible grade of leather manufacture.

Kiln-drying experiments were continued and, the work on jarrah having been completed, a start has been made with karri. This timber is rather more difficult to dry and takes a little longer. The results obtained, however, have proved most satisfactory. The kiln-drying investigations have been followed with interest by the timber firms, two of which have embarked on large kilns.

The preservation of timber is a very important branch of the work, particularly since the State is commercially interested in the process of impregnation known as the Powell process. The main line of investigation has been the determination of the part played by the sugar and the arsenic which are the main ingredients used in the liquors. It has been proved that a portion of the sugar forms a loose combination with the timber fibres, but a great deal more work remains to be done before the scientific explanation of the extraordinary ease with which the liquor penetrates to the centre of large baulks of timber can be given. It is expected that the research will enable considerable modifications to be made in the process, which will have the effect of cheapening it. Investigations into blackboy gum have shown that a good fast dye substance with a fair range of colours can be extracted from this practically waste product.

6. PRESENT CONDITION OF THE FORESTS.

(a) *Jarrah.*—While steps are being taken to improve the condition of the forests under certain working plans, and some progress is being made in this direction, as will be seen by the report of the Assistant Working Plans Officer, which will be found in the 7th section of this report, the general condition of the forests is decidedly bad. Seventy-five years of practically uncontrolled cutting and entirely uncontrolled burning have reduced this national asset to such a condition that only a negligible quantity of sound, young trees is growing to the acre on the portion that has been cut over, with the result that, unless measures are taken to increase the stand and to protect the young trees from their worst enemy—fire, there will be little or no timber for future generations. How serious is the position of affairs is shown by the results of a very careful survey of close on 40,000 acres of cut-over jarrah country. It was found that the average number of sound saplings under 10 inches in diameter was 2.45 to the acre, while there were 21.2 useless saplings to the acre. Taking large and small trees, the devasted jarrah forests contain 32.6 useless jarrah trees per acre, of which 29.8 are under 20 inches in diameter.

Before the position can be ameliorated, it will be necessary for the population living in and around the forests to realise the gravity of the situation, and to co-operate with the department in its efforts to prevent forest fires. The department has already laid down its scheme for preventing fires in the Mundaring region under Working Plan No. I., in the tuart belt under Working Plan No. II., and in the forests of Collie coal mining leases under Working Plan No. III. All the care that can be taken, all the look-out stations, firebreaks, and fire-fighting men will be of no avail unless the people themselves help in the great task of saving their own forest heritage from destruction. An excellent example has been shown by the Collie townspeople, who have formed a society whose objects are mainly to prevent forest fires. It is to be hoped that this will be the forerunner of many other similar societies throughout

the timber country. The presence of buds on the majority of jarrah trees all through the prime belt shows that an excellent seed year is to be expected in 1922-23. The periodicity of a general seed year like this is not definitely known, though it is generally regarded as coming every five years.

(b) *Karri.*—The condition of the karri forests is very different from that of the jarrah forests. In the first place, it is only in exceptional cases that fires occur at intervals of less than eight years, while the jarrah country is burnt over regularly every three or four years. The result of the longer interval between fires is that the karri saplings manage to grow to a sufficient height to get their tops clear of the fire, and are not burnt back to the same extent as are the jarrah saplings. The chief trouble in the karri forests is the disastrous condition of the immature timber after the fellers have removed the mature trees. How damaged are the younger trees will be realised when the density of the stand is considered. The average quantity of timber removed per acre by the State Sawmills at Pemberton over three years' operations works out at 2,000 cubic feet, while the maximum amount recorded was 30,000 cubic feet per acre. The average contents of these gigantic trees is 700 cubic feet, and when dense masses of them are felled, it is little wonder that the younger trees are very severely damaged.

Another serious drawback to the present system of working these forests is the very large amount of timber left behind, not only in mature standing trees which the feller passes by owing to some alleged defect, but in long stumps left in the ground. The invention of a portable steel staging has greatly increased the waste of timber through the practice of the fallers setting up the stage on any pretext and cutting the tree at heights which sometimes reach 10 feet from the ground. No less than 250 cubic feet to the acre of sound timber is left behind in this manner. Another serious loss of wealth occurs in the waste of long lengths of timber at the crown. The log when felled is cross-cut into certain suitable lengths, having regard to the mill requirements, and if the length from the last cut to the crown is too short, it is left in the forest. Much very useful fruit case and general purpose timber for local requirements is thus lost. The passing over of mature timber by the feller and the long stumps left in the forest are a difficult matter to remedy at the present time, as the staff available for policing the forests is too small to do more than exercise a very general surveillance. Sawmill managers are alive to the loss they sustain through these causes, and from time to time improvement takes place through the appointment of a new bush foreman. It is very important that all marketable timber should be cut down before the fellers leave a certain area, for the trees they leave are so barked that they are certain to be rendered unmarketable, through the inroads of borers and fungus disease. The trees under standard size (108 inches girth at 4ft. 3in.) suffer in the same way and should also be removed, but unfortunately this is not possible, as there is no market for karri poles and piles. The very satisfactory results obtained by the powellising process in rendering this timber very resistant to both fungus disease and the attacks of white ants lead one to hope that a market will be found for karri poles, which have been impregnated by this process for a distance of, say, 10 feet from the butt. Experiments are being carried out by the Perth Electricity and Gas Department with completely powellised poles, but it seems clear that the expensive impregnation of such poles from end to end is unnecessary, seeing that only the lower end is subject to attack.

From what has been written it will be seen that it would be better to work the karri forests on a clear felling system, leaving only sufficient over-mature trees to the acre to assure abundance of seed for the next crop. No reliable information is available as to the seeding periodicity of karri.

(c) *Tuart.*—There is little to report regarding this belt of timber. The regeneration in the fenced portion of State Forest No. 1 is improving, definitely proving the contention of the writer that the entire absence of regeneration for the past 50 years is due to grazing and fires. While a number of trees carry set seed vessels or flower buds, nothing in the nature of a general seed year is yet to be expected. Here again local inhabitants cannot give any information regarding the periodicity of general seed years. The inroads of the bud-cutting weevil, *Haplonix tibialis,* are serious, but whether the damage is sufficient to warrant prevention can only be ascertained when a general seed year is in sight.

The regeneration of tuart is by no means as simple a matter as that of karri or jarrah. Not only are the flower buds cut off by a weevil, but the seed that falls to the ground from the seed vessels that have escaped the Haplonix do not germinate freely. From observation of artificially sown seed, it would seem that a large percentage of the seed is carried away by ants, for it is only when the seed is sown in prepared country protected from these insects that a complete germination occurs. If this is the case, then the germination of seed in places where heavy localised fires have occurred is caused by the burning of logs and tops, for observers have noticed that ants are unable to make their way through fine wood ashes. The general belief current in the timber areas that fires cause a good germination of trees of the eucalypt family through the mere roasting of the seed is erroneous, as the seed falls, as a general rule, after the fire season is over.

As will be seen in Section 7, wherein a description of the progress of the working plan covering the tuart belt is given, the sylvicultural operations necessary to render the supply of this very valuable timber perpetual presents some difficulty.

(d) *Wandoo.*—There is no area of prime wandoo country in the hands of the Crown.

(e) *River Banksia.*—The increased use of this beautiful timber for railway coach building makes it very necessary that its sylvicultural requirements should be carefully investigated. It is a species only to be found growing close alongside running streams. Though its roots must be for the greater part of the year under water, yet it is quite intolerant of water when it reaches any height up the stem. Exceptional winters occur at very long intervals when the rainfall is such that heavy flooding of the streams and rivers remains for considerable periods. One such winter occurred in 1917, and it was noticed that by the following summer a very large percentage of the river bank-

sias were dying. On making inquiries it was found that in the summer of 1890-1891 a similar mortality occurred, and that was the season which followed the record floods. This is a particularly interesting fact, as it not only shows the intolerance of banksia to long immersion, but also its very rapid growth: for in the space of 27 years the killed timber was replaced by marketable trees, which in their turn were drowned in 1917. A survey of the remaining supplies of mature trees that escaped the flood of that year shows that the visible supply of accessible banksia falls short of the estimated requirements of the Railway Department for the next 30 years. So valuable a timber requires very special care, and it is to be hoped that the excellent practice, which for some years has been adopted by the Surveyor General's Department of reserving a narrow frontage to all streams when surveying farm lands, will be continued. It is only by this means that the banksia strips will remain the property of the Crown.

(f) *Sandalwood.*—The predicted slump in the sandalwood market which followed the wild gamble which resulted in no less than 24,784 tons of sandalwood being exported in two years to supply a demand in China which is on an average 5,000 tons per year, has taken place, and it is probable that for a few years at any rate the sandalwood areas will receive less attention from the exploiter. The most interesting advance that has been made in the sylvicultural knowledge of this small tree is the discovery that it is definitely parasitical. Its Indian cousin, *Santalum album*, has long been known to be a parasite, but the proof of the same habit of growth in *Santalum cygnorum* has only recently been scientifically demonstrated. The haustoria of this species fix themselves on various hosts, but the most common in the Great Southern and Eastern districts is the common jam tree (*Acacia acuminata*). Another interesting fact that is of the utmost importance if a future crop of sandalwood is to be grown before the present accessible supplies are entirely exhausted, is that sandalwood will reach merchantable size in 25 years. The little plantation of this species, which was established by Mr. Ednie Brown in 1898, and which in the dark forestry period which followed his death was alienated for grazing purposes, now carries some 200 trees of sandalwood, which, in spite of the stock eating them and fires burning them, include many specimens of a size equal to the wood exported to-day to China.

Throughout the country the absence of young sandalwood trees is very noticeable; this is largely due to the fact that the young sandal tree is a good fodder plant. The result of this will be that in the near future, with more stock in the back country, the natural regrowth of sandalwood will come to an end altogether. This makes the early commencement of a sandalwood plantation on a large scale an urgent necessity.

In the past year large areas of country have been inspected in search of a suitable and sufficient area in one locality for sandalwood reforestation. A small area suitable for growth of sandalwood was located five miles east of Bendering siding. The actual area fit for sandalwood is small, only about 1,000 acres, but, as the neighbouring country had been good mallet forest, a reserve of about 10,000 acres was secured for a combined sandalwood and mallet proposition.

On Bendering Reserve 36 acres have been planted with sandalwood nuts. These sowings have been rather in the nature of an experiment, from which it is hoped to gain information, so that in the future the larger operations can be carried out under the most favourable conditions.

An area of country around Cocanarup, six miles west of Ravensthorpe, was inspected. It was found that a suitable area of sufficient size was unalienated there. At present the area is held as a pastoral lease and has been temporarily reserved against settlement. The Cocanarup area would appear to be satisfactory for an extensive sandalwood plantation.

(g) *Botanical.*—643 specimens were added to the forest herbarium and of these 311 have been identified (see Appendix 7). Mr. Gardner, who has carried out the duties of botanical collector, was selected to accompany an exploration party to the Kimberley District. The party left Perth in March and are expected back in Perth in December next. It is anticipated that a great deal of valuable information will be obtained regarding the forest species of this very little known region. The identity of the sandalwood which occurs between Derby and Wyndham is not known, and the very high content of the wood in santalol, and the decidedly left-hand optical rotation of the oil make the determination of the species a matter of very great interest.

Thanks are due to Mr. Herbert, the botanical expert attached to the Analyst's Department, for the great assistance he has rendered this department in the determination of species. A close touch has been kept throughout the year with Mr. Maiden, Curator of the Sydney Botanical Gardens, and he has very kindly cleared up a number of complications and confusions regarding the eucalypts of the State.

(h) *Publicity.*—During the year publicity work was continued on lines identical with those of previous years. The steady demand for the department's publications necessitated the printing of new editions of many of them. The popular leaflets—each devoted to a particular forest specimen or to special forest products—have increased in public appreciation, more particularly among the pupils at State schools. In the schools under the Education department, especially in those within the metropolitan area, forestry is a subject that is receiving a gratifying share of attention, and one result of this was that many hundreds of scholars called at the department in order to obtain literature dealing with the matter. The bulletin "Notes on the Forests and Forest Products and Industries of Western Australia," issued in the previous year, was so constantly asked for that a new edition had to be issued in the year now under review. The new edition is much larger than the one that preceded it, and contains a number of features not touched upon in the first issue, and for it a price equal only to the cost of production by the Government Printer is being charged. Included in the publications of the year was a table giving the true cubic content of logs of various girths and lengths. The system of tabulation adopted is simple and, given the length of a log and its mid-girth, its volume in cubic feet can at once be ascertained by a single reference to the

page with the appropriate mid-girth at the top.

In conjunction with the Forest Products Laboratory, the department, at the invitation of the Council of Industrial Development, organised an exhibition of forest products, and this was opened on 13th June in the hall of the Council in Barrack Street. The exhibition was one of the most successful ever held in Perth, some 35,000 persons visiting the display during the period it was on view. The experimental paper-making machine, operated by assistants from the Forests Products Laboratory, was a centre of continuous attraction. The fine furniture shown at the exhibition, all of kiln-dried jarrah or other indigenous timbers, also aroused the keenest interest, and was convincing evidence of the capacity of the State's timbers for filling every purpose in the cabinet-making and decorative arts. It has been a matter of complaint that our hardwoods when made up into articles of furniture are apt to develop such defects as shrinking and warping. The complaint is not without foundation, but it is applicable to every other timber, Australian or foreign. No timber can give good results as furniture wood or for exterior or interior finish unless it is dried to the degree necessary to assure a minimum of working in the particular climate in which it is to be used. The exhibition demonstrated beyond all question that kiln-dried Western Australian timber shows very little of the defects which in the past have been advanced to its discredit.

The exhibition also included a display of the many uses to which the Chinese put our sandalwood. The entomological section showed many interesting insects, some of them harmful and some of value to the forester. The inroads of the larva that attacks marri was explained both by means of an attacked log and by a diagram.

The success of the Powell process of impregnating eucalypt timber was demonstrated by exhibits of powellised and unpowellised jarrah and karri, which had been placed in a coal mine where the attacks of fungi were so severe as to reduce the unpowellised wood to punk in three years. The powellised wood was as good as the day it was put into the mine.

A section was devoted to wood distillation, and all the by-products obtainable by the process were displayed. The possibilities before the State through the utilisation of the blackboy and grass tree were shown by exhibits of the various articles that can be made from these interesting plants.

Woodturning found a place also in the exhibition and two firms sent in attractive collections of tool handles made from marri and other timbers.

The tanbark section created a great deal of interest, showing as it did the very large number of trees and shrubs that are indigenous and yield a higher percentage of tannin than the best barks of the old world.

A number of diagrams, maps, and charts were hung on the walls, and these showed graphically the situation regarding the following matters:—the comparative forest areas of all countries of the world; the areas in the British Empire; the area in Western Australia compared with the area of the State; the area of virgin forest remaining; the export of sandalwood and profit made by China; the importation of softwoods, and many other forest data.

A series of photographs taken by Professor Wilson of the Arnold Arboretum of all our important trees made an interesting little gallery of type specimens. Panels of the timbers and photographs of forest scenes completed the decorative portion of the exhibition.

The Forestry Commission of the United Kingdom organised an Empire Timber Exhibition in London, at which Western Australia was represented by a very comprehensive collection of exhibits. The uses of our timbers for all purposes was demonstrated, and their suitability for high-class furniture-making was made a special feature by the inclusion of a panelled room and many examples of carved tables, chairs, and chests. Considerable interest was aroused among users of timber in the Old Country who up to then had regarded jarrah and karri purely as sleeper timbers.

7.—PROGRESS OF WORKING PLANS.

The drawing up and control of the working plans, together with a great deal of administrative and field work, has fallen on Mr. S. L. Kessell, Assistant Working Plans Officer, and his report on the progress of the plans already under operation is here given in full:—

Major forest operations have been confined to three centres in the vicinity of which considerable progress has been made in developmental, cultural, and protective operations.

All work has been organised in such a manner that the initial experiment shall form the nucleus of extended operations and the training ground of the future field staff.

Future Organisation.—It is estimated that the land in the South-West Division of this State which will yield a higher return under timber than under field crop amounts to 3,000,000 acres. For the proper control of this area it is proposed that it be divided into six districts, each under the control of a professional district forest officer. A district will be divided into ten "blocks" of 50,000 acres each, forming the range of a resident forester. A compartment of 500 acres will form the unit of permanent division within the forest.

Such a scheme must of necessity be modified in practice, as will be shown by subsequent reference to working plans already in operation. The principle of decentralisation and control of work within the district by professional officers will result in greater efficiency and more economical administration, as soon as trained and experienced men are available.

With the organisation set out above, the system of local auction sales of standing timber, forest produce and forest leases, can be inaugurated. Such sales will be held annually in adjoining centres of population, and the area of country to be thrown open or the volume of timber to be disposed of each year will be laid down in the working plan.

These documents will be available for public inspection and resumés will be published, so that all interested may know precisely what will comprise the various sale lots each successive year. In local centres where the system of public auction of permits to cut standing timber was given a trial during the past year, the amounts offered by the successful purchasers reached figures far in excess of the highest royalties previously paid in this State.

The exploitation of the timber will be left to private enterprise, but all work of sylvicultural and protective nature will have to be carried out by the Government. This will result in the settlement of the unoccupied portions of the South-West with a permanent rural population dependent for work on the forests. The cost of this settlement will be met by the increased royalties which will be obtainable when the Government regains full control of the timber resources of the State.

Current Operations.—During the financial year—

1. Working Plan No. II. has received the approval of the Governor in Council.
2. Working Plan No. III. has been completed, and now awaits approval.
3. Working Plan No. I. has been drafted in a preliminary form to govern operations pending the collection of sufficient data for the completion of the document.

Working Plan No. I. (Mundaring District).—The following extracts are taken from the preliminary Working Plan Report, which at present governs this working circle: —

Location.—The prime jarrah country between the Eastern Goldfields railway line on the North and the River Serpentine on the South.

		acres.
Area—Approximately		505,000
Area of State Forest		*Nil*
Area held under Permit (Forests Act, 1918)	Sawmilling ...	1,090
	Hewing ...	2,166
	Firewood ...	33,487
Area held under Lease		*Nil*
Area held under Concession		290,000
Area held under Permit (Lands Act, 1904)...		*Nil*

Social and Industrial Features.—With the exception of timber workers, who are destructively exploiting the forest, and will leave as soon as the forest is cut out, the area is practically without population. This is partially explained by the large area of reserved watershed which is included, but the main factor is the general unsuitability of the land for ordinary farming pursuits.

Present Condition of the Forest.—12,380 acres in proximity to the Mundaring Reservoir were ringbarked in 1903 to increase the run-off of water into the reservoir, resulting in an excessive overflow during the winter months, and a very marked increase in the salinity of water flowing down certain creeks during the summer months. A remarkably fine and even crop of jarrah seedlings sprang up after the ring-barking, but repeated fires have thinned out the seedlings and converted most of the survivors to clumps of coppice shoots.

The remainder of the area is jarrah bush, which has been very heavily cut over, especially near the Eastern Railway line, owing to its proximity to Perth. Regrowth has attempted to replace groups of trees which have been removed, but fires have prevented normal development.

The prime jarrah is intercepted by narrow marri flats, and on the Eastern and Western extremities where the granite comes to the surface, pockets of clay soil carrying a sparse crop of wandoo are found intermingled with ridges of good jarrah. On watershed reserves where cleared farm lands have been resumed by the Crown, soil capable of supporting a crop of fast-growing exotics is at present lying idle.

Future Treatment: Objects of Management.—

(1) To manage all forests extending over the watershed of reservoirs, so as to maintain a well-regulated supply of pure water in creeks and springs.

(2) To produce the greatest sustained yield of well-grown jarrah timber of the most valuable market sizes that the country is capable of supporting.

(3) To utilise all areas of soil unsuited for the production of a marketable crop of jarrah for the raising of other species, both indigenous and exotic.

Proposed Sylvicultural Methods.—The jarrah forest will be worked on the group selection system. This will entail the marking of annual coupes before felling operations are commenced, instead of allowing sawmillers to select their own trees for felling under the faulty minimum girth system.

Jarrah is a strong light-demander, and consequently the object in marking will be to open up extensive blanks, and leave existing groups of immature trees practically intact.

After the sawmiller, or in certain exceptional cases the sleeper hewer, has taken all marked trees which contain marketable timber, the Forests Department will have to undertake the preparation of the blanks for natural regeneration. The chief operations involved will be controlled burning, cutting back of advanced growth, and ringbarking of useless trees. Certain of these overmature trees will serve as mother trees, and will not be ringbarked until successful regeneration is assured.

