

1920.

QUEENSLAND

DEPARTMENT OF PUBLIC LANDS

ANNUAL REPORT

OF THE

DIRECTOR OF FORESTS

FOR THE

YEAR ENDED 30th JUNE, 1920.

QUEENSLAND FOREST SERVICE.

Annual Report of the Director of Forests for the Year ended  
30th June, 1920.

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Brisbane, 23rd November, 1920.

SIR,—I have the honour to present to you the Annual Report of the Queensland Forest Service for the year ending 30th June, 1920.

I have, &c.,

E. H. F. SWAIN, Director of Forests.

The Hon. J. H. Coyne, M.L.A.,

Minister for Lands, Brisbane.

## Minister's Foreword.

Perhaps the most obvious, yet the most obscured, aspect of the forestry question is that forestry is land settlement, pure and simple. Men must "go on the forests" as men must "go on the land." ; wells must be sunk, paddocks grassed and fenced, roads made, timber felled, and a crop sown, grown, harvested, and marketed. What matter if the seed sown produce trees instead of wheat?—the operations are identical and the results the same.

Had the obvious been recognised, then the policy of forest development would have achieved popular favour equal to that of agriculture. But in the rush of pioneering, the place of the tree in the scheme of things was overlooked, the reckless doctrine was preached that forests were encumbrances on the face of the earth, and we proceeded with good heart to demolish a vital resource.

Nowhere in the world has forestry been more unfortunate than in Australia. The Japanese were silviculturists two thousand years ago. Modern European forestry is four hundred years old. But because we learned, as Britishers, to expect the lumber resources of the Baltic to be laid at our door at our behest, we forgot, as Australians, the lesson of self-reliance, and we are now at the mercy of foreigners who threaten to cease supply.

The Queensland Forest Service has set out to put right for Queensland the mistakes of the past. This Report is a record of its achievement for the year ending 30th June, 1920.

23rd November, 1920.

J. HARRY COYNE,  
Minister for Lands.

# QUEENSLAND'S FOREST RATIO

4,000,000 acres now reserved shown



12,000,000 " required "



## QUEENSLAND FOREST SERVICE, 1919-1920.

### PROSPECT.

The Queensland Forest Service, with limited stocks of timber in hand and strong demands in sight, has upon it the burden of the responsibility, not only of supplying the wood requirements of the community of to-day, but of making immediate provision for the needs of three generations ahead.

The pivot of forestry is silviculture. Upon the adoption of right silvicultural processes depends the economical establishment of the area of fully-stocked forest necessary for Queensland's industrial development. The earlier these processes are adopted the sooner a condition of imminent bankruptcy of timber will be avoided, and stability in timber prices maintained.

The Forest Service undertakes, by the practice of silviculture, to maintain an adequacy of the raw material required for the sustenance of the industries of the State which are dependent upon the forests. But effective silviculture depends primarily upon effective utilisation of original crops. So long as forests are merely culled for selected species, so long and so far is the practice of forestry limited and delayed.

Consequently, the finding of markets for hitherto unmarketable products is the task which has devolved upon the forester as a task precedent to forest practice for forest replacement upon an extensive scale.

This necessity has led to a broad extension of the traditional functions of the administration, an extension which is still sometimes regarded as an invasion of the commercial field. The newly developing conditions of the time and of the continent possibly have also, in this regard, influenced the development of Australian forest policies, particularly in Queensland, where a popular reaction against the granting to private persons of silvically ruinous timber concessions has been marked.

Thus, whilst the function of sowing and growing wood crops for the use of the community as a whole is and remains the central purpose of the Forest Service, there has been added to it the duty of actual delivery of the produce of the State forests directly from the stump to the market, and in certain cases to the very door of the consumer in manufactured form.

The Queensland Forest Service, in pursuance of this larger duty now vested in it, is proceeding to classify and survey the timber lands of the State, construct and maintain forest roads, tramways, and other works for the transport of forest produce, and generally to protect, use, and manage some millions of acres of timber land for wood production and supply in perpetuity. From the end of the present financial year it will become possessed of four State-owned sawmills. To it will be transferred also the responsibility, not merely of producing, but of delivering at rail the whole annual requirements of the Railway Department in sleepers, girders, piles, and other hardwood materials. The control of the State's log export trade by the forestry authority is pending; and a consequential participation in the lumber import trade in order to bridge the gap between the old forests and the new is a matter which may call for consideration eventually.

The opening up of direct trade with New Zealand in Queensland hardwood is a possibility of the near future.

There is a prospect of obviating the importation of camphor from Japan at high prices by the conversion of some of the waste lands of the Queensland coast into mixed forests of Kauri and Camphor, capable of supplying the entire camphor requirements of the Commonwealth. Both species appear to succeed upon this soil type.

The reclamation of the prickly-pear fields of inland Queensland by the formation of heavy plantations above them is within the realm of practicality, and with this end in view the Forest Service during the coming year will sow and plant experimentally on pear-infested soils such drought-hardy, umbrageous, and copiously leaf-littering species as Southern Silky Oak, Camphor Laurel, and Canary Island and other exotic pines.

Such plantations, if successful, would provide not only wood for regions deficient in natural forest, but also a surplus of material for wood-pulping. Queensland Hoop Pine refuse already has been determined to be of high value for the production of Kraft paper, and it is hoped that tests now being made in Western Australia for the Forest Service will establish the utility for similar purposes of the readily-propagated *Grevillea robusta*. The production by the forester of a 60-ft. tall Blackbutt stand on Fraser Island in five years gives assurance that supplies of raw material for the Australian wood-pulping industry will not be lacking when the industry is established.

Utilisation of the minor products of the timber lands is a consummation ardently desired by the Forest Service: *Eucalyptus kinos* are 70 per cent. tannic acid, the *Cupanias* contain commercial saponins, the *Bauhinias* yield gum arabic, the citron-scented gum and the citron-scented *Ti-trees* produce important essential oils, the *Alstonias* a caoutchouc, the *Macrozamia*s a promising starch and a vegetable wool, and the grass-tree a valuable resin, whilst some millions of acres of apparently useless woodlands are capable of furnishing huge quantities of power charcoal and alcohol, and other derivatives of wood distillation.

These facts give but a faint idea of the importance to Queensland of a Forest Products Laboratory. Its immediate establishment is a necessity if we are to derive the maximum utility from our heritage.

An Institute of Silvical Research and a School of Forestry are equally necessary.

The Forest Service lives from day to day in the hope that in the ensuing year will materialise a modern Forestry and Lumbering Bill, and an urgently-needed re-organisation and strengthening of the Forest Service personnel.

Upon these things depends the future of the forest industries of the State.

It may be apposite here to draw attention to the Report of the Research Committee of the Imperial Forestry Conference, printed as Appendix D to this Annual Report.

### RETROSPECT, 1919-1920.

The period of forest history in Queensland of which this report is the record, was the first year of post-war reconstruction and resettlement.

For this reason, the fact that the period has been characterised by a remarkable expansion of Forest Service function, operation, and revenue is hardly a matter for surprise.

In the business of forestry, the war found Queensland almost entirely unprepared. Despite the warnings of the authority of the day, public opinion failed to sense the dangers of forest neglect. The original timber belts had suffered grave erosion in the course of seventy years of settlement, and the remnant reservations held by the State when the war came were held insecurely, and were in constant jeopardy of being thrown open for land settlement. The policy was indefinite, the laws were inadequate, and the Forest Service itself was virtually without personnel, constitution, or even funds, notwithstanding that its credit as the result of eleven years' operations was a surplus over expenditure of no less a sum than £382,704.

For this situation and for its corollary of waste and reckless usage of a precious natural resource, the primary causes are low wood values, an artificial price depression due to the short-sighted policy of permitting the wholesale dumping in Australia at less than cost of the surplus products of American sawmills engaged in cut-throat competition, and of the cheap labour garrisons of Japan and Russia.

Thus, whilst on the horizon the cloud of a world famine in timber was clearly perceptible to seeing eyes, Australia was engaged in busily squandering its limited woodland substance because a fierce competition from abroad had rendered its unique heritage of little value temporarily and for the time being made impossible the profitable practice of forestry.

As a direct result of the artificial timber price depression of the pre-war period, Queensland found itself reduced to a forest reservation in the ratio of less than 1 per cent. of its territorial extent, and, by consequence, in the humiliating position of being forced to repurchase from private holders of its alienated timber belts two-thirds of its total requirements of pine, plus nine-tenths of its needs in hardwood.

At some cost to the community the importance of forests in the scheme of nature has thus been focussed sharply by post-war conditions, and the first year of repatriation has demonstrated that upon the shoulders of Australian foresters is cast an immense and almost overwhelming responsibility.

Happily there has been evidence of a public appreciation in Queensland of the task lying to hand in the rehabilitation of the forests, and there has not been lacking during the year just ended that support, popular and political, which is essential to active development.

Upon the agenda list of Parliament during the session just ended appeared a Forestry and Lumbering Bill, designed to remedy the faults of the past and to establish a forest estate and a forest authority who should have means and power to re-invest the forest revenues in the forest.

Notable among the announcements of the year were those of the Hon. J. H. Coyne, Minister for Lands, who laid down the policy that the State forests were essentially Governmental timber farms, and that forestry was to be practised thereon as a form of land settlement, yielding permanent occupation and permanent residence to a large population who should be engaged thereon in sowing, growing, harvesting, and marketing the State's timber crops.

In accordance with that policy, and in line with the repatriation activities of the State, extensive operations were designed, and, during the year, numbers of returned soldiers were enlisted into the Forest Service. As in the case of the man who goes on the land to grow an agricultural crop, the first tasks have been those of land organisation, the establishment of headquarters, the erection of buildings, the fencing and grassing of paddocks, and the provision of wells and dams. No less important were the steps preliminary to the harvesting of the original timber stand, and in this connection the opening up of the State forests by effective roads has been one of the principal lines of development. The shortage of wood for home-building during this first year of reconstruction rendered the delivery of log supplies a matter of extreme urgency, and notwithstanding the disabilities of drought and team shortage, and the totally inadequate permanent staff, the Forest Service has made successful response to the extraordinary calls upon it. Concurrently, silvical research has been prosecuted earnestly by the all-too-meagre investigative section of the Department, and data have been acquired which will prove invaluable when the larger silvicultural processes follow upon the fundamental work of organisation now commenced.

It is gratifying to record that the employment in forestry of returned soldiers, properly selected, has been an unqualified success in Queensland, and the Queensland Forest Service is the richer by these 1919-20 additions to its personnel.

It must be added that the small original staff of the Department has been hard pushed in the effort to plan, initiate, and supervise the works necessitated by the effective employment of the labour forces added to it.

The temporary suspension of personnel procedure in the Public Service pending the appointment of a Public Service Commissioner made it impossible for the overhead staffing arrangements to keep pace with the forced progress rendered necessary by repatriation circumstances, and although the response on the part of officers was immense, their grading and remuneration were no better at the end of the year than at the beginning, at which time reorganisation proposals precedent to the initiation of the new operations were submitted for consideration. Officers graded as Forest Rangers and Assistant Foresters were doing the work of District Foresters, and *vice versa*; one officer having fifty workmen under his direction was receiving a smaller wage than any one of his men; whilst the accounting officer of the Forest Service was in receipt of £3 10s. per week. An unfortunate consequence of these conditions was the loss by resignation of a number of experienced officers just when they were most sorely needed, whilst the damped enthusiasm accruing from many resultless efforts to secure a betterment of their status made it not easy to retain the services of the remainder, in the face of brighter prospects in private trade.

At the date of writing this report, the proposals of the Public Service Commissioner for the rectification of these anomalies were in process of adoption.

Accommodation for the additional clerical assistance needed at Head Office was unprocurable in the Department, and this condition added to the difficulties of administration by producing serious congestion and some incidental confusion of office processes.

Notwithstanding the remarkable and almost insuperable disabilities under which the year's work has been performed, the essential results cannot be viewed by the Forest Service with other than satisfaction. Forestry in Queensland has emerged from the period with substantial achievement and greater strength as a function of government. Financially, the expenditure involved has been returned two-fold in enhanced revenues, as each one of the operations of the Forest Service had been planned to yield an early return in cash.

## FINANCIAL.

### REVENUES.

As a consequence of the commercialisation of the timber sales policy, the middleman log-buyer has been almost eliminated, in so far as State Forest trading is concerned, and the profits previously derived by him have accrued to the Service.

The earnings of the administration were increased beyond those of the preceding Annual Report period by £49,671, and passed the previous high-water mark of 1914 by £46,423.

The gross receipts for the year totalled £125,664 6s. 11d., but deductions on account of guarantee deposits, &c., reduced the net revenue to £121,152, which constituted a record for the Department.

Thus the financial forecast of the preceding Annual Report has been realised. For the next succeeding yearly period a still greater income may be anticipated, and the addition of other revenue-producing functions, such as sawmilling, railway-timber contracting, and log export trading, should send the gross income of the Forest Service next year to well over £300,000, as against the £66,200 recorded for 1917.

The revenue status of the forestry and lumbering administration of Queensland is disclosed by the following comparisons, *i.e.*, of the latest financial statements of the six Forestry Departments of Australia, and that also of South Africa:—

State.	Year.	Revenue.	Expenditure.	Surplus + Deficit -
	£	£	£	£
Queensland .. .. .	1919-20	121,152	59,539	+61,613
New South Wales .. .. .	1918-19	97,592	102,484	-4,892
Victoria .. .. .	1917-18	57,731	60,193	-2,462
South Australia .. .. .	1918-19	23,880	33,952	-10,072
Western Australia .. .. .	1918-19	42,050	23,463	+18,587
Tasmania .. .. .	1918-19	7,399	No record	
South Africa .. .. .	1918-19	99,716	218,400	-118,684

The wealthiest of these Departments is that of Queensland.

Over 90 per cent. of the revenues of the year were derived from the sale of timber, either at the market or upon the stump. The Hoop Pine districts of Southern Queensland yielded £108,937, or 87 per cent. of the total receipts for the State. The Central district produced 6 per cent., or £7,816, and the famous Maple areas of Northern Queensland only £8,910, or 7 per cent. of the total, most of the sales of timber in that region having been made from privately owned timber lands.



The Bowen, Ravenswood, and Townsville districts showed the greatest percentage increases in revenue; and the Gympie, Bundaberg, and Ipswich districts the largest financial additions. Toowoomba produced only 13.7 per cent. advance in receipts on the previous year's figures, whilst Maryborough finished the period with £323 short of the previous annual returns. The Atherton district receipts fell by over £2,022, or 74 per cent., as a consequence of the log congestion produced by shipping strikes and shipping shortages.

The following statement shows the Forest Service transactions from the year 1904 to 30th June, 1920, excluding income from forest agistment, whether by occupation license or Forest Service paddocks, which are credited to Lands Department:—

COMPARATIVE STATEMENT OF REVENUE AND EXPENDITURE, 1904-1920.

	Expenditure.	Percentage of Revenue.	Revenue.	Surplus to Consolidated Revenue.
	£		£	£
1904 .. .. .	837	7.3	11,441	10,604
1905 .. .. .	712	6.2	11,577	10,865
1906 .. .. .	1,331	9.1	14,560	13,229
1907 .. .. .	1,549	7.0	22,236	20,687
1908 .. .. .	2,132	7.6	27,979	25,847
1909 .. .. .	2,448	7.0	35,200	32,752
1910 .. .. .	2,548	6.4	39,645	37,097
1911 .. .. .	2,930	5.4	53,840	50,910
1912 .. .. .	5,397	8.5	63,447	58,050
1913 .. .. .	7,386	11.7	62,973	55,587
1914 .. .. .	7,653	10.2	74,729	67,076
1915 .. .. .	7,416	10.6	69,793	62,377
1916 .. .. .	9,473	15.7	60,401	50,928
1917 .. .. .	13,930	21.0	66,200	52,270
1918 .. .. .	21,877	30.6	71,481	49,604
1919 to 30th June, 1919 ..	12,564	32.7	38,574	26,010
1919-1920 .. .. .	59,539	49.1	121,152	61,613
Totals .. .. .	159,722	18.9	845,228	685,506

EXPENDITURE.

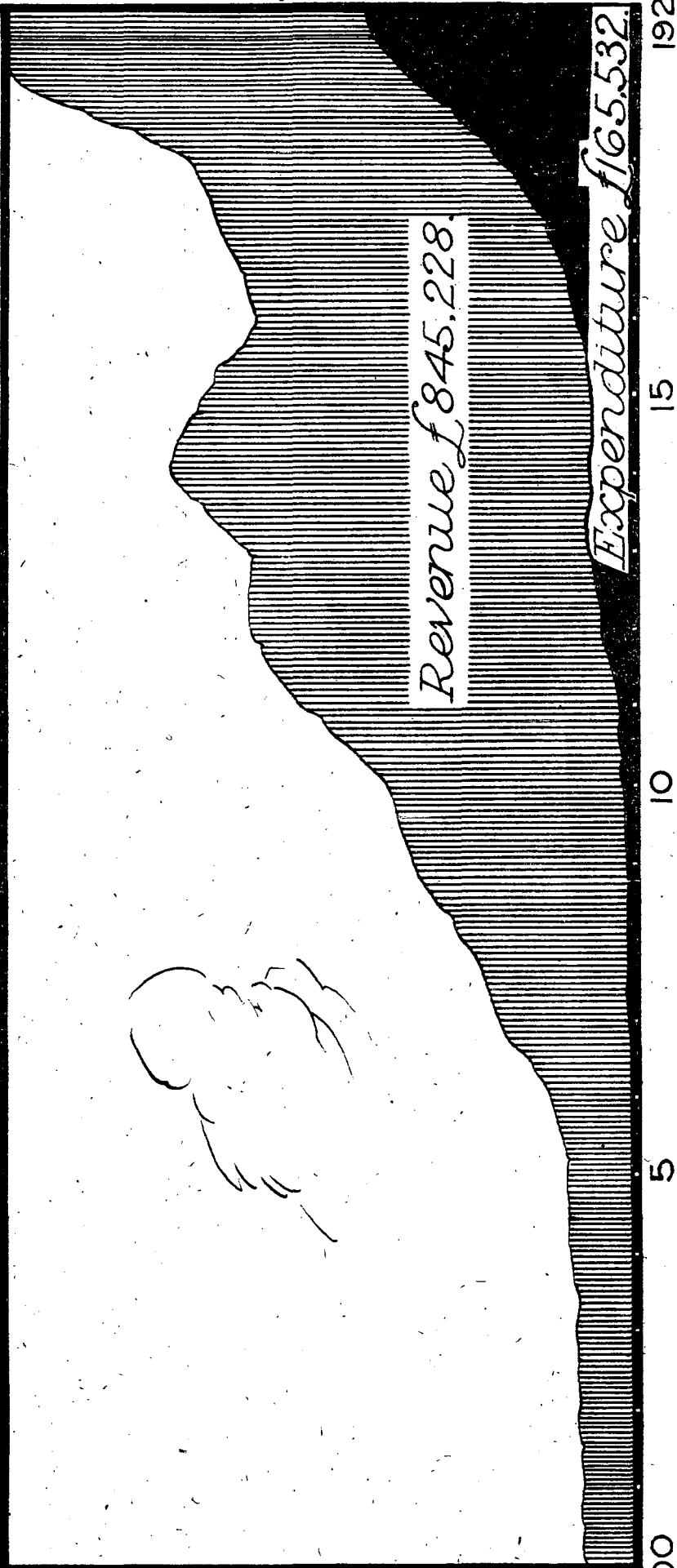
The total expenditure of the Forest Service for the twelve months ended 30th June, 1920, was £59,539, or 49 per cent. of the net revenues. Of this expenditure, forestry and timber trading, £19,765, or one-third of the total, was derived from a loan of £20,000 from the Commonwealth Government for the purpose of employing returned soldiers in forestry work. The loan was obtained at cost, and the Commonwealth subsidised the operations by contributing 25 per cent. of the wages paid. A further £13,876 of the total expenditure of the administration represented a trading expense automatically recouped by the sale of the timber involved.

The following statement discloses the true position with regard to the expenditures of the Forest Service for the financial period under review:—

	1918.	Percentage of Total.	1920. From Revenue.	1920. From Repatriation Loan.	1920. Total.	Percentage of Total.
	£		£	£	£	
<b>OVERHEAD EXPENSES—</b>						
Salaries .. .. .	6,021	..	9,633	1,532	..	..
Travelling allowances and incidentals ..	3,898	..	4,850	..	..	..
	9,919	45.4	14,483	1,532	16,015	28.0
<b>CAPITAL IMPROVEMENTS—</b>						
Forest organisation, silviculture, &c. ..	8,744	..	11,700.	16,292	..	..
Roads to Crown timber areas .. .. .	2,574	..	727.	..	..	..
Repurchase of timber lands .. .. .	640	..	147.	..	..	..
Forest School and Laboratory .. .. .	..	..	782.	..	..	..
	11,958	54.6	13,356.	16,292	29,648	49.0
<b>HARVESTING AND MARKETING—</b>						
Trading .. .. .	..	..	11,935	1,141	13,876	23.0
	£21,877	100	39,774	19,765	59,539	100

It will be observed that, of the £59,539 spent by the administration, £13,876 was automatically recouped upon sales as a sales cost, and £29,648, or 50 per cent. of the whole, was converted into capital improvements yielding profits for the future.

Forestry Share of Forest Revenue.  
1900 - 1920.



It will be noted also that the percentage of overhead charges fell from 45 per cent. in 1918 to 28 per cent. in 1919-1920.

### FOREST ORGANISATION.

The year 1919-1920 has been given up largely to the pioneering work of forest organisation, which includes the establishment of forest headquarters, with all necessary buildings, offices, and paddocks, the provision of water and grass, and the opening up of timber tracts by well-laid-out and properly constructed roads.

Each one of the operations now completed had been planned to yield an early money return. The road systems have been designed to reduce the costs of logging and thereby to increase the net proceeds of log sales. The supplying of grass and water for the use of bullocks and horses employed upon the State forests similarly, was designed to promote economy in log-harvesting processes and the enhancement of revenues; whilst in the provision of housing for forest workmen upon a rental basis interest and depreciation upon the capital outlaid are assured.

The projects were planned, initiated, and supervised by the original and limited staff of the Forest Service, and were a response to repatriation demands, though they represent essentially the results of the employment of returned soldiers in forestry work.

A list of the accomplished projects follows:—

#### FOREST ORGANISATION—PROJECTS COMPLETED 1919-1920.

##### No. 1.—ESTABLISHMENT OF FOREST STATIONS AND PADDOCKS.

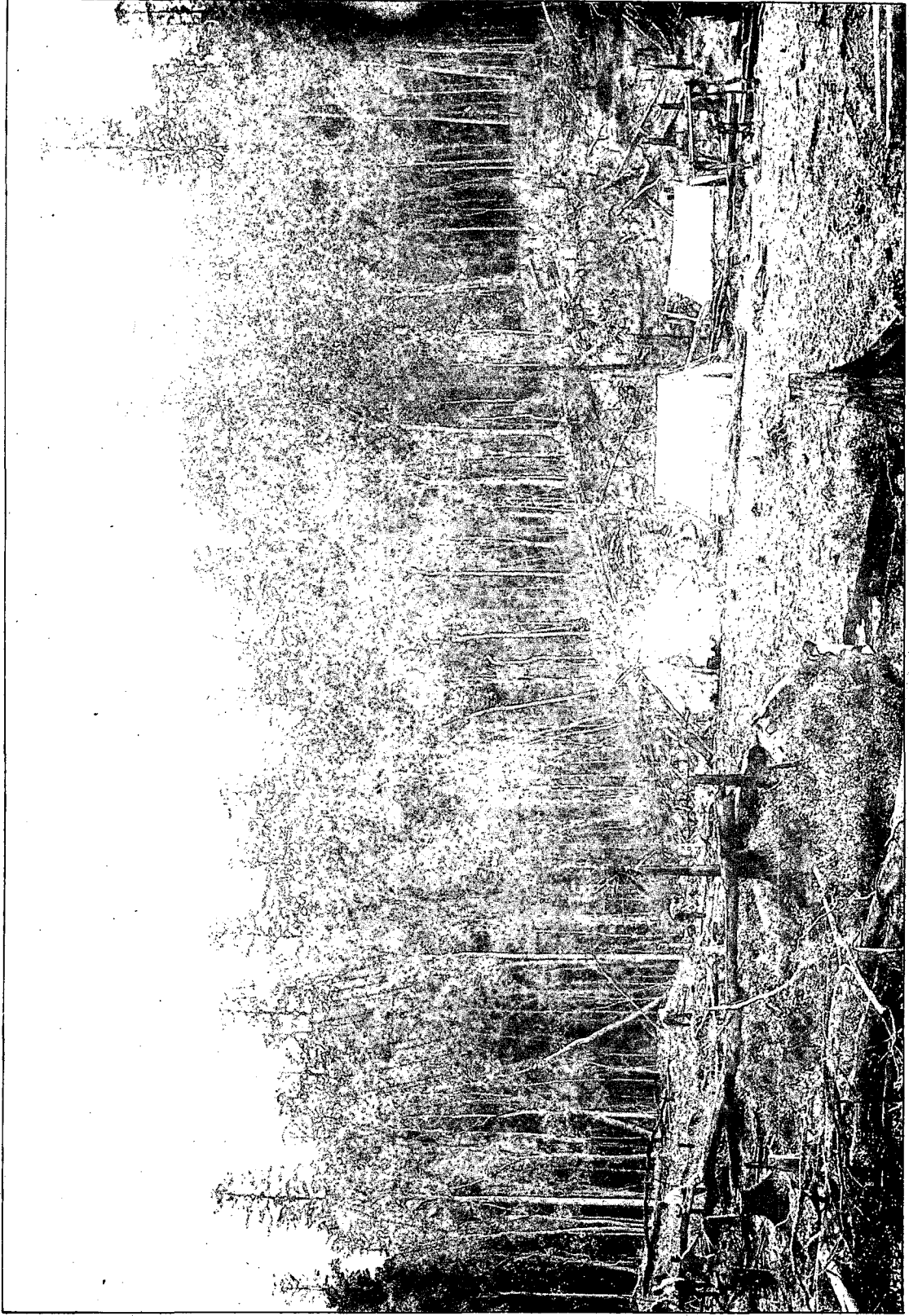
District.	Area.	Project.	Particulars of Work Done.	Cost.
Gympie ..	Brooloo State Forest	Western Creek ..	Erected bunk house 46 ft. x 12 ft. with 7 ft. veranda. Feed room, 22 ft. x 12 ft. Well sunk and timbered, 22 ft. 16 acres felled, burnt, and grassed; $\frac{1}{4}$ acre fenced; 2 roads 37 perches cleared for houses. House let 8s. 6d. per week.	£ s. d. 774 3 1
Gympie ..	Brooloo ..	Derrier Creek ..	16 acres cleared and fenced for horse paddock; well sunk and timbered, 27 ft.; $\frac{1}{4}$ acre cleared for building site.	80 2 1
Gympie ..	Brooloo ..	Paddock No. 1 ..	140 acres rung; 12 chains of 3-wire fence and gate erected.	17 10 1
Gympie ..	Brooloo ..	Paddock No. 2 ..	260 acres rung of useless timbers. 57 $\frac{1}{2}$ chains 2 barbed and 1 plain fence with double gate 17 ft. erected	91 14 6
Gympie ..	Brooloo ..	Paddock No. 3 ..	240 acres rung of useless timbers; 20 chains of 3-wire fence erected; well sunk 20 ft.; brace and windlass erected.	91 5 2
Gympie ..	Brooloo ..	Paddock No. 4 ..	20 acres cleared and burnt, sown with Rhodes grass. 55,000 super. ft. timber was disposed of from this area during operations on paddock.	76 1 2
Gympie ..	Brooloo ..	Paddock No. 5 ..	90 acres rung; 12 chains 3-wire fence with 2 gates erected.	25 17 7
Gympie ..	Reserve 256, Imbil	Farm, Butler's corner	13 $\frac{1}{2}$ acres stumped; 14 acres cleared; 3 acres scrub felled; 40 $\frac{1}{2}$ chains 2 barbed and 1 plain wire fence erected.	121 15 6
Gympie ..	Reserve 256, Imbil	Imbil forest station	36 chains 2 barbed and 1 plain wire fence erected; 1 30 ft. x 30 ft. feed and timber shed erected.	162 9 7
Gympie ..	Reserve 235, Amamoor	Forest station establishment	50 $\frac{1}{2}$ chains 2 barbed and 1 plain wire fence erected; feed room 22 ft. x 12 ft., gable end and shingle roof.	191 12 6
Gympie ..	Reserve 235, Amamoor	Paddock No. 1 ..	90 acres grubbed of useless timber; 24 acres ringbarked; 3 chains 2 barbed and 1 plain wire fence erected.	296 3 11
Gympie ..	Reserve 235, Amamoor	Paddock No. 2 ..	160 acres rung of useless timber .. ..	11 0 0
Gympie ..	Reserve 235, Amamoor	Paddock No. 3 ..	320 acres rung of useless timbers; rented at £2 per week.	32 10 0
Gympie ..	Reserve 235, Amamoor	Paddock No. 4 ..	40 acres rung of useless timbers .. ..	4 17 10
Gympie ..	Reserve 700, Corella	Paddock .. ..	Ringing, grubbing, clearing wattles, weeds, &c.	53 9 11
Gympie ..	Reserve 256, Kandanga	Horse paddock ..	Ringbarking 90 acres; splitting and erecting posts for 45 chains of fencing.	37 19 2
Gympie ..	Kilkivan ..	Horse paddock ..	Splitting, erecting, and boring posts for 31 chains fencing.	31 2 6
Gympie ..	Biggenden ..	Forest station establishment	One 30 ft. x 12 ft. with 7 ft. veranda bunk house and toolroom erected, let at weekly rental; 56 chains 2 barbed and 1 plain wire fence erected; 150 acres of useless trees in horse paddock ringbarked.	333 14 10
Dalby ..	Braemar ..	Fencing Braemar State Forest	8 $\frac{1}{4}$ miles of 3-wire fencing erected; 1 mile of road cleared.	476 18 3
Dalby ..	Braemar ..	Overseer's dwelling..	House, 28 ft. x 12 ft. erected; two 7 ft. verandas; tank, stand, &c.; let at weekly rental of 6s.	213 14 2

FOREST ORGANISATION—PROJECTS COMPLETED, 1919-1920—*continued.*No. 1.—ESTABLISHMENT OF FOREST STATIONS AND PADDOCKS—*continued.*

District.	Area.	Project.	Particulars of Work Done.	Cost.
Dalby	Braemar	Water conservation	Constructing an overshot dam	£ s. d. 25 19 1
Dalby	Yeulba	Fencing horse paddock	1½ miles wire fencing, gates, &c., erected	58 3 2
Fraser Island	Fraser Island	House	Temporary hut for accommodation of teacher, 9 ft. x 15 ft., with iron roof.	19 14 9
Fraser Island	Fraser Island	Galley	Erecting galley for men	6 18 11
Fraser Island	Fraser Island	Hut	Erecting hut for clerk, 9 ft. x 15 ft., with iron roof.	20 11 11
Fraser Island	Fraser Island	Maintenance ground and buildings	Brushing and clearing paddock; fencing; building small tool hut.	13 7 0
Fraser Island	Fraser Island	Paddocks	Burning off, brushing, felling, lumping, and eradicating lantana and wattle at beach; preparing horse paddock and settlement.	105 5 5
Fraser Island	Fraser Island	Removal of buildings to new settlement	Removing residences, drying sheds, offices, &c., from beach to new settlement some 5 miles away; re-erecting on new sites.	426 14 7
Fraser Island	Fraser Island	Additional housing	Building kitchen, new room, and adding veranda to station residence; also building tool shed.	155 15 5
Fraser Island	Fraser Island	Stumping sites for new station buildings	Removing stumps, clearing, and burning up some 5 acres.	92 8 11
Fraser Island	Fraser Island	Fencing new station	Fencing 20½ chains post and rails; 53.65 chains of 3 wire, 27.11 chains of 2 wire, and 10.11 chains of wire netting.	125 2 6
Fraser Island	Fraser Island	Water supply	Building a 6,000-gallon concrete tank as reservoir for nursery and settlement. Pumping plant, pipes, &c., to be installed.	89 10 5
Brisbane	Reserve 283, Colinton	Paddock	260 chains of fencing erected	154 11 8
Brisbane	Reserve 283, Colinton	Water supply	Clearing out old well and sinking to 65 ft., slabbing, &c., Transport of boring plant to and from Benarkin. Boring further 45 ft. until plentiful supply of water obtained.	199 16 4
Brisbane	Reserve 283, Colinton	Water supply	Purchase and installation of pumping plant, piping, tank, &c., for supply to nursery and houses.	360 16 9
Brisbane	Reserve 283, Colinton	Horse paddock	Cleaning up, stacking, burning, and ringing paddock.	54 5 6
Brisbane	Reserve 283, Colinton	Office and tool room	Erection of office and tool room, with verandas.	172 17 4
Brisbane	Reserve 283, Colinton	2 cottages, Benarkin	Erecting two cottages for workmen on the plan of the soldiers' settlement home, at £250 each. These have since been completed and let at weekly rental of 10s. each.	398 19 4
Brisbane	Reserve 318, Maroochy	Forest station establishment	Brushing, clearing, and burning horse and house paddock.	24 15 10
Brisbane	Reserve 69, Bunya	Forest station establishment	Fencing, clearing, burning, and ringing paddocks, upkeep of horse, &c.	74 6 4

## No. 2.—FORESTRY ROADS.

District.	Area.	Project.	Particulars of Work Done.	Cost.
Gympie	Brooloo	Road No. 1	16 acres cleared; 23 acres scrub felled; excavations, 1,209 cubic yards; filling-in, 514 cubic yards; forming 65 chains; gravelling 99 chains; one 11 ft. 6 in. culvert erected; one 26 ft. bridge erected.	£ s. d. 1,877 16 7
Gympie	Brooloo	Road No. 2	3 acres cleared; 7 acres scrub felled; excavations, 2,610 cubic yards; filling-in, 51 cubic yards; forming 12 chains; gravelling 20½ chains; one bridge erected.	947 7 5
Gympie	Brooloo	Road No. 3	4 acres cleared; 2 acres scrub felled; excavations, 1,141 cubic yards; filling-in, 22 cubic yards; forming 14 chains.	362 15 8
Gympie	Brooloo	Road No. 5	3 acres cleared; 8 acres scrub felled; excavations, 800 cubic yards; filling-in, 34 cubic yards; forming 24½ chains; gravelling 19½ chains.	408 16 3
Gympie	Brooloo	Road No. 6	Excavations, 36 cubic yards; filling-in, 3 cubic yards; gravelling, 2 chains; two bridges 30 ft. x 16 ft., completed.	70 2 2



OPENING UP A QUEENSLAND PINE FOREST—IMBIL, 1920—RETURNED SOLDIER-FORESTERS' CAMP,  
(Note that roadsides are cleared and grassed with the dual object of keeping the roads  
dry and providing grass for the logging teams.)

