REPORT
of the
ROYAL COMMISSION
Appointed to Inquire into and Report upon
Forestry and Timber Matters
in Western Australia

by
G. J. RODGER, Esq.
ROYAL COMMISSIONER.

Presented to both Houses of Parliament.
To His Excellency the Honourable Lieut.-Gen. Sir Charles Gairdner, Knight Commander of the Most Distinguished Order of St. Michael and St. George; Companion of the Most Honourable Order of the Bath; Commander of the Most Excellent Order of the British Empire, Governor in and over the State of Western Australia and its Dependencies in the Commonwealth of Australia.

May it please Your Excellency:

I have the honour to submit my report in pursuance of the Commission dated the 14th day of March, 1951, and amending Commission dated the 11th day of July, 1951, appointing me to be a Royal Commissioner to inquire into and report upon the following aspects of the Forestry and Timber Industry within the State of Western Australia:

1. Forest resources and potential, including softwood development.
2. Demands on such resources from within and without the State, and the extent to which, and the manner in which, such demands should be met.
4. Forest regulation and administration.
5. Forest utilisation and harvesting of timber crops, including dead timber.
6. Sawmilling and fire prevention and protection.
7. Forest policy, including the granting and conditions of existing and future permits.
8. Forest legislation and regulations.
9. Remedial action in relation to the foregoing.
10. Whether any (and if so what) changes are desirable in the administration of the Forests Department.

Prior to commencing the inquiry, notices directing the attention of the public to the Commission were inserted in three Perth newspapers and in three provincial newspapers circulating in those districts of the State where the forestry and timber industry has become established. In addition, advice was sent by letter to the Conservator of Forests, the heads of other Government Departments and Trade Associations engaged in milling and the usage of timber.

My inquiries commenced on the 10th May, 1951, and continued until the 19th October, 1951.

The taking of sworn evidence in Perth occupied 23 days. The remainder of the time was devoted to visiting and inspecting forests, sawmills and other wood working plants in the metropolitan, South-West, Goldfields and Southern areas, in pursuing inquiries on informal lines, both in Western Australia and interstate, and in examining evidence.

Forty-eight witnesses were examined on oath and 140 exhibits were submitted, mostly on matters of a confidential nature. At the various centres visited, informal evidence was taken from any interested persons. Considerable use was made of the files, records and maps of the Forests Department.

1.—Forest Resources and Potential, Including Softwood Development. (Term of Reference 1).

A.—The Native Forests.

The State of Western Australia occupies 625 million acres and comprises about one-third the area of the Commonwealth of Australia, but only about 16 million acres in the extreme South-West receives the rainfall required for the growth of trees in forest formation.

From the forestry aspect, the State can be divided into the following broad vegetative regions:

(i) The tall eucalypt forests of the South-West.
(ii) The temperate savannah woodlands fringing Region (i) on the east.
(iii) The open eucalypt forests of the southern inland.
(iv) A wide belt of mulga bush stretching from east to west across the State north of about 30°S. latitude.
(v) The sclerophyllous grass steppes (commonly known as spinifex plains) extending northwards from about 25°S. latitude, with a large area of desert steppe in the interior.
(vi) Savannah woodland reaching northwards from about 17°S. latitude.
(vii) Monsoonal woodlands of the Far North, with narrow areas of tropical forest fringing the main water-courses.
(viii) Mangroves along the coastal estuaries northwards from about 25°S. latitude.

From the viewpoint of economic forestry, the only region producing forest of sawmilling value is (i) the tall eucalypt forests of the South-West, although tree growth wherever it occurs elsewhere has a considerable local value, particularly in the case of (iii) the open eucalypt forests of the southern inland, and (iv) the mulga bush.

The native forest resources of Western Australia are almost entirely hardwood.
Region (i)—The Tall Eucalypt Forests of the South-West.

The region in which these forests occur occupies about 16 million acres in the southwest corner of the State west of the 25th. isohyet. It includes the capital city of Perth and the ports of Fremantle, Bunbury, Busselton and Albany.

A systematic classification of the forest lands of the State was commenced soon after the appointment of C. E. Lane Poole as Conservator of Forests in 1916, and was completed on the bulk of the more valuable accessible forest country by 1921. In the course of this work, assessments were made of the stocking of merchantable timber in the forests.

The basic information thus provided has been gradually extended and improved by further assessments of merchantable timber volume which the Forests Department has continued to carry out in previously unclassified country and in connection with proposals for dedications as State forests, the letting of sawmilling permits and applications for alienation of land.

However, in hardwood forests, particularly in the virgin state, the considerable variations which occur in the form and soundness of the trees make the determination of merchantable timber volumes exceedingly difficult and the extent to which the products of a forest are merchantable fluctuates considerably with economic conditions.

The results of any such assessment work must, therefore, be recognised as representing the position on a broad basis only, while the changes which are continually taking place in the stocking of a forest as a result of such influences as forest fires, utilisation operations and silvicultural treatment, to all of which the forests of the South-West have been subject, make periodic stocktaking essential.

To ascertain all the resources and potentialities of a forest, it is necessary to know, not only the timber of merchantable size and quality, but the full stocking in trees of all sizes and their rates of growth.

The Department first began to obtain this information by carefully measuring sample plots, but about 1938, a commencement was made with the establishment of a system of permanent assessment lines. The aim was to establish these lines 20 chains apart, and periodically measure the trees along them over a width of one chain, thus obtaining an actual measurement of five per cent. of the whole of the forest, as well as figures of growth and yield. For a commencement, lines were established and measured one mile apart and two chains in width in order to obtain quickly some reasonably representative data. However, as a result of the war and its aftermath, it was not possible to continue this work for some time.

There was also commenced in 1946 the practice of making assessments along temporary lines in the forest cut over during the previous quarter. While this work has covered only a comparatively small portion of the forest area, it provides useful information with regard to the varying effect of site upon yield and quality, and can assist in improving total estimates pending a complete revision of the first stocktaking.

The accurate assessment of forest resources has always been a time-consuming operation, but in recent years considerable advances have been made in accurately delineating forest type boundaries from aerial photographs. This allows other information, such as the distribution of tree size classes and volumes to be determined with much smaller samples, and consequently much less field work than was previously necessary. The Forests Department has for some time been using aerial photographs to assist in the work of forest assessment.

The Forests Department is the only organisation with any reliable information upon which to base estimates of the total resources of the forests of the south-west region as a whole, and the Conservator of Forests (Stoate, T. N.) gave evidence of successive estimates in this direction made by his Department. No great degree of accuracy was claimed for any of these estimates, but the later ones, as a result of increased local demand, have reflected the result of increased merchantability of lower volume stands and lower quality material. It was suggested by some witnesses that the latest figures presented were unduly conservative, but no sound bases are considered to have been advanced for the doubts expressed.

Forest Areas, Species and Their Uses.

The land tenure of this region can be expressed in the following categories:

<table>
<thead>
<tr>
<th>Description</th>
<th>Acres.</th>
</tr>
</thead>
<tbody>
<tr>
<td>State forests</td>
<td>3,410,000</td>
</tr>
<tr>
<td>Timber reserves under the Forests Act</td>
<td>82,000</td>
</tr>
<tr>
<td>Timber reserves under the Land Act</td>
<td>210,000</td>
</tr>
<tr>
<td>Other Crown lands</td>
<td>4,360,000</td>
</tr>
<tr>
<td>Private property</td>
<td>8,256,000</td>
</tr>
</tbody>
</table>

On the 4,360,000 acres of Crown lands, 660,000 acres are believed to be worthy of consideration for dedication as State forest, 1,700,000 acres carry forest too poor in quality to justify generally the cost of the application of forest management at the present day, and the remaining 2,000,000 acres are considered to carry practically no timber of sawmilling value.

On the 8,256,000 acres of private property, it has been very roughly estimated that 200,000 acres are carrying good forest, and a further 1,000,000 acres carry scattered timber, much of which is reserved to the Crown. The remaining 7,000,000 acres of private property is, for all practical purposes, believed to carry no marketable forest.

The forest species which produce timber of sawmilling value in this region include jarrah, karri, wandoo, marri, blackbutt, tingle, tuart, yate and sheoak.
(a) **Jarrah (Eucalyptus marginata).**

The principal species in the forests of the South-West, both in extent and value, is jarrah, the timber of which is renowned for its durability against wear and decay, its resistance to termite attack, and its strength. These characteristics have resulted in the development of a valuable overseas and Australia-wide market for it in such uses as railway sleepers, general construction timbers and flooring. Its deep red colour and beauty of grain have also gained it a place as a cabinet timber. In view of its comparative abundance and availability, it has become the general utility timber of Western Australia. As a species jarrah originally occurred naturally over an area of about 13 million acres, but the main jarrah forest is contained within a compact belt of lateritic soils some 25 miles wide and 200 miles long, between the 25in. and 45in. isohyets, stretching along the Darling Range from the vicinity of Perth in the north to Manjimup in the south, where it is bordered by belts of karri forest. Jarrah also extends from the Darling Range eastwards to the coastal sand plain, and westwards to the 20in. isohyet, where it intermingles with the wandoo forest, but the productive capacity of these forest fringes is very low.

Much of the country carrying jarrah has been, and is still being, alienated and cleared in the course of agricultural settlement.