In the country which was ringbarked in 1903 a crop of wattles (*Acacia pycnantha*) will be raised in open spaces pending the time when the regrowth will be sufficiently developed to produce seed.

Other species will be raised as far as possible by the sowing of seed *in situ*. It seems likely that *Pinus insignis* will have to be raised in a nursery and planted out.

Two small nursery sites have been fenced at Greystones in the Helena Block.

The autumn nursery, on comparatively dry alluvial soil has been ploughed and experimental sowings of 12lbs. of *Pinus insignis* seed and 10lbs. of *Pinus pinaster* seed made.

Twenty pounds of *Pinus insignis* seed will be sown in the spring nursery during the coming season.

At Byfields, on the Helena Block, experimental sowings and planting have been started on a small scale.

An experiment likely to be of far-reaching economic importance is the sowing *in situ* of acorns of varieties of the cork oak obtained from Melbourne, Perth, and South Africa.

Subdivision of the Area.—

1. Roads.—Exploitation in the past has been seriously hampered by a lack of the necessary roads.

The supply of firewood to No. I. and II. Pumping Stations has been erratic and costly, owing to the absence of suitable roads.

The success of all major and minor operations in the bush depends on an economical transport system for bulky produce, and, when dealing with a forest from which it is proposed to draw perpetual supplies of timber, roads are the only transport system which answer all requirements.

An excellent start has been made with 17 miles of completed forest road, which has been built around Mundaring Reservoir. This road has been a big undertaking, as the route has of necessity led up on to the hills surrounding the reservoir, and has then had to cross every creek and gully leading into it.

The linking up of the whole district by a road system is now a comparatively simple matter, as future roads radiating out from the existing roads will follow some of the broad gullies up an easy gradient on good ironstone gravel surfaces.

2. *Firebreaks.*—During the past summer a camp composed largely of apprentices subdivided the Helena and Gunjin blocks into compartments of 500 acres or thereabouts. Sub-compartments were plotted showing the extent of various types of country in proximity to Mundaring Reservoir. Ultimately there will be a firebreak around every compartment, the boundaries of which have been laid out in accordance with topographical features.

The initial firebreaking of the external boundary and a limited number of cross-lines must be undertaken during the present calendar year.

The formation which has carried timber tramlines will serve as a cheap road and firebreak in many parts of the district.

Firebreaks which will ultimately be cleared lines are at present only being cleared of undergrowth and small timber.

Utilisation.—The Helena and Gunjin blocks, which are the only portion of the district not held under concession, are being worked on the system of annual sales of marked standing timber on annual coupes of fixed area.

All permits issued operate from 1st January to 31st December.

The "possibility" of each block will in future be calculated separately, and each block worked over on a cutting cycle of 25 years. The marking for the time being is based largely on sylvicultural requirements.

Fire control.—A *sine qua non* of forestry throughout the jarrah country is complete protection of the bush from fire. Unless the protection is complete and sustained, it is better that the bush should be burned as frequently as possible, to prevent the inevitable fierce fire which will later result from accumulated debris. The system of frequent fires may to some extent protect the existing timber, but it does not allow a new forest to become established or an existing forest to reap the benefit of increased soil fertility due to an accumulation of leaf litter. The indirect and unseen damage caused by fires in the forests of this country are as serious as the more obvious destruction of young trees and timber.

Firebreaks a chain wide will not stop a fire, but they form an essential line from which even the fiercest fire can be stopped by counter fires and the smaller fires stopped by beating. All fires start from a spark, and the more rapidly a fire is seen the easier it is to deal with it.

Fire lookouts are being built on Mount Gunjin and Mount Dale. These observation stations consist of a covered lookout platform raised 30 feet above the ground and an accommodation hut.

The lookout platform is fitted with a telescope mounted on graduated disc for taking angular readings. The two stations are to be connected by telephone, and intersections to any smoke observed can be obtained and the fire located. Communication with camps of forest workmen employed on sylvicultural work in the bush will be maintained by portable field telephone systems similar to those used by military field engineers. Fire rangers may be necessary for a year or two until popular education and spark arresters on locomotives eliminate the two most frequent causes of fires.

Grazing control.—Grazing must be eliminated on this working circle until the public realise that a few mouthfuls of rough feed do not justify the destruction of thousands of pounds worth of young timber.

Administration.—Until experienced professional officers are available, the general administration of the working plan must be carried out by the working plans staff. Foresters and forest workmen are being trained to take charge of "blocks."

Working Plan No. II. (*Tuart Working Circle*).—This working plan was gazetted by order of the Governor-in-Council on 29th June, 1921, and brought into operation on 1st July, 1921. The following is a short summary of its main provisions:—

Location.—Crown lands situated between the Capel and the Sabina Rivers, carrying or capable of carrying prime tuart.

Area.—5,258 acres.

Present condition of the Forest.—Cutting operations have been carried out spasmodically over the whole forest for the past 50 years. On portions which have remained Crown lands throughout the whole time, minimum girth regulations have been observed, but on a large portion of the area cutting has been unrestricted except by the high specifications enforced by buyers. During the last forty years there has been practically no regeneration.

A strip survey yielded the following summary of the present stocking.

AREA—5,258 acres.

——	Sound Trees.	Trees of doubtful Utility.	Useless Trees.
Saplings	2,629	...	...
Immature trees (5in. to 23in. B.H. diameter)	40,734	11,000	4,034
Mature trees (over 23in. B.H. diameter)	9,191	6,042	9,478

Increment.—Very little data were available, but measurements of a five-acre sample plot over a period of four years indicated that the probable average increment was .7in. per annum in girth.

Accepting 23in. B.H.* diameter as maturity, the rotation works out at approximately 100 years.

Future Treatment.

Objects of Management.—To fully utilise the existing crop of tuart and provide for a sustained annual

* B.H. = Breast height, which is taken as 4ft. 3in. from the ground.

yield of tuart timber in such a manner that any fluctuation shall be in the direction of an increased yield.

Proposed Sylvicultural System.—The forest is to be worked under the group selection system. The size and position of groups within the annual coupe will depend entirely on sylvicultural requirements and experience gained during the first few years of working.

Trees marked for falling during the first period are to be numbered in order to obtain a graded yield table for use in calculating the yield during future periods.

The causes of the complete failure of regrowth during the past forty years are discussed in the working plan report in full. Grazing and the associated fires are held to be the prime causes.

Rotation.—100 years.

Cutting Cycle.—10 years.

Artificial Regeneration.—Experimental work both with nursery beds and broadcasting *in situ* are being undertaken, but artificial regeneration is only to be looked upon as a last resource.

Subdivision of the Area.—Existing roads are in bad repair, but all heavy carting will be done over cleared breaks through the bush. Firebreaks half a chain wide have been cleared around the whole of the external boundary of the forest. Cross breaks of the same width are to be cut through the forest until the whole is subdivided into compartments of 250 acres or thereabouts.

Utilisation.

Determination of the Cut.—The data available were insufficient to base the cut on any of the recognised methods for selection forests, and consequently the following method was devised:—

Although the rotation is 100 years the problem of securing adequate regeneration remains to be solved, and consequently the number of trees to be cut during the first period has been based on the assumption that the existing crop must suffice for 120 years.

The somewhat faulty nature of the smaller trees is compensated for by their comparatively open position. This will mean that thinnings, even in the groups, will be so light that it may be reckoned that 25 per cent. of the trees booked as sound, having B.H. diameters between 5in. and 23in., will reach maturity. Twenty-five per cent. are already excluded, being booked under "doubtful and useless." Thus the actual percentage of immature trees estimated to reach maturity is 18.5.

No allowance is made for the small number of inferior saplings nor for the large number of useless trees which must be felled or ringbarked.

Immature sound trees	...	40,734
Mature sound trees ...	...	9,191
Trees of doubtful utility	...	6,042

$$\text{Annual "possibility"} = \frac{\frac{40{,}734 + 9{,}191 + 6{,}042}{4}}{120}$$

$$= 212 \text{ trees.}$$

Distribution of the Cut.—Cutting cycle: 10 years.

A system of reduced areas has been introduced with the object of bringing the forest to a more normal state in the shortest possible period.

Disposal of major Forest Produce.—A sawmill has been erected to ensure the use of all marketable timber, and to keep the cutting within the calculated possibility. Orders for local Government use in the Railway Workshops will absorb the output of large dimensioned pieces, while the short ends and branchwood will, it is hoped, be absorbed for turnery and coachbuilding establishments. It may be necessary to install a certain amount of turning machinery at the mill.

Forest Protection.

Grazing.—The fencing of the external boundary and a system of annual leases of grazing rights over specified areas is to be introduced. Water will be provided in all paddocks and the leases sold by public auction at a given time each year.

Fire.—Fires must be kept out at all costs, but, as the area involved is only 5,000 acres of flat country, fire control is largely a matter of local organisation and education.

Insect Control.—The insect which severs the flower buds of tuart in such large quantity before every flowering has been identified as *Haplonyx tibialis*. The necessity for the protection of insectivorous birds in this part is more urgent than in any other part of the timber country.

Administration.—Pending the appointment of a professional officer to the district which will include this working circle, the area will be controlled by the working plans staff, and will form a forester's range.

A system of accountancy has been evolved whereby a trading, profit and loss account and balance sheet will be drawn up annually for the forest.

Progressive accounts of all revenue and expenditure will be kept, so that the annual balance sheet will be drawn up by the transference of totals standing against respective items.

Some doubtful assumptions will have to be made to close the balance sheet during the first period, but the filing of the incomplete document will result in the preserving of records, which will prove valuable in summing up the financial position of the working circle in future years, and also provide experience in the methods of forest accountancy, of which very little is known at the present time.

Working Plan No. III.—Collie coalfields working circle.

The working plan report is now complete and awaits the approval of the Governor.

A complete working plan survey was carried out, and the following extracts show the relation of the coal mining industry to its timber supply, which up to the present has been obtained exclusively from land held under coal mining leases by the respective companies.

Location.—Crown land held under coal mining lease in the neighbourhood of Collie, and gazetted State forest on 29th October, 1920.

Area.—37,227 acres.

Present condition of the Forest.—This working circle is composed of three types of forest country:—29,835 acres of typical jarrah country heavily cut over and badly burnt; 7,360 acres of sandy flat carrying very sparse jarrah mixed with banksia, sheoak and other scrub; 147 acres of swamp country carrying paperbark and other scrub, the land being under water during winter months.

STATEMENT OF WORKING PLAN SURVEY OF COALFIELDS WORKING CIRCLE.

Areas.		Jarrah.									Marri (Number of).				Blackboys.
		Volumes.			Number of Saplings	Number of Dead Trees.	Useless Trees (Number of).								
Lease.	Classified	Splitting.	Milling.	Removed.			Under 10in. B.H.D.	10in.–20in. B.H.D.	Over 20in. B.H.D.	Totals.	Saplings.	Under 20in. B.H.D.	20in.–30in. B.H.D.	Over 30in. B.H.D.	Number of.
							PREMIER LEASES.								
acres. 2,760	acres. 2,687	cub. ft. 327,900	cub. ft. 343,130	cub. ft. 338,940	3,630	2,980	32,730	13,065	9,165	54,960	815	6,800	1,840	1,020	Not booked.
							COLLIE CO-OPERATIVE LEASES.								
2,735	2,460	554,730	801,170	924,960	21,025	4,945	46,740	15,100	7,950	69,790	5,165	11,730	1,250	340	do.
							WESTRALIA BLACK DIAMOND COLLIERIES LEASES.								
3,065	1,734	496,855	323,580	625,625	5,550	2,670	41,440	14,220	6,140	61,800	5,235	26,355	2,825	470	do.
							PROPRIETARY LEASES.								
5,040	3,870	500,145	566,025	1,066,800	6,300	5,145	70,165	32,655	13,845	116,665	2,270	8,715	1,815	240	do.
							T. D. BRIGGS' AND NEW WALLSEND COLLIERIES LTD. LEASES.								
4,640	3,700	547,990	610,350	648,645	4,485	5,180	84,520	37,890	13,725	136,135	3,515	13,580	1,270	325	do.
							COLLIE COAL CO., THE SCOTTISH COLLIERIES, AND EAST COLLIE COAL MINING BRIQUETTING CO., LTD., LEASES.								
20,250	16,620	2,919,020	2,773,880	2,330,790	14,580	18,280	354,450	134,310	64,320	553,080	6,930	39,825	8,020	4,655	443,120
							STATE FOREST (Not at present held under Mining Lease).								
...	6,155	772,930	1,059,125	1,915,415	35,670	9,965	158,420	36,970	25,065	221,175	13,275	32,895	7,080	3,735	45,065
38,490	37,226	6,119,570	6,477,260	7,851,175	91,240	49,165	788,465	284,210	140,210	1,213,605	37,205	139,900	24,100	10,785	488,185
Average	1	164·38	173·9	210·9	2·45	1·3	21·18	7·6	3·76	32·6	1·0	3·75	·64	·29	21·4

During the past 12 months the coal mines used approximately 4,000 loads of timber in the square. If an average recovery of 50 per cent. is allowed under the present system of splitting timber for mining purposes, this means an annual consumption of 400,000 cubic feet. If there is no big increase in the output of coal during the next two decades, the mining leases may be said to be carrying 15 years' supply of free splitting and round mining timber, but, in view of the fact that the output of coal in 1920 was 15 per cent. in excess of the output during 1919, it seems scarcely safe to assume that the volume increment of the timber will suffice to meet the additional demand caused by increased output of coal.

The use of sawn timber for certain purposes may relieve the situation to a slight extent, but, when it is realised that there are on an average only 2.5 healthy saplings to the acre and that it may take 30 years to grow jarrah trees to a size suitable for mining timber, the urgent necessity for forest conservation and regeneration is apparent.

By reference to tabulated summary above, it will be seen that for every 2.45 sound saplings to the acre, there are on an average 21.2 useless jarrah saplings under 10 inches, B.H. diameter. No more striking indictment of the present practice of burning the bush at frequently recurring intervals could be found than in the statement that the present sparse jarrah forest contains on an average 32.6 useless jarrah trees per acre, of which 29.8 are under 20 inches B.H. diameter.

Objects of Management.—To provide a sufficient and economic supply of timber for the coal mines.

Proposed Sylvicultural System.—All country capable of growing marketable jarrah timber will be worked under the clear felling system. Limited coupes will be denuded of all free splitting and milling timber and other forest produce of any value. All small rubbish will be felled and burnt, while larger trees will be subsequently ringbarked after having served as mother trees.

Even-aged plantations of *Pinus pinaster* and *Eucalyptus globulus* are to be established on sandy flats incapable of growing a crop of jarrah.

Nursery and Plantation Work.—Initial costs of all plantation work must be kept down to a minimum, and with this object a number of experimental plots have been sown this year to test the relative merits of various methods of sowing *in situ*. Experimental sowing has been carried out by dibbling and broadcasting seed on burnt, unburnt, and ploughed land respectively. A small temporary nursery has been established in the arboretum enclosure.

Subdivision of the Area.—Owing to the comparatively intensive nature of the work and short rotations, the compartments will be limited to 160 acres. This will ultimately all be bounded by firebreaks one chain wide. Firebreaks will be cleared at least one year before felling operations commence on the compartment.

Utilisation.

Mining Timber.—The area of the annual coupe and the volume of timber cut will depend on the

requirements of the respective mines. The system of cutting is based on close co-operation between the Forester in Charge and the mine managers. Coupes for each mine carrying approximately three months' supply of timber are marked out and denuded of all timber suitable for mining purposes before the timber getters move on to a fresh coupe.

At the beginning of each month mine managers submit a statement accompanied by a statutory declaration setting out the amount of timber cut during the preceding month and royalty is charged at rates prescribed by regulation. All money received as royalty on mining timber is paid into a special account, in accordance with Section 39 of the Forests Act, and devoted to forest operations within the working circle.

Milling Timber.—The milling timber left on coupes which have been cut out by mining companies will be offered for sale by public auction in the first week of March each year.

Forest Protection.

Grazing Control.—On account of the close association of grazing with bush fires and the damage likely to be done to plantations of exotics, it has been necessary to control the grazing of cows in this working circle.

Local residents at first strongly resented interference with long-standing privileges, but the saneness of the Department's policy and the importance of forestry to Collie were quickly recognised, and local support in the carrying out of this working plan is now assured.

A Forests Protection Society, with the following objects, has been formed:—"To encourage the economic use of local timbers and provide for a perpetual supply by co-operating in the protection of the forests, especially from damage by fire."

Members of this society are allowed to take out a license to graze one or two cows on specified portions of the State Forest.

Owners of large herds of cows are granted forest grazing leases provided a herdsman is employed or fencing carried out, so as to confine the cattle to specified areas.

Fire Control.—Fire prevention is more important than fire suppression.

Popular education is the surest means of fire prevention.

Fire suppression will be dependent on a break system and organised fire fighting. Telephonic communication from pit heads should give early warning of fires. Four forest workmen will form the nucleus of a mobile fire fighting force. Organised volunteer labour will always be available in case of emergency.

Administration.—Pending the appointment of a District Forest Officer, whose range will include this working circle, the area will be controlled by the Working Plans Officer.

The circle as at present constituted forms a forester's range.

The system of control laid down in the working plan provides for early decentralisation.

A similar system of forest accountancy to that evolved for Working Plan No. II. has been adapted for this working circle. An annual balance sheet will be drawn up and the economic and financial results of various operations summarised each year.

General.—A glossary of forest terms for local use has been prepared, and it is imperative that steps be taken at an early date to standardise the forest terms in use throughout Australia.

The recording of experimental work has been systematised, but the lack of trained observers in the field renders the collection of accurate data difficult.

Trained staff, both for the professional and general divisions of the service, is urgently required. Experienced timber workers are being engaged as forest workmen and trained as foresters, but the problem of the training of the professional man, which is even more vital and urgent, seems no nearer a solution.

The work of educating the public in the elements of forestry and awakening a realisation of the incalculable damage done by forest fires is an essential activity which must be undertaken if forestry is to progress in this country. There can be no forestry while every man is content to see the bush burn.

8.—PINE PLANTATIONS.

The large scheme of pine planting under which it was proposed to plant one square mile annually has not been proceeded with, owing to the impossibility of obtaining rails to link up the area with the existing railway system. All rails obtainable were required by the Government for the urgent work of land settlement. Experimental work has been continued on the site, so that, when the necessary rails and funds are available, the work can be pushed on.

Except for pine planting under Working Plans I. and III., under which soft woods are being introduced in chosen localities in the jarrah forests, where they are likely to prove more successful than the indigenous timbers, the only planting work done was at Ludlow.

Ludlow Pine Plantation.—The work of converting the portion of this area planted with Monterey pine into a plantation of cluster pine was continued. The seed sown last year in the nursery yielded 140,000 transplants, and of these 136,000 survived and were planted out on 67 acres, compartments I, W, Q, and portion of T. In addition, 32,350 cluster pine seedlings were lifted from those portions of compartment A when they were too dense, and planted out on 15 acres on the remainder of compartments T and S. In all, 82 acres were planted. Direct sowing of cluster pine seed was carried out over 52 acres covering compartments B, N, and parts of K, R, and S.

Compartment B: 32 acres had been sown in 1919 with excellent results, a good crop of seedlings covering the whole area. Unfortunately a fire occurred in March, 1921, which destroyed these. The fire was started through a piece of lighted marri bark falling in the compartment. On investigation it was found that it had been blown by the wind a distance of 8 chains from a burning tree outside the plantation, and beyond the Bunbury-Busselton railway line. The Forester-in-Charge of the plantation was alone at the time, but succeeded in confining the fire to the compartment by lighting back fires from the surrounding breaks.

Provision for the 1923 planting was made by the sowing of 95 lbs. of seed in the nursery. The 16 acres of golden wattle yielded 500 lbs. of cleaned

seed, which is being utilised in connection with the operations under Working Plan No. I. at Mundaring, also a certain quantity was distributed free of cost to settlers.

9.—HAMEL STATE NURSERY.

In Appendix 8 will be found a statement showing the year's operations. It will be seen that 58,501 trees were raised, and 49,826 trees sold, while 1,361 trees were issued free. The increasing demand for cypress trees, which are, it seems, chiefly used for hedgerow purposes, will make it necessary to restrict the distribution of this and certain other species. It cannot be considered a function of the department to supply trees for ornamental garden use. A gratifying increase in the number of forest trees distributed has occurred, while numerous packages of seeds have been exchanged with foresters and arboriculturists in many parts of the world.

10.—FOREST PROTECTION.