## FOREST ORGANISATION—PROJECTS COMPLETED, 1919-1920—continued.

## No. 2.—FORESTRY ROADS—continued.

District.	Area.	Project.	Particulars of Work Done.	Cost.
Gympie	Brooloo	Subsidiary roads comp. 8-10-11	Forming and clearing 55 chains x 16 ft. wide, between compts. 10 and 11; cutting 4 chains; forming and clearing 50 chains.	£ s. d. 82 10 9
Gympie	Reserve 235, Amamoor	Amamoor road	Gravelling 26 chains; forming 26 chains; rut-filling 22 chains; light side cutting 29 chains; marking 28 chains of water-tables.	150 11 4
Gympie	Reserve 235, Amamoor	Amamoor road extension	Clearing 86 chains; cutting 1,000 cubic yards; scrub felling 2½ acres; one log culvert erected.	115 8 7
Gympie	Reserve 235, Amamoor	Portion 94, Amamoor road	Clearing 50 chains; cutting 500 cubic yards; corduroying 70 ft.	67 17 4
Gympie	Reserve 235, Amamoor	Road No. 5 extension	Clearing 47 chains; cutting 600 cubic yards	69 14 4
Gympie	Reserve 235, Amamoor	Harry's Creek road extension	Clearing 5 chains; scrub-felling 3 acres; corduroying 2½ chains.	45 10 0
Gympie	Reserve 235, Amamoor	Maintenance Harry's Creek road	Filling ruts, draining, &c.	15 4 2
Gympie	Reserve 256, Imbil	Branch Gully road	Cutting 800 cubic yards; clearing 60 chains x 2½ chains wide; corduroying ½ chain.	246 15 0
Gympie	Reserve 256, Kandanga	Road No. 1	Cutting 360 cubic yards; forming 35 chains; clearing 90 chains of forest and 12 chains scrub.	129 9 5
Gympie	Reserve 700, Corella	Roads Reserve 700, Corella	Length of road, 2 miles; one bridge 10-ft. and one 15 ft. erected.	43 8 1
Gympie	Biggenden	Woowoonga Creek road	Blasting and clearing large rocks in creek crossing.	4 13 10
Brisbane	Reserve 283, Colinton	Road A B	94 chains cleared, 16 ft. wide; repairs and renewals to culvert.	25 1 9
Brisbane	Reserve 283, Colinton	Road B to J	25 chains cleared, 20 feet wide	11 17 6
Brisbane	Reserve 283, Colinton	Road C to D	40 chains cleared, 20 ft. wide, and burnt off	28 13 3
Brisbane	Reserve 283, Colinton	Road K to G	173 chains cleared, 20 ft. wide, and burnt off	99 14 8
Brisbane	Reserve 283, Colinton	Creek road	2½ chains side cutting; culvert made	3 0 0
Fraser Island	Fraser Island	Section 1, White Cliffs road	Part of first section to connect with White Cliffs settlement mill and tramline, length 76½ chains; side cutting 4,563 cubic yards; removal of fifteen large trees.	145 16 1
Fraser Island	Fraser Island	F. Station deviation	Clearing and making new roads to settlement.	23 6 4
Fraser Island	Fraser Island	Maintenance of existing roads	Clearing old roads; repairing bridges; altering and attending all roads.	52 6 1
Fraser Island	Fraser Island	Crossing Poyungan Creek	Building slab bridge 23 ft. x 10 ft., and a 10 ft. roadway, with logs top-dressed with sand, over 8 chains of morass.	50 0 0

## No. 4.—SUBSIDIES TO SHIRE COUNCILS FOR ROADS.

District.	Area.	Project.	Particulars of Work Done.	Cost.
Gympie		Pie Creek Bridge	Subsidy to Widgee Shire Council for construction of bridge.	£ s. d. 10 0 0
Gympie		Road 393, Woondum	Subsidy to Noosa Shire Council to construct road to Reserve 393, Woondum.	257 0 0
Gympie		Crossing, Yabba Creek	Subsidy to Widgee Shire Council, crossing over Yabba Creek.	100 0 0
			Money expended by Public Estate Improvement Branch on various roads on behalf of Forestry.	360 7 4

Dealing with the work of the Gympie Forest District, Mr. District Forester Simon comments as follows:—

## FOREST STATIONS.

At the beginning of the year a station was established on each of Biggenden and Kilkivan State Forests, and at Imbil, Brooloo State Forest. At the end of the year additional stations were in existence at the following places:—Derrier Creek and Western Creek, Brooloo State Forest; Butler's Corner, Reserve 256, Imbil; Reserve 235, Amamoor; and Reserve 256, Kandanga.

"Building of houses, sheds, paddocks, and well-sinking has been carried on at various forest stations; the most progress was made at Western Creek, where a five-roomed house and a feed-shed were erected, and another house partly so. A well was sunk and yards built.

"*Roads.*—Roadmaking on Reserve 235, Amamoor, was continued with the same measure of success as during the previous year. The chief undertaking, however, was at Western Creek. Soon after Assistant Forester Dawson completed the lay-out of Road No. 1, or early in August, a start was made in constructing same. We were fortunate in obtaining an experienced road foreman, but otherwise we started on the big venture with a team of returned soldiers more or less green and soft after the holiday following their return. About a dozen men were given work who had no previous experience. They were used to town conditions and could not adapt themselves to stop. It was early seen that to make a success of forest improvement work it was essential to employ a maximum amount of workmen who were used to bush work, and preferably axemen. Roads Nos. 1, 2, and 5 were nearing completion but for the gravelling at the end of the year. Much more work than was specified was undertaken.

"The bridges on the roads are a credit to the builder (Sub-foreman Sweetenham); the timbers used are Brush Box and Ironbark, and the bridges will last for very many years.

"*Grazing Improvement and Management.*—Timber haulage at reasonable rates is dependent on an adequate grass supply. Our operations and schemes were hampered at Imbil owing to scarcity of grazing areas. This was particularly the case on Brooloo State Forest. Although the areas being operated on contained sufficient grazing areas within their limit, the teamster was compelled to look elsewhere for fodder for his working stock, while the adjoining farmer, grazier, and speculator overstocked the State Forest with growing stock and kept the grass in check.

"Last year we commenced to rectify the position by fencing and ringbarking tree-weeds. At the beginning of the year we had one paddock on Brooloo State Forest; at the end of the year the number was six, all securely fenced and watered. The scrubs are more or less impenetrable by working stock. Fencing costs were low, as the operations generally consisted of fencing across a neck of scrub. The paddocks are from 100 to 300 acres in extent, and rent from 15s. to 40s. per week. As the paddocks are guarded against overstocking, and in consequence of elimination of useless species, they will become of more than present value. Apart from the fact that we are obtaining revenue from our grazing areas, the supply of paddocks is enabling outside teams to come in.

"On Reserve 235, Amamoor, four paddocks are being prepared by ringbarking trees. An area of scrub was felled and grass sown during the year on Paddock No. 1. A good strike of grass was obtained, and our bullock team is now grazing in the paddock. The other paddocks will have sufficiently advanced in value during the year, that they will be sought by teamsters. Paddocks were urgently needed in this locality; the few teams operating held a very strong position, and anyone who attempted to usurp their self-appointed domain was frozen out.

"Occupation licenses were cancelled on several timber reserves. Licensees, for a very nominal sum, were permitted to use grass required for the exploitation of the timber. In such case no provision exists for the selling of grass, but the difficulty has been successfully overcome by granting the right to graze as condition of logging agreement or timber contract.

"This aim is to gradually take over control of all grazing on State forests and timber reserves. The machinery already exists, as is evinced by our success, but under the proposed new Forestry Bill the position will be more clearly defined and the procedure less cumbersome.

"Apart from grazing problems, unrestricted and inadequately controlled grazing is harmful to the young forest and carries with it enormous damage by fire."

Mr. District Forester W. R. Petrie writes with reference to Fraser Island operations:—

"*Forest Roads.*—The first section of a road to connect with Mr. McKenzie's line was commenced.

"Messrs. Wilson, Hart, & Co. and Hyne & Sons' private tramline is still in excellent condition, though not worked up to its full capacity.

"Mr. H. McKenzie's tramline was so far completed as to allow of a start being made in hauling logs to his Island mills. The line is well put down, and should prove capable of dealing with a large supply of logs without much upkeep being necessary.

"In November a crossing over Poyungan Creek was completed for the sum of £50. The work included a slab bridge 23 ft. x 10 ft., and a roadway over 8 chains of morass, made of logs and brush, with a top dressing of sand 12 in. deep and 10 ft. wide.

"*Water Supply.*—All the necessary piping, pump and engine, &c., was purchased for the water supply, and arrangements made for the construction of a 6,000 gallon concrete tank.



LOGGING KAURI IN NORTH QUEENSLAND.

SNIGGING KAURI PINE FROM THE FORESTS OF THE MOUNT LEWIS RANGES, NORTH QUEENSLAND.  
Extremely rough and broken country.



LOGGING KAURI IN NORTH QUEENSLAND.

HAULING TIMBER FROM SAME LOCALITY.

Rough granite ranges where "shooting" is necessary to get the logs out to the loading ground  
for transport to Mount Molloy, the nearest railway station.



"State School for Fraser Island.—A State School was erected by the Department of Public Instruction, on a site near the Forest Station, and the teacher commenced duty at the end of January, 1920. Its establishment marked a step towards the stabiliment of Forestry on the Island, in that a more contented class of employees is now possible.

"I would again stress the importance of constructing a tramline and road to deep water at Ungower Light. This I consider to be essential to the development of the Island. The question of constructing a sleeper mill should be considered. Seeing that Messrs. McKenzie's Limited has already four sawmills on the Island, with the prospect of another, the output from them, together with the pile trade and sleepers, should be ample to keep both his and the proposed Ungower wharf occupied if co-operation is possible.

"During April, 1920, the Forestry motor launch 'Heather' was put in running order. After being so long out of commission, the benefit of having her running again was duly appreciated by all concerned."

### LOGGING OPERATIONS.

The timber-faller was busy in Queensland during the year.

The total log cut for the State, combined for both private and Crown lands, was greater by 34,000,000 superficial feet than that of the preceding period, the increase being accounted for by the stronger demand for Queensland pine for both home building and the Southern trade. There were harvested during 1919, 140,966,000 superficial feet of pine logs, as against 107,152,000 for 1918. The cut of pine thus equalled that of the big logging year of 1914, when the out-turn amounted to 141,557,000 superficial feet.

The utilisation of hardwood logs, however, had dropped from 110,679,000 superficial feet in the first year of war to 71,782,000 superficial feet last year, so that the mills dealt with only 84 per cent. of the gross turnover of 1914—viz., 213,535,000 superficial feet, as against 253,072,000 superficial feet.

There were, however, twenty-one fewer mills at work—viz., 226, as against 247.

THE STATE'S LOG CUT, 1914 TO 1919.

	TOTAL LOG CUT (FROM CROWN AND PRIVATE LANDS).			
	1914.	1917.	1918.	1919.
	Superficial feet.	Superficial feet.	Superficial feet.	Superficial feet.
Softwoods .. .. .	141,557,000	98,651,000	107,152,000	140,966,000
Hardwoods .. .. .	110,679,000	68,059,000	71,855,000	71,782,000
Cedar .. .. .	836,000	247,000	395,000	787,000
	253,072,000	166,957,000	179,402,000	213,535,000
Percentage .. .. .	100 per cent.	66 per cent.	70.8 per cent. 100 per cent.	84.3 per cent. 119 per cent.

THE STATE'S SAWMILL OUTPUT, 1914 TO 1919.

	1914.	1915.	1916.	1917.	1918.	1919.
Number of sawmills in operation ..	252	247	230	227	221	226
Number of hands employed ..	4,359	4,311	3,734	3,441	3,543	3,973
Value of machinery, plant, land, &c. £	601,119	568,458	567,356	545,184	562,531	617,633
Pine cut .. .. .	101,112,427	89,726,215	75,231,339	70,465,436	75,006,691	100,690,008
{ Super. feet	838,713	769,164	657,289	641,117	816,136	1,265,128
{ Value, £	668,997	433,536	290,738	197,783	316,057	629,485
Cedar cut .. .. .	14,329	11,085	6,343	3,893	7,442	13,160
{ Super. feet	66,674,215	54,790,162	46,328,581	40,999,378	43,113,168	43,069,357
{ Value, £	614,853	531,981	491,903	435,427	512,670	606,632
Planing, moulding, &c. ..	33,786	49,682	35,748	107,279	119,800	105,580

The operations of the Forest Service contributed 22.5 per cent. of the 1919 yield of log timber, as against 27 per cent. for 1917 and 25.7 per cent. for 1918. In detail, the Crown's share of the softwood log cut was 29 per cent.; of hardwood, 8 per cent.; and of cedar, 13.5 per cent. The remainder came from alienated forests now privately held.

FOREST SERVICE LOG CUT, 1914 TO 1919-20.

	1914.	1917.	1918.	1919.	1919-20.
	Superficial feet.	Superficial feet.	Superficial feet.	Superficial feet.	Superficial feet.
Softwoods .. .. .	50,906,000	37,864,000	38,743,000	41,972,000	44,298,000
Hardwoods .. .. .	14,858,000	7,390,000	7,142,000	5,853,000	5,712,000
Cedar .. .. .	335,000	173,000	172,000	107,000	159,000
	66,099,000	45,427,000	46,057,000	47,932,000	50,169,000
Percentage .. .. .	100 per cent.	68 per cent.	69.6 per cent. 100 per cent.	72.5 per cent. 104 per cent.	75.8 per cent. 108.9 per cent.

By comparison, the turnover for the financial year 1919-1920 was greater by 2,237,000 superficial feet than the cut for the calendar year.

## COMPARISON 1919 WITH 1919-20.

	1919.	1919-20.
	Superficial feet.	Superficial feet.
Pine .. .. .	41,972,000	44,299,000
Hardwoods and other timbers .. .. .	5,853,000	5,712,000
Cedar .. .. .	107,000	159,000
	47,932,000	50,169,000

The details are as follows:—

## FOREST SERVICE TIMBER CUT.

	1918.	1919.	1919-20.
	Superficial feet.	Superficial feet.	Superficial feet.
Hoop and Bunya logs and tops .. .. .	35,488,681	40,567,959	43,113,383
Kauri .. .. .	1,438,610	663,308	339,111
Cypress .. .. .	710,878	741,336	846,229
Bally Gum .. .. .	46,444		
Beech .. .. .	437,377		
Silky Oak .. .. .	121,124	854,813	771,955
Putt's Pine .. .. .	5,117		
Yellow-wood .. .. .	56,748		
Other .. .. .	438,388		
Total Softwoods .. .. .	38,743,067	42,827,416	45,070,678
Red Cedar .. .. .	172,373	107,298	159,209
Hardwoods .. .. .	7,141,934	4,998,033	4,939,610
Grand Total .. .. .	46,057,374	47,932,747	50,169,497

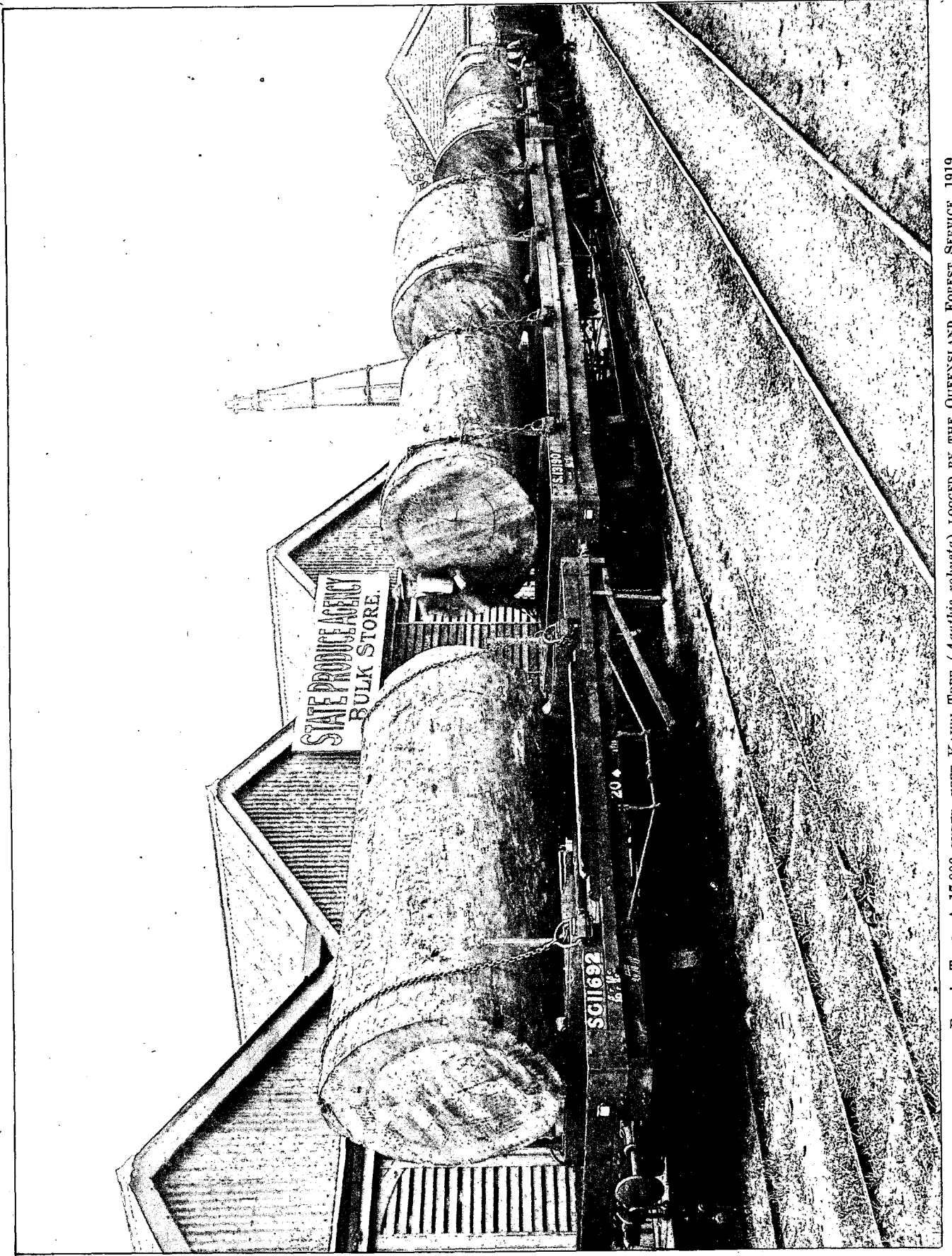
The Nanango, Gympie, and Ipswich districts provided 66 per cent. of the pine log output of the calendar year 1919, and 60 per cent. of that for the financial year 1919-1920. The figures are hereunder:—

## HOOP AND BUNYA LOG PINE CUT.

	1918.	1919.	1919-20.
	Superficial feet.	Superficial feet.	Superficial feet.
Nanango district .. .. .	11,447,000	10,907,156	10,841,881
Gympie .. .. .	7,784,000	7,206,445	8,169,355
Ipswich .. .. .	7,221,089	9,586,935	7,145,436

There were harvested in the South-western region of the State, 746,336 superficial feet of Cypress Pine for the calendar year, and 846,229 superficial feet for the financial year. The Roma and Dalby districts were the principal suppliers. The West has not yet recovered from the persistent droughts and alarms of the last few years; in 1914, four times as much Cypress Pine was marketed by the Forest Service as was sold during 1919-1920. The hardwood sales have also fallen off to a remarkable extent; against the 14,858,000 superficial feet disposed of in 1914, only 7,142,000 superficial feet were dealt with for the calendar year, or 5,853,000 superficial feet for the financial year. Of this total, nearly half came from the Fraser Island forest. The explanation is largely that the accessible hardwood areas formerly possessed by the Crown have been alienated for settlement. Such selected lands now furnish 92 per cent. of the hardwood log yield of Queensland.

The Atherton, Cairns, and Herberton districts accounted for 663,472 superficial feet of Kauri during the calendar year, or 339,161 superficial feet for the financial year—something like one-third of the 1918 cut. The same districts yielded practically the whole of the Red Cedar logged, and also the 207,149 superficial feet of Maple recorded.



BELL'S TREE—A 17,000 SUPER. FEET KAUNI TREE (*Agathis robusta*) LOGGED BY THE QUEENSLAND FOREST SERVICE, 1919.

The operations in hewn, split, and pole material were more active than for several years past, except in the case of mine timber stocks. Comparisons are drawn hereunder :—

## RAILWAY, MINING, AND MISCELLANEOUS.

	1918.	1919.	1919-20.
Sleepers and transoms .. .. .	116,723 pieces	253,720 pieces	181,316 pieces
Posts, rails, and palings .. .. .	68,267 pieces	85,398 pieces	97,285 pieces
Piles and girders .. .. .	101,214, l. ft.	228,509, l. ft.	434,559, l. ft.
Telegraph poles and house blocks .. .. .	92,289, l. ft.	112,151, l. ft.	126,116, l. ft.
Mining and miscellaneous .. .. .	1,305,171, l. ft.	702,797, l. ft.	692,727, l. ft.
Fuel .. .. .	50,921 tons	44,059 tons	49,333 tons
Sandalwood .. .. .	406 tons	498 tons	546 tons
Mangrove .. .. .	98 tons	18 tons	18 tons
Guano .. .. .	560 tons	139 tons	139 tons
Foam bark .. .. .	5 tons	4 tons	..
Sand and gravel .. .. .	..	13 loads	..
Hoop Pine gum .. .. .	..	90 lb.	..

There have not been wanting during the period under review the usual difficulties of the timber trade with respect to log transport. Decasualisation of the sawmilling industry may not be anticipated so long as reliance is placed completely upon bullock teams for delivery of the log supplies. Either the season is dry and the stock too poor to work, or the stock is fat and the roads are impassable because of the rains. In the second half of the year, owing to droughty conditions, the teams were unable to keep pace, *inter alia*, with the Forest Service mill at Imbil, and notwithstanding the high prices prevailing for feed, it became necessary to purchase two horse teams; and a bullock team was added subsequently. In anticipation, however, of ultimate resort to power logging methods, the forest road system for the Brooloo Forest was designed for steam or motor traction. Logging tramways were planned also for the Pidna and other reservations, and applications were called for appointment to the newly-created post of Forest Engineer.

In the North, the haulage problem became particularly acute during 1919, and not only were the charges for bullock-team hire exorbitant, but it was often difficult to get timber hauled at all. The caterpillar tractor was tried out by one enterprising firm, but did not prove a financial success. Steam traction, on the other hand, was found to provide the cheapest form of road transport for logs.

The solution of the road transport problem, however, will still leave untouched the supreme difficulty of the Northern timber trade—viz., lack of export facilities. Great areas of valuable timber land have been thrown open to selection, and great masses of timber must either be marketed or destroyed forthwith. The handling facilities at Cairns, however, are obsolete, and the shipping outlet is continually congested with log accumulations. Thousands of pounds worth of material is being lost to the community annually because of export hold-ups, which subjects the log stacks of Maple and Kauri to the ravages of summer swarms of wood-borers. During the past year the situation has been aggravated by two shipping strikes, which involved timber traders and the Forest Service itself in heavy losses. Meanwhile the North has colossal stocks of prime timber for sale, and the South is entreating delivery. The District Forester at Atherton quotes a timber-buyer as having said :—“Give me the shipping to send unlimited quantities of timber to the Southern markets, and I will quote you for all timber over 5 feet girth of any species.” Timber could be cut in a face if this “shipping problem” could be solved. As it is, forests are being sacrificed vainly in North Queensland, whilst Melbourne is obtaining log supplies from Borneo.

In the Hoop Pine forests of the South, the Forest Service has been attending to its own logging operations, and with success. So far as the Gympie forest district is concerned, the report of the District Forester speaks for itself. Mr. Simon, in his Annual Report, says :—

“The object has been to concentrate operations as much as possible, except in cases where the timber on a certain piece of land was urgently in need of exploitation because of its proposed alienation. With this in view, the majority of the Pine harvesting was carried out on Brooloo State Forest and the Mary Valley timber areas. The reason for concentration is that forest organisation is carried on hand in hand with timber harvesting; a further reason is that consequent on organisation movement the roads and grazing were improved, and with improved roads and grazing the inauguration and spread of the direct sales system is vastly helped. The teamsters are suspicious of innovations, and the natural attitude is to stiffen their backs and sneer as a new method is suggested. They could not, however, resist the temptation we were able to offer in the matter of roads, &c.

"The increased revenue derived by the initiation of 'direct sales system' is substantial, as is shown by the completion reports and results appended. The success of our earlier ventures was so marked that at the half-yearly sales on Brooloo State Forest three timber blocks, which to then had always been offered as sales at stump, we withdrew, and tenders were invited for logging contracts. As we expected, opposition was encountered, but the objection was not so forceful as it was on previous occasions. The blocks are now each supplying timber for 'direct sales,' *i.e.*, sales on railway trucks. Logging contracts were entered into with fresh teamsters on the other portions of Brooloo State Forest. The number of logging contractors at the end of the year was fifteen. Four sales at stump contracts still existed on Brooloo State Forest, two of which feed bush mills, and the other two operate on rough country to which extensive organisation has not been extended.

"1,313,595 superficial feet of pine were logged on Brooloo State Forest by our workmen employed on a weekly wage. The advantages which accrue are that the logging is done with less waste than it is practicable to insist on in every instance under sales at stump contracts, and trees are felled to the best possible advantage of the remaining forest.

"The average cost of cutting per 100 superficial feet is 1s. 6½d., including lost time, accident compensation, supervision, measuring, and the usual track cutting. Much of the timber was logged at a face entailing a deal of extra labour, as every tree that was saleable was logged. Instances have recently come under my notice where 2s. is being paid for logging at a face.

"There were several direct sales of logs other than pine from trees of 80 in. g.b.h. and over—*viz.*, small pine secondary woods which, if put to auction in the usual manner, would probably not have been purchased. These sales do not, therefore, readily admit of a comparison.

"Eleven lots of pine cut from trees 80-in. g.b.h. and over were delivered under the 'direct sales' system, and yielded a profit over stump sales of £1,150 10s. 3d., or 2s. 6d. per 100 superficial feet on the quantity delivered, *i.e.*, 1,201,837 superficial feet.

"During the year the Forest Service sawmill at Imbil was kept regularly supplied with timber, obtained and delivered by the Forest Service itself from Brooloo State Forest. A number of 'direct sales' timber cases for 100,000 superficial feet or over of pine each were also supplied during the year, as well as a large number of miscellaneous orders for pine, other scrubwoods, and hardwood. A large number of stumpage sales under the control of the Forest Ranger also eventuated in the district during the year."

In the Brisbane, Ipswich, and Nanango districts similar results were obtained. In the Bundaberg district it had not been possible to adopt Forest Service conversion procedure by the close of the year.

#### DIRECT HAULAGE.

During the financial year, 3,343,101 superficial feet pine, 54,864 superficial feet hardwood, 196,141 superficial feet scrubwood, and 482,696 superficial feet of cabinet woods were logged, at a cost of £12,761 15s. 8d.

Added profit on above over sale at stump amounted to some £4,000.

In the North the direct delivery policy met with unexpected obstacles in the shape of two shipping strikes, unprecedented congestion, and a boycott of Forest Service log sales. If success was not complete, the experience has been most valuable indeed, and further operations have been planned.

The arrangements with respect to the sales of railway and mining timber have not been satisfactory in all respects, and these operations have proved the least profitable yet the most difficult of any in which the Forest Service has engaged. There was every prospect at the end of the year, however, of an improvement in the procedures prescribed.

The sum of £400 was spent on hardwood harvesting on the Corella Forest by Forest Service workmen, the timber manufactured being chiefly for railway supplies. An order was filled for electric light poles for Blackall Town Council.

Strong attempts have been made by the Forest Service during the year to secure the utilisation of previously unmarketable woods. The visit to Bowen of Forest Ranger Arnold resulted in the subsequent satisfying of a keen local demand for fruit-case timber by the furnishing from the Atherton forests of secondary timbers otherwise unsaleable. The logging of the knotty "tops" of Hoop Pine was increased greatly during the period. Whilst in 1917 this class of material was wasted utterly, in 1918 the Forest Service disposed of over 4,000,000 superficial feet of it. In 1919 the sales had risen to 7,513,600 superficial feet, and for the period of the financial year 1919-20 the quantity marketed was 8,158,183 superficial feet.

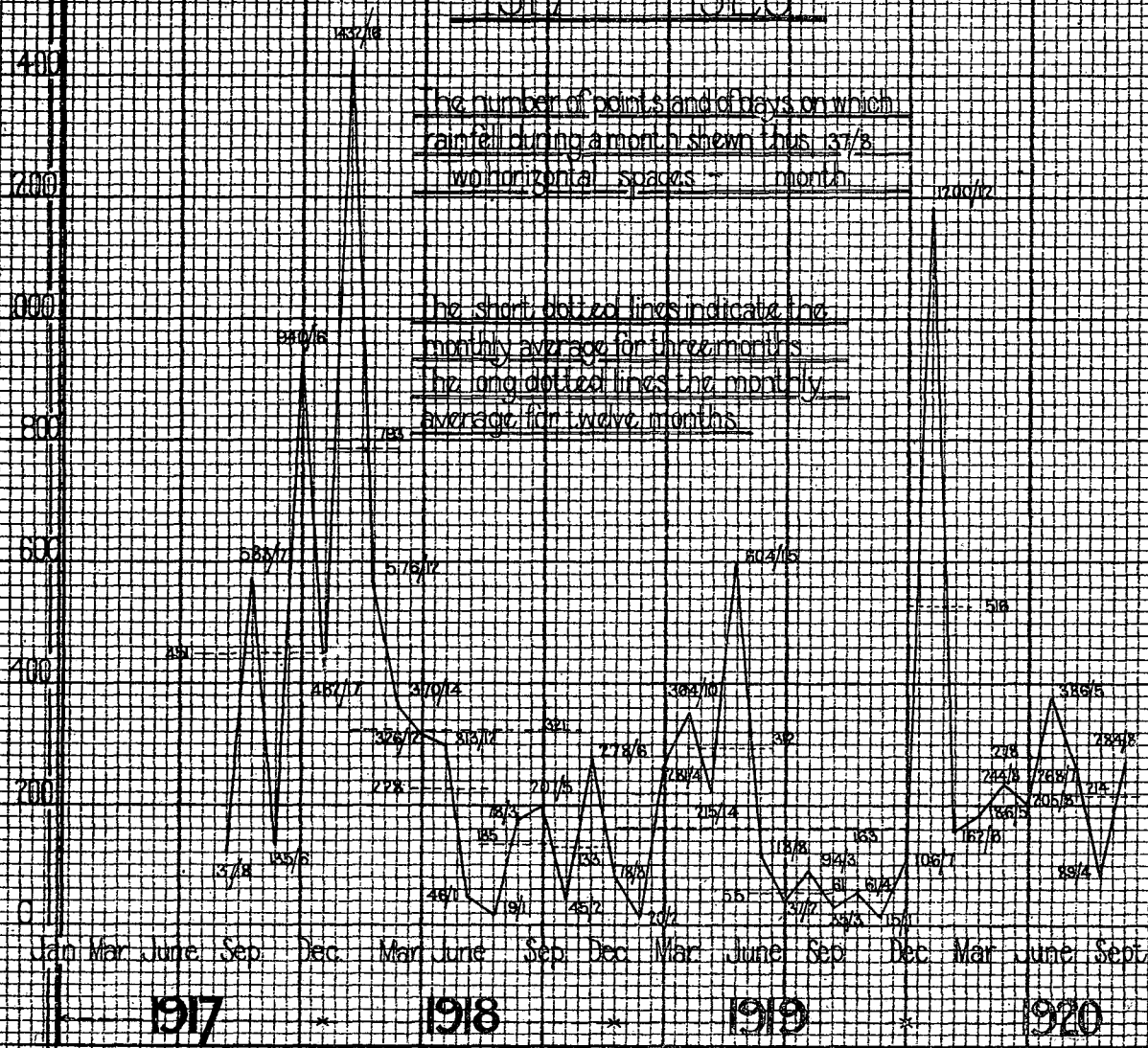
About 80,000 superficial feet of otherwise unsaleable Brown Oak and Marara were milled for Forest Service use in the erection of offices and dwellings at the various Forest Stations. The logs, many of which were under 40 in. girth, yielded 60 per cent. of sawn timber.