The area of the State now carrying jarrah and associated wandoo of sawmilling quality and volume can be shown in the following categories:

<table>
<thead>
<tr>
<th>Category</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>State forest</td>
<td>3,000,000</td>
</tr>
<tr>
<td>Crown lands worth consideration</td>
<td>500,000</td>
</tr>
<tr>
<td>for dedication as State forest</td>
<td></td>
</tr>
<tr>
<td>or timber reserve</td>
<td></td>
</tr>
<tr>
<td>Crown lands carrying some</td>
<td>1,500,000</td>
</tr>
<tr>
<td>marketable timber but too low in</td>
<td></td>
</tr>
<tr>
<td>volume to be worth reserving</td>
<td></td>
</tr>
<tr>
<td>for forestry purposes</td>
<td></td>
</tr>
<tr>
<td>Private property, much of which</td>
<td>1,000,000</td>
</tr>
<tr>
<td>carries only scattered trees</td>
<td></td>
</tr>
</tbody>
</table>

The 3,500,000 acres of jarrah-wandoo country on State forest and on Crown lands worthy of dedication as State forest or timber reserve includes many scattered areas of low volume, which in total amount to a considerable acreage, but which it is impracticable to exclude from surrounding areas of good forest. The net acreage of good jarrah forest is therefore probably less than 3,000,000 acres.

About half, and by far the better half, of this good jarrah forest has already been cut over for saw logs.

The jarrah forest generally regenerates freely, following opening of the forest canopy by trade operations or fire. Sound figures of growth and volume for the different types of jarrah forest over any long period are, however, not yet available. Early growth may be fast for a few years, but it is known that the subsequent growth rate in both diameter and height is usually extremely slow.

A feature of the present condition of the jarrah forest is a paucity of foliage and a general appearance of stag-headedness. It is believed that restoration of the crowns to full vigour would result in an important improvement in the rate of growth and increment, and the Forests Department, in collaboration with the Forestry and Timber Bureau of the Commonwealth, is making an intensive study of the problem.

Despite the very slow rate of growth and comparatively low volume per acre carried by much of the jarrah forest, the general soundness of the tree compared with other species of eucalypts, the particular value of its timber and the ease of roading and logging in the undulating country in which it occurs are considered to justify the retention in State forest of all good forest of this species. It is also believed that all good jarrah forest should be placed under management and protection from fire as early as practicable.

It can be confidently anticipated that there will always be an extensive local market for jarrah, as well as a certain interstate and overseas market if a surplus production is available.

It will not be always practicable or desirable to restrict fellings to trees over 90in. G.B.H. (girth at breast height) as at present, and material of much smaller size and faster growth must provide at least a large proportion of the production in this species at some time in the future. It is therefore important that the extent to which its termite resistant qualities and its durability may be affected by faster growth should be determined.

(b) **Karri (E. diversicolor).**

The timber of karri is less resistant to decay and termite attack than jarrah, and for this reason the use of karri has not been generally popular in Western Australia, but the strength and stiffness of the timber and the long clear lengths obtainable give it a particular value for use as beams, mine guides, and in superstructural work generally. In the past, favourable markets have been found for it overseas. In recent years it has been in keen demand in South Australia for house building, particularly in roofing timbers, and recently it has been more generally accepted in the building industry in Western Australia. In this State it has for many years been valued as a fruit case timber.

The main forest of karri occurs in the high rainfall regions (40in. to 50in.) of the South-West, on granitic soils, in the vicinity of the Southern Ocean, stretching from near Nannup south-westerly towards Denmark, and covering a belt of country about 50 miles long, with an average width of about 10 miles. Other patches of karri forest occur notably in the Porongorup Ranges north of Albany, and between the Margaret River and Karridale north of Cape Leeuwin, where it occurs on limestone soils.

Karri generally occurs as belts of pure forest separated by belts of jarrah, and over a small area on the southern coast is intruded by the tingle forest.

Prior to 1925, large areas of karri forest, after being cut over by sawmills, were alienated under the Group Settlement Scheme. The total area of good karri forest
now remaining is estimated to be about 400,000 acres, of which about 360,000 acres have been dedicated State forest. It is estimated that there is the equivalent of about 50,000 acres of karri in mixed jarrah and karri forest on Crown lands which should also be dedicated State forest. About 45,000 acres of the remaining karri forest have been cut over for sawmill logs.

No difficulty exists with regard to the regeneration of karri and although information as to its rate of growth is scanty, it is known to grow much faster than jarrah, and there are already some fine young stands of this species in the State.

The karri forest carries such a high volume per acre, the trees reach such large dimensions, and the timber has qualities of such special value, that there can be no doubt as to its economic success under sound forest management, and every effort should therefore be made to conserve and develop the total remaining area of karri forest.

(c) Wandoo (E. redunca var. elata and E. accedens).

The timber of wandoo is particularly heavy, hard and durable, and is used for such purposes as railway sleepers, wagon timbers, building timbers and poles. It can be used in contact with iron and steel without corrosion occurring. Recently it has achieved some prominence for flooring and joinery work as it shrinks so little in seasoning that it can be dressed and put into use after a very short drying period. The wood and bark both contain a relatively high percentage of tannin and its use in the production of tannin extract is extending. The tree is a prolific source of honey and strong representations were received from apiarists for the retention of all wandoo forest.

The main wandoo forest (E. redunca var. elata) occurs as open savannah woodland in a wide belt to the east of the main jarrah forest on soils derived partly from the denudation of the old laterite plateau of the region and partly from the underlying granite. It reaches its best development on the broad clay loam flats of this region and is of poorer quality on the slopes where a high percentage of powder bark wandoo (E. accedens), together with poor quality jarrah and marri is found.

Although wandoo forest is of comparatively low volume per acre for sawmilling, it has a much higher volume as a source of tannin extract.

No information is available with regard to the rate of growth of wandoo, but it is believed to be very slow.

The wandoo forest which has been dedicated State forest is located along the eastern fringe of the jarrah belt, and is so relatively small that the area has been included in the figures for the jarrah forest, as also is a reference to the possible desirability of dedicating as State forest a further 300,000 acres of wandoo and associated jarrah.

Most of this 300,000 acres is within water catchment areas, but outside these catchment areas are Crown lands also carrying wandoo which it is believed should be either dedicated State forest or proclaimed forest reserve to protect the Crown asset against a possible sudden demand for agricultural settlement.

Should later developments show that this country could be more usefully employed for other purposes than forestry, the dedication or reservation could be revoked.

(d) Marri (E. calophylla).

Marri, also known locally as red gum, has not been used very extensively as a timber because of the common occurrence of gum veins. In the Perth metropolitan area it is used in the manufacture of cases, and it will no doubt find a much greater and wider range of use in the future.

Marri occurs in mixture throughout the jarrah forest. It is also found in the karri belt in which it occurs both in mixture with karri and as pure stands. After jarrah, it is the most abundant species in the South-West forest region.

As the timber is not generally considered to be of sawmilling value, no estimate of the merchantable volume available has been made, but the total must be very considerable and it is likely that it will eventually play an important part in providing raw material for the timber industry of Western Australia.

On the rare occasions when logs of this species practically clear of gum veins are encountered in logging operations, they are sawn in the general purpose mills, and sawmillers describe the timber as satisfactory.

Powellised marri railway sleepers laid down in 1912 have proved their suitability for that purpose, and untreated and creosoted sleepers are now being tested. The Forests Department has built a number of houses of marri in an endeavour to demonstrate its value.

No satisfactory method has yet been devised of distinguishing trees clear, or practically clear, of gum veins, and consequently utilisation of the species is not attractive to the sawmill while he can more readily obtain adequate supplies of less faulty timber in other species.

Increased utilisation of marri in general production may eventually require some discrimination to be made between the stumpages charged for marri as compared with other more valuable species, but it is unlikely that such concession would have any beneficial effect at the present time.

(e) Yarri (E. patens).

The timber of this species, commonly known as blackbutt, is now regarded for most purposes as equal in strength and durability to jarrah, and is being used for railway sleepers, house construction and other purposes. It occurs generally in small patches in gullies and pockets in the jarrah belt. Only limited quantities are available.
(f) Tuart (E. gomphocephala).

Tuart is a hard, heavy timber which has found favour for such purposes as railway wagon undercarriages, wheel felloes and spokes, and wheelwright and coach building work generally.

The occurrence of this species is, however, confined to a few thousand acres on the narrow strip of coastal plain from Lake Pinjarra north of Perth to Busselton in the south. The best forest occurs on a small area of some 4,000 acres between the Capel and Sabina Rivers north of Busselton, and is included in an area of 6,000 acres in that locality dedicated as State forest.

(g) Red Tingle (E. jacksoni) and Yellow Tingle (E. gilfoylei).

The natural occurrence of these species is so limited that they are of comparatively minor importance, although the timber of red tingle is undoubtedly of value on account of its light weight, pleasing appearance and good working qualities, and yellow tingle is a useful timber for superstructural work.

The tingle forest in mixture with karri covers a comparatively small area of about 14,000 acres around the lower reaches of the Frankland and Deep Rivers in the south, where an average annual rainfall of about 50in. is received.

(h) Yate (E. cornuta).

The timber of this species is of exceptional strength, but its occurrence is limited to a few isolated localities around the edge of the jarrah belt.

(i) Sheoak (Casuarina Fraseriana).