(a.) *Fires.*—Fires are the worst enemy of the forest, and, since they are lit, unintentionally or intentionally, by man, wide publicity is necessary to convince the public of the necessity of preventing and controlling fires. Such a campaign has been carried on in the press throughout the year, but it is probable that it will be necessary to supplement printed matter with lectures, in order that success may be achieved in this direction.

(b.) *Grazing.*—The whole of the forest belt has been used by graziers, either licitly or illicitly, as a pastoral run. The control of grazing is necessary before any regeneration work can be carried out. Partial control has been attained in the tuart belt, and on the coal-mining leases the grazing of milch cows is in a satisfactory position. On the Helena and Gunjin blocks arrangements have been made to run in and impound the semi-wild and tame horses.

(c.) *Insects.*—The knowledge regarding insects friendly or harmful to the forests has been extended. The most interesting observation as to the life history of the large larva that attacks marri and is the primary cause of gum veins was made by Mr. S. L. Kessell. The imago was identified as *Phoracantha tricuspis Newm.*, var. *gigas* Hope, and is a large longicorn beetle. The egg is apparently deposited on the bark of the tree and the larva penetrates through to the sapwood and heartwood, and after making a crooked tunnel up the tree, broken by excursions to the outside, apparently for air, it makes an ear-shaped groove in the sapwood, and retires into the heartwood to make a pupating chamber, whence it emerges later through the opening that has resulted from the cutting out of the sapwood. The time taken from egg to imago is not yet known, and further observation is necessary to discover the season or seasons of the year when the eggs are deposited. The gummation which follows the attack of the larva, in 99 cases out of 100, is probably caused by bacteria. Microscopic examination of the woody tissues affected reveals the fact that the trouble is confined to certain undifferentiated tissues, which appear to be formed only at certain seasons. It is important that research be continued in two directions. In the first place, is it possible to control the insect and so prevent the attack? If so, marri timber can be grown free of gum veins and will find a ready market, for it is one of the best of the eucalypt timbers. Secondly, can the formation of gum be induced artificially? If so, it will be possible to promote the formation of a tannin agent which promises commercial possibilities of no mean value.

The tuart bud cutting beetle, which has been identified as *Haplonix tibialis,* was observed at work by Mrs. C. E. Lane-Poole. This weevil was seen to bore a hole in the operculum of the flower bud and deposit an egg, seal up the hole, and then cut off the bud, either at the petiole or lower down the twig, and then repeat the process on another bud. One particular insect put up a record of boring, depositing eggs in, and cutting off four buds in an hour. In the course of two weeks a larva emerges from the egg in the bud, which is now lying on the ground, and, living on the stamens and ovaries, makes its way down to the base of the bud, whence it emerges by cutting a hole through to the outside. The time taken from egg to imago, while not definitely known, cannot well extend beyond the interval of two flowering seasons. The imago works from December to May.

The Government Entomologist rendered the department assistance in the matter not only of identifying specimens, but also through Mr. Clark, Entomological Collector, of obtaining information regarding the life histories of noxious insects. Mr. Clark devoted half of his time to forest entomology, and during this time investigated the jarrah pin-hole borer which causes so much damage to standing trees. While unable to fix the blame to any insect, he has found a borer which he identifies as *tomicus truncatus* in the tunnels of the wood. The problem has been rendered difficult owing to the impossibility of rearing the adult insect from eggs in timber removed from growing trees and placed under observation. The pest has a wide range, attacking all the eucalypts of the South-West. Another injurious insect that has claimed the attention of the Collector is the jarrah girdler, which apparently causes the "die back," which gives the stagheaded appearance to trees. The larva, which is one of the flat-headed borers, starts its attack in the bark, then girdles the sapwood, then retires to the bark until it is full grown, when it penetrates to the hard wood, where it excavates its pupal chamber. While the adult has not yet been captured, it is probably a Buprestid beetle and most likely *Anilara uniformis.* The Government Entomologist and Mr. Clark have also rendered very great assistance in connection with the alteration in the vermin regulations. For many years cats—originally liberated or escaped from domesticity, and now wild—have been protected on the ground that they assisted in the destruction of rabbits. It was shown that, while the good they did in this direction was very small, they did incalculable harm by destroying insectivorous birds. A committee was formed, on which Mr. Clark represented the Forests Department, and the result of the deliberations of this body was the inclusion of cats under the heading of vermin.

11.—FOREST CONFERENCES.

The Empire Forestry Conference was held in London in July, 1920, and Mr. Mackay, Commissioner of Forests, Victoria, and the writer, were appointed to represent the Commonwealth. Nearly every self-governing dominion and colony was represented by an expert forester, so that the meeting was of par-

ticular interest. Prior to the convening of the Conference, a printed questionnaire was submitted to every Forests Department of the Empire, with a view to eliciting all the information possible regarding the Empire's timber supplies. The reports obtained are of great value, showing as they do that, with the possible exception of India and South Africa, the amount of forestry work being done is lamentably short of the requirements of the Empire.

The following resolutions were adopted by the Conference:—

1.—*Forest Policy.*

In view of the great importance to the Empire as a whole, as well as to each of its component parts, of producing a sustained yield of all classes of timber, and of encouraging the most economical utilisation of timber and other forest products, and of maintaining and improving climatic conditions in the interests of agriculture and water supply, each of the Governments of the Empire should lay down a definite forest policy to be administered by a properly constituted and adequate forest service.

2.—*Survey of Resources.*

The foundation of a stable forest policy for the Empire and for its component parts must be the collection, co-ordination, and dissemination of facts as to the existing state of the forests and the current and prospective demands on them.

3.—*Constitution and Status.*

In order to attain continuity in the development of forest resources, it is desirable that certain elements of stability be secured in the constitution of the forest policy. This may be done by the following measures:—

1. The definition, where this has not been done already, of forest policy in a Forestry Act or Ordinance.
2. The reservation for the purpose of economic management and development of forest lands under conditions which prevent the alienation of any which is primarily suitable for forests, except for reasons consistent with the maintenance of the forest policy as a whole.
3. The assurance to the forest authority of funds sufficient to carry out the accepted policy for a series of years.
4. The grant to members of the forestry service of the status of civil servants with due provision for pension.
5. The appointment as the chief officers of the forestry service of persons having a high standard of training in forestry, their selection and promotion being by merit alone.
6. The establishment in each of the larger parts of the Empire and for the Colonies not possessing responsible government collectively, of an officer or officers, having special duties of advising as to forest policy and surveying its execution.

4.—*Organisation of Forest Industries.*

It is extremely desirable that the forest authority should be in close touch and consultation with organisations representing the interests concerned in the extraction and utilisation of timber and other forest products.

5.—*Publicity.*

It is the duty of the forest authority in every part of the Empire to adopt and encourage methods of education and publicity in order that the people may be fully informed of the aims and purposes of forest policy and may thus be induced to co-operate towards its successful fulfilment.

6.—*Distribution of Forest Plants.*

The Conference have had brought to their attention the advantages which have accrued in several parts of the Empire from the wide distribution of forest plants, and desire to bring the method of encouraging tree-planting by distribution of plants either from Government or private nurseries gratuitously or at cost price to the earnest attention of their Governments.

7.—*Terminology and Trade Nomenclature.*

The following questions should be referred to the proposed Imperial Forestry Bureau immediately on its formation:—

i. Standardisation of forest terminology;
ii. Correct identification of timbers, and standardisation of their trade names.

8.—*Research.*

The scheme of research work set out receives the approval of the Conference, and is recommended to their Government for early consideration and approval by them.

This takes the form of the report from a committee appointed "to prepare a draft scheme for the organisation of that research work which is essential to the progress of forestry, including both the production and utilisation of forest produce, the committee to pay particular regard to the importance of avoiding overlapping and of co-operation with existing institutions."

The report deals with the organisation and subdivision of research, with the relation of the different parts of research to one another and to education and practice, and with the subjects of research both generally and in relation to the needs of the different parts of the Empire.

9.—*Education.*

It should be a primary duty of forest authorities throughout the Empire to establish systematic schemes of forestry education. It has been found for climatic and other reasons that it would not be possible for each part of the Empire to establish a complete scheme of forestry education of its own, and therefore it is essential that those parts of the Empire which are willing and able to establish complete systems should, as far as possible, frame such schemes with a view to combining for meeting the needs of those parts which can only themselves make a partial provision for their requirements.

Part of this subject has been dealt with by a committee whose report, which refers mainly to the higher training of forest officers, is approved by the Conference.

The main principles embodied in this report are as follows:—

1. That one institution for training forest officers be established in the United Kingdom.
2. That students be selected from graduates having taken honours in pure or natural science at any recognised university.
3. That it be an integral part of the work of the institution to arrange supplementary courses at suitable centres for students requiring special qualifications and also special courses for forest officers from any part of the Empire, whether at the institution itself or at centres of training in other parts of the world. The Governments should recognise these courses as part of the ordinary duties of the forest officer, at any time during their service, and the Governments concerned should give special facilities to forest officers in their service to attend such courses.
4. That a department of research into the formation, tending, and protection of forests be associated with the training institution.
5. Encouragement should be given to the existing provision made by universities and colleges for forestry instruction for those who do not desire to take the full course suggested for the forestry service. It appears that this is especially applicable to the United Kingdom.

It is also desirable to make adequate provision for woodmen's schools for the training of foresters as distinct from those which are intended for forest officers.

10.—*Forestry Bureau.*

The Conference approve the suggestions and recommendations for the constitution of an Imperial Forestry Bureau which are contained in the report of a committee, and strongly urge upon their respective Governments that they should contribute to the support of the bureau as therein suggested. They feel that it will be largely upon the work of such a bureau that the

proper development of the forestry resources of the Empire will depend, and they therefore cannot overemphasise its importance as a part of Empire organisation.

11.—*Future Conferences.*

The Conference is convinced that the holding of conferences of representatives of the Empire on forestry matters is of great service. They desire to thank the Forestry Commission of the United Kingdom for causing the Conference to be assembled and for making the necessary arrangements. They recommend that the next Conference be held in the year 1923 and that, if the Dominion Government approves, it be convened in Canada.

Interstate Conference.—A conference was convened by the New South Wales Forestry Commission in February, to try and reach finality regarding the establishment of one Australian Forestry School for the training of professional foresters for all States of the Commonwealth. As reported last year, the Hobart Forestry Conference resolved:—

Australian School of Forestry.

That this Conference emphasises the urgent need for the establishment of an Australian Forestry School for the training of higher-grade foresters.

That a delegation should wait upon the forthcoming Premiers' Conference, consisting of Messrs. Owen Jones, Chairman, Forests Commission, Victoria, and N. W. Jolly, Commissioner, Forestry Commission, New South Wales, with a view to submitting a scheme for the establishment of an Australian School of Forestry.

This resolution was subsequently affirmed by the Premiers' Conference. The Sydney Conference included representatives from all States except Tasmania, the writer representing the Federal Government, as well as Western Australia, and finality was reached regarding many details. It was clear from this meeting that all the State foresters wholeheartedly supported the central school, and the only hitch was the doubt in the minds of certain of them as to whether their Governments would support it also. Unfortunately the misgiving in regard to one State proved well founded, for the Victorian Government has not decided to support the scheme. Another State only gives its support on condition that all States co-operate. In consequence of Victoria's attitude, the establishment of an Australian Forestry School must be abandoned, and instead there is every prospect of each State establishing a school of its own, a course which, besides being very expensive, will not give anything like the results that could be obtained from an Australian School with a well qualified and adequate teaching staff.

12.—LEGISLATION.

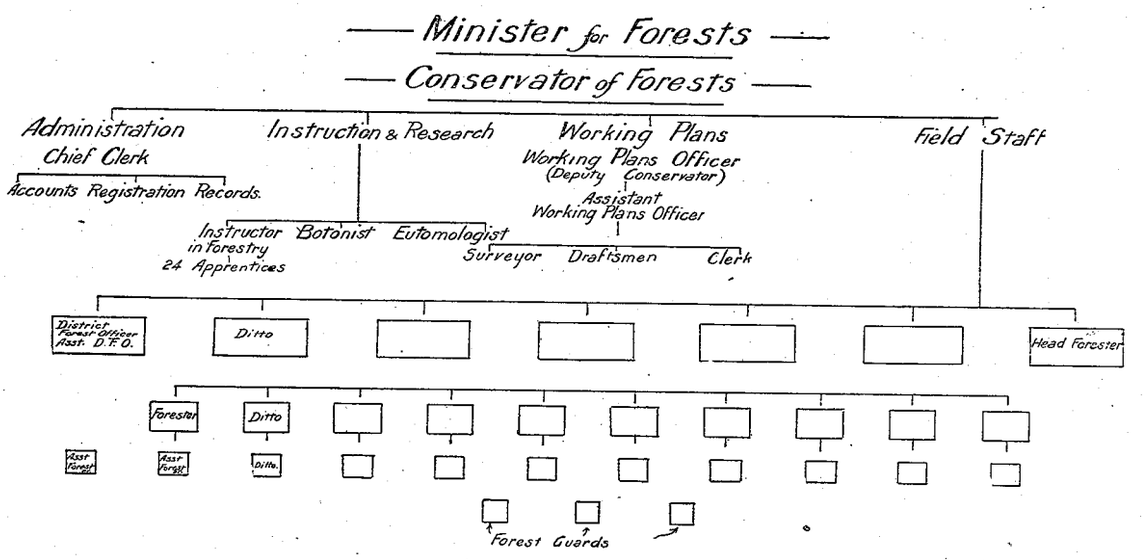
No amendment was made to the Forests Act. The timber regulations made under the Land Act were revised and consolidated, and certain additional regulations were promulgated.

Of these the most important was the introduction of the full cubic measurement of timber. For many years the system known as "Hoppus's," or better perhaps the "quarter girth system," has been used, and a serious under-estimation of the mill logs has resulted. The true measurement of the log exceeds the quarter girth system of measurement by 21½ per cent. A book of tables giving the cubic contents of logs of all girths and lengths was printed to take the place of Hoppus's tables.

An attempt was made to reduce the waste which results from felling trees too high from the ground. A regulation fixing the felling height at 18in. was promulgated and, while reports from all District Foresters showed that it was, on the whole, working satisfactorily, the organised opposition raised by sawmillers and by representatives of the fellers was so strong as to induce the Government to issue instructions to the Department not to enforce this regulation.

13.—ADMINISTRATION.

Staff.—The administration of the department was gone into carefully with the Public Service Commissioner, with the result that the divisions of the staff were laid down as shown in the following diagram:—



It was also decided that, so far as the whole of the field staff of the department was concerned, the provisions of the Public Service Act would not apply.

Up to the present a great difficulty has been experienced in obtaining not only trained professional officers to fill the positions of district and assistant district forest officers, but also of men trained in practical forest management to fill the positions of foresters and assistant foresters.

The writer, the assistant working plans officer, and the forestry instructor are the only professional foresters at present, and the growth of the work will make it necessary in the near future to make a further effort to obtain the services of at least three more professional officers to take charge of districts. While no difficulty has been experienced in finding men capable of filling positions of timber inspectors and general ranging work, there are no trained practical foresters to be found to take over sylvicultural work in the areas in which operations are being conducted under working plans. The system of selecting likely men and training them by correspondence classes has been continued, and during the year three temporary assistant foresters passed the examination and were promoted to assistant foresters. Eight assistant foresters who were already on the staff also passed the necessary examination for promotion to forester.

In order to make sure of an adequate and sufficiently trained field staff in the future, the apprentice system was revived. A school was established at Ludlow, in the tuart belt, where the boys obtain the necessary theoretical and practical training in forestry. The syllabus of training which has been printed provides for six months at the school for the first year and two months a year for the next three years. The remainder of the apprentices' time is spent in practical work in the forests, where sylvicultural operations are in progress. Six boys are to be admitted annually to the school, after passing the necessary entrance examinations. The success of the training depends largely on the instructor, and Mr. Davey, a forestry graduate of Adelaide University was appointed to the position in January, and after having made himself familiar with the work being undertaken, and with the local conditions, he took up his duties at Ludlow. After four years' apprenticeship, and having passed the necessary examination, the apprentice is promoted to the grade of forest guard, and two years later, again subject to examination, to assistant forester. During the year two apprentices successfully passed their final examination, and were promoted to forest guards.

The process of converting the department from a tax-gathering institution into a forestry department must necessarily depend on the rate at which it is possible to train the field staff. In the meantime the major portion of the forests which is not subject to any working plans is being policed by foresters and assistant foresters. These titles have superseded that of ranger. In all, there are 13 foresters engaged in this work, and they are under the direction of the Head Forester. The inspection branch consists of nine inspectors and assistant inspectors, under the direction of the chief timber inspector. There were four foresters, two assistant foresters, two temporary assistant foresters, two forest guards, and six apprentices engaged in sylvicultural and other operations under the three working plans, under the direct supervision of the assistant working plans officer.

The housing of the administrative and clerical division in Perth is far from satisfactory, four of the staff being located in part of the building occupied by the Fisheries Department, which is several minutes' walk from the head office. The remainder of the staff are not only very much cramped for room, but are located in several rooms, making proper supervision very difficult. The provision of adequate accommodation at head-quarters is a matter that requires serious consideration.

CONCLUSION.

The forest policy of Western Australia is to-day passing through a crisis, the outcome of which cannot be foreseen. Swept by the full force of vested timber exploiting interests, and lacking support from the one quarter which could give support, it threatens to become a total wreck. At this juncture it is well to remember the carefully weighed judgment of the Commission which was appointed to inquire into the forest problems of the United Kingdom regarding the danger that politics hold for a policy which, if it is to succeed, must have a continuity not of years but of generations:—

> The afforestation policy of the State, once embarked upon, should be as little as possible liable to be disturbed by political changes or moulded by political pressure. We cannot, and do not, claim that it should be independent of Parliamentary control, but when Parliament has once adopted a policy of afforestation the decisions that have to be taken as that policy develops should not be taken by politicians, and if grievances and difficulties arise they should be adjusted in an atmosphere in which forest policy and not political expediency is the deciding factor.

Forestry is the one State enterprise which is justifiable from every point of view. A national duty devolves on the people of to-day to repair the wastage that they make in the forests, which do not belong to them only, but to their children and their children's children.

The forest policy which governs the use by the present generation of this vast national wealth must be based on a sound legislative enactment which removes the forest authority as far as practicable from political control. It takes many long years for a tree to grow and, to borrow Dr. Addison's phrase, "However much we may allow for justifiable expediency the policy cannot safely rest on a shifting opportunism to the neglect of conviction."

C. E. LANE-POOLE,
Conservator of Forests.

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APPENDIX 1A.

Statement of Revenue for the Year ended 30th June, 1921.

TO SUNDRY RECEIPTS.

	£ s. d.	£ s. d.
Licenses	573 13 6	573 13 6
Log Royalty on timber obtained from permits granted under Section 11 of the Land Act, 1898—		
Jarrah	25,115 14 4	
Karri	7,607 11 1	
Wandoo	0 6 0	
		32,723 11 5
Log Royalty on timber obtained from permits granted under the Forests Act, 1918—		
Jarrah	4,759 17 5	
Sheoak	118 6 1	
Banksia	247 14 1	
Pine thinnings	62 11 9	
		5,188 9 4
Royalty on hewn sleepers	1,492 5 9	1,492 5 9
Other Royalty—		
Piles and Poles ...	1,607 17 6	
Beams	162 2 9	
Sandalwood	17,653 0 0	
Charcoal	6 15 7	
Firewood	318 0 0	
Kiln-dried Jarrah ...	23 3 0	
Bark	1 10 0	
Confiscated Timber ...	23 7 3	
Posts	22 7 4	
Round Back Sleepers ...	3 0 0	
Redgum	28 12 7	
Scaffold Poles	7 5 0	
Kingia Grass	2 19 9	
Illegally cut timber ...	435 9 4	
Illegally cut Piles and Poles	29 18 10	
Confiscated Firewood ...	27 8 0	
		20,352 16 11
Inspection Fees—		
Hewn Sleepers from Crown Lands ...	424 10 9	
Sawn Sleepers from Crown Lands ...	1,212 8 4	
Sawn Timber from Crown Lands	445 15 0	
Hewn Sleepers from Private property ...	1,185 18 1	
Sawn Sleepers from Private Property ...	453 19 9	
Sawn Timber, Private Property	43 2 0	
Re-inspected	101 5 3	
Hewn Timber	0 1 4	
Beams	75 17 11	
Piles and Poles ...	70 4 3	
Banksia	4 11 4	
		4,017 14 0
Sales—		
Brands	37 4 0	
Trees and Seeds ...	549 16 1	
Publications	17 14 7	
		604 14 8
Miscellaneous Revenue—		
Freight and Postage ...	37 9 8	
Sale of Firewood ...	102 8 6	
Registration Fees ...	253 14 0	
Exemption Fees ...	15 19 6	
Search Fees	0 2 6	
Sundries	127 5 6	
Preparation Fees ...	4 0 0	
		540 19 8
Rents—		
Concessions	697 0 0	
Leases	7,995 0 0	
Tramways	1,118 1 10	
Saw Mill Sites	73 19 10	
Forest Leases	82 1 6	
Cottage Rent	8 12 0	
		9,974 15 2
		£75,469 0 5

APPENDIX 1B.