# RAINFALL at MBI

1917 1920

The number of points and of days on which  
rain fell during a month shown thus 137/8  
with horizontal spaces - months

The short dotted lines indicate the  
monthly average for three months  
The long dotted lines the monthly  
average for twelve months



Jan Mar June Sep Dec Mar June Sep Dec Mar June Sept  
1917 1918 1919 1920

Following the suit of the Forest Service, local builders are now employing Brown Oak and *Cryptocarya obovata* boards for linings, and Ironwood and Scrub Box for chamfer boards. Pink Poplar (*Euroschinus falcatus*) and Silver Ash (*Flindersia schottiana*) have also come into favour in Brisbane at 16s. per 100 superficial feet in the log. The demand for Yellowwood and Crow's Ash was keen at the same price for 48 in. girth and upwards.

The market was canvassed also on behalf of the smaller scrubwoods for use for minor purposes, as, for instance, mouldings, table legs, tool handles, mallets, and rulers, &c., and some success was met with in respect to such species as Grey Ebony (*Diospyros pentamera*); Cork Cedar (*Ficus* sp.), and Red Birch (*Ackama Muelleri*). The logging of these small trees was done for the most part by resident Forest Service workmen, and the average cost of falling was 1s. 9d. per 100 superficial feet, the higher rate being due to smallness or to the presence of flanks and spurs.

The comparative failure of recent batches of imported axe handles when used for rough forest work led to the hand manufacturing of axe handles from split billets of Spotted Gum obtained from trees unsaleable as mill logs. The cost of the hand-made article was 1s. 9½d., and it has been entirely successful. Pick handles similarly made from unsaleable Spotted Gum cost 2s. 3½d. The number manufactured was 337 pick handles and 611 axe handles.

Enquiries were received from one of the large railway companies in France with respect to supplies of railway sleepers. Similar information was sought by South African and Indian buyers. The necessity for conserving local supplies for local needs was paramount, however, and the policy was adopted of exporting only the surpluses of each year's operations.

This policy was applied definitely at the end of the year in respect of Hoop and Bunya Pine logs, by the issuance of a Proclamation under the Sugar Acquisition Act, whereby the Crown acquired all such logs for local use, and itself became the exporter of the surplus. The function was added to the Forest Service, and preference in export was awarded to such industries as those of the Southern match manufacturers and ply-wood makers, the New South Wales State Timber Yards, and the Victorian Railways. Other industries were dealt with in descending order of reliance upon Queensland supplies.

#### SILVICULTURAL INVESTIGATION AND EXPERIMENT.

The silvicultural investigations and experimentation essential to forest extension have been carried on to the limit possible under the unwonted circumstances of the year, through which continued the drought conditions of the two years preceding.

##### CLIMATIC CONDITIONS.

Low rainfalls have been experienced at the Imbil Forest Experiment Station from 1917 to 1920; the annual falls are illustrated graphically on the chart facing this page. The chart typifies the climatic conditions prevailing throughout Southern Queensland. Apart from the heavy rains of December, 1919, and January, 1920, the falls were of the scantiest.

Similar conditions obtained in Northern Queensland, where September frosts did much damage, and the failure of the usual rainy season devastated the young forest growth during the final four months of 1919. The rainfall resumed normality in the early part of 1920, but the promise of good seasons was marred by the visitation of a cyclone which wrought untold destruction to the timber belts in the region from Gordonvale to Port Douglas and westward. The illustrations to this report convey a not-altogether-adequate idea of the havoc resulting, but they may serve to indicate some of the difficulties attending the pursuit of tropical forestry in this State, where man has been not the only destroyer of the original timber asset.

On Fraser Island the rainfall was 46.68 inches, of which nearly 40 inches fell in the last half of the period under review. The total fall was 11 in. below the average for the previous six years, which included the drought years of 1915 and 1919. It was 24 in. below the average for all recorded years.

##### THE SEED FALL.

Following upon two years of seed failure, consequent upon climatic adversity, the 1920 fall of Hoop Pine seed was good, and, despite the bad conditions for development, proved fertile. Some 1,400 lb. were collected for nursery use. Bunya Pine also yielded a satisfactory crop, and 1,300 lb. were obtained from Gympie, and 2,000 lb. from Blackbutt.

On Fraser Island, 392 lb. of seeds of *Callitris arenosa*, and 98 lb. of *Eucalyptus pilularis* were harvested.

In North Queensland the seed fall was much below par. At the end of 1919, Maple, Milky Pine, Ash, and Putt's Pine showed promising crops, but the cyclone of February, 1920, destroyed all prospect of collection. Red Cedar fruited poorly, and *Flindersia laevis* failed.







QUARTERLY FLOWERING AND FRUITING RETURN—QUEENSLAND FOREST FLORA—continued.

TREES IN FLOWERS.		SEED FORMING.		SEED RIPENING.		SEED FALLING.	
Common Name.	Botanical Designation.	Common Name.	Botanical Designation.	Common Name.	Botanical Designation.	Common Name.	Botanical Designation.
Silver Ash	F. Schottiana Bursera australasica Sterculia diversifolia	Endiandra Sieberi Notelaea longifolia Endiandra discolor	Clerodendron floribundum Nephelium distyle Melaleuca leucadendron	Hoop Pine Bunya Pine Red Stringy bark Swamp Mahogany	Schizomeria ovata Euroschinus falcatus Diospyros pentamera Sterculia diversifolia	..	A. Cunninghamii A. Bidwilli E. resinifera E. robusta
Pink Poplar	Eugenia parvifolia Eugenia cyanocarpa Melaleuca leucadendron var. glauca Elaeocarpus cyaneus Alyxia ruscifolia Myrtus tenuifolia Leptospermum stellatum	Eupomatia laurina E. pilularis Ricinocarpus pinifolius E. haemastoma Alphitonia sp. Schizomeria ovata Leptospermum stellatum Sterculia diversifolia	Petalostigma quadriloculare Ricinocarpus pinifolius Ficus stenocarpa	..	Petalostigma quadriloculare Ricinocarpus cyaneus Petalostigma quadriloculare Leptospermum stellatum Backhousia myrtifolia	..	Cupania anacardioides
Turpentine Scrub Box	Syncarpia Hillii Tristania conferta Hardenberga monophylla Eugenia hemilampra Tristania suaveolens var. glabrescens Angophora lanceolata Hibiscus tillaceus	White Gum	..	..	..	..	..
Mahogany	..	..	..	..	..	..	..
Paper Bark Tea Tree Yellow Stringy bark	E. acmenioides Acacia perrinervis E. corymbosa Halfordia drupitera E. fesselaris Xylomelum pyriforme Eugenia cyanocarpa Evodia accedens Myrtus tenuifolia Pithecolobium Lovellae Petroseonia virgata	..	..	..	..	..	..
Red Bloodwood	..	..	..	..	..	..	..
Moreton Bay Ash	..	..	..	..	..	..	..

QUARTER ENDING 31ST DECEMBER, 1919—continued.

QUARTER ENDING 31ST MARCH, 1920.



QUARTERLY FLOWERING AND FRUITING RETURN—QUEENSLAND FOREST FLORA—*continued.*

TREES IN FLOWER.		SEED FORMING.		SEED RIPENING.		SEED FALLING.	
Common Name.	Botanical Designation.	Common Name.	Botanical Designation.	Common Name.	Botanical Designation.	Common Name.	Botanical Designation.
Blue Gum	<i>Xylomelum pyriforme</i>		<i>Pleiococca Wilcoxiana</i>	Blue Gum	<i>E. tereticornis</i>		<i>E. tereticornis</i>
Pink Foambark	<i>Leucopogon margarodes</i>		<i>Synoum glandulosum</i>	Swamp Mahogany	<i>E. robusta</i>		<i>E. robusta</i>
Queensland Nut	<i>Banksia integrifolia</i>		<i>Ratonia pyriformis</i>	Pink Foambark	<i>Cryptocarya glaucescens</i>		<i>Cryptocarya glaucescens</i>
Flooded Gum	<i>E. tereticornis</i>		<i>Acronychia imperforata</i>	Scrub Box	<i>Cupania pseudorhus</i>		<i>Tristania conferta</i>
White Wattle	<i>Casuarina suberosa</i>		<i>Dodonaea triquetra</i>	Queensland Boxwood	<i>E. resinifera</i>		<i>Denhamia pittosporoides</i>
Hard Bolly Beech	<i>Cupania pseudorhus</i>		<i>Beilschmedtia obtusifolia</i>	Forest She-Oak	<i>Panax elegans</i>		<i>Rhodanmia argentea</i>
Mahogany	<i>Macadamia ternifolia</i>		<i>Acacia penninervis</i>	Red Bloodwood	<i>Rhodanmia argentea</i>		<i>Casuarina torulosa</i>
Marara	<i>E. saligna</i>		<i>Xylomelum pyriforme</i>	Black Bean	<i>E. corymbosa</i>		<i>E. corymbosa</i>
River She-Oak	<i>Litsea sp.</i>	Silver Beech/	<i>Melaleuca leucadendron</i>	Queensland Nut	<i>Castanospermum australe</i>		<i>Macadamia ternifolia</i>
Brown Oak	<i>Tristania suaveolens</i>	Scrub Box	<i>Elaeocarpus grandis</i>	Marara	<i>Weinmannia lachnocarpa</i>		<i>Weinmannia lachnocarpa</i>
Moreton Bay Fig	<i>Weinmannia lachnocarpa</i>	Mahogany	<i>Tristania conferta</i>	Golden Box	<i>Macadamia ternifolia</i>		<i>Vitex lignum vitae</i>
Blue Gum	<i>Casuarina Cunninghamiana</i>	White Cedar	<i>Melia composita</i>	Red Heart	<i>Macadamia ternifolia</i>		<i>Syncarpia subargentea</i>
	<i>Tarrietia argyrodendron</i>	Black Bean	<i>Castanospermum australe</i>	Wild Lime	<i>Weinmannia lachnocarpa</i>		<i>Dissiliaria baloghoides</i>
	<i>var. trifoliolata</i>	Crow's Ash	<i>Flindersia australis</i>	White Poplar	<i>Tristania suaveolens</i>		<i>Sterculia sp.</i>
	<i>Ficus sp.</i>	Marara	<i>Weinmannia lachnocarpa</i>	Mahogany	<i>Tristania suaveolens</i>		<i>Tristania suaveolens</i>
	<i>E. tereticornis</i>		<i>E. saligna</i>	Thorny Yellow-wood	<i>Rhodospheara rhodantha</i>		<i>Rhodospheara rhodantha</i>
		Forest She-Oak	<i>Casuarina torulosa</i>	Yellow Marblewood	<i>thema</i>		<i>Ficus sp.</i>
		Flooded Gum	<i>E. saligna</i>	Brown Fig	<i>Ficus sp.</i>		<i>Ficus sp.</i>
		Thorny Yellow-wood	<i>Cupania pseudorhus</i>	Yellow Fig	<i>Cupania pseudorhus</i>		<i>Cupania pseudorhus</i>
		Pink Foambark	<i>Litsea sp.</i>	Pink Foambark	<i>Cedrela australis</i>		<i>E. patentinervis</i>
		Pepperwood	<i>Rhodospheara rhodantha</i>	Red Cedar	<i>Owenia venosa</i>		<i>Owenia venosa</i>
		Hard Bolly Beech	<i>Ficus sp.</i>	Roseapple			
		Yellow Marblewood					
		Yellow Fig					

QUARTER ENDING 30TH JUNE, 1920—*continued.*

REGENERATING *FLINDERSIA CHATAWAIANA* FORESTS IN NORTH QUEENSLAND.



1.—*F. Chatawiana* REGROWTH PRODUCED BY ASSISTED NATURAL REGENERATION.—GADGARRA STATE FOREST, OCTOBER, 1919.



2.—*F. Chatawiana* (MAPLE) SEEDLINGS, RESULTING FROM REGENERATION OPERATIONS.

## EXPERIMENTAL SILVICULTURE.

The purpose of the operations carried on was, primarily, the accumulation of the data on which to found future silvicultural practice. With that object in view, close observations were maintained throughout the period and valuable records were added to the files in consequence.

Following is a list of the silvicultural experiments in the several forest districts:—

## SILVICULTURAL EXPERIMENTS AND OPERATIONS.

District.	Area.	Project.	Particulars of Work Done.	Cost.
Gympie	Brooloo	Planting Experiment No. 1	897 Red Cedar and 8761—10/12 Bunya	£ s. d. 4 12 6
Gympie	Brooloo	Planting Experiment No. 3	1,500 2—0 Bunya	8 12 8
Gympie	Brooloo	Planting Experiment No. 4	988 2—0 Bunya plants as refills; 650 refills second planting	7 16 7
Gympie	Brooloo	Planting Experiment No. 5	1½ acres seed-spotted with Hoop Pine; ½ acre seed-spotted pit hole system; ¾ acre planted with 1/3—0 Hoop Pine	11 19 0
Gympie	Brooloo	Planting Experiment No. 6	1,020 Red Cedar	13 17 7
Gympie	Brooloo	Planting Experiment No. 7	26,458 Bunya Pine bulbs; 2,000 holes dug for Red Cedar but not planted; 800 holes dug for Bunya Pine but not planted	125 0 4
Gympie	Brooloo	Planting Experiment No. 9	250 Bunya refills scattered	5 7 4
Gympie	Brooloo	Planting Experiment No. 10	550 2 1/6 Bunya (old)	4 13 5
Gympie	Brooloo	Seed collection	2,375 lb. seed of various species collected	46 7 4
Gympie	Imbil	Nursery	Watering, weeding, planting, attending to Imbil Nursery	293 6 8
Gympie	Imbil	Hoop Pine liberation	Hoop Pine liberations to free the stand and encourage regeneration	17 19 6
Gympie	Imbil	Eucalyptus regeneration	80 acres treated; ringbarking, brushing, cutting damaged Ironbark saplings level with ground for coppice growth	16 5 5
Gympie	Imbil	Advertising and samples	Shipping and forwarding woods and forest products samples	74 17 3
Gympie	Brooloo	Planting Experiment No. 12	1,503, 1, 10/12—0 Bunya Pine	5 11 0
Gympie	Brooloo	Planting Experiment No. 13	1 acre planted Bunya Pine	3 14 0
Gympie	Brooloo	Scrub Felling Compt. No. 11	47 acres felled	143 13 4
Gympie	Brooloo	Experimental sowing Bunya Pine	Brushing, planting, and marking out	12 19 1
Gympie	Kilkivan	Pine liberation	100 acres treated	48 17 7
Gympie	Biggenden	Experimental Planting No. 1	10 acres felled	33 10 4
Brisbane	Reserve 283, Colinton	Nursery	Clearing, grubbing, burning, ploughing, fencing, &c., of 1½ acres for nursery; plant watering and attending to same	131 17 9
Brisbane	Reserve 283, Colinton	Seed spotting	1½ acres spotted with Blackbutt and Ironbark	2 9 0
Brisbane	Reserve 283, Colinton	Thinning and improvement work	Thinning dense stands, removing debris, ringing useless trees on 100 acres, and thus assisting natural regeneration	169 17 3
Dalby	Yeulba	Nursery	Preparing ground for nursery to be constructed	3 4 7
Dalby	Braemar	Nursery	Preparing ground, fencing, and making beds for nursery	25 10 9
Fraser Island	Fraser Island	Experimental Area No. 1	Clearing, ploughing, fire lines ground plot, fencing, and putting area under treatment for Cypress regeneration (results most successful)	35 2 6
Fraser Island	Fraser Island	Experimental Area No. 4	Planting 180 Callitris Arenosa, 32 Cup. pseudorhus, 27 Hoop Pine, 2 Kauri, 1 White Cedar and Oak, and 85 Taxodium	2 15 2
Fraser Island	Fraser Island	Experimental Area No. 6	Planting 198 Tallow-wood, 192 Blackbutt, 92 Ironbark plants	3 5 8
Fraser Island	Fraser Island	Experimental Area No. 7	Planting 230 Blackbutt, 238 Tallow-wood, 40 Red Stringy; also 918 seed spots were sown on this area	2 8 5
Fraser Island	Fraser Island	Experimental Area No. 9	17 acres cleared, 30 acres ploughed and harrowed, 37 acres ringbarked, 235 lb. Cypress seed sown	81 6 2
Fraser Island	Fraser Island	Experimental Area No. 10	34 acres cleared	45 3 3
Fraser Island	Fraser Island	Experimental Area No. 11	6,639 trees (Cedar and Eucalyptus) planted	16 12 2
Fraser Island	Fraser Island	Experimental Area No. 13	Fencing 7 chains 17 links, splitting and hauling 46—8/17 posts and strainers, tubing and planting 1,043 trees (1 acre) 100 per cent. success obtained in this instance by tube method of planting. lumping, 1 acre	15 19 8

## SILVICULTURAL EXPERIMENTS AND OPERATIONS—continued.

District.	Area.	Project.	Particulars of Work Done.	Cost.
Fraser Island . .	Fraser Island	Experimental Area No. 14	Brushing and felling 1 acre, hauling and splitting 46—8/17 posts and strainers, fencing 7 chains 17 links, planting 120 trees, lumping 1 acre	£ s. d. 14 3 4
Fraser Island . .	Fraser Island	Experimental Area No. 15	Brushing and felling 1 acre splitting and hauling 46—8/17 posts and strainers, lumping 1 acre, fencing 7 chains 17 links	10 12 1
Fraser Island . .	Fraser Island	Experimental Area No. 16	Brushing, felling, and lumping 3 square chains, hauling and splitting 15—16/17 posts; 429 seed spots sown	5 12 8
Fraser Island . .	Fraser Island	Experimental Area No. 17	Brushing, felling, and lumping 1 square chain; this project was for trying-out tray-method	1 3 0
Fraser Island . .	Fraser Island	Experimental planting	12,292 trees planted . . . . .	22 18 4
Fraser Island . .	Fraser Island	Seed collection and extraction	630 lb. of seed were extracted, of various species	86 18 1
Fraser Island . .	Fraser Island	Nursery (old)	Attention to nursery, planting, weeding, watering, &c., at old station	119 0 9
Fraser Island . .	Fraser Island	Nursery (new)	Preparing ground, fencing, &c., for new nursery; planting and watering	156 10 6
Gympie . .	Brooloo . .	Scrub falling Compt. 8	35 acres felled . . . . .	69 4 0

A general account of the silvicultural operations of the more important forestry districts is given hereunder:—

## FRASER ISLAND.

On Fraser Island the species dealt with in planting plots comprised Red Cedar, Blackbutt, Tallowwood, Hoop and Bunya Pine, and Cupressus macrocarpa, to the total of 13,000 plants. The results generally were successful.

The excellent growth of various species in the experimental plots is revealed by the following table:—

## THE PLANTATION GROWTH ON FRASER ISLAND.

Species.	Planting Dates.	Height at 30th June, 1920.
		Ft. in.
Blackbutt . . . . .	November, 1918 . . . . .	22 0
Red Stringybark . . . . .	November, 1918 . . . . .	22 0
Tallow-wood . . . . .	November, 1918 . . . . .	20 0
Yate . . . . .	November, 1918 . . . . .	19 0
Karri . . . . .	November, 1918 . . . . .	18 0
Spotted Gum . . . . .	March, 1919 . . . . .	19 0
Yellow Stringybark . . . . .	March, 1919 . . . . .	9 6
Hoop Pine . . . . .	January, 1918 (9 in.) . . . . .	9 0
Kauri . . . . .	January, 1918 (2 ft.) . . . . .	12 0
Red Cedar . . . . .	February, 1918 (9 in.) . . . . .	17 0
Pinus longifolia . . . . .	January, 1918 . . . . .	3 0
Taxodium distichum . . . . .	January, 1918 . . . . .	5 9
Silky Oak . . . . .	January, 1918 . . . . .	11 6
Black Bean . . . . .	February, 1918 . . . . .	6 0
Flindersia australis . . . . .	February, 1918 . . . . .	8 0
Pinus taeda . . . . .	January, 1918 . . . . .	5 0
Bunya . . . . .	January, 1918 . . . . .	4 3
Alphitonia sp. . . . .	January, 1918 . . . . .	19 0
White Cedar . . . . .	March, 1918 . . . . .	9 0

District Forester W. R. Petrie reports as follows:—

“Twenty-two acres were planted (on area No. 11) with Tallow-wood, Red Stringybark, Ironbark, Eucalyptus ficifolia, Red Cedar, Spotted Gum, and Eucalyptus carnea the spacing adopted being 12 ft. x 12 ft. Most of the trees were well grown, and all the Eucalypts were “tubed” or “bamboosed” and the Red Cedar open-root planted.

“One acre was planted 6 ft. x 6 ft. with Eucalyptus pilularis, Eucalyptus microcorys, and Eucalyptus resinifera on Area No. 13. Most of these were well grown plants, and they were all tube-planted and, as usual with this mode of planting, all lived.

“A start was made with planting Area No. 14 per bamboo method, 120 plants being put in.

“The Nursery being overcrowded, 1,000 Bunya bulbs, 1,666 very small Red Cedar, 1,000 very small Hoop Pine, and 800 miscellaneous species, chiefly of the Pinus genus, were planted out into open forest country early in the period. They practically all failed. The weather following the planting was very dry, but still it did not kill tubed and bamboosed trees.

“Trees for hedging, shade, &c., were planted at the New Forest Station, and comprised the following:—

30 *Leptospermum citratum*,  
 45 *Cupressus macrocarpa*,  
 110 *Cupressus macrocarpa* var. *Lambertiana*,  
 10 *Flindersia Australis*,  
 4 Red Cedar,  
 4 *Callitris calcarata*,  
 3 *Sterculia acerifolia*,  
 2 *Nephelium tomentosum*,  
 464 She-Pine.

“The following planting was done to fill in blanks on ‘seed spot’ areas:—

Area No. 6.—Tallow-wood 198, Blackbutt 192, and Ironbark 92.

Area No. 7.—Tallow-wood 238, Blackbutt 230.

“Shortage of planting areas necessitated 42 Kauri being planted on Area No. 4, and 31 Beech, 23 Silky Oak, and 30 Crow’s Ash on Area No. 5.

“The following trees were experimentally planted on Areas already planted up:—

Area No. 4.—1,501 Red Cedar,  
 106 *Cupressus macrocarpa*,  
 166 *Cupressus macrocarpa* var. *Lambertiana*  
 24 *Cupania pseudorhus*,  
 50 *Flindersia Acuminata*,  
 69 *Taeda*,

Area No. 5.—49 *Cupania pseudorhus*,

Area No. 11.—5,063 Red Cedar.

Tests were made of the two methods of planting—viz., tubing and bamboo planting. The cost of tubing and planting 1,043 trees upon one acre was £4 12s. 1d. with 100 per cent. success, as against probably only 20 per cent. success upon the same site with the cheaper open-root planting. Using the large bamboo tubes available, the expense of planting was much the same as for the tube method, but the cost of cutting and sowing the bamboo proved prohibitive.

Costing trials were carried out also with regard to seed spotting, using charcoal and black swamp soil mulches. Gathering charcoal proved expensive (£5 13s. 10d. per acre); the seed spotting itself amounted only to £2 9s. 2d. per acre. The District Forester reports:—

“This experiment was projected primarily to compare costs of attaining success by direct sowing assisted by charcoal mulch, with costs of successful planting of well-grown trees; and secondly to place on record definitely the beneficial results of charcoal or alternatively black swamp soil used as a mulch for conserving the moisture, and thus promoting germination and assisting the resultant regeneration to resist the effects of insolation on the Island sand.

“Advantage was taken of ideal weather conditions early in May and the ‘spots’ were prepared, and seed sown.

“Germination was excellent all round, but the black soil ‘spots’ had the advantage.

The following results and observations are recorded with regard to seed spotting without mulching:—

“Project Area No. 6.—This is an area of two acres, felled in 1917, and half of it ‘seed spotted’ with various *Eucalypts* in February, 1918, and the other half sown in lines with Cypress seed (*Callitris arenosa*) and lightly chipped in.

“The area is typical of a large tract of the Island which will eventually have to be taken in hand and made to produce timber, and the idea was to demonstrate its suitability for Cypress Pine and the great inferiority, to parts like the ‘sandbox’ part of Area No. 11, for instance, in growth promotion of *Eucalypts*.

“The practicability of raising Cypress plantations by direct sowing on these areas was also demonstrated, as was also the results of direct sowing of *Eucalypts* on similar areas.

“The position now is that the area contains a very irregular stand of *Eucalypts*, with other competing species such as *Casuarina suberosa*, *Acacia penninervis*, &c., on the *Eucalypt* half, and an excellent stand of Cypress Pine on the Cypress half. The Cypress



rows are very uniform, though the young trees are of course small. Aggressive Wattle and Forest Oak obtain, but will shortly be removed on this small area for comparison's sake, though on large similar areas a very fair proportion of Cypress would get through without this cleaning.

"Project Area No. 7.—This is an area of one acre of poor forest felled in October, 1917, and devoted to the (as far as Fraser Island is concerned) exotic *Eucalyptus citriodora*.

"The method adopted was 'seed spot,' the sowing being done on 2nd March, 1918, after a 'burn.' The site was chosen as almost the Island extreme in quality from the good scrub areas. The object was to test out 'seed spotting' on such an area with this species to demonstrate that it would grow on such localities and the very considerable inferiority in growth to that on scrub areas.

"981 seed spots were sown, and the germination was excellent, but on 19th February, 1919, only 614 seed spots contained seedlings. Growth was very irregular. Some trees are now 6 ft. high, while many are only a few inches."

Success was attained in treating Cypress Pine areas for natural regeneration. Project Area No. 1 was dealt with in 1916, and the methods adopted proved most successful. As is usual with *Callitris arenosa*, the seed trees did not all seed each year, and by consequence, there is now some unevenness of age in what are otherwise very fine stands. Project No. 9 was undertaken to clothe with Cypress Pine a ridge, naturally stocked with useless, stunted trees and dense shrub undergrowth, with patches of Grass tree. The District Forester now states that—

"On the harrowed and ploughed parts the germination promises excellent results, and is in marked contrast to unharrowed parts. Growth of the earlier planted and sown parts indicates clearly that ringbarking should be the first work undertaken. Brushing and burning should be delayed until the trees are dead and most of the debris fallen."

#### ATHERTON DISTRICT.

On the North Queensland tableland the experiments in most cases were marred by the unusual combination of spring frosts and summer droughts, but the resulting disaster to plant growth was made the subject of observation, and studies were made of the influence of the abnormal weather conditions upon the forest vegetation of the nurseries and neighbourhood.

Indian Teak plants proved unable to endure the frosts of the tableland. On the other hand, the native equivalent—*Gmelina fasciculiflora*—exhibited proof of hardiness. Drought and frost badly affected Maple, Silkwood, Silver Ash, and Silver Maple plants set out in plantation, but the same species succeeded in natural regeneration under a shelterwood. Their congeners, *Flindersia Ifflaiana* and *F. australis*, successfully survived in plantation. Hoop Pine plants suffered from the drought, but Bunya Pine withstood it. Kauri (*Agathis Palmerstoni*) showed wonderful adaptation to circumstances with a 70 per cent. survival, the wallabies accounting for most of the losses.

The following successful establishment of tree plants in the experimental plantations resulted from the Northern experiments:—

	Plants.
Agathis Palmerstoni .. .. .	7,000
Araucaria Cunninghamii .. .. .	700
Araucaria Bidwilli .. .. .	150
Flindersia spp. .. .. .	150
Gmelina fasciculiflora .. .. .	250
Cedrela australis .. .. .	500
	8,750

Red Cedar, as usual, was damaged by its natural enemy—the twig borer (*Hypsipyla robusta*).

The February cyclone did not leave the plantation plots unscathed, and the Kauri areas suffered somewhat, necessitating subsequent attention in the direction of pruning and straightening injured and bent saplings.

At the Atherton Station germination tests for Hoop and Kauri Pine resulted as follows:—

	Seed Sown.	Period of Germination.	Seedlings.	Percentage.	Method.
<i>Hoop Pine.</i>					
No. 1 Bed .. .. .	3,072	8 days	2,880	93	Broadcast with grass covering.
No. 2 Bed .. .. .	3,072	14 days	2,160	70	Broadcast with $\frac{1}{2}$ inch sand cover.
No. 3 Bed .. .. .	2,808	10 days	1,664	59	Spotting 1 inch apart in rows 4 in. apart
<i>Kauri Pine.</i>					
No. 4 Bed .. .. .	8,115	5 days	5,500	68	Spotting in beds.



HOOP PINE (*Araucaria Cunninghamii*) FIVE YEARS AFTER SOWING THE SEED—BROOLOO FOREST, 1920.

Acting District Forester J. M. Fraser reviews the experimental plots as follows :—

*Atherton Plantation Experiments—*

- “ Area ‘ A.’—During the cyclone of 2nd February last, little material damage was done, but the tops of the young Kauri Pine were permanently bent in the direction of the blow. Many were pruned off altogether by the nurseryman, and others straightened up by tying a ‘ splint ’ against the bend.
- “ Area ‘ B.’—An indefinite number of plants were placed in this area during the wet season, and most of them seem to have become firmly established. The maximum height of the Maple is 22 ft.
- “ Area ‘ C.’—This area must be written off as a success, but may be converted to a success in the growing of Hoop Pine. No attempt was made to refill with Cedar during the wet season.
- “ Area ‘ D.’—This area has been replanted with Hoop Pine and a few Bunyas, and at 30th June, 1920, looked well established. The covering crop was ample, and afforded shelter until the plants became well rooted.
- “ Area ‘ E.’—This area has remained untouched, as far as planting is concerned, but the natural regeneration of Ash and Bally Gum is pleasing and permanent. The Ash appears to be particularly hardy, and is making rapid growth.
- “ Area ‘ F.’—(Arboretum).—This area still contains only Hoop and Bunya Pines, but these are making splendid development and the branches are now practically interlocking. It was intended to plant out a quantity of Pines of various species, but the protective growth of weeds was insufficient to justify the risk, so the work was not carried out. The Indian Teak may be written off as far as this area is concerned.

A quantity of natural regeneration of Ash and Bally Gum appeared on the edge of the scrub last year, and this is now spreading through the undergrowth into a dense crop. The young Maple and a few *Fl. bourjotiana* near the scrub edge are making excellent progress, and are now about 18 ft. to 20 ft. high.

- “ Area ‘ G.’—Strips.—This area now carries only a few Stringybark Cypress Pines, and during the wet season was planted up with Kauri Pine at 8 ft. spaces, and a few Maple. There are also a few Maple produced by natural regeneration, which are, as usual, progressing well. The protective crop for the Kauri Pine ‘ plant-outs ’ consists for the most part of a natural regeneration of Bally Gum, which will make a valuable mixture for future marketing. This Bally Gum covering crop is about 8 ft. to 12 ft. in height.
- “ Area ‘ H.’—This area has in the past been a very exposed one for delicate plants such as Maple, and has been subject to severe frosts, the protective crop being insufficient to preserve the young plants through the winter. A quantity of Hoop Pine and a few Bunyas were planted out here during the last wet season, and these are firmly established unless the remainder of the year proves to be abnormally dry. In the higher parts of this area Kauri Pine has been planted, and a few young Maple where they were certain of a protective crop. All were doing well when inspected recently.

“ No new areas were prepared during the year, as those already prepared are not put to anything like full use. It is hoped that by the time the next annual report is in course of preparation there will be other areas to report upon in various districts, where comparative results may be noted. At present we have only Res. 191 from which to collect silvicultural data. In a country like North Queensland, where the districts show such enormous range of temperature and rainfall results may vary materially in a distance of a few miles, timbers which are useless in one part may be a great success in another climate or a drier or moister region. The altitude of our reserves in different parts ranges from about sea level to over 3,500 ft. above sea level, with a rainfall varying from 22 in. to 180 in. per annum. The winters, of course, vary in severity as the altitude varies.