A timber is obtained from this species which is in particular demand both in Western Australia and South Australia for barrel staves. It is also an excellent cabinet wood. It occurs throughout the jarrah forest but is generally of comparatively small size, and the total quantity available for sawmilling is very limited.

Apart from the value of its timber, the association of this species with jarrah may be of some silvicultural importance.

Potential Forest Area.

The Forests Act, 1918, provides that any Crown land, including land reserved or purchased or otherwise acquired, may be dedicated as a State forest and that any Crown land may be reserved from sale as a timber reserve. Other provisions of the Act make it clear that dedication as State forest is intended to provide more permanent tenure than reservation as timber reserve. It is therefore important that land which is of such forestry value as to justify its retention under forest should be dedicated State forest.

The present area of State forest in the south-west of Western Australia is approximately 3,410,000 acres, and of timber reserves under the Forests Act, 82,000 acres. In addition there are about 210,000 acres of timber reserves under the Land Act, which, by the provisions of the Forests Act, are also under the exclusive control and management of the Forests Department and cannot be revoked until a report of the Conservator of Forests for such revocation has been obtained.

It is considered that any timber reserves which can be shown to be worthy of permanent retention for forestry purposes should be dedicated State forests. It is noted, for example, that some of the areas upon which expenditure has been incurred by the Forests Department in successful afforestation with softwoods are still timber reserves. It is desirable that any land upon which the Forests Department proposes to incur any considerable expenditure upon reforestation or afforestation should first be dedicated State forest.

I am satisfied with regard to the desirability of dedicating as further State forest a large area included in the following Crown lands in the far south of the State:

<table>
<thead>
<tr>
<th>Area Description</th>
<th>Approximate acreage</th>
<th>Approximate timber volume in trees over 90in. G.B.H.</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Granite Peaks area of karri in the south and mixed karri and jarrah in the north</td>
<td>156,500</td>
<td>1,500,000</td>
</tr>
<tr>
<td>The Milyanup area of good jarrah</td>
<td>119,000</td>
<td>500,000</td>
</tr>
<tr>
<td>The Shannon River area</td>
<td>48,000</td>
<td>250,000</td>
</tr>
<tr>
<td>The Deep River area of good karri</td>
<td>14,500</td>
<td>400,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>336,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2,650,000</td>
</tr>
</tbody>
</table>

The Under Secretary for Lands advised that examination of these areas had been referred to him, but it would be at least 12 months before a surveyor would be available to examine them on his behalf. In the meantime they were temporarily reserved from alienation.

The Conservator of Forests has, for the protection of its marketable timber, also sought dedication of the following areas of the wandoo forest towards the northern end of the south-west region. These areas are:

<table>
<thead>
<tr>
<th>Area Description</th>
<th>Approximate acreage</th>
<th>Approximate timber volume in trees over 72in. G.B.H.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Julimar Timber Reserve together with areas of other timber reserves and vacant Crown lands to the north and west</td>
<td>137,000</td>
<td>240,000</td>
</tr>
<tr>
<td>Northern portion of Helena catchment area</td>
<td>11,000</td>
<td>46,000</td>
</tr>
<tr>
<td>South-Eastern corner of Canning and Serpentine catchment areas</td>
<td>15,000</td>
<td>30,000</td>
</tr>
<tr>
<td>Various areas of Crown lands adjoining the eastern boundary of the catchment areas</td>
<td>230,000</td>
<td>398,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>393,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>714,000</td>
</tr>
</tbody>
</table>
The Under Secretary for Lands stated that these wandoo lands had been withdrawn from selection, and he was at present awaiting from the Conservator of Forests his estimation of the timber they carried, as it was considered that Cabinet should decide which of these lands should be devoted to forestry and which to settlement.

The volume of sawmilling log per acre on these lands is comparatively low, but wandoo is a very valuable timber, highly rated for its durability, and for the production of tannin extract, while the tree is a prolific source of honey.

The dedication as State forest of the wandoo country in the catchment area would appear to be justified for catchment protection purposes, and I am satisfied from observations that portion, at least, of the remaining wandoo land should also have the timber on it protected by reservation, particularly in view of its close proximity to the metropolitan area.

In 1943 the Conservator of Forests, the Surveyor General and the Director of Agriculture agreed that certain country in the South-West should be made available for agricultural settlement in anticipation of a post war demand, and on a number of areas ranging from south of the Blackwood River near Karridale to Rocky Gully near Mt. Barker the Forests Department in consequence made arrangements for sawmilling to proceed. Unfortunately with the increased development of bulldozing, the utilisation of this timber has been unable to keep pace with the clearing.

This destruction of Crown timber is a matter for concern, and it is considered that the extension of settlement should be dependent upon the prior utilisation of the timber.

Whilst realising the need for agricultural development and that sound reasons may have existed to justify the destruction of some forest in the interests of agricultural settlement, it is most important that any country of considerable forestry value now remaining unalienated should be dedicated to forestry as early as possible to avoid destruction of the Crown's timber asset.

However, in connection with areas upon which there might appear to be doubt as to the desirability of their dedication or reservation for forestry purposes, it is considered that the Conservator of Forests, the chairman of the Land Settlement Board, the Director of Agriculture and the Surveyor General should confer and make a recommendation with a view to early action being taken.

The practice of reserving timber to the Crown on alienated land was, several times, brought under my notice. This reservation, effected under sections 16 and 29 of the Land Act, 1933-1950, is an important measure designed to permit the alienation of land in advance of complete removal of the marketable timber. The Forests Department acts as the agent of the Crown in controlling the cutting of this timber, and co-operates with the land owner by including in the cutting permit a condition that trees are not to be removed from areas under pasture.

Land clearing and farm development is usually a gradual process which can be confined to those parts of estates from which the timber has been removed, and the removal of timber from the remainder can, if necessary, often be deferred for a time.

However, with the advent of the bulldozer, areas in some districts are being cleared and burnt at a faster rate than the local sawmills can remove the timber from them.

It was claimed by some witnesses that as the land owner had no interest in protecting the timber, this reservation actually resulted in its loss. Many witnesses were under the misapprehension that the land owner could ringbark the timber without obtaining permission from the Forests Department, and an example of such drastic action was shown to me. It was contended in other cases that even if the timber were not destroyed, the land owner could simply run a fire through it, cultivate the ground roughly and sow clover seed, thus establishing a pasture from which the timber could not be removed. It was obvious that many did not appreciate that the exclusion of pasture from the timber logging operations was a concession on the part of the Government.

It was stated that if the reservations of timber to the Crown on alienated land were withdrawn or the land owner given some equity in the stumpage value of the timber, its protection would be assured. It is considered, however, that such reservation is essential in many cases to avoid unnecessary destruction of timber, and thus assist in providing stability in the timber industry.

If the practice were dispensed with, immediate applications for the alienation of land for its timber volume alone would be received, which, if granted, would result in loss to the Crown of a considerable asset. Such action would eventually react to the disadvantage of the genuine settler in that alienation of land would be refused until the timber was removed.

The best solution suggested was that the reservation over the timber should be withdrawn five years after the pasture had been permanently established. If adopted, adequate safeguards would need to be provided to ensure that the pasture has been permanently established for the requisite period.

**Timber Volumes.**

Following the completion of the original classification of forest lands, it was estimated at the end of 1927 that on 4,660,000 acres of jarrah and karri on State forests and Crown lands which had been classified, there was the following log timber of sawmilling size—

<table>
<thead>
<tr>
<th>Merchandise</th>
<th>Merchantable jarrah logs in trees</th>
<th>over 90in. G.B.H.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loads</td>
<td></td>
<td>20,662,000</td>
</tr>
<tr>
<td></td>
<td>Merchantable karri logs in trees</td>
<td>over 108in. G.B.H.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>26,695,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Loads</th>
<th>20,662,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>6,033,000</td>
<td>26,695,000</td>
</tr>
</tbody>
</table>
At that time it was estimated that there were also about 2,000,000 loads of jarrah of merchantable size not suitable for sawmilling under the conditions of those times. By the end of 1944, 6,315,000 loads of jarrah and 1,572,000 loads of karri had been removed from State forests and Crown lands in the South-West for sawmilling and heewing. A further estimate at that time gave the following figures of timber still standing on State forest and Crown lands:—

<table>
<thead>
<tr>
<th>Merchantable logs of jarrah and wandoo in trees over 90in. G.B.H.</th>
<th>23,710,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Merchantable logs of karri in trees over 90in. G.B.H.</td>
<td>6,453,000</td>
</tr>
<tr>
<td>----------------------------------------------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>Total</td>
<td>30,163,000</td>
</tr>
</tbody>
</table>

Since 1944, a further 2,000,000 loads of jarrah and 500,000 loads of karri, approximately, have been removed as sawing and heewing logs, and the Forests Department has now submitted the following estimate of the standing timber on State forest and Crown land in the south-west of the State:—

<table>
<thead>
<tr>
<th>Merchantable logs of jarrah and wandoo in trees over 90in. G.B.H.</th>
<th>27,000,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Merchantable logs of karri in trees over 90in. G.B.H.</td>
<td>6,000,000</td>
</tr>
<tr>
<td>----------------------------------------------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>Total</td>
<td>33,000,000</td>
</tr>
</tbody>
</table>

It will be noted that despite the quantities which have been removed in trade operations, and losses due to fire, the estimates of the total quantity of timber standing in the forests have progressively increased. A certain number of trees in classes below 90in. G.B.H. have passed into the highest class since 1928, but the increase in the later estimates is mainly due to a gradual lowering of log standards with the increasing scarcity of log timber. As a result, many trees previously considered of doubtful merchantability can at present be considered merchantable.