BY REVENUE EXPENDITURE.

	£ s. d.	£ s. d.
Subdivision 1—		
Salaries	5,409 16 0	
Wages	4,699 18 10	
Travelling and Forage...	2,327 19 0	
Allowance Reg. 79 ...	28 0 0	
		12,465 13 10
Subdivision 2—		
Maintaining State Nursery	234 14 3	
Incidental	2,583 2 1	
Imperial Conference ...	83 18 6	
Workers' Compensation	78 0 4	
Sandalwood Commission	683 0 11	
		3,662 16 1
Excess of Revenue over Revenue-Expenditure ...		59,340 10 6
		£75,469 0 5

APPENDIX 1C.

OTHER EXPENDITURE, 1920–1921.

General Loan.

	£ s. d.	£ s. d.
Purchase of Land		10,654 15 7
Pine Planting—		
Ludlow	394 16 4	
Mundaring	370 5 6	
Gnangara	322 4 3	
		1,087 6 1
		£11,742 1 8

APPENDIX 1D.

Forests Improvement and Reforestation Fund Expenditure.

	£ s. d.	£ s. d.
Working Plan No. 1.		
Road Construction—		
Contracts	3,006 11 0	
Wages	3,927 1 10	
Allowances	80 3 8	
Equipment	279 12 4	
Horses and Carts ...	129 13 11	
Forage	271 18 11	
Freights and Fares ...	39 1 4	
Postage and Telephones	15 4 0	
Miscellaneous	46 0 10	
		7,795 7 10
Greystone Nursery—		
Wages	182 9 9	
Allowances	4 11 2	
Equipment	3 6 3	
Freights and Fares ...	4 2 1	
Seeds	28 6 9	
Miscellaneous	1 9 9	
		224 5 9
General Survey—		
Wages	272 16 0	
Allowances	145 9 9	
Equipment	130 4 11	
Freights and Fares ...	43 1 0	
Forage	9 7 3	
Miscellaneous	20 7 9	
		621 6 8
Firebreaks	704 7 6	
Salaries (General) ...	518 9 10	
		1,222 17 4
Total		9,863 17 7

APPENDIX 1D.—*continued.*

Working Plan No. 2.						
Mill Buildings and Workmen's accommodation	2,616	11	1			
Machinery	2,695	2	8			
Tools and Equipment	329	19	5			
Pipe Line	536	9	10			
Railway Siding ...	1,991	15	4			
Railway Bridge... ...	43	18	6			
Stock (Working) ...	39	17	0			
Rent on Siding ...	15	0	0			
Freights and Fares ...	628	10	8			
Miscellaneous Wages ...	263	19	9			
General Expenses ...	36	18	2			
				9,198	2	5
				752	17	1
Tuart Fence	...			229	19	4
Measuring Timber ...	...			3	19	8
Marking Trees	...					
				£10,184	18	6
Total	...					
Working Plan No. 3.						
Firebreaks	448	1	6			
Regeneration Cleaning...	63	0	0			
Sowing Pines	17	5	0			
Salaries	913	16	11			
Allowances	99	2	4			
Equipment	16	10	10			
Freights and Fares ...	15	9	1			
Miscellaneous	14	19	3			
				1,588	4	11
Total	...			1,588	4	11
RESEARCH WORK.						
Kiln Drying—						
Salaries	254	9	4			
Wages	342	2	10			
Freights and Fares ...	14	7	4			
Equipment	87	7	2			
Timber for Drying ...	77	14	11			
Fuel	174	13	9			
Repairs to Boiler ...	11	3	4			
Miscellaneous	10	3	10			
				972	2	6
Entomology	...			141	8	4
Powell Process	...			199	11	1
Herbarium	...			409	15	2
Tan Barks	...			9	11	9
Sylviculture	...			50	6	0
Museum	...			172	17	3
Miscellaneous	...			482	17	1
Total	...			2,438	9	2
Classification—						
Salaries	2,659	9	4			
Wages	1,639	17	6			
Travelling Allowance ...	100	18	9			
Camp Allowance ...	377	10	9			
Sustenance Allowance	60	0	7			
Equipment	187	0	4			
Forage	237	11	6			
Freights and Fares ...	90	17	0			
Miscellaneous	45	19	5			
				5,399	5	2
MISCELLANEOUS.						
Special appropriation for Liquidation of Land Improvement Loan Fund	15,448	9	8			
Salaries and Travelling	1,716	0	0			
Advertising	1,979	18	3			
Publicity...	462	19	4			
Sandalwood Propagation	868	5	6			
Commonwealth School	236	13	7			
Arboreta	68	11	2			
Apprentices School ...	189	13	3			
Miscellaneous	24	18	2			
				20,995	8	11
Grand Total				£50,470	3	3

APPENDIX 1E.

Revenue and Expenditure.

The following statement shows the Revenue and Expenditure of the Department since its inception in 1893 :—

Year.	Revenue.			Expenditure.		
	£	s.	d.	£	s.	d.
1st Jan. to 31st Dec., 1895	3,175	5	2	1,108	5	5
1st Jan. to 31st Dec., 1896	4,838	11	2	2,020	11	5
1st Jan. to 31st Dec., 1897	12,320	6	4	3,489	14	4
1st Jan. to 31st Dec., 1898	30,150	6	3	3,356	5	7
1st Jan. to 31st Dec., 1899	16,999	11	3	2,438	7	5
1st Jan. to 31st Dec., 1900	15,525	19	2	2,648	11	10
1st Jan. to 31st Dec., 1901	18,477	16	2	2,747	6	3
1st Jan. to 31st Dec., 1902	18,752	11	7	4,301	6	1
1st Jan. to 31st Dec., 1903	20,478	9	1	3,789	3	4
1st Jan. to 31st Dec., 1904	20,018	19	4	4,192	16	9
1st Jan. to 31st Dec., 1905	18,479	18	6	5,089	18	6
6 months, 1st Jan. to 30th June, 1906	10,973	18	4	3,385	1	9
1st July, 1906, to 30th June, 1907	22,783	1	5	6,207	15	2
1st July, 1907, to 30th June, 1908	23,498	13	3	8,801	14	3
1st July, 1908, to 30th June, 1909	29,484	3	8	9,030	12	6
1st July, 1909, to 30th June, 1910	31,549	6	11	8,531	0	9
1st July, 1910, to 30th June, 1911	37,477	3	5	8,862	16	8
1st July, 1911, to 30th June, 1912	44,560	10	10	10,469	4	10
1st July, 1912, to 30th June, 1913	48,236	14	0	11,463	2	11
1st July, 1913, to 30th June, 1914	53,038	16	0	12,092	15	3
6 months, 30th June, to 31st Dec., 1914	22,906	0	0	5,468	14	0
1st Jan. to 31st Dec., 1915	45,725	13	9	8,869	15	11
1st Jan. to 31st Dec., 1916	29,820	12	10	9,575	3	2
1st Jan. to 31st Dec., 1917	36,128	17	11	10,263	2	5
6 months, 1st Jan. to 30th June, 1918	22,113	1	8	6,199	1	11
1st July, 1918, to 30th June, 1919	42,050	12	4	10,872	18	3
1st July, 1919, to 30th June, 1920	59,220	4	3	12,961	13	11
1st July, 1920, to 30th June, 1921	75,469	0	5	16,128	9	11
	814,254	5	0	194,365	10	6

It will be seen from the above statement that to the 30th June, 1921, the revenue exceeded the expenditure by the large sum of £619,888 14s. 6d.

APPENDIX 1F.

Statement of Timber Inspected by the Inspection Branch of the Forests Department during the Year ended 30th June, 1921.

	Inspection Fees.			
	Loads.	Amount.		
		£	s.	d.
Sawn Jarrah, Heart out...	45,094	2,155	5	1
Hewn Jarrah, Heart out...	33,571	1,610	10	2
Miscellaneous Timber ...	2,031	105	16	7
	Lin. feet.			
Jarrah Beams, Heart in...	16,299	75	17	11
Piles and Poles	4,646	70	4	3
		4,017	14	0

APPENDIX 2A.

Production of Mill Timber for Year ended 30th June, 1921.

	Jarrah.		Karri.		Total.	
	Loads.	Cub. ft.	Loads.	Cub. ft.	Loads.	Cub. ft.
Concessions	51,628	2,581,400	...	...	51,628	2,581,400
Leases	161,520	8,076,000	...	...	161,520	8,076,000
Permits	251,302	12,565,100	78,988	3,949,400	330,290	16,514,500
Total	464,450	23,222,500	78,988	3,949,400	543,438	27,171,900

NOTE.—From the 1st July to 31st December, 1920, measurements were calculated on the quarter girth (Hoppus') system. From the 1st January, 1921, the new system of calculation, as provided under Forests Department Regulation No. 97, has been used.

Amended percentages of recovery of sawn timber from the round are :—Jarrah 35 per cent. and Karri 27 per cent. The totals above will therefore represent 190,203 loads of sawn timber or 9,510,150 cubic feet.

Mill Logs.—This statement includes all timber from Crown Lands, Sawmill Permits, Timber Leases and Concessions, but does *not* include timber cut on Private Property.

APPENDIX 2B.

Timber (excluding hewn) obtained from Private Property for Year ended 30th June, 1921.

Name of Timber.	Logs in loads.	Sawn Timber in loads.
Jarrah Logs and sawn timber	1,032	4,285
Tuart	...	143
Native Pear	...	5
River Banksia Logs and sawn timber	157	8
Blackbutt	...	4
Karri	...	15
Total	1,189	4,460

APPENDIX 2C.

Inspected Hewn Jarrah Sleepers obtained during Year ended 30th June, 1921.

	Loads.	Cub. ft.
From Crown Lands, Saw Mill permits, etc., on which Royalty has been paid	7,917	395,850
From Private Property, Leases and Concessions ...	25,334	1,266,700
Total	33,251	1,662,550

NOTE.—The average recovery by the hewer is 20 per cent. of the log. The above total represents 166,255 loads, or 8,312,750 cubic feet in the round.

APPENDIX 2D.

Timber (other than Jarrah and Karri) and other Forest Produce obtained from Crown Lands for the Year ended 30th June, 1921.

Name of Timber or other Forest Produce.	No.	Loads, measured in Round.	Tons.
Banksia	...	509	...
Barks—Mangrove	...	...	32
Other	...	...	11
Blackboy	...	...	200
Blackbutt	...	63	...
Bulitch	...	77	...
Charcoal	...	...	419
Firewood	...	...	44,198
Kingia Grass	...	...	26
Marri (Red Gum) Kino	...	...	7
Marri (Red Gum) Timber	...	92	...
Mining Timber	...	1,966	...
Morrell	...	18	...
Sandalwood	...	...	6,953
Sheaoak	...	151*	...
Split Posts and Rails	22,879	...	...
Total	22,879	2,876	51,846

*Measured in the square.

APPENDIX 2E.

Total Production of Timber for Year ended 30th June, 1921.

Appendix Reference.	In the Log.		In the Square.	
	Loads.	Cub. ft.	Loads.	Cub. ft.
Total Milling Timber (Appendix 2A)	543,438	27,171,900	190,203	9,510,150 ✓
Total Sawn Timber from Private Property (Appendix 2B)	13,699	684,950	4,821	241,050 ✓
Total Hewn Timber (Appendix 2C)	166,255	8,312,750	33,251	1,662,550 ✓
Total Miscellaneous Timbers (Appendix 2D)	3,156	157,800	1,105	55,250 ✓
Total, Appendices 2A to 2D	726,548	36,327,400	229,380	11,469,000

APPENDIX 2F.

Round Piles and Poles ... ... 167,834 lineal feet
Heart in Beams ... ... 19,889 „

APPENDIX 2G.

Mining Timber and Firewood Consumed during Year ended 30th June, 1921.

Locality.	Wood Fuel Consumed.	Mining Timber Consumed.	Sleepers.	Total.
	tons.	tons.	No.	tons.
Greenbushes Mining Fields	5,724	...	...	5,724
Collie Coal Fields	...	6,456	...	6,456
Metropolitan Area	159,195	...	...	159,195
Golden Mile, Coolgardie, Norseman, Kunanalling, Golden Ridge and Kanowna	310,960	10,500	...	321,460
Northern Goldfields, Ora Banda, Comet Vale, Menzies, Kookynie, Laverton, Mt. Morgans and Mt. Margaret Districts	70,500	1,800	...	72,300
Southern Cross, Marvel Loch, Mt. Rankin, Burbridge, Westonia, Manxman, and Bullfinch Districts	30,500	9,000	...	39,500
Goldfields Water Supply Pumping Stations, Nos. 5, 6, 7 and 8, plus other small pumping plants	9,000	...	...	9,000
Eastern Goldfields Districts (household)	40,000	...	...	40,000
Eastern Goldfields (baker's)	14,000	...	...	14,000
Batteries (State and private) and Factories outside Golden Mile ...	10,000	...	...	10,000
Eastern Goldfields, Tramways	14,000	...	...	14,000
Eastern Goldfields Electric Power and Light	50,000	...	...	50,000
Eastern Goldfields Producer Plants and blacksmiths (as charcoal) ...	1,500	...	...	1,500
Sleepers for tram lines (6ft. 6in. to 7ft. x 7in. x 4in. to 7in. x 4½ins.)	...	...	3,000	...
	† 715,379	27,756	* 3,000	743,135

* Not included in total. † Exclusive of Mining Timber and Firewood consumed on the Murchison and other Distant Goldfields not mentioned above.

APPENDIX 2H.

Exports of Timber, Tanning Barks, Sandalwood, etc., for Year ended 30th June, 1921.

Timber and Country of Destination.	Quantity.	Value.
Timber, Dressed :—	super. ft.	£
Commonwealth of Australia	9,099	131
South African Union ...	7,400	69
	16,499	200
Timber, Undressed :—		
Commonwealth of Australia	34,920,539	320,584
New Zealand	5,571,800	71,935
United Kingdom	17,894,400	178,756
South African Union ...	33,816,900	327,985
India	10,217,000	88,581
Egypt	6,889,900	55,800
Mauritius	1,834,200	22,014
Ceylon	339,600	3,316
Hong Kong	128,300	1,797
China	3,354,200	38,707
Java	262,300	3,577
Belgium	2,549,500	24,567
	117,778,639	1,137,619
Casks and Shooks :—		
Commonwealth of Australia	...	22,412
Wood Manufactures, N.E.I. :—		
Commonwealth of Australia	...	2,492
United Kingdom	...	2
South African Union ...	...	2
Java	...	8
	...	2,504
Total, Timber Exported ...	**...**	**£1,162,735**

Timber and Country of Destination.	Quantity.	Value.
Sandalwood :—	cwt.	£
Commonwealth of Australia	6,752	6,650
Hong Kong	122,492	96,238
India	8,480	7,736
Java	124	96
China	43,079	35,890
Straits Settlements ...	35,852	35,191
	216,779	**181,801**
Tanning Barks :—		
Commonwealth of Australia	41,279	22,871
United Kingdom	367	202
	41,646	**23,073**
Essential Oils :—		
Commonwealth of Australia	...	1,217
United Kingdom	...	6,312
Italy	...	318
Japan	...	2,260
		10,107
Total Exports		**£1,377,716**

APPENDIX 2I.

Timber Imports for the Year ended 30th June, 1921.

Timber and Country of Origin.	Quantity.	Value.
Timber, Dressed, N.E.I. :—	super. ft.	£
Commonwealth of Australia	52,823	2,090
United Kingdom	300	6
	53,123	2,096
Timber for making Boxes and Doors :—		
Commonwealth of Australia	...	260
United Kingdom	100	5
	100	265
New Zealand Pine :—		
Commonwealth of Australia	28,906	997
Logs, not Sawn :—		
Dutch Borneo	51,700	320
Timber, Undressed :—		
Commonwealth of Australia	2,026,071	64,976
India	95,500	8,557
Straits Settlements ...	18,800	352
Dutch Borneo	224,100	2,139
Japan	10,900	387
Java	5,900	75
United States of America	1,113,500	18,143
	3,494,771	94,629
Veneers, Three-ply :—		
Commonwealth of Australia	...	12,672
United Kingdom	255	55
Finland	492	83
Japan	5,526	1,213
Norway	6,700	779
Russia	756	104
Sweden	4,276	456
	18,005	15,362
Veneers, N.E.I. :—		
United Kingdom ...	345	41
Japan	916	72
	1,261	113
Architraves :—		
Commonwealth of Australia	...	2,076
United States of America	...	128
	...	2,204
Spokes and Staves (Dressed and Partly Dressed) :—	No.	
Commonwealth of Australia	72,768	2,793
Laths for Blinds :—		
Commonwealth of Australia	...	269
Sweden	...	8
	...	277
Picture and Room Mouldings :—		
Commonwealth of Australia	...	528
United Kingdom	...	155
United States of America	...	264
	...	947
Barrels, Casks, Vats, etc. :—		
Commonwealth of Australia	...	7,031
Singapore	...	10
France	...	1
Italy	...	2
Spain	...	1
United States of America	...	240
	...	7,285

Timber and Country of Origin.	Quantity.	Value.
Brush Maker's Woodware, Wood Tool Handles :—		£
Commonwealth of Australia	...	2,923
United Kingdom	...	131
United States of America	...	6,653
	...	9,707
Oars and Sculls :—		
Commonwealth of Australia	...	133
United Kingdom	...	25
Japan	...	84
United States of America	...	375
	...	617
Carriage Turnery, N.E.I. :—	No.	
Commonwealth of Australia	10,137	5,630
United Kingdom	...	231
United States of America	...	265
	10,137	6,126
All Wood Articles, N.E.I. :—		
Commonwealth of Australia	...	16,319
New Zealand	...	2
Canada	...	504
United Kingdom	...	4,396
India	...	3
Ceylon	...	3
Straits Settlements ...	...	15
France	...	77
Italy	...	36
China	...	16
Japan	...	306
Switzerland	...	6
Sweden	...	20
Czecho Slovakia	...	16
United States of America	...	2,014
	...	23,733
Total, Timber Imports ...	...	**£167,471**
Tanning Extracts :—	cwt.	
Commonwealth of Australia	76	176
United Kingdom	20	55
Straits Settlements ...	515	1,105
Sicily	200	372
Dutch Borneo	170	300
	981	**2,008**
Essential Oils :—		
Commonwealth of Australia	...	2,388
United Kingdom	...	231
India	...	8
Ceylon	...	418
Straits Settlements ...	...	13
Jamaica	...	6
West Indies (St. Thomas)	...	38
France	...	504
Italy	...	1,791
Sicily	...	7
Holland	...	463
Spain	...	21
Russia	...	9
Japan	...	9
China	...	121
Czecho Slovakia	...	3
United States of America	...	76
	...	**6,106**
Total, Imports		**£175,585**

APPENDIX 2J

Quantity of Timber treated by Forest Saw Mills, etc., Exported during the Year ended 31st December, 1920.

——	Jarrah.	Karri.	Other.	Total.	Inter-state.	New Zea-land.	United King-dom	South Africa.	British India.	Egypt.	Mauri-tius.	East Indies.	China.	Japan.	Bel-gium.	United States of America.
	loads.	loads.	loads.	loads.	loads.	loads.	loads.	loads.	loads.	loads.	loads.	loads.	loads.	loads.	loads.	loads.
Logs and Spars in the rough	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hewn Beams and Piles	1,128	...	...	1,128	18	...	...	207	20	...	...	...	...	...	883	...
Undressed 7in. x 2½in. to 12in. x 6in. ... } *	55,065	32,383	20	87,468	60,375	4,133	17,960	2,286	726	...	1,041	...	151	...	784	12
Undressed 12in. x 6in. and over ... } *																
Laths	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Pickets and Palings	393	...	...	393	393	...	...	...	...	...	...	...	...	...	...	...
Flooring Boards	4,819	...	101	4,920	4,920	...	...	...	...	...	...	...	...	...	...	...
Paving Blocks	2,308	...	...	2,308	829	...	1,479	...	...	...	...	...	...	...	...	...
Sleepers—Sawn	18,292	3,010	...	21,302	1,378	627	1,988	47,825	6,218	4,637	180	161	2,580	35	...	...
Hewn†	44,327	...	...	44,327												
Sleepers, Powellised	...	...	...	56.2.9	...	...	...	...	...	...	...	...	...	...	...	...
Telegraph Arms	...	1,061	...	1,061	...	...	1,061	...	...	...	...	...	...	...	...	...
Total, Undressed Timber	126,332	36,454	121	162,907	67,913	4,760	22,488	50,318	6,964	4,637	1,221	161	2,731	35	1,667	12

* This Item includes a quantity of flooring boards and paving timber, details of which are not available.
† Hewn on Concessions, etc., or shipped from Companies and Firms which own the Saw Mills.

