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1923.

WESTERN AUSTRALIA.

REPORT

OF

THE FORESTS DEPARTMENT

FOR THE

YEAR ENDED 30TH JUNE, 1923

BY

S. L. KESSELL,
CONSERVATOR OF FORESTS.

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

[THIRD SESSION OF THE ELEVENTH PARLIAMENT.]

PERTH:

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1923.

Forests Department,
Perth, 27th September, 1923.

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, 1923.

I have the honour to be,
Sir,
Your obedient servant,

S. L. KESSELL,
Conservator of Forests.

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REPORT OF THE FORESTS DEPARTMENT FOR THE YEAR ENDED 30th JUNE, 1923.

I. CONSTITUTION OF STATE FORESTS.

1.—FOREST RESERVATION.

It is most disappointing to have to report that no further action has been taken by the Government towards the dedication of prime jarrah forest country as State Forest. The recent Royal Commission on Forestry, referring to the dedication of State Forests, stated in their report:—"Evidence shows that there is no reason why this approval should be withheld." The necessary plans covered by the joint recommendations of the Surveyor General and the Conservator of Forests for the dedication of some 2,000,000 acres of jarrah country as State Forest, and 458,000 acres as Timber Reserves, were submitted to the Hon. Premier in 1921.

The classification of the prime Karri country has been completed, but owing to the fact that the prime timber country occurs in comparatively narrow belts or small patches surrounded by land suitable for closer settlement, it will be necessary to define the boundaries of State Forests south of Manjimup by survey. At an early date the areas to be recommended for dedication will be determined by conference with the Surveyor General. As soon as weather conditions are favourable it is proposed to establish survey camps to carry out this work.

In one instance only has the declared policy of the Government to reserve prime timber country for timber production been departed from. An area of 2,290 acres on the east side of Lefroy Brook, from which a heavy crop of Karri had been removed by the State Saw Mills in connection with the operations of their Pemberton Mills, was handed over for Group Settlement purposes, under the Hon. Premier's instructions. It is important that the principle be recognised that prime timber country remains prime timber country even after the original crop of timber be removed. The decision to use for Group Settlement purposes the land referred to above put an end to proposals which had been drafted whereby it was suggested that a number of settlers might be established who should work for a number of months each year on their own holdings in the valleys and during the slack seasons on their farms be employed on forest operations on the adjoining hillsides.

TIMBER RESERVES IN THE WHEAT BELT.

The attention of the Lands Department was again drawn to the necessity for making adequate provision for the retention of timber reserves when sub-dividing land in the wheat belt. The further east the operations of the wheat farmer extend the greater is the necessity for the provision of such reserves in the form of windbreaks and shelter belts. In a newly settled district, where each farmer has only a relatively small proportion of his holding cleared, the use of such reserves is not apparent, but as the whole countryside becomes gradually denuded of trees the problem

of combating wind and water erosion will become of great importance to the individual farmer.

In comparatively low rainfall areas, such as the Southern Cross district, the difficulties of establishing plantations of trees when local conditions force the farmer to appreciate their necessity will be considerable, and there is always the risk that he may be overwhelmed by the forces of Nature before the position can be remedied. Protests in the case of the district referred to above, where sub-divisions were carried out last year, had no effect, but it is understood that the Surveyor General is now taking the matter up with a view to adopting some definite policy relating to the retention of belts of timber at reasonable intervals in any sub-division of land still further east. Meanwhile this Department is taking steps to arrange for the establishment of small experimental plantations from which data can be secured concerning the species most suitable for varying soil and climatic conditions in different districts, and the cheapest and most satisfactory methods of establishing such species.

2.—ALTERATION IN AREA OF FOREST RESERVATION.

STATE FORESTS.

Under Forests Act, 1918.

	June, 1922.	June, 1923.	Increase.
	acres.	acres.	acres.
Jarrah	39,257	45,758	6,501
Karri	<i>Nil</i>	<i>Nil</i>	...
Tuart	6,091	6,091	...
Other Species	540	540	...
	45,888	52,389	6,501

The increase is accounted for by the addition of State Forest No. 6 over areas along St. John's Brook near Barabup.

Timber Reserves under Forests Act, 1918.

	June, 1922.	June, 1923.	Increase.
	acres.	acres.	acres.
Jarrah	326	326	...
Karri	1,766	1,766	...
Other Species (Eastern Goldfields)	856,224	857,174	950
	858,316	859,266	950

In view of this State's undertaking to contribute 3,000,000 acres to the forests of the Commonwealth permanently dedicated to the production of timber, and the advances made by other States towards the dedication of their agreed quota, the above tables disclose a most unsatisfactory position for which this department cannot be held responsible.

3.—CLASSIFICATION.

An amount of £2,379 was spent on the classification of timber country lying between Manjimup and Denmark, the area covered being 247,740 acres. With the exception of a comparatively small area (estimated at 110,000 acres) lying between the Weld and Frankland Rivers, which may include a few patches of heavy timber, the field classification of the whole of the prime timber country of the State is now complete. The plotting of the work is not sufficiently advanced to permit final figures being given, but the following approximate statistics give some indication of the position:—

	acres.
(a.) Area of prime Jarrah forest	2,330,000
(b.) Area of prime Karri forest	75,000
(c.) Area of prime Red Tingle Tingle forest	6,700
(d.) Area of prime Tuart forest	6,000

Owing to the conflicting reports regarding the value of Red Tingle Tingle (*Eucalyptus jacksoni*) timber, the writer, accompanied by two experienced timber workers, visited the prime tingle country in the vicinity of the mouth of the Frankland River in December, 1922. Some two years previously a small saw mill had operated in this locality cutting timber for a bridge over the Frankland River, and the red tingle tingle sawn was found to contain innumerable gum veins having the same macroscopic features as the gum veins of marri (*Euc. catophylla*) with which it is associated. It is rather remarkable, however, that whereas a large amount of Kino exudes through insect borings in marri, the bark of Red Tingle Tingle does not show the same discolouration. On investigation it was found that in stands of pure tingle where the tree was evidently growing under optimum conditions the timber was practically free of gum veins. The timber when clean is probably the most valuable in the State for furniture and such like purposes. It is even and straight in the grain, of a pleasing light reddish colour, and remarkably light in weight for a hardwood. When polished it has very much the finish and appearance of Queensland Maple. In view of the very limited extent of the forest and the high quality of the timber, the reservation of the forest until supplies of hardwood suitable for similar purposes from the Eastern States are exhausted has been recommended, and that when it is decided to exploit the forest the cutting should be subject to stringent conditions concerning proper seasoning and grading of the timber.

Yellow Tingle Tingle (*Euc. guilfoylei*) which grows on the fringes of the prime Red Tingle forest is a much inferior tree. The timber is a light yellow colour, much harder and more difficult to work than Red Tingle. It resembles Tuart and Wandoo timbers in many ways and will probably serve the same purposes.

The tests previously made on these timbers would appear unreliable, and further preliminary tests which have been carried out at the University Engineering School, Crawley, are given in Appendix II.

Reference to this Appendix will show a striking uniformity in the density, transverse strength and modulus and the end compression figures of the Yellow Tingle Tingle of the present University tests, and the Red Tingle Tingle of the previous Railway

tests. This seems to preclude all doubt that they are tests on one and the same timber, viz., Yellow Tingle Tingle. The cause for the error may be that the two trees when growing are practically indistinguishable to the untrained eye.

It is to be noted that the Red Tingle Tingle tested was of very poor quality. Some of it had been cut from semi-dry off-cuts, and throughout all the pieces seasoning faults and gum veins were present. It seems reasonable to suppose that higher strength values would be obtained from good specimens of the cleaner timber of the pure Red Tingle Tingle forest.

II. REVENUE.

(Gross revenue £87,658.)

The gross revenue for the year 1922-1923 shows a decrease of £872. A considerable drop in revenue from royalties on jarrah timber was largely counter-balanced by an increase in royalty collected on sandalwood. As the royalty rate per unit on both classes of forest produce remained constant, the fluctuation in revenue represents a corresponding fluctuation in quantity removed from Crown lands (see Appendix 1A).

1.—TIMBER TRADE REVENUE.

(Total Revenue £51,458.)

The total production of timber (sawn and hewn) for the year amounted to 10,660,500 cubic feet (see Appendix 2E) which, at 2s. 6d. per cubic foot, represents a value of £1,332,562. Of this quantity 7,911,310 cubic feet were exported, and the value declared to the Customs Department was £997,454. The export trade consisted mainly of undressed timber, which shows a decrease on the previous year of 392,257 cubic feet. There is also a slight decrease in the quantity of dressed timber exported, although the declared value of £5,122 is £277 in excess of the previous year.

Again the chief market for our hardwoods has been South Africa, and, after that, the Eastern States of Australia. In both cases marked increases on last year's figures are shown. The timber trade as a whole, however, continued somewhat depressed.

Labour conditions have been under review by the Commonwealth Arbitration Court. Decisions increasing the hours to 48 per week, and modifying the weekly hire system, particularly with regard to sick pay, have been given effect to.

Further amendments to the existing award relating to rates of pay are under consideration.

Until towards the end of the year there has been little indication of improvement in the overseas market for railway sleepers. The export trade has been largely maintained on existing contracts. Inquiries are now being received from countries which in the past have been large buyers of our sleepers, and a few orders have recently been placed.

In order to provide work for sleeper hewers, it has been necessary to place orders for sleepers for local Government railways in certain districts, and with this object a very satisfactory arrangement between the Railways and this department has been in operation. Small permits have been advertised and applicants informed that orders for a certain quantity

of sleepers, at a stated price, would be placed with the person obtaining the permit. It is proposed to extend this system with a view to building up a reserve of a million sleepers for seasoning purposes. This reserve will be drawn on both for the building of new lines and the maintenance of existing lines. The sleeper supplies for the reserve will be obtained principally from Group Settlement country by arrangement with the department controlling settlement.

The import trade shows an increase of £16,980 on the previous year. The value of timber imported during the year 1922-1923 was £109,428. This represents an enormous bill to be met by 344,000 people, and paid to foreign countries for raw material which might be produced on land at present lying idle within the State. Foreign supplies are not unlimited, and unless immediate steps are taken to establish extensive plantations of softwoods, supplies will only be obtain-

able by sending still greater sums of money out of the State each year.

(a) *Concessions and Leases*.—Rents on leases, £6,960; rents on concessions, £686.

Following upon the decision of the Government in the early part of 1922 to extend the terms of the concessions and leases which are held by Millars' Timber and Trading Company, Ltd., in accordance with Section 6, Subsection (b) (1) of "The Forests Act, 1918," His Excellency the Lieutenant Governor and Administrator in Council, in exercise of the power conferred by Section 6 of "The Forests Act, 1918," but subject to the conditions therein stated, approved on the 6th December, 1922, of the extension of the term of each of the timber leases and concessions held by Millars' Timber and Trading Co., Ltd., as set out hereunder, for the respective periods as stated below, as from the expiration of the current term of such lease and concession:—

Lease No.	Mill.	Period of Extension.	Date of Expiration with Extension.
145	Jarraewood	5 years 6 months	30-6-1929
149	do.	do.	30-6-1929
150	do.	do.	30-6-1929
257	Kirup	4 years 11 months	31-8-1929
291	do.	do.	30-11-1930
330	Marrinup	3 years 5 months	30-11-1930
331	Nanga Brook... ..	5 years ½ month	15-1-1933
244	do.	do.	15-7-1929
299	do.	do.	15-7-1930
261	do.	do.	15-10-1929
322	Hoffman	do.	15-4-1932
186	Mornington	4 years	31-12-1927
227	do.	do.	31-12-1929
228	do.	do.	31-12-1929
229	do.	do.	31-12-1929
230	do.	do.	31-12-1929
269	do.	do.	30-9-1928
296	do.	do.	31-12-1928
297	do.	do.	31-12-1928
325	do.	do.	31-3-1931
Concession No. 12/1	Canning	8½ months	15-9-1925

In view of the extension of the Group Settlement Scheme over country near Augusta known as the Karridale Concession (No. 12/2) and the desire of the Lands Department that the title of the land be freed as far as possible from all encumbrances, Millars' Timber and Trading Company, Ltd., were informed on 27th November, 1922, that unless they complied with the terms of the Concession Agreement the concession would be cancelled as from 1st September, 1923.

(b) *Sawmilling permits granted under Section 11, "Land Act Amendment Act, 1904."*—Royalties: Jarrah, £25,435; Karri, £4,714.

On 10th June, 1920, Mr. Lane-Poole, when Conservator of Forests, recommended that royalties payable on the above class of permit should be greatly increased. Owing to delays in gazettal, the rates were not brought into force until a decided slump in the timber trade was clearly in sight. In consequence, royalty at these increased rates was never collected, but pending an inquiry by the Royal Commission on Forestry a debit was raised against the firms concerned and royalty collected only at the rate applying prior to 16th October, 1921.

The report of the Royal Commission sets out a table of royalty rates based on distance of mill siding from port, which it considered would prove equitable in the great majority of cases, and recommended that it be brought into force as soon as the industry showed signs of revival.

In order that the trade might have opportunity to adjust its prices and quotations for forward contracts the following schedule was gazetted on 13th June, 1923:—

HIS Excellency the Governor in Executive Council has been pleased, on the recommendation of the Conservator of Forests, to repeal the second schedule to the Forest Regulations, 1920, published in the *Government Gazette* on the 14th day of October, 1921, in substitution for the second schedule to the said Regulations originally published on the 12th day of November, 1920, and to insert in such regulation a schedule in lieu thereof, as follows:—

THE SECOND SCHEDULE.

*Royalties payable under Permits.
Jarrah and Karri Logs in the Round.*

From Permits within 81-100 or more miles, inclusive, from main line siding to Port, £0 0s. 0.6d. per cubic foot.

From Permits within 61-80 miles, inclusive, from main line siding to Port, £0 0s. 0.89d. per cubic foot.

From Permits within 41-60 miles, inclusive, from main line siding to Port, £0 0s. 1.25d. per cubic foot.

From Permits within 21-40 miles, inclusive, from main line siding to Port, £0 0s. 1.67d. per cubic foot.

From Permits within 1-20 miles, inclusive, from main line siding to Port, £0 0s. 2.19d. per cubic foot.

Hewn Jarrah or Karri sleepers measured in the square, three times the above rates.

Sawn and hewn beams with heart in, £0 0s. 3.6d. per lineal foot.

Split, sawn, and round timber cut for mining purposes other than firewood, £0 0s. 1.2d. per cubic foot.

Royalty on Mallet Bark, 10s. per ton.

The foregoing scale of Royalties shall come into force on the first day of January, 1924.

In the meantime the Royalties as prescribed by the second schedule to the Regulations under "The Forests Act, 1918," published in the *Government Gazette* on the 12th day of November, 1920, shall (subject as hereinafter provided) apply, and be deemed to have applied from the publication thereof to the coming into force of the foregoing scale, namely:—

Jarrah and Karri logs in the round, £0 0s. 0.6d. per cubic foot. Sawn and hewn beams with heart in, £0 0s. 3.6d. per lineal foot. Hewn Jarrah sleepers, measured in the square, £0 0s. 1.2d. per cubic foot.

The royalty on Mallet Bark shall continue at ten shillings per ton, and the royalty on split, sawn, and round timber cut for mining purposes other than firewood shall continue at £0 0s. 1.2d. per cubic foot, as prescribed by regulations published in the *Government Gazette* on the 14th day of October, 1921.

Discount.

If payment of royalties is made within the month within which accounts are rendered, or such extended period, if any, as the Conservator in his discretion may determine, a discount of 15 per cent. will be allowed.

Inspection Fees.

Sawn and hewn timber for railway sleepers, £0 0s. 0.6d. per cubic foot.

Other sawn and hewn timber, £0 0s. 0.8d. per cubic foot.

Piles, poles, and beams, one-third of the royalty.

Provided that, if payment is made within the current month in which accounts are rendered, or such extended period as the Conservator in his discretion may determine, a discount of 15 per cent. will be allowed.

Provided also that the Conservator may remit such inspection fees for the inspection of timber for use within the State, but, subject to the discount aforesaid, the minimum fee shall be for timber for railway sleepers £0 0s. 0.3d. per cubic foot, and for other sawn and hewn timber, £0 0s. 0.4d. per cubic foot.

Provided also that inspection fees at half-rates shall be payable for the re-inspection of sleepers in respect of which inspection fees at the full rates have been paid.

(c) *Permits issued under "The Forests Act, 1918."*

—Royalties: Sawn Jarrah, £9,013; Hewn Jarrah, £4,430; Banksia, £3.

In view of the continued shortage of oversea orders, the policy of issuing new permits either to keep existing mills operating or for local requirements only has been maintained. This policy may be departed from to some extent in order to provide for the rapid removal of marketable timber from country in process of alienation in connection with Group Settlement operations. That stage has been reached when the question of the control of cutting in the prime forest region should not depend on the exigencies of the export market. The population of the State may be expected to increase rapidly, and the timber reserves, which are decidedly limited, are being wastefully exploited for foreign buyers. The right of sawmillers who have invested considerable capital in large sawmilling plants in the forests of the State must be recognised, but there is no room for additional big

companies to start up, even if the overseas market may appear to justify their doing so. The one big reserve of prime jarrah country held for State requirements is permit 60/11, held nominally by the Commissioner for Railways, but this should be regarded as a National reserve to help tide over the lean years which must elapse between the cutting out of the last of the original crop of jarrah which existed in the virgin forest and the maturing of the first of the new crop which reforestation measures will provide.

(d) *Piles, Poles, and Beams.*—Royalty: Piles and Poles, £170; Beams, £46.

The removal of piles, poles, and beams from prime forest country has been reduced to a minimum. Any proposals in the future for obtaining supplies of piles and poles should be considered in the light of the silvicultural requirements of the bush rather than the current market demands. With a department organised to control the removal from the forest and a trade prepared to hold supplies of standard sizes in depôts, an industry of value to the State might be set up, but neither party is yet in a position to fulfil the necessary conditions. In the meantime a certain number of poles and piles may be cut from land in process of alienation for Group Settlement purposes, and it is proposed to encourage the utilisation of these by allowing them to be removed at a fixed royalty by persons holding permits for other classes of forest produce over these areas.

2.—INSPECTION BRANCH.

(Inspection fees—£10,567.)

The control of inspection work by Foresters in charge of districts has continued to prove satisfactory. Personal supervision has been exercised by the Chief Timber Inspector over the work of Assistant Foresters new to inspection work, and there have been no complaints by buyers on whose behalf inspection has been carried out. Information concerning the last shipment of 110,000 sleepers forwarded to South Africa showed that less than .15 were found to be below specification on arrival in South Africa, and the whole of the rejects were accepted for use in branch lines.

It has been necessary to warn certain sawmillers and agents of the trouble they are likely to bring on themselves by allowing either uninspected or rejected timber to be forwarded to port of shipment in their name.

3.—MINING TIMBER.

(a) Royalty on timber for coal mines at Collie, £1,322.

The control of timber cutting for the coal mines at Collie continues to operate satisfactorily, and a report of reforestation operations following the clear cutting of coupes by the timber getters for the mines will be found on page 12. The above royalty is paid into a special fund in accordance with Section 39 of "The Forests Act, 1918." The fund is now in credit to the extent of £1,504 11s. 4d. (see Appendix 1c).

(b) License fees, £473.

(c) Tramway rents, £1,028.

The major portion of these items represents the return from the somewhat unsatisfactory control at present exercised over the cutting of firewood in the Eastern Goldfields.

The large companies supplying firewood to the mines at Kalgoorlie continue to operate under the unsatisfactory system of licensing individual cutters.

The cutting of immature timber in the immediate vicinity of the large towns, and especially Kalgoorlie, has been stopped to a very large extent. Certain prosecutions have been necessary in this connection, but the preservation of the limited amount of re-growth which has been able to struggle through up to the present time has such a very considerable effect in assisting to ameliorate living conditions in these centres that its destruction must be prevented at all costs.

4.—SANDALWOOD.

(Royalty £16,430.)

During the early months of the year the demand was limited and the price obtained by the sandalwood getters was low.

In March, 1923, the Government finally decided that the export should be limited and the industry controlled by the issue of a single permit for the pulling and removal of sandalwood from Crown land over the whole of that portion of the State from which licensed persons had previously been allowed to pull for export. Tenders for this permit, in which the person tendering was invited to state the minimum payment he was prepared to guarantee to sandalwood getters and the amount he was prepared to pay to the Government as royalty per ton of sandalwood removed, finally closed on 27th April, 1923. A number of tenders were received and these are now under consideration by Cabinet. As soon as these tenders were invited, the market, as far as the sandalwood getter was concerned, improved. Prices increased and there has been an unlimited demand. The explanation, of course, is that merchants realised that the successful tenderer would have to buy in the stocks of all other merchants or allow them to benefit by the increased market price in China which the permit holder would be in a position to force. Such a move on the part of the merchant represents profit easily made, but the delay in deciding on the acceptance of a tender must prove costly to the Government which stands to lose increased royalty rates on several thousand tons of wood.

The export figures for the value of essential oils sent out of the State during the past year shows an increase in value of £13,197. The figures for 1921-1922 are £6,878, and for 1922-1923 £20,075. This increase is largely accounted for by the opening up of a big export trade in sandalwood oil by the firm of Plaimar, Ltd. The necessity for protecting supplies of raw material for what promises to become a secondary industry of considerable importance is fully appreciated, and the interests of persons requiring supplies of sandalwood oil will be fully protected in the proposed permit. The development of the oil distillation business presents possibilities of the more complete utilisation of the roots of the sandalwood tree, and provision for the taking over of these roots for the use of oil distillers operating within the State has been made in the proposed form of permit. Sandalwood oil distillers have also started to draw certain supplies from the North-West, where the Kimberley sandalwood (*Santalum lanceolatum*) is re-

served for oil distillation purposes within the State, and its export prohibited.

The control of cutting in the unoccupied territory presented certain difficulties, but regulations have been framed whereby persons producing an order from any recognised firm of sandalwood oil distillers within the State may obtain a license to pull the quantity of wood and roots set out in the license, at a fixed royalty of 5s. per ton.

5.—TIMBER ILLEGALLY CUT.

(Revenue £926.)

Although there have been 27 prosecutions for breaches of the Forests Act and Regulations, and fines to the extent of £102 10s. have been inflicted, no very serious cases have been dealt with. Most cases appear to have arisen through carelessness, and where it has been necessary to prosecute firms engaged in the industry, breaches have chiefly occurred through lack of proper supervision of certain of their employees. If firms seek to save overhead expenses in this manner and their employees trespass over the boundaries of the area on which they are entitled to cut, or do not observe forest regulations, then the firm concerned is responsible for such offence and must take the consequences.

6.—SALES OF TUART.

A revenue of £3,076 was obtained from the operations of the mill cutting tuart at Wonnerup. The mill only operated for six months ending 30/12/22, and for that period showed a net profit of £317 9s. 11d. A full balance sheet will be found in Appendix 1E, and operations in connection with the working circle which determine the working periods of the mill on page 12.

7.—REVENUE FROM OTHER SOURCES.

(£2,378.)

Firewood permits yielded £503. Other items of any importance, such as forest leases (£287) and sales of trees from Hamel Nursery (£417), are dealt with elsewhere in the report.

III. EXPENDITURE.

(Total expenditure from all funds, £38,827.)

1.—ADMINISTRATION.

(Charged against Consolidated Revenue, £15,246.)

Although the revenue substantially exceeded estimates, the cost of administration, which includes such revenue-returning services as timber inspection, was £623 below the estimates approved by Parliament. A considerable saving has been effected by the timber inspection work being placed under the control of Foresters in charge of districts. The number of full time inspectors has been reduced and travelling time of others saved, thus enabling more effective patrol of the bush to be carried out.

2.—REFORESTATION FUND.

The following statements show the position of the Reforestation Fund (Section 41, Forests Act, 1918) at the beginning and end of the financial year:—

Gross Revenue of Department, 1922-1923	£86,335
Less—	
Administration charges	£15,246
Interest on loan	1,985
Sinking Fund on loan	187
Salary, Conservator	615
	18,033
Net Revenue	£68,302

Three-fifths of the above sum, representing the net revenue of the department, is placed to the credit of the Reforestation Fund, the position of which is given in detail below:—

<i>Reforestation Fund.</i>		£
Balance from 1921-1922	19,168	
From Revenue 1922-1923	40,981	
Sundry recoups 1922-1923	392	
	60,541	
Less expenditure for 1922-1923	21,955	
Balance	£38,586	

The above statement shows a very satisfactory state of affairs and indicates that for the first time the Reforestation Fund is established on a really sound basis. Forest work is seasonal and the receipts paid into the fund depend largely on the state of the timber trade, consequently the amount expended during any year on reforestation work should be based on the balance carried forward from the previous year's revenue collections rather than on estimates for the current year.

(a.) *Working Plan No. 1, Mundaring District.*
(Expenditure—£2,783.)