It is extremely difficult in a virgin or recently virgin forest, such as constitutes the forests of the South-West of Western Australia, to determine the degree of soundness of the timber in the standing tree, and the effect that fluctuations in market value may have upon the merchantability of poorly formed and unsound trees. Any estimates made now must therefore be regarded as only being applicable within very wide limits.

In recognition of this difficulty, the Forests Department has adopted the practice of calculating the volume of all doubtful trees and classifying them separately. In cut over areas, these trees have already been passed by or rejected by the miller. In addition to the 33,000,000 loads given as the volume of merchantable timber in the forests of the South-West, the Forests Department estimates that in the doubtful class there is a further 8,000,000 loads over 90in. G.B.H. and 3,000,000 loads under 90in. G.B.H. What percentage of this doubtful volume will be utilisable over the years remains to be determined. Much of it is already burnt at the butt or fire scarred and can be expected to suffer further damage or destruction.

I am satisfied that the revised estimates followed very careful examination of the position, and represent the application to the original assessments of a considerable volume of information which was not available for the previous estimates.

An endeavour was made to compile for this Commission a new estimate of the forest stocking from data obtained from the permanent assessment lines laid down since 1938. I have carefully examined this material. The data from the permanent assessment lines will eventually provide the basis for a very comprehensive stocktaking of the forests, but the area so far covered in this work is too restricted to enable the results to be applied safely to a thorough revision of the total estimates. At present they indicate that the jarrah volume may be over-estimated, particularly in the south, where the bulk of the virgin forests remains to be cut, and that the karri volume may be under-estimated.

The Forests Department has prepared the following presentation of the position as at 31st December, 1950. It contains a number of assumptions based upon the data from the permanent assessment lines, but some indication of the position in this manner is necessary before the potentialities of the forest can be discussed.

On approximately 4,000,000 acres of State forest and Crown land proposed for dedication as State forest—

<table>
<thead>
<tr>
<th>Merchantable logs of jarrah and wandoo in trees over 90in. G.B.H.</th>
<th>25,000,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Merchantable logs of karri in trees over 90in. G.B.H.</td>
<td>6,000,000</td>
</tr>
<tr>
<td>Jarrah, wandoo and karri logs in trees between 72in. and 90in. G.B.H.</td>
<td>8,000,000</td>
</tr>
<tr>
<td>Logs in trees between 60in. and 72in. G.B.H.</td>
<td>4,000,000</td>
</tr>
<tr>
<td>A volume of potentially merchantable log timber in trees between 25in. and 60in. G.B.H.</td>
<td>3,000,000</td>
</tr>
<tr>
<td>Logs of doubtful merchantability in trees over 90in. G.B.H.</td>
<td>8,000,000</td>
</tr>
<tr>
<td>Logs of doubtful merchantability in trees between 60in. and 90in. G.B.H.</td>
<td>3,000,000</td>
</tr>
</tbody>
</table>

On approximately 1,500,000 acres of Crown land of low forest value—

| Logs in trees over 90in. G.B.H. | 3,000,000 |

On approximately 1,200,000 acres of private property—

<table>
<thead>
<tr>
<th>Logs in trees over 60in. G.B.H.</th>
<th>6,500,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>--------------------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>Total</td>
<td>65,500,000</td>
</tr>
</tbody>
</table>

It is desired to make it quite clear that these figures cannot be regarded as any more than rough estimates, and in the case of the immature timber on State forests and Crown lands, and the total timber volumes on Crown lands of low forest value and private property, are little more than intelligent guesses.

In this connection it is interesting that sawmillers in evidence gave details of 58,728 acres of private property carrying 91,394 loads of milling timber. A further 256,095
acres were mentioned without figures of timber volume, and a further 100,000 loads were mentioned without figures of acreage. These figures included some thousands of acres of private property carrying only scattered trees, as well as good forest country. They do not include timber on private property reserved to the Crown which has been roughly estimated to be in the region of 1,000,000 loads. They are an indication that the figures quoted by the Forests Department of 1,200,000 acres of private property carrying 6,500,000 loads of milling timber over 60ln G.B.H. are not unduly conservative.

The Forests Department is at present engaged in a detailed revision of previous estimates, and by the time it is completed in 1954, if not before, the position may prove to be considerably different from that represented above. It must not, however, be overlooked at any time that the economics of the sawmilling industry and the intensity of departmental control over logging operations are two factors which must have a considerable effect upon any figures of merchantable volume.

Potentialities of Timber Production.

In considering the potential future yields of the forests of the South-West, the following factors have to be taken into consideration:

1. No future increment can be credited to forest on private property or low volume forest on Crown lands. These areas are never likely to be brought under the silvicultural treatment and intensive protection from fire which is necessary to secure net increment, but on the other hand it is to be expected that the bulk of them will eventually be cleared for agricultural settlement.

2. No increment can be credited to any forest until it has been developed and protected from fire. About half the forest area of the South-West is still virgin forest, in which, as in all virgin forests, the stocking is mainly in mature and over-mature trees, and growth is equalised by losses from decay, etc. Even after the virgin forest is cut over, much of the stocking remaining is in over mature, unsound or useless trees, and consequently the useful increment is comparatively low.

3. The actual stocking of the forests, even in the larger sizes, is not known with any certainty, and no useful information is available with regard to the volume of timber in trees under 60ln G.B.H.

4. No future net increment can be credited to trees or timber classed as of doubtful merchantability. Not only is it impossible to determine the actual extent of interior soundness of all standing trees, it is also impossible to say to what extent they might become merchantable under changed economic conditions. It is true that much material of a quality not present generally merchantable is being utilised near centres of consumption like Perth, and that the degree of merchantability may generally be expected to increase everywhere as supplies become shorter. It has, however, to be recognised that jarrah is usually inherently sounder at the northern edge of the jarrah belt near the metropolitan area than farther south, and in the more remote areas it is doubtful if much of the present stocking in this quality will ever be utilised, as fire and other losses are usually heaviest in this class of material.

5. Losses due to fire and other causes are unknown and always unpredictable. Over the last 10 years an average of 60,000 acres per year has been burnt over in the forests of the South-West, and in 1949-50, a particularly bad fire year, nearly 250,000 acres were burnt. It needs to be appreciated that one severe fire may cause destruction equal to the growth of many years in the area burnt over. However, losses from fire should become less as the protection service is extended and improved. A reasonable allowance can usually be made for normal losses from other causes, such as insects, disease, etc., but destructive epidemics in one form or another are always possible, and for some time it has been noted that in some districts appreciable patches of cut over jarrah forest have been dying out completely from some unknown cause. It is impossible to forecast the extent such losses may reach before the trouble can be remedied.

6. There are no increment figures available which can be applied to provide useful estimates of the total annual yield which may be expected from the forests of the South-West in the future. In both jarrah and karri, specially selected plots in the best regrowth can be found to show rates of growth comparable with those of some of the best hardwood in any part of Australia. Thus in karri plots are available which at 21 years show a mean annual increment of 155 cubic feet per acre, equal to an average annual increment of 9.5 per cent., and at 82 years, a mean annual increment of 108 cubic feet, equal to an average annual increment of 2.4 per cent. Such special plots cannot, however, be used as bases for estimates of general production. Under sound forest management the jarrah forest may eventually be brought to yield as much as 25 cubic feet of mill log per acre per annum, or even more, but speculation of this nature is of no practical consequence at the moment, as so little is known of even the total present stocking of the forest.
The ultimate potentialities of the native forest resources of the South-West region cannot therefore be usefully determined on the information at present available.

The Conservator of Forests in evidence suggested that 8 cubic feet per acre per annum for jarrah and 30 cubic feet per acre for karri might be taken as the mean annual increment for the cut over forest without making allowance for fire losses. If the associated merchantable species, such as wandoo, are included with the jarrah, and tingle is included with the karri, this would mean that the 3,500,000 acres of good jarrah forest would have a mean annual increment of 28,000,000 cubic feet, or 560,000 loads, and the 400,000 acres of karri an increment of 12,000,000 cubic feet, or 240,000 loads, giving a potential total annual increment in the forests of the South-West of 800,000 loads. From this must be deducted losses due to fire and epidemics. It is necessary to point out, however, that at present only about half the forest has been cut over and is able to show net increment. Moreover this increment must largely accrue upon young regrowth and upon material over about 72in. girth breast high, as the intermediate size classes are largely non-existent. The trees in the 72in. G.B.H. and over class include many which are over mature or have been dominated for some many years that they are not readily capable of vigorous growth. It is possible that under sound forest management and intensive fire protection, the above rates of growth may be increased several times, but no information is at present available to enable any estimate to be made in this direction. It is important that more reliable figures of forest stocking and rates of growth should be obtained as early as possible.

Region (ii)—The Temperate Savannah Woodlands.

This region covers about 17,000,000 acres stretching in a long strip with an average width of about 50 miles from the south coast along the eastern fringe of the jarrah belt to the Indian Ocean near Northampton. The average rainfall ranges from 15in. to 20in. per annum. The most common tree species are york gum (E. foecunda var. loxophleba) and jam (Acacia acuminata), but intrusions of wandoo and outliers of mallet occur. The land in this region has nearly all been alienated and largely cleared. Only minor areas still carry timber.