APPENDIX 2K.

Summary of Exports of Forest Produce since 1836.

Year.	Timber.		Sandalwood.		Tanning Bark.	Essential Oils.*
	Loads.	Value.	Tons.	Value.	Value.	Value.
		£		£	£	£
1836*a*...	200	2,500	...	...	...	...
1837 ...	...	...	...	...	...	...
1838 ...	...	...	...	...	...	...
1839 ...	...	...	...	...	...	...
1840 ...	...	...	...	...	...	...
1841 ...	...	...	...	...	...	...
1842 ...	...	...	...	...	...	...
1843 ...	...	...	...	...	...	...
1844 ...	*b*	163	...	...	...	...
1845 ...	...	...	4	40	...	...
1846 ...	51	255	32	320	...	...
1847 ...	244	1,120	370	4,444	...	...
1848 ...	67	333	1,335	13,353	...	...
1849 ...	...	...	...	...	...	...
1850 ...	210	1,048	...	...	...	...
1851 ...	25	268	219	1,593	...	...
1852 ...	141	806	...	...	...	...
1853 ...	1,044	5,220	...	...	...	...
1854 ...	1,170	7,023	...	...	...	...
1855 ...	1,538	12,076	...	...	...	...
1856 ...	1,410	9,671	...	...	...	...
1857 ...	1,384	9,449	280	2,524	...	...
1858 ...	585	2,340	745	7,455	...	...
1859 ...	1,345	6,051	1,278	17,259	...	...
1860 ...	1,096	4,932	1,687	16,360	...	...
1861 ...	555	2,497	2,558	24,945	...	...
1862 ...	1,376	7,151	2,393	21,541	...	...
1863 ...	658	2,963	2,807	25,265	...	...
1864 ...	1,166	5,508	2,724	24,520	...	...
1865 ...	3,679	15,693	1,686	13,490	...	...
1866 ...	1,713	6,849	2,965	23,722	...	...
1867 ...	1,135	4,541	2,305	18,442	...	...
1868 ...	160	638	3,256	26,045	...	...
1869 ...	3,598	14,273	4,124	32,998	...	...
1870 ...	3,144	17,551	6,112	48,890	...	...
1871 ...	4,370	15,304	3,366	26,926	...	...
1872 ...	740	2,590	3,942	31,536	...	...
1873 ...	1,363	4,771	6,292	62,916	...	...
1874 ...	6,912	24,192	7,057	70,572	...	...
1875 ...	6,847	23,965	6,646	66,465	...	...
1876 ...	4,381	23,743	6,577	65,772	...	...
1877 ...	6,723	36,979	4,247	31,851	...	...
1878 ...	11,618	63,902	4,675	35,064	...	...
1879 ...	12,545	69,742	4,667	35,001	...	...
1880 ...	13,251	66,252	5,097	51,970	...	...
1881 ...	15,855	79,277	7,716	77,165	...	...
1882 ...	18,730	93,650	9,605	96,050	...	...
1883 ...	19,940	79,760	7,031	56,250	...	...
1884 ...	17,284	68,936	2,620	20,960	...	...
1885 ...	16,963	67,850	4,527	36,216	...	...
1886 ...	12,523	50,092	3,431	27,450	...	...
1887 ...	7,096	28,384	4,317	34,533	...	...
1888 ...	10,515	42,060	4,470	33,525	...	...
1889 ...	15,770	63,080	6,385	57,465	...	...
1890 ...	23,444	82,052	5,136	51,355	...	...
1891 ...	25,479	89,179	3,760	37,600	...	...
1892 ...	21,653	78,419	5,716	42,870	...	...
1893 ...	10,259	33,888	3,893	32,160	...	...
1894 ...	21,274	74,804	2,784	23,430	...	...
1895 ...	25,105	88,146	3,851	30,863	...	...
1896 ...	30,912	116,420	6,848	65,800	...	...
1897 ...	47,866	192,451	5,852	49,480	...	...
1898 ...	81,723	326,195	4,349	31,812	...	...
1899 ...	138,271	553,198	4,084	29,719	...	...
1900 ...	114,508	458,461	5,095	39,038	...	...
1901 ...	143,012	572,354	8,864	73,931	...	...
1902 ...	125,135	500,533	7,995	61,771	...	...
1903 ...	154,969	619,705	4,406	37,913	859	...
1904 ...	161,446	654,949	4,510	25,417	32,876	...
1905 ...	174,190	689,943	5,521	38,817	154,087	...
1906 ...	*c*176,614	708,993	8,848	70,958	140,720	...
1907 ...	*c*128,091	511,923	9,212	65,999	98,773	...
1908 ...	*c*197,390	813,591	9,564	77,668	79,934	...
1909 ...	*c*216,609	867,419	4,805	37,456	59,633	...
1910 ...	*c*241,482	972,698	8,228	70,775	93,733	...
1911 ...	*c*248,990	986,341	6,907	65,506	83,470	...
1912 ...	*c*225,942	903,396	3,154	27,533	49,094	...
1913 ...	*c*272,397	1,089,481	6,260	47,589	47,377	...
1914*d*...	*c* 125,595	502,153	4,702	39,800	18,197	*e* 5
1915*e* ...	*c* 190,370	808,392	8,375	78,926	6,127	*e* 381
1916*e* ...	108,642	441,991	6,271	61,381	10,208	*e* 1,102
1917*e* ...	77,813	310,893	7,230	72,669	18,959	*e* 2,060
1918*e* ...	68,725	274,141	6,494	81,834	16,886	*e* 3,995
1919*e* ...	82,715	344,119	8,998	117,072	18,875	*e* 3,987
1920*e* ...	101,306	487,666	13,945	233,586	22,121	*e* 3,704
1921*e* ...	196,325	1,162,735	10,839	181,801	23,073	*e* 10,107
Total ...	4,189,322	17,362,077	346,044	3,243,422	975,002	25,341

a The exports up to the year 1834 consisted only of supplies to shipping of which no record is kept. *b*. Not available. *c* Approximate figures only. *d* Six months ended 30th June. *e* Year ended 30th June.
* Principally Sandalwood Oil.

196,325
50
85.0

APPENDIX 3A.

TIMBER CONCESSIONS IN FORCE AS AT THE 30TH JUNE, 1921.

Concessionaire.	No.	Locality.	Term.	Original Area.	Present Area.
				acres.	acres.
Millars' T. & T. Co., Ltd. ...	12/0	Cockburn Sound	1-1-1889 to 31-12-1901 1-1-1902 to 31-12-1915 1-1-1916 to 31-12-1929	250,000	250,000
Millars' T. & T. Co., Ltd. ...	12/1	Canning	1-1-1883 to 31-12-1924	100,000	82,735
Millars' T. & T. Co., Ltd. ...	12/2	Sussex	15-1-1883 to 14-1-1925	46,000	42,498
			Total	396,000	375,233

APPENDIX 3B.

TIMBER LEASES IN FORCE AS AT THE 30TH JUNE, 1921.

Lessee.	No.	District.	Term.	Original Area.	Present Area.
				acres.	acres.
Ainslie, James	145/113	Jarrahwood	1-1-1899 to 31-12-1923	4,480	4,389
Ainslie, James	149/113	Jarrahwood	1-1-1899 to 31-12-1923	4,480	4,092
Ainslie, James	150/113	Jarrahwood	1-1-1899 to 31-12-1923	4,480	3,522
Millars' T. & T. Co., Ltd. ...	186/113	Collie	1-1-1899 to 31-12-1923	27,000	16,012
Millars' T. & T. Co., Ltd. ...	227/113	Collie	1-1-1901 to 31-12-1925	4,480	2,743
Millars' T & T. Co., Ltd. ...	228/113	Collie	1-1-1901 to 31-12-1925	4,480	4,130
Millars' T. & T. Co., Ltd. ...	229/113	Collie	1-1-1901 to 31-12-1925	4,480	3,962
Millars' T. & T. Co., Ltd. ...	230/113	Collie	1-1-1901 to 31-12-1925	4,480	4,480
Good, Frederick Daniel ...	244/113	Pinjarra	1-7-1899 to 30-6-1924	17,280	13,259
Good, Frederick Daniel ...	257/113	Donnybrook	1-10-1899 to 30-9-1924	33,280	28,876
Millars' T. & T. Co., Ltd. ...	261/113	Pinjarra	1-30-1899 to 30-9-1924	58,270	22,937
Wittenoom, Edward Horne	269/113	Collie	1-10-1899 to 30-9-1924	5,000	2,080
Macmurtrie, William	288/113	Donnybrook	1-7-1900 to 30-6-1925	36,960	12,637
Ainslie, James	291/113	Donnybrook	1-1-1901 to 31-12-1925	17,920	17,308
Millars' T. & T. Co., Ltd ...	296/113	Collie	1-1-1900 to 31-12-1924	11,520	4,101
Millars' T. & T. Co., Ltd. ...	297/113	Collie	1-1-1900 to 31-12-1924	13,440	12,771
Ainslie, James	299/113	Pinjarra	1-7-1900 to 30-6-1925	19,840	18,795
McNeil, Alexander James ...	309/113	Collie.	1-4-1901 to 31-3-1926	21,310	793
Wittenoom, Edward Horne	322/113	Collie	1-4-1902 to 31-3-1927	44,800	22,024
Wittenoom, Edward Horne...	325/113	Collie	1-4-1902 to 31-3-1927	1,280	1,195
Smith, Henry Teesdale ...	330/113	Pinjarra	1-7-1902 to 30-6-1927	10,240	7,781
Smith, Henry Teesdale ...	331/113	Pinjarra	1-1-1903 to 31-12-1927	9,600	7,194
			Total	359,100	215,081

APPENDIX 3C.

SAW MILL PERMITS IN FORCE AS AT THE 30TH JUNE, 1921.

Permit Holder.	Original No.	Regranted as No.	Locality.	Term.	Original Area.	Present Area.
					acres.	acres.
Whittaker Bros.	1/11	76/11	North Dandalup ...	1-7-1915 to 30-6-1925	20,000	20,000
Bunning, Robert	8/11	93/11	Argyle	1-10-1916 to 30-6-1922	4,700	4,700
Bunning Bros., Ltd.	9/11	94/11	Collie	1-10-1916 to 30-6-1922	10,000	10,123
Preston Valley Sawmills, Ltd.	10/11	95/11	Noggerup	1-1-1917 to 31-12-1921	19,800	19,732
Swan Sawmills, Ltd.	14/11	92/11	Lowden	1-4-1917 to 31-3-1921*	9,000	6,700
Bunning, Robert	15/11	96/11	Argyle	1-4-1917 to 30-6-1922	5,300	5,300
Bunning Bros., Ltd.	25/11	99/11	Collie	1-7-1918 to 30-6-1922	10,000	10,000
State Saw Mills	27/11	...	Near Dwellingup ...	1-1-1909 to 31-12-1921	20,001	18,934
Port & Co., Ltd.	34/11	...	Pindalup	1-7-1910 to 30-6-1921	28,510	28,510
Timber Corporation, Ltd. ...	35/11	...	Greenbushes ...	1-10-1909 to 30-9-1921	6,800	6,800
Bunning Bros., Ltd.	36/11	97/11	Collie	1-4-1917 to 30-6-1922	10,000	10,000
Lewis, Francis Jas. ; Reid, F. W. S.	37/11	inc. 51/11	West Collie	1-1-1910 to 31-12-1921	6,000	19,730
Wilgarrup Karri and Jarrah Co., Ltd.	42/11	...	Near Bridgetown ...	1-4-1910 to 31-3-1931	23,000	21,514
Buckingham Bros.	44/11	...	Muja	1-7-1910 to 30-6-1921	17,960	17,730
State Saw Mills	60/11	...	Yourdamning ...	1-4-1912 to 31-3-1922	38,000	38,000
The Kauri Timber Co., Ltd. ...	61/11	late 12/11	Nannup	1-1-1912 to 31-12-1921	58,000	57,595
Trees, Ltd.	71/11	late 70/11	Collie	1-4-1914 to 31-12-1928	20,028	20,028
Minister for Works and Trading Concerns	73/11	pt. 76/11	Palgarup	1-1-1915 to 31-12-1924	7,000	7,000
Commissioner of Railways ...	78/11	...	Near Dwellingup ...	1-7-1915 to 30-6-1925	81,500	81,235
Minister for Works and Industries	79/11	...	Wuraming	1-10-1915 to 30-9-1925	38,690	38,550
Minister for Works and Industries	80/11	...	Bingham River ...	1-10-1915 to 30-9-1925	25,740	20,510
Minister for Works and Industries	81/11	...	Wuraming Hill ...	1-10-1915 to 30-9-1925	25,878	25,878
Minister for Works and Industries	82/11	...	Near Worsley ...	1-10-1915 to 30-9-1925	4,750	8,000
Buckingham Bros.	83/11	...	Near Bingham River	1-7-1916 to 30-6-1926	25,000	20,130
Whittaker Bros.	84/11	...	North Dandalup ...	1-1-1916 to 31-12-1925	15,350	15,430
Minister for Works and Industries	85/11	...	Pemberton	1-7-1916 to 30-6-1926	79,000	76,590
Minister for Works and Industries	86/11	...	Manjimup	1-7-1916 to 30-6-1926	143,000	142,695
Wandoo Timber Co., Ltd. ...	89/11	...	Muja	1-10-1916 to 30-9-1922	37,000	37,000
				Total	790,007	788,414

*Renewal pending.

APPENDIX 3D.

HEWING PERMITS IN FORCE AS AT THE 30TH JUNE, 1921.

Permit Holder.	No.	Locality.	Term.		Area.	Area as at 30-6-21.
			From	To		
					acres.	acres.
Johnson, A. M.	1	Noggerup	26-2-17	28-2-22	2,200	960
Plavin, Chas.	27	Dardanup	8-2-18	7-5-21*	3,000	3,000
Plavin, Chas.	34	Worsley	10-4-18	9-4-21*	4,700	4,683
Plavin, Chas.	48	Worsley	28-8-18	27-2-22	940	940
Bunney, A. R.	65	Kelmscott	14-4-19	13-4-21*	1,000	900
Parsons, C. E.	71	Brookhampton	23-5-19	23-5-22	148	148
Plavin, Chas.	92	Quilergup	19-8-19	18-8-21	4,375	4,375
Faulkner, R. J.	142	Muja	1-9-20	31-8-21	1,000	1,000
Plavin, Chas.	152	Worsley	20-9-20	19-9-21	1,150	1,150
Farrelly, J. M.	165	Noggerup	1-1-21	31-12-21	740	740
Kendall, J. H.	168	Mundaring	1-1-21	31-12-21	460	460
Kendall, J. H.	169	Mundaring	1-1-21	31-12-21	460	460
Trew, S. G.	170	Sawyers Valley	1-1-21	31-12-21	600	600
Trew, S. G.	171	Sawyers Valley	1-1-21	31-12-21	600	600
Middleton, R.	182	Newlands	1-1-21	31-12-21	1,800	1,800
Savage, Jas.	191	Jarrahwood	1-3-21	31-12-21	1,000	1,000
Savage, Jas.	192	Jarrahwood	1-3-21	31-12-21	900	900
Aubin, L.	193	Quilergup	1-3-21	31-12-21	1,262	1,262
May, J.	195	Greenbushes	1-3-21	31-12-21	210	210
Shaw, J.	196	Greenbushes	1-3-21	31-12-21	285	285
Sandford, B. J.	199	Argyle	1-3-21	31-12-21	1,300	1,300
Scott, J. H.	200	Boyanup	1-3-21	31-12-21	1,660	1,660
Ribe, W. F.	211	Sawyers Valley	1-5-21	30-4-22	46	46
Wood, G. E.	213	Donnybrook	1-5-21	31-12-21	500	500
Hansen, C.	215	Quilergup	12-5-21	31-12-21	750	750
				Total	31,086	29,729

* Renewals Pending.

APPENDIX 3E.

SAWMILLING PERMITS IN FORCE AS AT THE 30TH JUNE, 1921.

Permit Holder.	No.	Locality.	Term.		Area.	Area as at 30-6-21
			From	To		
					acres.	acres.
Harper, A. J.	49	Albany	16-9-18	15-9-21	1,282	1,282
Plavin, Chas.	54	Inglehope	15-10-18	14-10-28	6,320	7,600
Adelaide Timber Co., Ltd.	57	Wilga	28-11-18	30-9-22	15,775	15,775
Bunney, A. R.	65	Kelmscott	14-4-19	13-4-21*	1,000	900
Mitchell & Ryan	79	Hester	27-6-19	25-6-21*	1,720	1,720
Connell, W. R.	90	Bridgetown	19-8-19	18-11-21	1,100	1,100
Swan Saw Mills, Ltd.	91	Quilergup	22-8-19	21-8-29	15,800	15,800
Smith, A.	97	Collie	2-9-19	1-9-22	3,150	3,150
Farley, D. V. C.	98	Donnybrook	30-9-19	29-9-22	550	550
Plavin, Chas.	101	Wuraming	20-11-19	19-11-24	5,000	3,100
Buckingham Bros.	106	Muja	25-11-19	24-11-24	5,200	5,200
Collie Land and Timber Co., Ltd.	107	Bingham River	29-11-19	28-11-24	8,870	8,870
Holmes, T. H.	114	Dwellingup	25-2-20	24-2-22	2,800	2,800
Mann, A. S.	118	Pinjarra	29-3-20	28-3-22	7,724	7,724
Smith, J. F.	120	Barrabup	24-3-20	23-3-22	4,850	4,850
Lewis & Reid, Ltd.	123	Mullalyup	30-4-20	29-4-21*	880	880
Hampel, J. F. W.	126	Wilgarup River	31-5-20	30-5-22	1,225	1,225
Bentley, J. L.	139	Capel	28-5-20	...	...	...
Gardiner, M.	140	Bussell's Brook	1-7-20	30-6-21*	4,078	4,078
Groth, H. A.	141	Marbellup	28-6-20	27-6-21*	1,000	1,000
The Timber Corporation, Ltd.	144	Palgarup	15-9-20	14-9-21	1,000	1,000
Bunning Bros., Ltd.	147	Donnybrook	27-8-20	26-8-21	600	600
Jenkins, W. M.	155	Balingup	1-12-20	30-11-21	1,104	1,104
Grist & Nicholas	156	Capel River	1-1-21	31-12-21	1,300	1,300
Plavin, Chas.	157	Bowelling	1-11-20	31-10-25	35,500	35,500
Amalgamated Collieries of W.A., Ltd.	161	Collie	1-1-21	31-12-21	500	500
Millars' T. & T. Co., Ltd.	164	Jarrahwood	1-1-21	31-12-21	2,580	2,580
Whistler & Whistler	167	Bridgetown	1-1-21	31-12-21	1,500	1,500
Lawson, S. E.	183	Collie	1-1-21	31-12-21	2,270	2,270
Connell, W. R.	186	Bridgetown	1-3-21	28-2-22	420	420
Ryan, J. P.	187	Glenlynn	1-3-21	28-2-22	3,400	3,400
Thompson, G. P.	188	Argyle	1-3-21	28-2-22	760	760
Forte, N. G.	189	Marbellup	1-3-21	28-2-22	300	300
Groth, H. A.	197	Marbellup	1-3-21	28-2-22	1,000	1,000
Steele, H.	198	Albany	1-3-21	28-2-22	2,050	2,050
Lewis & Reid, Ltd.	204	Mullalyup	1-5-21	30-4-22	8,000	8,000
Lawson, S. E.	207	Collie	1-5-21	31-12-21	236	236
Palmer, R.	208	Collie	1-5-21	30-4-22	122	122
Talbot, A. J.	210	Collie	1-6-21	31-5-22	5,000	5,000
Timber Corporation, Ltd.	216	Greenbushes	1-4-21	31-3-31	34,800	34,800
Cummins & Barham	220	Collie	1-6-21	31-12-21	2,415	2,415
				Total	193,181	192,461

* Renewals pending.

APPENDIX 3F.

FIREWOOD PERMITS IN FORCE AS AT THE 30TH JUNE, 1921.