Silvicultural work (£64).—The small expenditure on regeneration cleaning operations in the indigenous forest was due chiefly to a desire to see the results of the work carried out on some 3,000 acres during the previous year before undertaking further extensive operations of a similar nature. There are considerable difficulties in keeping men engaged on this work in communication with fire lookout stations, and consequently, as other work in connection with road-making and afforestation needed attention, the staff

needed for fire protection purposes during the summer months was employed on those operations. Particulars concerning pine planting operations will be found under "Afforestation" (page 14).

Road Construction (£693).—Some fifty chains of road were necessary to make available to firewood contractors for No. 1 Pumping Station an extensive area of country in proximity to the Pumping Station. The excessive damage done to roads by the heavily loaded wood drays during winter months made it necessary to provide access to ironstone country with as short a lead along roads as possible. This short length of road, which has been constructed with a substantial rock foundation, will solve the problem of winter carting and permit of the cleaning up of an area of forest very heavily cut over by saw mills.

Fire Control.—The total area under control was 120,000 acres, and the running expenses for the season under review were £855, which works out at 1¼d. per acre.

This expenditure is listed hereunder:—

	£
Publicity	11
Firebreaks, burning, and maintenance	93
Manning look-outs	238
Fire fighting	187
Patrolling	167
Horse allowances	69
Paddocking	3
Horses and vehicles	87
Total	£855

The cost per acre may be reduced by the extension of the scheme to the south, when a greater area of country may be watched by existing lookout stations, by the reduction in the number of fires from preventable causes and the securing of greater assistance and co-operation from surrounding settlers.

The lookout towers, erected on Mount Gungin and Mount Dale, were manned constantly from the middle of December until the middle of April. The first fire occurred on December 4th, and the last one on April 3rd.

The number of fires which owed their quick suppression to discovery by lookouts was 80 per cent. of all fires reported. No difficulty was experienced in locating fires on all parts of the area, except when large fires were burning on surrounding land, causing clouds of smoke to blow across the protected portion of the forest.

The total number of fires reported was 75, details concerning which are scheduled hereunder:—

Area burnt—Acres.	Number of Fires.						
	Nov.	Dec.	Jan.	Feb.	Mar.	Apl.	Total.
0 to 1 .. ..	...	2	...	3	1	1	7
2 " 10 .. ..	...	6	2	7	3	4	22
11 " 20 .. ..	...	...	2	2	3	6	13
21 " 50 .. ..	...	...	1	7	5	...	13
51 " 100	1	...	1	7	5	...	14
Over 100 .. ..	...	...	...	1	5	...	6
	1	8	6	27	22	11	75

Causes of Fires.

	Nov.	Dec.	Jan.	Feb.	Mar.	Apl.	Total.
Government Locos. ...	...	1	1	2	1	1	6
Travellers ...	...	3	1	9	6	7	26
Hunters and Bee Robbers ...	1	1	1	7	9	1	20
Bush Workers ...	...	1	3	3	...	1	8
Settlers burning-off ...	...	...	...	1	1	1	3
Stock Owners ...	...	...	...	1	...	...	1
Campers ...	...	...	...	...	1	...	1
Unknown ...	...	2	...	4	4	...	10
	1	8	6	27	22	11	75

The area burnt was 8,184 acres, which represents 6.82 per cent. of the total area. Fortunately about five-sixths of the area burnt was either wandoo or very poor jarrah bush. 5,600 acres were burnt by one fire which was maliciously started by some person who deliberately rode along the line extending from the head of the Helena to Chidlow's Well, and set *en route*, on a hot day, over 20 fires at intervals. No staff could possibly be expected to cope with systematic incendiaryism such as this, and they are to be congratulated in confining the burnt area to 5,600 acres.

The fires experienced this season, which may be divided into "Grass" fires and fires in native bush, were, on the average, rather fiercer than those of the previous season. Their greater intensity was probably due to the extra accumulation of litter, and also to the very long dry spell. Even the fiercest fire, however, did not move at a much faster rate than one mile per day.

The grass fires chiefly occurred near the Victoria Reservoir, the inflammable material being silver grass. There are only about 100 acres of these patches, but they constitute a starting point for large fires, as the local residents make a practice of burning these paddocks for the sake of the horse feed. Until these areas can be planted with exotics, it will probably be advisable to burn them early in the season.

Until the end of January the fires were not particularly fierce, but practically no rain fell from the third week in January until the end of March, consequently fires became progressively more difficult to control. Fires broke out until April 19th, but after the first week in April no serious one was experienced, and the season was officially closed on April 30th.

Fires are more easily confined to small areas in the jarrah bush than in the poorer mixed bush or in wandoo country, so that, considering the area burnt, the damage to good jarrah bush was comparatively little. The area of prime forest country burnt was not more than 1.7 per cent. of the protected area. The chief factors influencing prevention of fires are public education and reduction of the fire hazard by the removal of the more inflammable material which is found on the ground throughout most of the bush. The delivery of lectures by the Head Forester, the distribution of pamphlets summarising the clauses of the Bush Fires Act and Forests Act, in so far as they apply to burning out of season; the placing of fire warnings in prominent positions; personal talks between members of the staff and settlers, together with a recognition of the work accomplished by the Department in the district, is having its effect on local public opinion. Although there is little doubt that most of the fires that occurred were deliberately lit, the persons responsible for them constitute a very small proportion of the local residents of the district. For instance, few fires occurred at such places as Mundaring, the Weir, and Mahogany Creek, although many people live in the

vicinity, whereas many fires occurred around such places as the Victoria Reservoir and Chidlow's Well. It is apparent that a small number of people, *e.g.*, kangaroo hunters, etc., are desirous of burning the bush at these latter places, and suitable measures will be instituted to deal with them.

As regards the second factor, firewood contractors are rapidly clearing up much of the dead waste timber, and this, coupled with other controlled fire operations of the Department, should go far to minimise the fire hazard from this source.

As foreshadowed in last year's annual report, the burning of firebreaks, by setting a running fire in the bush on a still day and so burning a strip a chain or two wide, without preliminary clearing, was continued. Strips to a length of 45 miles were burnt, at a total cost of £106 5s., *i.e.*, an average cost of 7¾d. per chain.

As many of the fires that occur are deliberately lit, the persons intent on burning the bush naturally light them inside the external breaks, and so greatly reduce their efficacy. However, many fires are accidentally lit, particularly along main thoroughfares and railways, along which a system of narrow breaks will prevent the spread of many fires from this source. The practice of burning these strips is likely to be modified in favour of keeping open well worn tracks which are to be found in any bush which has been cut over.

Direct beating was the chief method employed in fire fighting, for which healthy young red gums proved the best weapons. Where possible the head fire was attacked, but where the fire was so fierce as to render this impossible, the tail and side fires were first attacked and the head fire thus "pinched" until night-fall, when the atmospheric conditions enabled the head fire to be tackled. Experience has shown that fires which in the day time seem incapable of suppression are comparatively easily dealt with at night.

Counterfiring was resorted to from paddocks, roads, forest tracks, and occasionally from tracks especially cleared for the purpose.

Long logs, part of which were alight in the burnt country and part in unburnt country frequently had to be cut.

Except during week-ends, regular patrolling was not resorted to early in the season, the men being employed on effective forest work.

(b.)—Working Plan No. II.—Tuart Working Circle.
(Expenditure, £5,334.)

Silvicultural work.—The full permissible annual cut under the working plan was removed by December, 1922, and milling operations ceased. The coupe was marked on the Group Selection system by the Forester in charge, who was also responsible for the falling and hauling to the mill. The relation of the lower storey

of peppermint (*Agonis flexuosa*) to the tuart is at present unknown. Fires resulting in excessive coppicing of the peppermint have resulted in dense thickets of this species with a root formation in places resembling the so-called mallee roots. However, until the problem of obtaining satisfactory regeneration on the numerous open spaces which do exist has been solved, there is no justification for attempting to deal with the peppermint thickets. Grazing and fire control will go far towards solving the problem, but plentiful regeneration would seem to be limited to a heavy seed year, which up to the present we have not experienced since the forest has been protected.

Some 6,000 tuart seedlings were raised in trays at Hamel and have been planted out under varying conditions with a view to determining the conditions under which seedlings may be expected to survive if once established, and to test the economy of introducing artificially raised seedlings into the forest, rather than wait for a number of years for conditions favourable to natural regeneration.

Utilisation.—The expenditure in connection with milling operations was £3,104, and the falling cost 4s. 6d. per load, which compares favourably with the contract rate of 5s. usually paid in the district for similar work. Our fallers were cutting larger trees yielding shorter logs, so that the saving effected was probably partly due to the use of a motor-driven cross-cut saw (Vaughan). Hauling is one of the most difficult problems in connection with milling operations in this country. The fine sandy nature of the surface means a constant heavy pull. A Holt caterpillar tractor was tried, but proved much more expensive than bullocks. The caterpillar track was most satisfactory, but the wagon, despite tyres ten inches in width, when loaded with anything heavier than a four load log, sunk in sand to such a depth as to prove an almost impossible load. Bullock haulage up to 2½ miles cost 14s. per load, but this is the maximum range to which teams can work, and during the next financial year it will be necessary to lay several miles of light tramline so that logs may be transported to the mill by horse traction. On this level country it is probable that two horses will pull as heavy a load of timber along a tramline as 24 bullocks will haul using whims, and the horses will travel at a much faster rate. For the last six months of its operations this mill showed a slight profit.

Grazing control.—During the year the remainder of the forest was fenced. Five miles 63½ chains of 6-wire boundary fence, and one and three-quarter miles of 3-wire division fence were erected at a cost of £480. Grazing leases were sold by auction. There was a keen demand for these leases, and very satisfactory prices were obtained.

All paddocks have been supplied with water, either by scooping out shallow dams where soaks existed, or sinking wells. In the case of wells, tanks have been erected which are kept filled in summer by the use of a portable motor. It was found that grazing rights were only appreciated during winter and spring months, and that during the summer there was reason to believe that stock would frequently nip off seedling tuart, consequently at the last sale grazing rights were only let for six months of the year. This principle will be observed in the granting of all future grazing leases in this working circle.

Fire Control.—Although the season was fairly mild, some extensive fires raged around the boundaries of the forest. The system of external firebreaks proved

very effective. Only one fire crossed into the forest over a break which had not been cultivated. This fire, however, was suppressed after burning five acres, which represents the total burnt out of the 6,091 acres.

Experiments were made with a view to establishing couch grass in breaks but with little success. Further experiments, however, will be made. The cultivation of breaks was done by contract as far as possible, the cost varying from threepence to fifteen pence per chain, depending on the extent to which the break had been cleared.

Accommodation.—A second workman's cottage was erected at a cost of £465.

(c.)—*Working Plan No. III.—Collie Coal Field Working Circle.*

(Expenditure: Reforestation Fund, £2,916; Mining Lease Royalty Account, £238.)

Silvicultural Work—Clear felling system.—The total area now cleaned up and closed for regeneration is 892 acres. Of this area 680 acres were dealt with during the year under review. The cost of regeneration cleaning according to the following specification was 10s. 5d. per acre:—"All trees under 6in. B.H. diameter felled level with ground. All marris and banksias over 6in. B.H. diameter ringbarked." The few remaining large size jarrah have up to the present been left for seed purposes, and as soon as a satisfactory regeneration is seen on the ground they will be ringbarked. Vigorous coppice growth has resulted on all areas dealt with, and experimental thinnings have been made on certain compartments. Specifications have now been altered to provide for the felling of jarrah and marri trees up to 12in. B.H. diameter. It is considered that the value of the coppice growth resulting will alone justify the extra cost.

The following data prepared by Forester A. Sharp, setting out the treatment and results on the first compartment dealt with, is of considerable interest:—

1. The whole of the marketable timber was removed in 1920.
2. Regeneration cleaning was carried out in March and April of 1921.
3. No fire has been through the area since before regeneration cleaning.
4. A heavy thinning of resulting coppice has been carried out. Shoots on high stumps were knocked off and the number of low stumps reduced to two, three, or four.
5. The following tally was made in June, 1923:—

Diameter, B.H. (inches.)	Height (feet.)	Jarrah (number.)	Marri (number.)
	Under 4 ...	420	100
½ to 1 ...	4 to 6 ...	140	50
½ " 1 ...	6½ " 10 ...	110	60
½ " 1 ...	10½ " 15 ...	100	20
1 " 2 ...	15 " 20 ...	51	10
2 " 3 ...	15 " 20 ...	61	15
2 " 3 ...	21 " 25 ...	10	...
2 " 3 ...	20 " 25 ...	...	70
	Total ...	1,217	

In ten years we may thus expect to obtain over 20 loads of mining props from one acre of ironstone gravel hillside.

Group Selection System.—Regeneration cleaning under the above silvicultural system has been carried out over 60 acres on the old Lucknow Concession at a cost of 7s. 6d. per acre. Although not within the working circle, this work was put in hand in order to employ men in proximity to the lookout tower so that they might be available in case of emergency.

Grazing Control.—The system of issuing grazing licenses to owners of one or more cows on payment of a fee of 5s. per head per annum has been continued. A large number of cattle owners in the town are employing a herdsman who is responsible for the cattle not trespassing on State Forest. This arrangement has reduced the number of registered cows to 68, which are distributed among 50 owners. No fires were traceable to persons owning one or two head of cattle, but persons owning herds running on an exclusive grazing lease have been warned that, if in future years the same trouble occurs through fires starting up on their respective leases, serious consequences will result. As many as six fires in one day occurred on one grazing lease. The area burnt has now been excluded from the lease and no cattle are permitted to graze thereon. The problem of controlling the grazing of cattle owned by persons resident in Collie will never be satisfactorily dealt with until fenced commonages are provided, and the control taken in hand by some local governing body.

Fire Control.—A look-out tower 80 feet in height has been erected on a rounded hill top about $4\frac{1}{2}$ miles south-west of Collie on the old Lucknow Concession. Tall timber near the site of the tower and the general contour of the surrounding country made such a high structure necessary. An accommodation hut for the lookout man was erected at the foot of the tower, and the hut and look-out platform connected with the District Office by telephone. The tower, which affords a splendid vision over the coal bearing basin, is fitted with an old theodolite for determining direction, and a range finder, having an effective range of $9\frac{1}{2}$ miles. The whole structure cost £747. In the opinion of the forester in charge of the district, the tower, although only operating during the last few weeks of the fire season, has already saved timber worth more than the total cost involved in its erection. During the months of March and April the tower located 66 fires. The total dealt with in the district was 74, details concerning which are given hereunder:—

<i>Causes of Fires.</i>	
Escaped from private property...	27
Kangaroo hunters	3
Graziers	12
Bush Workers	7
Travellers on roads and tracks	5
Government locomotives... ..	4
Honey getters	3
Campers	3
Unknown	10
Total	74

<i>Areas Burnt.</i>	
Under 5 acres	24
Six to 20 acres	24
Twenty-one to 50 acres	13
Fifty-one to 100 acres	7
Over 100 acres	6
Total	74

Crown Lands under protection	acres.	120,000
Portion of above burnt		2,477
Percentage burnt		2 per cent.

From the above figures it will be seen that the fire protection of much more than the actual working

circle was attempted and very satisfactory results attained. The greatest trouble arose from fires making headway in large tracts of country which have been alienated within the area of Crown Lands under protection, and then threatening to spread into Crown lands. Before the next fire season, a topographical survey will be made to determine natural and artificial fire lines in proximity to the boundaries of the larger tracts of private property, and any narrow strips of Crown lands between such natural fire lines and the boundaries will be sacrificed to permit cheaper and more efficient counter firing.

It is interesting to compare the fires occurring on such private property with results on Crown lands under protection—

Area of private property under observation	50,000 acres.
Area burnt	17,000 "
Percentage burnt	34 per cent.
Compared to 2 per cent. on adjoining Crown lands.	

(d.)—*Education of Apprentices.* (£1,663.)

The school for apprentices at Ludlow was in session from 5/7/22 to 14/10/22 for forest guards and 2nd year apprentices under Mr. Stoate. One apprentice entered into indentures. Other apprentices, when not at the school, were engaged on effective forest work in various centres, although their pay and allowances appear against this item.

The total number of apprentices is now seven, and the number who have completed their apprenticeship and are employed as forest guards is five.

(e.)—*Sandalwood Propagation.* (£527.)

Practically no rain fell at Bendering after the 220 acres were sown with Sandalwood nuts in 1922. Heavy general rains fell in this district early in the winter of 1923 and satisfactory evidences of germination were noted in June of 1923.

In the same month another patch of Jam country was sown with nuts collected in the summer 1921-1922 on the same lines as the previous year. The area dealt with amounts to 220 acres, and this will be fenced next Spring and the rabbits within the fenced area exterminated.

(f.)—*Advertising, Publicity and Popular Education.*

General administration and fire protection operations in particular have been assisted considerably by the policy of explaining to bush workers the aims and objects of the department. Head Forester McVicar has done good work in this connection and his services as a lecturer have been greatly in demand. An illustrated booklet on "The Hardwoods of Western Australia" was prepared and copies forwarded to the Empire Forestry Conference held in Canada in July, 1923.

Active steps are being taken to see that the timber resources of the State are adequately displayed at the coming Empire Exhibition.

(g.)—*Silvicultural Operations.* (£664.)

A general heading of this nature was included in the scheme of expenditure submitted to Parliament in 1922 to cover new operations in the Jarrah bush not conducted under a working plan.

An experimental area consisting of a few thousand acres of prime Jarrah bush practically cut out by a sawmill in the vicinity of Dwellingup has been planned, and a simple working plan is being prepared to cover operations. On this area the Group Selection System, coupled with thinning of existing stands of poles and piles, is tried on more intensive lines with the dual object of establishing a demonstration area

and testing the possibility of a resident forester personally attending to all silvicultural operations and fire protective measures on a limited area of forest country. It is realised that, in a few years, the forester will have completed silvicultural operations on as large an area of country as he can protect from fire, but it is hoped by that time to have some general scheme of fire control operating over the whole district.

(h.)—*Top Disposal Operations.*

The proposal to deal with the accumulated debris after all falling operations throughout the jarrah bush is one of the most important proposals put forward by the department since the passing of "The Forests Act, 1918." The accumulation of lop and top on some of the bush worked over for the first time by big saw mills is tremendous, and the fire which inevitably sweeps through this inflammable material in the summer following falling operations destroys some and seriously damages much of the immature timber which is left behind by the fallers owing to girth restrictions imposed by regulations. The possibility of effectively carrying out this work at a rate in keeping with the revenue-producing capacity of the trees thus protected was tested first on the Mornington leases held by Millars' Timber and Trading Company. The generous co-operation of this company rendered the experimental work possible. The most effective measures were found to be:—

- (a) the burning of the bush by a slow creeping ground fire in advance of falling operations;
- (b) the cutting away of inflammable material for two to three feet from around the butts of standing poles and piles;
- (c) the burning of individual tops at a time when the leaves and twigs are sufficiently inflammable to burn but not to cause fierce heat which will seriously damage standing timber.

The cost of these operations was found to be less than twopence per load of timber removed, and consequently, in view of the enormous saving in young timber resulting, it was decided to extend operations throughout the entire jarrah belt during the coming financial year.

3.—AFFORESTATION.

(Expenditure—£1,779 from General Loan Funds.)

Work up to date has been largely of an experimental nature, and the following general conclusions have been arrived at.

1. *Sowing.*—A species such as *Pinus pinaster* which lends itself readily to this treatment is unable to become established on sand plain country in this State unless the areas to be sown have been very thoroughly ploughed after a severe fire. Although the indigenous scrub may not appear dense on the surface, it has a tremendous mass of roots with a comparatively wide range. Root competition would appear to be the most serious difficulty to be overcome in establishing a young plantation whether by sowing or planting.

2. *Planting.*—With the present high cost of labour it is likely to prove far less costly to prune plantations, if necessary, than to plant closely and thin early. It is economically possible to plant *Pinus*

pinaster at 5 feet by 5 feet on sand plain country where the plants can be speared or notched in, especially if sufficiently clear to plough before planting. On heavier country, where ploughing is impossible owing to logs, pit planting is necessary, and any planting distance less than 7 feet by 7 feet would not appear justified. For the faster growing pines, 8 feet by 8 feet would appear advisable. The following comparative cost, worked out at Collie where sand plain country in the nature of old lacustrine formation carrying the coal measure is being dealt with, should prove interesting:—

PLANTING VERSUS SOWING COST AT COLLIE.

The following are approximate figures:—

<i>Sowing:</i>		£	s.	d.
Clearing and burning	... ..	1	5	0
Heaping and burning	... ..	0	10	0
Ploughing	... ..	1	5	0
Seed	... ..	0	6	0
		3	6	0

Note.—With cross ploughing, 25s. extra:
Cost £4 11s.

Planting: Spear 6ft. x 6ft.
(Without ploughing).

		£	s.	d.
Clearing and burning	... ..	1	5	0
Planting	... ..	0	17	0
Cost of seedlings	... ..	0	10	0
		2	12	0

Note.—With ploughing, £1 15s. extra: £4 7s.

Pit 6ft. x 6ft.

(Without ploughing).

		£	s.	d.
Clearing and burning	... ..	1	5	0
Planting	... ..	2	15	6
Cost of seedlings	... ..	0	10	0
		4	10	6

Note.—£2 15s. 6d. based on actual cost of £4 for 5 x 5 espacement. With ploughing, £1 15s. extra = £6 5s. 6d.

3. *Nursery work.*—*Pinus insignis* (and to a less extent other species of pines) if held for two years in nursery lines often become too large for economic handling when planting out. Ten months old seedlings—sown in August and planted out the following May—are satisfactory if raised on comparatively rich swamp or alluvial soil which is moist all the summer. If such nursery sites are not available, it would appear necessary to make provision for irrigating or watering the nursery by artificial means, so that twelve months old *Pinus insignis* seedlings may be sufficiently large to use as planting stock.

(A).—*Nangara.*

The experimental work on the sand plain country North of Perth has been continued. The *Pinus pinaster* from sowings during 1921 are nearly all dead. Those sown in 1922 germinated fairly well. The planting carried out in 1922 was more successful than the sowings. In January 97 per cent. of the plants were alive, but deaths occurring between that date and June reduced the total survivors to 80 per cent. The blanks were filled with transplants.

Two principles were followed in choosing areas for this year's work, viz., (a) consolidation of existing sowings and plantings; (b) the selection of as many different types of country as possible, e.g., pure bank-

sia, jarrah, redgum, and paper bark, so that the suitability of various types of country for pine growth might be tested.

In view of the indifferent results that had been obtained on these plantations in the past two years, it was decided that more thorough cultivation of the soil should be tried this year. Five plots were treated, as follows:—

On four of the plots the standing timber was first thinned out and ringbarked.

- (1) 18¾ acres in Compartment 124 ploughed and cross-ploughed and sown with 7 lbs. of *Pinus pinaster* to the acre on 11th May.
- (2) 9 acres in Compartment 123 were ploughed and harrowed and sown with 7 lbs. of *Pinus pinaster* to the acre on 28th May.
- (3) 18 acres in Compartment 117 were ploughed and harrowed and sown with 7lbs. of *Pinus pinaster* to the acre, partly on 28th May and partly on 31st May. An external strip about three chains wide and a small patch in the centre were sown after the harrowing, whereas the remaining area was sown before.
- (4) 10 acres were ploughed one way only and planted 5ft. x 5ft. with *Pinus pinaster* transplants from Ludlow. Planting operations commenced on 4th June and were completed on 26th June. Three men, two digging and one planting, put in on an average 1,200 pines per day, i.e., 400 pines per man per day.
- (5) Timber clear felled and the area planted without soil preparation.

The fact that there was no marked difference in the rate of planting on ploughed and unploughed land was probably due to the presence of the roots of a large number of dwarf blackboys growing on the former area. Other things being equal, planting on ploughed land should be faster.

The quantity of seed sown to the acre was high owing to old stock being used, although, with the usual germination tests, it gave very satisfactory results.

The rate of planting was low for sand plain country and will need to be brought to compare more favourably with results obtained at Ludlow.

(B)—Mundaring District.

(i.) Plantations.

As indicated in last year's report, the object of the plantation work in this district has been to utilise for the growing of softwoods cleared farm land at present lying idle on the banks of the reservoir.

(a.) *Greystone Plantation.*—An area of 55 acres in Compartments A and B was planted with *Pinus insignis* in June and July, 1922. The Northern portion of this area, about 21 acres, gave very satisfactory results, 90 per cent. of the plants surviving the following summer. The good results were due (a) to the large healthy planting stock and (b) to the favourable planting weather. About 10½ acres, comprising the Northern end of Compartment A, which had not been cleared to the same extent as the rest, gave the poorest results. 55 per cent. of the area requiring re-stocking. On the remainder of the area slightly over 60 per cent. of the plants survived the first summer. A dry spell experienced during the

planting of this latter area probably contributed largely to the high mortality. This dry spell probably also accounted for the fact that the pines showed little growth until the beginning of November.