Apart from the wandoo used in a few sleeper mills and for tannin extraction, the only species of other than local value is the brown mallet (E. astringens). The bark of this species has a tannin content in the vicinity of 49 per cent., which makes it one of the most concentrated natural tanning materials of economic importance in the world, and although the bark of other species of mallet, the white mallet (E. folcata) and blue mallet (E. gardneri), which occur in the same district have an appreciable tannin content, brown mallet is considerably superior. All three species occur naturally on both sides of the Great Southern Railway from Pingelly to Tambellup in close association with the remnants of the old laterite peneplain.

West of the Great Southern Railway about 59,000 acres are held as State forest and a further 62,000 acres reserved in some form, primarily on account of the presence of mallet. East of the railway the number of areas scattered throughout the sand plain country totalling some 324,000 acres, on which isolated patches of mallet occur.

Originally brown mallet trees up to 2ft. in diameter were found, but the operations of bark strippers, its particular sensitivity to fire and clearing for agriculture have all assisted to reduce its occurrence, apart from individual trees, to small patches of re-growth which often find some natural protection in their location on stony outcrops and their proximity to poison plant country. Supplies of tanning barks in the world are gradually decreasing and the total quantity of all the mallet bark stripped in the State is now only about 800 tons per year, over half of which comes from private property.

In view of the increasing shortage of tanning materials, the particularly high value of the bark of mallet, and the readiness with which it seeds, the Forests Department, in addition to protecting natural stands from fire, has taken an interest in its regeneration, and since 1928 has seeded some 17,000 acres in the Narrogin district. Healthy stands have developed on about half the areas so far sown, but many years must elapse before the suitability or otherwise of many of the soil types for the growth of mallet can be adequately demonstrated.

In the meantime, it is considered that the Forests Department is justified in continuing experimental planting on a small scale and in maintaining its close control of the stripping of mallet from the remaining natural stands on Crown lands. This control limits the stripping of trees to a minimum girth of 10in. Investigations by the Department indicate that trees of 20in. girth would yield nearly four times the quantity of dry bark yielded by a 10in. tree, a 30in. tree 12 times as much as a 10in. tree, and a 40in. tree over 20 times as much. However, the limited quantities available and the danger of loss by fire of the isolated patches in which mallet occurs make it impracticable to increase the minimum stripping girth at the present time.

Region (iii)—The Open Eucalypt Forests and Woodlands of the Southern Inland.

This region stretches eastwards from the edge of Region (ii) to beyond the Eastern Goldfields. Its northern boundary is generally about 30°S. latitude, but towards the coast a prolongation north-westwards reaches 26°S. latitude. It receives an average annual rainfall varying from 15in. in the west to less than 10in. in the east. It covers about 70,000,000 acres, but the western portion, that receiving the higher rainfall, comprises the main wheat belt of Western Australia, and has been largely denuded of trees. The remainder carries belts of eucalypt forest, amounting in total to some 15,000,000 to 20,000,000 acres.
(a) The Wheat Belt.—This zone receives an average annual rainfall ranging from 11in. in the east to 15in. in the west. The main tree species native to the zone include salmon gum (E. salmonophloia), gimlet (E. salubris), morrell (E. longicornis) and yorrell (E. gracilis). Their occurrence is, however, now very scattered, and insufficient to meet even local requirements. The Forests Department has for some time been endeavouring to encourage the establishment of small forest plots throughout the better rainfall areas of this region by establishing arboreta and supplying planting stock to road boards and private individuals. This work has much to commend it.

(b) The Goldfields Forests.—The 15,000,000 to 20,000,000 acres carrying forest in this zone are included within about 1,600,000 acres of timber reserves under the Forests Act, 440,000 acres of timber reserves under the Land Act, and about 16,600,000 acres of non-reserved Crown lands. The main tree species are salmon gum (E. salmonophloia), morrell (E. longicornis), gimlet (E. salubris), merrit (E. flocktoniae), boongul (E. transcontinentalis), mahogany (E. brockwayi), and several species known as blackbutt (E. le souefiti, E. clelandi, E. dundasi, E. stricklandi).

The existence of these forests has been of great value in providing firewood and mining timber for the Goldfields. The demand for firewood for mining purposes is, however, decreasing. Whereas some 30 years ago it was in the vicinity of 1,000,000 tons per annum for the Kalgoorlie mines, it is now only about 200,000 tons, and with coal and oil gradually superseding wood as fuel for the production of power, a still further and very appreciable decrease may be expected.

A railway specially built for the carriage of firewood and controlled by the mining companies in co-operation on a cost basis, under the name of the Lakewood Firewood Company, is at present hauling wood a distance of over 100 miles, but may soon have to close down owing to the reduction in demand.

Some 6,000,000-7,000,000 acres of these forests have already been cut over for fuel and mining timber.

In the virgin stands, the volume in firewood per average acre is about four tons, and some saw logs are produced, mainly from salmon gum and morrell. Despite the heavy cutting which has taken place, there appear to be ample supplies available for the requirements of the Goldfields for at least the next 50 years, although the hauling distance might have to be extended as far as 150 miles in that time if the present rate of requirement persists. The increment in height growth is about 10in. per annum. Increment in girth breast high is from .2in. to .5in. per annum, the higher increment being obtained on the more isolated trees. It is remarkable that in a region receiving a rainfall of less than 10in. per annum, and with an even higher evaporation rate, and no ground water close to the surface, some of these species should be able to develop into trees up to 90ft. in height. Many of the species are sensitive to fire, and all appear to seed freely. When regeneration does occur, it may with some species form very dense thicketss. Little action is needed to obtain regeneration, and as about 90 per cent. of the area cut over has already regenerated without assistance, and regrowth is available up to 40 and 50 years of age, no considerable expenditure on the close control of cutting operations appears to be necessary.

The Forests Department is at times pressed to permit the cutting of the older regrowth as it is nearer to the centres of consumption than the remaining virgin forest. Future cutting should, however, for the time being, be confined as far as practicable to the virgin forest, for the following reasons:

1. The regrowth is still developing, but there is a large area of virgin forest which needs to be cut to bring it to a condition of healthy growth.
2. Close to centres of consumption, the areas of regrowth need to be retained and managed as protection forests for the towns in the vicinity.
3. In the interests of soil conservation and the perpetuation of the forests, second growth trees should not be cut until they are producing sufficient seed to provide another crop.

In view of the remarkable development made by these species under very difficult conditions and their possible value in other dry but treeless areas, the Forests Department should vigorously pursue studies in their silviculture.

(c) Sandalwood (Santalum spicatum).—This species originally occurred practically throughout the State, except in the Kimberleys and the extreme South-West. Owing to the extensive destruction which has arisen from its high market value, destruction in clearing for wheat farming, and lack of regeneration owing to its susceptibility to rabbit attack, production of sandalwood is now confined to the Eastern Goldfields and to the Murchison River district. It is therefore being included in this section of the report.

Another species, the northern sandalwood (Santalum lanceolatum) is obtained from the Kimberleys in the mountainous country north of Derby, but it is not plentiful or easily accessible.

The strong demand for sandalwood from China and other east Asiatic countries has in the past provided a high financial return. The value of sandalwood exported from the State up to 30th June, 1950, was $6,697,476, and of the oil, £6,697,476. To prevent excessive fluctuations in demand and supply, legislation has been passed which places the issuing of orders in the hands of the Australian Sandalwood Company, as a result of which the Government receives a proportion of the net return from sales, as well as a royalty of £9 per ton on the wood.

Various other legislative enactments have been passed to protect immature sandalwood trees and the industry.
Sandalwood is parasitic on other plants. It is very slow growing and little success has so far attended efforts directed towards its regeneration in areas where it is unprotected from the rabbit.

It has been suggested that as sandalwood is usually parasitic on acacias, further tests of the possibility of reproducing the species should be made in the more favourable southern areas by sowing it in conjunction with acacias producing bark of high tannin content. Experiments of this nature on a small scale are considered justified.

Region (iv) The Mulga Bush.

North of latitude 30°S. there is a wide belt of mulga stretching from east to west across the State. This region carries some 50,000,000 acres of an acacia association, commonly known as mulga. It contains not only the true mulga (Acacia aneura), but also a number of other species. All have value as sheep and cattle fodder, and practically the whole of the mulga region is now held under pastoral lease.

Throughout this region are a number of mining fields, and from before the advent of the pastoralist, these have depended largely on the local mulga for their fuel, and to some extent their supplies of mining timber. The cutting of mulga for mining purposes is confined to the better sites, where the trees assume a height of 20 or more feet. The amount obtained from such sites varies from one to three tons per acre, but in view of the scattered occurrence and low proportion of these better sites, a considerable area has been ranged over, and hauling distances of 40 or 50 miles have been known in recent years.

Three of the larger mines once had private tramlines into the mulga country, but at present only one of these remains—the Sons of Gwalia Mine—which uses mulga to develop producer gas for power purposes.

A conflict of interests arises through the varied uses to which mulga can be put. Its uses include—

1. Soil conservation.
2. Feed for sheep, particularly during drought periods when grass and herbage are lacking.
3. Fencing posts on pastoral properties.
4. Mining timber and firewood.

From the point of view of both the pastoralist and the soil conservationist, it is undesirable that mulga should be extensively felled. In South Australia its felling is not permitted, and in New South Wales it is allowed only on a restricted scale.