*“ Natural Regeneration Operations.—*

“ Two important projects in natural regeneration of Maple were undertaken during the year, Reserve 310 Gadgarra and Evelyn State Forest. Both projects were commenced at the beginning of 1920, and a large amount of work has been carried out on each during the half-year. The procedure is as follows :—

“ A small growth of the so-called useless scrub timbers up to a diameter of about 4 in. is felled and, as far as possible, stacked, leaving as little trash about as possible. The clearing is, however, not confined to an area round each seed tree, but practically the whole of the scrub, wherever the seed trees are widely and evenly distributed, is brushed out. As a rule, the seed will be distributed for a distance of 100 to 200 yards to the westward of each seed tree. The prevailing winds at the time of seed fall are between north east and south. In many places seedling Maple have been noted several hundred yards from the parent trees. Fellings were undertaken on a small scale some years ago on Reserve 310, and results have clearly demonstrated that it is the most successful method of reproducing Maple. There is a dense growth of Maple from 5 ft. to 9 ft. in height in most of the clearings, intermixed with Putt’s Pine, Bull Oak, and other species. These may be thinned out later, but a mixed stand will be left, as a dense stand of tropical scrub timbers of any one species is very likely impracticable, and a mixture of marketable species is therefore more desirable.

"So far it has not been possible to ascertain whether clearing before the seedfall or after is the more successful, but results of observations point to the clearing before the seedfall being more successful. In the first place, the clearing before seedfall allows the seed to be distributed to a greater distance from the parent tree, and in the second place the destruction of the resultant seedlings during brushing operations is avoided. These two reasons alone justify the brushing before seedfall, and any additional liberation work in connection with the seedlings may be undertaken after seedfall with very little extra labour, but as a rule seems to be unnecessary. In the brushing after seedfall even the most careful man is liable to destroy a large number of seedlings, although in the trial areas brushed after the seedfall there is a good crop of young Maple.

"In the tropical scrub, a young growth of weeds, &c., is in evidence within a few weeks to act as covering for the Maple until it can provide its own shade.

"On Reserve 310, about 500 acres have now been dealt with, and on Evelyn about 350 acres.

"Natural regeneration of Kauri Pine has not been attempted yet to any extent, but it is expected that this will be used to a great extent on the proposed National Park in the Kuranda and Oaklands district, and also in the Reserve in the Tinaroo Ranges which was surveyed by Surveyor McCallum recently. The conditions in those districts are more favourable for the growing of coniferae than the Atherton district.

"In all probability recommendations will be made that camps be established for assisting natural regeneration of various species on some of the larger reserves which will not be logged for years to come. Thus a plentiful supply of young growth of advanced age will remain when the mature timber is removed. This, however, is a matter for future report.

"At Reserve 191 Barron a splendid growth of young Bally Gum is in evidence, this species being very hardy and suitable for natural regeneration. This growth will require drastic thinning."

#### GYMPIE DISTRICT.

Originally it had been intended to propagate and plant out large quantities of Hoop and Bunya Pine during the year, but owing to adverse weather conditions and the depredations of swarms of starving bush vermin in search of food and moisture, the original project had to be abandoned.

Some plots were planted, however, in the Gympie district; they showed from 20 per cent. to 60 per cent. success, despite the fact that the rainfall for the year was equal only to that of a western Queensland station. Hoop Pine proved to be the premier plant for planting, and it established a definite claim to drought hardiness. The planting of Bunya bulbs proved to be the most economical method at 15s. 10d. per acre (7 x 7), but, owing to the drought, rodent attacks inflicted a high mortality this year. Of the exotic pines, *Pinus taeda* (American Loblolly) was 60 per cent. successful, but *Pinus laricio*, *Pinus ponderosa*, and *Pinus muricata* did not do as well.

Of *Callitris arenosa* and *C. glauca*, Acting Forest Factor W. Fraser writes:—

"*Callitris arenosa* and *C. glauca* show 30 per cent. success, which can be considered satisfactory in view of the fact that they were planted six weeks before the start of a six-months dry spell. These plants, like Hoop Pine, can stand a heavy covering of soft weeds. In places they were completely covered for 4-5 months but, since the soft weeds have died off in the winter, the plants are showing well. Both *arenosa* and *glauca* are faster growers than Hoop Pine in the early stages, spreading very wide at the base, but having a thin drooping crown, and should be a good mixture with Hoop Pine."

In the Imbil plantation, plots of 1917-18 Hoop and Bunya Pine show a very satisfactory 60 per cent. success after three years' bad seasons. The former has attained a height of 14 ft., and the latter 8 ft. 6 in. *Pinus taeda* is 5 ft. 9 in. high with a 50 per cent. survival. Silky Oak (*Grevillea robusta*) has reached the astonishing height of 20 ft. in three years since planting, during which time rainfall averaged 36 in. *Pinus maritima* failed almost entirely, and the results with Camphor Laurel were disappointing. On the other hand, *Pinus insignis* attained a height of 15 ft. with 40 per cent. thriving.

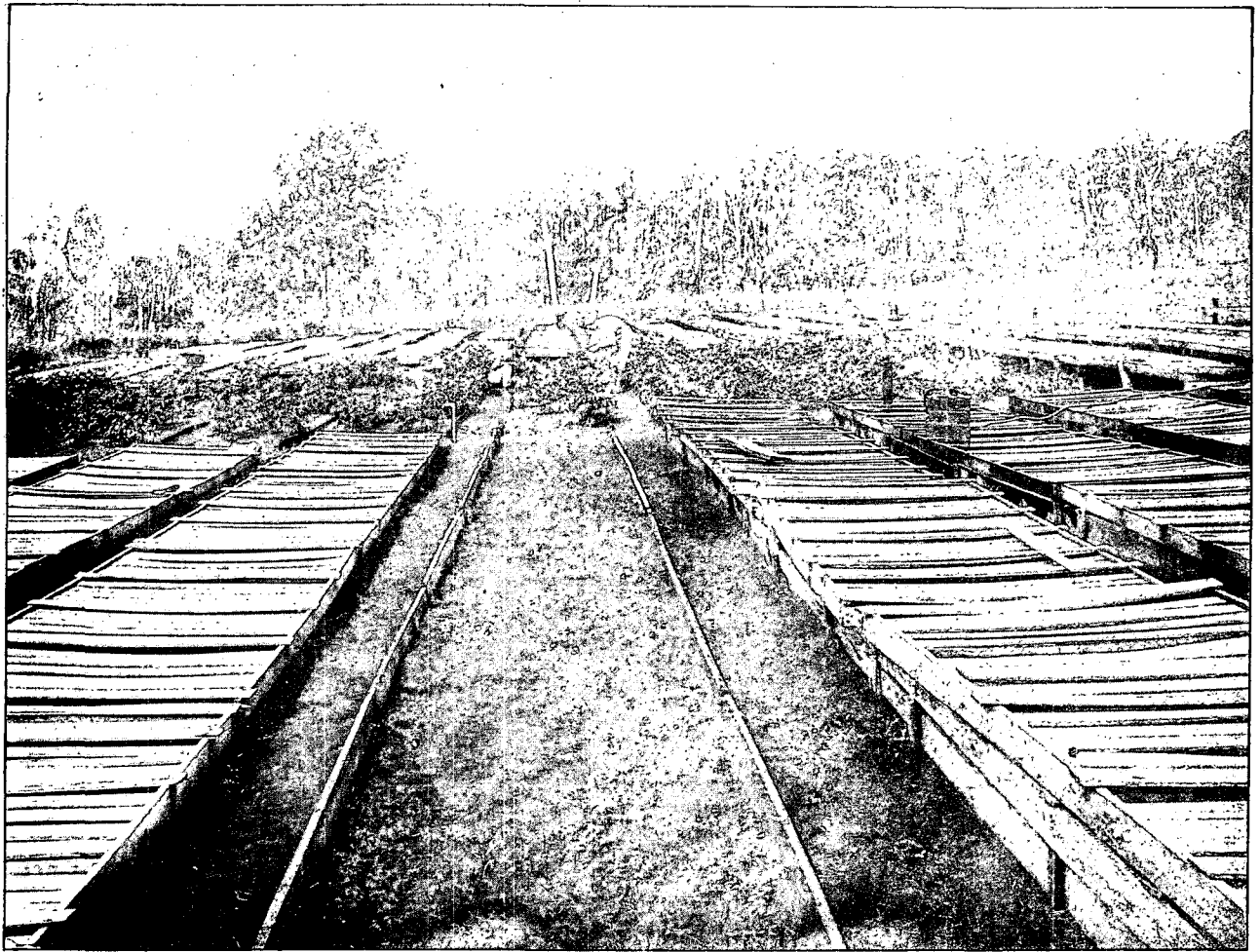
Some 500 lb. of Hoop Pine seed were sown in 75 seed-beds at Imbil Forest nursery, but, owing to the failure of the rains and the inadequacy of the water supply, germination was not satisfactory, and the greater part of the seed collected had to be held over for 1920 spring sowing.

*Natural Regeneration.*—Experiments in Eucalyptus forests were carried out on a small scale at Imbil and Biggenden, and on a much larger scale on Reserve 700, Corella; the result is not yet apparent owing to scarcity of seed.

The blanks in plantations at Imbil are being filled up by natural regeneration of Ironbark, Flindersias, and Silky Oak. The White Cedar which sprung up after the burn has almost disappeared.

Natural regeneration of Hoop Pine was very good on Biggenden Scrub areas this year; the rain in December last fell exactly at the right time for the seed. At Imbil, Amamoor, and Kilkivan, natural regeneration of this species was very sparse.

Some liberation fellings were carried out on Biggenden State Forest and Kilkivan State Forest; the thinning was light and in the nature of an experiment. No result is apparent yet.



A SECTION OF A FOREST SERVICE TREE NURSERY—IMBIL, 1920.



A THREE-YEARS-OLD EXPERIMENTAL PLANTATION OF 2-0 HOOP PINE—BROOLOO STATE FOREST, MAY, 1920.

The following were the nursery stocks held at the close of the year:—

	Atherton.		Evelyn.		Fraser Island.			Imbil.			TOTALS.			
	2-0	1-0	1-0	4-0	3-0	2-0	1-0	3-0	2-0	1-0	4-0	3-0	2-0	1-0
Hoop Pine .. .. .	50	85,000	250	106	515	85	24,000	151	96	42,000	106	666	231	151,250
Bunya Pine .. .. .	25	970	30	224	420	4,984	..	..	..	..	224	420	5,009	1,000
Agathis Palmerstonii ..	1,250	4,700	..	..	..	..	..	..	..	..	..	..	1,250	4,700
Cypress Pine .. .. .	..	275	..	..	..	..	..	..	..	..	..	..	..	275
Maple .. .. .	250	550	..	..	..	..	..	..	..	..	..	..	250	550
Red Cedar .. .. .	20	400	..	..	..	..	..	..	7,700	..	..	..	7,720	400
Canary Pine .. .. .	..	750	..	..	..	..	..	..	..	850	..	..	..	1,600
Swietenia robusta .. ..	..	7	..	..	..	..	..	..	..	15	..	..	..	22
Agathis robusta .. .. .	..	..	..	..	..	115	..	..	..	..	..	..	115	..
Agathis Australis .. ..	..	..	..	..	..	3	12	..	..	..	..	..	3	12
Euc. Pilularis .. .. .	..	..	..	..	..	..	552	..	..	..	..	..	..	552
Euc. microcorys .. .. .	..	..	..	..	..	..	324	..	..	..	..	..	..	324
Flind. Schottiana .. ..	..	..	..	..	..	..	43	..	..	..	..	..	..	43
Flind. Australis .. .. .	..	..	..	..	..	139	..	..	..	..	..	..	139	..
Flind. acuminata .. .. .	..	..	..	..	..	471	..	..	..	..	..	..	471	..
Flind. Oxleyana .. .. .	..	..	..	..	..	14	..	..	..	..	..	..	14	..
Flind. Bennettiana .. ..	..	..	..	..	..	..	500	..	..	..	..	..	..	500
Podocarpus pedunculata ..	..	..	..	..	..	594	36	..	..	..	..	..	594	36
Pinus taeda .. .. .	..	..	..	..	..	4,650	100	..	..	..	..	..	4,650	100
Pinus insignis .. .. .	..	..	..	..	..	13	..	..	8,500	..	..	..	13	8,500
Spruce .. .. .	..	..	..	..	..	..	35	..	..	3	..	..	..	38
Sterculia sp. .. .. .	..	..	..	..	..	..	12	..	..	..	..	..	..	12
Taxodium distichum .. ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Weinmannia jachnocarpa ..	..	..	..	..	..	..	24	..	..	..	..	..	..	24
Pink Foambark .. .. .	..	..	..	..	..	..	..	..	..	660	..	..	..	660

#### FOREST PRODUCTS RESEARCH.

A Forest Products Showroom was opened during the second half of the year, with the object of bringing potential markets into touch with the secondary woods and minor products of the State Forests, and thereby leading to profitable utilisation of otherwise unsaleable assets.

A large number of hand samples of indigenous woods were distributed to inquirers in Great Britain, Holland, South Africa, France, Switzerland, and other places, as well as to the various States of Australia.

Among these were a number of samples of woods likely to be suitable for the manufacture of tobacco pipes, such as *Callistemon lanceolatus*, *Castanospermum australe*, *Eugenia corniflora*, *Flindersia Chatawaiana*, and *Daphnandra aromatica*. Fourteen species of wood from Fraser Island were supplied for this purpose, twenty-two for carving, and eighteen for cabinet-making, whilst small lots of *Backhousia myrtifolia* and *Halfordia drupifera* were furnished for trial for tool handles, for which purpose they were approved entirely. Red Birch, Bally Beech, Sassafras, and Pink Poplar were found to be suitable for broom backs, paint brush handles, blind rollers, &c., whilst Marara, Brown Oak, Silver Beech, and White Bean found favour for picture mouldings.

Samples of *Geijera Muelleri* were sent to the Department of the Navy, Sydney, for trial for shipbuilding purposes.

Tests of timber for shipbuilding uses were conducted by the Commonwealth Naval Dockyard, on specimens supplied by the Forest Service, with the results shown below:—

	Chittoe.	Penda.	Sour Hwd.	J.R. Hwd.	Lignum vitæ.
Frictional Test (15 minutes run) —					
Temperature at first .. .. .	71	74	73	76	70
Temperature after 15 minutes run .. .. .	106	99	93	90	78
Difference in temperature .. .. .	35	25	20	14	8
Wearing Tests (3 hours run) —					
Thickness of block 1 square inch of wearing surface .. .. .	.908	.986	.963	.954	.966
Thickness of same block after 3 hours run .. .. .	.893	.968	.94	.947	.965
Difference .. .. .	.015	.018	.023	.007	.001
Swelling Test —					
Thickness before immersion .. .. .	.5	.5	.503	.503	.449
Thickness after 14 days in salt water .. .. .	.518	.5245	.516	.514	.451
Difference of amount of swelling .. .. .	.018	.0245	.013	.011	.002

The Johnstone River hardwood (*Backhousia Bancroftii*) proved to approach most nearly to the imported *Lignum vitæ* in the attributes required.

Samples of timber likely to be suitable for the manufacture of artificial limbs were sent to the University of Queensland for testing. The judgment of the University is given in the following words:—

- (1) *Cork Cedar (Ficus sp.)*.—Equal to willow, as it is light and will hold screws. Easily glued and easy to work. I made, with the assistance of Mr. Peterson, one of the returned soldiers sent to me by the Red Cross, a bucket for a leg  $\frac{1}{4}$ -inch thick, which stood without a leather binding a pressure of 72 pounds weight. I glued the wood with kaesine glue, immersed the leg in water for 24 hours, and afterwards exposed it to the sun's rays for the same time, and found hardly any shrinkage. Wood did not split.
- (2) *Queensland Boxwood (Denhamia pittosporoides)*.—Far superior to the English Pear tree and even Box, for its straight grain and facility for carving. Eminently suitable for artificial hands and limb joints. A splendid substitute for English Box for opticians' chucks and general scientific apparatus.

Studies in the technology of Queensland timbers were continued so far as administrative conditions and funds permitted; a classification system was adopted. Some fresh information was secured also with respect to the weights of the indigenous woods, as follows:—

Species.	Weight per Cubic Foot.
Laportea gigea	1b.
Euroschinus falcatus, Ailanthus imberbiflora, Elaeocarpus grandis	16
Doryphora sassafras, Sterculia acerifolia	25-30
Litsea reticulata, Cryptocarya obovata, Bursera australasica, Cryptocarya glaucescens, Sloanea Woollsii	30-35
Rhodospaera rhodantha, Water Gum	35-40
Cupania xylocarpa, Cupania pseudorhus, Dysoxylon Muellieri	40-45
Flindersia Schottiana, Diospyros pentamera, Amoora nitidula, Maba fasciculosa: Flindersia Oxleyana, Flindersia australis, Alphitonia excelsa, Lucuma sericea, Siphonodora australe	45-50
Myrtus Hillii, Vitex lignumvitae, Owenia venosa, Weinmannia lachnocarpa, Tarrietia argyrodendron, Tristania conferta, Sideroxylon Pohlmannianum	50-55
Nephelium distyle, Geijera Muellieri, Strychnos arborea, Endiandra compressa, Emmenosperrum alphonitoides	55-60
	60-65

Arrangements were entered into with the Western Australian Forest Products Laboratory for the carrying out of tests with respect to the wood-pulping qualities of the Queensland woods, for which purpose £150 was provided. The first species to be dealt with was *Grevillea robusta*.

The importance of an official timber nomenclature acceptable to the timber trade was realised by the Forest Service, and some attempt has been made to select appropriate titles. One of the most-abused woods in this regard is *Tarrietia argyrodendron*, which has been known variously as *Crow's Foot Elm*, *Silky Elm*, *Stavewood*, *Ironwood*, *Booyong*, *Black Jack*, and *Hickory*, none of which names suggests its value or utility. This wood has been determined to be of considerable utility for the purposes of picture mouldings, staves, and flooring and lining. The Forest Service has adopted at this date the official trade name of *Brown Oak*, which suitably describes the wood. Other tentatively adopted designations are the following:—

Botanical.	Present Vernacular.	Tentatively adopted Official Trade Name.
<i>Calophyllum costatum</i>	Calophyllum	Satin Mahogany
<i>Calophyllum inophyllum</i>	Bumpy Ash of Queensland or Cudjerri of N.S.W.	Silver Ash
<i>Flindersia Schottiana</i>	Lignum vitæ or Cherry of Kilkivan	Golden Box
<i>Vitex lignum-vitæ</i>	Corkwood of N.S.W. or Sugar Bark of Kilkoy, &c.	Queensland Boxwood
<i>Denhamia pittosporoides</i>	Paper Bark of Imbil	Red Birch
<i>Ackama Muellieri</i>	Red Ash	Golden Birch
<i>Endiandra compressa</i>	Dark Yellow-wood	Grey Birch
<i>Nephelium connatum</i>	Crow's Foot Elm, Silky Elm, Hickory, or Black Jack	Red Ash
<i>Alphitonia excelsa</i>	Red Crow's Foot Elm of Atherton and Killarney	Yellow Marblewood
<i>Rhodospaera rhodantha</i>		Brown Oak
<i>Tarrietia argyrodendron</i>		
<i>Tarrietia argyrodendron</i> var. <i>trifoliolata</i>		Brown Oak
<i>Tarrietia argyrodendron</i> var. <i>peralata</i>		
<i>Tarrietia actinophylla</i>		Brown Oak
<i>Grevillea robusta</i>		
<i>Orites excelsa</i>		Brown Oak
<i>Cardwellia sublimis</i>		
<i>Embothrium Wickhami</i>	Silky Oak, Brown, Pink, and Red	Silky Oak
<i>Darlingia spectatissima</i>		Pink Poplar
<i>Euroschinus falcatus</i>	Queensland Maiden's Blush or Ribbon-wood of Atherton	
<i>Casuarina Cunninghamii</i>	River Oak	River She-Oak
<i>Casuarina glauca</i>	Swamp Oak	Swamp She-Oak
<i>Casuarina torulosa</i>	Forest or Red Oak	Forest She-Oak
<i>Casuarina Luehmannii</i>	Bull Oak	Plain She-Oak
<i>Elaeocarpus grandis</i>	Blue Fig or Quandong	Silver Beech
<i>Litsea reticulata</i>	Bolly Gum, Brown Beech, or Killarney	Bolly Beech
<i>Litsea ferruginea</i>	Sycamore	
<i>Flindersia acuminata</i>	Putt's Pine or Silver Beech	Silver Maple

Samples of Foambarks were sent to the Government Analyst for analysis. Pink Foambark (*Cupania pseudorhus*) was found to contain 6.9 per cent. of Saponin and White Foambark (*Cupania xylocarpa*) 2.2 per cent.

An excellent sample of starch was obtained from the *Macrozamia* "palm." A useful "kapok" was also obtained. As this "palm" occurs in large quantities, further investigation is desirable.

The gum of *Sterculia diversifolia* showed adhesive properties; and should be worth testing further.

The Forest Service herbarium was arranged and extended, and the set of timber specimens for structural identification was added to.

Through the good offices of the Government Botanist (Mr. White), a large number of botanical specimens collected by forest officers were identified. In this way several new specimens were discovered by officers of the Forest Service and added to the list of Queensland flora. These were *Flindersia laevis*, a Maple, collected by Assistant Forester Fraser; a new variety of Red Cedar (*Cedrela Toona* var. *vestita*), collected by Assistant Forester Moore; *Ackama quadrivalvis*, collected by Assistant Forester Fraser; *Endiandra longipedicellata*, collected by District Forester Mocatta; *Endiandra Palmerstoni*, previously named *Cryptocarya Palmerstoni*, fresh material collected by District Forester Mocatta.

## FOREST PROTECTION.

### BUSH FIRES.

So dry were the conditions of the year that extensive outbreaks of fire through the forests were precluded by the very scantiness of the ground herbage. The Northern cyclone of February, 1920, however, produced a highly inflammable trash which was productive of damaging fires in the Kuranda, Oaklands, and Mount Molloy districts. Small outbreaks occurred also in the Gympie District upon the Biggenden, Brooloo, and Corella State Forests, whilst locomotive sparks caused considerable anxiety on Fraser Island, where premature "burns" and the firing of natural regeneration on unprotected areas resulted in inconvenience and unnecessary destruction of forest values.

Other fires, more or less indefinitely recorded, occurred in many unguarded reservations.

In several instances, outbreaks were traceable to incendiarism, inspired probably by the desire to force the sale of timber at low prices at a time inconvenient to the Forest Service arrangements for orderly logging. In other cases, the burning-off operations of adjoining selectors were responsible. On the Biggenden Forest, thirty acres were swept by such a fire breaking into the reserve at the only point where fire lines had not been constructed. On Brooloo State Forest, 31,345 superficial feet of Pine were badly scorched by a similar fire, despite the early presence of the forest staff.

In this case the damaged Pine was logged forthwith by the Forest Service itself; in other cases, in which incendiarism was suspected, the scorched timber was sold to reputable buyers subject to the condition that the buyer would hold himself responsible for any further outbreaks. In consequence, none resulted, whilst unprotected areas suffered. The deliberate firing of certain areas for green feed by persons illicitly grazing cattle thereon was accountable for some measure of destruction, and the necessity, not merely for the promulgation of definite forest fire laws, but also for the assumption of complete grazing control upon forest reservations by the Forest Service itself, was made clear.

That fire control pays is certain. For many years past the 17,000 acres of the Corella Forest have been burned over at least once in three years. The soil has been impoverished and the humus washed away as ashes in solution. Effective natural regeneration of the hardwood crop has been prohibited, and the mature trees have been injured and laid open to white ant infestation, with consequent deterioration not only in quantity of saleable material but in quality and market value of the product. Since the Forest Service established residential management, the fires have been controlled. In 1918 only 4,000 acres were burned over; last year the acreage damaged was reduced to 1,000, notwithstanding that six separate outbreaks occurred. The cost of fire control for the forest was about 2½d. per acre.

A lookout station has been cleared on Kilkivan forest and a fire-line system installed on the Biggenden reserve. On Fraser Island the fire lines saved the plantations. Here they consisted of two parallel narrow cleared lines separate from each other by a belt from which inflammable growth had been excluded.

### FOREST FAUNA.

The shortage of water aggravated the forest fauna to unusual attacks upon the flora of the reservations. Soft scrubwoods and even stinging trees were bitten into by thirsty bush rodents, and the succulent bulbs of newly planted Bunya Pines met with a serious onslaught. Wallabies were particularly destructive in this respect. On Biggenden State Forest these animals, seeking moisture, ringbarked Hoop Pine saplings to 2 inches diameter, stripping the bark off the bole up to a height of 4 feet. In the Northern Queensland forests, the succulent spring shoots of Kauri Pine and other trees were eagerly devoured. On Fraser Island the same pest accounted for much of the Red Stringybark seedlings of the year's germination.

Bush rats have proved destructive to all seed, and in the North accounted for much of the coniferous seedling regrowth.



Scrub turkeys did havoc among 1920 Hoop Pine regeneration by widespread scratching up, and also the wholesale nipping-off of the cotyledons. Both bandicoots and wallabies disposed of large quantities of the newly-fallen seed.

No doubt the provision of permanent water upon the State Forests will reduce effectively the liability of wallaby attack upon seeds and seedlings, but further organised control is essential, at all events upon the areas of concentrated regeneration. The year's observations with regard to the forest fauna affords testimony also of the advantage to be derived from the consolidation of the forests into large blocks. The widespread natural regrowth of valuable species upon the big reservations of the Oaklands and Kuranda districts is in marked contrast to the scanty results obtainable on the small reserves of the Evelyn State Forest and the Barron Reserve 191, which are hemmed in by settled portions, from which the original rodent population is collected.

#### THE TWIG BORER.

As in India, the Twig Borer (*Hypsipyla robusta*) played havoc among the experimental plantations of Red Cedar. In the endeavour to robast so notorious a pest, planting operations were transferred to Fraser Island, where previously the borer was unknown. Eventually, however, it made its appearance, and in November the affected tops were cut away and burnt, but in the succeeding autumn reinfestation resulted. It was then discovered that the borer was present on two species native to the Island—viz., *Schizomeria ovata* and *Elaeocarpus Eumundi*. A borer of similar appearance was discovered also upon young Maple at Atherton. At the Imbil area observations are being made of the progress and method of attack with a view to countering, if possible.

#### NOXIOUS WEEDS.

Prickly-pear infestations were dealt with upon a number of forests, and Lantana and Nagoora Burr were more or less eradicated from the Biggenden and Amamoor reserves. Experiments were made on the Goodnight Scrub State Forest on the destruction of Lantana by means of the lantana fly, specimens of which were obtained from the Government Entomologist (Mr. Tryon) and released on the area. The experiment resulted negatively, as owing to adverse conditions the fly did not succeed in establishing itself.

#### CLIMATIC INJURIES.

Acting District Forester J. M. Fraser writes as follows:—

"On 2nd February, 1920, a cyclone of great intensity swept all the coastal country from about Gordonvale to north from Port Douglas, and destroyed from 25 per cent. to 35 per cent. of timber at least. From Oaklands to Mount Molloy and Port Douglas large areas of scrub were reduced to bare poles or were entirely uprooted or broken off.

"Practically no provision can be made for the protection of scrub from the action of cyclones, except to locate nurseries, &c., in country sheltered from average cyclone. The prevailing winds in North Queensland are from the east to the south, and only on very rare occasions is any other wind experienced. In fact only between the months of August and December are winds from a westerly direction known. The path of the centre of a cyclone is no guide to the direction of the wind at any certain spot. The cyclone of 10th March, 1918, blew from the south-west to the south-east in the one disturbance, while that of the 2nd of February last appears to have blown only from the south-east. It is probable that the majority of 'blows' have come from the south-east."

The forest nurseries suffered somewhat from drought and frost during the year.

#### FOREST SURVEY AND ENGINEERING.

Five fully equipped forest survey camps and two cruising camps were engaged by the end of the financial period upon the important duty of forest demarcation. Four distinct types of survey operation were employed—viz., reconnaissance, topographical, cruising, and working plan. Some 600,000 acres of timber country were dealt with. Of this area, 55,291 acres were subjected to an intensive engineering-cum-valuation (working plan) survey preparatory to the commencement of developmental work, and the adoption of working plans. In addition, 15½ miles of forest roadways and 6¼ miles of logging tramway were located and set out.

Particulars are given hereunder:—

<i>Forest Survey—Projects 1919-1920.</i>		Acres.
(a) Topographical Survey—		
Parish of Cairns	.. .. .	1,200
Parishes Ravenshoe, Ismailia, and Ongera	.. .. .	10,880
Reserve 496, National Park, Canungra (part of)	.. .. .	47,000
		59,080
(b) Engineering and Valuation (Working Plan) Survey—		
Reserve 124, Glastonbury (which includes original Reserve 119, Reserve 124, and 125) area surveyed	.. .. .	13,000
Reserve 289, Cooyar	.. .. .	4,655
Reserve 95, New Cannindah	.. .. .	5,510
Austral Logging Area, Minerva	.. .. .	1,910
Reserve 399, Emu Vale	.. .. .	13,500
Reserve 379, Cooyar (Pidna); also 6¼ miles gravitation tramway	.. .. .	8,000
Subdivision of Western Creek (Brooloo)	.. .. .	1,200
Subdivision of Compt. 1, Western Creek	.. .. .	100
Reserve 95, New Cannindah (completing)	.. .. .	7,416
		55,291
Road engineering surveys in Brooloo State forest, 756 chains.		55,291
Also 15½ miles road and engineering surveys.		



A CYCLONED KAURI—GARIOCH FOREST,  
NORTH QUEENSLAND, FEBRUARY, 1920.

One of many Kauri Pine-trees  
similarly destroyed, portion 147, parish  
of Garioch.



A NORTH QUEENSLAND JUNGLE AFTER THE CYCLONE OF 2ND FEBRUARY, 1920.

Effect of cyclone on scrub on top of the Port Douglas Range, which received the full force of the blow. This scrub consisted, like all coastal scrub, more of a dense mass of undergrowth, saplings, vines, &c., than large timber. All foliage disappeared, and practically all large timber, but the loss of the foliage relieved the wind pressure on the saplings and smaller timber and left them standing, with the appearance shown here.

(c) Cruising—		Acres.
Glen Pullen (pro. resumption)	.. .. .	298
Eden Park	.. .. .	8,579
Chinchilla State Forest	.. .. .	444,477
		453,354
(d) Reconnaissance—		
Parish of Cairns	.. .. .	2,000
Parishes Ravenshoe, Ismailia, Ongera	.. .. .	22,880
Reserve 399, Emu Vale	.. .. .	13,500
		38,380
Total area dealt with	.. .. .	606,105

A feature of the Forest Service survey operations has been the employment of the new Bonner Reflecting Abney introduced recently into the U.S.A. Forest Service. The instruments have been eminently successful and are described by officers as "far and away the handiest for forest-survey and road-grading work."

The cost of the timber cruise of 444,600 acres of Chinchilla State Forest by Assistant Forester W. J. Gorman worked out at .17 of a penny per acre. Of this tract 351,640 acres were found suitable for permanent reservation, and the cruise disclosed the existence of 450,000,000 superficial feet of useful hardwood, mostly Ironbark and Spotted Gum, *vide* Schedule hereto.

District.	Holding.	Area to be Permanently Retained.	Narrow-Leaf Ironbark.	Cypress Pine.	Spotted Gum.
		Acres.	Super. Ft.	Super. Ft.	Super. Ft.
Chinchilla	State forest	322,640	62,765,000	43,706,500	336,879,500
Chinchilla	Timber reserve	29,000	12,931,800	..	..
		351,640	75,696,800	43,706,500	336,879,500

Mr. Gorman also carried out an exploration of the timber resources of portions of the Roma, Charleville, and Springsure districts, covering a million acres of more or less wooded country. Of this area, 336,000 acres were defined by him as suitable for forest reservation as follows, the cost amounting to .018 of a penny per acre:—

District.	Holding.	County.	Parish.	Area.
				Acres.
Roma	Westgrove	Westgrove	Forest	16,000
Roma	Dooloogora	..	Dooloogarah, Tabor	} 320,000
Charleville	Chesterton (resumed)	..	Attica, Barnago	
Charleville	Eddystone Vale (resumed)	..	Eddystone	
			Total	336,000

In the Gympie district the survey camp under Assistant Forester J. R. Dawson laid out 14½ miles of forest roadway, providing a main highway for the important Brooloo State Forest. Two low ranges were negotiated, with a maximum grade of 1 in 10, except for two pinches of 1 in 6 and 1 in 7. The division of Western Creek logging area into twelve compartments of approximately 100 acres each was undertaken, and ten residential allotments were surveyed on compartment No. 1. On Timber Reserves 124, 257, and 1530 Glastonbury, 41 miles of theodolite traverse were run, eight logging areas were marked off, and 60 miles of strip assessment surveys completed. The primary control of Reserve 119 was finished by the end of the year, and secondary control operations commenced.

In the Brisbane district, Assistant Forester L. S. Twine's camp completed the laying-out of a 6¼ miles gravitation logging tramway in Pidna Forest, the steepest grade being 1 in 16 and 1 in 20 for two short straight-down runs. A Forest Station site was marked out and a contour survey and valuation of the whole forest completed. Twelve million superficial feet of pine were located. A working plan survey of Yarraman State Forest 289 was almost concluded by the end of the period, the work involving the division of the area into 100-acre compartments, of which 15 allotments were laid out on the ground in readiness for development. In all, 74 miles of survey and 56 miles of strip work were carried out by the camp.