Permit Holder.	No.	Locality.	Term.		Area.	Area as at 30–6–20.
			From	To		
					acres.	acres.
Morris, C. G.	66	Albany	30–4–19	29–4–22	340	340
Ferguson, J. H.	69	Wooroloo	3–10–18	31–12–21	3,900	3,900
Brady & Clancy	78	Albany	9–9–19	8–9–21	1,290	1,290
Powell, G. S.	84	Albany	18–7–19	17–1–22	950	950
Smith & Smith	113	Kalamunda	18–2–20	17–2–22	395	395
Kent, Geo., and others	115	Sawyers Valley ...	1–1–20	31–12–21	4,200	1,500
Morton, A., and others	116	Lion Mill	1–1–20	31–12–21	1,300	1,300
Weston, F. J., and others	117	Pickering Brook ...	1–1–20	31–12–21	25,000	25,000
Bell & Spiers	129	Balcatta	28–8–20	27–8–21	880	880
Georgeff, M.	130	Balcatta	17–5–20	16–5–22	1,180	1,180
Rieger, W. H.	131	Kalamunda	27–5–20	26–5–22	300	300
Nicholls, J. H.	135	Roleystone	9–6–20	8–6–21	1,500	1,500
Blamire, R.	138	Kalamunda	1–6–20	30–6–22	4,400	4,400
Treeby, J. H.	143	Kalamunda	31–8–20	30–8–21	230	230
Scala, D. S.	150	Mundaring	25–9–20	24–9–21	635	635
Powell, G. S.	162	Marbellup	31–12–20	31–12–21	950	950
Pettitt, C. H.	166	Gingin	1–1–21	31–12–21	213	213
Trew, S. G.	172	Sawyers Valley ...	1–1–21	31–12–21	600	600
Trew, S. G.	173	Sawyers Valley ...	1–1–21	31–12–21	600	600
Trew, S. G.	174	Mundaring	1–1–21	31–12–21	460	460
Trew, S. G.	175	Sawyers Valley ...	1–1–21	31–12–21	600	600
Trew, S. G.	176	Sawyers Valley ...	1–1–21	31–12–21	600	600
Perth Firewood Supply Co., Ltd. ...	177	Mundaring	1–1–21	31–12–21	460	460
Ablett, Thos.	178	Jandakot	1–1–21	31–12–21	60	60
Leslie & McManus	181	Wanneroo	1–1–21	31–12–21	300	300
McMullen, W.	185	Warbrook	1–3–21	28–2–22	575	575
Bryant & Waters	190	Glen Forrest	1–3–21	28–2–22	950	950
Ray, A. G.	201	Beechina	1–3–21	28–2–22	1,790	1,790
Young, J.	203	Helena River	2–4–21	...	13,400	13,400
Hunter, A. A.	205	Clackline	1–5–21	30–4–22	600	600
Ribe, W. F.	212	Sawyers Valley ...	1–5–21	30–4–22	46	46
				Total ...	68,704	66,004

APPENDIX 3G.

MISCELLANEOUS PERMITS IN FORCE AS AT THE 30TH JUNE, 1921.

Permit Holder.	No.	Locality.	Term.		Area.	Area as at 30–6–20.
			From	To		
					acres.	acres.
Rowley Forest Products Co., Ltd. ...	1A	All Waste Crown Lands	1–3–15	30–4–25	...	...
Freney, M. R.	67	N.W. Coast	1–5–19	30–4–22	...	...
Hall, W. R.	104	Kalgoorlie	1–10–19	30–9–22	4,400,000	4,400,000
Banfield, E. B.	105	Hamel	14–11–19	30–6–21	26	26
Lyon, D.	132	Bickley	25–5–20	24–5–22	200	200
Dods, J. R.	153	Waroona	7–9–20	...	...	...
Howe, E. L.	159	Mt. Kokeby	7–10–20	...	12	12
Western Fur and Leather Co., Ltd.	163	Bridgetown	1–12–20	30–11–22	48,000	48,000
Braddock, C. L.	179	N.W. Areas	1–1–21	31–12–25	70,000*	70,000*
Bunning Bros., Ltd.	180	Noggerup	1–1–21	30–6–21	...	...
Amalgamated Collieries of W.A., Ltd.	202	Collie	1–4–21	31–3–22	750	750
Westley, E. A.	209	Wooroloo	1–6–21	31–5–22	218	218
Johnson & Lynn, Ltd.	214	Collie	1–5–21	30–4–31	1,000,000	1,000,000
				Total ...	5,449,206	5,449,206

* 70,000 square miles—Not included in total.

APPENDIX 3H.

SUMMARY OF APPENDICES 3A TO G.

Number in Force.	Class of Holding.	Total Areas.	
		Original.	Present.
		acres.	acres.
3	Timber Concessions (Appendix 3A)	396,000	375,233
22	Do. Leases (Appendix 3B)	359,100	215,081
28	Sawmill Permits (Appendix 3C)	790,007	788,414
25	Hewing Permits (Appendix 3D)	31,086	29,729
41	Sawmilling Permits (Appendix 3E)	193,181	192,461
31	Firewood Permits (Appendix 3F)	68,704	66,004
13 –	Miscellaneous Permits (Appendix 3G)	5,449,206*	5,449,206*
163	Total	7,287,284	7,116,128

* Not including 70,000 square miles (Permit No. 179).

APPENDIX 4.

LIST OF SAWMILLS.

Name of Sawmill Owner, and District.	Locality—Permit or Lease No. or P.P.	Type of Mill.	Horse-Power of Mill.	Average distance from Stump to Landing.	Average distance from Landing to Mill.	Distance from Mill to Main Line Siding.	Distance from Siding to nearest Port.	Output in loads per day	Percentage of recovery.	Rate per ton on Sawn Timber to Port of shipment.	Remarks.
ALBANY DISTRICT.				M. Ch.	M. Ch.	M. Ch.	M. C.			s. d.	
Douglas, J. R., Denmark... ...	P.P. (town Block)	Spot Mill ...	14	...	...	0 60	38 0	...	...	...	Cutting for wheelwrights' work.
Douglas Bros., Kalgan River ...	P.P. Loc. 1498 ...	do. ...	25	0 40 to mill	...	13 0	13 0	...	...	...	Cutting furniture timber and also fruit cases; working intermittently.
Groth & Adams, Marbellup ...	P.P. Loc. 723 ...	Circular saw ...	6	1 40 to mill	...	0 20	12 0	1	50	11 11	Cutting Sheoak timber.
Harper, A. J., Albany	P.P. Town Lot 105	Spot mill ...	12	4 40	4 40	0 20	At Albany	1	90	15 8	Cutting fruit cases on private property. Shifting mill to Permit 49.
Hawkins, A. W., Porongorup ...	P.P. Loc. 464 ...	do. ...	40	0 20	Landing at mill	12 0	31 0	1½	50	28 1	Cutting fruit cases; working intermittently.
Keith, A. E., Hay River ...	P.P.	Circular saw ...	15	1 0	do.	3 0	30 0	1	50	11 11	Cutting fruit cases for own use.
Saw, Bros., Bow River	P.P. Loc. 723 ...	do. ...	5	0 40	...	26 0	10 0	...	...	...	Cutting own requirements only.
Steele, H., Albany	P.P. Town Lot 42	Circular saw and band-saw	6	3 0	Landing at mill	1 0	At Albany	1	50	*11 11	Cutting barrel staves and furniture wood (Sheoak).
BRIDGETOWN DISTRICT.											
Connell, W. R., Jayes Road ...	P. 90	Spot mill ...	10	2 40 to mill	...	2 0	60 0	5	...	8 4	Local use only. (Mill Sold to Bond and Bounty, 8-2-21).
Hill, E. E., Bridgetown	... ...	do. ...	6	0 40	...	4 0	67 0	2	...	8 4	Cutting fruit cases on private property.
Holdsworth & Son, Hester ...	... ...	... ...	...	...	...	...	...	...	...	9 1	Cutting fruit cases only.
Johnston, J., Balbarrup	P.P.	Spot mill ...	12	...	...	No particulars available.		...	...	...	Cutting fruit cases on private property for own use. (Capacity 7 dozen per day.)
Linsay, Greenbuhes	... ...	... ...	...	...	...	...	...	...	...	...	
Machin, J., Glentullock	P.P.	do. ...	12	0 40	...	12 0	67 0	4	...	8 4	Cutting fruit cases on private property.
Markey Bros.	P.P.	... ...	...	...	...	...	...	2	...	...	
Mitchell & Ryan, Hester ...	P. 79	Circular saw ...	12	0 40	...	2 0	67 0	6	40	8 4	Working intermittently.
Ryan, J. P.	P. 187, S.M.S. 18/33	... ...	...	...	...	...	...	...	...	...	Closed down.
Smith, H., Winnigup Road ...	P.P.	Circular saw ...	10	0 40	...	3 40	62 0	20 per month	70	7 11	Working intermittently.
State Saw Mills, No. 1, Manjimup ...	P. 86/11	Vertical and twin saw	80	1 0	6 0	4 0	90 0	31	38·68	11 11	
State Saw Mills, Pemberton, No. 2	P. 85/11	Vertical saw ...	450	0 40	7 30	17 0	93 0	50	45	11 10	Rebuilt and working.
State Saw Mills, Pemberton, No. 3	... ...	Twin saws ...	300	0 40	6 0	17 0	93 0	45	38	9 10	
Timber Corporation, Ltd., Greenbushes	Lease 268/113 ...	Vertical saw ...	60	0 40	12 0	2 0	52 0	25	40	9 11	
Timber Corporation, Ltd., Palgarrup	P. 216	Twin saws ...	25	0 40	2 0	1 40	85 0	20	40	15 3	
Young, J., Balbarrup	P.P.	Spot mill ...	10	0 30	...	5 0	90 0	1	...	10 8	Cutting fruit cases on private property.
Wilgarrup Karri & Jarrah Co., Ltd., Jarnadup	P. 42/11, S.M.S. 7/33	Vertical saw ...	75	0 20	6 0	0 30	93 0	32·53	40·02	11 10	
COLLIE DISTRICT.											
Amalgamated Collieries of W.A., Ltd., Collie	Coal Mining Lease 245	Spot mill ...	60	0 60 to mill	No landing	0 40	41 0	3	46	10 10	Cutting timber for mining and general purposes.

Buckingham Bros., Muja ...	P. 106, 44/11; Mill on Loc. 2819	Twin saws and traveller	26	1 0	4 0	0 53	53 0	7½	55	12 4	
Bunning Bros, Ltd., Collie ...	P. 99/11; Mill on Loc 2519	Twin saws ...	117	0 60	5 0	6 2	50 0	30	50	11 11	
Bunning Bros., Ltd., Muja ...	P. 97/11; Mill on Loc. 1676	do. ...	90	1 0	4 0	0 60	53 0	12	50	12 4	
Collie Land & Timber Co., Ltd., Collie	P. 107, Mill on permit S.M.S. 8/33	Spot mill ...	14	0 40 to mill	...	7 0	54 0	...	...	12 5	Nearing completion. Now exempt.
Lawson Bros., Collie	Collie Town Lot 196	do. ...	14	0 80 to mill	...	0 30	41 0	2	50	10 10	Operating from 1-7-21. Cutting for local requirements.
Lewis & Reid, Ltd., Harris River	P. 37/11, S.M.S. 15/33, Mill on permit	Twin saws ...	60	1 0	3 0	7 0	38 0	18½	45	10 5	General purposes.
Lewis & Reid, Ltd., Allanson ...	P. 37/11, Mill S.M.S. 6/33, on townsite (Allanson)	Spot mill and traveller	24	1 40 to mill at siding	...	...	38 0	4½	39	10 5	Now closed.
Millars' Timber & Trading Co., Ltd., Mornington	Leases	Vertical and twin saws	60	0 40	12 0	6 0	26 0	45	47	10 2	Destroyed by fire, 21-12-20.
Do. ...	... ...	do. ...	500	0 40	18 0	6 0	26 0	80	45	8 11	
Millars' Timber & Trading Co., Ltd., Nanga Brook	... ...	Twin saws ...	400	0 40	8 0	28 0	37 0	60	45	10 4	
Millars' Timber & Trading Co., Ltd., Yarloop	... ...	do. ...	64	0 40	18 0	9 0	37 0	...	...	10 4	
Do. ...	... ...	Band saw ...	...	...	...	...	...	...	...	...	
Do. ...	... ...	Vertical and twin saws	350	0 40	9 0	9 0	37 0	50	45	10 4	
Palmer, R., Collie	Collie Town Lot No. 529	Spot mill ...	24	2 0 to mill	...	...	41 0	2	50	10 10	Cutting for local use only.
Plavin, C., Collie	P. 157, S.M.S. 16/33	Spot mill and traveller	16	1 0	0 1	2 40	41 0	1½	53	10 10	Closed and mill removed.
State Saw Mills, No. 6, Worsley ...	P. 82, Mill on Permit	Twin saws ...	20	0 40 to mill	...	4 40	29 0	5	60	9 4	General purposes.
Trees, Ltd., Treesville	P. 71, Mill on Permit, S.M.S. 9/11A	do. ...	32	1 0 to mill	...	31 0	26 0	10	48	8 11	Working.
DONNYBROOK DISTRICT.											
Adelaide Timber Co., Ltd., Wilga ...	P. 57, S.M.S. 14/33	do. ...	24	3 0 to mill	No bush landing	0 2	58 0	7·5	47	12 10	
Bendall, William, Argyle ...	P.P. L. 989 ...	do. ...	10	0 15	do.	3 0	21 0	...	85	8 4	Cutting fruit cases for own use. (Cap. 7 doz.), working intermittently only.
Best and Adams, Donnybrook ...	P.P. L. 55 ...	... ...	10	0 40	...	...	6 0	2	50	...	
Bowman, J. H., Charlie's Creek ...	P.P. L. 109 ...	Circular saw ...	4	...	...	...	31 0	...	...	9 7	Cutting fruit cases for own use. (Cap. 7 doz.), working intermittently only.
Bunning Bros., Ltd., Yabberup ...	P.P. L. 3321 ...	Spot Mill ...	14	1 0	...	1 0	39 0	8	45	10 7	Closed down on 4th June, 1921.
Bunning Bros., Ltd., Argyle ...	93/11, 96/11, 147, P.P 2170	Twin saws ...	50	1 0	7 0	0 12	21 0	14	48	8 4	
Davern, J. T., Lowden	P.P. L. 89 ...	Circular saw ...	10	...	...	...	36 0	...	...	10 2	(Cap. 300 dumps) working intermittently only. Cutting fruit cases.
Farley, D. V. C., Capel River ...	S.M. Permit No. 89	do. ...	25	0 20 to mill	...	10 0	16 0	·75	85	7 6	(Cap. 10 doz.) Cutting fruit cases and scantling for sale.
Gardiner, Maitland, Bussell's Brook	P. 140, S.M.S. 10/33	do. ...	10	0 60	...	22 0	10 0	2·5	46	6 6	Timber cut for local trade only.
Howlett, E., Argyle	P.P. L. 2640 ...	do. ...	6	0 40	...	2 0	21 0	...	50	8 4	Cutting fruit cases, working intermittently only.
Grist and Nicholas, Goodwood Rd.	P. 156, P.P. L. 725	do. ...	19	0 40	...	9 0	25 0	8	46	8 10	
Hurst and Reilly, Boyanup	P.P. L. 250 ...	do. ...	10	0 5	...	2 0	18 0	...	...	7 10	Cutting fruit cases for own use and for sale.
Hutton, T. G., Capel	P.P. L. 77 ...	Spot mill ...	6½	0 10	...	5 0	16 0	...	80	7 6	Cutting fruit cases on P.P. for own use, working intermittently only. (Cap. 10 doz.).

APPENDIX 4—*continued.*

Name of Sawmill Owner, and District.	Locality—Permit or Lease No. or P.P.	Type of Mill.	Horse-Power of Mill.	Average distance from Stump to Landing.	Average distance from Landing to Mill.	Distance from Mill to Main Line Siding.	Distance from Siding to nearest Port.	Output in loads per day.	Per centage of recovery.	Rate per ton on Sawn Timber to Port of shipment.	Remarks.
DONNYBROOK—*continued.*				M. Ch.	M. Ch.	M. Ch.	M. Ch.			s. d.	
Jones, Thomas B., Mumballup ...	P.P. L. 1 05 ...	Circular saw ...	10	...	...	...	43 0	...	...	11 1	Cutting fruit cases and scantling for own use and sale (cap. 15 doz.).
Kirkpatrick, J. K., Charlie's Creek	P.P. L. 112 ...	do. ...	4	...	...	...	31 0	...	50	9 7	Cutting fruit cases for own use (cap. 4 doz.), working intermittently only.
Lewis and Reid, Ltd., Mullalyup ...	L. 231, P. 123, 204, S.M.S. 2/33	Twin saws ...	20	1 40 to mill	...	1 0	40 0	12	45	10 8	To operate from 1–7–21.
Martin, R. M., Upper Preston ...	P.P. L. 48, L. 591	Circular saw ...	8	...	...	...	31 0	1	75	9 7	Cutting fruit cases for own use only, working intermittently.
JARRAHWOOD DISTRICT.											
Forests Department, Wonnerup ...	State Forest No. 2	Twin saws ...	40	1 20 to mill	...	0 20	6 0	5	75	6 6	Operating under Working Plan No. 2. Cutting Tuart.
Kauri Timber Co., Ltd., Barabup	P. 217	Vertical and twin traveller	90	0 60	5 0	6 40	35 0	50	50	11 11	
Kauri Timber Co., Ltd., Ellis Creek	P. 61/11, S.M.S. 7/11a	Band saw ...	70	0 60	6 0	13 0	45 0	40	48	10 8	
Millars' Timber and Trading Co., Ltd., Jarrahwood	P. 164	Twin saws ...	35	0 40	8 0	On Main Line	28 0	25	40	8 10	Re-opened November, 1920.
Smith, J. F., Bibilup	P. 120, S.M.S. 5/33	do. ...	16	1 0	1 0	0 40	40 0	10	40	6 6	
Swan Saw Mills, Ltd., Claymore ...	P. 91, S.M.S. 4/33	Twin saws ...	40	0 60	3 0	2 0	22 0	30	45	11 4	
McSweeney, J., Boyanup ...	P. 110	Spot mill ...	14	0 40	...	4 0	16 0	5	50	7 6	Dismantled February, 1921.
Millars' Timber and Trading Co., Ltd., Ferguson River	288/113, Con. S.M.S. 3/33	No. 1 Spot mill	16	1 0 to mill	...	15 0	10 0	5	60	6 6	do. do.
Millars' Timber and Trading Co., Ltd., East Kirup	257/113	Vertical and Twin saws	500	0 40	5 0	13 0	37 0	70	45	10 4	
Millars' Timber and Trading Co., Ltd., Ferguson River	288/113 Con. ...	No. 2 Spot mill	16	1 0	3 0	13 0	10 0	8¼	44	6 6	
Miller, Thomas, Thompson's Brook	P.P. L. 61 ...	Circular saw ...	6	...	0 20	4 0	31 0	1	90	9 7	Cutting fruit cases and scantling, working intermittently.
Parmenter, S. T., Mullalyup ...	P.P. L. 905 ...	do. ...	6	...	...	0 40	40 0	...	75	10 8	Cutting fruit cases (cap. 5 doz. ¾-flats), working intermittently.
Patroni, J., Upper Capel ...	P.P. L. 1292 ...	do. ...	8	...	...	...	25 0	1	80	8 10	Cutting fruit cases for own use only, working intermittently.
Pinto, B., Preston Rd.	P.P. L. 35 ...	do. ...	2½	...	...	1 40	31 0	...	80	9 7	Cutting fruit cases for own use (cap. 40 cases ¾-flats), working intermittently.
Preston Valley Saw Mills, Ltd., Lowden	P.P. L. 48/1588 ...	Twin saws ...	18	2 0	2 0	1 0	36 0	8	50	10 2	
Preston Valley Saw Mills, Ltd., Noggerup	P. 95/11, S.M.S. 13/11a	do. ...	40	1 0	4 0	0 15	49 0	25	45	11 10	Cutting sleepers, scantlings. Closed down; recommenced operations 29–1–21.
Slattery, B., Ferguson River ...	P.P.L. 578 ...	Circular saw ...	4	...	...	...	10 0	·25	85	6 6	Cutting fruit cases for own use, also Banksia for sale. Working intermittently.
Smith, H. S., and Sons, Boyanup	P.P. L. 54 ...	do. ...	12	...	...	...	16 0	...	50	7 6	Cutting fruit cases for own use, working intermittently.
Thompson, G. P., Argyle	P. 138, P.P. L. 297	do. ...	10	0 40	...	...	18 0	·75	40	7 10	Cutting fruit cases and scantling.
Trainer, D. C., Boyanup	P.P.	do. ...	6	1 0	1 0	4 0	16 0	...	90	7 6	Cutting fruit cases. Dismantled about December, 1920.