However, the importance of the gold mining industry to the State and the fact that much of the plant installed is adapted for wood fuel, has made it essential to devise a system whereby its interests can be met with as little interference as possible with the pastoralist. To this end, licenses authorising cutting include conditions which specify—

1. That trees below a diameter of 3 in. may not be cut.
2. That trees must be felled at a height of not more than 6 in. above ground level.
3. That seven trees over 4 ft. in height must be left standing on every square chain.

To preserve post supplies, pastoralists may apply to the Forests Department to have certain areas excluded from any forest produce license issued to timber or firewood cutters.

In Western Australia regeneration of mulga has occurred on the better sites on pastoral leases, particularly on the flats where water collects and remains for a few days, but has totally failed on the poorer sites. This lack of regeneration could be attributed to such causes as the destruction of seed by sheep and the erosion of the surface soil following cutting and the grazing of ground herbage.

Some pastoralists in evidence contended that young mulga is unpalatable to stock, but this view is not accepted in other States where the only mulga regeneration to be observed is usually in areas from which stock and vermin have been excluded.

Present indications are that the demands of the mining industry will diminish, and for the benefit of the pastoral industry the retention of the mulga is essential. However, unless some control is exercised over grazing, it is likely that the pastoral industry itself will eventually destroy the mulga. If the mulga growth is to be retained, it will apparently be necessary to provide that certain areas are closed against grazing until satisfactory regeneration is secured.

Investigation is needed to ascertain if possible methods of grazing the mulga bush can be developed which will permit adequate regeneration and prevent its permanent deterioration.

Regions (v) to (viii)—Other Regions of the State.

The only other region of the State with any claim to the production of tree growth of value is the far north. Reports received in evidence were such as to lead to the belief that a special visit to the area was unjustified, and it is considered that the following text of a report by the Conservator of Forests provides a sufficient description of the forest growth in that region and its potentialities.

Along the Fitzroy River there are small areas of river rain forest totalling perhaps 3,000 acres, which can contribute only to local use.

North and south of the King Leopold Ranges are broken belts of native cypress pine (Callitris intratropica) in small, often inaccessible patches, which also cannot contribute to the requirements of southern Western Australia.

The Conservator of Forests has already made arrangements with the Forestry and Timber Bureau of the Commonwealth, for
co-operation with the officer of that Bureau in the Northern Territory, in any studies which may be undertaken in connection with the reforestation of cyress pine and other useful species in the north.

B.—Afforestation.

Western Australia has no natural softwood forests of any consequence, the only supplies of this nature being the small isolated areas of very slow-growing cyress pine in the far north.

The shortage of native softwoods applies to Australia generally and is a matter of considerable importance, for in normal times softwood is economically more suitable than hardwood for many of the purposes for which modern civilisation requires timber. In appreciation of this fact, all the States of Australia have for many years experimented with the planting of softwoods introduced from other countries.

An introduced species, free from the retarding effects of the insect and fungal pests of its native country, often shows outstanding development in a new country if the soil and climate prove suitable. This has happened with many species of eucalypts in other parts of the world, such as South Africa, the Mediterranean region, South America and California, where they have grown at a much faster rate than in their native habitats in Australia.

*Pinus radiata* from California has likewise given surprising results in rate of growth in certain parts of Australia, and fortunately without the development of internal stresses in the timber to the extent that often occurs in fast-grown eucalypts.

However, it is so difficult to determine and express the sum of the many factors which combine to make the value of a forest site that it is often practically impossible to forecast reliably how a species will behave in a new habitat. Extensive afforestation with introduced species should therefore not be undertaken without very thorough investigation and trial.

The first planting of pines in Western Australia took place at Bunbury in 1896, under the direction of Ednie Brown, Conservator of the newly-established Woods and Forests Department of that time. Pine planting was commenced at Hamel in 1899, and at Ludlow in 1908.

The early plantings of *Pinus radiata* in Western Australia were not generally successful, and upon the appointment of C. E. Lane Poole, as Conservator of Forests, in 1916, he immediately began replacing the poor *Pinus radiata* on the coastal sands at Ludlow with broadcast sowings of *Pinus pinaster* seed. In 1921 sowings were made with this species at Gnangara on the coastal plain north of Perth, and in 1926 the first large scale plantings with it were carried out there. Since that time *Pinus pinaster* has been the main species used on the coastal sands, and in recent years planting has been confined to the leiria strain, the trees of which are of much better form and faster growth than other strains of *Pinus pinaster*.

By the end of the 1951 planting season, 14,500 acres, approximately, had been planted with softwoods, made up of 11,000 acres of *Pinus pinaster*, 3,200 acres of *Pinus radiata* and 300 acres of other species for trial purposes. About 4,800 acres were under 15 years of age, 4,800 acres from 15 to 20 years of age, 4,100 acres from 20 to 25 years of age, and 800 acres of 20 years old and over. The 4,800 acres over 20 years of age are at present yielding a return in thinnings. The total yield from these plantations during 1950-51 was 9,484 loads of log timber.

The plantings have been spread over 43 different centres and several further areas are at present in course of preparation. The large number of plantation centres and the consequent diversity of sites available for trials have provided excellent opportunities for investigation into the requirements of the pine in various soils, and into remedial treatments where unhealthiness has occurred. As a result of the work of the Conservator of Forests (Stoate, T. N.) in these directions, thousands of acres in Western Australia and South Australia which previously could only be regarded as waste land are now promising to produce satisfactory forests. However, the extent of land in Western Australia which can be said to have so far proved suitable for the growth of any particular species is very limited. It is important that the investigations and trials with *Pinus pinaster* and other species on the various soils available should be actively continued.

The extending recognition of varieties in many softwood species, and the modern tendency to develop new strains by artificial breeding emphasise the great need for pest control. There is always the possibility that some of the natural enemies of a successfully introduced species may affect entry to this country, despite the most stringent quarantine regulations. Before concentrating upon a particular variety in any extensive scheme of afforestation, it is important that it should be tested to ensure that it is not unusually susceptible to the normal enemies of the species in its native habitat. For the same reason, it is unwise to unduly concentrate plantings of one particular species of variety. Extensive plantings should, if practicable, be broken by belts of native forest or areas planted with other species so that the risk of epidemics suddenly developing over extensive areas may be reduced as far as practicable.

Many residents and organisations in country centres expressed interest to the Commission in the matter of afforestation with softwoods in Western Australia, but, particularly in newly-developed districts, the hope was often advanced that such work would be relegated to the less accessible areas, away from the vicinity of settlement. This outlook is considered unfortunate. Wood is so heavy and bulky to transport to the consumer that it should be grown as close as practicable to the centres of consumption. Industries based upon animal life have the advantage that the animals can move of their
own accord from place to place to obtain their food, and in many cases even transport themselves to market. It is also a fact that softwood forests, with their attendant sawmills and other industries, mean a more intensive population per square mile of land under production than is possible with any other primary industry, except those requiring intensive cultivation, such as vegetable growing and orchards.

However, in the comparatively older settled Albany-Mt. Barker district, the evidence given generally suggested that it was considered a matter of importance to provide softwood forests in the district to make good the inroads of settlement into the natural forest resources, and to provide cases for the fruitgrowing industry.

A sawmiller (Bunning, C. R.) suggested that wherever possible, softwood forests should be established in the vicinity of large isolated sawmills. The purpose of his suggestion was to build up the population of mill towns enabling better amenities to be provided for both sawmill and forest employees, to provide additional labour for forest fire fighting, to provide employment for the female population of mill towns in nursery work and planting, and to provide employment for residents in mill towns during periods of depression in the timber industry, as well as to provide a source of timber supply when the natural resources of the district in this material are depleted.

The suggestion has much to commend it, but it is dependent upon suitable country being available in comparatively large compact blocks, and upon the sawmiller intensively utilising the timber upon the areas to be planted, in order to avoid waste. At the same time, the latter point must not be carried to extremes, as the sacrifice of a few hundred feet of hardwood timber per acre of doubtful prospective value to permit the growth of, say, 6,000 cubic feet of softwood in 40 years might well be justified in practically any circumstances.

A working plan prepared by the Conservator of Forests, and approved by the Governor, provides for the planting of 10,800 acres between 1950 and 1954, both years inclusive, as part of a plan for the establishment of 200,000 acres of softwood forest over the next 30 years. To ensure the complete utilisation of forest production which can only be effected by careful integration of various forest industries, he believes that the aim should be to establish an eventual total forest estate of 240,000 acres within comparatively compact areas of not less than 120,000 acres each.

It is not considered that any extension of the planting programme beyond 2,000 acres per annum should be undertaken until sufficient suitable area has been proven suitable and dedicated State forest, except that in order to compensate for the lack of planting in recent years, there need be no objection to more than 2,000 acres per year being planted in the first few years of the scheme before maintenance works become heavy.

With a planting rate of 2,000 acres per year and an M.A.I. of 150 cubic feet per annum, 80,000 net acres of effective softwood forest should at the end of 40 years be yielding a return of 240,000 loads annually of log timber, or 72 million super feet of sawn timber, roughly equivalent to half the estimated total requirements of the State in sawn timber in 40 years' time, and would not exceed the expected deficiency in hardwood supplies at that time. Some allowance has to be made for possible losses from fire, failures and other causes, and it is considered that 100,000 acres of softwood forest is the minimum area that should be aimed at, while if areas of proven suitability and economic location can be made available, a total softwood estate of 200,000 acres for Western Australia would be quite reasonable.