The Atherton forest survey party suffered from the disability of food shortage, due to the shipping strike, a severe drought for half the year, and an abnormal rainfall for the other half, the impediment of the debris of the 1918 cyclone, the rough and broken nature of the country, and the difficulty of retaining survey hands. Nevertheless, 62 miles of compass-chain and 55

miles of compass-step surveys were completed. The survey of the Kuranda Forest abutting upon the Barron Gorge was finished early in the year, and the camp was transferred to the Ravenshoe district, where 257,000 acres of the broken Tully tracts were disposed of by topographical survey. In reviewing the work accomplished, Mr. Acting District Forester J. M. Fraser writes :—

“ We must remember that North Queensland consists of large areas of more or less unknown country, a great part clothed in dense tropical jungle, carrying valuable cabinet woods. A few of the fossickers are familiar with the country, but very few men outside these old timers have even a rough idea of the timber stocks or the routes of access thereto. For some years, therefore, survey camps must be almost continually employed on preliminary classification and assessment surveys of this vacant land, recommending for permanent reservation the timber-bearing country, and noting approximately the amount of timber, species, and accessibility. Much of this timber will be naturally reserved for years to come, but we shall be in a better position to provide for the future by ascertaining the extent and accessibility of our resources. Theodolite work is slow and expensive and has been avoided as much as possible in this type of survey. In the case of the Kuranda National Park and the Tully country, a backbone of theodolite work was already provided, which served to balance the compass work.

“ In the case of the virgin areas, a main traverse or road survey should be run by theodolite and chain and carefully plotted. All main creeks and spurs are then traversed with prismatic compass and chain and ‘ tied ’ to the theodolite work. The ordinary strip lines are then run with compass and chain about 20 chains apart or with less broken country carrying average scrub, 40 chains apart, connecting with all traverses crossed.

“ The heights of all stations on the whole system are noted by aneroid barometer, and thus a very good idea of the contour is arrived at, though, of course, not of sufficient accuracy for the final location of a road.”

Somewhat similar disabilities were experienced by Mr. C. B. Saunders’s camp in the Killarney forests, where heavy rains repeatedly hung up the processes of survey. The work was commenced in the second half of the Annual Report period, and consisted of preliminary reconnaissances and subsequent traverses upon Reserve 399, including boundary surveys and the laying-out of three main logging areas. During the course of the survey, a fall of about 100 ft.-120 ft. in the Condamine River was located, which affords promise of generating 100-180 horse-power by the construction of a small weir.

Incidental timber cruises were carried out by members of the field inspection staff as distinct from the survey parties. These cruises included 820 acres of private forest in the parish of Emu Vale, which had been resumed for forestry purposes. Inspections were undertaken also for the Public Curator, and the services of District Forester Twine were borrowed by the Commonwealth Government for the War Service Homes Commission in connection with its purchase of 20,000 acres of timberland in this State.

### FOREST RESERVATION.

The continued decline in the figures of forest reservation for Queensland came to an end with 1918, during which year the lost acreage amounted to no less than 80,000; and the combined area of State forests, National parks, and timber reserves stood at eighty-eight one-hundredths of 1 per cent. of the territorial extent of Queensland.

On the 11th September the Premier of this State addressed a letter to the Premier of New South Wales, advising him that it had been decided to allot a minimum forest area of 5,000,000 acres as State forests, and 1,000,000 acres as timber reserves in the State.

On the 21st April, 1920, the Interstate Forestry Conference at Hobart adopted the following resolution; which was endorsed subsequently by the Premiers’ Conference in Melbourne of May, 1920 :—

“ The forestry authorities of the various States estimate that to meet the future requirements of Australia a forest area of 24,500,000 acres will be necessary, this estimate being based upon the following distribution among the States :—

	Acres.
Queensland .. .. .	6,000,000
New South Wales .. .. .	8,000,000
Victoria .. .. .	5,500,000
South Australia .. .. .	500,000
Western Australia .. .. .	3,000,000
Tasmania .. .. .	1,500,000

“ It is recommended that this Conference endorses the desirability of aiming at the reservation of this area.”

At the close of the present financial year, the Acting Premier, Hon. J. A. Fihelly, was able to advise the executive officer of the conference of State Premiers that the reservations of forest areas was already effected in this State as at the 30th June, 1920, were as follows:—

	Acres.
State Forests .. .. .	1,260,832
National Parks .. .. .	73,980
Timber Reserves .. .. .	2,583,450
<b>Total .. .. .</b>	<b>3,918,262</b>

This total disclosed a gain on the previous year's figures of a good 51,243 acres of forest. The Acting Premier was able further to inform the executive officer of the Premiers' Conference that "action is being taken to demarcate the necessary additional forest reservations to bring the reserved area up to the area of 6,000,000 acres recommended by the Premiers' Conference to be reserved in this State."

The statistical position on 30th June, 1920, was as follows:—

#### FOREST RESERVATION, 30TH JUNE, 1920.

	<i>State Forests.</i>	No.	Area in Acres.
31st December, 1918 .. .. .		69	1,121,900
Proclaimed 1st June, 1919, to 30th June, 1920 .. .. .		15	138,817
Increase by recomputation .. .. .		..	115
		84	1,260,832
	<i>Timber Reserves.</i>		
31st December, 1918 .. .. .			2,671,139
		Acres.	
Made State forests .. .. .		87,961	
Cancelled .. .. .		97,289	
Decrease by recomputation .. .. .		2,566	
<b>Total decrease .. .. .</b>		<b>187,816</b>	<b>2,483,323</b>
Added since 31st December, 1918 .. .. .			100,127
			2,583,450
<b>Total forest reservation at 30th June .. .. .</b>			<b>3,844,282</b>
National parks (at present under Forest Service control) .. .. .			73,980
<b>Total .. .. .</b>			<b>3,918,262</b>

There were thus 97,289 acres of timber reservations cancelled, and 100,127 acres of new reservation added. A further 87,961 acres of temporary reservation, together with 50,856 acres of previously unreserved country, were permanently dedicated as State forests for the production in perpetuity of the community's timber crops. Among these new State forests were 21,000 acres of hardwood and Cypress Pine in the Dalby district, and 17,000 acres of the Maple belt of the Atherton tableland.

#### REPURCHASE OF TIMBER LANDS.

		£	s.	d.
Brisbane (Cooyar) .. .. .	Purchase of selection 1079, County Cavendish, from E. M. Loughead, 23 acres 1 rood 27 perches	117	1	10
Bundaberg .. .. .	Surrender of 433 acres, A. F. 4543, Parish Yandaran, from E. Gumley	30	0	0
		£147	1	10

The additions to the area of temporary reservation included 27,400 acres of Dalby and Roma districts, 30,000 acres in the Toowoomba district, 14,000 acres in the Ipswich and Brisbane districts (including 1,070 acres of Hoop Pine), and 8,580 acres in the Gayndah district.

The cancelled reserves covered 79,441 acres of waste land on Stradbroke Island, 6,970 acres in the Bundaberg district, and 5,500 acres in the Warwick district.

The distribution of the present extent of forest reservation throughout the State is disclosed by the following Schedule:—

RETURNS OF STATE FORESTS, TIMBER RESERVES, AND NATIONAL PARKS IN THE STATE ON 30TH JUNE, 1920.

District.	STATE FORESTS.		TIMBER RESERVES.		NATIONAL PARKS.	
	No.	Area in Acres.	No.	Area in Acres.	No.	Area in Acres.
Atherton	6	40,628	3	17,043	..	..
Bowen	..	..	1	75,383	..	..
Brisbane	18	60,960	43	118,193	7	47,553
Bundaberg	5	64,770	18	72,322	..	..
Cairns	1	37,850	2	28,700	..	..
Charters Towers	..	..	1	125,000	..	..
Clermont	..	..	2	164,350	..	..
Cooktown	..	..	4	411,080	..	..
Dalby	5	368,061	16	211,744	..	..
Dalby and Nanango	..	..	..	..	1	22,500
Gayndah	..	..	10	38,875	..	..
Gladstone	5	37,007	13	137,663	..	..
Gympie	9	59,549	37	235,753	1	106
Herberton	2	731	5	20,567	1	270
Ingham	..	..	4	102,538	..	..
Inglewood	..	..	11	94,309	..	..
Innisfail	..	..	1	18,000	..	..
Ipswich	6	76,923	23	58,542	..	..
Mackay	..	..	12	196,186	..	..
Maryborough	6	257,775	22	89,876	1	100
Nanango	14	86,103	6	16,422	..	..
Port Douglas	..	..	5	209,876	..	..
Rockhampton	2	48,320	5	36,307	1	216
Roma	1	8,695	4	33,571	..	..
Springure	1	69,000	1	3,240	..	..
Taroom	..	..	1	2,240	..	..
Toowoomba	2	17,060	4	35,450	..	..
Warwick	1	27,400	10	29,980	2	3,235
Windorah	..	..	1	240	..	..
Totals	84	1,260,832	265	2,583,450	14	73,980

Queensland has advanced a point since 31st December, 1918, in the matter of its forest allotment. It now possesses a timber reservation equal to 89 per cent. of the area of the State. Its place in this respect in the list of Australian States is fourth, thus:—

State.	Area of Present Reservations.	Percentage of State.	Percentage of Original Forest Area.
Victoria	4,000,000	7.11	33.9
Tasmania	1,000,000	5.95	9.1
New South Wales	7,000,000	3.53	46.6
Queensland	3,850,000	.89	9.5
Western Australia	600,000	.25	7.94
South Australia	176,000	.07	4.63

Compare with this schedule the figures for some of the older and more densely populated countries of the world:—

Country.	Total Forest Area (Square Miles.)	Percentage of Territorial Area.
Sweden	90,241	52.20
Japan	71,890	48.33
Russia (in Europe)	859,375	39.00
Austria	37,700	31.66
Hungary	34,750	29.30
Germany	54,015	25.90
France	38,620	18.65
Australia	159,375	5.36
Queensland	6,122	0.89

The comparison emphasises the need for progressive action, and this action has been forthcoming during the year. For the first time in its history, a definite policy of forest reservation has been formulated for Queensland and a definite allotment set. Although only 89 per cent. of the State is held at present for timber production and supply, or a mere 3,918,262 acres, the Government of the day has determined upon a minimum of 6,000,000 acres and a maximum of 12,000,000 acres of forest reservation for Queensland, with a view to settling upon and around this Crown timber land estate a permanent population employed in the important industry of timber-growing and timber-getting—the fourth greatest industry in the State.

The Forest Service has adopted the following rules for demarcation of the new reservations now to be added:—

1. State forests should be located as closely as possible to present and prospective markets, because of the heaviness and bulk of the material to be transported therefrom.
2. Forest lands are most valuable when handled in large unbroken units.
3. State forests should be of sufficient extent to make possible and profitable their management as separate areas.
4. The imported theory of setting apart the poorer lands for forestry holds to an infinitely less degree here than in Europe or America, since the Australian climate is such as to make comparatively poor lands desirable in the eyes of the settler and the land speculator.
5. Primarily, State forests should furnish a soil and climate adapted to the production of marketable timber. If they carry seed trees of the right species, so much to the good; if a mature stand, still better; if an abundant young growth, best of all.
6. If the cover furnishes watershed protection, reservation may be justified even in default of other factors. Ruggedness is an argument in favour of retention. Preference should be extended to mountain forests.
7. Areas necessary for administrative purposes must be included in any State forest proposition.
8. "Administrative purposes" include forest stations, nursery and planting sites, water supply and grazing areas, mill and camping lots, log depôts, roads and chutes, and means of access generally, lookout points, telephone lines, firebreaks, and every other area needed in the work of the forester; and such areas as are requisite for public camping grounds, health or pleasure resorts, or other purposes for the use of the public.
9. Patches of agricultural or other non-forest land which might otherwise be eliminated, but are so intimately an integral part of the forest that they cannot be segregated without destroying a forest unit, should be retained. A State forest should not be shredded by alienation to a point making protection, general administration, or application of forest management impracticable.
10. Agricultural land which might otherwise be cut out, but carries a heavy stand of timber of such value that the timber speculator in place of the *bonâ fide* selector would seek to acquire title, should not be made available until the timber has been removed completely.
11. When a considerable area of forest is clearly of great economic value to the State and an attempt to transform it into agricultural country might result in irreparable disaster by disturbing a well-established climatic or economic equilibrium, it should be retained.
12. Preliminary forest exploration work should be pushed as far and as quickly as practicable. A cursory examination should be enough to secure a temporary demarcation of likely lands up to a 25 per cent. margin above the State quota.
13. Final demarcation up to the limits of the prescription for the State must be the exclusive function of the Forest Services, and should be undertaken in the course of forest valuation and organisation surveys.
14. Private forests necessary to consolidate existing forest reservations or sufficient to establish new State forests—especially when they occur along the route of projected railway lines—should be resumed and placed under forestry management.

#### THE TIMBER MARKET.

The 1919-1920 Queensland timber market showed clearly the impress of reconstruction conditions.

The basic wage for forest workmen had increased with the higher cost of living and the alteration in the value of money. The costs of tree felling and log haulage had advanced, the latter, perhaps, abnormally in direct response to drought influences upon the supply of grass and water, and in consequence of the distances of road haulage lengthening as the railside timber zones became exhausted.

#### NORTH QUEENSLAND.

In North Queensland, extremely high rates were demanded for bullock traction, and teamsters were not content with a less earning than £30 per week, being more than double that payable in the Southern districts. Bullock-drivers claimed £12 per week and traction-engine men £10 per week, whilst offsidars had to be paid £6 per week.

Acting District Forester J. M. Fraser, of Atherton, writes:—

"The greatest profits now appear to go to the cutters, haulers, and the timber dealers. Cutters earn from 30s. to £5 per day during dry periods, and teamsters earn from £3 to as much as £10 per day. As a proof of the money to be made from the haulage of timber, the following may be quoted as prices for bullock teams:—The average range from £500 to £750, and a few days ago a team changed hands at £950."

And again—

"The costs of handling are still rising, and when timber ceases to advance in price a large amount will be in danger of going to waste unless other means are used to transport it to market.

All prices are apparently based on the cost of feeding horse teams, which are the costliest means of transport with feed at its present price. It costs anything from about £65 per month to feed a horse team.

"This report should have embodied a table of charges of timber haulage, but although it had been attempted to draw one up several times it has been found too intricate a matter to provide a stable scale.

"The lowest haulage costs known to this office are those at Mount Molloy, where timber is being hauled 10 miles for 6s., and the highest charges are at Ravenshoe, where it is costing 12s. 6d. for a distance of 7 miles. Cutting has now reached an average of 2s. 3d., with a minimum of 1s. 6d. and a maximum of 3s.

"Loading averages 8d. per 100 superficial feet for timber not more than 60 feet from the line, all timber at a greater distance from the line being charged an extra 6d. for snagging or rolling. Special charges are sometimes made for badly shaped timber or for a bad ramp. Sometimes also an owner may pay a special price to secure precedence for his timber. During the year there were two shipping strikes which affected the price of log timber very considerably. The market has since been gradually climbing, however, and the prices at the close of the year were about as follows, f.o.b. Cairns:—

Maple, 6 ft. to 6 ft. 11 ins., 29s. per 100, Silkwood sold as Maple.  
7 ft. to 7 ft. 11 ins., 31s. per 100.  
8 ft. up, 33s. per 100.

Kauri Pine, 6 ft. to 6 ft. 11 ins., 29s. per 100.  
7 ft. to 7 ft. 11 ins., 30s. per 100.  
8 ft. up, 31s. per 100.

Oak, 6 ft. to 6 ft. 11 ins., 22s. per 100.  
7 ft. to 7 ft. 11 ins., 24s. per 100.  
8 ft. up, 26s. per 100.

Bally Gum, 6 ft. up, 26s.  
Putt's Pine, 6 ft. up, 26s.  
Walnut, 6 ft. up, 26s.  
Black Bean, 6 ft. up, 26s.  
Crow's Foot (Silky Elm), 7 ft. up, 21s.  
Candlenut, 6 ft. up, 21s.  
White Pine, 6 ft. up, 21s.

"The above list has been written in the timber dealers' phraseology.

"Prices on ramps at the same time were as follows:—

Maple, 6 ft. to 6 ft. 11 ins., 15s.  
7 ft. to 7 ft. 11 ins., 18s.; special lots, 2s. per 100 more.  
8 ft. up, 21s.

Kauri Pine, 6 ft. to 6 ft. 11 ins., 13s.  
7 ft. to 7 ft. 11 ins., 15s.  
8 ft. up, 18s.

Bally Gum, 6 ft. up, 10s.  
Putt's Pine, 6 ft. up, 12s. 6d.  
Candlenut, 6 ft. up, 10s.  
White Pine, 6 ft. up, 11s. 6d.  
Black Pine, 7 ft. up, 13s. 6d.  
Oak, 7 ft. up, 11s.

The above are approximate only, as prices vary greatly on different ramps on the upper and lower tableland.

"A first glance at these prices would indicate that the dealer is making an abnormal profit, but the dealer claims that the two prices should be considered in this light: The higher price on the boat is offered by the Southern purchaser to any dealer who can guarantee to place it f.o.b. Cairns, while the lower price on ramps is the highest price the dealer can offer when taking the risk of not getting shipping space. In any case, the Northern dealer is making a very large profit on his timber. If the shipping space could cope with the timber output, there is no doubt that prices on ramps, particularly with the timbers of lesser importance, would rise without affecting the f.o.b. price to a great extent."

#### SOUTH QUEENSLAND.

In South Queensland the advance in costs was much more normal.

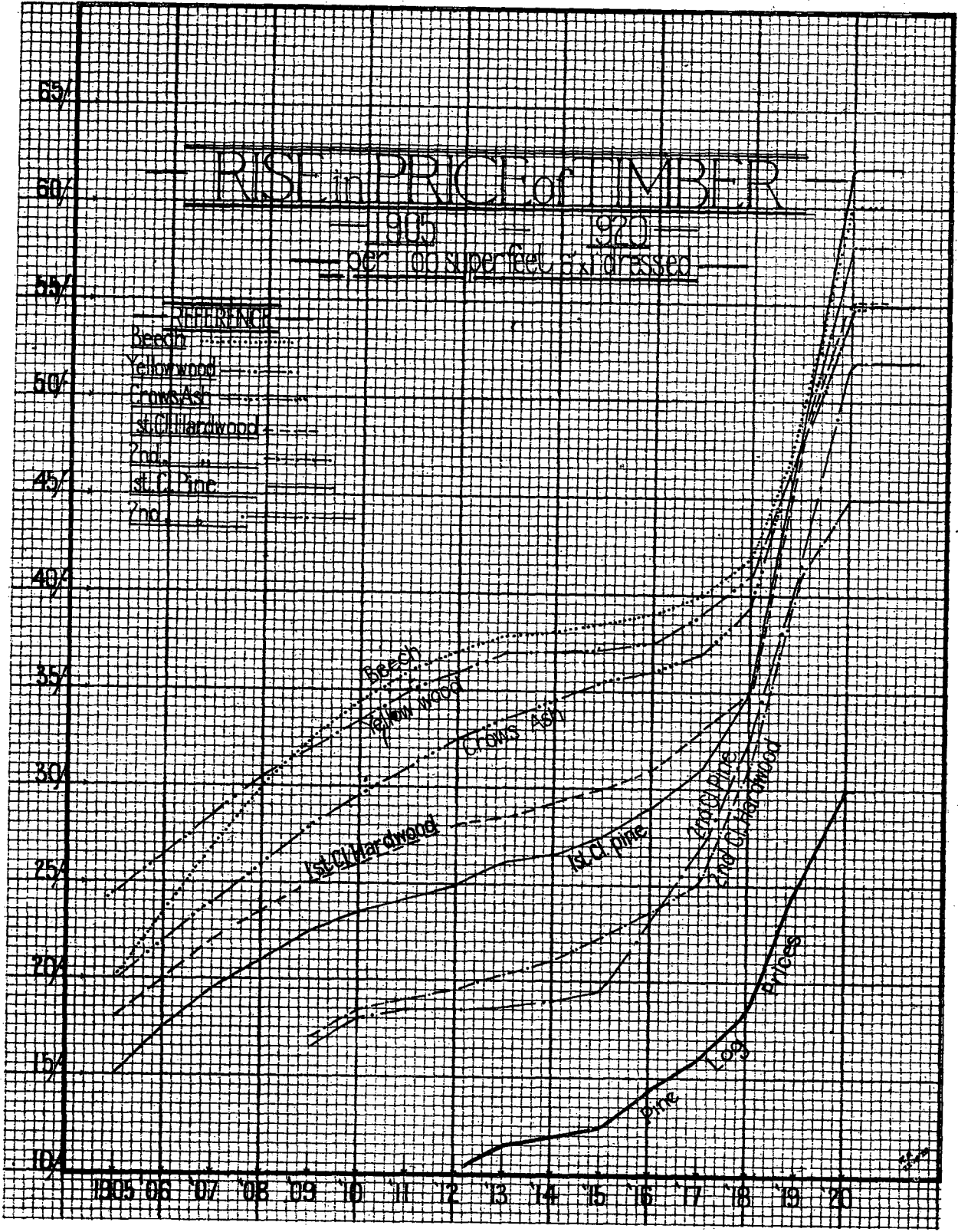
The increasing cost of harvesting did not account entirely, however, for the continued advance in log and sawn values and for the determined buoyancy of the local timber markets during the year.



# RISE in PRICE of LUMBER

1905 1920  
per 100 Super feet dressed

REFERENCE	
Beech	.....
Yellow wood	.....
Crows Ash	.....
1st Cl. Hardwood	.....
2nd	.....
1st Cl. Pine	.....
2nd	.....



The Brisbane price of pine logs 60 in. plus in girth advanced from 21s. at the beginning to 27s. 6d. at the close. The value of "tops" increased also from 12s. to 14s. 6d. Ironbark logs quoted in July, 1919, at 14s. Brisbane, reached 18s. by June, 1920.

In that month the Forest Service list of upset prices for logs of all species stood as follows:—

FOREST SERVICE UPSET PRICE, BRISBANE.

Species.	60 In. plus.	48-59 In.	38-47 In.	Tops, 60 In. plus. Logs, 40 In.	Tops, 60 In.
	s. d.	s. d.	s. d.	s. d.	s. d.
Hoop and Bunya Pine	25 0	21 6	16 0	12 0	11 0
	72 Inches plus.		60-71 Inches.		Minus 60 Inches.
	s. d.		s. d.		s. d.
Yellow-wood and Crow's Ash	18 0		16 9		14 6
Ironbark	16 6		15 3		13 0
Bumpy Ash, Tallow-wood, Spotted Gum, Red Stringybark, Blue Gum, Silver Ash	15 6		13 9		12 0
Flooded Gum, Blackbutt, Grey Gum, Marara	14 6		13 6		12 0
Turpentine, White and Yellow Stringybark, Scrub Box, Gumtop Box, Bloodwood	13 6		12 6		10 0
Rose Apple, Ironwood Box, Lignum Vitæ Box, Water Gum	13 3		11 6		9 6
	70 Inches plus.		60-69 Inches.		Under 60 Inches.
	s. d.		s. d.		s. d.
Red Cedar	42 6		40 0		35 0
Maple and Silkwood	35 0		32 6		27 6
Silky Oak	32 6		30 0		25 0
Kauri	32 6		30 0		25 0
Putt's Pine	30 0		27 6		22 6
Calophyllum, Rosewood, Rose Satinwood	25 0		22 6		17 6
Red Bean and White Cedar	20 0		18 0		15 6
White Beech and Black Beech	18 0		15 0		12 6
Bolly Gum and Silver Beech	16 0		14 0		11 0
Pink Poplar			11 0		9 6
Hard Bolly Gum			11 0		9 6
Brown Oak			10 0		9 0
Miscellaneous Scrubwoods			9 6		8 6
Pencil and Mackay Cedar	27 6		25 0		21 6
Mountain Ash and Hickory	25 6		21 6		19 6
Milky Pine or Milkwood, Damson	22 6		20 6		18 6
Johnstone River Hardwood, Penda, and Ti-tree	20 6		19 0		17 0
Black Pine, Ash, Walnut	19 6		18 6		16 6
Candlenut	19 0		17 6		16 0

A comparison of Forest Service upsets for June, 1919, and June, 1920, revealed the following differences in the case of Brisbane log market for Queensland Pine and Ironbark:—

FOREST SERVICE UPSET AT BRISBANE.

Species.	Class.	June, 1919.	June, 1920.
		s. d.	s. d.
Hoop and Bunya Pine	60 inch plus	18 6	25 0
	48 inch—59 inch	16 6	20 6
	40 inch—47 inch	13 6	16 0
	Tops 60-inch plus and Logs minus 40 inch	9 6	12 0
	Tops minus 60 inch	8 6	11 0
Ironbark	72 inch plus		16 6
	60 inch—71 inch	14 0	15 3
	Minus 60 inch	12 6	13 0

Sawn timber rates similarly had advanced. Thus dressed Pine 6 in. x 1 in. quoted Brisbane at 42s. in the first month of the financial year was listed at 62s. in the last.

Forest Service sales at stump realised generally higher rates. For Pine 14s. 9d. per 100 superficial feet was secured in the Nanango district, as against 12s. in 1918, and for hardwood in the Ipswich district 7s. was paid, as against 3s. 6d. in 1918. Red Cedar realised 19s. 3d. in North Queensland, where up to 10s. was paid for Maple. White Cedar brought up to 12s. in the Gympie district.

In the case of hardwood timber used by the Railway Department for the construction and maintenance of lines, the sale price was fixed at the actual costs of delivery by the Forest Service, plus a minimum royalty at the stump. A similar arrangement was made in connection with the sale of timber for mining purposes. These two lines of operation consequently were the least profitable and the most difficult to handle.

## PRICE FIXING IN RELATION TO TIMBER VALUES.

The advance in timber values has been not merely local, but universal. The imported equivalent of Queensland Pine—viz., American Redwood—was quoted in 1914 at from 22s. to 24s. 6d.; in 1917 the market prices ranged from 32s. to 35s. 6d. By 1919 it could be secured only on payment of up to 54s., and this year's shipments are costing 90s. Baltic Pine prices similarly have advanced from 10s. per 100 running feet in 1914 to 32s. in 1920.

In considering these advances it must not be overlooked that in the case of lumber there is no such thing as a prices level, and that the normal trend in all countries is an upward incline, due obviously to the gradual depletion of the original forests (particularly of the accessible areas) and the operation of the law of compound interest in the case of plantations created by the expenditure of money. Hitherto the factor of cost of production has not been taken into account in the sale of forest products, and a hurried, shortsighted liquidation of alienated timber crops throughout the world has resulted in depressed values for wood. The effect of war has been to cut Australia off sharply from its previous inundation by low-cost foreign lumber surpluses, and so soon as the pessimism of war conditions cleared away there began that lift in local timber values which, though viewed with grave alarm by the industries momentarily directly affected, represents not so much a price inflation as a reversion to value-normality, taking into account the previously forgotten but essential factor of cost of forest production.

The prices graph accompanying this report covers the history of timber prices from the beginning of recent settlement in Queensland and discloses that there has been a natural and normal persistent upward incline in timber values. This is consequent upon the erosion of the original forests.

During the past year the upward curve has taken a much sharper turn, traceable to the influences above referred to. So far as the Crown is concerned, the selling value of logs as determined by voluntary purchase by sawmillers in the open market at auction or by tender has followed an almost parallel course to that of sawn timber, and the sawmiller *per se* has not benefited abnormally by the higher prices of to-day, except where he has been farseeing enough to possess himself in the past with options or holdings over alienated forests. In such cases the unearned increment of these forests has been very great indeed, as is illustrated by the fact that in a recent resumption of timber land by the Crown the claim for compensation was more than twenty-five times the capital value at which the Crown threw the land open to selection fifteen years earlier.

There is little possibility of any considerable fall in timber values in Queensland.

Undoubtedly importation of wood into the Commonwealth must be resumed as soon as possible, and be continued until Australia has become self-reliant in the matter of timber supply. But mill costs have more than doubled in all countries, and in the case of our largest supplier, the United States of America, the present mill price represents little more than the cost of production. Normalisation of the exchange rate should result in a lowering of the delivered cost at Australian ports, but this is likely to be balanced by an increase in the mill price as American surplus timber supplies become reduced, owing not only to the overcoming of an existing car shortage, with the consequent diversion of a proportion of the Western supplies to the Eastern States to make up the deficiency resulting from the exhaustion of the South-eastern Pine belts during the war period.

The chief factor of the timber price situation is the shipping freight on lumber.

Should oversea freights fall to any extent, the dumping of foreign wood surpluses at Australian ports will follow. The effect would be a depression of local timber values.

The competition of cheap imported woods is likely to affect Queensland less than any other State, particularly as Queensland Pine and cabinet wood are of higher intrinsic worth than the lumber from the United States of America or the Baltic.

Some consternation has been manifested in Queensland at the prospect of a continuance of existing timber prices, and this consternation found expression in a recent demand for price-fixing. In this connection, it appears desirable to discuss the proposition from the point of view of the forester as well as of the consumer.

Forest utilisation is largely a price problem. Low prices connote wasteful exploitation and the culling of the stand for its choicest products. High prices of very necessity produce that pitch of perfection in utilisation, which is precedent to economical silviculture. When Red Cedar cost nothing it was chopped down and used for the basest purposes, and its but-little-less-choice associates were regarded as worthy only of destruction. Before the Southern markets discovered the virtues of Silky Oak and Maple, North Queensland settlers were using these high-grade cabinet woods for fencing posts and fruit cases. Hoop Pine itself, Queensland's most abundant softwood, now elevated to parity with choice New Zealand Kauri in the Melbourne market, was being diverted to uses to which despised but more or less useful woods could have been applied with reason and economy. At this date Queensland Pine is being sought after to such an extent and at such high prices for ply-wood and joinery purposes that the home builder has been forced to the overdue realisation that cabinet-quality timber is not absolutely essential for ordinary house construction. Consequently, some 20,000,000 superficial feet of knotty Pine logs, previously left each year in the "scrubs" to rot, are at length finding a market. So also in the case of Brown Oak (Crow's Foot Elm) and Pink Poplar (Maiden's Blush) and other secondary "scrubwoods," heretofore destroyed as useless or left in the State forests to become obstacles to the silviculturist intent upon renewing the depleted timber stand.

The first effect of a reduction in timber prices would be the degrading and elimination of these new additions to the shortened market and the consequential accentuation of present difficulties for the timber-getter and the forester in the matters of supply and silvics.

It is axiomatic that the market value of the log fixes the radius of profitable haulage, and therefore of the acreage of forest to be drawn upon to supply the needs of sawmills. A reduction of log price or an increase in log haulage costs automatically reduces the area of operation and, therefore, the quantity of raw material available at rail. At the present time there is a shortage of logs, and the natural tendency is to increase log prices in order to increase log supplies. When the reverse happens, the standing timber beyond the existing limits of profitable haulage becomes unmarketable, and the individual settler, unable to await the reaction, is forced to fell and burn an indispensable national and personal asset in order to make a more immediate livelihood by growing a shorter-period crop. So whilst the country is perilously short of wood, indispensable supplies of timber may be destroyed by the compulsion of economic conditions.

The increase in the price of timber in Australia is due primarily on one side to the cutting out of railside zones of timber, and on the other the clearing of timber lands for farming beyond the limit of profitable haulage. The log supply is being steadily circumscribed and eroded.

### ADMINISTRATION.

The post-war commercialisation of the forest policy brought into prominence the desirableness of commercialising the administration and the administrative procedure.

So far as was consistent with Public Service conditions, business methods have been applied throughout.

The detailed costing of forest projects was considered to be of primary importance because of its bearing upon effective expenditure. The existing system was extended and improved to permit of the early checking of project costs, and as a consequence the forest manager is now measurable by his results.

The revenue bookkeeping was taken over from the Land Agents during the year in the cases of the Brisbane, Gympie, and Nanango districts, and the books and forms were subjected to the revision demanded by the new circumstances.

Office equipment was modernised wherever possible, and filing cabinets were installed throughout. The decimal filing system of records was adopted in order to meet forestry's specialised needs, and considerable advantage to the administration has followed its application.

In the drafting section, the preparation of working plan maps was begun, and the processes of the Branch were improved and extended.

Throughout the Service the office accommodation proved hopelessly insufficient; and seriously hampered the expanding operations of the department. At the close of the year twenty-one officers at Head Office were occupying two small rooms, sitting abreast at tables. The Director's office was encroached upon to meet emergencies, and office furniture had to be removed to the corridors.

At Gympie and Atherton similar conditions prevailed, and in the latter case the accommodation was so extremely limited as to preclude the possibility of employing the necessary clerks to relieve the District Forester of routine clerical duty.

At Dalby, Rockhampton, and Bundaberg also, office conditions were bad.

The persistent shortage of trained forest officers threw upon Head Office an increasingly heavy burden. In order to overcome the consequent difficulties and to enable the existing personnel to acquire instruction by correspondence, the policy was adopted of issuing mimeographed information circulars. Amongst the many so distributed were the following:—

#### INFORMATION CIRCULARS.

- Forest Reservations—Queensland Forest Service.
- The Forest Service and its Men—Organisation.
- Field Methods—Sawmilling in North Queensland, Queensland Forest Service.
- Fire Protection Methods.
- Scrub Turkeys and Forest Protection.
- Susceptibility of Trees to Frost.
- New Topographical Survey Methods.
- Topographical Surveys in National Parks (U.S.A. methods).
- Methods—Forest Surveys—Forest Classification, Valuation and Organisation Surveys.
- Working Plans—Subdivision, &c.
- Subdivision of Forests—Principles and Methods.
- Tramways—Costs, Construction, and Use.
- Silviculture (from "Australian Forestry Journal").
- Silvicultural Systems.
- Study of Natural Regeneration of Kauri in New Zealand.
- The Normal Cultivated Kauri Forest.