PINJARRA DISTRICT.

Anderson, D., "Sunshine Mill" ...	Con. 12/1	Spot mill ...	16	1 0 to mill	...	1 60	...	6	50	8 5	Destroyed by fire during 1920.
Anderson, D., "Barton" ...	Con. 12/1	... ...	...	...	...	...	...	...	...	...	
Bettenays, J., Karragullen ...	P.P.	... ...	...	...	...	...	...	...	...	...	Expected to commence operations in July, 1921.
Buckingham J. A., Kelmscott ...	P. 65	Twin saws ...	10	4 40 to mill	...	...	23 0	2½	60	6 7	Sold and dismantled.
Downs and Tomkins, Serpentine ...	P.P.	do. ...	10	...	...	5 0	...	4	...	14 11	Worked intermittently during past year. No timber shipped.
Edgeworth and Co., Pinjarra ...	P.P.	Spot mill ...	10	...	...	1 0	55 0	...	...	9 11	Cutting fruit cases from billets from other mills.
Federal Trading and Engineering Co., Ltd., Armadale	P.P.	do. ...	14	2 0 to mill	...	4 40	20 0	...	...	6 2	Finished cutting. Partly dismantled.
Federal Trading and Engineering 93-mile, Pinjarra-Dwarda Railway	P.P. Loc. 5542 ...	Twin saws ...	28	1 0 to mill	...	0 1½	93 0	15	...	16 6	
Gittos and Arnold, Pinjarra ...	P.P.	Spot mill ...	16	...	...	Alongside	...	...	...	...	Cutting fruit cases from billets from other mills.
Mann, A. S., Wundowie	P. 118	do. ...	6	1 0 to mill	...	...	53 0	...	...	...	Cutting shingles and fruit cases. No timber shipped.
Millars' Timber and Trading Co., Ltd., Jarrahdale	Con. 12/0 and 12/1	Twin saws ...	700	0 40	20 0	7 0	41 0	80	45	9 9	
Millars' Timber and Trading Co., Ltd., Marrinup	Lease 330/113, P. 112	do. ...	250	0 40	4 0	On Main Line	68 0	26	45	14 2	
Millars' Timber and Trading Co., Ltd., Nanga Brook	Leases 331/113, 299/113	do. ...	400	0 40	8 0	28 0	37 0	60	45	10 4	
Palmateer, G. H., Bickley ...	P.P.	... ...	6	...	...	0 60	...	...	...	...	Cutting fruit cases from billets from other mills (for own use only).
Patterson, J. H., Amphion ...	P. 81/11	do. ...	30	1 0	2 0	0 40	90 0	12	45	15 4	
Perth Jarrah Saw Mills, Ltd., Lion Mill	P.P. 1317	do. ...	40	2 0	10 0	0 20	37 0	12	42	10 4	Worked P.P. in addition to Permit Area.
Plavin, C., Plavin's Siding ...	P. 54	do. ...	20	1 40	...	...	78 0	15	48	15 0	
Port and Co., Ltd., No. 1 Pindalup	P. 34/11, S.M.S. 13/33	Horizontal ...	30	1 0	2 0	Alongside Main Line	90 0	13	51	15 8	
Port and Co., Ltd., No. 2, Pindalup	P. 34/11	Twin saws ...	12	1 0 to mill	...	2 0	90 0	4	60	15 8	
Railway Department's No. 1 Mill (let to Mr. T. H. Holmes), Dwellingup	P. 114	do. ...	35	0 60	4 40	0 2	70 0	12	48	11 4	
Railway Department's No. 2 Mill, Dwellingup	P. 78/11	do. ...	100	1 0	4 0	5 0	70 0	49	47	14 4	
Railway Department, Midland Junction	... ...	Band saws ...	80	...	...	...	...	10	50	...	Cutting Tuart and Wandoo only.
Rosenhall, A. H., Meelon ...	P.P.	Spot mill ...	5½	...	...	0 20	61 0	...	...	13 8	Cutting fruit cases from billets from other Mills.
State Saw Mill No. 5, Holyoake ...	P. 27/11, S.M.S. 12/33	Twin saws ...	60	0 40	7 0	On Main Line	78 0	40	48	14 8	State Mill No. 5, as from 15-4-20.
State Saw Mill, No. 4, Wuraming	P. 79/11, S.M.S. 17/33	do. ...	30	1 0	3 25	1 0	92 0	19 5	47	15 10	
Stinton, H. S., Roleystone ...	P.P.	Spot mill ...	10	1 0 to mill	...	2 0	46 0	1	55	9 1	
The Australian Lumber Co., 88-mile Siding, Pinjarra-Dwarda Rly.	P.P. Loc. 703 ...	Twin saws ...	30	0 40 stump to mill	...	0 33	88 0	...	45	16 1	
The Bailey Timber Co., Mandurah	P.P.	Spot mill ...	36	1 40 stump to mill	...	0 12	66 0	1	70	...	Cutting Tuart.
The Waroona Timber Co., Waroona	P.P.	... ...	...	...	...	...	...	...	...	...	Expected to commence operations in July, 1921.
Whittaker Bros., Ltd., North Dandalup	P. 84/11, S.M.S. 12/11a	Twin saws ...	60	0 70	9 0	3 60	46 0	31	53	13 11	

APPENDIX 5.

Table showing number of various Timber Workers' Registration Certificates issued from 1st July, 1920, to 30th June, 1921.

Hewers	286
Fallers	285
Haulers	113
Carters	49
Managers and Bush Foremen	42
Teamsters	25
Swampers	180
*Firewood	242
†Charcoal	14
‡Timber Getters	26
Horse Drivers	26
Barrel Stave splitters	7
§Sandalwood Pullers	5
Blackboy and Kingia Grass Cutters	4
Whistle Boys	2
	1,306

*This includes cutters and carters.

†This includes burners and carters.

‡Working on Coal Mining Leases at Collie.

§Working on Special Sandalwood Permit at Carnarvon.

APPENDIX 6.

Return of Licenses issued from 1st July, 1920, to 30th June, 1921.

*Managers and Bush Foremen	6
Firewood	3,316
Mining Timber	183
Timber	6
Bark Strippers	46
Fence Post	16
Sandalwood Licenses	636
Total	4,209

*These figures allude to Goldfields only.

APPENDIX No. 7.

List of Herbarium Specimens collected during the year ended 30th June, 1921, and identified by the Government Botanist.

Botanical Name.	Local Name.
Acacia acuminata, Benth.	Raspberry Jam.
,, elata, R. Br.	
,, bidentata, Benth.	
,, cochlearis, Wendl	
,, colletioides, A. Cunn. ...	
,, craspedocarpa	Mulga.
,, ephedroides, Benth. ...	
,, lasiocalyx, C. Andrews ...	Silver Wattle.
,, myrtifolia, Willd	
,, multispicata, Benth. ...	
,, Osswaldi, F.v.M.	
,, pulchella, R. Br.	
,, Ridleyana, W. V. Fitz. ...	
,, salicina, Lindl.	
,, sphacelata, Benth.	
,, teretifolia, Benth.	
Acanthocarpus Preissii, Endl. ...	
Actinotus leucocephalus, Benth. ...	Flannel Flower.
Adiantum aethiopicum, L.	Maidenhair Fern.
Agrostocrinum stypandroides ...	False Blind Grass.
Albizza lebbeck, Benth.	
Andersonia trachyanthera, F. v. M.	
Anigozanthus bicolor, Endl. ...	Kangaroo Paw.
,, manglesii, V. Don ...	do.
,, pulcherrima, Hooker...	do.
,, viridis, Endl. ...	Green Kangaroo Paw.
Annogramme (Grammitis), rutaefolia R. Br.	Rock Fern.
Anthocercis anisantha, Endl. ...	
Asphodelus fistulosus, L.	Onion Weed.
Aspidium unitum, Swartz. ...	
Astroloma divaricatum, Sau. ...	
,, longifolia, Send.	
,, microphyllum, Stschegl....	
,, pallidium	
Beackea astartioides, Benth. ...	
,, Behrii, F. v. M.	
Balaustion pulcherrimum, Hook. ...	
Banksia ilicifolia, R. Br.	Holly Leaf Banksia.
,, littoralis, R. Br.	Swamp Banksia.
Billardiera coriacea, Benth.	
,, Lehmanniana, F. v. M. ...	
Boronia cymosa	
,, coerulescens, F. v. M. ...	
,, crenulata, S. M.	
,, spathulata, Lindl.	
Borya nitida, Labill.	Pin Grass.
Brachysema praemorsum	
Briza maxima, Linn.	Blowfly Grass.
Burchardia umbellata, R. Br. ...	
Caladenia deformis, R. Br.	
,, dilatata	Spider Orchid.
,, discoidea	
,, flava, R. Br.	
,, gemmata, Lindl.	
,, longicauda, Lindl. ...	
,, Patersoni, R. Br. ...	Spider Orchid.
Calectasia cyanea, R. Br.	Mallee Pine.
Callitris verrucosa	Cypress Pine.
	Star of Bethlehem.
Calothamnus chysantherus, F. v. M.	
,, quadrifidus, R. Br. ...	
,, sanguineus, Labill. ...	
Candollea Huegelii, Endl.	
,, pedunculata, R. Br. ...	
Cassia artemisioides, Gard.	
,, chatelainiana, Gard. ...	
,, desolata, F. v. M.	
,, eremophila, A. Cunn. ...	
,, pleurocarpa, F. v. M. ...	
Cassytha glabella, R. Br.	Bush Dodder.
Casuarina humilis	
Chamaescilla corymbosa	Blue Squill.
Cheilanthes tennifolia, Swartz ...	Rock Fern.
Cheiranthera filifolia	
Chloanthes coccinea, Bartl.	
Chorizema Dicksonii, Grah. ...	
,, ilicifolium, Labill. ...	
Clematis aristata, R. Br.	
Comesperma scoparium, Steety. ...	
,, virgata	
,, volubile, Labill. ...	
Commersonia crispa, Turcz. ...	
Conospermum Huegelii	
Conostylis candicans, Endl. ...	
,, involucrata, Endl. ...	
Convolvulus erubescens	

APPENDIX 7—*continued.*

Botanical Name.	Local Name.
Craspedia Richea	Billy Button.
Cryptandra nutans, Stend	
,, arbutiflora, Fenzl. ...	
,, parvifolia, Turcz. ...	
,, calendulaceum, R. Br.	
Cryptostemma calendulaceum R. Br.	Cape Weed
Dampiera eriocephala	
,, incana, R. Br.	
,, linearis, R. Br.	
,, luteiflora, F. v. M. ...	
Daviesia cardiophylla, F. v. M. ...	
,, cordata, S. M.	
,, divaricata, Benth.	
,, euphorbioides, Benth. ...	Centipede Bush.
,, nematophylla, F. v. M. ...	
,, nudiflora, Meissn.	
,, preissii, Meissn.	
,, striata, Turcz.	
Dianella revoluta	
Diplolaena microcephala, Bartl. ...	
Diplopeltis Huegelii, Endl.	
Diuris carinata, Lindl.	
,, setacea	
,, longifolia, R. Br.	Donkey Orchid.
Dodonaea amblyophylla, Diels. ...	
,, inaequifolia, Turcz. ...	
,, larraeoides, Turcz. ...	
,, lobulata, F. v. M. ...	Native Hop.
Drakaea elastica, Lindl.	
,, glyptodon, Fitz.	Hammer Orchid.
,, Jeanensis, R. S. Rogers ...	,,
Drosera bulbosa, Hook.	Sundew.
,, gigantea, Lindl.	Rainbow Plant.
,, heterophylla, Lindl. ...	Sundew.
,, macrantha, Endl.	Rainbow Plant.
,, pencillaris, Benth.	
,, stolonifera, Endl.	
Dryandra floribunda, R. Br. ...	Prickly Banksia.
,, Fraseri, R. Br.	
,, Hewardiana, Benth. ...	
Duboisia Hopwoodii	Pituri.
Echium plantagineum (E. violaceum)	Paterson's Curse.
Eremophila alternifolia, R. Br. ...	
,, Brownii, F. v. M. ...	
,, Drummondii, F. v. M.	
,, Oldfieldii, F. v. M. ...	
,, oppositifolia, R. Br. ...	
,, Paisleyi, F. v. M. ...	
Eriostemon spicatus, A. Rid. ...	
Erodium cygnorum, Nees.	Storksbill or Cranebill.
Eryngium rostratum, Cav	
Eucalyptus annulata, Benth. ...	
Eucalyptus calycogona, Turcz. ...	Snap and Rattle.
,, corrugata, Maiden ...	
,, dicipiens, Endl. ...	White Gum.
,, eremophila, Maiden ...	
,, falcata, Turcz.	White Mallet.
,, longicornis, F. v. M. ...	Morrell.
,, redunca, Schau. var. oxymitra, Maid.	Blueleaf Mallet.
,, rudis, Endl.	Flooded Gum.
Franklandia lucifolia, R. Br. ...	
Fusanus acuminatus, R. Br. ...	Quandong.
Gastrolobium bilobum, R. Br. ...	Heart Leaf Poison.
,, crassifolium, Benth. ...	Narrow Leaf Poison.
,, obovatum, Benth. ...	
,, oxylobioides	York Road Poison.
,, spinosum forma ...	Prickly Poison.
,, spinosum, Benth. var. Trianqulare, Benth.	,,
,, villosum, Benth. ...	Crimp-leafed Poison.
Glossodea Brunonis, Endl.	
Gompholobium polymorphum ...	
Goodenia trichophylla, De Vr. ...	
Grammitis (sub. genus of Annogramme) rutaefolia, R. Br.	Rock Fern.
Grevillea acuaria, F. v. M. ...	
,, Endlicheriana, Meissn. ...	
,, haplantha, F. v. M. ...	
,, Huegelii, Meissn. var. simplicifolia, F. v. M.	
,, ornithopoda, Meissn. ...	
,, oxystigma, Meissn. ...	
,, paradox, F. v. M. ...	
,, petrophiloides, Meissn. ...	
,, pterosperma, F. v. M. ...	
,, Pritzelii, Diels.	
,, quercifolia, R. Br. ...	

APPENDIX 7—*continued.*

Botanical Name.	Local Name.
Grevillea synaphaeae, R. Br. ...	
„ Thelemanniana, Endl. ...	
„ vestita, Meissn.	
Guichenotia macranthus, Turcz. ...	
Hakea cristata, R. Br.	
„ erinacea, Meissn.	
„ incrassata, R. Br.	
„ lissocarpha, R. Br.	
„ marginata, R. Br.	
„ myrtoides, R. Br.	
„ recurva, Meissn.	Needle Tree.
„ sulcata, R. Br.	
„ varia	
Halgania lavandulacea, Endl. ...	
Helichrysum bracteatum	
„ Lawrencella, F. v. M. ...	Everlasting Daisy.
„ stipitatum	
Helipterum cotula, D.C.	
„ Manglesii, F. v. M. ...	Everlasting.
„ rubellum, Benth. ...	
„ tenellum, Turcz. ...	
Hemigenia sericea, Benth. var. parviflora, Benth.	
Hibbertia amplexicaulis	
„ montana var. major, var. confertifolia	
„ nutans, Benth.	
„ pedunculata, Steud. ...	
Hibiscus Huegelii.	
Hovea chorizemifolia, D.C. ...	
„ pungens, Benth.	
„ trisperma, Benth.	Purple Hovea.
Hypocalymma augustifolium, Endl.	Myrtle.
„ robustum, Endl. ...	„
Hypoxis glabella, R. Br.	
Ionidium brevilabre, Benth. ...	
„ calycinum, Stend D.C. ...	Wild Violet.
„ floribundum, Walp. ...	
Isopogon roseus, Lindl.	
Isotoma Brownii	
„ petraea F. v. M.	
„ striata, Benth.	Lamb-Poison.
Johnsonia lupulina, R. Br.	
Kennedya stirlingii.	
Keraudrenia integrifolia, Stend. ...	
Kochia villosa, Lindl.	
Labichea lanceolata	
Lambertia multiflora, Lindl. ...	
Laxmannia grandiflora, Lindl. ...	
Leptospermum erubescens, Schau ...	Water Bush.
Leschenaultia formosa, R. Br. ...	
Leucopogon australis, R. Br. ...	
„ fimbriatus, Stschegl. ...	
„ obtusatus, Sond. ...	
„ pulchellus, Sond. ...	
Lindsaea linearis, Swartz.	
Linum marginale	
Lobelia tenuior, Benth.	
Logania serpyllifolia var. augustifolia	
Loranthus quandang	
Lyperanthus nigricans	Potato Orchid.
Lysinema ciliatum, R. Br.	
Macarthuria australis, Hueg. ...	
Marianthus erubescens (Putterl) ...	
Marsilea Drummondii	
Melaleuca radula, Lindl.	
„ subtrigona, Schau. ...	
Microseris Forsteri, Hooker ...	
Mirbelia floribunda, Benth.	
„ spinosa, Benth.	
Olearia adenolasia, F. v. M. ...	

APPENDIX 7—*continued.*

Botanical Name.	Local Name.
Olearia rudis, F. v. M.	
Orthrosanthus laxus	
Oxylobium capitatum, Benth. ...	
„ parviflorum, Benth. ...	Box Poison.
Patersonia xanthina, F. v. M. ...	
Pelargonium australe, Wildenow. ...	
Phebalium microphyllum, Turcz. ...	
Pholidia scoparia, R. Br.	
„ woollsiana, F. v. M. ...	
Phyllanthus calycinus, Labill. ...	
Pimelea ferruginea, Labill.	
„ rosea, R. Br	
„ sulphurea, Meissn.	
Polypompholyx multifida	
Podotheca gnaphaliodes	
„ chrysantha, Benth. ...	
Porana sericea, F. v. M.	
Prasophyllum cuculatum.	
„ elatum, R. Br. ...	
Pritzelia pygmaea, F. v. M. ...	
Pterostylis vittata, L.	
Ptilotus alopecuroideus, F. v. M. ...	
„ Drummondii, F. v. M. ...	
„ obovatus, F. v. M. ...	
Ricinocarpus glaucus, Endl. ...	
Scaevola holosericea, De Vi. ...	
„ longifolia, De Vries. ...	
„ pincea	
„ spinescens, B. Br. ...	
Senecio lautus, Forst.	
Simsia latifolia, R. Br.	
Solanum ellipticum, R. Br. ...	
„ hystrix	
„ lasiophyllum, Dunal. ...	
„ Oldfieldii, F. v. M. ...	
Sollya heterophylla	
Sowerbaea laxiflora, Lindl.	
Sphenotoma gracilis	
Spyridium globulosum, Benth var. albicans, Diels	
Stackhousia, Brunonis, Benth. ...	
„ pubescens, S. Ri h. ...	
„ viminea, Smith ...	
Stipa elegantissima	
Sterculia Gregorii, F. v. M.... ...	
Stylidium Brunonianum, Benth. ...	
„ calcaratum, R. Br. ...	
Stypandra glauca, R. Br.	Blind Grass.
Styphelia tenuiflora, R. Br. ...	
„ „ Lindl. ...	
„ verticillata	
Swainsonia canescens, F. v. M. ...	Goat Poison.
Synaphea favosa, R. Br.	
„ polymorphia, R. Br. ...	
Templetonia retusa, R. Br. ...	
Tetratheca viminea	
Thelymitra crinita	
Thryptomene fimbriata Herbert, sp. nov.	
Thysanotus multiflorus, R. Br. ...	
„ Patersoni, R. Br. ...	
Tribonanthes uniflora, Lindl. ...	
Trymalium ledifolium, Fenzl. ...	
Triodia pungens	
Utricularia Hookeri, Lehm. ...	
Verticordia Huegelii	
Waitzia aurea	
Westringia rigida, R. Br.	
Xanthorrhoea gracilis	Blackboy.
Xerotes Endlicheri, F. v. M. ...	
Xylomelum augustifolium, Kipp ...	Sand-plain Pear.

APPENDIX 8.

Trees raised at and distributed from Hamel State Nursery during the year ended 31st March, 1921.