The working plan states that there are 240,000 acres of Crown lands in the State considered reasonably safe for planting with softwoods. The Forests Department, however, has experienced considerable difficulty in securing the reservation of suitable land for pine planting. The Lands Department appears to have some hesitation in reserving for afforestation areas which might eventually be sought for agriculture. However, it appears reasonable to expect that there is sufficient land available for settlement in Western Australia to justify some sacrifice being made on the part of other settlement in the interests of the State as a whole, just as large areas of forest have in the past been sacrificed for agricultural settlement.

Recent action to reserve land for pine planting in Western Australia is as follows:

Gnangara Plantation.—In December, 1950, the Conservator of Forests requested the reservation of approximately 17,470 acres adjoining Gnangara timber reserve on the north. The request was refused on the ground that the area would be needed in the not too distant future for subdivision into small farms and gardens. Approximately 122,000 acres adjoining the above area on the north is held under lease until 1961 by the Commonwealth Government as a bombing range. Approaches have been made to the Commonwealth authorities for the release of this land upon expiration of the lease, but no agreement has yet been reached.

Willcock Plantation.—In February, 1949, the Conservator of Forests requested the temporary reservation of approximately 5,700 acres of surveyed land, which was granted. In June, 1950, the Conservator requested the reservation as a forest reserve of 23,580 acres, including the above 5,700 acres. Reservation of 9,850 acres was approved but the request for the remainder of the larger area, including the 5,700 acres of surveyed land, was refused on the ground that it was needed for developmental purposes.
2. Forest Regulation and Administration.

(Term of Reference 4.)

Forest regulation covers the organisation of the forest into working units and its management. The main object of forest management is generally the development and maintenance of the forest stocking necessary to secure the highest possible sustained yield. With a long rotation crop, such as timber, continuity of policy and planned management is essential. Forest regulation is therefore usually exercised under the directions and prescriptions of forest working plans, which set out the objects of management and the actions to be taken to achieve them. Such working plans are usually sanctioned by the highest competent authority, and major deviations permitted only with the approval of the same authority.

Section 31 of the Forests Act, 1918, provides that the Conservator shall, from time to time, prepare working plans for each State forest and timber reserve, that such working plans shall regulate the management of each State forest and timber reserve respectively for a period not exceeding 10 years, and that they may specify, inter alia, the maximum quantity of forest produce that may be disposed of annually.

Section 31 also provides that every working plan shall be subject to the approval of the Governor, and when so approved, shall have effect, and shall not be altered except on the recommendation of the Conservator.

In the years immediately following the passing of the Forests Act, a number of working plans were prepared and approved for specific forest areas.

In 1926, however, the then Conservator of Forests, S. L. Kessell, concerned with the rapidly rising rate of exploitation of the native forests, decided to correlate all the existing working plans and to place the industry as a whole on a regulated yield basis.

A working plan for the karri forest was approved to take effect as from 1st January, 1927. Under this plan the cut of karri from State forests, timber reserves and other Crown lands was limited to 150,000 loads per annum over a period of 15 years. It was known at that time, however, that there was sufficient mature merchantable karri to last at this rate of cutting for at least 40 years.

A working plan for the jarrah forest was also approved to take effect as from 1st January, 1929, limiting the cut of that species from all State forests, timber reserves and other Crown lands to 460,000 loads annually over a period of 45 years.

A total average annual cut of jarrah and karri of 610,000 loads was therefore allowed under these two plans.
In 1944 it was decided to control the saw-milling of all species on all State forests, timber reserves and other Crown lands under one general working plan, except that the operations of sleeper sawmills would be controlled by a special sleeper milling working plan, and the operations of case mills by a case milling working plan.

A general jarrah, karri and wandoo working plan, to replace the original jarrah and karri working plans, was approved to take effect as from 1st January, 1945. This plan covers the operations on all State forests and other Crown lands of the general purpose sawmills, which constitute the bulk of the sawmilling industry in Western Australia. It allows a cut in saw logs for such mills of approximately 600,000 loads per annum. It is designed to ensure a stable long term industry providing continuity of output and employment, and was based upon the existing organisation of the sawmilling industry. It divided the bulk of the forests of the South-West into milling areas, designed to provide, for a mill of the approved type and capacity, a life at least sufficiently long to enable the capital costs involved in its establishment and working to be recouped by the time the permissible cut on the area was exhausted. It also endeavoured to provide that as the permissible cut on a sawmilling area was exhausted, other areas would be made available for a mill of similar capacity, so that continuity of employment and output would be assured. It was not possible to provide in all cases that such areas would be made available adjoining the exhausted permits, and provision was made for a partial migration of the sawmilling industry from the older forest workings of the north to the virgin forests of the south.

In general, it was expected that the whole of the virgin forests would be developed and worked over under this plan in the 30 years ending 31st December, 1975.

The total permissible cut in general purpose sawmills working on State forests, timber reserves and other Crown lands at that time was something like 750,000 loads, but the actual cut was only about 650,000 loads annually, and it was appreciated that it would take some years after the end of the war for maximum production to be attained, while the total permissible cut at any time was never likely to be achieved.

With these factors in mind, as well as the possibility of a need for reduction in the available cut at the end of 30 years, the plan set down the following distribution of the cut for general sawmilling:

<table>
<thead>
<tr>
<th>Five years—</th>
<th>Loads annually</th>
<th>Total loads</th>
</tr>
</thead>
<tbody>
<tr>
<td>1946-1949</td>
<td>634,300</td>
<td>3,171,500</td>
</tr>
<tr>
<td>1950-1954</td>
<td>626,100</td>
<td>3,150,500</td>
</tr>
<tr>
<td>Ten years—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1955-1964</td>
<td>603,700</td>
<td>6,037,000</td>
</tr>
<tr>
<td>1965-1974</td>
<td>546,700</td>
<td>5,467,000</td>
</tr>
</tbody>
</table>

17,806,000

As the plan is subject to revision within not more than 10 years from the beginning of 1945, the proposed cut for the last two decades has necessarily to be tentative only. In addition, the plan notes that other species such as blackbutt, tuart, marri, bullich, she-oak and exotic pine will be cut.

The sleeper milling working plan was also approved to take effect as from 1st January, 1945. Based upon the 24 sleeper mills operating upon State forests, timber reserves and other Crown lands at the time, this plan prescribed cutting areas estimated to be capable of producing their likely requirements or those of mills of similar capacity in their place for a period of 10 years, but provided that the Conservator could at any time make the total provision in the round for the 10 years of the plan 1,000,000 loads. The plan provides that no additional sleeper mills will be permitted except to effect satisfactory utilisation in country to be devoted to post war settlement schemes, or to satisfy some abnormal demand for timber for post war development, or where it is necessary to prevent loss of timber in clearing land already alienated. The general jarrah, karri and wandoo working plan stated that there were possibly 500,000 to 1,000,000 additional loads of log timber in poor forest on the fringes of the main jarrah forest, and that this additional material would probably also be utilised by sleeper mills. It has not been found possible to complete the case milling working plan, but a draft has been prepared, and in the course of such preparation, the forest has been tentatively divided into fruit case milling areas. The operations of fruit case mills are normally restricted to already cut over areas, and from which it is desired, for silvicultural reasons, to remove material too short or otherwise unsuitable for general purpose or sleeper mills. Tentatively the cut for these mills has been fixed at about 30,000 loads per annum.

The average annual cut allowed under these working plans from 1950-1954 is therefore as follows:

- General purpose mills: 626,100 loads
- Sleeper mills: 100,000 loads
- Fruit case mills: 30,000 loads

However, the working plans make provision for some additional cutting to meet special circumstances, and the figure for fruit case cutting is likely to be increased rather than reduced. It is considered that the total allowable cut from State forests and Crown lands might therefore be regarded as 800,000 loads for the period in question.
**Determination of the Allowable Cut.**

In compiling these working plans, the Department has been under the handicap of having to make assumptions with regard to the degree of utilisation that would be achieved in the forest, and the rate of growth that would follow exploitation. Any determination of the allowable cut must therefore be subject to review as additional information becomes available on these points.

Apart from the difficulty of determining the volume of merchantable timber in the forest, there is insufficient information available to enable either the present or potential increment of the forests of the South-West to be satisfactorily determined. Without such information, approximate estimates only can be made of the desirable annual cut.

The estimate of resources on page 15 indicates that the greater part of the volume available for cutting from State forests and other Crown lands over the next 60 to 90 years is in the jarrah forest, which constitutes the bulk of the forest area of the South-West. About one half of the jarrah forest is still virgin.

Data from assessment lines has been produced by the Conservator of Forests which suggest that the cut over forest is growing in volume at the rate of about .7 per cent. per annum. If the annual cut is based on this rate of increment, the cut from State forests and other Crown lands, which was 507,928 loads in 1950–51, would need to be reduced by about 50 per cent. On the other hand, if the cut were to approach the present permissible cut on State forests and other Crown lands of 1,000,000 loads per annum, it appears that the present estimated growing stock above 25in. G.B.H. would be progressively and rapidly reduced. There is a strong possibility that the stage would ultimately be reached when the quantity of timber available for cutting will be comparatively small until sizes at present under 25in. G.B.H. reach exploitable size.