Experimental Planting of Bunya Bulbs—History and Procedure.  
 Natural Regeneration and Planting Methods in New Zealand.  
 Eucalypts in Relation to Soil Fertility, by P. N. Stoate.  
 Methods of Distillation of Sandalwood Oil.  
 Official Nomenclature of Queensland Woods.  
 The Forming of Australian Forest Plantations and Forest Nurseries.  
 Methods—Seed Spotting, Seeding, Planting, &c.  
 Nursery Treatment of Eucalypts.  
 Natural Regeneration—Hoop Pine Operations.  
 Utilisation of Australian Woods for Tobacco Pipes.

A circulating library of works on forestry was established also at Head Office, with branches at Gympie, Atherton, and Fraser Island, &c. The District Forester at Gympie, in his annual report, refers to the policy in the following words:—

“*Forest Library*.—A local forest library was formed about the middle of the year. Any member of the staff is eligible on application, the only condition of membership being that books, &c., are to be taken care of and returned promptly when perused. Forestry journals of this and other countries, bulletins, periodicals, and journals have in this manner received a wide circulation, thus providing the means of educating many who would otherwise not be aware of what was taking place outside their immediate circle. The ‘forestry sense’ that is being generally developed justifies the undertaking, which it is intended to further develop.”

The importance of publicity in relation to the forest policy was realised. The most valuable contributions were the statements issued by the Minister himself the (Hon. J. H. Coyne, M.L.A.). These served, not merely to correct the public mind with respect to several popular misconceptions, but to establish firmly the comprehension that forestry is a necessity of pioneering times and not merely a luxury of a later civilisation. This conclusion is borne out by the following excerpt from the report of a district forest officer:—

“The newspaper paragraphs and articles which appeared from time to time in the Brisbane Press have had a heartening effect on the staff, and have tended to create a forestry interest among the large section of the local populace.

“I am convinced that the propaganda is bearing fruit, opposition is gradually dying down, apathy is being dispelled, and both are being replaced by a growing curiosity.”

The Forest Service was represented in the 8-Hour Day Celebration by an appropriate display.

#### DIRECTOR'S INSPECTIONS.

The slenderness of the administrative assistance provided during the heavy reorganisation period of 1919-20 necessarily imposed restrictions on the absence from Head Office of the Director of Forests. Visits were paid, however, to the Gympie, Imbil, Dalby, Roma, and Killarney districts, and to Hobart, Tasmania, on the occasion of the Interstate Conference on Forestry.

#### FOREST OFFENCES.

During the year five prosecutions for unauthorised timber-getting were undertaken, and fines amounting to £22 3s. 6d. were inflicted. Twenty-two seizures were made, and the sum of £43 3s. 8d. realised as a result of sales of confiscated timber.

Warnings were issued in several cases respecting illegal grazing on forest reservations, and these were sufficient to check the practice.

#### INTERSTATE AND IMPERIAL CONFERENCES.

At the Interstate Forestry Conference held in Hobart in May, 1920, Queensland was represented by the Hon. J. H. Coyne, M.L.A., Minister for Lands, and Mr. E. H. F. Swain, Director of Forests.

The following papers were presented by this State:—

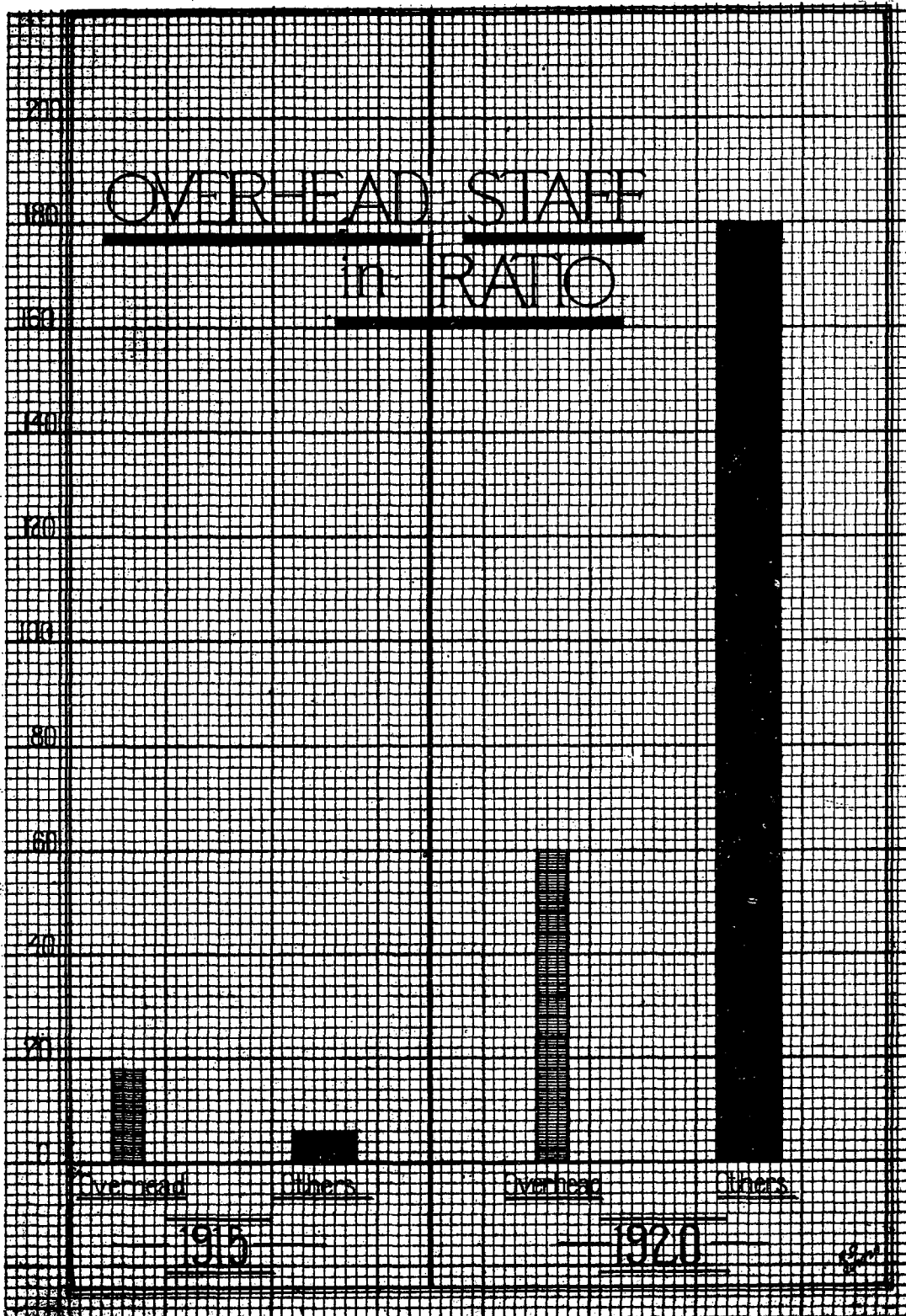
1. “Forestry in Queensland.”
2. “The Australian Forest Ration and its Apportionment.”
3. “Financing of Forestry.”

The resolutions of the Conference are appended to this report. (Appendix B.)

In London in July was held an epoch-marking Imperial Forestry Conference, to which Queensland was invited to send representatives. The demands of repatriation and post-war expansion of forestry activity in this State, however, were such as to preclude the despatch of any officer of the Forest Service, but a statement was prepared setting out the then position in Queensland with regard to:

1. Timber Supply.
2. Timber Utilisation.
3. The Organisation of the Forest Service.
4. Education and Training of Forest Officers and Foresters.
5. Research.

# OVER-HEAD STAFF in RATIO



This statement was forwarded to the Agent-General who, in conjunction with the Australian representatives elected subsequently by the Hobart Forestry Conference, represented Queensland.

In view of its importance, both the statement and the resolutions of the Conference are added to the report as appendices (Appendices C and D).

### PERSONNEL.

Since the last Annual Report of the Queensland Forest Service was presented to the Minister, important forest development operations have been undertaken and returned soldiers in considerable numbers have been employed upon the State forests. By consequence, the personnel is now treble what it was at that date; the present strength of the Department is 239 men, 75 per cent. of whom are paid upon a weekly wage basis.

The variation in the constitution of the personnel over a period of three years is illustrated in the following schedule, showing percentage and distribution:—

CONSTITUTION OF FOREST SERVICE PERSONNEL, 1917-1920.

	1917.	1918.	1919-20.
	Per Cent.	Per Cent.	Per Cent.
Administrative .. .. .	11	8	11
Field inspection .. .. .	57	41	14
Wages staff .. .. .	32	51	75

The schedule reveals the decline of the overhead strength from 68 per cent. to 25 per cent. of the personnel, with a corresponding increase in the proportion of forest workmen employed under their direction.

Details of staffing are as follows:—

#### Officers and Employees of the Forest Service.

31st December, 1919.		30th June, 1920.	
<b>Administrative—</b>		<b>Administrative—</b>	
Director of Forests .. .. .	1	Director of Forests .. .. .	1
Draftsman .. .. .	1	Draftsmen .. .. .	2
Clerks and Typists .. .. .	4	Clerks and Typists .. .. .	23
	6		26
<b>Field Inspectors—</b>		<b>Field Inspectors—</b>	
District Foresters .. .. .	4	District Foresters .. .. .	4
Assistant Foresters .. .. .	11	Assistant Foresters .. .. .	10
Forest Rangers .. .. .	5	Forest Rangers .. .. .	6
Forest Guards .. .. .	10	Forest Guards .. .. .	9
Cadet .. .. .	1	Cadets .. .. .	5
	31		34
<b>Wages Staff—</b>		<b>Wages Staff—</b>	
Overseers .. .. .	5	Foremen .. .. .	15
Survey Assistants .. .. .	6	Overseers .. .. .	14
Workmen .. .. .	27	Sub-Foremen .. .. .	18
Carrier .. .. .	1	Cooks .. .. .	6
	39	Carpenters .. .. .	3
		Drivers .. .. .	2
		Workmen .. .. .	131
	76		179
<b>Total .. .. .</b>	<b>76</b>	<b>Total .. .. .</b>	<b>239</b>

Of the 239 officers and employees on the pay-sheets of the Department on 30th June, 1920, 148, or 62 per cent. of the full strength of the Forest Service, were returned soldiers employed under the terms of a Commonwealth Repatriation Loan, according to which the Federal Government agreed to pay 25 per cent. of the wages bill.

### INDUSTRIAL MATTERS.

In October, 1919, a claim was made by the Australian Workers' Union for an industrial award applying to forestry employees. This claim was granted by the Court of Industrial Arbitration after a conference between the parties had given rise to an agreement. The award provided for a 44-hour week and a basic wage of £3 7s. 10d. for the Southern division of the State, £3 11s. 6d. for the Central division, and £3 15s. 2d. for the Northern division. In view of the difficulty of prescribing wages on a craft basis for a compound industry such as forestry, where one employee in the course of a week's work upon a forest might touch on a multitude of occupations impossible of costing not only on this account, but because of the absence of the forms of supervision available

in ordinary industries, the award divided the employees of the Forest Service into five distinct grades—viz., the probationer, the forest workman, the overseer, the sub-foreman, and the foreman. The rates of pay were fixed as follows:—

## WAGES.

	No. 1 District.	No. 2 District.	No. 3 District.
	£ s. d.	£ s. d.	£ s. d.
Probationers	Per hour. 0 1 6	Per hour. 0 1 7	Per hour. 0 1 8
Forest Service labourers	Per week. 3 7 10	Per week. 3 11 6	Per week. 3 15 2
Forest Service sub-foremen	3 9 8 to 3 17 0	3 13 4 to 4 0 8	3 17 0 to 4 4 4
Overseers	3 13 4 to 4 2 6	3 17 0 to 4 6 4	4 0 8 to 4 10 0
Foremen	3 17 0 to 4 13 6	4 0 8 to 4 17 2	4 4 4 to 5 0 10

The relations between the Department and its wages employees have been of the most pleasant, and no industrial troubles have occurred. Towards the close of the Annual Report period the employees were circularised as to their views upon an impending claim by the Australian Workers' Union for variation to a craft basis. The views of the employees in this respect proved to be in consonance with those of the Department, whilst in other respects the suggestions emerging from the circularisation of the employees resulted in the forming of a mutually satisfactory award for the current year upon the 1920 basic wage of £3 17s.

The salaried staff were not so fortunate as the wages men. In several instances, officers were in receipt of smaller remunerations than their lowest scale workmen, whilst the cooks in forest survey camps were earning as much as or more than the Surveyor in charge. Pending the appointment of a Public Service Commissioner, nothing could be done by the administration to remove these anomalies, and an excusable impatience upon the part of several officers led to resignations from the Service.

The existence of enthusiasm among its personnel is necessary to the useful existence of the Forest Service, whose operations are based upon silvical observation and experiment upon the one hand and a trade in timber and forest products upon the other. Without the goodwill and personal interest of each individual officer, progress in forestry is entirely out of the question. The psychology of the forest workman is notoriously different from that of his fellows in other industries, and the forest officer is not very different from his assistant in this respect.

This psychology must be taken into account in prescribing personnel principles and procedures for a Service whose development requires more than the perfunctory performance of work. Each individual must appreciate that he is engaged in an occupation through which he himself can expand, and that his work is an expression of that which is best in him. In forestry, more so even than in ordinary commercial business, the financial aspect demands the selection and retention of the best available and most psychologically suitable material, which must also be the most highly paid, because of the one important law that underlies the commercial realm—payment for services rendered. Economy as the price of efficiency is the worst form of extravagance.

## STAFF CHANGES.

The following staff changes took place during the year;—Assistant Forester McEniery, officer in charge of Bundaberg Survey Camp, resigned in April, 1920. His place as officer in charge of the camp was filled by Mr. N. D. Allom, returned soldier forest overseer.

Assistant Forester Woodrow, officer in charge of Nanango section of the Brisbane district, resigned in May, 1920. Forest Ranger Joyner, who had recently returned from service with the A.I.F., was transferred to Nanango in succession to Mr. Woodrow.

In August, 1919, Forest Guard Copley was transferred from Yarraman to Cooyar.

In September, 1919, District Forester Mocatta, of Atherton, was transferred to Rockhampton, and his place at Atherton was taken by Assistant Forester J. M. Fraser, officer in charge of the survey camp, North Queensland.



In February, 1920, Forest Guard Gillies was transferred from Gladstone to Benarkin, and Forest Guard Horsman, was transferred from Yandina to Many Peaks to fill the vacancy in the Gladstone district.

In March, 1920, Assistant Forester Moore was transferred from Ipswich to Brisbane, and Assistant Forester Sutton, of Gympie, took Mr. Moore's place at Ipswich.

Forest Ranger Arnold was transferred in April, 1920, from Charters Towers to Mareeba.

Mr. R. C. S. Douglas, returned soldier, was appointed as Forest Topographer at Head Office in November, 1919. Two junior clerks were appointed to Head Office in February and March, 1920. A messenger was appointed in June, 1920.

#### TECHNICAL OFFICERS.

Applications were invited for the position of Forest Engineer in the latter part of the year, a condition of the appointment being the subsequent taking of a special course in logging engineering and forest management at the School of Forestry and Lumbering, University of Washington, U.S.A. Mr. C. E. Paterson, B.E. (Qsld.) was selected.

Approval was obtained also for the calling of applications for the positions of Silviculturist, Working Plans Officer, and Instructor in Forestry at the projected Queensland School of Forestry, a condition of the appointment similarly being the taking of courses in forestry abroad.

## APPENDICES.

### Appendix A.—REPORT FOR SIX MONTHS ENDED 30th JUNE, 1919.

#### THE LOG MARKET.

The log market continued firm during the six months. Pine log values increased by 2s., the market value at Brisbane on 30th June, 1919, for logs over 60 in. girth being 21s., and for tops of the same dimensions 12s. was paid. Utilisation of tops under 60 in. was commenced during this period, and in June, 1919, the market value of these reached about 9s. Hardwood prices also were buoyant; Ironbark values increased from 12s. to 14s. Brisbane, Tallow-wood from 11s. to 12s. 6d., Red Stringybark and Blue Gum from 11s. to 11s. 6d.

The following comparisons between the January and July, 1919, Forest Service price list, which show the upset prices adopted in log sales by the Service, will indicate the log timber market movement for the period under review:—

Timber.	Market Value—Brisbane.	
	Jan. 1919.	June, 1919.
	s. d.	s. d.
Pine 60 in. plus ..	16 6	18 6
Pine Tops 60 in. plus ..	9 3	9 6
Pine Tops under 60 in. ..	Not quoted	8 6
Cedar ..	37 6	42 6
Maple ..	32 6	35 0
Silky Oak and Kauri ..	27 6	32 6
Rosewood ..	25 0	25 0
Red Bean and White Cedar ..	20 0	20 0
White Beech and Black Bean ..	18 0	18 0
Yellow-wood, Crow's Ash, and Bumpy Ash ..	13 0	13 0
Bally Beech and Silver Beech ..	12 0	16 0
Pink Poplar ..	10 0	11 0
Silky Elm ..	9 0	10 0
Golden Box ..	Not quoted	10 0
Misc. Scrubwoods ..	9 0	9 6
Ironbark ..	12 0	14 0
Tallow-wood ..	11 0	12 6d.
Red Stringybark and Blue Gum ..	11 0	11 6
Grey Gum and Blackbutt ..	10 0	11 0
White Stringybark and Scrub Box ..	8 0	10 0

The actual market values were somewhat in advance of the above prices.

#### SILVICULTURE.

The climatic conditions during the half year were unfavourable. Following a lengthy dry spell at the end of 1918, the first two months of the new year were also marked by dry weather. During March-May the fall improved, but in June the weather was once more very dry. Taken generally, the rainfall was very much below the average, and the effect on experiments was very unfavourable.

Following are the rainfalls recorded at the Imbil and Fraser Island Nurseries:—

Month.	Fraser Island.	Imbil.
	Ins.	Ins.
January ..	.87	.44
February ..	3.69	2.63
March ..	5.83	5.60
April ..	6.95	3.57
May ..	7.81	5.83
June ..	2.04	5.82
Total for Six Months ..	27.19	18.89

#### SEEDFALL.

The Hoop Pine seed fall failed in all districts, and owing to the adverse weather conditions propagation of this species was not possible.

The same cause was responsible for the failure of the Crow's Ash and Yellow-wood seeding in the Yarraman district, and Eucalyptus flowering was poor. At Gympie the Crow's Ash seeding was fair, as was also the seeding of Foambark. Bunya seeding was very poor.

Red and White Cedar, Silky Oak, Black Bean, and Brown Oak, however, seeded well. A good quantity of Red Cedar seed was secured for propagation in the nurseries. Brown Oak (*Tarrietia argyrodendron*) and Black Bean (*Castanospermum australe*) seeded well on the Atherton Tableland, where there was a failure in the Maple crop. Seed of the latter species

was, however, procured during an inspection by District Forester Mocatta, of the Banyan Creek lands, where the Maple was seeding.

Kauri seeded poorly in the Ravenshoe district, and the seedfall was unfortunately missed, only a small quantity of seed being procured. Black Pine and *Flindersia pubescens* also seeded lightly.

#### OPERATIONS.

Operations were confined mainly to experimental plantings and nursery work.

Extracts from District Officer's reports are appended:—

#### GYMPIE DISTRICT.

##### *Imbil.*—

Five acres were prepared for planting site at Western Creek and planted with 3,400 plants, mainly Hoop Pine and Bunya Pine and Red Cedar, but Beech, *Flindersias*, and several exotics went to make up the total. The planting was done with planting tools, and the total cost was £7 9s. 2d. Pumpkin seed was sown to form a shelter, but the plants were destroyed by pumpkin beetles.

A hardwood plantation site of about 4½ acres was planted with 2,720 plants, mainly Hoop Pine, Bunya (seedlings and bulbs), and Eucalypts (in tubes and open rooted). In preparing this site, all marketable timber was logged, and the remainder, consisting of heavy forest of Grey Gum, Yellow Stringybark, Forest Oak, Brush Box, and Ironbark was clean felled and burnt. The cost of planting 1 acre of above with Bunya bulbs was 15s. 10d.

About ½ acre of timbered land adjoining above site was planted with Bunya bulbs.

In May, 2½ acres of about 1½ acres was planted with 850 plants, consisting of Hoop Pine, Bunya Pine, Red Cedar, White Beech, Crow's Ash, Silky Oak, She Pine, *Pinus insignis*, *Pinus taeda*, *Pinus muricata*, *Pinus laricio*, *Callitris glauca* and *arenosa*, and *Cupania pseudorus*. The site was prepared by clear felling and burning of heavy forest and bastard scrub. The soil is rich red loam.

In June, 1,560 Red Cedar (1-0) plants were planted among soft weeds which followed a clear felling and burn of scrub. Tracks 18 inches and 24 inches wide were cut through the weeds, the rows being 6 feet apart.

Dry weather subsequent to the planting out has militated somewhat against the success of these experiments. Hoop Pine, however, weathered these adverse conditions remarkably well.

The experimental plantations established in 1918 were assisted by the fair rains of March to May; very few deaths were noticed.

In May, about 40 acres of hardwood forest were treated as an experimental operation in assisting natural regeneration of first-class hardwood, to the exclusion of "tree weeds." The total cost was £7 0s. 8d.

##### *Fisherman's Pocket.*—

Further small silvicultural experiments were conducted on this area.

##### *Biggenden.*—

Light fellings were made over a considerable area of the State forest to release Hoop Pine seedlings. A further area of scrub of about 2 acres was felled as a natural regeneration experimental site.

A small planting of Bunya bulbs was also made.

#### FRASER ISLAND DISTRICT.

##### *Nursery Work.*—

6,800 plants of various species, chiefly Queensland Scented Cypress (*Callitris arenosa*), Hoop Pine (*Araucaria Cunninghamii*), Silky Oak (*Grevillea robusta*), and Kauri (*Agathis robusta*, var. *glauca*), were tubed during the period. Survival is consistent. 1,400 plants (chiefly Eucalypts—Blackbutt, Spotted Gum, and Ironbark) were grown in bamboos, and percentage of survival is good. Open-root plantations of 2,600 plants were made, chiefly Bunya Pine (*Araucaria Bidwilli*) and Pinus species—a number failed in this instance. Sowings of seed resulted in a large number of seedlings being obtained. Best results were obtained with Red Cedar (6,500 plants), Tallow-wood (5,500), and Blackbutt (5,000). Minor parcels of other seeds were sown, with varying successes. Growth was not up to average owing to rainfall which did not occur in the summer "growing" months. Nursery costs for the year were £78 2s. 6d.

##### *Plantations.*—

Following are the District Forester's notes on the planting areas:—

*Area No. 2.*—Trees which were planted a few years ago on a small part by the tube and bamboo methods are now very fine, notably Kauri and Hoop Pine, *Euc. maculata* and *E. citriodora*, and to a lesser extent Beech and *Cupressus finibris*. Camphor, Silky Oak, and Crow's Ash have not done well on this area.

*Area No. 4.*—This area contains some exceptionally fine specimens of planted Kauri, Hoop, Black Bean, Crow's Ash, Silky Oak, and Red Cedar, and numerous other species which are not doing so well. The planting of this area was completed in 1918, but 1,898 seedlings were experimentally interplanted during this half-year.

*Area No. 5.*—This area contains 3 acres, and was planted 12 by 12 during the half-year with various species, for 25s. per acre. Then 2,283 seedlings were experimentally interplanted. Much promise is shown by the species originally intended to form the plantation, such as Hoop Pine, Silky Oak, White Cedar, Beech, and Quandong. The experimentally interplanted lot, such as the Pinus genus, are not uniform.

*Area No. 9.*—Four acres were cylinder-planted 6 by 6 during the half-year, at £3 14s. 3d. per acre; and although the period was exceptionally dry, practically all the young trees lived.

*Area No. 11.*—Five acres of the area were cylinder and bamboo planted 12 by 12 with Eucalypts during the period, and practically all the young trees are thriving. About 36 acres were "seed spot" sown with Blackbutt, Tallow-wood, and Red Stringy. 24½ lb. of seed were used, and the labour in sowing cost £2 6s. 6d.

## NATURAL REGENERATION.

*Area No. 1.*—This is an area of assisted natural regeneration of Cypress situated near the Orange Tree Camp on Wungoolba Creek, and containing 53 acres. A further sum of £12 10s. 9d. was spent during the half-year in destroying Lantana, Wattle, and Forest Oak (*Casuarina suberosa*) smothering young Cypress. This area bids fair to become an unqualified success. The regeneration is ample at present.

*Area No. 3.*—On this area a good seedfall was obtained, but abnormally dry conditions spoil the prospects of success.

*Area No. 10.*—This is an area of assisted natural regeneration of Cypress on Bennett's Creek. A further sum of £52 16s. 6d. was spent in regeneration fellings and burnings during the half year.

## GROWTH.

Yearly girth increment measurements were taken for various species by the District Forester. Growth was not up to average on account of the dry weather. Measurements are as follows:—

*Natural grown trees.*—

Kauri Pine from  $\frac{1}{2}$  in. to  $1\frac{1}{8}$  in.

Beech from  $0\frac{1}{8}$  in. to  $1\frac{1}{8}$  in.

*Callitris arenosa* from  $\frac{3}{8}$  in. to  $1\frac{1}{8}$  in.

*Trees planted or sown.*—

*Callitris arenosa*, sown *in situ* January, 1914. Height (June, 1919), 19 ft.

Blackbutt.—Sown *in situ* on 26th January, 1914. Height (June, 1919), 64 ft., girth  $21\frac{1}{4}$  in.

*Pinus taeda*.—Sown 3rd March, 1914. Planted out 20th July, 1915. Present height (June, 1919), 16 ft.

Tallow-wood.—Sown 1914. Height (June, 1919), 41 ft.

Hoop Pine.—Planted out 28th August, 1914. Height (June, 1919), 8 ft. 9 in.

Bunya Pine.—Sown March, 1913. Bulbs planted out January, 1914. Height (June, 1919), 9 ft. 8 in.

## ATHERTON DISTRICT.

Experimental silvicultural operations were continued in this district.

484 Kauri plants were propagated in the nursery at the beginning of 1919. Owing to the scanty seedfall it was not possible to go into extensive planting of this species. At June about 9,000 Kauri plants were held in the nursery beds ready for planting out when conditions became more favourable. The failure of the Maple seed crop precluded the undertaking of extensive experiments in regard to this species.

Observations of natural regeneration were made, however, and some interesting conclusions arrived at regarding its treatment.

Experiments with Hoop and Bunya Pine were very successful, and, despite adverse conditions of drought and frost, these species made remarkable headway. Bunya 2 ft. 6 in. high doubled this height during the year period. Wallabies did some damage.

Other species tried out were *Flindersia acuminata* (Putt's Pine), *F. Ifflaiana* (Hickory), *F. Australis* (Crow's Ash), Teak, Stringybark Cypress, *Flindersia laeviscarpa*, Silkwood (*F. Mazlini*), and White Beech, the most successful being the Stringybark Cypress (*Callitris Macleayana*).

Following are brief notes on the position at the end of June respecting the various experimental planting areas:—

*Area "A"*.—Kauri, planted in 1916, trees now average 15 ft. 3 in. high, withstood drought and frost, and shows great promise.

*Area "B"*.—Maple, planted various dates, contains some very fine specimens up to 18 ft. high. Better success expected when shelter wood established.

*Area "C"*.—Maple and Cedar.—Some losses of Cedar through drought; balance healthy and fairly free from twig borer. Maple success not general.

*Area "D"*.—Kauri, Hoop, and Cedar.—20 per cent. survival; losses caused through drought and animal depredations.

*Area "E"*.—Maple and Cedar.—Maple healthy, and making excellent growth. Cedar reached an average height of 15 ft.; natural regeneration of *Flindersia Bourjotiana* throughout.

*Area "F"*.—Arboretum.—Contains Hoop and Bunya Pine, Yellow-wood, and Crow's Ash, and a few Teak. Also a number of Maple and *Flindersia Bourjotiana* trees.

*Area "G"*.—No work was done on this area during the period. Success of planted trees was not general, but a good new crop of Maple regeneration of excellent development was noticeable.

Natural regeneration operations towards the freeing of young Cedar resulted in the establishment of a good crop of healthy young trees, and further regeneration is expected as a result of the seeding of the parent trees.

On *Area "H"* (unplanted) a good crop of Maple regeneration has made its appearance, and is developing strongly.

## BUNDABERG.

On Goodnight Scrub State Forest, operations in the direction of freeing young Pine from vines and other plant pests were continued.

## FOREST ORGANISATION.

## GYMPIE DISTRICT.

*Imbil.*—

During the period under review, various improvements were made to the forest station. Fencing of the paddock was completed in January and February. A timber shed and workshop 30 ft. by 20 ft. was constructed of secondary woods—Brown Oak, Scrub Box, Marara, and Red Heart. Fifty racks were erected in the shed, two-thirds of which was thus taken up, the rest being used as a workshop.

Some 9,000 super. ft. of Grey Gum was logged and cut up for shades and kerbing for the nursery.

Firebreaks were constructed to protect the various plantations. Surveys of 14½ miles of new road were also effected.

*Grongah.*—

An overseer was appointed to this reserve. Fencing of paddock and forest station site was effected.

*Biggenden.*—

Erection of an overseer's residence was commenced, secondary woods being used in its construction. Establishment of a forest paddock and water supply was also put under way.

*Amamoor.*—

The work of the road construction gang, which was strengthened by additions to its number, was continued.

*Fraser Island.*—

During the six months period, organisation operations were continued as follows:—

A length of 20½ chains of new road, sidelong formation, was made at a cost of £40 12s. 6d.

A crossing was put in near Area No. 5, connecting country on the north of Wungoolba Creek with that on the south, for the sum of £8 11s. 9d.

Arrangements were made towards the installation of a water supply plant for the use of the forest station and nursery.

The sum of £5 19s. 10d. was expended on paint and painting for the office during the half-year.

£3 6s. 9d. was similarly spent on the wharf shed.

The erection and painting of the drying shed was also completed, £70 17s. 1d. being expended during the term. This brings the total cost of erection and painting up to £221 18s. 11d. Towards the latter end of the half-year the question of moving the whole forest station establishment up to the scrub was under consideration.

ATHERTON DISTRICT.

The netting fence at the nursery was shifted to a new position during the period under review; the result was the establishment of a more efficient safeguard against the depredations of wallabies.

BRISBANE DISTRICT.

Improvement work was continued on State forests at Bunya and Yandina, in the direction of fencing and forest station establishment.

At Benarkin State Forest, operations were commenced towards the establishment of a forest station and nursery on the Reserve.

FOREST PROTECTION.

FIRE.

Forest Service operations in the direction of fire prevention were continued, and on the various reserves in process of organisation fire lines were constructed. A good deal of work was done by forest staff also in fire fighting. Early in the year officers were requested to furnish detailed fire plans for the various reserves under their control. Some of these have since come to hand, and have been incorporated in the general plans of organisation.

D

INSECTS, BIRDS, AND ANIMALS.

Observations of the cedar twig borer were continued. The depredations of this pest in North Queensland were found to abate somewhat in the droughty weather. Investigations were also pursued respecting a borer found in Maple, but owing to occurrence of some confusion the specimens collected could not be identified.

On Fraser Island, Eucalyptus regeneration was attacked by various caterpillar species, and badly damaged.

The relation of bird life to the forests was studied, and while it was established that a number of birds, such as cockatoos, do a large amount of damage by destruction of the seed and young trees of useful species, it was also found that in many cases they are the ally of the forester in destroying the more harmful insect pests, and also through their predilection in some instances for the seed of the competing tree-weeds. At the forest stations all possible was done to promote the preservation of the insect-devouring birds and, in some instances, decrease in the caterpillar and insect pests was noticeable.

Rats and wallabies proved troublesome, also, to the young growth. The depredations of these animals are greater in the dry weather, when they are "hard put to it" to find the moisture necessary to support life. Means of dealing with their depredations are being put into effect.

NOXIOUS PLANTS.

The eradication of Pear and Lantana formed part of the programme of forest organisation on the various reserves, and the destruction of vines affecting useful growths was also taken in hand.

CLIMATIC INJURIES.

As a result of silvicultural experiments much information regarding the protection of young trees from injury through extreme climatic conditions was obtained.

FOREST DEMARCATION.

The following Schedule shows the extent of forest demarcation work done during the six months:—

From 1st January, 1919 to 30th June, 1919.