Botanical Name.	Vernacular Name.	No. of Trees on hand 31st March, 1920.	No. of Trees raised year ended 31st March, 1921.	No. of Trees distributed, Season 1920.					No. of Trees on hand 31st March, 1921.
				Sold to Public.	Distributed Free.	Raised for Plantation and Arboreta.	Otherwise disposed of.	Total.	
Acacia acola	... ...	61	...	26	12	...	12	50	11
,, acuminata	Raspberry Jam Tree	1,492	...	104	105	...	989	1,198	294
,, Baileyana	Cootamundra Wattle	672	876	471	...	...	201	672	876
,, buxifolia	... ...	18	...	8	7	...	1	16	2
,, dealbata	Silver Wattle	321	335	224	...	...	5	229	423
,, decurrens	Sydney Green Wattle	110	210	103	6	...	1	110	210
,, elata	Cedar Wattle	240	122	88	...	...	38	126	236
,, juniperina	Prickly Wattle	...	57	...	...	...	...	...	57
,, leprosa	Seville Wattle	19	...	5	9	...	2	16	3
,, longifolia	Long Leafed Golden Wattle ...	94	...	56	16	...	19	91	3
,, melanoxylon	Blackwood	40	233	40	...	...	...	40	233
,, montana	Mountain Acacia	42	...	9	15	...	14	38	4
,, myrtifolia	Myrtle leafed Acacia	...	14	...	...	...	...	...	14
,, podalyriæfolia	Mt. Morgan Silver Wattle ...	204	120	97	10	...	23	130	194
,, pycnantha	Golden Wattle	573	805	209	...	...	234	443	935
,, spectabilis	Mudgee Wattle	18	...	6	...	...	8	14	4
Agathis australis	New Zealand Kauri Pine	7	...	...	...	1	...	1	6
Agonis flexuosa	Western Australian Peppermint	592	1,160	577	...	...	15	592	1,160
Araucaria Bidwilli	Bunya Bunya	407	3	97	37	...	7	141	269
,, Cunninghami	Moreton Bay Pine	...	206	...	...	...	...	...	206
,, excelsa	Norfolk Island Pine	676	29	346	37	...	7	390	315
Callitris robusta	Cypress Pine	188	397	186	...	...	2	188	397
Castanospermum australe ...	Moreton Bay Chestnut	24	...	6	3	...	...	9	15
Ceratonia siliqua	Carob Bean	673	1,623	563	6	...	54	623	1,673
Cinnamomum camphora	Camphor Laurel	976	1,208	927	...	...	4	931	1,253
Cupressus Knighti	Knight's Cypress	428	318	379	...	...	49	428	318
,, lusitanica	Busaco Cedar	996	4,345	954	...	...	20	974	4,367
,, macrocarpa	Monterey Cypress	13,442	8,204	12,854	116	...	472	13,442	8,204
,, sempervirens	Mediterranean Cedar	874	1,558	716	...	...	3	719	1,713
,, torulosa	Nepal Cypress	561	360	282	...	...	18	300	621
Dracaena Draco	Dragon's Blood Tree	26	...	...	...	...	...	...	26
Erythrina indica	Coral Tree	40	19	9	...	...	1	10	49
Eucalyptus alba	Ridge Gum	142	...	6	24	12	...	42	100
,, botryoides	False Mahogany	304	912	152	...	...	127	279	937
,, citriodora	Lemon Scented Gum	541	454	401	12	...	128	541	454
,, cladocalyx	Sugar Gum	5,240	4,707	4,966	...	...	274	5,240	4,707
,, ficifolia	Red Flowering Gum	3,030	2,246	2,373	72	...	527	2,972	2,304
,, globulus	Tasmanian Blue Gum	738	580	653	...	...	85	738	580
,, gomphocephala ...	Tuart	25	...	12	...	...	13	25	...
,, Guilfoylei	Tingle Tingle	...	8	...	...	...	...	...	8
,, macrocarpa	Sand Plain Gum	272	256	78	48	...	112	238	290
,, melliodora	Yellow Box	41	227	21	...	...	20	41	227
,, paniculata	Queensland Ironbark	60	47	25	25	...	10	60	47
,, patens	West Australian Blackbutt ...	...	10	...	...	...	...	...	10
,, pilularis	Victorian Blackbutt	...	9	...	...	...	...	...	9
,, Preissiana	Preiss's Gum	43	...	3	14	1	25	43	...
,, pyriformis (Red) ...	Pear-shaped Fruited Gum ...	11	...	...	...	1	0	11	...
,, ,, (Yellow) ...	do.	10	...	...	...	1	9	10	...
,, regnans	... ...	...	8	...	...	...	...	...	8
,, resinifera	Kino Gum Tree	16	...	6	9	1	...	16	...

APPENDIX 8—*continued.*

Trees raised at and distributed from Hamel State Nursery during the year ended 31st March, 1921—continued

Botanical Name.	Vernacular Name.	No. of trees on hand March 31, 1920.	No. of trees raised year ended March 31, 1921.	No. of Trees Distributed, Season 1920.					No. of trees on hand 31st March, 1921.
				Sold to Public.	Distributed free.	Raised for Plantation and Arboreta.	Otherwise disposed of	Total.	
Eucalyptus tetragona	Four-angled Fruited Gum ...	36	...	6	8	1	21	36	...
,, tetraptera	Broad-Leafed Mallee	248	207	126	37	...	13	176	279
Ficus australis	Port Macquarie Fig	1,516	...	485	12	...	3	500	1,016
,, macrophylla	Moreton Bay Fig	2,240	...	464	...	...	6	470	1,770
Grevillea robusta	Silky Oak	241	51	143	...	...	98	241	51
Hakea eucalyptoides	Flowering Hakea	420	...	186	...	...	9	195	225
Jacaranda mimosifolia	Palixander Tree	120	136	31	6	...	4	41	215
Juniperus Bermudiana	Bermuda Pencil Cedar	114	229	103	...	...	2	105	233
,, Cedrus	Pencil Cedar	82	...	24	6	9	...	39	43
Lagunaria Patersoni	Pyramid Tree	733	...	223	...	...	3	226	507
Leucadendron argenteum	Silver Tree of South Africa ...	11	...	6	3	...	2	11	...
Melia umbraculiformis	Pride of India	2,005	790	598	6	...	131	735	2,060
Passiflora edulis	Passion Fruit	17	78	6	...	...	11	17	78
Pinus Canariensis	Canary Island Pine	570	559	443	36	...	8	487	642
,, pinaster	Cluster Pine	18,238	5,718	1,682	...	16,556	...	18,238	5,718
,, insignis	Monterey Pine	16,190	14,200	11,002	500	200	4,488	16,190	14,200
,, halepensis	Aleppo Pine	,840	930	1,175	6	...	2,659	3,840	930
Pittosporum eugenoides	... ...	10	...	...	...	1	...	1	9
,, undulatum	Victoria Native Laurel	1,552	1,267	1,252	48	...	205	1,505	1,314
Platanus occidentalis	Western Plane	5,244	...	959	2	...	217	1,178	4,066
Prosopis juliflora	Algaroba Bean	211	...	6	60	...	1	67	144
Quercus Aegilops	Valmia Oak	214	...	...	...	...	24	24	190
,, lusitanica	Portuguese Oak	419	...	270	6	...	3	279	140
Robenia pseudo-acacia	False Acacia	1,089	140	160	6	...	923	1,089	140
Salix alba	Huntingdon Willow	32	...	...	1	...	...	1	31
,, Huntingdoni	do.	30	...	...	1	...	...	1	29
,, coerulea	do.	18	...	...	1	...	...	1	17
,, purpurea	Bitter Willow	23	...	...	1	...	...	1	22
,, nigra	Black Willow	20	...	...	1	...	...	1	19
,, viminalis	Common Osier	43	...	...	1	...	...	1	42
Schinus Molle	Pepper Tree	992	1,268	935	...	...	57	992	1,268
Sterculia hetrophylla	Kurrajong	2,692	1,020	1,078	6	...	498	1,582	2,130
,, acerifolia	Flame Tree	394	...	146	12	...	...	158	236
Syncarpia laurifolia	Turpentine Tree	67	...	3	...	...	2	5	62
Telopea speciosissima	New South Wales Waratah ...	12	...	...	2	...	...	12	...
Thuya occidentalis	Arbor Vitae	435	32	34	...	...	...	34	433
,, orientalis	do.	192	...	46	...	...	...	46	146
Tris ania conferta	Brush Box	529	210	196	...	...	15	211	528
Xylomelum occidentale	West Australian Native Pear ...	...	...	...	...	146	3	149	...
		95,274	58,501	49,826	1,361	16,939	12,945	81,062	72,713

APPENDIX 9.

List of Trees planted in the Hamel State Nursery Arboretum.

Botanical Name.	Vernacular Name.	Native Habitat.
Acacia acinacea	... ...	Victoria and South Australia.
,, acola	... ...	
,, acuminata	Raspberry Jam	Western Australia
,, aspera	... ...	New South Wales and Victoria
,, Baileyana	Cootamundra Wattle	New South Wales
,, cusifolia	... ...	
,, dealbata	Victorian Silver Wattle	South-Eastern Australia and Tasmania
,, decurrens	Sydney Green Wattle	New South Wales
,, elata	Cedar Wattle	New South Wales
,, horvistri	... ...	
,, juniperina	Prickly Wattle	Eastern Australia.
,, leprosa	... ...	Victoria and New South Wales
,, longifolia	... ...	Eastern Australia
,, melanoxylon	Blackwood	Victoria and Tasmania
,, microbotrya	Manna Wattle	Western Australia
,, montana	Mountain Wattle	South Australia and New South Wales
,, myrtifolia	Myrtle-leafed Acacia	South Australia
,, normalis	Normal Sydney Green Wattle ...	New South Wales and Queensland
,, podalyriæfolia	Mount Morgan Silver Wattle ...	Queensland
,, pruinosa	... ...	Eastern Australia.
,, pycnantha	Golden Wattle	Victoria and South Australia
,, saligna	Coastal or Weeping Wattle	Western Australia
,, spectabilis	... ...	New South Wales and Queensland
Agonis flexuosa	Peppermint	Western Australia
Araucaria Bidwilli	Bunya Bunya Pine	Queensland
Beilschmiedia Thomæa	... ...	West Indies
Callitris robusta	Cypress Pine	Australia
Castanospermum australe	Black Bean, Moreton Bay Chestnut ...	Queensland
Casuarina stricta	Drooping Sheoak	South-Eastern Australia
Ceratonia siliqua	Carob Bean	Mediterranean
Cinnamomum camphora	Camphor Laurel	China and Japan
Cupressus Benthami	Bentham's Cypress	Mexico
,, Knighti	Knight's Cypress	United States of America
,, lusitanica	Busaco Cedar	Mexico
,, macrocarpa	Monterey Cypress	United States of America
,, sempervirens (horizontalis) ...	Mediterranean Cedar	Mediterranean
,, torulosa	Nepal Cypress	India
Erythrina indica	Coral Tree	New South Wales
Eucalyptus alba, Reinw.	Ridge Gum	Western Australia
,, bosistoiana	Gippsland Grey Box	South-Eastern Victoria
,, calycogona, Turcz.	Mallee	Western Australia
,, calycogona, Turcz. var. gracilis, colletiodes, A. Cunn.	Snap and Rattle	Western Australia
,, Campaspe, S. le M. Moore ...	Gimlet-Wood	Western Australia
,, citriodora	Lemon-scented Gum	Queensland
,, cladocalyx	Sugar Gum	South Australia and Victoria
,, clelandi, Maiden	Goldfields Blackbutt	Western Australia
,, coccifera	... ...	Tasmania
,, cornuta	Yate	Western Australia
,, ficifolia	Red Flowering Gum	Western Australia
,, fœcunda, Schau.	Mallee	Western Australia
,, fœcunda, var. loxophleba (Benth.), Maiden	York Gum or Mallee	Western Australia
,, globulus	Blue Gum	Tasmania and Victoria
,, Guilfoylii	Tingle Tingle	Western Australia
,, gomphocephala	Tuart	Western Australia
,, leucoxylon	White Ironbark	Victoria, South Australia, and New South Wales
,, longifolia	Woolly Butt	Eastern Australia
,, macrocarpa	Sand Plain Gum	Western Australia
,, maculata	Spotted Gum	New South Wales and Queensland
,, megacarpa	Western Australian Blue Gum ...	Western Australia
,, melliodora	Yellow Box	New South Wales and Victoria
,, obliqua	Messmate	South-Eastern Australia and Tasmania
,, occidentalis	Brown Mallet	Western Australia
,, oleosa, F. v. M. var. longicornis, F. v. M.	Morrell	Western Australia
,, paniculata	Red Iron Bark	New South Wales
,, patens	Western Australia Black Butt ...	Western Australia
,, pilularis	Victorian Blackbutt	Victoria
,, polyanthemos	Red Box	South-Eastern Australia
,, Priessiana	... ...	Western Australia
,, pyriformis (red)	Flowering Mallee	Western Australia
,, ,, (yellow)	Flowering Mallee	Western Australia
,, redunca	Wandoo	Western Australia

APPENDIX 9—continued.—*List of Trees planted in the Hamel State Nursery Arboretum.*

Botanical Names.	Vernacular Names.	Native Habitat.
Eucalyptus redunca, Schau (Affin) var. elata, Benth.	White Gum or Wandoo	Western Australia
„ regnans	Blackbutt and Mountain Ash ...	South-Eastern Australia
„ resinifera	Red Mahogany	New South Wales and South Queensland
„ rostrata	Southern Australian Redgum ...	Southern Australia
„ salubris, F. v. M.	Gimletwood	Western Australia
„ sideroxylon	Red Iron bark	South-Eastern Australia
„ tereticornis	False Mahogany	Eastern Australia
„ tetragona	... ...	Western Australia
„ tetraptera	Broad-leafed Mallee	Western Australia
„ torquata	Goldfields Red Flowering Gum ...	Western Australia
„ torquata, Leuhm.	Goldfields Red Flowering Gum ...	Western Australia
„ viminalis	Manna Gum	South-Eastern Australia
Ficus australis	Port Macquarie Fig	New South Wales and Queensland
„ macrophylla	Moreton Bay Fig	New South Wales and Queensland
Grevillea robusta	Silky Oak	Queensland
Hakea eucalyptoides	Flowering Hakea	South-Eastern Australia
Hakea laurina	Emu Tree	Western Australia
Jacaranda mimosifolia	Palixander Tree	India
Juniperus Bermudiana	Pencil Cedar	Bermuda Island
„ cedrus	Pencil Cedar	Canary Islands
Lagunaria Patersoni	Pyramid Tree	New Zealand
Leucadendron argenteum	Silver Tree	South Africa
Pinus canariensis	Canary Island Pine	Canary Islands
Pittosperum eugenioides	... ...	New Zealand
„ undulatum	Victorian Native Laurel	South-Eastern Australia
Prosopis juliflora	Algaroba or Mesquite Tree	Western United States of America
Sophora Tetraptera	... ...	New Zealand and Chili
Sterculia acerifolia	Flame Tree	Queensland
Syncarpia laurifolia	Turpentine Tree	Queensland and New South Wales
Thuya occidentalis	Arbor Vitæ	North America
„ orientalis	Arbor Vitæ	China and Japan
Tristania conferta	Brush Box	New South Wales and Queensland

APPENDIX No. 10.

Preliminary Results of Tannin Survey executed by Federal Forest Products Laboratory.

Specimen.	Tannin Content.	Colour—	
		Reds.	Yellows.
	%	%	%
Acacia acuminata	19	1·9	3·7
,, aneura	4	...	...
,, ,, leaves	4	...	...
,, microbotrya	30	...	...
,, ,, leaves and twigs	24	...	...
,, salicina leaves and twigs	9	...	...
,, sp. (mulga)	4·4	...	...
,, ,, leaves and twigs	4	...	...
,, galls	4	...	...
Banksia grandis	8	...	...
,, littoralis	1	...	...
,, sp.	17	...	...
Cassia artemisioides	15	...	...
Dodonea lobulata, leaves and fruit	8	...	...
,, ,, twigs and stems	4·7	...	...
,, adenophora	6	...	...
Dryandra floribunda	6	...	...
Eucalyptus alba	35	6·8	23·0
,, calophylla ...	1	...	...
,, calycogona ...	7	...	...
,, diversicolor ...	19	...	...
,, erythronema ...	33	7·5	20
,, falcata	36	10·6	17·7
,, Griffithsii	6	...	...
,, incrassata ...	13	...	...
,, longicornis ...	13	...	...
,, loxophleba ...	13	...	...
,, marginata ...	5	...	...
,, occidentalis ...	29	...	...
,, ,, wood ...	1	...	...
,, ,, var. astringens	50	...	...
,, obcordata ...	31	5·5	19
,, redunca	23	17	28
,, rostrata	18	...	...
,, rudis	1·8	...	...
,, salmonophloia ...	15	14	36
,, ,, wood	1·8	...	...
,, salubris	22	9·7	21·8
,, torquata	19	12	22
,, spathulata ...	30	...	...
Grevillea eriostachya, leaves and twigs	4	...	...
Hakea glabella	21	...	...
,, multilineata, leaves and twigs	3	...	...
,, ,, bark ...	4	...	...
,, sp.	2	...	...
Jacksonia Sternbergiana ...	6	...	...
Mangrove (Black)	41	...	...
,, (Red)	33	...	...
Oxylobium callistachys ...	19	...	...
Persoonia longifolia	15	...	...
Santalum cygnorum (nuts) ...	2·5	...	...
Euc. F.D.H. 842	12	...	...
Euc. patens	5	...	...
Acacia decurrens var. mollis ...	44	3·7	4·3

APPENDIX No. 11.

Summary of Prosecutions for year ended 30th June, 1921.

Nature of Offence.	Fine. £ s. d.	Remarks.
Unlawfully cutting sleepers on reserve near Holyoake	5 0 0	And costs. Sleepers were also confiscated. In lieu of paying fine defendant elected to "take out" seven days.
Unlawfully cutting and removing timber from reserve	10 0 0	And costs.
Unlawfully cutting under-sized timber	5 0 0	And costs, also extra Royalty.
Unlawfully cutting and removing a number of jarrah logs from a reserve	5 0 0	And costs, also extra Royalty.
Unlawfully cutting timber on a prohibited area	5 0 0	And costs.
Unlawfully removing timber from Crown Lands without being the holder of a registration certificate	...	Case dismissed ; each side to pay own costs.
Unlawfully neglecting to brand stumps and crowns of felled trees	...	Case dismissed ; each side to pay own costs.
Unlawfully cutting timber under standard size on Crown Lands	3 0 0	And costs.
Unlawfully cutting timber under standard size on Crown lands...	3 0 0	And costs.
Unlawfully cutting timber under standard size on Crown lands...	3 0 0	And costs.
Unlawfully felling undersized timber on lease	10 0 0	And costs.
Unlawfully felling timber on a reserve	50 0 0	And costs ; also extra royalty paid.
Unlawfully cutting timber (Unregistered Timber Worker) ...	5 0 0	And costs.
Unlawfully cutting undersized timber and wasteful cutting ...	5 0 0	And costs.
Unlawfully cutting and removing young green timber from State Forest	...	Case withdrawn ; defendant could not understand English. He was also reported "soft" by police.
Unlawfully cutting young green trees on a State Forest	5 0 0	And costs.
Unlawfully cutting young green trees on a State Forest	5 0 0	And costs ; default 14 days.
Unlawfully cutting young green trees on a State Forest	...	Dismissed without costs.
Unlawfully removing timber from a State Forest without being in possession of a registration certificate	5 0 0	And costs.
Unlawfully starting a bush fire	...	Case dismissed ; no evidence to prove that fire was started within 20 yards of a State Forest or Reserve.
Unlawfully cutting sleepers on Crown lands	5 0 0	And costs ; sleepers seized and sold.
Unlawfully cutting young green timber for firewood on Kurrawang State Forest and trucking same to Kalgoorlie Gold Mines	5 0 0	And costs ; or 21 days in default.
Unlawfully cutting Forest Produce on State Forests and Crown Lands, and also not being registered in the prescribed form	2 10 0	And costs.
Unlawfully cutting Forest Produce on State Forests and Crown Lands, and also not being registered in the prescribed form	2 10 0	And costs.
Unlawfully cutting Forest Produce on State Forest and Crown Lands, and also not being registered in the prescribed form	2 10 0	And costs.
Unlawfully cutting Forest Produce on State Forest and Crown Lands, and also not being registered in the prescribed form	2 10 0	And costs.
Unlawfully cutting Forest Produce on State Forest and Crown Lands, and also not being registered in the prescribed form	2 10 0	And costs.
Unlawfully obtaining Forest Produce from State Forest... ...	5 0 0	And costs ; also £32 1s. damages.
Unlawfully employing an unregistered Timber Worker	2 10 0	And costs.
Unlawfully employing an unregistered Timber Worker	2 10 0	And costs
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By Authority: FRED. WM. SIMPSON, Government Printer, Perth.