During the last week of August, 1922, 2,000 transplants from Hamel were planted out and grew particularly well, not more than 1 per cent. of them dying during the summer, which fact argues for the economy of using big planting stock. On 31st May, 1923, the filling up of the 17,000 blanks was commenced with two-year-old seedlings from the spring nursery, at a cost of £107.

(b.) *Murdos Plantation.*—After preliminary sucker bashing and burning, planting operations were commenced on 22nd May, but were interrupted by a spell of dry weather, during which time the labour was employed on clearing a 3-foot strip round the break. As soon as conditions were favourable, 7,800 large *Pinus insignis* were planted at the Western end of Compartment D. Afterwards 27,000 *Pinus pinaster*, which were mostly transplants, with a few two-year-old seedlings, were planted in Compartments B, C, and A. 16,500 small one-year-old *Pinus insignis* seedlings were then planted to complete Compartment D.

A satisfactory burn was not obtained over country to be planted, and in addition to increasing the cost of planting, the native scrub did not receive such a satisfactory setback as desirable.

It has been decided to discontinue the planting of *Pinus pinaster* closer than 7ft. x 7ft. where pit planting is necessary.

Summary.—The area of plantation of various species established during the year amounted to:—

<i>Pinus insignis</i>	..	..	42 acres.
<i>Pinus pinaster</i>	..	..	17 acres.
<i>Pinus palustris</i>	..	..	3 acres.
<i>Pinus canariensis</i>	..	..	1 acre.

(ii.) Nurseries.

(a.) *Autumn Nursery, Greystones.*—14lbs. of *Pinus insignis* was sown during May, 1922, and took from four to eight weeks to germinate. In two of the beds birds caused considerable destruction by digging up and eating seeds. The lower beds were free from this trouble. A thick growth of weeds suppressed many of the plants, but on the other hand protected them from birds and also prevented erosion. Weeding, however, became necessary, particularly on account of wild radish, and was commenced in the middle of August and was continued until the end of October. The rows of seedlings were weeded by hand, and the Planet-Junior plough run between them. During the latter half of September the pines became very yellow and unhealthy looking, and they were manured with sulphate of ammonia, with apparently little effect. The plants improved considerably on the advent of the wet weather in 1923, and 25,000 healthy plants were taken out. 7,300 large *Pinus insignis* transplants which were left over from the planting, were bedded back during August, 1922. These grew rapidly and were too big to handle easily when they were required for planting out; moreover, their root systems were very bad. During August, 1922, 30,000 *Pinus pinaster* seedlings were bedded back, while a further 3,000 were left in the beds. These latter proved by far the better plants, particularly in respect of their root systems. Some 27,000 *Pinus pinaster* seedlings were planted out from the nursery.

(b) *Greystones Spring Nursery*.—4,000 plants were taken out at the beginning of July, 1922, and the rest were left in the beds. The Planet-Junior plough was put between the rows twice during the summer. At the beginning of the planting season there were 16,000 large healthy plants in the nursery, and with the exception of a few particularly big plants they were eminently suitable for filling up the blanks in the 1922 planting.

(c) *Byfields Nursery*.—14lbs. of *Pinus insignis* seed was sown in this nursery during May, 1922. Germination was good, but the greater part of the seedlings were eaten by birds as they germinated. The plants grew slowly, became yellow with the hot November weather, and many died during the summer. Practically none of these plants were suitable for planting out during 1923.

24lbs. of *Pinus pinaster* seed was sown at the beginning of June, 1922, with similar results to those obtained from the *Pinus insignis* sowings. It is expected, however, that possibly 20,000 *pinaster* seedlings will be fit for planting out during 1924.

Of a small sowing of *Pinus palustris* seed, all plants, except about 12, were killed by birds as the seedlings began to show above ground.

Between 25th and 30th August, 1922, the following sowings were made in the lower portions of the nursery:—

	Cost of sowing, per lb.
	£ s. d.
<i>Pinus insignis</i> , 5½lbs.	1 1 0
<i>Pinus canariensis</i> , 1lb.	1 12 0
<i>Pinus palustris</i> , 1¼lbs.	0 12 0

The *palustris* seed was not treated in any way, and was nearly all eaten, but the *Pinus insignis* and *Pinus canariensis* seed was coated with red lead and was not touched by birds.

A small quantity of blood and bone manure was placed in the drills with the seed, causing rapid growth in the plants in their early stages. All the spring sown plants grew well until the beginning of December, when the hot weather caused a check in their growth. The manure doubtless gave them a good start, but the only plants suitable for planting out during 1923 were 1,500 *Pinus insignis* and 400 *Pinus canariensis*.

(d) *Nursery below Weir Wall*.—The clearing of this nursery site, one of the "stock jobs" of the fire season, was commenced in the first week of February. The area was ploughed during the last week of April, sowing was commenced on 30th April and completed on 13th May. The area of the nursery was .8 of an acre, and the cost of establishing it is listed hereunder:—

	£	s.	d.
Clearing	38	0	0
Ploughing	4	0	0
Fencing 12 chains	8	10	0
Sowing	58	5	2

The cost of sowing various species of seed was:—

	£	s.	d.
	per lb.		
<i>Pinus insignis</i> 22lbs.	1	19	9
<i>Pinus pinaster</i> 8lbs.	1	11	5
<i>Pinus torreyana</i> 2lbs.	0	6	0
<i>Pinus laricis</i> 4 ozs.	1	17	4
<i>Pinus muricata</i> 8 ozs.			

All the seed was rubbed in red lead before sowing. Eight seeds of *Pinus torreyana* and 20 seeds of other species were sown to the foot. Blood and bone

manure was placed in the drills and some of the first seed sown had germinated at the beginning of June.

(e) *Bickley Nursery*.—12lbs. of *Pinus pinaster* and 4lbs. of *Pinus insignis* were sown in this nursery. Sowing commenced on May 1st, 1923, but work was slow on account of the large quantity of couch grass in the ground. The seed was coated with red lead but the drills were not manured. The cost of establishing nursery, ploughing and seeding was £50 8s. 4d.

(f) *Notes on nursery work in Mundaring district*.—The difficulty of finding suitable nursery sites in proximity to the planting areas in this district has in the past been due to the fact that the alluvium in the valley bottom is drowned in the reservoir and the only patch of swamp land available suffers from excessive salinity if worked in summer.

It would appear from our experience in this district that unless *Pinus insignis* seedlings can be raised to a sufficient size for planting out in less than twelve months they grow to a size too large for economic handling before the second planting season.

This reduces methods of raising them to the following:—

1. Sow in early spring (August) in comparatively rich swamp land which retains its moisture near the surface all the summer, and thus obtain plants suitable for putting out in plantations in the following late autumn (May).

2. Sow in late autumn (May) and artificially water as necessary during the summer months, thus obtaining plants fit for putting out in the plantation twelve months after sowing.

For this reason it was found necessary to establish a new nursery in this district below the Weir Wall where water from the pumping station may be obtained.

(iii.) *Experimental Planting of Exotics.*

(a) *Acacias*.—On the area sown with *Acacia pycnantha* in 1921 numerous seedlings were seen at the close of the winter 1922. More came up during the autumn of 1923, and although the stocking cannot yet be estimated owing to the difficulty of locating the small seedlings amongst the scrub, there is now a fair crop on the area. From the *Acacia pycnantha* seed sown during 1922 a few seedlings came up during the subsequent damp weather, but a great deal of the seed did not germinate until 1923. In all probability most of the seed sown still lies dormant in the ground.

(b) *Pines*.—These are dealt with under "Plantations" and "Nurseries."

(c) *Oak*.—The promising results which were looked for from these sowings have been nullified by the depredations of kangaroos and semi-wild horses. A *Quercus ilex* seedling is the only survivor of oaks in the Greystones Nursery, and this plant has shown hardly any growth during the last year or two.

(d) *Willows*.—Numerous willow cuttings were planted about the middle of August, 1922, but after commencing to grow, were eaten by kangaroos and brumbies.

(e) *Ash*.—A row of *Fraxinus americana* that was sown in the Byfields Nursery germinated well. Of the 150 seedlings which came up, about half died during the summer, and the survivors were eaten by brush. Those eaten by brush, however, were not all killed, and it is expected that 40 plants will be available for planting out.

(C)—*Collie*.

(a) *Planting*.—15 acres of *Pinus pinaster* seedlings were planted at a spacing of 5ft. x 5ft. on an area adjoining last year's planting. The clearing of this area cost 26s. per acre, and consisted in felling and lopping all trees under 9in. D.B.H., as well as black-boys, etc., and ringbarking all large trees. Owing to all labour being required for fire protection work, the firing of the area was delayed and the early rains mitigated against a good burn. Mattocks were necessary to prepare the planting holes owing to the presence of matted roots in the ground. The cost of planting averaged £4 7s. 10d per acre. All blanks in the area planted last year have been filled.

(b) *Sowing*.—An area of 40 acres was cleared for sowing. The early rains prevented a successful burn, which is essential for efficient ploughing, and the sowing will accordingly be done next season, although unless seedlings on ploughed areas sown in previous years show great improvement it will probably be planted with seedlings from the nursery.

(c) *Nursery work*.—30,000 *Pinus pinaster* seedlings were raised and 16,500 were planted out, the balance being rather small will be held over for planting next season. 7,500 *Pinus palustris* seedlings which were sown last season were not planted out because of their stunted growth. They will remain in the nursery until next planting season. The following seeds were sown in the nursery for next season's planting stock:—

100lbs. *Pinus pinaster*,
20lbs. *Pinus insignis*,
1lb. *Pinus taeda*,
 $\frac{1}{2}$ lb. *Pinus laricis*,
 $\frac{1}{2}$ lb. *Pinus muricata*.

The *Pinus pinaster* and *Pinus insignis* seedlings are now showing above ground. About half of each species was sown with a small sprinkling of blood and bone manure, and half without. The fertilised seedlings were twice as large as the others and the germination of the former was very much better, but the growth of weeds among the fertilised seedlings has been correspondingly greater.

(D) *Ludlow Pine Plantation* (£633).—63.5 acres of the areas on which *Pinus insignis* had failed were planted up with *Pinus pinaster* transplants. The *Pinus insignis* on this area at 9 feet x 9 feet, notched in, were planted in 1909, and although the trees had grown to from 20-30 feet in height and were still alive, there was no chance of their developing to marketable size. These trees are standing on the area and if dead, will serve to assist by the shade they afford, rather than hinder the young *Pinus pinaster* plants, and so for the purpose of cleaning up the undergrowth and killing the pines a fire was put through to the compartments to be planted in autumn. The fire cleaned up the undergrowth but killed remarkably few pines. This demonstration of the resistance of young pines to a comparatively fierce surface fire was remarkable. The pines alive subsequent to the planting will be ringbarked.

The *Pinus palustris* seed drilled on the 32 acres of ground which was so carefully prepared in 1922 was a failure, and *Pinus pinaster* seed was drilled on 25 acres of the same area this season, so that the *pinaster* might have opportunity to become established before the indigenous woody shrubs took possession. The reason for the failure of the *palustris* is obscure. The

seed was fertile as shown by germination obtained in nursery beds, and the explanation would seem to be either that small rodents or birds were attracted by the large thin-cased seed. Twenty-five pounds of *Pinus pinaster* seed was sown in nursery beds.

IV. PROGRESS OF WORKING PLANS.

No further Working Plans have received the approval of the Governor in Council. A Working Plan for portion of the Collie District outside the boundary of the present Collie Coal Fields Working Circle is in course of preparation.

V. SILVICULTURAL NOTES.

1.—NATURAL REGENERATION OF JARRAH.

There are many problems connected with the regeneration of Jarrah still awaiting solution which have a practical bearing on forest operations. In the last annual report it was suggested that the seedling resulting from seed germinating in unburnt country with a fair accumulation of litter on the forest floor had a much greater chance of surviving the following summer than seed germinating on burnt country. It is now suggested that seedlings on unburnt country in the very early stages are liable to attack by so many leaf-eating insects that burning is an essential operation in connection with regeneration work for that reason alone. This is open to question. Seedlings on unburnt country are difficult to find among the leaf litter and undergrowth, and, consequently, their presence is often unsuspected. Two stronger arguments in favour of burning would appear to be (a) reduction of fire hazards; (b) elimination to a certain extent, for one year at least, of root competition with woody shrubs.

The time to burn is another matter of importance. Observation goes to show that seed-fall usually occurs in early summer, so that a fire after the end of December may result in the destruction of all seed. The large size and comparatively fleshy nature of Jarrah seed is not generally recognised. These characteristics may account for the greater difficulty of securing regeneration in Jarrah forests than many eucalypt forests of the Eastern States. Seed dispersal by wind is more limited, and insects are more likely to use and store it for food. Seed years, when every tree is laden with seed, would appear to be of greater importance in securing even regeneration over large areas. There is plentiful evidence on every area where ringbarking operations have been carried out in any part of the Jarrah bush, in connection with agricultural operations, that regeneration of Jarrah occurs sooner or later. Our problem is to find out the maximum period we may have to wait for regeneration, and the methods most likely to give quick results. Sample plots with the above object are being established in various centres where they will be subject to close observation.

VI. ARBORICULTURE.

The principle of distributing trees from Hamel Nursery at cost price to persons residing outside the Metropolitan Area has been continued. The number of trees sold amounted to 41,500; 4,200 were distributed free, and 30,000 raised for use in plantations and arboreta.

After discussion with the Education Department and the Forests League, a scheme has been prepared whereby it is hoped to promote the planting of trees by schools and instil into children a love of trees and a knowledge of their methods of growth. Schools are to be encouraged to establish endowment plantations, and, in certain approved centres, arboreta. In establishing an endowment plantation the full cost will be borne by the school assisted by organisations formed by old scholars and parents and citizens. Apart from fencing and any heavy clearing that may be necessary, all operations should be carried out by the children themselves. The Forests Department will assist with advice concerning species and planting methods. The returns realised by the sale of the mature crop will be credited to a fund for expenditure on the needs of the individual school carrying out the work.

In certain centres where the Forests Department is desirous of establishing arboreta for the purpose (a) of testing the rate of growth of certain species under varying soil and climatic conditions; (b) of serving as a demonstration area for persons desirous of planting trees on their own properties; (c) of serving the same educational purposes as a school endowment plantation, it is proposed that the establishment and control of these arboreta be undertaken by schools.

The financial assistance which the Forests Department will render to any proposed arboretum will depend largely on the value to be derived from the scheme under consideration. In all cases the Department will provide the design, supply the trees, and retain control of all operations relating to the cutting and removal of trees from the arboretum. A school assisting in the establishment, care, and maintenance of an arboretum on these lines will receive all revenue obtained from sales of timber produced.

The following extract from a paper by Professor E. H. Wilson, of the Arnold Arboretum, on "Northern Trees in Southern Lands," instances the value which may be derived from arboreta. He bases his conclusions on the extraordinary success achieved by the *Pinus insignis* in plantations in Australia and New Zealand. In its indigenous habitat in California this tree is considered of little value—

Quite unheralded came this Californian tree to the antipodes where it is destined to become of vastly increasing value and probably the most important soft-wood tree for many southern lands. The success of this tree proves two things. First, the indispensable value of botanic gardens and arboreta in every country. Secondly, that a tree of little value for its timber in one country may be of enormous value in another. A third fact which this tree clearly demonstrates may be set down, namely that no one can properly appraise the value to the world of any one species of tree. Experiment alone can prove this, and even then the results are conclusive only for the district and perhaps immediate neighbourhood where they are carried out.

VII. FIRE PROTECTION NOTES.

One of the main problems in organising fire control measures on a large scale in the Jarrah bush, is the difficulty of keeping men engaged on effective forest work in communication with lookout stations. The problem of locating fires in their early stages is solved by look-out stations at intervals of fifteen to twenty miles, but, unless a staff is to be retained for

the express purpose of fire suppression, it is difficult to get news of outbreaks quickly to men working in the bush.

During the first few years in a district newly organised, work can be found for gangs of men in proximity to the look-out station itself or along the route of a telephone line, but gradually the men must move further afield, and then we are dependent entirely on finding an elevated position in the neighbourhood of the work from which messages can be exchanged by heliograph with one of the look-out stations.

Wireless telephony appears to offer the greatest possibilities in solving this problem. If a look-out station were equipped with a small broadcasting set, and each gang in the bush had a small portable receiving set, then it should be possible for the foreman of the gang to listen-in at fixed periods and obtain instructions concerning any fires which may have broken out. Enquiries are being made at the present time concerning the cost and the possibilities of obtaining suitable instruments.

Experience in fire-fighting operations is demonstrating the great importance of plans showing all cleared tracks and natural fire lines. These old roads, tramway formations, creeks, etc., are of far greater importance in fire suppression than a limited number of artificial breaks. Plane-tableing operations are in progress to obtain this information for lithographing on to plans of the various areas under protection at the present time.

VIII. RESEARCH AND INVESTIGATION.

1. FOREST PRODUCTS LABORATORY.

Despite the interest displayed in the retention of the Commonwealth Forest Products Laboratory in Perth by the Forestry League of Western Australia, the University Senate, the Sawmillers' Association, and other public bodies, it has been decided that this institution shall be transferred to Melbourne.

"The fanatical attempt to centralise things in Melbourne" referred to by the ex-Prime Minister when replying to a deputation on the subject of the Laboratory in April, 1922, appears to have at last received Ministerial sanction, and the only thanks received by the Western Australian Government for its generous assistance in establishing and maintaining this Commonwealth institution is a reminder that the Commonwealth Government have spend £5,340 on the Laboratory compared to Western Australia's contribution of £2,200. For a State to voluntarily contribute 30 per cent. of the funds expended in connection with the maintenance of a Commonwealth institution is surely a very tangible indication of its interest in the matter. Another very pertinent point in connection with the work of the Forest Products Laboratory, which the Director of the Institute of Science and Industry and the Commonwealth Government appear to overlook, is that all work of any considerable value undertaken by the Laboratory has been initiated, and in many cases carried out, by Western Australians. Practically the whole of the credit for the recent bulletin on the use of Australian Hardwoods for Paper Pulp, and the Tannin Survey of the various States, is due to Mr. C. E. Lane Poole who, when Conservator of Forests in this State, conceived the original idea of the Laboratory

and, with the help of a committee consisting of Senator W. Kingsmill and Mr. C. S. Nathan, started the investigations mentioned above.

It is hoped that the submergence of the identity of the Forest Products Laboratory in a general research institution in Melbourne may only be of a temporary nature, and that when the importance of the subject again receives proper recognition the opinion of Forest authorities of all the States who are in a position to appreciate the undeveloped forest resources of this State, and the waste at present associated with our considerable export trade in timber, may carry some weight in deciding the site of the permanent Laboratory.

The question of continuing the functions of the Forest Products Laboratory in seeking to encourage the development of secondary industries which may use forest products either ignored or wasted at the present time, is under consideration. The work which may be started depends entirely on funds available, and it seems that rather than tinker with numerous different lines of research, any or all of which may prove valuable, it would be better to specialise on one or two problems at a time, and seek to carry these to a successful conclusion, by working on a semi-commercial scale if necessary before touching other problems.

(a) *Tannin Survey.*

Attention is drawn to further results set out in Appendix 12.

(b) *Paper Pulp.*

Attention is directed to a bulletin entitled "The Manufacture of Pulp and Paper from Australian Woods," published in 1923 by the Commonwealth Institute of Science and Industry, Albert Street, East Melbourne, pages 33 to 37 of which refer more particularly to Western Australian Hardwoods.

2. WOOD TECHNOLOGY.

The branch of research work, although temporarily placed under the charge of the Officer in Charge of the Forest Products Laboratory, has never been subsidised by the Commonwealth Government. The amount expended by the Department has been £2,669, but to this should be added £1,600, expended by the State Sawmills, who have borne the expense of investigating the possibility of kiln drying Karri timber as a commercial proposition.

The control of this work has rested with this Department, and thanks are due to Professors H. E. Whitfeld and A. Tomlinson, who have consented to act with the writer as a committee controlling all investigations relating to wood technology. The report of Mr. S. A. Clarke, B.Sc., Eng., who has been in charge of the work, is given hereunder:—

Of chief interest during the year has been the development of a suitable drying schedule for Karri. The problem proved somewhat more difficult than was anticipated, but with the completion of the present experiment, a comparison of the rapid seasoning properties of powdered and untreated Karri, the data necessary to attain this end, will all have been obtained.

So far the kiln has been used for the purpose of developing the conditions necessary for the successful drying of Western Australian hardwoods. For this purpose, the type of kiln which was built, the "Water Spray Humidity Regulated" has proved undoubtedly the

best, on account of the very delicate control of drying conditions. Kiln drying, however, from the standpoint of running cost alone, is a comparatively expensive process, and it is essential that the most economical and rapid seasoning methods should be used. Since the experimental work in this State was commenced, very rapid progress has been made in other parts of the world in the direction of altering and improving existing types of driers in order to make them more amenable to the control of the three essentials—temperature, humidity and circulation. Such advances have been made that it now appears extremely probable that some of these improved types of driers would prove far more efficient and economical for use with the local hardwoods. The Australian agents for one of these improved commercial timber kilns have been in close communication with this Department for some time past, and from a thorough examination of the evidence forwarded, it would appear that, providing that control in this kiln can be made sufficiently delicate for the exacting requirements of our Eucalypts, material reductions in the cost of rapid seasoning are possible.

A very interesting comparative test was commenced last January on the air and kiln drying of Tuart, and although this test is as yet incomplete, sufficient has been done to show that green Tuart can be thoroughly dried to a flawless product by the kiln process. In addition, a number of minor tests have been carried out as opportunity offered. The variation in moisture content and dimension of jarrah and karri with the changing seasons has yielded some interesting results. A small experiment on the centrifugal drying of wood (a process which was alleged to have given strikingly good results in Canada) proved that with karri, at least, the treatment had no effect. A comparative test on the value of preliminary water soaking was commenced, and is still proceeding. Pieces of karri were divided into three parts, which were treated respectively by kiln-drying, by air-drying, and by soaking for three months followed by air-drying. From the progress results obtained it would appear that soaking has little effect on the subsequent drying of the wood, as both the air-dried and the soaked and subsequently air-dried sets of specimens cracked severely.

Strength tests carried out on the Tingle Tingles gave valuable information which has been recorded elsewhere. A number of problems relative to the local timbers were studied, the chief being the question of grading. That a country so well to the front as this in many features connected with the timber trade should still possess no definite system of grading is regrettable. It is hoped that, as the results of investigations undertaken, sawmillers may be convinced of the advantages which will accrue to the trade from the adoption of uniform grading rules.

3. BOTANICAL INVESTIGATION.

(Expenditure, £331.)

Owing to the enthusiasm and energy of the botanical collector (Mr. C. A. Gardner) the Department now possesses a properly catalogued Herbarium containing 2,009 species of indigenous plants, mostly trees and woody shrubs. During the year 260 species were added to the collection (see Appendix 7); 31 species new to science were named, two of which introduced new genera into Western Australia (viz., *Ericopsis formosus* and *Kessellia tomentosa*).

Seeds of indigenous tree species were collected for propagation within the State, and a large number

were supplied to scientific institutions, botanical gardens, and Forest Departments in other parts of the world.

Thanks are again due to Mr. J. H. Maiden, Curator of the Botanic Gardens, Sydney, for valuable assistance in the identification of the more difficult species of eucalyptus.

4. ENTOMOLOGICAL INVESTIGATIONS.

Problems relating to forest entomology have been investigated by the Government Entomologist (Mr. L. J. Newman), assisted by Mr. J. Clark, and considerable progress made in our knowledge of the subject by their continued interest.

The destruction of the foliage of Jarrah trees, especially on the sand plain, has been particularly marked this year, and the remarks of Mr. Newman on the insect causing the damage are of particular interest. The insect is an undetermined moth which deposits her eggs singly under the epidermis of the leaf. The eggs hatch, giving rise to a tiny leaf-mining caterpillar which continues to feed between the upper and lower epidermis of the leaf until fully grown. When fully developed it eats out an oblong cell in the leaf and sews the edges together with silk, with the exception of one end, where an aperture sufficiently large to allow the thorax and legs to be protruded is left open. This cell falls to the ground, and then the insect protrudes its legs and thorax and burrows into the ground, so that finally the case is buried below the ground. There is only one generation per annum. The moths issue after the first rains and deposit their eggs. The caterpillars feed until October or November, when they pupate until the following April or May after taking the extraordinary precautions already explained.

IX. LEGISLATION.

Regulations under the Forests Act, 1918, relating to the following subjects have been gazetted:—

March 9th, 1923—Sandalwood in the North-West.—Owing to the sparse population in this division of the State difficulties had existed in controlling the removal of sandalwood from Crown lands north of the twenty-sixth parallel of south latitude. The wood is reserved for use by persons distilling sandalwood oil within the State, and provision is now made for the issue of licenses to persons who can produce a written order from recognised firms of oil distillers within the State for the obtaining from Crown lands of the quantity covered by such orders. A royalty of five shillings per ton is payable on all wood so obtained.