(a) Topographical Survey—

	Acres.
R. 167 National Park, Kuranda, Ph. of Cairns .. .. .	1,800
R. 551 Dinden and Danbulla .. .. .	18,744
R. 399 Emu Vale, Gilbert, and Gladfield ..	13,500
Parish Ongera .. .. .	4,000
	<hr/>
	88,044

(b) Engineering and Valuation Survey—

R. 235 Amamoor .. .. .	5,100
R. 95 New Cannindah .. .. .	2,470
Casey Gully logging areas and Western Creek logging area, Brooloo .. .. .	4,220
Brooloo State Forest road engineering surveys .. .. . 415 chains	
R. 256 Kandanga and Imbil, road surveys .. .. . 1,140 chains	
	<hr/>
	11,790

(c) Flying Valuation—

Reserves and Crown lands in Inglewood district .. .. .	380,517
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(d) Reconnaissance—

Parishes of Ongera, Ravenshoe, and Ismailia .. .. .	2,000
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Total area dealt with .. .. . acres 432,351

This period was notable in that it saw the establishment of two new forest survey camps, under the direction of returned soldier surveyors.

At the end of June three forest valuation survey camps, two camps engaged on topographical surveys for the Forest Service, and one flying valuation camp were at work.

#### THE TIMBER CUT.

The timber cut on Crown lands for the six months was as follows:—

Pine .. .. .	10,638,902
Pine Tops .. .. .	2,703,737
Kauri .. .. .	476,722
Cypress .. .. .	359,679
Maple .. .. .	239,770
Red Cedar .. .. .	67,102
Other softwoods .. .. .	213,501
Hardwoods .. .. .	2,403,039
Fencing .. .. .	38,999 pcs.
Fuel .. .. .	22,232 cords
Telegraph poles and house blocks .. .. .	47,229 l. ft.
Mining and miscellaneous .. .. .	374,324 l. ft.
Sandalwood .. .. .	132 tons
Foambark .. .. .	2 tons 15 cwt.
Hoop Pine Gum .. .. .	90 lb.
Sleepers and transoms .. .. .	94,358 pcs.
Piles, girders, and corbels .. .. .	85,031 l. ft.

Forest Service direct utilisation was continued during the half year.

#### ADMINISTRATIVE SECTION.

The half-year was not marked by any great increases to either the salaried or wages staffs.

Preparation of systems, both in office and field, occupied a good deal of attention. Those dealt with included the costing and filing systems, while instructions for forest survey were also drawn up. These paved the way for the extension of Forest Service energies.

The resignation of Mr. S. J. Higgins of his position as Forest Guard in charge of flying valuation survey camp, Nanango district, was received during the six months.

Mr. J. M. Fraser, authorised surveyor, was appointed as Assistant Forester, North Queensland district. Mr. L. H. Arnold was appointed to the position of Forest Ranger at Charters Towers, and Mr. R. L. Taylor to the position of Forest Guard, Bundaberg survey camp. Four cadet foresters and one junior clerk were appointed.

Transfers were made as under—

Assistant Forester Twine from Gympie to Brisbane.  
Assistant Forester Weatherhead from Imbil to Benarkin.  
Forest Guard Spiden from Gympie district to Brisbane district.

At 30th June, 1919, the staff was comprised as under—

#### Administrative—

Director .. .. .	1
Draftsman .. .. .	1
Clerks .. .. .	5
	<hr/>
	7

#### Field Staff—

District Foresters .. .. .	4
Assistant Foresters .. .. .	12
Forest Rangers .. .. .	6
Forest Guards .. .. .	10
Cadets .. .. .	5
	<hr/>
	37

#### Wages Staff—

Overseers .. .. .	6
Survey Assistants .. .. .	8
General .. .. .	33
	<hr/>
	47
	<hr/>
	91

A total of 91, as against 76 at the end of the previous year. The percentages in the various classes were the same as at 21st December, 1920—viz., Administrative, 8 per cent.; Field staff, 41 per cent.; Wages staff, 51 per cent.

Accommodation conditions remained bad, the congestion at Head Office and elsewhere hampering the efforts of officers.

#### FOREST OFFENCES.

Sixteen seizures were made, and sales of confiscated timber realised £14 14s. 5d. Six prosecutions were made; all were successful, and fines amounting to £46 5s. 6d. were inflicted.

#### FOREST RESERVATION.

The position with regard to forest reservations at 30th June, 1919, was as follows:—

#### STATE FORESTS.

	No.	Area in Acres.
At 31st December, 1918 .. .. .	74	1,122,129
Reclaimed during six months .. .. .		29,371
		<hr/>
Total .. .. .		1,151,500

#### TIMBER RESERVES.

	Area in Acres.
At 31st December, 1918 .. .. .	2,671,139
Cancelled during year .. .. .	113,640
	<hr/>
Gazetted during six months .. .. .	2,557,499
	2,218
	<hr/>
Total reservation, at 30th June, 1919	3,711,217
Area of national parks .. .. .	73,980
	<hr/>
Grand total .. .. .	3,785,197

The reservation figure at 30th June, 1919, shows a decrease of 81,822 acres on the figures at 31st December, 1918.

## AREA OF STATE FORESTS, TIMBER RESERVES, AND NATIONAL PARKS IN THE STATE ON 30TH JUNE, 1919.

District.	STATE FORESTS.		TIMBER RESERVES.		NATIONAL PARKS.	
	No.	Area in Acres.	No.	Area in Acres.	No.	Area in Acres.
Atherton	4	4,384	4	19,732	..	..
Bowen	..	..	6	75,383	..	..
Brisbane	15	54,610	47	113,624	7	47,553
Bundaberg	5	64,516	16	70,435	..	..
Cairns	1	37,850	2	28,700	..	..
Charters Towers	..	..	1	125,000	..	..
Clermont	..	..	2	164,350	..	..
Cooktown	..	..	4	411,080	..	..
Dalby	4	347,080	17	231,744	..	..
Dalby and Nanango	..	..	..	..	1	22,500
Gayndah	..	..	8	30,218	..	..
Gladstone	5	38,427	13	137,663	..	..
Gympie	8	59,457	35	234,006	1	106
Herberton	2	731	4	18,490	1	270
Ingham	..	..	4	101,578	..	..
Inglewood	..	..	10	94,138	..	..
Innisfail	..	..	1	18,000	..	..
Ipswich	5	76,037	22	57,182	..	..
Mackay	..	..	12	196,186	..	..
Maryborough	6	257,775	22	90,188	1	100
Nanango	11	57,653	9	35,612	..	..
Port Douglas	5	209,876	5	209,876	..	..
Rockhampton	2	48,320	5	36,307	1	216
Roma	..	..	2	617	..	..
Springsure	1	69,000	1	3,240	..	..
Toowoomba	1	8,260	5	15,095	..	..
Warwick	1	27,400	10	35,480	2	3,235
Windorah	..	..	1	240	..	..
Totals.	71	1,151,500	268	2,559,717	14	73,980

## FINANCIAL.

## REVENUE.

The Forest Service revenue for the year amounted to £39,095, this figure representing a higher rate of earning than that attained in any previous year.

Details are as under:—

District.	Licenses.		Timber Sales.		Confiscated Timber.		Totals.	
	£	s. d.	£	s. d.	£	s. d.	£	s. d.
Aramac	2	6 0	1	8 8	..	..	3	14 8
Atherton	1	15 0	1,020	18 5	..	..	1,022	13 5
Banana	0	7 6	..	..	..	..	0	7 6
Barcaldine	12	17 6	48	10 9	..	..	61	8 3
Birdsville	..	..	..	..	..	..	..	..
Blackall	4	18 0	23	9 8	..	..	28	7 8
Bouli	3	17 6	1	7 3	..	..	5	4 9
Bowen	5	8 0	55	18 4	..	..	61	6 4
Brisbane	2	10 0	1,383	17 1	..	..	1,386	7 1
Bundaberg	11	2 0	1,259	14 0	..	..	1,270	16 0
Burketown	0	18 0	4	15 0	..	..	5	13 0
Cairns	7	12 6	314	15 11	..	..	322	8 5
Camooeal	1	0 0	1	3 5	..	..	2	3 5
Charleville	5	11 6	4	11 8	..	..	10	3 2
Charters Towers	35	15 6	402	19 8	..	..	438	15 2
Chillagoe	..	..	..	..	..	..	..	..
Clermont	2	0 0	521	5 11	..	..	523	5 11
Cloncurry	10	4 6	18	8 1	..	..	28	12 7
Cooktown	4	13 0	49	13 9	..	..	54	6 9
Coen	0	4 0	..	..	..	..	0	4 0
Croydon	1	2 0	10	5 0	..	..	11	7 0
Cunnamulla	2	9 0	..	..	..	..	2	9 0
Dalby	1	0 0	464	1 9	..	..	465	1 9
Emerald	3	0 0	174	6 5	..	..	177	6 5
Gayndah	4	12 6	19	17 5	..	..	24	9 11
Georgetown	3	0 0	..	..	..	..	3	0 0
Gladstone	5	3 0	702	8 9	..	..	707	11 9
Goondiwindi	2	10 0	20	6 3	..	..	22	16 3
Gympie	8	10 6	7,694	18 7	..	..	7,703	9 1
Herberton	2	18 0	364	9 7	..	..	367	7 7
Hughenden	25	14 6	150	5 0	..	..	175	19 6
Hungerford	..	..	..	..	..	..	..	..
Ingham	8	4 6	171	19 2	13	0 0	193	3 8
Inglewood	7	17 0	273	10 4	..	..	281	7 4
Innisfail	0	17 6	77	10 0	..	..	78	7 6
Ipswich	3	15 0	7,067	10 1	..	..	7,011	5 1
Isisford	1	3 6	..	..	..	..	1	3 6

## REVENUE—continued.

District.	Licenses.			Timber Sales.			Confiscated Timber.			Totals.		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Jundah	1	18	6	..	..	..	..	..	..	1	18	6
Kynuna	1	5	0	..	..	..	..	..	..	1	5	0
Longreach	7	0	6	26	7	8	..	..	..	33	8	2
Mackay	18	4	6	228	18	9	..	..	..	247	3	3
Mackinlay	0	19	6	..	..	..	..	..	..	0	19	6
Maryborough	22	13	0	1,561	19	11	1	14	5	1,586	7	4
Maytown	..	..	..	..	..	..	..	..	..	..	..	..
Mitchell	..	..	..	..	..	..	..	..	..	..	..	..
Mount Morgan	0	5	0	..	..	..	..	..	..	0	5	0
Mount Perry	0	17	0	..	..	..	..	..	..	0	17	0
Muttaburra	4	10	6	..	..	..	..	..	..	4	10	6
Nanango	3	10	0	10,232	7	7	..	..	..	10,235	17	7
Normanton	4	0	0	26	1	0	..	..	..	30	1	0
Port Douglas	..	..	..	..	..	..	..	..	..	..	..	..
Ravenswood	2	18	0	66	0	9	..	..	..	68	18	9
Rockhampton	13	13	0	1,116	11	10	..	..	..	1,130	4	10
Roma	1	16	0	53	14	6	..	..	..	55	10	6
St. George	1	7	6	22	14	8	..	..	..	24	2	2
St. Lawrence	0	5	0	52	15	8	..	..	..	53	0	8
Springure	1	9	6	..	..	..	..	..	..	1	9	6
Stanthorpe	0	7	6	..	..	..	..	..	..	0	7	6
Stonehenge	0	8	0	..	..	..	..	..	..	0	8	0
Surat	0	5	0	1	6	3	..	..	..	1	11	3
Tambo	2	2	6	10	13	3	..	..	..	12	15	9
Taroom	0	15	0	18	19	2	..	..	..	19	14	2
Thargomindah	0	8	0	..	..	..	..	..	..	0	8	0
Thornborough	0	15	0	..	..	..	..	..	..	0	15	0
Thursday Island	13	4	0	59	18	4	..	..	..	73	2	4
Toowoomba	8	15	0	2,525	19	10	..	..	..	2,534	14	10
Townsville	23	9	6	208	2	4	..	..	..	231	11	10
Warwick	0	10	0	283	9	0	..	..	..	283	19	0
Windorah	0	15	0	1	9	6	..	..	..	2	4	6
Winton	5	17	6	..	..	..	..	..	..	5	17	6
Totals	339	2	0	38,741	15	11	14	14	5	39,095	12	4

The expenditure for the semi-annual period amounted to £12,566 11s., as against £21,877 for the preceding twelve months.

The expenditure represented 32.1 per cent. of the revenue, and was distributed as follows:—

## Overhead Expenses—

	£	s.	d.
Salaries .. .. .	3,926	11	2
Travelling and incidental .. .. .	1,692	17	9
Total overhead expenses .. .. .	5,619	8	11
Per cent. of total expenditure .. .. .	44.7 per cent.		

During the fifteen and a-half years, from 1st January, 1904, to 30th June, 1919, the Forest Service revenues amounted to £724,597, and the expenditure to £100,185, leaving a surplus of £624,412.

## Capital Improvements—

	£	s.	d.
Forest organisation and silviculture .. .. .	5,192	19	10
Forest station establishment .. .. .	1,026	19	5
Roads to Crown timber areas .. .. .	727	2	10

Total capital improvements .. .. .	6,947	2	1
Per cent. of total revenue .. .. .	55.3 per cent.		

During the period, overhead expenses represented 44.7 per cent. of the total expenses, as against 45.4 per cent. in 1918, while the percentage expended during the six months in capital improvements was correspondingly larger than in the previous year.

## Appendix B.—INTERSTATE CONFERENCE ON FORESTRY, HOBART, APRIL, 1920.

### Summary of Resolutions Agreed to by the Conference.

#### IMPERIAL CONFERENCE ON FORESTRY.

*Resolved*—That this Conference recommends that two delegates be sent from Australia to the forthcoming Imperial Conference on Forestry, and suggests the appointment of C. E. Lane Poole, Esquire, Conservator of Forests, Western Australia; and H. R. Mackay, Esquire, Commissioner, Forests Commission, Victoria, as gentlemen having a wide and thorough knowledge of the forestry resources of Australia; and, in view of the fact that this is a matter of National and Imperial concern, rather than one affecting the States individually, the Conference recommends that the Commonwealth Government be asked to bear the cost of such representation.

#### AUSTRALIAN SCHOOL OF FORESTRY.

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

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



*Resolved—*

- (1.) That there shall be established an Australian School of Forestry for the training of officers in the profession of forestry.
- (2.) That the Australian School of Forestry be established in New South Wales.
- (3.) That such school shall provide for the issue of a diploma, and the qualification for entrance shall be a two years' science course in an Australian University, or its equivalent, as laid down by the governing body; except in the case of any Australian forest officer or employee selected by the forest authority of a State for a course of training owing to special ability and qualifications.
- (4.) That the cost of establishment and maintenance be met by contributions from the States on a population basis, and a subsidy from the Commonwealth on the basis of one-sixth of the gross total contributions by the States.
- (5.) That the cost of providing for a teaching staff, to include an experienced principal and associate lecturers, should not be more than £6,000 per annum, and the cost of the establishment should not exceed £12,000.
- (6.) That no charge should be made for training and instruction at the school.

- (7.) That the control of the school should be vested in a council, constituted by the appointment of an equal number of representatives of each State and the Commonwealth.

## FOREST PRODUCTS LABORATORY.

*Resolved—*That the cordial support of this Conference be given to the early establishment of a Forest Products Laboratory in Perth, Western Australia, as set forth in the paper read to the Conference by Mr. Boas, M.Sc.; and that it be intimated to the Right Honourable the Prime Minister that, in the opinion of the Conference, early steps should be taken to ensure the formation of this much-needed institution.

## NATIONAL FOREST AREA FOR COMMONWEALTH.

*Resolved—*That this Conference endorses the figures as prepared by each State for allotment of a National Forest Area of 24,500,000 acres of indigenous forest for the Commonwealth of Australia; and that the delegates appointed by the Conference to present details of the proposed Forestry School be asked to urge the consideration of this resolution at the forthcoming Premiers' Conference.

## COMMONWEALTH SUBSIDY FOR FORESTRY.

*Resolved—*That this Conference urge upon the Commonwealth Government the advisability of subsidising the forestry operations of the States, and of guaranteeing, in addition, adequate loan funds for the purpose.

## NEXT CONFERENCE TO BE HELD IN QUEENSLAND.

*Resolved—*That the next Interstate Conference on Forestry be held in Queensland.

**Appendix C.—BRITISH EMPIRE FORESTRY CONFERENCE.**

*Resolutions Passed at the Meeting held in London, 22nd July, 1920.*

The British Empire Forestry Conference, consisting of the delegates from the Empire whose names are given herewith, assembled in London in July, 1920, and sat in Committee on 12th, 13th, 14th, 20th, and 21st July, and in full session on 7th and 22nd July. After deliberation and discussion, they have passed the following resolutions which they will bring to the notice of their respective Governments:—

## 1. FORESTRY POLICY.

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

## 2. SURVEY OF RESOURCES.

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

## 3. CONSTITUTION AND STATUS.

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

- (1.) The definition, where this has not been done already, of forest policy in a Forestry Act or ordinance.
- (2.) The reservation, for the purpose of economic management and development, of forest land under conditions which prevent the alienation of any which is primarily suitable for forests except for reasons consistent with the maintenance of the forest policy as a whole.
- (3.) The assurance to the Forest Authority of funds sufficient to carry out the accepted policy for a series of years.
- (4.) The grant to members of the Forestry Service of the status of civil servants, with due provision of pension.
- (5.) The appointment as the chief officers of the Forestry Service of persons having a high standard of training in forestry, their selection and promotion being by merit alone.

- (6.) The establishment in each of the larger parts of the Empire and for the Colonies not possessing responsible government collectively, of an officer, or officers, having special duties of advising as to forest policy and surveying its execution.

#### 4. ORGANISATION OF FOREST INDUSTRIES.

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

#### 5. PUBLICITY.

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

#### 6. DISTRIBUTION OF FOREST PLANTS.

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

#### 7. TERMINOLOGY AND TRADE NOMENCLATURE.

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

- (1.) Standardisation of forest terminology;
- (2.) Correct identification of timbers, and standardisation of their trade names.

#### 8. RESEARCH.

The scheme of research work set out in Annexure "B" receives the approval of the Conference, and is recommended to their Governments for early consideration and approval by them.

This takes the form of the report from a Committee appointed "to prepare a draft scheme for the organisation of that work which is essential to the progress of forestry, including both the production and utilisation of forest produce, the Committee to pay particular regard to the importance of avoiding overlapping and of co-operation with existing institutions." The report deals with the organisation and subdivision of research, with the relation of the different parts of research to one another, and to education and practice, and with the subjects of research both generally and in relation to the needs of the different parts of the Empire.

#### 9. EDUCATION.

It should be a primary duty of Forest Authorities throughout the Empire to establish systematic schemes of forestry education. It has been found for climatic and other reasons that it would not be possible for each part of the Empire to establish a complete scheme of forestry education of its own, and therefore it is essential that those parts of the Empire which are willing and able to establish complete schemes should, as far as possible, frame such schemes with a view to combining for meeting

the needs of those parts which can only make a partial provision for their requirements.

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

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

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

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

#### 10. FORESTRY BUREAU.

The Conference approve the suggestions and recommendations for the constitution of an Imperial Forestry Bureau which are contained in the report of a Committee, and strongly urge upon their respective Governments that they should contribute to the support of the Bureau as therein suggested. They feel that it will be largely upon the work of such a Bureau that the proper development of the forestry resources of the Empire will depend, and they therefore cannot over-emphasise its importance as a part of Empire organisation.

#### 11. FUTURE CONFERENCES.

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

## Annexure B.

## RESEARCH.

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

The Committee beg to report as follows:—

"1. We desire to emphasise the importance of systematic research work in developing the growing and utilisation of timber and other forest products. So far the need for research, while generally appreciated by responsible forest officers, has not received that general recognition which the subject demands.

"2. We believe that in order to secure adequate progress three principles should receive attention—

(1) That the State is primarily responsible for forestry research work. This is so for a number of reasons. Forest problems are of National importance, while a considerable proportion of the forests of the Empire are State-owned and State-managed. Forest problems frequently require long periods of time and co-ordinated effort for solution. The State alone can meet these demands.

(2) Research work on an adequate scale can be efficiently conducted only by men who are qualified by training and taste for research, and who are not hampered by routine or administrative duties. Evidence has been placed before us showing that disregard of this principle has frequently led to a complete cessation of progress in research.

(3) The salaries and status of research officers should be such as to attract and retain the services of the most highly qualified men.

## SUBDIVISION OF RESEARCH.

"3. Forest research work can conveniently be divided into two main branches—

(1.) The growing of forest crops.

(2.) The utilisation of timber and other forest products.

"Each of these two main branches can be considered from two points of view—viz., the general and the local. The general point of view regards the principles or methods governing research work, e.g., the methods of compiling and co-ordinating statistics of growth, whereas the local point of view is concerned with the application of a principle to a limited range of conditions, e.g., the silvicultural study of a species of purely local interest.

"General research may consequently be conducted at one centre for very wide areas; local research, on the other hand, must be conducted on the spot. Both are important, and neither should be neglected.

## RELATION OF THE TWO MAIN BRANCHES OF FORESTRY RESEARCH.

"4. Research on the growing and research on the utilisation of timber and forest products are obviously intimately connected, and it is

necessary for the two branches of research to be closely co-ordinated, both in their actual conduct and in the administration responsible for them. From their nature, however, they cannot always be contained in one institution. It may be argued that the centre for silvicultural research should be in or near the place of production (the forest), while research in utilisation should be carried out in or near the principal centres of consumption, which are frequently remote from forests. We consider it undesirable to attempt to lay down any hard-and-fast rule in this matter, and believe that, provided adequate co-ordination is secured, there is no reason why the two branches of research may not be successfully conducted either together or apart as circumstances may dictate.

## RELATION OF RESEARCH TO EDUCATION.

"5. Although the duty of research officers will be primarily to carry out research work, we consider that they should devote a limited portion of their time, if necessary, to educational work in their own subjects; this, we hold, will be of advantage not only to the student but also to the research worker himself, besides leading to an economy in staff.

## RELATION OF RESEARCH TO PRACTICE.

"6. We consider that research work will lose a great part of its value unless it can be followed to its logical conclusion—namely, its application to practice. Apart from the publication of results in the form best calculated to make the information-useful to those who can benefit by them, there is the necessity for ensuring that the results are applied, if only on a small scale, to practice, and that the results of this practical application are recorded. In this way a definite chain is established, for example, between the laboratory, the experimental plot, and the forest.

## AGENCY OF RESEARCH.

"7. We have already remarked that the State is primarily responsible for forestry research work. If this principle be accepted, the further principle of State control and subsidy follows. As regards the agency of research, the work may be carried out, either directly by the State, through its own officers, or through the medium of Universities or other institutions, associations, or individuals.

## SUBJECTS FOR RESEARCH.

"8. The chief problems with which forestry research deals may be grouped under the following heads:—

A.—*Research into the growing of forest crops*—

(1) Silviculture, including regeneration and silvicultural systems;

(2.) Statistical investigations as to rate of growth and volume production, which alone can provide the data essential for rational and economic forest management;

(3.) Forest botany, including ecology and mycology;

(4.) Forest entomology;

(5.) Soil investigations;

(6.) Meteorology.

*B. Research into the utilisation of timber and other forest products—*

- (1.) Wood technology, including the testing, seasoning, and preservation of timber;
- (2.) Investigations into products other than timber.

“Most of the research problems of outstanding importance fall under the head of silvicultural, statistical (that is, the collation of data dealing with the rate of growth and production) or technological (from which we exclude any questions which fall rather under the head of administrative or executive work). From the evidence at our disposal we are convinced that in no part of the Empire is sufficient attention devoted to the investigation of silvicultural and statistical problems, considering their great importance in connection with the future maintenance and economic working of the forests. We therefore recommend that each part of the Empire should include in its Forest Service at least one research officer, and that adequate funds should be placed at his disposal to ensure progress in those branches of research. We

recognise that in some cases a small Service may not have funds for the immediate appointment of more than one research officer; in such a case we hold strongly that this officer should be specially trained in silvicultural and statistical work.

“Problems connected with other branches of forest research vary in degree in different localities, but, wherever conditions demand it, we recommend that similar steps be taken to ensure the progress of research in the branches concerned.

“We desire here to record the fact that, in our opinion, forestry research in its various branches, including investigations into the properties and utilisation of timber, have not hitherto received wide enough recognition from non-official sources, and we would venture to draw the attention of organisations and individuals interested in the subject to the wide scope which exists for liberality in the financial support of these branches of research, which are of vital importance to the well-being of the Empire.

## Appendix D.—FORESTRY IN QUEENSLAND.

*Notes Prepared by the Queensland Forest Service for the Purposes of the British Empire Forestry Conference, London, 1920.*

### 1. TOPOGRAPHY, GEOLOGY, SOILS, AND CLIMATE.

The State of Queensland comprises an area of 670,500 square miles. This area is fairly evenly bisected by the Dividing Range into a coastal watershed, embracing approximately 350,000 square miles, and an interior plain of about 320,000 square miles drained by tributaries of the Murray River and Lake Eyre.

For the most part the Dividing Range is a chain of low hills, except in the South, and in the Darling Downs, where the elevations range from 3,000 to 5,000 ft. Along practically the whole length of the east coast, however, and leaving only a small belt of flat littoral, there is a well-defined range, broken to allow of the exit of the larger coastal rivers; this range is generally of greater elevation than the Dividing Range, and attains its highest point, 5,120 ft., in the Bellenden Ker Range, near Cairns, on the north-eastern coast.

There being no mountains in Queensland extending beyond the permanent snowline, the rivers are dependent on the rainfall. Thus the coastal rivers fed by the Pacific Ocean precipitation of 30 to 140 inches per annum are good permanently flowing streams, while the water-courses of the interior, with rainfall of 5 inches to 25 inches per annum, are completely dried up in drought seasons.

Geologically Queensland has two divisions, occupying nearly equal areas but possessing very different physical features. One division embraces the eastern coast, from the New South Wales border northwards to the 12th parallel of latitude, with an average width of about 200 miles from east to west, and well watered and timbered, and an area in the north-west portion of the State—viz., the Burke district, extending from the extreme north-west southwards to Cloncurry and Boulia. The loftiest mountain

ranges occur in this division, the highest peak, Bellenden Ker, a one-time high tableland, attaining an elevation of 5,120 feet.

This region consists of stratified rocks of different ages, from the oldest palæozoic—the exact age of older rocks has not yet been determined—up to those of recent origin. There are also large areas of granites, porphyries partly of igneous and partly of metamorphic origin, as well as other intrusive and interbedded igneous rocks. It is in this division that most of the mineral wealth of the State exists.

The other large division, known as the Western Interior, consists almost entirely of the lower cretaceous rocks overlaid unconformably in places by the desert sandstone, which is of upper cretaceous age.

This division, locally known as the Rolling Downs Formation, presents a vast area of almost treeless plain, with occasional clumps of “Gidya” scrub.

The rainfall over this division, more especially in the south-west, is small. The river beds are generally dry.

On the coastal belts of Queensland on which the bulk of the softwood and cabinet-wood timbers are to be found, the soils have in the main been derived in places and indicate generally the nature of the surrounding rocks. The extensive deep and red soils of the high plateaux, such as the Atherton Tableland, arise chiefly from the decay of basalts, andesites, and allied rock types; the black soils occupy the areas subject to flooding, and the red and chocolate soils the drained hillsides. The sandy soils originate from the decomposition of the sandstones and allied types—e.g., the Gympie formation—covering a large part of the south-eastern corner of the State. The clay soils are due to the decomposition of palæozoic slates, and the light loams

originate from the granites and from mingling of soils by stream action from dark and sandy rocks associated in the same district. The interior country is for the most part formed of sedimentary soils over sandstone. These are black on the areas subject to periodical flooding and red and grey on the higher and drier areas. This belt covers the western side of the peninsula practically from Cape York to the New South Wales border, and represents by far the greater part of Queensland, excluding the area intruding near Cloncurry as previously noted.

As before mentioned, the rainfall in Queensland varies considerably. The coast belt fares best, with the fall varying from 30 to 140 inches annually, while in the west the annual averages are from 5 to 30 inches per annum, the highest average being experienced under the shadow of the coastal ranges.

Generally speaking, the tropical North experiences much heavier rainfall than the South; which fact influences the growth of timber to a considerable extent. Here the forests suffer from periodical cyclonic visitations.

The climate is temperate generally, mean temperature on the coast varying from 52 deg. to 78 deg. in the winter, and from 73 deg. to 86 deg. in the summer.

## 2. FOREST TYPES.

Summer rains and winter droughts, accompanied by excessive evaporation, differentiate the forestry problems of Queensland from those of the other States, and at the same time give character to the wooded vegetation.

In addition to extensive areas of more or less open hardwood, Queensland possesses the most important softwood resources of the Commonwealth.

Between the two types of forest, there exists a sharp line of demarcation.

*The Softwood Forests.*—This type, known in the vernacular as "scrub," occupies the soils of high moisture content in the 30 to 100-inch rainfall belt fringing the long stretch of coast. It hugs the alluvial bottoms and the rich volcanic highlands, and is of patchy distribution. Actually a jungle type, the density is high and the mixture ordinarily consists of a hundred various species, the majority of which are small shade bearers of the lower storey, really medium hardwoods. The natural standards of the type furnish the principal timbers of Queensland.

There are several sub-types, the most considerable being the Araucaria mixture.

*The Araucaria Sub-type.*—This sub-type is comparatively abundant in the south-west corner of the State, but rarely extends north of Gladstone. The dominant species are Hoop Pine (*Araucaria Cunninghamii*) and Bunya Pine (*Araucaria Bidwilli*). The natural stand varies between ten to twenty trees per acre in mixture with miscellaneous sorts. The biggest trees furnish up to 6,000 feet of sawn timber. The timber is sold as Queensland Pine without discrimination of species, and furnishes the chief building wood of the State. It is the accepted timber for butter boxes, and is achieving favour as a plywood. Specimens of Hoop Pine with from 10 per cent. to 20 per cent. moisture gave weight 30-37.5 per cent.; modulus of rupture 14,700-9,750; crushing 8,480-6,750.

Probably there are over 1,000,000 acres of this type in the State in patches with a stand of mature timber of the species measuring between one and two thousand million superficial feet log measurement.

Associated trees include—

Yellow-wood (*Flindersia Oxleyana*);

Crow's Ash or Queensland Teak (*Flindersia Australis*);

White Ash (*Flindersia Schottiana*)

(all valuable hardwoods of 40-50 lb. weight per cubic foot);

White Beech (*Gmelina Leichhardtii*), perhaps the finest carving softwood in Australia, now very rare;

Bally Gum (*Litsea reticulata*), second only to White Beech for working and carving;

Pink Poplar (*Euroschinus falcatus*), a light softwood, fairly plentiful, but not much used owing to seasoning difficulties; and

Crow's Foot Elm, also plentiful, a "scrub" hardwood with an oak-grain, suitable for staves and axe handles.

*The Jungle Sub-type.*—As the moisture content increases, the Araucarias are displaced by the more robust moisture-loving species, among which the natural orders Meliaceae and Laurineae are strongly represented. The trees achieve large dimensions and provide the more important of the cabinet woods. In the Killarney scrubs of the south-east corner, the volcanic highlands support a limited extent of this sub-type, which here is composed of a mixture of such species as Southern Maple (*Cryptocarya glaucescens*); Silky Oak (*Grevillea robusta*, *Orites excelsa*, and *Stenocarpus saligna*); Sassafras (*Doryphora sassafras* and *Daphnandra micrantha*); Rose Mahogany (*Synoum glandulosum* and *Dysoxylon Fraserianum* and *D. Muelleri*); Whitewood (*Schizomera ovata*); &c.

In the North Queensland scrubs the same factors of heavy rainfall and rich volcanic soil produce a similar profusion of valuable softwoods, the chief of which, Red Cedar, is now almost cut out. Its successor in popular favour is Maple (*Flindersia Chatawaiana*), of which five or ten years' supply remains. This is a fine well-grown tree with a pink, slightly aromatic, softwood which is shipped to Southern cabinet-makers. It is one of the few Australian timbers suitable for rifle stocks and aeroplane propellers.

Other important Northern woods are—

Silkwood (*Flindersia Mazlini*);

Kauri (*Agathis Palmerstoni*);

Satinwood (*Dysoxylon Pettigrewianum*);

Silky Oak (*Cardwellia sublimis*);

Black Walnut (*Cryptocarya Palmerstoni*);

Yellow Walnut (*Cryptocarya Bancrofti*);

Bally Gum (*Blepharocarya involucri*);

Candlenut (*Aleurites moluccana*);

Black Bean (*Castanospermum australe*);

Pencil Cedar (*Lucuma galactoxylon*);

Cairns Hickory (*Flindersia Ifflaiana*).

*The Hardwood Forests.*—The hardwood forests are widespread, alternating with the *Araucaria* forests of the moist south-eastern corner, and with the Cypress Pine scrubs of the dry West. As the available moisture decreases the forests become more open, the more valuable species drop out, and the yield per acre becomes low. The forests are preponderatingly Eucalyptian, with some admixture of other Myrtaceous and Leguminous species.

On the moist sands of Fraser Island and the alluvial bottoms of the south-east corner, the association is one of—

Tallow-wood (*Euc. microcorys*);  
Blackbutt (*Euc. pilularis*);  
Scrub Box (*Tristania conferta*);  
Turpentine (*Syncarpia Hillii*);  
Flooded Gum (*Euc. saligna*);  
Red Stringybark (*Euc. resinifera*).

All these are useful building woods, 50 to 60 lb. in weight per cubic foot.