March 14th, 1923—Concessions.—The cutting of immature timber on land held under timber concessions is now prohibited. The definition of mature timber is the same as that which has applied for a number of years to trees on land held under sawmilling permits granted under the Land Act Amendment Act, 1904.

March 28th, 1923—Protected Plants.—The following arboreal species found in the North-West Division of the State have been added to those which it is prohibited to cut or destroy on Crown lands:—

Coral Tree (*Erythrina vespertilis*).
Baobab Tree (*Adausonia Gregorii*).
Livistona alfredi.
Livistona eastoni.
Cycad palms.

13th June, 1923.—Royalties payable on timber removed under sawmilling permits granted under the Land Act Amendment Act, 1904 (see page 7).

The amendment to the Bush Fires Act, 1902, referred to in last year's Annual Report, has again been recommended to the Hon. Minister for Lands for his consideration, and it is hoped that the provisions included in the proposed amendment may be soon given effect to, thereby rendering more effective and less costly the fire protection work already undertaken by this department.

X. ROYAL COMMISSION ON FORESTRY.

The report of the Royal Commission on Forestry appointed on 18th January, 1922, consisting of W. G. Pickering, Esq., M.L.A., Chairman, H. W. Mann, Esq., M.L.A., and P. O'Loughlin, Esq., M.L.A., completed their inquiries and their report was made available in November, 1922.

Many valuable conclusions were arrived at, and advantage has been taken of suggestions put forward as a result of their investigations. The summary of the recommendations of this Commission as set out at the end of their report, is quoted hereunder, in extenso:—

That—

- (1) The control of the Forestry Department be vested in the Conservator as set forth in the Act.
- (2) The appointment of an Advisory Board of two to act with the Conservator be made.
- (3) The allocation of the three-fifths of the net revenue from forestry be adhered to.
- (4) The provision of loan funds for expenditure on afforestation of conifers be made to the extent experiment may warrant.
- (5) The extension of the area at Collie to be reserved for mining timber purposes.
- (6) The State Sawmills or Railway Department take over the Wonerup tuart mill, failing which its operations be continued for another 12 months, when the position can again be reviewed.
- (7) The system of fire protection already in force in this State be continued, and that of fire look-outs be extended as funds become available.
- (8) The use of the most approved spark arrester be enforced for certain areas during certain periods of the year.
- (9) Conifers of different varieties be experimented with, and the *pinus pinaster* and other approved varieties be planted extensively.
- (10) The Gibraltar-Gnarlbine Forest Reserve be extended to the West. (Commission cannot recommend any encroachment on the existing reserves.)
- (11) When granting Tramway Permits, convenience of mining fields on prospective routes be considered.
- (12) The establishment of wood-pulp works for dealing with karri regrowth and regeneration be encouraged, and the utilisation of karri poles in substitution for jarrah.
- (13) The principle of marking and cutting of poles likely to be destroyed during felling operations be adopted.
- (14) The pure karri country should not be alienated for any purpose.
- (15) The control of the sandalwood industry be placed under the Forestry Department.
- (16) The immediate reservation of as large an area as practicable of sheoak country in the neighbourhood of Albany.
- (17) The planting of experimental areas with false acacia, for the purpose of axe and other handles, be put in hand.
- (18) The areas for Forest control agreed upon by the Lands and Forestry Departments be immediately gazetted.

- (19) The inauguration of a system of fire control throughout the karri country be commenced.
- (20) The investigations by the Forests Products Laboratory be continued.
- (21) The problem of powellising karri poles, to take the place jarrah, be investigated.
- (22) The forests on all catchment areas be reserved, and placed under the control of the Forestry Department.
- (23) Regulations be framed to ensure the retention of sufficient trees on farms for shade, wind-breaks, and firewood purposes.
- (24) The increase in royalty so soon as the industry shows signs of revival.
- (25) A conference of sawmillers with Conservator to obtain co-operation in cleaning up cut-out areas be convened.
- (26) The areas of permits be extended where conditions render it necessary for profitable cutting.
- (27) Royalty be immediately increased to prevent loss of revenue consequent upon reversion to Hoppus measurement.
- (28) Additional Arboreta be established; a museum for the display of Forests products; the introduction of a Forest Primer into primary and secondary schools, and the observation of Arbor Day.
- (29) The staff be dealt with on the lines indicated on pages 18 to 20 of the report.

XI. PERSONNEL.

(a.) The department has lost through death a valuable officer in Forester W. B. Moore, who passed away at Collie on 9th January, 1923. Forester Moore was a popular officer, who served the department for eleven years, and at the time of his death was officer in charge of the Collie district.

(b.)—Resignations.

Mr. S. A. MacKay, B.Sc., who was temporarily employed as an Assistant District Forest Officer, tendered his resignation as from 28th February, 1923.

(c.)—Appointments.

The appointment of the writer as Conservator of Forests dates from 1st January, 1923.

With the concurrence of the New South Wales Forestry Commission, Mr. T. N. Stoate, B.Sc., was appointed Assistant Working Plans Officer as from 1st April, 1923. This officer had for some twelve months previously occupied this position coupled with that of Instructor in Forestry while on extended leave from the New South Wales department. Owing to the large development of field work demanding attention, his duties have been disassociated from those of Instructor, and his indefatigable enthusiasm has largely contributed to the success which has attended the inauguration of reforestation operations.

A classified position of Chief Timber Inspector has been created and Mr. H. McCoy, who has most efficiently carried out the duties associated with the position for several years, has been appointed as from 1st July, 1923.

Mr. A. Rule, M.A., B.Sc., a graduate of the Aberdeen School of Forestry, was granted temporary employment in March, 1923, and subject to completing a satisfactory course of practical training under local conditions will be appointed Instructor in Forestry when it becomes necessary to re-open the school for apprentices.

One temporary assistant forester was appointed, and one apprentice signed indentures.

(d.)—Reduction in Staff.

Owing to the closing of the Wonnerup Mill for a period, the services of the Manager, Mr. J. Coxon, terminated as from 23rd December, 1922.

S. L. KESSELL.

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APPENDIX 1B.

Forest Improvement and Reforestation Fund as on 30th June, 1923.

SECTION 41 (2), "FORESTS ACT, 1918."

Dr.	£	s.	d.	£	s.	d.	Cr.	£	s.	d.
1923.							1922.			
30th June—To Working Plan							1st July—By Balance brought forward	19,168	0	0
No. 1—							1923.			
(Jarrah belt) ...	2,783	0	0				30th June—By three-fifths of net revenue	40,981	0	0
„ Working Plan No. 2—							in accordance with Forests Act			
(Tuart belt) ...	5,335	0	0							
„ Working Plan No. 3 (Collie										
Mining Leases) ...	2,916	0	0	11,034	0	0				
„ Sylvicultural Operations ...	664	0	0							
„ Research ...	665	0	0							
„ Education of Apprentices ...	1,663	0	0							
„ Popular Education ...	133	0	0							
„ General Equipment ...	618	0	0							
„ Advertising and Publicity ...	431	0	0							
„ Sandalwood Propagation ...	527	0	0							
„ Classification of timber ...	2,379	0	0							
„ Arboreta ...	192	0	0							
„ Salaries of Field Staff engaged										
on non-administrative work	2,533	0	0							
„ Miscellaneous ...	724	0	0	10,529	0	0				
„ Balance carried forward				38,586	0	0				
				£60,149	0	0				
							1923.			
							1st July—By Balance brought forward	£38,586	0	0

APPENDIX 1c.

Mining Leases Royalty Account.

SECTION 39 (1) "FORESTS ACT, 1918."

Dr.	£	s.	d.	£	s.	d.	Cr.	£	s.	d.
1923.							1922.			
June 30—To Expenditure on Collie Mining							July 1—By Balance brought forward	420	11	10
Leases ...	238	4	5				1923.			
„ „ Balance carried forward	1,504	11	4				30th June—By Royalties collected during the	1,322	3	11
							financial year			
				£1,742	15	9				
							1923.			
							July 1—By Balance brought forward	£1,504	11	4

APPENDIX 1D.

REFORESTATION FUND AND MINING LEASES ROYALTY ACCOUNT.

Detailed Statement of Expenditure on Working Plans for Year ended 30th June, 1923.

	Working Plan, No. 1.	Working Plan, No. 2.	Working Plan, No. 3.		Total.
			Reforestation Fund.	Mining Leases Royalty Account.	
	£	£	£	£	£
Permanent Plant ...	200	501	162	4	867
Subdivision of Area ...	112		21		133
Sylvicultural Work ...	64	26	444	6	540
Road Construction ...	693		3		696
Clearing and forming tracks			20		20
Fire Protection (Capital) ...	63	50	747		860
Fire Protection (Maintenance)	855	204	435		1,494
Grazing Control (Capital) ...		674	1		675
Grazing Control (Maintenance)		25	19		44
Administration ...	597	562	723	126	2,008
Maintenance of Roads and Bridges	175		11		186
Experimental Work ...	7	19	41		67
Utilisation ...	17	169	47		233
Cost of Seed ...			11	3	14
Raising plants in Nursery ...			28		28
Clearing of Land for planting			110		110
Preparation of Soil ...			45	48	93
Cost of planting			48	51	99
Tuart Mill ...		3,104			3,104
	2,783	5,334	2,916	238	11,271

APPENDIX I.E.

WONNERUP TUART MILL.

Trading, Profit and Loss Accounts and Balance Sheet for Six months ended 31st December, 1922.

Dr.				1922.				Cr.					
31st Dec.								31st Dec.					
To Stock	£	s.	d.	By Sales	...	...	...	£	s.	d.
„ Wages	599	13	8	„ Stock on hand	...	...	...	354	0	0
„ Haulage	1,193	19	5							
„ General Expenses	611	13	0							
„ Freights etc.	25	19	4							
„ W. Material	27	0	6							
„ Rent on Siding	20	19	4							
„ Repairs	10	0	0							
„ Falling	37	1	8							
„ Gross profit	205	10	3							
				1,592	6	0							
				£4,324	3	2					£4,324	3	2

PROFIT AND LOSS.

To Insurance				By Gross profit							
Less paid in advance	...	...	...	£	s.	d.	£	s.	d.
	114	5	0	1,592	6	0					
	36	18	11								
„ Discounts	...	...	...	77	6	1			
„ Compensation	...	...	...	554	3	4			
„ Depreciation	...	...	...	18	3	6			
„ Interest on Capital	...	...	...	269	3	2			
„ Net profit...	...	...	...	356	0	0			
				317	9	11					
				£1,592	6	0			£1,592	6	0

APPROPRIATION ACCOUNT.

To Loss Brought Forward				By Profit for period					
	...	...	...	£	s.	d.	£	s.	d.
	1,839	1	7	317	9	11			
				1,521	11	8			
	£1,839	1	7				£1,839	1	7

WONNERUP TUART MILL.

Balance Sheet for Six months ended 31st December, 1922.

LIABILITIES.				ASSETS.									
Capital	...	...	...	£	s.	d.	£	s.	d.				
Reforestation Fund	...	...	...	11,870	18	1	Buildings—						
	2,004	17	7				Workers' Accommodation	2,046	14	10			
							Mill buildings	2,239	3	7			
							Turnery shop	60	11	9			
										4,346	10	2	
							Pipe Line (Water Supply)				577	9	10
							Railway Siding				2,157	5	4
							Bridges and Crossings				195	10	4
							Plant and Machinery	4,223	17	5			
							Less depreciation	164	16	7			
											4,059	0	10
							Tools and Equipment	676	0	1			
							Less depreciation	104	6	7			
											571	13	6
							Sundry Debtors				55	15	1
							Stock on hand				354	0	0
							Insurance paid in Advance				36	18	11
							Loss to 30th June, 1922	1,839	1	7			
							Less profit as per Profit and Loss Account	317	9	11			
											1,521	11	8
											£13,875	15	8

APPENDIX 1F.

Statement of General Loan Fund, for Year ended 30th June, 1923.

DR. 1923. 30th June.			1923. 30th June.			CR. £ s. d.
	£	s. d.		£	s. d.	
To Amount provided by Treasury Department	1,779	0 0	By Sundries—			
			Purchase of land ...	...	...	85 0 0
			Purchase of Seed ...	...	...	19 0 0
			Mundaring District—			
				£	s. d.	
			Greystones ...	488	0 0	
			Byfields ...	92	0 0	
			Murdos ...	55	0 0	
			Weir Wall ...	63	0 0	
			Bickley ...	34	0 0	
			Experimental ...	25	0 0	
			Administration ...	88	0 0	
						845 0 0
			Gnangara ...			197 0 0
			Ludlow ...			633 0 0
						£1,779 0 0

APPENDIX 1G.

Statement of Timber Inspected by the Inspection Branch of the Forests Department during the year ended 30th June, 1923.

Timber Inspected.	Inspection Fees.	
	Cubic Feet.	Amount.
Sawn sleepers ...	1,871,581	£ 4,182 9 8
Hewn sleepers ...	2,497,790	5,188 15 5
Sawn and Hewn timber ...	194,922	521 19 11
Re-inspected sleepers ...	40,010	183 9 6
Miscellaneous Timbers ...	...	97 16 10
	Lineal Feet.	
Heart in Beams ...	6,455	13 13 8
Piles and Poles ...	48,671	378 7 4
		£10,566 12 4

APPENDIX 1H.

Revenue and Expenditure.

The following statement shows the Revenue and Expenditure of the Department since its inception in 1895:—

Year.	Revenue.	Expenditure.				Total.
		Consolidated Revenue Fund.	General Loan Fund.	Reforestation Fund.	Mining Leases Fund.	
1st January to 31st December, 1895 ...	£ 3,175	£ 1,108	£ ...	£ ...	£ ...	£ 1,108
1st January to 31st December, 1896 ...	4,839	2,021	...	...	...	2,021
1st January to 31st December, 1897 ...	12,320	3,490	...	...	...	3,490
1st January to 31st December, 1898 ...	30,150	3,356	...	...	...	3,356
1st January to 31st December, 1899 ...	17,000	2,438	...	...	...	2,438
1st January to 31st December, 1900 ...	15,526	2,649	...	...	...	2,649
1st January to 31st December, 1901 ...	18,478	2,747	...	...	...	2,747
1st January to 31st December, 1902 ...	18,753	4,301	...	...	...	4,301
1st January to 31st December, 1903 ...	20,478	3,789	...	...	...	3,789
1st January to 31st December, 1904 ...	20,019	4,193	...	...	...	4,193
1st January to 31st December, 1905 ...	18,480	5,090	...	...	...	5,090
1st January to 31st December, 1906 ...	10,974	3,385	...	...	...	3,385
6 months, 1st January to 30th June, 1906 ...	22,783	6,208	20	...	...	6,228
1st July, 1906, to 30th June, 1907 ...	23,499	8,302	443	...	...	9,245
1st July, 1907, to 30th June, 1908 ...	29,484	9,031	584	...	...	9,615
1st July, 1908, to 30th June, 1909 ...	31,549	8,531	1,833	...	...	10,364
1st July, 1909, to 30th June, 1910 ...	37,477	8,863	2,888	...	...	11,751
1st July, 1910, to 30th June, 1911 ...	44,561	10,469	3,135	...	...	13,604
1st July, 1911, to 30th June, 1912 ...	48,237	11,463	3,842	...	...	15,305
1st July, 1912, to 30th June, 1913 ...	53,039	12,093	4,432	...	...	16,525
1st July, 1913, to 30th June, 1914 ...	22,906	5,469	1,063	...	...	6,532
6 months, 30th June, to 31st December, 1914 ...	45,726	8,870	1,399	...	...	10,269
1st January to 31st December, 1915 ...	29,821	9,575	911	...	...	10,486
1st January to 31st December, 1916 ...	36,129	10,263	842	...	...	11,105
1st January, to 31st December, 1917 ...	22,113	6,199	268	...	...	6,467
6 months, 1st January to 30th June, 1918 ...	42,051	10,873	594	...	...	11,467
1st July, 1918, to 30th June, 1919 ...	59,220	12,962	...	7,241	...	20,203
1st July, 1919, to 30th June, 1920 ...	75,469	16,128	11,742	*50,873	...	78,543
1st July, 1920, to 30th June, 1921 ...	87,182	16,439	2,324	27,794	965	47,522
1st July, 1921, to 30th June, 1922 ...	86,336	15,246	1,779	21,563	238	38,826
1st July, 1922, to 30th June, 1923 ...						
	£ 987,774	226,051	38,099	107,271	1,203	372,624

* This amount includes the sum of £15,448 paid to liquidate the advances made to the Department from Land Improvement Loan Fund.

It will be seen from the above statement that to the 30th June, 1923, the revenue exceeded the total expenditure by the large sum of £615,150.

APPENDIX 2A.

Production of Mill Timber for Year ended 30th June, 1923.

	Jarrah.		Karri.		Total.	
	Loads.	Cubic feet.	Loads.	Cubic feet.	Loads.	Cubic feet.
Concessions	15,519	775,950	...	...	15,519	775,950
Leases	48,681	2,434,050	...	...	48,681	2,434,050
Permits	314,878	15,743,900	74,151	3,707,550	389,029	19,451,450
Total	379,078	18,953,900	74,151	3,707,550	453,229	22,661,450

NOTE.—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 152,698 loads of sawn timber or 7,634,900 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, 1923.
(Reported to Forests Department.)

Name of Timber.	In the Log.		In the Square.		Lineal feet.
	Loads.	Cubic feet.	Loads.	Cubic feet.	
Jarrah	20,834	1,041,700	7,292	364,600	...
Tuart	160	8,000	56	2,800	...
Karri	4,018	200,900	1,085	54,250	...
Marri	283	14,150	99	4,950	...
Blue Gum	3	150	1	50	...
Peppermint	3	150	1	50	...
Piles and Poles ... ..	...	...	...	...	112,289
Heart in Beams ... ..	...	...	...	...	2,494
Total	25,301	1,265,050	8,534	426,700	114,783

APPENDIX 2C.

Inspected Hewn Jarrah Sleepers obtained during Year ended 30th June, 1923.

	Loads.	Cubic feet.
From Crown Lands, Saw Mill permits, etc., on which Royalty has been paid	15,548	777,400
From Private Property Leases and Concessions	34,408	1,720,400
Total	49,956	2,497,800

NOTE.—The average recovery by the hewer is 20 per cent. of the log. The above total represents 249,780 loads, or 12,489,000 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, 1923.

Name of Timber or other Forest Produce.	No.	Cubic feet measured in Round.	Tons.	Lineal Feet.
Banksia	296	...	...
Barks and Gums	3	...
Blackboy	20	...
Charcoal	145	...
Cypress Pine	150	...	...
Firewood	37,782	...
Fencing Posts and Rails	6,190	...	...	22,866
Heart in Beams	28,340
Mining Timber	222,270	...	...
Piles and Poles	9,027	...
Sandalwood
Sheoak	*5,169	...	...
Tuart	51,354	...	...
Total	6,190	279,239	46,977	51,206

* Measured in the square.

APPENDIX 2E.

Total Production of Timber for Year ended 30th June, 1923.

Appendix Reference.	In the Log.		In the Square.	
	Loads.	Cubic feet.	Loads.	Cubic feet.
Total Milling Timber (Appendix 2A)	453,229	22,661,450	152,698	7,634,900
Total Sawn Timber from Private Property (Appendix 2B)	25,301	1,265,050	8,534	426,700
Total Hewn Timber (Appendix 2c)	248,780	12,489,000	49,956	2,497,800
Total Miscellaneous Timbers (Appendix 2D)	5,777	288,850	2,022	101,100
Total, Appendices 2A to 2D	734,087	36,704,350	213,210	10,660,500

APPENDIX 2F.

Piles, Poles and Heart in Beams Inspected during the Year ended 30th June, 1923.

Round Piles and Poles	6,455 lineal feet.
Heart in Beams	48,671 lineal feet.

APPENDIX 2G.

Mining Timber and Firewood Consumed during Year ended 30th June, 1923.

Locality.	Wood Fuel Consumed.	Mining Timber Consumed.	Sleepers.	Total.
	tons.	tons.	No.	tons.
Greenbushes Mining Fields	330	...	...	330
Collie Coal Fields ... ..	...	4,677	...	4,677
Metropolitan Area	154,000	...	...	154,000
Golden Mile, Coolgardie, Norseman, Kuranalling, Golden Ridge, Kanowna, Mt. Monger, St. Ives, Carbine and Gibraltar	260,000	8,000	...	268,000
Northern Goldfields, Broad Arrow, Bardoc, Ora Banda, Comet Vale, Menzies, Kookynie, Laverton, Mt. Morgans and Mt. Magnet Districts	20,000	800	...	20,800
Southern Cross, Marvel Loch, Mt. Rankin, Burbridge, Westonia, Manxman and Bullfinch Districts	16,000	2,000	...	18,000
Goldfields Water Supply Pumping Stations, Nos. 4, 5, 6, 7, and 8, plus other small pumping plants	14,000	...	...	14,000
Eastern Goldfields Districts (household)	30,000	...	...	30,000
Eastern Goldfields (bakers)	10,000	...	...	10,000
Eastern Goldfields Batteries (State and private) outside Golden Mile	6,000	...	...	6,000
Eastern Goldfields Breweries, Cordial, Confectionery and Soap Factories	1,000	...	...	1,000
Eastern Goldfields Tramways (locomotive wood)	16,000	...	...	16,000
Eastern Goldfields Electric Power and Light	43,148	...	...	43,148
Eastern Goldfields Producer Plants and blacksmiths (as charcoal)	1,700	...	...	1,700
Sleepers for tram lines (6ft. x 7in. x 4in. to 7½in. x 4½in.) ... ..	...	...	*41,000	...
Total	†572,178	15,477	*41,000	587,655

* 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, 1923.

Item and Country of Destination.	Quantity.	Value.	Item and Country of Destination.	Quantity.	Value.
<i>Timber Dressed :—</i>	cubic feet.	£	<i>Sandalwood :—</i>	cwts.	£
Commonwealth of Australia	17,338	5,122	United Kingdom	2	2
<i>Timber, Undressed :—</i>			Hong Kong	89,314	59,671
Commonwealth of Australia	2,636,037	310,470	Ceylon	40	30
United Kingdom	381,875	46,726	Straits Settlements	7,047	5,322
Singapore	834	100	Java	8	3
Ceylon	158,200	19,392	China	48,309	30,799
New Zealand	500,134	63,982	India	9,388	8,131
South African Union	3,484,117	460,911		154,108	103,958
India	222,592	28,448			
Egypt	163,083	19,427	<i>Tanning Barks :—</i>		
China	83,917	10,079	Commonwealth of Australia	39,594	21,158
Mauritius	197,242	24,546	United Kingdom	12	3
Belgium	49,608	5,949		39,606	21,161
Holland	6,200	1,065			
Japan	10,133	1,237			
	7,893,972	992,332	<i>Essential Oils :—</i>		
<i>Wood Manufactures, N.E.I. :—</i>			Commonwealth of Australia	...	12,091
Commonwealth of Australia	...	2,689	United Kingdom ... ..	...	7,498
United Kingdom ... ..	...	23	Ceylon ... ..	...	56
British Malaya ... ..	...	34	China ... ..	...	430
Ceylon ... ..	...	5		...	20,075
South Africa ... ..	...	30		...	20,075
	...	2,781	Total, Exports .. ..	...	£1,155,025
<i>Barrels, Casks and Shooks, etc. :—</i>					
Commonwealth of Australia	...	8,825			
United Kingdom ... ..	...	379			
United States of America	...	369			
	...	*9,573			
<i>Doors :—</i>					
Commonwealth of Australia	...	23			
Total, Timber Exported ..	...	£1,009,831			

* A very large proportion of this amount represents empty returns.

APPENDIX 21.

Timber Imports for the Year ended 30th June, 1923.

Item and Country of Origin.	Quantity.	Value.	Item and Country of Origin.	Quantity.	Value.
<i>Timber, Dressed, N.E.I. :—</i>	cubic feet.	£	<i>Oars and Sculls :—</i>		£
Commonwealth of Australia	3,721	1,373	United Kingdom ... ..	...	222
New Zealand	449	155	United States of America	...	74
Canada	83	15		...	296
United States of America	8	16	<i>Clothes Pegs :—</i>		
Norway	5,591	1,224	Commonwealth of Australia	...	1,463
Sweden	6,545	1,039	United States of America	...	137
	16,397	3,822		...	1,600
<i>Timber for making Boxes and Doors :—</i>			<i>Doors :—</i>	No.	
Commonwealth of Australia	...	629	Commonwealth of Australia	1,691	2,321
British Malaya	15,858	1,159	<i>All Wood Articles, N.E.I. :—</i>		
Sweden	2,825	715	Commonwealth of Australia	...	11,935
Norway	2,992	496	United Kingdom ... ..	...	2,266
Germany	42	20	New Zealand ... ..	...	14
	21,717	3,019	Canada ... ..	...	376
<i>New Zealand Pine :—</i>			British Malaya ... ..	...	1
New Zealand	4,624	1,803	Hong Kong ... ..	...	1
<i>Logs, not Sawn :—</i>			Portugal ... ..	...	3
Dutch Borneo	44,025	1,846	China ... ..	...	4
<i>Timber, Undressed :—</i>			Denmark ... ..	...	7
Commonwealth of Australia	71,304	20,443	Czecho-Slovakia ... ..	...	43
New Zealand	43,539	7,922	France ... ..	...	46
United Kingdom	4,664	1,624	Italy ... ..	...	69
British Malaya	942	463	Japan ... ..	...	19
Canada	369	144	Norway ... ..	...	70
New Caledonia	423	208	Java ... ..	...	6
Norway	2,745	829	Sweden ... ..	...	16
Japan	2,429	1,188	United States of America	...	1,012
Siam	167	116	Germany ... ..	...	84
Sweden	6,245	1,472		...	15,972
Philippine Islands	1,684	631	Total, Timber Imports ...	...	£109,428
Russia	22	8	<i>Tanning Extract :—</i>		
United States of America	86,351	23,619	Commonwealth of Australia	...	745
	220,884	58,667	United Kingdom ... ..	...	49
<i>Architraves and Mouldings :—</i>			New Zealand ... ..	...	2
Commonwealth of Australia	...	636	India ... ..	...	61
<i>Laths for Blinds :—</i>			South Africa ... ..	...	733
United States of America	...	261	Straits Settlements ... ..	...	370
<i>Picture and Room Mouldings :—</i>			Czecho-Slovakia ... ..	...	9
Commonwealth of Australia	...	1,562	United States of America	...	151
United Kingdom ... ..	...	50		...	2,120
Italy ... ..	...	120	<i>Tanning Barks :—</i>	cwt.	
United States of America	...	24	Commonwealth of Australia	4,195	3,278
Germany ... ..	...	177	South Africa	3,458	1,593
	...	1,933		7,653	4,871
<i>Spokes, Dressed :—</i>	No.		<i>Essential Oils :—</i>		
Commonwealth of Australia	49,452	2,111	Commonwealth of Australia	...	2,273
United States of America	15,220	311	United Kingdom ... ..	...	220
	64,672	2,422	British Malaya ... ..	...	4
<i>Barrels, Casks, etc. :—</i>			India ... ..	...	12
Commonwealth of Australia	...	3,428	West Indies (St. Thomas)	...	8
United States of America	...	1	Ceylon ... ..	...	99
	...	3,429	Jamaica ... ..	...	4
<i>Brushmaker's Woodware and Wood Tool Handles :—</i>			France ... ..	...	481
Commonwealth of Australia	...	2,435	Spain ... ..	...	33
United Kingdom ... ..	...	362	Holland ... ..	...	5
Canada ... ..	...	24	China ... ..	...	25
Norway ... ..	...	43	Sicily ... ..	...	67
United States of America	...	8,531	Italy ... ..	...	314
Germany ... ..	...	6	Japan ... ..	...	8
	...	11,401	Java ... ..	...	401
			Paraguay ... ..	...	3
			Bulgaria ... ..	...	7
			Belgium ... ..	...	5
			United States of America	...	64
				...	4,033
			Total, Imports	...	£120,452

APPENDIX 2J.

Summary of Timber treated by Forest Saw Mills exported from Western Australia during the Year ended 31st December, 1922.

	Jarrah.	Karri.	Other Timber.	Total.	Inter- state.	New Zea- land.	United King- dom.	British India.	Ceylon.	South Africa.	Mauri- tius.	Egypt.	Bel- gium.	Hol- land.	China.	Japan.
Logs and Spars in the rough ...	cub. ft. 5,950	cub. ft. ...	cub. ft. ...	cub. ft. 5,950	cub. ft. 5,950	cub. ft. ...	cub. ft. ...	cub. ft. ...	cub. ft. ...	cub. ft. ...	cub. ft. ...	cub. ft. ...	cub. ft. ...	cub. ft. ...	cub. ft. ...	cub. ft. ...
Hewn Beams and Piles ...	5,550	...	...	5,550	...	...	...	...	...	...	...	...	5,550	...	...	...
Undressed, 7 x 2½ to 12 x 6 ...	3,002,600	326,650	550	3,329,800	2,515,150	143,350	254,250	2,850	27,950	148,900	115,750	100	101,350	5,900	5,450	8,800
Undressed, 12 x 6 and over																
Pickets and Palings ...	8,700	...	...	8,700	8,700	...	...	...	...	...	...	...	...	...	...	...
Flooring Boards ...	151,800	...	...	151,800	149,300	...	...	...	...	...	...	...	...	...	...	...
Paving Blocks ...	124,550	2,750	...	127,300	109,000	...	2,750	...	...	2,500	...	...	...	...	...	...
Sleepers—Sawn ...	1,972,300	700	...	1,973,000	247,850	77,150	86,700	104,450	235,650	1,046,950	52,250	121,500	...	15,550	...	...
Powellised ...	...	442,600	...	442,600	150,450	...	...	...	...	...	...	...	500	...	...	...
Hewn ...	*1,191,850	...	...	1,191,850	118,650	108,750	...	5,700	11,450	275,000	...	...	...	...	...	...
Telegraph Arms ...	19,100	...	...	19,100	...	...	19,100	251,500	51,200	627,900	33,650	...	...	...	...	...
Total ...	6,482,400	772,700	550	7,255,650	3,305,050	329,250	363,000	364,500	326,250	2,101,250	201,650	121,600	107,400	21,450	5,450	8,800

* Probably 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.*	Year.	Timber.		Sandalwood.		Tanning Bark.	Essential Oils.*
	cub. ft.	Value.	Tons.	Value.	Value.	Value.		cub. ft.	Value.	Tons.	Value.	Value.	Value.
1836...	10,000	2,500	...	...	...	...	1882...	936,500	93,650	9,605	96,050	...	...
1837...	...	...	...	...	...	...	1883...	997,000	79,760	7,031	56,250	...	...
1838...	...	...	...	...	...	...	1884...	861,700	63,986	2,620	20,960	...	...
1839...	...	...	...	...	...	...	1885...	843,150	67,850	4,527	36,216	...	...
1840...	...	...	...	...	...	...	1886...	626,150	50,092	3,431	27,450	...	...
1841...	...	...	...	...	...	...	1887...	354,800	525,750	4,317	34,533	...	...
1842...	...	...	...	...	...	...	1888...	525,750	42,060	4,470	33,525	...	...
1843...	...	...	...	...	...	...	1889...	788,500	68,080	6,385	57,465	...	...
1844...	b	163	...	...	...	...	1890...	1,172,200	82,052	5,136	51,355	...	...
1845...	...	...	4	40	...	...	1891...	1,273,950	89,179	3,760	37,600	...	...
1846...	2,550	255	32	320	...	...	1892...	1,082,650	78,419	5,716	42,370	...	...
1847...	12,200	1,120	370	4,444	...	...	1893...	512,950	33,888	3,893	32,160	...	...
1848...	3,350	333	1,335	13,353	...	...	1894...	1,063,700	74,804	2,784	29,430	...	...
1849...	...	...	...	...	...	...	1895...	1,255,250	88,146	3,851	30,363	...	...
1850...	10,500	1,048	...	...	...	...	1896...	1,545,600	116,420	6,848	65,800	...	...
1851...	1,250	268	219	1,593	...	...	1897...	2,393,300	192,451	5,852	49,450	...	...
1852...	7,050	806	...	...	...	...	1898...	4,086,150	326,195	4,349	31,812	...	...
1853...	52,200	5,220	...	...	...	...	1899...	6,913,550	553,198	4,084	29,719	...	...
1854...	58,500	7,023	...	...	...	...	1900...	5,725,400	458,461	5,095	39,038	...	...
1855...	76,900	12,076	...	...	...	...	1901...	7,150,600	572,354	8,864	78,931	...	...
1856...	70,500	9,671	280	2,524	...	...	1902...	6,256,750	500,533	7,995	61,771	...	...
1857...	69,200	9,449	745	7,455	...	...	1903...	7,743,450	619,705	4,406	37,913	859	...
1858...	29,250	2,340	1,278	17,259	...	...	1904...	8,072,300	654,949	4,510	25,417	32,876	...
1859...	67,250	6,051	1,637	16,360	...	...	1905...	8,709,500	689,943	5,521	38,817	154,087	...
1860...	54,800	4,932	...	...	...	...	1906...	8,830,700	708,993	8,848	70,958	140,720	...
1861...	27,750	2,497	2,558	24,945	...	...	1907...	6,409,550	511,923	9,212	65,999	98,773	...
1862...	68,800	7,151	2,393	21,541	...	...	1908...	9,869,500	813,591	9,564	76,668	79,934	...
1863...	32,900	2,963	2,807	25,265	...	...	1909...	10,830,450	867,419	4,805	37,456	59,633	...
1864...	58,300	5,508	2,724	24,520	...	...	1910...	12,074,100	972,698	8,228	70,775	93,733	...
1865...	183,950	15,693	1,686	13,490	...	...	1911...	12,449,500	986,341	6,907	65,506	83,470	...
1866...	85,650	6,849	2,965	23,722	...	...	1912...	11,297,100	903,396	3,154	27,533	49,094	...
1867...	56,750	4,541	2,305	18,442	...	...	1913...	13,619,850	1,089,481	6,260	47,589	47,377	...
1868...	8,000	638	3,256	26,045	...	...	1914...	6,279,750	502,153	4,702	39,800	18,197	e
1869...	179,900	14,273	4,124	32,998	...	...	1915...	9,968,500	808,392	8,375	78,926	6,127	e
1870...	157,200	17,551	6,112	48,890	...	...	1916...	5,432,100	441,991	6,271	61,381	10,208	e
1871...	218,500	15,304	3,366	26,926	...	...	1917...	5,890,650	310,893	7,230	72,669	18,959	e
1872...	37,000	2,590	3,942	31,536	...	...	1918...	3,890,650	274,141	6,504	81,334	16,886	e
1873...	68,150	4,771	6,292	62,916	...	...	1919...	3,436,250	344,119	8,998	117,072	18,875	e
1874...	345,600	24,192	6,646	66,465	...	...	1920...	5,065,300	437,666	14,355	240,579	22,121	e
1875...	342,350	23,965	6,577	65,772	...	...	1921...	9,816,250	1,162,735	10,839	181,301	23,073	e
1876...	219,050	23,743	4,247	31,851	...	...	1922...	8,309,750	1,063,475	3,990	54,769	13,328	e
1877...	336,150	36,979	4,875	35,064	...	...	1923...	7,911,310	1,009,831	7,705	103,958	21,161	e
1878...	580,900	63,902	4,667	35,001	...	...	Total	226,142,160	19,435,383	358,259	3,408,142	1,009,491	52,294
1879...	627,250	69,742	5,197	51,970	...	...	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.						
1880...	662,550	66,252	...	...	...	...	* Principally Sandalwood Oil.						
1881...	792,750	79,277	7,716	77,165	...	...					

APPENDIX 2L.

Summary of Imports of Timber, Tanning Materials and Essential Oils, since 1848.

Year.	Timber, Wood- ware, etc. (not including furni- ture, bamboo, cane, etc.)	Tanning Materials.	Essential Oils.
	Value £	Value £	Value £
1848	464	...	...
1849	...	...	...
1850	...	...	...
1851	189	...	...
1852	3,216	...	...
1853	2,479	...	...
1854	790	...	...
1855	831	...	...
1856	1,464	...	...
1857	1,124	...	...
1858	774	...	...
1859	1,528	...	...
1860	690	...	...
1861	2,095	...	...
1862	1,459	...	...
1863	1,920	...	...
1864	1,568	...	...
1865	894	...	...
1866	548	...	...
1867	1,442	...	...
1868	1,727	...	...
1869	1,451	...	...
1870	1,408	...	...
1871	1,518	...	...
1872	736	...	...
1873	1,660	...	...
1874	1,008	...	...
1875	1,774	...	...
1876	2,707	...	...
1877	3,098	...	...
1878	2,036	...	...
1879	2,947	...	...
1880	2,340	...	...
1881	3,061	...	...
1882	3,639	...	...
1883	3,692	...	...
1884	6,667	...	...
1885	2,930	...	...
1886	11,479	...	...
1887	17,888	...	...
1888	8,136	...	...
1889	4,461	...	...
1890	7,686	...	...
1891	14,979	...	...
1892	18,406	...	...
1893	26,713	...	...
1894	14,493	...	...
1895	17,964	...	...
1896	47,128	...	...
1897	5,381	...	...
1898	164,552	...	...
1899	55,566	...	...
1900	45,689	...	...
1901	56,266	1,416	1,105
1902	80,134	1,740	1,546
1903	97,810	3,418	1,751
1904	102,383	3,556	1,348
1905	157,856	1,322	2,122
1906	98,494	582	1,592
1907	95,229	1,412	1,915
1908	122,016	2,767	1,549
1909	93,205	2,392	4,584
1910	90,502	4,129	4,003
1911	171,280	3,531	3,686
1912	152,133	2,912	4,938
1913	167,244	3,089	4,598
1914	202,640	2,651	5,392
1914-15	78,736	629	2,823
1915-16	107,763	2,082	4,988
1916-17	76,849	3,313	4,788
1917-18	75,681	2,848	3,484
1918-19	58,305	2,020	4,358
1919-20	62,824	1,181	4,168
1920-21	100,083	3,748	10,043
1921-22	171,654	*4,899	6,106
1922-23	92,448	5,865	6,577
	109,428	6,991	4,033
Totals	3,149,358	68,493	91,497

*This and subsequent years include Tanning Extracts, not previously recorded.

APPENDIX 3D.

Sawmilling Permits in Force as at the 30th June, 1923 (Granted under Forests Act, 1918).

Permit Holder.	No.	Locality.	Term.		Original Area.	Present Area.
			From	To		
Harper, A. J. ...	49	Albany ...	16-9-18	15-9-23	acres.	acres.
Westralia Timber and Trading Co., Ltd.	54	Inglehope ...	15-10-18	14-10-28	1,282	1,282
Adelaide Timber Co., Ltd.	57	Wilga ...	23-11-18	30-9-23	6,320	7,600
Swan Saw Mills, Ltd.	91	Quilergup ...	22-8-19	21-8-29	15,775	15,755
Smith, A.	97	Collie ...	2-9-19	1-3-23	15,800	15,800
Farley, D. V. C.	98	Donnybrook ...	30-9-19	29-9-23	3,150	3,150
Westralia Timber and Trading Co., Ltd.	101	Wuraming ...	20-11-19	19-11-24	550	550
Buckingham Bros.	106	Muja ...	25-11-19	24-11-23	5,000	3,100
Collie Land & Timber Co., Ltd.	107	Bingham River ...	29-11-19	28-11-23	5,200	5,200
Mann, A. S.	118	Wundowie ...	29-3-20	28-3-24	8,870	8,344
Groth, H. A.	141	Marbellup ...	28-6-20	27-6-23	7,724	6,820
Timber Corporation, Ltd.	144	Palgarup ...	15-9-20	14-3-24	1,000	1,000
Nicholson, Jno.	145	Barabup ...	1-9-21	31-8-24	1,000	1,000
Bunning Bros., Ltd.	147	Capel ...	27-8-20	30-6-24	10,000	10,000
Jenkins, W. M.	155	Balingup ...	1-12-20	30-11-23	600	600
Westralia Timber and Trading Co., Ltd.	157	Bowelling ...	1-11-20	31-10-25	1,104	1,104
Whistler Bros.	167	Bridgetown ...	1-1-21	31-12-23	35,500	35,500
Lewis & Reid, Ltd.	187	Glenlynn ...	1-3-21	29-2-24	1,500	1,500
Thompson, G. P.	188	Argyle ...	1-3-21	29-2-24	3,400	3,480
Groth, H. A.	197	Marbellup ...	1-3-21	29-2-24	760	714
Steele, H.	198	Albany ...	1-3-21	29-2-24	1,000	1,000
Timber Corporation, Ltd.	216	Greenbushes ...	1-4-21	31-3-31	2,050	2,050
Waters, A.	218	Sawyers' Valley ...	1-7-21	30-9-23	34,800	8,090
Douglas Bros.	226	Kalgan River ...	1-9-21	31-8-23	190	190
Hurst & Reilly	229	Boyanup ...	1-10-21	30-9-23	200	420
Douglas Bros.	241	Kalgan River ...	1-12-21	30-11-23	1,344	1,344
Miller, E. E.	243	Donnybrook ...	1-12-21	30-11-23	3,000	3,000
Wilson, E.	273	Mawson & Eriken ...	1-4-22	31-3-24	50	50
Lawson & Muschamp	281	Collie ...	1-5-22	31-3-24	218	218
Wandoo Timber Co., Ltd.	282	Collie ...	1-4-22	31-3-24	3,732	3,732
State Saw Mills	310	Bridgetown ...	14-7-22	13-7-23	960	960
Connell, R. C.	311	Collie ...	1-8-22	31-7-23	10,000	10,000
Lewis & Reid, Ltd.	317	Collie ...	1-9-22	31-8-23	1,350	1,350
Smith & Andrews	318	Hester ...	10-8-22	31-12-23	5,350	5,350
Bunning Bros., Ltd.	322	Lowden ...	1-11-22	31-10-23	630	630
Margaret River Timber Co., Ltd.	328	Margaret River ...	1-11-22	31-10-23	657	657
Timber Corporation, Ltd.	329	Greenbushes ...	1-11-22	31-10-23	19,315	19,315
Wandoo Timber Co., Ltd.	361	Muja ...	1-4-23	31-3-24	13,700	13,700
Margaret River Timber Co., Ltd.	362	Margaret River ...	1-4-23	31-3-24	1,210	1,210
State Saw Mills	367	Bridgetown ...	1-6-23	31-5-24	1,700	1,700
					760	760
			Total ...		226,751	198,225

APPENDIX 3E.

Hewing Permits in Force as at the 30th June, 1923.

Permit Holder.	No.	Locality.	Term.		Original Area.	Present Area.
			From	To		
Johnson, A. M.	1	Noggerup ...	26-2-17	29-2-24	acres.	acres.
Westralia Timber and Trading Co., Ltd.	34	Worsley ...	10-4-18	9-4-24	2,200	821
Carter, A.	191	Jarraewood ...	1-3-21	31-12-23	4,700	4,300
Scott, J. H.	200	Boyanup ...	1-3-21	31-12-23	1,000	1,000
Jackson, A. E.	236	Donnybrook ...	1-11-21	30-6-23	1,660	1,491
Sartori, G. & J.	289	Nannup ...	1-5-22	30-6-23	2,011	2,011
Sexton, J. W.	290	Nannup ...	1-5-22	30-6-23	5,400	5,400
Jackson & Rodgers, Ltd.	294	Wilgarrup ...	1-6-22	30-6-23	1,760	1,760
Callahan, J.	301	Nannup ...	1-7-22	30-6-23	1,300	1,300
Petterson, O. A.	302	Nannup ...	1-7-22	30-6-23	1,016	1,016
Colson, F. N.	325	Nannup ...	1-7-22	30-6-23	912	912
Aubin, L.	326	Jarraewood ...	1-11-22	31-10-23	2,048	2,048
Lawson, S. E.	330	Mungallup ...	1-11-22	31-10-23	465	465
Bailey, W. J.	334	North Greenbushes ...	1-11-22	31-10-23	100	100
Bailey, W. J.	336	North Greenbushes ...	11-11-22	30-6-23	345	345
Dore, C.	353	Kirup ...	11-11-22	30-6-23	270	270
Scott, E. J.	355	Worsley ...	14-2-23	30-6-23	2,040	2,040
Bloxsome, J. R.	358	Yornup ...	1-3-23	31-12-23	1,528	1,528
Trew, S. G.	359	Lion Mill ...	10-3-23	30-6-23	200	200
Palmer, W. C.	360	Noggerup ...	10-3-23	30-6-23	1,260	1,260
Piggott, F. C.	364	Donnybrook ...	1-4-23	31-3-24	2,028	2,028
Sloan, H.	366	Donnybrook ...	1-5-23	30-6-23	500	500
		Muja ...	15-5-23	30-6-23	1,000	1,000
			Total ...		33,743	31,795

APPENDIX 3F.

Firewood Permits in Force as at 30th June, 1923.

Permit Holder.	No.	Locality.	Term.		Original Area.	Present Area.
			From	To		
Morris, C. G.	66	Albany	30-4-19	29-4-24	340	340
Brady, M. J.	78	Albany	9-9-19	8-9-23	1,290	1,290
Smith, Jas. and John	113	Kalamunnda	18-2-20	17-2-24	395	395
Georgeff, M.	130	Balcatta	17-5-20	16-5-24	1,180	1,180
Blamire, R.	138	Kalamunnda	1-6-20	30-11-23	4,400	4,317
McMullen, W.	185	Warbrook	1-3-21	29-2-24	575	575
Young, J.	203	Helena River	2-4-21	...	13,400	13,400
Hunter, A. A.	205	Clackline	1-5-21	30-4-24	600	600
Forte, N. G.	219	Redmond	1-8-21	31-7-23	5,900	5,800
Goodall & Pepper	230	Marbellup	1-10-21	30-9-23	590	590
Groat, A.	244	Balcatta	1-12-21	30-11-23	1,180	1,180
Kent, G.	260	Sawyers' Valley	1-1-22	30-6-24	506	506
Dean, G.	264	Nannup	1-4-22	31-3-24	840	945
Colquhoun & Farrell	266	Sawyers' Valley	1-4-22	30-6-24	205	205
Trew, W.	267	Sawyers' Valley	1-4-22	30-6-24	570	570
Weston, F. J.	268	Pickering Brook	10-3-22	30-6-24	1,217	1,217
Saunders, J.	269	Pickering Brook	10-3-22	30-6-24	4,000	4,000
Eatts & Cadwallader	270	Pickering Brook	10-3-22	30-6-24	1,863	1,737
Hadley, S. A. D.	274	Ludlow	1-4-22	31-3-24	950	1,200
Goodall & Pepper	285	Marbellup	1-4-22	31-3-24	950	950
Houston, W. G.	299	Chidlow's	1-5-22	30-6-24	1,095	1,095
Martyr, W.	306	Chidlow's	1-7-22	30-6-24	896	896
McArthur & Lindley	308	Bedfordale	1-7-22	30-6-23	240	240
McCracken, G. T.	314	Mundaring	21-8-22	20-8-23	612	612
Murphy, O. F.	321	Jandakot	1-1-23	31-12-23	55	55
Gadd's Diorite Quarries, Ltd.	331	Bedfordale	1-11-22	31-10-23	1,500	1,500
Ferguson, Guild & Keenan	338	Beechina	1-1-23	30-6-24	1,680	1,680
Trew, S. G.	339	Sawyers' Valley	1-1-23	30-6-24	600	600
Nicholls, J. H.	340	Karragullen	1-1-23	30-6-24	1,500	1,500
Weston, F. J.	341	Pickering Brook	1-1-23	30-6-24	4,000	4,000
Eddy, J. C.	342	Pickering Brook	1-1-23	30-6-24	394	394
Letch, C. W. E.	348	Wundowie	1-2-23	31-1-24	1,776	1,776
Eatts, J.	351	Kelmscott	1-3-23	29-2-24	1,075	1,075
Georgeff, M.	352	Balcatta	1-3-23	29-2-24	113	113
				Total ...	56,487	56,533

APPENDIX 3G.

Miscellaneous Permits in Force as at 30th June, 1923.

Permit Holder.	No.	Locality.	Term.		Original Area.	Present Area.
			From	To		
Rowley Forest Products Co., Ltd. ...	1A	All waste Crown Lands ...	1-3-15	28-2-25	...	...
Hall, W. R.	104	Kalgoorlie	1-10-19	31-7-29	4,400,000	4,400,000
Western Fur and Leather Co., Ltd. ...	163	Bridgetown	1-12-20	30-11-23	48,000	48,000
Braddock, C. L.	179	North-West areas	1-1-21	31-12-25	*70,000	*70,000
Lawson, Bros.	312	Collie	1-7-22	31-12-23	16,420	16,420
Woodward, J. H. F.	332	Ludlow	1-1-23	31-12-27	6,091	6,091
Woodward, J. H. F.	333	North-West	1-1-23	31-12-27	*6,200	*6,200
Kerr, G.	347	Donnybrook	17-1-23	...	...	...
Alexander, C. B.	354	North-West Coast	1-3-22	29-2-24	14,080	14,080
Macgregor, A. L. G.	357	Darkan	1-4-23	31-3-24	16,000	16,000
Tollison, G. J.	365	Wanneroo	1-5-23	30-4-24	230	230
				Total ...	4,500,821	4,500,821

* Square miles, not included in total.

APPENDIX 3H.

Summary of Appendices 3A to 3G.