On the drier ridges of the coast and near West, Ironbark (*Euc. paniculata*, *E. crebra*, *E.*

*sideropholia*, &c.), and Spotted Gum (*Euc. maculata*) preponderate. These are the valuable heavy hardwoods (60-80 lb.) used in railway construction, and of these large quantities exist. Other plentiful species are Grey Gum (*E. punctata* and *E. proprinqua*), and Bloodwood (*E. corymbosa*). In the North, *Eugenias* and *Xanthostemons* appear. In the drier West the *Acacias* replace the Eucalypts.

*The Cypress Pine Forests.*—Cypress Pine (*Callitris glauca*) furnishes the domestic timber of western New South Wales and Queensland. It occurs either pure or under open Ironbark, and is found chiefly in the sandy belts of the dry West in a 20-30 inch rainfall. Droughts and fires have thinned these forests, and prickly-pear infests them to more or less degree. At the same time they afford a useful resource. The timber is a coniferous hardwood, aromatic, but somewhat knotty and brittle. It is one of the few species that can be grown under droughty conditions, and for that reason has an especial value to foresters.

### 3. FOREST AREA.

Table I.

STATEMENT SHOWING LAND CLASSIFICATION OF QUEENSLAND WITH THE TOTAL AREA OF FOREST AND THE PERCENTAGE OF THE LAND AREA COVERED BY FOREST.

	LAND AREAS OF QUEENSLAND.					Total.
	*Agricultural.	FOREST.			Other.	
		Merchantable.	Unprofitable or Inaccessible.	Total.		
Area (square miles) .. .. .	15,000	10,000	53,000	63,000	592,000	670,000
Percentage of total .. .. .	2.2	1.4	8.0	9.4	88.4	100

\* Only 1,250 square miles are under crop in Queensland, being 0.17 of the total area, or 8.04 per cent. of the estimated "agricultural" area.

Approximate only; no satisfactory survey has been made.

#### THE PRINCIPAL TIMBERS OF QUEENSLAND.

*Araucaria Cunninghamii* (Hoop Pine).—Hoop Pine is the chief softwood of Queensland, and is universally used for all indoor woodwork. It is excellent for joinery and cabinet purposes and staves, and it is the accepted timber for butter boxes. In the railway workshops it is more used than any other timber for sheeting, flooring, panelling, framing, and finishing of carriages, and also for the decks of sheep trucks.

Specimens with from 10 to 20 per cent. moisture have given—in weight 30-37.5; modules of rupture, 14,700-9,750; crushing, 8,450-6,750.

*Araucaria Bidwillii* (Bunya Pine).—Bunya Pine occurs with Hoop Pine but in much smaller quantities over a very restricted area between Gympie and Bunya Mountains. It is cut and sold indiscriminately with Hoop Pine, but is preferred for staves and for building motor boats.

Specimens with 11.6 per cent. moisture gave—weight, 31.5-5-33.7; modules of rupture, 14,150-13,700; crushing, 8,120-7,530.

*Agathis Palmerstoni* (Kauri Pine).—Kauri Pine is exported either in the log or in wide boards, and for local building purposes is to the

North what hoop pine is to the South. Like the Hoop and Bunya Pines, it is very liable to attack by borers if left lying in the scrub. In the railway workshops it is well thought of for cabinet-work, panelling, and framing, and, after Red Cedar, is the most suitable wood for pattern-making, and is favoured also for building light boats.

*Callitris spp.* (Cypress Pine).—The botanical determinations of species of the Cypress Pines still form a subject for debate. They occurred formerly in fairly large quantities in the dry south-western districts, where, however, the effects of cutting, fire, grazing, drought, and prickly-pear have rendered them comparatively scarce. They yielded the bulk of the timber used in the south-western districts, the wood being perhaps the most durable softwood in the world and white-ant resistant.

Western Cypress, with 33.2-36 per cent. moisture, gave—Weight, 50.5; modules of rupture, 5,120-4,920; crushing, 6,130-4,450!

*Eucalyptus paniculata* (Grey Ironbark) and *Eucalyptus crebra* (Narrow-leaved Ironbark).—These Ironbarks are the most highly esteemed of all hardwoods for general building purposes, and are specially sought after by the

Railway Department for all purposes where great strength is required, such as in girders, corbels, headstocks, &c., in bridge building, and sole bars and underframes for wagons and carriages. They are preferred for spokes, naves, and shafts of heavy vehicles, and for piles and sleepers. They are very durable.

Specimens with from 17.7 to 25.2 per cent. moisture, gave—Weight, 68.75; modules of rupture, 20,500-14,000; crushing, 12,200 to 9,400.

Average life of 2,050,000 sleepers replaced during 18½ years was 22.33 years.

*Eucalyptus maculata* (Spotted Gum).—This pale brownish wood ranks second only to Grey Ironbark as regards strength, and is similarly used, except in contact with the ground. The timber being of a somewhat greasy nature is favoured for skidding.

Specimens with 18.4-30.3 per cent. moisture, gave—Weight, 65.7-76.1; modules of rupture, 20,500-13,600; crushing, 11,250-9,000.

Average life of 77,000 sleepers replaced during 18½ years was 17.41 years.

*Eucalyptus microcorys* (Tallow-wood).—This yellowish somewhat-greasy timber is of excellent quality, particularly for purposes where it is exposed to weather; it is specially in request for sleepers and veranda posts and flooring. In the railway workshops it is used for pillars of covered wagons and for wagon sheeting. It is very durable.

Specimens with 14.54 per cent. moisture, gave—Weight, 58.75; modules of rupture, 18,200-9,900; crushing, 10,500-6,800.

Average life of 11,000 sleepers replaced during 18½ years was 17.52 years.

*Eucalyptus pilularis* (Blackbutt).—The light greyish wood is an extremely useful general building timber, and in the railway workshops is used for wagon sheeting; being very straight in the grain, it is much sought after for splitting into rails and palings; it is somewhat subject to gum veins.

Specimens with 20.55-7 per cent. moisture, gave—Weight, 56.71; modules of rupture, 16,200-13,000; crushing, 10,450-6,300.

Average life of 11,000 sleepers replaced during 18½ years was 15.81 years.

*Eucalyptus propinqua* (Grey Gum).—The red wood is of very fine quality, and is much favoured when logs are reasonably sound; useful for general building purposes and sleepers; very durable.

Specimens with 21.8-35.7 per cent. moisture, gave—Weight, 70.1-74.4; modules of rupture, 19,700-14,600; crushing, 11,000-6,800.

Average life of 19,500 sleepers replaced during 18½ years was 13 years.

*Eucalyptus resinifera* (Red Stringybark).—The straight-grained red wood is one of the most popular hardwoods for housebuilding, particularly for weather boards; used also for wagon sheeting. Rather subject to pinhole borers.

Specimens with 27.8-46 per cent. moisture, gave—Weight, 63.4-72.2; modules of rupture, 20,300-13,800; crushing, 10,600-8,200.

Average life of 193,000 sleepers replaced during 18½ years was 17.95.

*Eucalyptus acmenoides* (Yellow Stringybark).—Wood yellowish, cut and sold with other hardwoods for general purposes, but not specified for particular uses.

Specimens with 27.3-47.7 per cent. moisture, gave—Weight, 63.4-71.8; modules of rupture, 14,000-9,000; crushing, 8,850-7,400.

Average life of 14,500 sleepers replaced during 18½ years was 13.83 years.

*Eucalyptus corymbosa* (Red Bloodwood).—Perhaps the most widely spread Eucalyptus in Queensland, reaching its best development on the south coast.

Wood deep red, particularly subject to veins, on account of which it is rarely, if ever, sawn. Highly esteemed for fencing, house stumps, and sleepers, being the most durable hardwood in Queensland, but its life as a sleeper is diminished by its tendency to shell off along the veins.

Specimens with 20.53 per cent. moisture, gave—Weight, 55.3-73.3; modules of rupture, 23,200-9,700; crushing, 12,300-7,100.

Average life of 128,500 sleepers replaced during 18½ years was 17.06 years.

*Syncarpia laurifolia* (Turpentine).—The pinkish brown wood is, for a hardwood, comparatively light and easy to work, and of great durability. On account of its large shrinkage and tendency to warp in small sizes it is not favoured by sawmillers, but is very suitable for decking of wharves and for large beams, being very fire-resistant; used for sleepers and for fender piles of wharves, but deserving generally of far greater attention than it has yet received. In the railway workshops it is cut for wagon sheeting and pillars.

Specimens with 27.43-4 per cent. moisture, gave—Weight, 63.4-68; modules of rupture, 15,600-8,600; crushing, 9,990-7,480.

Average life of 29,000 sleepers replaced during 18½ years was 19.60 years.

*Tristania conferta* (Scrub Box).—Abundant on the south coast and on Fraser Island, where it is probably more plentiful than any other species of this order.

Though very durable and used largely in New South Wales, it rarely is sawn in Queensland, probably owing to its tendency to warp in small sizes.

*Cedrela australis* (Red Cedar).—The wood, of a deep red colour, is light, soft, easily worked, and aromatic, and extremely durable when exposed to the weather. It is the most valuable cabinet and decorative wood in Australia. Largely used for the construction of racing boats, and in the past, when comparatively plentiful and cheap, was preferred to all other woods for patternmaking.

Specimens with 12 per cent. moisture, gave—Weight, 33.5; modules of rupture, 11,500; crushing, 6,600.

*Flindersia australis* (Crow's Ash).—A hard, oily, yellowish-brown wood, of great durability, used chiefly for flooring ballrooms, skating rinks,

and verandas, and for sheeting of railway wagons; suitable for staves, handles of tools, and bearings.

Green specimens, with an unrecorded percentage of moisture, gave—Weight, 58.3-61.7; modules of rupture, 13,300-15,800; crushing, 6,800-7,600.

*Flindersia Chatawaiana* (Red Beech or Maple).—The pink slightly aromatic timber is used in the North for general building purposes, such as, weatherboards, chamfer boards, and studding plates, but is chiefly shipped South as a very valuable cabinet-wood—now the most popular in South Queensland. Suitable for rifle stocks, airship propellers, and boatbuilding, and used in railway carriage construction for pillars, framework, moulding, panels, and general furnishings. The most suitable wood for wheels of railway tricycles. A very fair bending timber.

*Dysoxylon Fraseranum* (Rosewood).—A red, fragrant wood, extremely durable and of great beauty for cabinet purposes when cut tangentially.

*Cardwellia sublimis* (Bull Oak, Brown Oak, Silky Oak).—This wood is now the common "Silky Oak" of the trade, and is used largely for cabinet-work. In the North it is used for staves and for general building purposes, especially in the Innisfail district, where it is cut into scantlings, weatherboards, chamfer boards, studding, lining boards, &c. It is a good timber for bending into seats of vehicles, and is in general use in railway carriage construction for bent roof sticks, mouldings, framework, and panelling.

Air dry weight about 38.

*Litsea reticulata and ferruginea* (Bally Gum (Laurineae)).—Useful for all inside work, staves, and boatbuilding. The wood is light and very soft, and is second only to White Beech for ease of working and carving; an excellent cabinet timber.

Specimens with 17.4 per cent. moisture, gave—Weight, 35.5; modules of rupture, 11,150-9,850; crushing, 6,100-5,200.

*Blepharocarya involucrigera* (Northern Bally Gum (Sapindaceae)).—A light, soft, pink timber, rather woolly but quite suitable for inside work. Is used largely for staves, chiefly on account of its comparative cheapness.

Air dry weight about 46.

*Cryptocarya Palmerstoni* (Black Walnut (Laurineae)).—Wood rich brown, moderately hard and heavy, of great beauty. Turns well and takes a fine polish, but disliked by sawmillers, owing to its injurious effect on the saws.

Air dry weight about 49.

*Tarrietia argyrodendron* (Crow's Foot Elm (Sterculiaceae)).—The brownish wood is straight-grained and beautifully marked when cut on the quarter, and should find a use for cabinet purposes and the panelling of houses and railway carriages. It was selected by an American tool-manufacturing firm from a series of samples comprising Black Bean, Red Bean, and Red Cedar as the most suitable for turning into handles for combination tools.

It is not durable when exposed to weather, and becomes fairly hard when dry. When green it is tough and very elastic, but is said to become brittle when dry, though axe handles turned from this wood and preserved in the Forests Office for over seven years show no signs of brittleness. The southern variety was once used for staves, when it was commonly known as stavewood.

Specimens of the variety trifoliolata, with 18.2 per cent. moisture, gave—Weight, 61.2-62.4; modules of rupture, 14,000-16,800; crushing, 18,900-10,500; but the air dry weight of an office specimen of peralata was only 51.

*Castanospermum australe* (Black Bean (Leguminosae)).—Wood of a rich dark brown with light streaks only moderately hard and heavy, and very durable. Formerly used in the North largely for housebuilding and fencing, but much too valuable for such purposes. An excellent cabinet wood of great beauty, used for framing, moulding, and panelling of railway carriages. Air dry weight about 46.

5. OWNERSHIP OF FORESTS.

Table II.

FORESTED AREA CLASSIFIED BY OWNERSHIP.

	AREA BELONGING TO—				—
	The State.			Corporate Bodies and Private Individuals.	
	*Dedicated to Timber Production.	†Other Forests.	Total.		
Area (square miles) .. .. .	6,250	46,875	53,175	†9,375	†62,550
Percentage of total .. .. .	10	75	85	†15°	†100

\* Through Forestry Department. † Through other authorities and for non-forestry purposes. ‡ Purely approximate.

NOTE.—The areas owned by corporate bodies and private individuals are forests in process of clearing for settlement purposes and not for forestry. They supply at present 77 per cent. of the total timber cut of the State.

6. THE RELATIONSHIP OF THE STATE TO THE FORESTS.

(a) The Forestry legislation of Queensland has been enacted under two measures:

- (1) "The State Forests and National Parks Act of 1906";
- (2) "The Land Act of 1910";

and by means of regulations under both enactments.

*The State Forests and National Parks Act.*—The Act provides mainly for the establishment of State Forests and National Parks, i.e., permanent forestry reservations which may not be interfered with except by authority of an Act



of Parliament. Special provision was made in the Act for the granting of Special Leases and Occupation Licenses under the Lands Act over State forests and National parks; and the mining laws are not affected by the Act. The Act also authorises the making of regulations to administer the State forests and National parks.

The regulations made under this Act provide for—

- (1) The control of the State forests and National parks by the Director of Forests;
- (2) The making of working plans in respect thereof;
- (3) The methods by which timber and forest produce are to be sold therefrom;
- (4) The prevention of illegal acts in connection therewith, *i.e.*, trespass, cutting timber without authority, defacement of brands, marks, &c., careless use of fire, &c., &c.;
- (5) The authorities of forest officers to prosecute in respect of forest offences on State forest and National parks;

and other minor provisions.

"*The Land Act of 1910*," a statute governing the leasing, sale, and administration of Crown lands generally, contains provisions relating to the removal of timber from reserves (temporary reservations), Crown lands (*i.e.*, land not lawfully granted, or contracted to be granted, in fee simple; or not reserved or dedicated for stated public purposes), and certain leases.

Selectors of certain selections are given timber rights commensurate with the security and purpose of their land tenure.

The Act provides for the making of regulations to govern sale of timber on timber reserves and Crown lands, and affords authority of entry on lands to officers.

"*The Timber and Quarry Regulations*."—The Timber and Quarry Regulations of 1912 set forth—

- (1) The procedure by which timber is to be sold from Crown lands and reserves;
- (2) The minimum prices and sizes at which timber and forest produce is to be sold;
- (3) The conditions pertaining to removal of quarry material;
- (4) Requirements to be observed by purchasers and persons handling Crown timber, &c.;
- (5) Conditions under which animals used in forests work may be depastured;

and other minor provisions *re* legal proceedings, &c.

An Act is to be brought before Parliament at an early date to afford to the Forest Service a greater measure of control of the estate.

(*b*) The Forest Service in Queensland is not yet fully developed. The limited staff cannot deal with the large area of country involved, and operations are necessarily confined to the more-closely settled areas contiguous to the chief markets.

Forest stations have been established on a number of the more accessible reserves. Houses have been provided for officers in charge of operations, and arrangements for the housing of the staff are proceeding.

*Forest Protection*.—On areas at present under treatment, the forest staff deals with fires as they occur. A system of road firebreaks is being established, and these, with supervision, are found to be effective in checking forest fires generally. Fire protection clauses are inserted in timber sale agreements and licenses wherever necessary. The new Act will make provision for greater powers on the part of the Forest Service in demanding aid of forest and neighbouring settlers and of timber-getters and timber-workers on the forest in the event of forest fires.

*Nurseries and Plantations*.—Forest nurseries have been established in the several main districts, and the propagation of indigenous and exotic plants is being carried forward as quickly as possible. Nurseries now in existence cover about 3 acres of ground.

Experimental planting is being undertaken, chiefly of Hoop and Bunya Pine (*Araucaria* species). An area of about 320 acres is under plantation, and the work is being extended.

Treatment of the present stand for the improvement of natural regeneration is also proceeding experimentally.

*Forest Organisation (Roads and Tramways)*.—Progress is being made with the survey of forest road systems and the construction of forest roads. Tramway projects are being initiated in several localities.

*Water Supply*.—Water is being provided on some of the drier reserves by means of sub-artesian bores, tanks, dams, &c. In several places where water is available pumping plants are being installed for nursery and domestic use.

*Timber Trading*.—The Forest Service activity has extended to timber harvesting and marketing, and during the past year the Service has logged and sold some 8,000,000 super. feet of timber; sales on the stump bring the total annual cut on Crown forests to about 60,000,000 super. feet log measurement.

(*c*) *Assistance to Private Forestry*.—No private forestry exists, and so long as funds for State forests are limited, subsidies on this account are inadmissible.

#### 7. FOREST AUTHORITY ("DEPARTMENT" OR "BRANCH") ORGANISATION, ETC.

The Forest Service of Queensland as at present constituted is merely a branch of the Department of Public Lands. It has this measure of autonomy, however, that under the State Forests and National Parks Act the Director of Forests is responsible to the Minister for the management and control of permanent reservations. In other cases the Lands Department has a certain control, *e.g.*, of the leasing of the timber reserves and of the reservation of Crown lands for forestry, &c. Forestry advice, however, is invariably sought on these questions.

Owing to the limited forestry staff, a large portion of the State is still supervised by Lands Department officers only in part responsible to the Director of Forests.

The forest personnel consists of the Director of Forests, to whom the district foresters are responsible. Each district forester, as the name signifies, has charge of a separate district and may control deputy foresters under the respective branches of silviculture, sales and engineering, forest factors, forest rangers, and forest guards, forest overseers and foremen in charge of reserves and working gangs and their staffs, and of cadet foresters placed within his district for training. Each district officer has necessary clerical assistance to enable him to carry on the uniform system of accounting and cost-keeping, and the vertical filing of records.

The appointment was made of a Forest Engineer to take charge of the Engineering Branch of the Forest Service.

A Forest School is being built at Imbil, in Southern Queensland, and an instructor and assistant are to be appointed. Short courses will then be arranged for officers at present in the Service, and a system of training of new entrants put into operation.

Education methods now being adopted are—

- (1) A distribution of publications from the Forest Library to all aspirants to forestry knowledge; and
- (2) A generous circularisation among the personnel of items of forestry information and interest, and of salient points from recognised works on forestry.

The system in force of compiling information has been found of great use in this regard.

Each year the Director of Forests furnishes his Annual Report to Parliament. This report covers the main activities of the Service.

Publications have been issued as under:—

- “The Structure and Identification of Queensland Woods.”
- “Notes on the Principal Timbers of Queensland.”
- “Silvicultural Notes on Forest Trees of Queensland.”
- “Australian Study of American Forestry.”
- “Financing of Forestry.”
- “Federal or State Forestry—Which?”

## 11. ANNUAL INCREMENT AND UTILISATION OF HOME-GROWN TIMBER.

Table III.

### ANNUAL INCREMENT.

	Area— Square Miles.	Estimated Increment per Square Mile.	Total Gross Increment.	Loss.			Net Increment (Col. 4 Less Col. 7).
				Fire.	Waste, Decay, &c.	Total.	
Under State control .. .. .	10,000	Sup. Ft. 32,000	Sup. Ft. 320,000,000	Sup. Ft. 80,000,000	Sup. Ft. 160,000,000	Sup. Ft. 240,000,000	Sup. Ft. 80,000,000
Other .. .. .	1,000	32,000	32,000,000	8,000,000	16,000,000	24,000,000	8,000,000
Totals .. .. .	11,000	64,000	352,000,000	88,000,000	176,000,000	264,000,000	88,000,000

## “Forestry in Queensland.”

### “The Australian Forest Ration and its Apportionment.”

Following is a statement of revenue and expenditure during the past fifteen years:—

Year.	Expenditure.		Revenue.	
	£	£	£	£
1904 .. .. .	837	..	11,441	..
1905 .. .. .	712	..	11,577	..
1906 .. .. .	1,331	..	14,560	..
1907 .. .. .	1,549	..	22,236	..
1908 .. .. .	2,132	..	27,979	..
1909 .. .. .	2,448	..	35,200	..
1910 .. .. .	2,548	..	39,645	..
1911 .. .. .	2,930	..	53,840	..
1912 .. .. .	5,397	..	63,447	..
1913 .. .. .	7,386	..	62,973	..
1914 .. .. .	7,653	..	74,729	..
1915 .. .. .	7,416	..	69,793	..
1916 .. .. .	9,473	..	60,401	..
1917 .. .. .	13,930	..	66,200	..
1918 .. .. .	21,877	..	71,481	..
	£87,619		£685,502	

The expenditure has been chiefly for overhead charges (staff, &c.), not for reproduction or replacement.

### 8. FORESTRY ACTIVITIES OF MUNICIPAL AND CORPORATE FORESTRY.

Private or municipal forestry is not practised in Queensland.

### 9. PROFESSIONAL AND OTHER SOCIETIES INTERESTED IN FORESTRY.

No societies, except such as the Brisbane Timber Merchants' Association (Creek street, Brisbane), are interested in the marketing of timber.

### 10. EDUCATIONAL RESEARCH AND EXPERIMENTAL WORK.

A Forest School of Forestry and Institute of Silvicultural Research is projected, the site to be at Imbil, Mary Valley line, Queensland.

Silvicultural research and experiment are being carried out at the several forest stations.

The work at the Forest Service office in Brisbane includes studies in wood technology and classification. A small Timber Museum exists. Timber exhibits are prepared for display at local and foreign exhibitions.

Table IV.  
ANNUAL UTILISATION.

Type of Product.	STATE CONTROL.		OTHER.*	
	Quantity.	Value at Place of Preparation.	Quantity.	Value at Place of Preparation.
Milling timbers .. .. .	Cubic Feet. 4,000,000	£ 72,000	Cubic Feet. 12,000,000	£ 216,000
Railway timbers .. .. .	750,000	6,750	800,000	7,000
Mining timbers .. .. .	330,000	3,250	300,000	3,000
Telegraph poles, &c. .. .	125,000	1,250	200,000	2,000
Post rails, &c. .. .. .	25,000	300	150,000	1,000
	5,250,000	..	13,450,000	..
Fuel .. .. .	45,000 tons	2,750	200,000 tons	13,000
Sandalwood .. .. .	500	500	..	..
Tan and Foambarks, &c. .. .	100	200	..	..
	..	£87,000	..	£242,000

\* Approximate only.

### 12. FOREST INDUSTRIES, ETC.

In 1918 the sawmilling industry absorbed 15,000,000 cubic feet of timber; of this, 9,000,000 cubic feet was Pine, 30,000 cubic feet Cedar, and the balance hardwoods. The value of this cut was £1,340,000, and approximately 3,500 persons were engaged in its manufacture, apart from considerable employment afforded in log-getting, railway, mining, and pole timber getting. In these activities it is estimated that about 1,500 to 2,000 persons are engaged.

No figures are available to show the quantity of timber cut on private lands. A close approximation is available in respect of milling timber, and indicates that the private cut is three times that of the Crown, due to the fact that in past times vast alienations of timber land

have been made, and these are being used up regardless of the future.

Fuel-getting and fencing operations are extensive and provide employment for a large number of persons, while about 100 persons are engaged in the getting of sandalwood, guano, and cupania and mangrove bark. No definite figures are available, however, of value of the products obtained.

A private pulp mill was erected at Yarraman for the purpose of making paper pulp from the tops of Hoop and Bunya Pine (*Araucaria* sp.). Operations ceased in the latter part of 1919, owing mainly to water difficulties.

For volume of timber consumed in various industries see Table IV. No other information is available.

### 13. STATISTICS AS TO EXPORTS AND IMPORTS OF TIMBER.

Table VI.

Type of Product.	Exports.		Imports.		Balance (plus or minus).	
	Quantity.	Value (f.o.b.)	Quantity.	Value (c.i.f.)	Quantity: Col. 2 - Col. 4.	Value: Col. 3 - Col. 5.
Queensland Softwoods .. .	Cubic feet. 2,000,000	£ 500,000	Cubic feet. ..	£ ..	Cubic feet. plus	£ plus
American Hickory .. .	..	..	6,000	1,500	1,994,000	498,500

NOTE.—Most of the timber export from Queensland is to the other States of Australia. Imports shown are from overseas. No timber is imported from the other States.

### 14. SUMMARY AND OUTLOOK.

Table VII.

Types of Product.	Utilisation. (Table IV., Col. 3.)	Exports. (Table VI., Col. 2.)	Home Consumption of Home Grown Timber. (Col. 2 minus Col. 3.)	Imports. (Table VI., Col. 4.)	Total Home Consumption of Home and Imported Timber. (Col. 4 plus Col. 5.)	Net Increment. (Table III., Col. 8.)	Balance. Plus or minus. (Col. 7 minus Col. 6.)
All classes .. .	Cubic feet. 19,600M	Cubic feet. 2,000M	Cubic feet. 17,600M	Cubic feet. 6M	Cubic feet. 17,606M	Cubic feet. 7,333M	Cubic feet. Minus 10,273M
Total per Head of Population .. .	28	2.86	25.14	.01	25.15	19.48	Minus 14.67

NOTE.—Population of Queensland, 700,000.

## 14. (c) SHORT SUMMARY OF STEPS WHICH SHOULD BE TAKEN, ETC.

The reason for the apparent overcutting taking place in Queensland lies in the operations of private landholders, who are all realising timber values immediately with no thought for the future.

As these private resources cut out, operators will be forced to go further afield on Crown lands in search of timber.

With increased utilisation under forestry management the amounts lost by waste, decay, fire, &c., will be reduced considerably, and the net increment of the Queensland forests enhanced correspondingly.

The position is, however, that the immediately prospective resource of timber is barely sufficient to meet requirements at the present rate, much less to meet the increased demand the future must hold.

The necessary steps to be taken are—

- (1) Permanent dedication of not less than 6,000,000 acres for pine forest;
- (2) Authorisation of an independent Forest Service free from political control in so far as technique and trade are concerned;

- (3) The provision of adequate funds for forest development purposes.

*Appendix A.*—No Commissions have reported on forestry and forest questions in Queensland.

*Appendix B.*—“*The State Forests and National Parks Act of 1906*” and Regulations; “*The Land Act of 1910*”; and “*Timber and Quarry Regulations.*”

*Appendix C.*—

“Annual Report of Director of Forests for 1918.”

“Australian Study of American Forestry.”

“The Structure and Identification of Queensland Woods.”

“Notes on the Principal Timbers of Queensland.”

“Financing of Forestry.”

“Federal or State Forestry—Which?”

“Forestry in Queensland.”

“The Australian Forest Ration and its Apportionment.”

*Appendix D.*—No forestry literature is issued in Queensland other than by the Forest Service.

### Appendix E.—RETURN OF COLLECTIONS UNDER THE STATE FORESTS AND TIMBER AND QUARRY REGULATIONS FOR THE YEAR ENDING 30th JUNE, 1920.

Place.	Licenses.		Sales of Timber.		Sales of Confiscated Timber.		Totals.	
	£	s. d.	£	s. d.	£	s. d.	£	s. d.
Aramac	3	2 0	11	12 2	..	..	14	14 2
Atherton	8	7 0	676	14 4	..	..	685	1 4
Banana	2	0 0	3	7 0	..	..	5	7 0
Barcaldine	24	3 0	92	5 1	..	..	116	8 1
Blackall	10	6 6	41	19 7	..	..	52	16 1
Boulia	10	13 0	0	7 0	..	..	11	0 0
Bowen	18	18 0	1,192	4 2	..	..	1,211	2 2
Brisbane	6	10 0	4,007	2 1	3	5 0	4,016	17 1
Bundaberg	27	12 0	4,030	3 1	..	..	4,057	15 1
Burketown	4	5 0	..	..	..	..	4	5 0
Cairns	19	7 6	848	18 7	5	19 3	874	5 4
Carooeweal	2	8 6	2	17 7	..	..	5	6 1
Charleville	10	18 0	14	12 6	..	..	25	10 6
Charters Towers	50	5 0	947	3 4	..	..	997	8 4
Chillagoe	2	15 0	..	..	..	..	2	15 0
Clermont	5	0 6	1,172	6 10	..	..	1,177	7 4
Cloncurry	41	9 6	210	3 1	..	..	251	12 7
Coen	0	2 0	..	..	..	..	0	2 0
Cooktown	10	3 0	195	6 2	..	..	205	9 2
Croydon	4	18 0	7	5 0	..	..	12	3 0
Cunnamulla	3	5 0	6	10 6	..	..	9	15 6
Dalby	2	17 6	1,610	4 3	..	..	1,613	1 9
Emerald	5	14 0	753	14 11	..	..	759	8 11
Gayndah	5	2 6	65	15 3	..	..	70	17 9
Georgetown	4	12 0	8	18 6	..	..	13	10 6
Gladstone	19	10 0	1,988	5 0	..	..	2,007	15 0
Goondiwindi	5	7 6	35	15 6	..	..	41	3 0
Gympie	17	18 0	40,468	18 7	..	..	40,486	16 7
Herberton	2	19 6	1,565	15 5	..	..	1,568	14 11
Hughenden	48	10 6	261	18 4	..	..	310	8 10
Ingham	19	1 6	503	6 1	..	..	522	7 7
Inglewood	18	5 6	1,134	6 6	..	..	1,152	12 0
Innisfail	0	15 0	99	0 1	4	16 8	104	11 9
Ipswich	2	9 0	25,804	19 5	..	..	25,807	8 5
Isisford	1	1 0	..	..	..	..	1	1 0
Jundah	2	8 6	..	..	..	..	2	8 6

Appendix E.—*continued.*

Place.	Licenses.		Sale of Timber.		Sales of Confiscated Timber.		Totals.	
	£	s. d.	£	s. d.	£	s. d.	£	s. d.
Kynuna .. .. .	4	1 6	..	..	..	..	4	1 6
Longreach .. .. .	21	11 3	71	8 8	1	10 0	101	9 8
Mackay .. .. .	27	18 6	352	13 1	..	..	380	11 7
Mackinlay .. .. .	0	19 0	..	..	..	..	0	19 0
Maryborough .. .. .	63	5 6	4,563	10 6	..	..	4,626	16 0
Mount Morgan .. .. .	0	18 0	..	..	..	..	0	18 0
Mount Perry .. .. .	0	17 6	..	..	..	..	0	17 6
Muttaburra .. .. .	11	8 6	..	..	..	..	11	8 6
Nanango .. .. .	2	10 0	22,642	18 2	27	12 9	22,673	0 11
Normanton .. .. .	9	5 6	216	9 8	..	..	225	15 2
Port Douglas .. .. .	0	12 6	5	19 0	..	..	6	11 6
Ravenswood .. .. .	7	4 0	402	10 11	..	..	409	14 11
Rockhampton .. .. .	49	12 6	3,451	9 10	..	..	3,501	2 4
Roma .. .. .	3	9 0	307	7 8	..	..	310	16 8
St. George .. .. .	11	15 9	29	19 6	..	..	41	15 3
St. Lawrence .. .. .	..	..	371	11 6	..	..	371	11 6
Springsure .. .. .	2	5 0	5	9 7	..	..	7	14 7
Stanthorpe .. .. .	1	5 0	60	5 4	..	..	61	10 4
Stonehenge .. .. .	0	13 0	..	..	..	..	0	13 0
Surat .. .. .	..	..	1	13 0	..	..	1	13 9
Tambo .. .. .	8	2 0	21	16 11	..	..	29	18 11
Taroom .. .. .	1	17 6	38	4 10	..	..	40	2 4
Thargomindah .. .. .	0	4 0	..	..	..	..	0	4 0
Thornborough .. .. .	1	11 0	..	..	..	..	1	11 0
Thursday Island .. .. .	10	9 0	249	7 4	..	..	259	16 4
Toowoomba .. .. .	26	0 0	3,335	8 6	..	..	3,361	8 6
Townsville .. .. .	40	14 6	444	0 11	..	..	484	15 5
Warwick .. .. .	1	0 0	533	13 5	..	..	534	13 5
Windorah .. .. .	2	7 0	..	..	..	..	2	7 0
Winton .. .. .	5	11 0	6	0 0	..	..	11	11 0
<b>Totals</b> .. .. .	<b>740</b>	<b>8 3</b>	<b>124,880</b>	<b>15 0</b>	<b>43</b>	<b>3 8</b>	<b>125,664</b>	<b>6 11</b>

By Authority: ANTHONY JAMES CUMMING, Government Printer, Brisbane.