Number in Force.	Class of Holding.	Total Areas.	
		Original.	Present.
3	Timber Concessions (Appendix 3A)	396,000	370,273
22	Timber Leases (Appendix 3B)	359,100	214,837
28	Sawmill Permits (Appendix 3C)	798,207	788,548
40	Sawmilling Permits (Appendix 3D)	226,751	198,225
22	Hewing Permits (Appendix 3E)	33,743	31,795
34	Firewood Permits (Appendix 3F)	56,487	56,533
11	Miscellaneous Permits (Appendix 3G)	*4,500,821	*4,500,821
160	Total	6,371,109	6,161,032

* Not including 76,200 square miles (Permits No. 179 and 333).

APPENDIX 4.
LIST OF SAW MILLS.

Name of Sawmill Owner, and District.	Date of erection of Mill.	Locality, Permit No, Lease or Private Property.	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 of squared timber per day.	Percentage of recovery.	Rate per ton on sawn timber to Port of shipment.	Remarks.
ALBANY DISTRICT.												
Brooks, W. D., Tennessee ...	Oct., 1922	P.P., Loc. 1191 ...	Circular saw ...	8	M. Ch. 0 30 to mill	M. Ch. ...	M. Ch. 1 0	M. Ch. 21 0	8 doz. fruit cases	40	s. d. 8 4	Cuts Karri and Jarrah fruit cases. Works intermittently. Operates on P.P.
Douglas, J. R., Denmark ...	1912	P.P., Town Lot 302	do. ...	14	0 40 to mill	...	0 40	37 0	1	50	10 4	Cuts Karri and Banksia for general wheelwright work. Works intermittently from P.P.
Douglas Bros., Kalgan ...	July, 1921	P.P., Loc. 1498 ...	do. ...	25	0 40 to mill	...	13 0	At Albany	1	40	12 6	Cutting Sheoak and Jarrah for fruit cases. Operating Permits 226 and 241. Works intermittently.
Drage, J. E., Mt. Barker ...	1913	P.P., Loc. 79 ...	do. ...	10	0 40 to mill	...	17 0	31 0	8 doz. fruit cases	40	10 7	Cuts Jarrah for fruit cases. Works intermittently on P.P.
Edgley, A., Redmond ...	1921	P.P., Loc. 2698 ...	do. ...	12	0 30 to mill	...	7 0	20 0	7 doz. fruit cases	35	8 2	Cuts Jarrah fruit cases. Works intermittently on P.P.
Groth & Adams, Marbellup ...	Feb., 1921	P.P., Loc. 723 ...	do. ...	6	1 40	...	0 15	12 0	1	40	6 10	Cutting Sheoak for fruit cases and barrel staves. Operating permits Nos. 141 and 197.
Harper, A. J., Albany ...	1918	P.P., Town Lot 105	do. ...	12	5 0	...	0 40	At Albany	1	50	3 0	Cutting Sheoak for fruit cases, staves, furniture, and firewood. Operating Permit 49. Works intermittently.
Keith, A. E., Hay River ...	1910	P.P., Loc. 2685 ...	do. ...	5	1 0 to mill	...	3 0	29 0	1	50	9 4	Cuts Jarrah fruit cases. Mill practically closed.
Saw, C., Bow River ...	1919	P.P., Loc. 723 ...	do. ...	5.7	0 40 to mill	...	26 0	37 0	1	50	10 4	Cuts Karri, River Banksia, Red and Yellow Tingle Tingle. Works intermittently from P.P.
Steele, H., Albany ...	May, 1921	P.P., Town Lot 43	Circular and band saws	6	5 40 to mill	...	1 0	At Albany	1	50	3 0	Cutting Sheoak for fruit cases, staves, and firewood. Operating Permit 198. Works intermittently.
Steicke, J. B., Porongorups ...	1913	P.P., Loc. 1855 ...	Circular saw ...	18	0 40 to mill	...	17 0	31 0	10 doz. fruit cases	40	10 7	Cuts Karri mainly and Jarrah fruit cases. Has worked intermittently only since 1919 on P.P.
BRIDGETOWN DISTRICT.												
Connell, W. R., Bridgetown ...	1922	P.P., Loc. 663 ...	do. ...	8	1 40 to mill	...	2 0	60 0	1	70	...	Cutting Jarrah fruit cases, pickets, etc., for own use and sale, from P.P.
Holdsworth, W., Hester ...	1920	P.P., Loc. 1077 ...	do. ...	6	...	...	0 5	60 0	...	75	...	Cutting Jarrah and Karri fruit cases from waste ends from various mills.
Jenkins, W. M., Balingup ...	April, 1922	Permit No. 155, S.M.S., 33/33	do. ...	10	1 20	...	3 0	45 0	4	40	...	Cutting Jarrah sleepers and scantling. Operating Permit 155.
Lewis & Reid., Ltd., Yornup ...	Nov., 1922	Permit No. 187, S.M.S., 18/33	Twin and circular saws	20	1 40	0 40	2 40	78 0	10	33	25 0	Cutting Jarrah. Operating Permit 187.
Lindsey, W., Greenbushes ...	1921	P.P., Loc. 797 ...	Circular saw ...	12	0 50 to mill	...	1 0	54 0	2	40	...	Cutting Jarrah sleepers, scantling, fruit cases, etc., from P.P.

Machin, H. J., Bridgetown	1918	P.P., Loc. 767	do.	12	...	...	11 0	...	10 doz. fruit cases	90	...	...	Cutting Jarrah fruit cases only, from P.P.
Machin, J. H., Glentullock	1918	P.P., Loc. 620	do.	6	...	...	8 0	75 0	$\frac{1}{2}$	...	...	...	Cutting Jarrah fruit cases, etc., for own use from P.P.
Markey & Son, Bridgetown	22-11-21	P.P., Loc. 2023	do.	8	...	...	1 40	60 0	$\frac{1}{2}$	33	...	...	Cutting Jarrah fruit cases; scantling, and sleepers.
Mitchell & Ryan, Hester	July, 1919	P.P., Loc. 5290	do.	16	1 40 to mill	...	3 0	...	$1\frac{1}{2}$	34	...	...	Cutting Jarrah fruit cases, scantling, and sleepers. Operating Permit 79.
Smith, H., Winningup Road	1920	P.P., Loc. 6060	do.	8	0 40 to mill	...	4 0	60 0	$\frac{1}{2}$	60	...	...	Cutting Jarrah fruit cases for own use and sale, from P.P.
Sticpivich, W. H., Bridgetown	1921	P.P., Loc. 2887	do.	12	1 0 to mill	...	5 0	60 0	1	40	...	...	Cutting Jarrah fruit cases, scantling, and sleepers from P.P.
Timber Corporation, Ltd., Greenbushes	1898	P.P., Loc. 890	Vertical and circular saws	50	1 0	12 0	2 0	59 0	10	42	12 2	...	Cutting all classes Jarrah. Operating Permit Nos. 216 and 239.
Whistler Bros., Dinninup	May, 1921	P.P., Nelson Loc. 1356	Circular saw	32	2 0	...	6 0	79 0	8	48.52	15 2	...	Cutting Jarrah and Wandoo sleepers, scantling, etc. Operating P.P. and Permit No. 167.
COLLIE DISTRICT.													
Amalgamated Collieries of W.A., Ltd., Collie	1920	Coal Mining Lease 245	do.	60	1 0	Nil	0 40	41 0	3	60	10 10	...	Cutting Jarrah for mining purposes. Mill not working at present.
Buckingham Bros., Buckingham's Siding	1912	Permit 44/11, S.M.S. 30/33	Twin and circular saw	26	1 52	8 0	0 60	53 0	14	49	12 5	...	Cutting Jarrah sleepers and building timbers from Permits 44/11, 83/11, and 106.
Bunning Bros., Ltd., Lyall's Mill	1903	P.P., Lease 5747/56	do.	200	1 0	9 0	6 0	49 0	30	50	13 1	...	Cutting Jarrah in all sizes. Operating permits 94/11, 95/11, 97/11, and 99/11.
Collie Land and Timber Co., Ltd., Collie	Oct., 1921	Permit 107, S.M.S. 8/33	Circular saw	14	2 40 to mill	...	9 0	52 0	8	45	...	...	Cuts Jarrah. Operates Permit 107. Not working during 1922-23.
Connell, R. C., Collie	Oct., 1921	P.P., Loc. 798	do.	12	1 40 to mill	...	3 0	41 0	4	36	12 10	...	Cuts Jarrah for general use. Not working during 1922-23. Operates Permit 311.
Lawson & Muschamp, Collie	1923	Permit 281, S.M.S. 23/33	do.	14	0 60	...	2 40	41 0	5	55	12 1	...	Cutting Jarrah sleepers and scantling from Permit 281.
Lewis & Reid, Ltd., Allanson	1917	S.M.S. 6/33	Twin and circular saws	30	2 40	2 40	0 5	37 0	4	33	10 4	...	Cuts Jarrah for general use. Mill not working. Operates on Permit 37/11.
Lewis & Reid, Ltd., Reid's No. 2 Mill	1915	S.M.P. 37/11, S.M.S. 15/33	Circular saw	60	1 0	3 0	6 60	36 0	20	40	...	...	Cutting Jarrah. Operates on Permits 317 and 37/11.
Millar's Timber & Trading Co., Ltd., Hoffman's Mill	1920	Timber Lease 261/113	Twin and circular saws	60	1 0	3 0	18 0	37 0	18.79	48.8	10 4	...	Cutting Jarrah. Operating Timber leases 261/113 and 322/113.
Millar's Timber & Trading Co., Ltd., No. 1, Mornington	1898	P.P., Loc. 1	Vertical twin and circular saws	60	0 30	20 0	6 60	26 0	45	44	9 4	...	Cutting all classes of Jarrah timber, including fruit cases for local and export trade. Operating Timber leases 186/113, 227/113, 230/113, 269/113, 296/113, 297/113 and 325/113.
Millar's Timber and Trading Co., Ltd., No. 2, Mornington	1898	P.P., Loc. 1	Twin and circular saws	60	0 30	20 0	6 60	26 0	45	44	9 4	...	Cutting all classes of Jarrah timber, including fruit cases for local and export trade. Operating Timber leases 186/113, 227/113-230/113, 269/113, 296/113, 297/113 and 325/113.

APPENDIX 4—continued.

Name of Sawmill Owner, and District.	Date of erection of Mill.	Locality, Permit No., Lease or Private Property.	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 of squared timber per day.	Percentage of recovery.	Rate per ton on Sawn Timber to Port of shipment.		Remarks.	
					M. Ch.	0 75	M. Ch.	18 0	M. Ch.	On line	M. Ch.	37 0			s.	d.		
Millar's Timber & Trading Co., Ltd., Yarloop	1896	P.P.	Band and circular saws	18	0 75	...	...	...	...	...	...	...	6.16	60	10	4	Cuts Jarrah. Not working at present.
Palmer, R., Collie	1919	Collie Town Lot 529	Circular saw ...	24	2 0 to mill	...	...	0 20	41 0	...	...	...	2	50	...	...	Cuts Jarrah for local use from P.P. Mill closed at present.
Snell, A., Harvey	1920	P.P., Loc. 58 ...	do. ...	10	2 60 to mill	...	...	20 0	29 0	...	...	...	3	50	...	...	Cuts Jarrah fruit cases mainly. Not working at present.
State Saw Mills, No. 6, Worsley	April, 1921	S.M.P. 82/11, S.M.S. 29/33	Twin and circular saws	50	1 0 to mill	...	...	5 0	28 0	...	...	...	8	48	...	...	Cutting Jarrah sleepers and scantling. Operating on Permit 82/11.
Trees, Ltd., Treesville	1920	S.M.P. 71/11, S.M.S. 9/11a	do. ...	36	1 20	...	1 0	31 0	57 0	...	...	...	10	45	...	...	Cuts Jarrah sleepers, boards, and scantling. Operates Permit 71/11. Not working during 1922-23.
Wandoo Timber Co., Ltd., Muja	1915	P.P., Loc. 1676 ...	do. ...	35	0 60	...	4 0	0 60	51 0	...	...	...	12.18	47	12	4	Cutting Jarrah for local use and export. Operating Permit 89/11.
Westralia Timber and Trading Co., Ltd., Bowelling	Feb., 1921	Permit 157, S.M.S. 16/33	do. ...	35	1 40	...	...	0 25	64 0	...	...	...	7½	47	13	5	Cuts Jarrah for export and local use. Operates Permit 157. Not working during 1922-23.
Westralia Timber and Trading Co., Ltd., Jardup	1921	P.P., Loc. 50 ...	do. ...	14	2 0 to mill	...	...	5 0	29 0	...	...	...	6	45	9	4	Cuts Jarrah and Blackbutt. Operates on private property. Not working at present.
DONNYBROOK DISTRICT.																		
Adams, W. F., Argyle	1923	P.P.	Circular saw ...	10	Cutting Jarrah fruit cases from mill dockings only.
Adelaide Timber Co., Ltd., Wilga	1909	Permit 57, S.M.S. 14/33	do. ...	42	1 20	...	3 0	Nil	58 0	...	...	...	7	45	12	10	Cutting Jarrah sleepers, building, and dressed timber, etc. Operating Permits 57 and 380.
Bendall, W., Donnybrook	Dec., 1920	P.P., Loc. 989 ...	do. ...	10	...	...	0 40	1 60	21 0	...	...	...	1	70	8	4	Cutting Jarrah fruit cases only, for sale and own use from P.P.
Bowman, J. H., Charlie's Creek...	1916	P.P., Loc. 109 ...	Twin and circular saws	12	1 0	...	...	...	...	...	...	...	100 cases	...	No export	...	Cutting Jarrah and Karri fruit cases for own use. Works only a few weeks during year.
Bunning Bros., Ltd., Argyle ...	...	P.P., Loc. 2170 ...	do. ...	60	1 0	...	10 0	15 0	21 0	...	...	...	15	45	8	4	Cutting Jarrah for local use and export. Operating S.M.P. 93/11, 96/11 and 147.
Crock & Foster, Wellington Mills	April, May, 1923	Timber Lease 288/113	do. ...	26	1 40	...	...	...	...	...	...	...	9	47	6	6	Cutting boards and scantlings.
Davern, J. T., Lowden	1919	P.P., Loc. 89 ...	Circular saw ...	10	...	...	1 0	0 20	35 0	...	...	...	2½	75	10	1	Cutting Jarrah fruit cases and scantling for own use only from P.P.
Farley, D. V. C., Goodwood	1-9-19	Permit 98, P.P. Loc. 1003	do. ...	30	0 40	...	...	10 0	16 0	...	...	...	10 doz dump fruit cases	70	8	11	Cutting Jarrah fruit cases and scantling for sale and local use from Permit 98.
Harris, C. T., Capel ... ..	...	P.P., Wellington Loc. 1095	do. ...	15	0 40	...	...	5 0	17 0	...	...	...	2	90	...	...	Cutting Jarrah fruit cases and scantling. Operating Permit 369.
Hurst & Reilly, Boyanup	April, 1922	Permit 229, S.M.S. 31/33	Twin and circular saws	6	...	...	20 0	3 40	16 0	...	...	...	1	60	7	4	Cutting Jarrah fruit cases and other timber on Permit 229.
Hutton, T. G., Capel	1917	P.P., Loc. 77 ...	Circular saw ...	6½	...	...	0 40	4 0	16 0	...	...	...	10 doz. fruit cases	50	8	11	Cutting Jarrah fruit cases and a little building timber from P.P.

Jones, T. B., Mumballup ...	...	P.P., Loc. 1405 ...	do. ...	7	...	0 20	1 0	43 0	3	70	11 1	Cutting Jarrah fruit cases for own use from P.P.
Martin, R. M., Queenwood ...	1918	P.P., Loc. 629 ...	do. ...	8	1 0	...	1 20	33 0	1½	70	9 7	Cutting Jarrah fruit cases for own use only from P.P.
McSweeney & Scott, Boyanup ...	Sept., 1921	Permit 200, S.M.S. 32/33	do. ...	8	1 0	At mill	1 40	15 0	2	70	7 4	Cutting Jarrah sleepers, fruit cases and scantling from Permit 200.
Millar, Thos., Thompson's Brook ...	...	P.P., Loc. 61 ...	do. ...	6	...	0 20	4 0	31 0	1	90	9 7	Cutting Jarrah fruit cases and scantling. Working intermittently on P.P.
Millar's Timber and Trading Co., Ltd., East Kirup	1910	Timber Lease 257/113	Vertical, twin, and circular saws	350	0 60	8 0	13 0	37 0	100	45	10 4	Cutting Jarrah. Operating Timber leases 257/113 and 291/113.
Millar's Timber and Trading Co., Ltd., Wellington Mills	April 1921	Timber Lease 288/113	Twin and circular saws	26	1 0	1 0	13 0	9 0	12	50	6 6	Cutting general timbers. Operating Timber lease 288/113.
Miller, E. E., Donnybrook ...	...	P.P., Loc. 158 ...	Circular saw ...	6	0 15	...	...	3 0	1	60	...	Cutting Jarrah fruit cases only. Operating Permit 243.
Parmenter, S. T., Mullalyup ...	Nov., 1921	P.P., Loc. 1708 ...	do. ...	6	0 10	...	1 0	41 0	4 doz. ¾ flat fruit cases	75	10 10	Cutting Blackbutt. Fruit cases only from P.P.
Patroni, J., Upper Capel ...	June 1921	P.P., Loc. 1292 ...	do. ...	10	0 40	...	5 0	25 0	3	60	8 10	Cutting Jarrah fruit cases for own use only from P.P.
Pinto, E. B., Preston ...	May, 1922	P.P., Loc. 1988 ...	do. ...	6	...	1 0	1 40	31 0	¾	70	9 7	Cutting Jarrah fruit cases for own use only from P.P.
Preston Valley Sawmills, Ltd., Lowden (No. 2)	Feb., 1920	P.P., Lease 48/822, S.M.S. 13/11a	Twin and circular saws	25	1 0	1 0	1 0	35 0	10-12	52	10 1	Cutting Jarrah, general sizes, from P.P.
Preston Valley Sawmills, Ltd., Noggerup	1906	S.M.S. 13/11a ...	do. ...	40	1 0	4 0	On main line	48 0	14	40	11 3	Cutting Jarrah for fruit cases and local and export markets. Operating Saw Mill Permit 95/11.
Slattery, B., Ferguson ...	1919	P.P., Loc. 578 ...	Circular saw ...	4	1 0	At mill	8 0	9 0	¼	75	No export	Cutting Jarrah, Banksia, Marri and Peppermint. Fruit cases principally from P.P.
Thompson, G. P., Argyle ...	3-4-21	P.P., Loc. 3217 ...	Twin and circular saws	6	...	1 0	1 20	19 0	½	40	8 4	Cutting Jarrah for own use and sale locally. Operating Permit 188.
Warner, W. A. (junr.), Mullalyup	Mar., 1921	P.P., Loc. 1012 ...	Circular saw ...	6	...	1 0	1 0	41 0	10 doz ¾ flat fruit cases	50	10 10	Cutting Jarrah for fruit cases, and timber for use on farm from P.P.
JARRAHWOOD DISTRICT. Forests Department, Wonnerup	30-6-21	State Forests, No. 2	Twin and circular saws	40	0 60	No landing	0 20	6 0	2	36	...	Cutting Tuart. Bulk of output for W.A.G. Railways. Mill ceased working January, 1923.
Group Settlers, Karridale ...	...	Crown Lands ...	Circular saw ...	10	...	0 60	2 40	5 0	4	45	...	Cutting Jarrah for Group Settlement Cottages from Group Settlement Blocks.
Kauri Timber Co., Ltd., Barabup	1909	Loc. 692, State Forest No. 6	Vertical, twin, and circular saws	85	0 60	20 0	6 0	22 0	29	41.52	9 11	Cutting Jarrah sleepers and building timber. Operating Sawmill Permit 61/11.
Kauri Timber Co., Ltd., Ellis Creek	1914	S.M.P. 61/11, S.M.S. 22/33	Band and circular saws	75	0 60	3 0	14 0	32 0	32	49.28	11 3	Cutting Jarrah sleepers and building timber. Operating Permit 61/11.
Margaret River Timber Co., Busselton	...	Permit 328, S.M.S. 26/33	Circular saw ...	20	1 0	1 0	0 40	20 0	10	40	...	Cutting Jarrah for local and export trade from Permit 328.
Millar's Timber and Trading Co., Ltd., Jarrahwood	...	P.P., Sussex Loc. 361	Twin and circular saws	40	0 60	7 0	0 5	28 0	20	43	9 2	Cutting Jarrah timber. Operating timber leases 145/113, 149/113, and 150/113.
Smith, J. F., Nannup ...	Mar., 1923	Town Lot 157 ...	Circular saw ...	20	...	0 20	0 20	46 0	1	45	No export	Cutting Jarrah for house timbers and fruit cases from P.P.

APPENDIX 4.—continued.

Name of Sawmill Owner, and District.	Date of erection of Mill.	Locality Permit, Lease No. or Private Property.	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 of squared timber per day.	Percentage of recovery.	Rate per ton on Sawm Timber of shipment.	Remarks.
					M. Ch.	M. Ch.	M. Ch.	M. Ch.			s. d.	
Sussex Timber Co., Ltd., Deller-ton	In course of erection	P.P., Loc. 3898 ...	Twin and circular saws	32	2 0 to mill	...	2 0	36 0	...	...	10 2	Cutting Jarrah timber, Operating Permit 145.
Swan Sawmills, Ltd., Claymore...	1921	Permit 91, S.M.S 4/33	Circular saw ...	40	1 0	1 0	2 0	22 0	15	41	8 5	Cutting Jarrah timber from Permit 91.
MANJIMUP DISTRICT.												
Edwards, R. H., Balbarrup ...	Sept., 1921	P.P., Loc. 7407 ...	Circular saw ...	8	0 5	...	13 0	90 0	$\frac{1}{2}$	50	15 8 no export	Cutting fruit cases, and Jarrah timber for own use from P.P.
Fanning, H. A., Balbarrup ...	Feb., 1922	P.P., Nelson Loc. 2278	do. ...	6	0 20	...	7 0	90 0	$\frac{1}{2}$	50	15 8 no export	Cutting Jarrah fruit cases and timber for own use from P.P.
Glauder, F., Pemberton ...	Dec., 1921	P.P., Nelson Loc. 2720	do. ...	6	0 40	...	21 0	93 0	$\frac{1}{2}$	50	15 11 no export	Cutting Jarrah, Marri, Sheoak and Banksia for own use from P.P.
Hornby, F. H., Balbarrup ...	1921	P.P., Nelson Loc. 1615	do. ...	6	0 40	...	7 0	90 0	1	50	15 8 no export	Cutting Jarrah, Marri, Blackbutt and Banksia. Fruit cases and timber for own use from P.P.
Johnson, J., Balbarrup ...	1912	P.P., Nelson Loc. 1907	do. ...	12	0 40	...	5 0	90 0	1	50	15 8 no export	Cutting Jarrah and Blackbutt, fruit cases and timber for own use from P.P.
Ralph, W., Balbarrup ...	1910	P.P., Loc. 2384 ...	do. ...	7 $\frac{1}{2}$	0 40	...	9 0	90 0	$\frac{1}{2}$	50	15 8 no export	Cutting Jarrah fruit cases and timber for own use from P.P.
State Sawmills, No. 1, Manjimup	5-12-1913	S.M.P. 86/11, Reserve 1655	Vertical, twin, and circular saws	240	0 60	12 0	4 0	90 0	39	40-44	15 8 and 5d. hauling	Cutting Jarrah and Karri timber for local and export trade from Permits 86/11 and 310.
State Sawmills, No. 2, Pemberton	1920	S.M.P. 85/11, Reserve 16354	Vertical and circular saws	400	0 40	9 0	17 0	93 0	50	40-45	15 11	Cutting Karri for local and export trade. Operating Permit 85/11.
State Sawmills, No. 3, Pemberton	1913	S.M.P. 85/11, Reserve 16354	Twin and circular saws	280	0 40	9 0	17 0	93 0	50	40-45	15 11	Cutting Karri for local and export trade. Operating Permit 85/11.
Timber Corporation, Ltd., Palgarup	1921	P.P., Nelson Loc. 1024	do. ...	25	1 0	2 0	2 60	85 0	10	40	15 3	Cutting Jarrah. Operates Permit 144 and P.P. Mill closed down on 11th March, 1922.
Wilgarrup Karri and Jarrah Co., Ltd., Jarnadup	April to Sept., 1911	S.M.P. 42/11, S.M.S. 7/33	Vertical and circular saws	75	0 30	7 0	0 30	93 0	34	39-65	15 11	Cutting Jarrah and Karri for local and export trade from Permit 42/11.
MUNDARING DISTRICT.												
Bettenay, J. & Sons, Karragullen	June 1921	P.P., Canning Loc. 403	Circular saw ...	12	...	...	2 0	...	1	60	...	Cutting Jarrah fruit cases from P.P.
Buckingham, W. S., Kelmscott	...	P.P., Loc. 33 ...	Vertical and circular saws	13	Direct hauling	...	3 40	...	$\frac{1}{4}$	60	...	Cutting Jarrah fruit cases and timber for own use from P.P.
Bunning Bros., Ltd., Lion Mill ...	1901	P.P., Loc. 1036 ...	Twin and circular saws	18	3 0	8 0	0 40	37 0	12	40	10 4	Cutting Jarrah, Wandoo and Blackbutt for export and local trade from P.P.
Curtis, Chisholm & Co., Canning Dale	April 1921	P.P., Loc. 520 ...	Circular saw ...	14	1 0 to mill	...	7 0	...	2 $\frac{1}{2}$	50	...	Cutting Jarrah for fruit cases and scantling from P.P.
Dennis, H. J., Wanneroo ...	June, 1922	P.P., Swan Loc. 2737	do. ...	5 $\frac{1}{2}$	...	0 60	...	...	6,000 fruit cases per yr.	65	...	Cutting fruit cases for local settlers from P.P.
Mann, A. S., Wundowie ...	Jan., 1921	P.P., Avon Loc. 6649	do. ...	12	3 0 to mill	...	0 4	53 0	2	50	...	Cutting Jarrah for local use from Permit 118 and P.P.

Millar's Timber and Trading Co., Ltd. (Barton's)	...	Concession 12/1 ...	Twin and circular saws	25	1 0	5 40	8 0	38 0	14	46	...	Cuts Jarrah sleepers and scantling. Mill has been closed since 27th March, 1922. Operates Concession 12/1.
Millar's Timber and Trading Co., Ltd., No. 1, Jarrahdale	1913	P.P. Cockburn Sound Loc. 282	do ...	110	1 20	21 0	7 0	30 0	45	45	9 5	Cutting Jarrah timber. Operating Concession 12/0.
Millar's Timber and Trading Co., Ltd., No. 2, Jarrahdale	1922	do. ...	do. ...	55	1 20	21 0	7 0	30 0	22	45	9 5	Cutting Jarrah timber. Operating Concession 12/0.
Millar's Timber and Trading Co., Ltd., Mundijong (Board Mill)	1919	P.P. Cockburn Sound Loc. 524	Circular saw ...	20	...	...	1 0	30 0	17	82	9 5	Cuts boards only from flitches supplied by other mills. Operating Concession 12/0. Mill was closed down on 15th February, 1922.
Palmateer, G. H., Bickley	1919	P.P. Loc. 672 ...	do. ...	6	...	...	0 40	...	...	...	...	Cuts waste Jarrah into fruit cases. Mill closed and is unlikely to start again.
Railway Department, Midland Junction	...	Midland Junction Workshops	Band and circular saw	80	...	...	...	...	10	50	...	Cutting Tuart and Wandoo for own use.
Stinton, H., Karragullen	Jan., 1913	P.P. ...	Circular saw ...	10	1 0 to mill	...	2 0	45 0	$\frac{1}{2}$	75	...	Cuts Jarrah fruit cases and timber. Mill being sold as parts and may not start again as complete mill.
Turner, W. H., Jarrahdale	Sept., 1921	P.P. Loc. 68 ...	Twin and circular saws	10	0 40 to mill	...	4 40	35 0	1	60	...	Cutting Jarrah fruit cases and scantling from P.P.
Walker & Potter, Wanneroo	May, 1922	P.P. ...	Circular saw ...	10	0 40 to mill	...	...	...	$\frac{1}{2}$	60	No export	Cutting Jarrah and Tuart fruit cases and scantling from P.P.
Waters, A., Sawyers' Valley	Sept., 1921	P.P. Lease 297/55	do. ...	8	0 60 to mill	...	0 70	35 0	...	...	...	Cutting Jarrah fruit cases and scantling. Operating Permit 218.
PINJARRA DISTRICT.												
Australian Lumber Co., Ltd. (No. 1, Hotham)	1921	P.P. Loc. 703 ...	Twin and circular saws	25	1 0	Direct to mill	0 20	88 8	12	45	16 7	Cutting Jarrah and Wandoo on private property.
Australian Lumber Co., Ltd. (No. 2, Hotham)	1921	P.P. Loc. 703 ...	do. ...	30	1 0	...	0 20	88 8	20	45	16 7	Cutting Jarrah on private property.
Bailey Timber Co., Mandurah	Nov., 1921	P.P. Loc. 16 ...	Crosscut and circular saws	75	3 0 to mill	...	12 0	61 0	3	70	13 2	Cutting Tuart, railway and coach building timbers on private property.
Edgeworth, & Co. Pinjarra	1920	P.P. Lot 14 ...	Circular saw ...	10	...	...	1 0	61 0	...	...	13 2	Cutting fruit cases from waste Jarrah from other mills.
Millar's Timber and Trading Co., Ltd., Marrinup	1910-11	Timber Lease 330/113	Twin and circular saws	36	0 60	2 0	...	73 0	12	50	14 2	Cutting Jarrah for local and export trade. Operating Timber Lease 330/113.
Millar's Timber and Trading Co., Ltd., Nanga Brook	1908	Timber Lease 261/113	Twin, vertical, and circular saws	60	0 40	7 9	23 0	37 0	43.63	44	14 9	Cutting Jarrah for local and export trade. Operating Timber leases 244/113 and 299/113.
Port & Co., Ltd., Pindalup	1911	S.M.P. 34/11, S.M.S. 13/33	Horizontal and circular saws	28	2 0	...	...	88 0	9	48	15 8	Cutting Jarrah for local and export trade from Permit 34/11.
Port & Co., Ltd., Pindalup (Board Mill)	In course of erection	S.M.P. 34/11, S.M.S. 27/33	Twin and circular saws	25	Nil	...	3 40	84 0	8	...	...	Cutting Jarrah for local and export trade. Mill started cutting 3-7-23 from Permit 34/11.
Railway Department, No. 1, Dwellingup	1912	Railway property ...	do. ...	30	2 0	Landing at mill	on line	70 0	4	48	14 6	Cuts Jarrah for local and export trade. Mill ceased cutting Jan., 1923.
Railway Department, No. 2, Dwellingup	Nov., 1912	P.P. Loc. 1037 ...	do. ...	100	0 60	3 0	4 40	75 71	50	49.16	14 6	Cutting Jarrah, Sheoak, and Bulitch for own use, but surplus for export. Operating Permit 78/11.

APPENDIX 4—continued.

Name of Sawmill Owner and District.	Date of Erection of Mill.	Locality, Permit No., Lease or Private Property.	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 of Squared Timber per day.	Percentage of Recovery.	Rate per Ton on Sawn Timber to Port of Shipment.	Remarks.
Rosenthal, C. H. A., Meelon ...	1-8-1921	Railway Reserve, Meelon	Circular saw ...	12	M. Ch. ...	M. Ch. ...	M. Ch. ...	M. Ch. 67 0	12 doz. fruit cases	...	s. d. 13 8	Cutting fruit cases from waste Jarrah from other mills.
State Saw Mills (Patterson, J. H.), Amphion	1913-14	S.M.P. 81/11, S.M.S. 19/33	Twin and circular saws	35	0 60	2 40	0 60	82 0	5	...	15 4	Cutting Jarrah for local and export trade from Permit 84/11.
State Sawmill No. 4, Wuraming	1913	S.M.P. 79/11, S.M.S. 17/33	Twin and circular saws	30	0 60	4 40	0 60	90 0	22½	38	15 10	Cutting Jarrah for local and export trade from Permit 79/11.
State Sawmill, No. 5, Holyoake	1911	S.M.P. 27/11, S.M.S. 12/33	do. ...	65	0 60	13 0	on line	77 0	47½	50	14 7	Cutting Jarrah for local and export trade from Permits 27/11 81/11.
Westralian Timber and Trading Co., Ltd., Inglehope	1919	Permit 54 ...	do. ...	37	0 60	3 0	on line	82 0	16	42	...	Cutting Jarrah for local and export trade from Permit 54.
Whittaker Bros., North Dandalup	1902	S.M.P. 84/11, S.M.S. 12/11a	do. ...	120	1 0	7 0	4 0	55 0	32	55	11 5	Cutting Jarrah for local trade. Operating Permits 76/11 and 84/11.

APPENDIX 5.

Table showing the number of various Timber Workers' Registration Certificates issued from 1st July, 1922, to 30th June, 1923, as compared with those issued during the year ended 30th June, 1922.

Variety of Registrations.	Number issued for year ended 30th June, 1922.	Number issued for year ended 30th June, 1923.
Hewers	421	459
Fallers	429	268
Haulers	123	105
Carters	45	50
Managers and Bush Foremen	59	49
Teamsters	37	20
Swampers	196	111
Firewood Cutters and Carters	208	126
Charcoal Burners and Carters	2	...
*Timber Getters	44	15
Horse Drivers	13	8
Barrel Stave and Billet Splitters	3	3
Ropemen	...	2
Handcutter	...	1
Whistle Boys	5	2
Shoemen	2	...
Beam Squarers	2	4
Engine Drivers	8	3
Hookmen	4	4
	1,601	1,230

* Working on Coal Mining Leases at Collie.

APPENDIX 6.

Table showing the number of Licenses issued from 1st July, 1922, to 30th June, 1923, as compared with those issued during the year ended 30th June, 1922.

License.	Number issued for year ended 30th June, 1922.	Number issued for year ended 30th June, 1923.
*Managers and Bush Foremen	15	16
Firewood	3,164	2,782
Mining Timber	78	67
Timber	22	3
Bark Strippers	40	35
Fence Post	22	21
Sandalwood	537	705
	3,878	3,629

* These figures allude to the Goldfields only.

APPENDIX No. 7.

List of Herbarium Specimens Collected and Identified, during the year ended 30th June, 1923.

Botanical Name.	Local Name.	Botanical Name.	Local Name.
<i>Abutilon crispum</i> , G. Don ...	Shrub.	<i>Conospermum</i> var. <i>marginatum</i>	
<i>Acacia aestivalis</i> , E. Pritzel ...	Wattle.	Benth.	
" <i>Coolgardiensis</i> , Maiden ...	Coolgardie Wattle.	" <i>flexuosum</i> , R. Br. ...	
" <i>coriacea</i> , D. C. ...	North-West - Coastal Wattle.	<i>Crotalaria Cunninghamii</i> , R. Br. ...	Green Bird Flower.
" <i>dilatata</i> , Benth ...		<i>Cryptandra pungens</i> , Steud. ...	
" <i>Drummondii</i> , Lindl. ...		<i>Cycas basaltica</i> , Gardner ...	Palm.
" <i>exocarpioides</i> , W. V. F. ...	Prickly Wattle (Gold-fields).	<i>Darwinia acerosa</i> , W. V. Fitzg. ...	
" <i>extensa</i> , Lindl. ...		" <i>collina</i> , Gardner ...	Yellow Mountain Bell
" <i>holsericea</i> , A. Cunn. ...	Wyndham Wattle.	" <i>purpurea</i> , Benth. ...	
" <i>ligustrina</i> , Meissn. ...	Frosty-leaved Wattle.	" <i>thryptomenoides</i> , Herbert	
" <i>lysiphloea</i> , F. v. M. ...		<i>Daviesia uniflora</i> , Herbert ...	
" <i>nervosa</i> , D. C. ...		<i>Dendrobium dicuphum</i> , F. v. M. ...	Tree Orchid.
" <i>obovata</i> , Benth. ...		<i>Dicrasytes stoechas</i> , Drumm. ...	
" <i>oncinophylla</i> , Meissn. ...	Narrow-leaved Black Wattle.	<i>Diololaena Dampieri</i> , Desf. ...	
" <i>Pelloia</i> , Gardner ...		<i>Epilobium junceum</i> , Forst. ...	
" <i>plectocarpa</i> , A. Cunn. ...		<i>Eremophila alternifolia</i> , R. Br. ...	
" <i>salicina</i> , Lindl. ...	Blue Bush, or Clay bush.	" <i>caerulea</i> , Sp. Moore ...	
" <i>saligna</i> , Wendl. ...	Weeping Wattle.	" <i>Delisseri</i> , F. v. M. ...	
" <i>sericata</i> , A. Cunn. ...	Large-leaved Wattle of Kimberley.	" <i>Latrobei</i> , F. v. M. ...	
" <i>subcaerulea</i> , Lindl. ...		" <i>oppositifolia</i> , R. Br. ...	
" <i>tetragonophylla</i> , F. v. M. ...	Prickly Wattle.	" <i>Paisleyi</i> , F. v. M. ...	
<i>Acrostichum scandens</i> J. Sm. ...	Climbing Fern.	" <i>Phillipsii</i> , F. v. M. ...	
<i>Actinotus superbus</i> , Sargent Ms. ...	Flannel Flower.	" <i>scoparia</i> (R.Br.) F. v. M. ...	
<i>Adenanthos intricata</i> , Gardner. ...		" <i>Sturtii</i> , F. v. M. ...	
<i>Adiantum lunulatum</i> , Burm. ...	Kimberley Maiden-hair Fern.	" <i>Weldii</i> , F. v. M. ...	
<i>Alysicarpus Chulii</i> , Gardner. ...		<i>Ericopsis formosus</i> , Gardner ...	Blood Flower.
<i>Anarthria laevis</i> , R. Br. ...		<i>Eriostemon Brucei</i> , F. v. M. ...	
<i>Anthotium rubriflorum</i> , F. v. M. ...		" <i>difformis</i> , A. Cunn. ...	
<i>Astartea fascicularis</i> , D.C. ...		" <i>thryptomenoides</i> , Spencer Moore.	
<i>Atalaya salicifolia</i> , F. v. M. ...	Kimberley Willow.	<i>Erodium cicutarium</i> , L'Her ...	Wild Geranium.
<i>Atriplex spongiosa</i> , F. v. M. ...	Creeping Salt Bush.	<i>Eucalyptus accedens</i> , W. V. Fitzg. ...	Powder Bark Wandoo.
<i>Avicennia officinalis</i> , Linn. ...	White Mangrove.	" <i>angulosa</i> (Benth), Maiden	Mallee.
<i>Banksia Brownii</i> , Baxter ...	Fern-leaved Banksia.	" <i>annulata</i> , Benth. ...	Moort.
" <i>prostrata</i> , R.Br. ...	Dwarf Banksia.	" <i>n. sp.</i> ...	Brown Mallet.
" <i>quercifolia</i> , R. Br. ...	Oak-leaved Banksia.	" <i>buprestium</i> , F. v. M. ...	Mallee.
<i>Barringtonia sphaerocarpa</i> , Gardner		" <i>calycogona</i> , Turcz. ...	Mallee.
<i>Bassia diacantha</i> , F. v. M. ...		" <i>campaspe</i> , Sp. Moore ...	Silver-topped Gimlet.
<i>Blumea integrifolia</i> , D.C. ...		" <i>Clelandi</i> , Maiden ...	Goldfields Blackbutt.
<i>Boronia spathulata</i> ...	Pink Swamp Boronia.	" <i>conglobata</i> (R. Br.) Maiden	Mallee.
<i>Brachysema praemorsum</i> , Labill. ...		" <i>cornuta</i> , Labill. ...	Yate.
<i>Burmannia disticha</i> , Linn. ...		" <i>crucis</i> , Maiden ...	Mallee.
<i>Callistemon phoeniceus</i> , Lindl. ...	Bottle Brush.	" <i>decipiens</i> , Endl. ...	Coastal White Gum.
<i>Callitris intratropica</i> , F. v. M. ...	Kimberley Cypress Pine.	" <i>decurva</i> , F. v. M. ...	Mallee.
" <i>Roei</i> , Endl. ...	Sand Plain Cypress.	" <i>doratoxylon</i> , F. v. M. ...	Mallee.
" <i>verrucosa</i> , R. Br. ...	Cypress Pine.	" <i>erythronema</i> , Turcz. ...	White Mallee.
<i>Calothamnus pachystachyus</i> , Benth.	Bottle Brush.	" <i>Ewartiana</i> , Maiden ...	Lace-barked Mallee.
<i>Calythrix angulata</i> , Lindl. ...		" <i>falcata</i> , Turcz. var. <i>ecosata</i> , Maiden	White Mallet.
<i>Canthium attenuatum</i> , R. Br. ...		<i>Flocktonia</i> , Maiden ...	Merrit.
<i>Carallia integerrima</i> , D.C. ...	Mangrove.	" <i>n. sp.</i> ...	Blue Mallet.
<i>Carapa obovata</i> ...	Mangrove.	" <i>gomphocephala</i> , D.C. ...	Tuart.
<i>Casuarina decussata</i> , Benth. ...	Karri Sheoak.	" <i>gracilis</i> , F. v. M. ...	Bastard Morrel.
" <i>Dorrieni</i> , Domin. ...		" <i>Herbertiana</i> , Maiden ...	Kimberley Mallee.
" <i>glauca</i> , Sieb. ...	Swamp Oak.	" <i>incrassata</i> , Labill ...	Mallee.
" <i>grevillioides</i> , Diels. ...		" <i>Kalganensis</i> , Maiden ...	Mallee.
" <i>Helmsii</i> , Ewart & Gordon		" <i>Kruseana</i> , F. v. M. ...	Small leaved Mallee.
" <i>humilis</i> , Ottot et Dietr.		" <i>Lehmanni</i> , Preiss ...	Bald Island Marlock.
" <i>lepidophloia</i> , F. v. M. ...	Goldfields Sheoak.	" <i>leptophylla</i> , F. v. M. ...	Mallee.
" <i>microstrobilus</i> , Gardner		" <i>longicornis</i> , F. v. M. ...	Red Morrel.
" <i>spinosissima</i> , Gardner	Prickly Sheoak.	" <i>marginata</i> , Sm. var. <i>Staeri</i> , Maiden	Albany Blackbutt.
<i>Ceifugosia hakeifolia</i> , F. v. M. ...		" <i>megacarpa</i> , F. v. M. ...	Bullich.
" <i>latifolia</i> , Benth. ...		" <i>melanoxylon</i> , Maiden ...	Black Morrel.
" <i>populifolia</i> , Benth. ...		" <i>microtheca</i> , F. v. M. ...	Coolibah, or Black-heart.
<i>Cephalotus follicularis</i> , Labill ...	Pitcher Plant.	" <i>miniata</i> , A. Cunn. ...	Wolly-butt.
<i>Cheilanthes tenuifolia</i> , Swartz ...		" <i>occidentalis</i> , Endl. ...	Swamp Yate.
<i>Cochlospermum heteronemum</i> , F. v. M.	Cotton tree.	" <i>oleosa</i> , F. v. M. ...	
<i>Clianthus Dampieri</i> , A. Cunn. ...	Sturt Pea.	" <i>pachyloma</i> , Benth. ...	Dwarf Mallee.
<i>Comesperma Drummondii</i> , Steetz ...		" <i>pallidifolia</i> , F. v. M. ...	Micum.
<i>Conospermum amoenum</i> , Meissn. ...	Blue Smoke Bush.	" <i>redunca</i> , Schau. var. <i>elata</i> , Benth.	Wandoo.
" <i>Brownii</i> , Meissn. ...	Blue-eyed Smoke Bush.	" <i>setosa</i> , Schauer ...	Bloodwood.
" <i>caeruleum</i> , R. Br. ...		" <i>Scheathiana</i> , Maiden ...	Mallee.

APPENDIX 7—continued.

Botanical Name.	Local Name.	Botanical Name.	Local Name.
<i>Eucalyptus Stowardii</i> , Maiden ...	Mallee.	<i>Melaleuca undulata</i> , Benth. ...	
" <i>Todtiana</i> , F. v. M. ...	Coastal Blackbutt,	" <i>violacea</i> , Lindl. ...	
" <i>transcontinentalis</i> , Maiden	Prickly Bark.	<i>Mirbelia multicaulis</i> , Benth. ...	
" <i>uncinata</i> , Turcz. ...	Redwood.	<i>Monotoca leucantha</i> , E. Pritzel. ...	
<i>Eulophia venosa</i> , Reichb. ...	Mallee.	" <i>tamariscina</i> , F. v. M. ...	
<i>Euphorbia pilulifera</i> , Linn. ...	Orchid.	<i>Moonia eclipoides</i> , Benth. ...	
<i>Excaecaria parviflora</i> , F. v. M. ...	Asthma Plant.	<i>Neurachne alopecuroides</i> , R. Br. ...	
<i>Ficus coronulata</i> , F. v. M. ...	Gutta-percha Tree.	<i>Olax phyllanthi</i> , R. Br. ...	
<i>Frankenia Interioris</i> , Ostf. ...	Rubber Tree.	<i>Olearia revoluta</i> , F. v. M. ...	
" <i>setosa</i> , W. V. Fitzg. ...		<i>Oxylobium spectabile</i> , Endl. ...	
" <i>tetrapetala</i> , Labill. ...		<i>Pelargonium Rodwayanum</i> , Lindl. ...	
<i>Franklandia fucifolia</i> , R. Br. ...		<i>Pentatropis linearis</i> , Dcne. ...	
<i>Gardenia megasperma</i> , F. v. M. ...		<i>Persoonia striata</i> , R. Br. ...	Quinine Tree.
<i>Gastrolobium parvifolium</i> , Benth. ...	Berry Poison.	<i>Petalostigma quadriculare</i> , F. v. M. ...	
" <i>spinosum</i> , Benth. ...	Prickly Poison.	<i>Philotheca Hessellii</i> , F. v. M. ...	
" <i>spathulatum</i> , Benth. ...		<i>Phyllanthus madaraspatanus</i> , Linn. ...	
" <i>trilobum</i> , Benth. ...	Bullock Poison.	<i>Pimelea punicea</i> , R. Br. ...	
<i>Gnaphalium luteo-album</i> , Linn. ...		<i>Pityrodia Bartlingii</i> , Benth. ...	
<i>Gompholobium Shuttleworthii</i> , Meissn. ...		" <i>caerulea</i> , (Muell & Tate)	
<i>Grevillea agrifolia</i> , A. Cunn. ...	Silver Grevillea.	" <i>E. Pritzel.</i>	
" <i>apiculoba</i> , F. v. M. ...		" <i>lepidota</i> , (F. v. M.) E.	
" <i>arida</i> , Gardner. ...		" <i>Pritzel.</i>	
" <i>Brownii</i> , Meissn. ...		" <i>Teckiana</i> , E. Pritzel. ...	
" <i>chrysendendron</i> , R. Br. ...	Silky Oak.	<i>Plantago coronopus</i> , Linn. ...	
" <i>cordata</i> , Gardner ...	Heart-leaved Grevillea.	<i>Pomaderris Mayeri</i> , Gardner ...	
" <i>eryngioides</i> , Benth. ...		<i>Potamogeton natans</i> , Linn. ...	
" <i>fasciculata</i> , R. Br. ...		<i>Prosalea eriantha</i> , Benth. ...	
" <i>heliosperma</i> , R. Br. ...	Beefwood.	<i>Prostanthera Cambellii</i> , F. v. M. ...	
" <i>heteroneura</i> , W. V. Fitzg. ...		" <i>Grylloana</i> , F. v. M. ...	
" <i>Hookeriana</i> , Meissn. ...		<i>Pterigeron odoratus</i> , Benth. ...	
" <i>Manglesioides</i> , Meissn. ...		<i>Pterocaulon sphaclatus</i> , Benth. et	
" <i>uncinulata</i> , Diels. ...		" <i>Hook.</i>	
" <i>viscidula</i> , Gardner ...		<i>Randia densiflora</i> , Benth. ...	
<i>Hakea auriculata</i> , R. Br. ...		<i>Regelia ciliata</i> , Schau. ...	
" <i>florida</i> , R. Br. ...		<i>Ruelingia coarcta</i> , Sp. Moore. ...	
" <i>laurina</i> , R. Br. ...	Parrot Bush.	<i>Santalum cygnorum</i> , D.C. ...	Sandalwood.
" <i>Preissii</i> , Meissn. ...	Needle Tree.	" <i>lanceolatum</i> , R. Br. ...	Northern Sandalwood.
" <i>undulata</i> ...		<i>Sarcocephalus cordatus</i> , Miq. ...	Leichhardt Tree.
" <i>varia</i> , R. Br. ...		<i>Scaevola Helmsii</i> , E. Pritzel. ...	
<i>Hibbertia Kimberleyensis</i> , Gardner		" <i>Koenigii</i> , Vahl. ...	
" <i>polystachya</i> , Benth. ...		<i>Senecio lautus</i> , Forst. ...	
<i>Hibiscus geranioides</i> , A. Cunn. ...		<i>Sesbania grandiflora</i> , Pers. ...	Cork Tree.
<i>Hypocalymma punicea</i> , Gardner ...		<i>Simsia simplex</i> , Lindl. ...	
<i>Hypoestes suaveolens</i> , Gardner ...		<i>Solanum cataphractum</i> , A. Cunn. ...	
<i>Imperata arundinacea</i> , Cyrillo ...		" <i>esuriale</i> , Lindl. ...	
<i>Isopogon Baxteri</i> , R. Br. ...		" <i>mumularium</i> , Sp. Moore	
<i>Jacksonia decumbens</i> E. Pritzel ...		" <i>Vansittartensis</i> , Gardner	
<i>Jussiaea suffruticosa</i> , Linn. ...		<i>Stachystemon brachyphyllus</i> , F. v.	
<i>Kessellia tomentosa</i> , Gardner ...		" <i>M.</i>	
<i>Kunzea sericea</i> , Turcz. var. <i>glabra</i> , Gardner		<i>Stylidium imbricatum</i> , R. Br. ...	
<i>Labichea punctata</i> , Benth. ...		" <i>pachyrhizum</i> , F. v. M. ...	
<i>Lachnostachys Coolgardiensis</i> , Sp. Moore.	Blanket Plant.	<i>Swainsona phacoides</i> , Benth. ...	
<i>Lagenophora Billardieri</i> , Cass. ...		<i>Synaphaea dilatata</i> , R. Br. ...	
<i>Lambertia ericifolia</i> , R. Br. ...		<i>Terminalia Cunninghamii</i> , Gardner	Wild Almond.
<i>Lipidosperma scabrum</i> , Nees. ...		" <i>Fitzgeraldi</i> , Gardner ...	Nutwood.
<i>Leprodia Drummondiana</i> , Steud. ...		" <i>petiolaris</i> , A. Cunningham.	Chestnut.
<i>Leschenaultia stenosepala</i> , E. Pritzel ...		<i>Themeda membranacea</i> , Lindl. ...	
<i>Leucopogon Dielsianus</i> , E. Pritzel. ...		<i>Thomasia sarotes</i> , Turcz. ...	
" <i>gibbosus</i> , Stscheegl. ...		" <i>tenuivestita</i> , F. v. M. ...	
" <i>hamulosus</i> , E. Pritzel ...		<i>Thryptomene australis</i> , Endl. ...	
" <i>oxycedrus</i> , Sond. ...		<i>Timonius Rumphii</i> , D.C. ...	
<i>Lhotzkya acutifolia</i> , Lindl. ...		<i>Tribulus occidentalis</i> , R. Br. ...	
<i>Livistona Eastoni</i> , Gardner ...	Kimberley Fan Palm.	<i>Trichinium Carlsoni</i> , F. v. M. ...	
<i>Logania campanulata</i> , R. Brk. ...		" <i>holsericeum</i> , Moq. ...	
<i>Loranthus amplexans</i> , Van Tiegh ...		" <i>obovatum</i> , F. v. M. ...	Fresh Water Mangrove.
" <i>Benthami</i> , Blakely ...		<i>Tristania suaveolens</i> , Smith. ...	
" <i>Kimbleyensis</i> , Gardner ...		<i>Triumfetta appendiculata</i> , F. v. M. ...	
" <i>Miqueli</i> , Lehn. ...		<i>Trymalium ledifolium</i> , Fenzl. var.	
" <i>Mitchelliana</i> , Blakely ...		" <i>platyphyllum</i> , Diels.	
" <i>Preissii</i> , Miq. ...		<i>Utricularia Kimberleyensis</i> , Gardner	
<i>Mallotus Derbyensis</i> , W. F. Fitzg. ...		<i>Velleia panduriformis</i> , A. Cunn. ...	
<i>Melaleuca arenaria</i> , Gardner ...		<i>Ventilago viminalis</i> , Hook. ...	Supplejack.
" <i>cordata</i> , Benth. ...		<i>Verrauxia Reinwardtii</i> , Benth. ...	
" <i>cuticularis</i> , Labill. ...		<i>Verticordia densiflora</i> , Lindl. ...	
" <i>elliptica</i> , Labill. ...		" <i>Fontanesii</i> , D.C. ...	
" <i>eriantha</i> , Benth. ...		" <i>Hughani</i> , F. v. M. ...	
" <i>exarata</i> , F. v. M. ...		" <i>insignis</i> , Endl. ...	
" <i>laxiflora</i> , Turcz. ...		" <i>monadelphica</i> , Turcz. ...	
" <i>micromera</i> , Schau. ...		" <i>polytricha</i> , Benth. ...	
" <i>pauperiflora</i> , F. v. M. ...		" <i>Roei</i> , Endl. ...	
" <i>platycalyx</i> , Diels. ...		<i>Wehelia thryptomenoides</i> , F. v. M. ...	
" <i>pungens</i> , Schau. ...		<i>Wilsonia humilis</i> , R. Br. ...	
" <i>rhaphiophylla</i> , Schau. ...		<i>Xanthostemon paradoxus</i> , F. v. M. ...	
" <i>uncinata</i> , R. Br. ...		<i>Zygophyllum apiculatum</i> , F. v. M. ...	
		" <i>eremaeum</i> (Diels) Ostf. ...	
		" <i>glaucescens</i> , F. v. M. ...	

APPENDIX 8.

Trees raised at and distributed from Hamel State Nursery during the year ended 31st March, 1923.

Botanical Name.	Vernacular Name.	No. of Trees on hand 31st March, 1922.	No. of Trees raised year ended 31st March, 1923.	No. of Trees distributed, Season 1923.				No. of Trees on hand 31st March, 1923.	
				Sold to Public.	Distributed Free.	Raised for Plantation and Arboreta.	Otherwise disposed of.		Total.
Acacia acinacea ...	Governor Latrobe's Acacia ...	17	...	...	...	3	6	9	8
,, acola ...	...	15	...	...	...	6	1	7	7
,, acuminata ...	Raspberry Jam ...	170	227	57	...	2	111	170	227
,, aspera ...	Rough Leafed Acacia ...	1	...	...	...	1	...	1	...
,, Baileyana ...	Cootamundra Wattle ...	715	853	681	...	24	10	715	853
,, buxifolia ...	...	30	...	1	...	6	1	8	22
,, cyanophylla ...	Black Wattle ...	11	...	...	...	3	8	11	...
,, cyclops ...	Coastal Wattle ...	4	...	...	...	3	1	4	...
,, dealbata ...	Silver Wattle ...	489	689	466	4	...	19	489	689
,, decurrens ...	Green Wattle ...	615	478	166	...	5	432	615	478
,, elata ...	Cedar Wattle ...	301	308	248	28	5	20	301	308
,, Farnesiana ...	Mimosa ...	16	...	...	...	6	1	7	9
,, Howittii ...	Howitt's Wattle ...	34	...	...	...	6	5	11	23
,, leprosa ...	Seville Wattle ...	32	...	7	...	6	4	17	15
,, linearis ...	Narrow Leafed Acacia ...	5	...	1	...	2	1	4	1
,, longifolia ...	Long Leafed Golden Wattle ...	44	...	13	...	5	20	38	6
,, melanoxylon ...	Blackwood ...	991	200	206	12	592	28	838	353
,, montana ...	Mountain Acacia ...	14	...	...	...	6	1	7	7
,, podalyriaefolia ...	Mt. Morgans Silver Wattle ...	533	553	391	108	3	15	517	569
,, prominens ...	Golden Rain Wattle ...	69	115	52	...	5	12	69	115
,, pruinosa ...	Frosty Acacia ...	...	8	...	...	...	...	...	8
,, pycnantha ...	Golden Wattle ...	676	808	636	36	3	1	676	808
,, spectabilis ...	Mudgee Wattle ...	30	...	11	...	6	9	26	4
Agathis Australis ...	New Zealand Kauri Pine ...	3	...	...	...	2	1	3	...
Agonis flexuosa ...	W.A. Peppermint ...	1,277	887	789	164	12	312	1,277	887
Araucaria Bidwilli ...	Bunya Bunya ...	213	...	82	54	...	1	137	76
,, Cunninghami ...	Moreton Bay Pine ...	196	...	44	61	2	...	107	89
,, excelsa ...	Norfolk Island Pine ...	964	...	27	50	...	118	195	769
Bauhinia purpurea ...	...	18	...	...	...	...	13	13	5
Callitris robusta ...	Cypress Pine ...	418	636	392	...	1	25	418	636
Ceretonis siliqua ...	Carob Bean ...	1,312	980	650	1	...	661	1,312	980
Cinnamomum camphora ...	Camphor Laurel ...	1,655	405	569	72	106	7	754	1,306
Clethra edulis ...	...	20	...	...	...	3	4	7	13
Cupressus Knighti ...	Knight's Cypress ...	626	...	57	312	5	84	458	168
,, lusitanica ...	Busaco Cedar ...	5,948	3,744	5,258	24	96	25	5,403	4,289
,, macrocarpa ...	Monterey Cypress ...	1,258	3,879	1,059	36	72	61	1,228	3,909
,, sempervirens ...	Mediterranean Cedar ...	1,569	...	533	...	...	46	579	990
,, torulosa ...	Nepal Cypress ...	448	...	26	...	...	...	26	422
Dracaena draco ...	Dragon's Blood Tree ...	26	...	6	...	...	20	26	...
Erythrina indica ...	Coral Tree ...	...	40	...	...	...	...	26	...
Eucalyptus botryoides ...	False Mahogany ...	898	766	511	84	...	263	858	806
,, citriodora ...	Lemon Scented Gum ...	1,393	681	458	114	...	821	1,393	681
,, cladocalyx ...	Sugar Gum ...	17,059	6,325	5,555	104	10,400	1,000	17,059	6,325
,, corrugata ...	Goldfields Blackbutt ...	...	12	...	...	...	...	...	12
,, corymbosa ...	Australian Bloodwood ...	406	36	...	30	214	90	334	108
,, diversicolor ...	Karri ...	25	...	...	25	...	...	25	...

Eucalyptus	eugenioides	...	422	...	...	30	239	103	372	50
	erythronema	...	17	...	...	6	3	8	17	...
	ficifolia	...	4,273	3,416	3,202	560	132	379	4,273	3,416
	Flocktoniae	...	...	6	...	...	...	...	...	6
	globulus	...	5,060	1,323	543	36	4,481	...	5,060	1,323
	gomphocephala	...	...	6,000	...	...	...	...	...	6,000
	goniocalyx	...	1,568	...	...	30	1,340	78	1,448	120
	Griffithsii	...	...	21	...	...	...	...	...	21
	Gunnii	...	609	...	...	30	150	357	537	72
	haemastoma	...	226	...	...	...	142	44	186	40
	Jacksoni	...	...	22	...	...	...	...	...	22
	Lane-Poolei	...	...	10	...	...	...	...	...	10
	Lehmanni	...	398	...	...	...	26	152	178	220
	LeSuefii	...	...	19	...	...	...	...	...	19
	leucoxylon	...	600	...	...	...	228	288	516	84
	longifolia	...	602	...	...	...	325	187	512	90
	macrocarpa	...	277	216	108	...	...	169	277	216
	maculata	...	600	...	...	30	351	249	600	...
	macrorrhyncha	...	394	...	...	...	238	78	346	48
	melliodora	...	252	...	73	...	...	89	162	90
	microcorys	...	205	60	...	30	100	39	169	96
	Muelleriana	...	417	...	...	30	150	127	307	110
	obliqua	...	608	...	...	...	240	262	502	106
	paniculata	...	557	...	...	...	319	118	437	120
	pilularis	...	1,050	...	...	30	897	95	1,022	28
	Priessiana	...	...	39	...	...	...	...	...	39
	pyriformis	...	4	...	...	...	3	1	4	...
	regnans	...	608	...	...	...	330	158	488	120
	resinifera	...	600	...	...	...	150	370	520	80
	robusta	...	675	...	...	...	327	238	565	110
	rostrata	...	606	...	...	...	230	276	506	100
	saligna	...	600	50	...	20	239	301	560	90
	sieberiana	...	607	...	...	30	330	133	493	114
	sideroxylon	...	607	...	...	...	239	278	517	90
	Stricklandi	...	...	21	...	...	...	...	...	21
	tetraptera	...	155	177	72	24	3	56	155	177
	torquata	...	17	...	3	...	2	12	17	...
	viminalis	...	612	...	...	30	238	254	522	90
	Websteriana	...	...	13	...	...	...	...	...	13
Ficus	Australis	...	620	...	139	62	2	1	204	416
	macrophylla	...	1,610	...	185	48	2	...	235	1,375
Grevillea	robusta	...	132	253	104	...	1	1	106	279
Hakea	laurina	...	427	...	149	76	5	77	307	120
	suaveolens	...	110	...	24	24	2	20	70	40
Jacaranda	mimosifolia	...	347	...	39	86	8	18	151	196
Juniperus	Bermudiana	...	459	...	21	...	...	23	44	415
	cedrus	...	18	...	2	...	3	9	14	4
	procera	...	...	17	...	...	...	...	...	17
Lagunaria	Patersoni	...	380	168	59	...	...	35	94	454
Lauris	Californica	...	11	...	...	...	3	2	5	6
Leptospermum	laevigatum	...	...	576	...	...	...	...	...	576
	Nicholli	...	51	...	...	36	3	7	46	5
Maclura	aurantiaca	...	350	...	...	...	...	344	344	6
	Osage Orange	...	...	...	...	...	...	...	...	...

APPENDIX 8—continued.

Trees raised at and distributed from Hämel State Nursery during the year ended 31st March, 1923—continued.

Botanical Name.	Vernacular Name.	No. of trees on hand March 31, 1922.	No. of trees raised year ended March 31, 1923.	No. of Trees Distributed, Season 1923.					No. of trees on hand 31st March, 1923.
				Sold to Public.	Distributed free.	Raised for Plantation and Arboreta.	Otherwise disposed of.	Total.	
Melia umbra-culiformis	Pride of India	2,180	974	860	52	15	3	930	2,224
Morus alba	White Mulberry	476	...	...	475	...	1	476	...
Passiflora edulis	Passion Fruit	40	...	12	...	...	...	12	28
Pinus canariensis	Canary Island Pine	1,303	1,016	754	104	430	15	1,303	1,016
„ palustris	Southern Pine ... ..	...	6,573	...	...	...	...	...	6,573
„ pinea	Stone Pine	180	553	93	...	72	15	180	553
„ pinaster	Cluster Pine	5,438	6,433	2,396	112	2,800	130	5,438	6,433
„ ponderosa	Yellow Pitch Pine ... ..	...	35	...	...	...	...	...	35
„ insignis	Monterey Pine	19,248	16,766	8,949	300	2,850	7,149	19,248	16,766
„ halepensis	Aleppo Pine	1,061	3,060	419	300	338	4	1,061	3,060
Pittosporum eugenioides ... ..	... ..	5	...	...	...	3	...	3	2
„ undulatum	Victorian Native Laurel	1,074	2,335	969	72	...	33	1,074	2,335
Platanus occidentalis	Plane Tree	3,547	720	509	20	...	2,570	3,099	1,168
Prosopis juliflora	Algaroba Bean	42	193	...	...	...	42	42	193
Quercus Lusitânica	Portuguese Oak	440	...	113	...	...	42	155	285
Robinia pseudo acacia	False Acacia	184	424	133	2	2	47	184	424
Salix alba	Huntingdon Willow	31	...	...	...	...	...	...	31
„ coerulea	do.	17	...	...	...	...	...	...	17
„ Huntingdoni	do.	29	...	...	...	...	...	...	29
„ purpurea	Bitter Willow	22	...	...	...	...	...	...	22
„ nigra	Black Willow	19	...	...	...	...	...	...	19
„ viminalis	Common Osier	42	...	...	...	...	...	...	42
Schinus molle	Pepper Tree	1,508	1,112	1,345	26	...	137	1,508	1,112
Sterculia heterophylla	Kurrajong	1,936	700	723	62	...	57	842	1,794
„ acerifolia	Flame Tree	325	155	96	28	2	6	132	348
Syncarpia laurifolia	Turpentine Tree	38	...	12	...	3	23	38	...
Thuya occidentalis	Arbor Vitae	401	...	78	24	...	46	148	253
„ orientalis	do.	166	...	6	...	...	45	51	115
Tristania conferta	Brush Box	892	690	372	60	323	77	832	750
Totals ... ..	...	108,929	76,776	41,514	4,216	29,930	20,136	95,796	89,909

APPENDIX No. 9.

Summary of Prosecutions for Year ended 30th June, 1923.

Nature of Offence.		Fine.	Remarks.
Unlawfully	causing felling of immature trees	£ 2 10 0	And costs.
"	causing felling of immature trees	2 10 0	And costs.
"	cutting immature timber	5 0 0	And costs.
"	cutting immature timber	5 0 0	And costs.
"	cutting immature timber	5 0 0	And costs.
"	cutting immature timber	5 0 0	And costs.
"	cutting timber on Crown Lands	5 0 0	And costs. also £90 damages.
"	cutting poles on a Timber Lease	5 0 0	And costs. Also charged royalty on poles.
"	cutting mining timber, not being a registered timber worker	2 10 0	And costs.
"	employing men who were not registered timber workers	2 10 0	And costs.
"	cutting sleepers from undersized trees on a Saw Mill Permit	5 0 0	And costs. Sleepers confiscated and sold.
"	cutting undersized trees on a Permit Area	5 0 0	And costs.
"	cutting undersized trees on a Permit Area	5 0 0	And costs.
Unlawful	allowing cutting of undersized trees on a Permit Area ...	2 10 0	And costs. Also £16 7s. 7d. damages.
Unlawfully	cutting and hewing undersized jarrah trees into sleepers on a Saw Mill Permit	5 0 0	And costs. In default, 14 days.
"	cutting and hewing undersized jarrah trees into sleepers on a Saw Mill Permit	5 0 0	And costs. In default, 14 days.
"	cutting and carting timber, not being a registered timber worker	2 10 0	And costs. Fine and costs subsequently remitted.
"	cutting and carting timber, not being a registered timber worker	2 10 0	And costs.
"	employing a person, not being a registered timber worker, in cutting and carting timber	2 10 0	And costs.
"	cutting poles on a Permit Area	10 0 0	And costs. Also £10 18s. damages. Case dismissed. Costs disallowed.
"	assisting in the cutting and removal of jarrah sleepers from a Reserve	...	...
"	removing jarrah sleepers from a Reserve	5 0 0	And costs. In default, 8 weeks. Royalty of 11s. per load charged on sleepers. Case dismissed in Police Court. No order as to costs. Appeal lodged by Department and upheld. Defendant fined £5 and costs.
"	cutting forest produce on a State Forest ... ..	...	...
"	failing to brand stumps of trees cut on a State Forest	2 10 0	And costs.
"	employing a person, not being a registered timber worker, in cutting and carting timber	...	Case dismissed in Police Court with costs against Complainant. Appeal lodged by Department and upheld. Defendant fined £2 10s. and costs.
"	cutting and removing jam posts from a Sandalwood Reserve	2 10 0	And costs.
"	cutting jarrah saplings on a Saw Mill Permit ... ..	...	Case withdrawn on payment of costs.

APPENDIX 11.

Results of Forests Department Tingle Tingle Tests, 1923.

Name.	Density, etc.					Average Moisture Content of Tests on Dry Weight. %	Transverse Strength. Specimens of approx. 4sq. in. sectional area.				End Compression. Ratio 3/1.		Shearing Strength. Beam Method. Max. shear = 3/2 mean.				
	Average Moisture Content on Dry Weight. %	Maximum Moisture Content recorded Centre of Section. %	Average Weight lbs./c.ft.	Variation lbs./c.ft.	Moisture Content when Green on Dry Weight. %		No. of Tests.	Max. Fibre Stress at Rupture. lbs./sq. in.		Modulus of Elasticity. lbs./sq. in.		No. of Tests.	Max. Stress at Rupture. lbs./sq. in.		No. of Tests.	Max. Shear at Rupture. lbs./sq. in.	
								Average.	Variation.	Average.	Variation.		Average.	Variation.		Average.	Variation.
FOREST DEPARTMENT TESTS, 1923.																	
Red Tingle Tingle	13	17	52	46-57	75	13	19	14,200	18,200-10,900	1,950,000	{ 2,500,000 to 1,500,000 }	17	8,200	9,700-6,400	3	2,800	3,400-2,300
Yellow Tingle Tingle	14	17	63	61-65	85	14	24	19,400	22,100-16,000	2,820,000	{ 3,260,000 to 2,330,000 }	23	10,000	11,000-8,700	22	2,900	3,800-2,100
RAILWAY TESTS—HUME (W.A. TIMBER TESTS, 1906, 4TH ED., 1918. PAGE 55).																	
Transverse Strength (No sectional Area given.)																	
Red Tingle Tingle	12	...	62	...	...	12	...	18,200	20,000-15,800	2,930,000	{ 3,300,000 to 2,580,000 }	...	10,250	10,270-10,240	...	1,300	1,490-1,120

APPENDIX 12.

Tannin Survey of Western Australia.

Supplementary data to Appendices 11, 12, and 13. Annual Report, 1921-22, on the Tannin Survey of W.A. carried out in the Forest Products Laboratory of the Commonwealth Institute of Science and Industry (Director, Sir G. H. Knibbs, C.M.G.) Investigator, Mr. D. Coghill.

Table I. includes those barks, etc., which for one reason or another appear worthy of consideration. They have all been analysed in full.

Table II. includes those barks, etc., not likely to be commercially useful. On these samples only preliminary analyses were made.

All analyses made by the official methods of the International Association of Leather Trades' Chemists.

TABLE I.
MATERIALS ANALYSED IN FULL.
(Barks if not otherwise specified.)

Botanical Name.	Common Name.	Locality and Month of collection.	% Tans.	% Non-tans.	% Insoluble.	% Moisture.	Colour.	
							Red.	Yellow.
<i>Eucalyptus campaspe</i>	Silver-topped Gimlet	Coolgardie, Sept.	(1) 25.6	15.3	51.1	8.0	9.2	4.0
<i>Eucalyptus Clelandi</i>	Goldfield's Blackbutt	do. ...	(2) 26.5	15.3	55.7	2.5	...	...
<i>Eucalyptus foecunda</i>	Brown or Red Mallee	Carrabin, October...	19.5	13.4	63.3	3.8	9.0	3.4
<i>Eucalyptus gomphocephala</i> (wood)	Tuart (sawdust) ...	Forestry Department Mill, Wonnerup	10.0	3.0	76.0	11.0	...	...
		Railway Department's Mill, Midland Junction	7.6	1.8	...	...	...	...
<i>Eucalyptus megacarpa</i> (wood)	Bullich (sawdust) ...	...	10.6	2.1	75.3	12.0	3.0	5.0
<i>Eucalyptus reducea</i> , var. <i>elata</i> (wood)	Wandoo (sawdust)	...	11.3	3.3	73.3	12.1	3.6	8.0
<i>Eucalyptus Stricklandi</i>	Yellow Flowering Gum	Widgiemooltha, September	19.6	15.1	56.5	8.8	7.4	12.2
<i>Eucalyptus torquata</i>	Goldfield's Red Flowering Gum	do. ...	16.1	8.8	66.7	8.4	...	...

Notes.—(1.) Sun-dried sample. (2.) Oven-dried sample.

TABLE II.
LIST OF MATERIALS ON WHICH PRELIMINARY ANALYSES WERE MADE.
(Barks if not otherwise specified.)

Botanical Name.	Common Name.	Locality and Month of collection.	% Tans.	% Non-tans.	Remarks.
<i>Eucalyptus foecunda</i> , var. <i>loxophleba</i> (wood)	York Gum (sawdust)	...	4.8	2.5	
<i>Eucalyptus gomphocephala</i>	Tuart ...	Ludlow, July ...	6.1	11.4	
<i>Eucalyptus gomphocephala</i> (wood) (1)	Tuart (sawdust) ...	Wonnerup, State Saw Mills	...	...
		(a) Taken 6in. from the top of the heap as lying exposed to the weather at the present time	2.7	1.1	} On two samples.
		(b) Taken from a layer between 2 and 3ft. deep in the stack, and 2 to 3ft. in from the outside edge	2.4	0.8	
		(c) Taken 5ft. from any exposed surface	5.3	1.5	} On two samples.
		Widgiemooltha, Sept.	5.8	1.8	
<i>Eucalyptus, LeSouefii</i> ...	Goldfields Blackbutt	Widgiemooltha, Sept.	2.7	0.9	} On two samples.
			2.6	1.3	
<i>Eucalyptus marginata</i> (wood)	Jarraha (sawdust) ...	...	12.3	15.3	Colour: 20.6 red; 6.9 yellow.
<i>Eucalyptus pallidifolia</i> (2)	Micum ...	Roebourne, September	1.2	0.6	
<i>Eucalyptus salmonophloia</i> (wood)	Salmon Gum (sawdust)	Kalgoorlie, August ...	27.7	9.2	Colour: 5.2 red; 20.0 yellow.
<i>Santalum cygnorum</i> ...	Sandalwood (chips)	Kalgoorlie, June ...	1.3	1.2	
Do. ...	Sandalwood (bark)	do. ...	1.4	2.8	
			17.1	11.8	

Note (1) Results seem to indicate loss of tans by leaching following exposure to rain, etc.; see analyses given in Table I.
(2) This sample was originally submitted as an unidentified specimen. On this account only a preliminary analysis was made. The material appears promising, providing supplies, etc., are available.