The problem can, however, be approached from a different angle, with particular attention to the forests of the future. There are formulae employed by foresters which can be used as a basis for calculating the cut in cases where reliable information is limited to the existing volume and the rotation on which the forest is to be managed. The simplest of these is known as von Mantel’s method, which can be expressed as the volume of the forest divided by half the rotation. However, this formula is based on the premise that increment on the existing growing stock is normal, and in the forests of the South-West of Western Australia, as in all virgin and recently virgin forests, the increment is far from normal, a large proportion of the volume being in mature and over mature sizes, with a marked deficiency in the smaller sizes. In the case of such forests, considerable judgment has to be exercised in the application of the principles underlying the formula, and certain assumptions have to be made, particularly with regard to the rate of growth of the forest it is aimed to grow and the character and quantity of the existing stocking of the forests:

1. From evidence supplied by the Forests Department, it appears reasonable to assess the stocking of merchantable timber above 25in. G.B.H. on 4,000,000 acres of State forests and Crown lands as roughly about 38,000,000 loads for jarrah and 8,000,000 loads for karri.

2. It is to be anticipated that in the future the forests will be soundly managed and protected from fire, when an average increment in girth breast high of .5in. in the case of jarrah and .8in. in the case of karri may be expected.

3. The age of many of the trees constituting the present forests of the South-West greatly exceeds that of any practical future rotation, and it does not seem unreasonable to assume a rotation for jarrah of 150 years and for karri 90 years.

4. As no information is available of the volume in sizes under 25in. G.B.H., it would be obviously incorrect to base calculations on rotations not adjusted to allow for the time taken to reach this size, which in the new crop is assumed to be 30 years for jarrah and 25 years for karri. The adjusted rotations for this calculation are 144 years for jarrah and 93 years for karri.

Von Mantel’s formula and the modifications given above still imply normal increment in the existing stand, but as already stated, the increment of the forests of the South-West is much below normal, largely because a considerable proportion of the volume is in virgin stands which carry no net increment. This proportion has been estimated approximately at half of the jarrah volume and 90 per cent. of the karri volume. Hence a realistic basis for determining the cut would appear to be 50 per cent. of jarrah volume divided by the rotation plus 50 per cent. divided by half the rotation, and 90 per cent. of karri volume divided by the rotation plus 10 per cent. divided by half the rotation.

This will give an annual cut of jarrah of about 396,000 loads, and of karri about 105,000 loads, or a total of 502,000 loads approximately.

In addition to the volume on which the above cut is based, there is roughly estimated to be also on Crown lands about 11,000,000 loads of poor quality jarrah logs, 5,000,000 loads of marri logs and 2,000,000 loads of jarrah in sub-marginal forest outside the working plan, i.e., a total of 18,000,000 loads.

If as much as half of this can be utilised during the next 30 years, a further 300,000 loads of log timber per annum will be available.
Some fire loss may be expected and to allow for this it will be necessary to attempt utilisation of more than half of the 18,000,000 loads mentioned above if a total cut of 800,000 loads per annum is to be obtained over the next 30 years.

On private property, including alienated land on which the timber is reserved to the Crown, there is roughly estimated to be a further 6,500,000 loads. If half of this volume can be utilised during the next 30 years, a further 100,000 loads of log timber per annum will be available.

Relation of the Sawmilling Industry to the Allowable Cut.

In distinction to the term “allowable cut” as determined by the working plan, the term “permissible cut” is used herein as representing the permissible cut on the permit for the cutting of which the mill was erected, or in the case of private property mills, the registered intake capacity of the mill. The total cut from State forests and all other Crown lands to date has been only a little over 50 per cent. of the allowable cut under the working plan. It is necessary to appreciate that the failure to cut the allowable cut in past years does not in itself permit the cut in the future to be increased to an equivalent extent.

In view of the fact that sawmillers have been only cutting about 50 per cent. of their permissible cut, and in an endeavour to meet the present urgent demand for timber, the Conservator of Forests has issued permits, and in certain cases increased the permissible cut on existing permits until the total permissible cut on State forests and Crown lands at the present day is 1,076,960 loads. Many of these permits are only for small parcels of timber and for short terms. Nevertheless the action has resulted in an increase in the number of mills drawing on Crown land supplies for their timber from about 60 in 1938-39 to 126 at the present day. The additional mills now operating upon Crown lands, having no immediate incentive to look elsewhere for their log supplies, will press for continuity of supply from Crown lands. The volume of timber in the State is obviously not capable of definitely sustaining all the existing sawmills if they cut to capacity, nor is the timber on Crown lands capable of maintaining all the mills at present drawing logs therefrom.

As a result of the erection of new mills, only about 50 per cent. of the permissible cut is still being taken, and few mills are cutting near capacity. Only one large mill, that of Bunning Brothers at Nyamup, exceeded its permissible intake last year, but the cut on Crown lands rose from 421,528 loads in 1949-50 to 586,688 loads in 1950-51. This sharp increase in intake can be expected to continue as more manpower becomes available to the mills.

It is undoubtedly necessary to consider the steps to be taken to regulate the cut in the future. To this end it is considered that the present working plan, until it is revised, should provide the basis, and the following statement has been prepared to show the relative positions under the working plans of all the mills in the State:

### Crown Lands.

<table>
<thead>
<tr>
<th>Mill Type</th>
<th>No.</th>
<th>Permissible Intake</th>
<th>Actual Intake 1950-51</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Purpose Mills</td>
<td>32</td>
<td>598,460</td>
<td>304,110</td>
</tr>
<tr>
<td>Should have closed down in 1949 under working plan provisions</td>
<td>11</td>
<td>142,440</td>
<td>24,940</td>
</tr>
<tr>
<td>Additional to the provisions of the working plan</td>
<td>37</td>
<td>158,339</td>
<td>87,773</td>
</tr>
<tr>
<td>Sleeper Mills</td>
<td>29</td>
<td>86,389</td>
<td>63,021</td>
</tr>
<tr>
<td>Converted from sleeper mills provided for in the working plan to long length scantling and sleeper mills</td>
<td>2</td>
<td>1,359</td>
<td>1,416</td>
</tr>
<tr>
<td>Case Mills</td>
<td>2</td>
<td>24,120</td>
<td>11,886</td>
</tr>
<tr>
<td>Shred Mills</td>
<td>2</td>
<td>2,339</td>
<td>3,506</td>
</tr>
<tr>
<td>Sheoak Mills</td>
<td>2</td>
<td>42,780</td>
<td>7,347</td>
</tr>
</tbody>
</table>

### Private Property.

<table>
<thead>
<tr>
<th>Mill Type</th>
<th>No.</th>
<th>Permissible Intake</th>
<th>Actual Intake 1950-51</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Purpose Mills</td>
<td>38</td>
<td>303,420</td>
<td>110,823</td>
</tr>
<tr>
<td>Sleeper Mills</td>
<td>13</td>
<td>30,560</td>
<td>15,944</td>
</tr>
<tr>
<td>Case Mills</td>
<td>29</td>
<td>42,780</td>
<td>7,347</td>
</tr>
</tbody>
</table>

### Combined.

- Grand total permissible intake: 1,348,139
- Grand total actual intake: 588,152

In addition, provision has to be made for the Kent River mill with an intake of 16,000 loads per annum, and for a cut of 64,800 loads per annum in the virgin forests remaining unallocated between the Shannon and Frankland Rivers.

The position must be faced that mills without log supplies must eventually close down, and the earlier the permissible cut is reduced to one which can be sustained over a long period, the less will be the dislocation in the timber industry. Any reduction should begin with mills in categories (a) (ii), (a) (iii) and (b) (ii).

Some reduction will be brought about early and naturally by the exhaustion of log supplies on short term permit areas. This is particularly the case in the metropolitan area, and its comparatively close proximity. In category (a) (ii) are some mills for which areas were sold in the extreme south in replacement, and hence they should close. In category (a) (iii) are many short term permits sold at the direction of the Government in an attempt to meet special demands. These will expire by exhaustion and should not be renewed.

Class (b) (i) and (b) (ii) mills will probably be maintained as additional cutting will become available from time to time on areas from which the marketable timber has to be removed in advance of clearing for agricultural settlement, but the class (b) (ii) mills should be required to return to the conditions of their original permit.

There will always be some cutting for case mills and other small mills on what is generally regarded as cut over or exhausted forest. This will vary with both general trade and local market conditions. In cities, for example, there is always a demand for palings
and in orchard districts, for fruit cases, both of which may be regarded as recovery lines and so obtainable from poor quality trees. The Department has always made case cutting activities freely available in exhausted bush, but such mills cannot be regarded as important components of a great timber industry, or as making any major contribution to the State's sawn timber production, and it is particularly important that the number of small mills should be strictly limited owing to the drain they place upon a very restricted pool of skilled sawmill labour. Some case mill operators, once they obtain an area on Crown land, have made application for a change to more lucrative lines of production, and have been supported in their demand by local shortages of building timber. It has been noted that against the advice of the Conservator, instructions have been issued that such applications are to be granted to increase the production of housing timber. This ignores several important factors including the State's essential need for timber for other purposes than housing, the necessity for long range stability in forestry and the sawmilling industry, and the fact that the important timbers in house building, namely, flooring and joinery, must be obtained from the larger mills, which necessarily can produce all the rough sawn timber required for housing in the course of their ordinary mill run.

Some sales in recent years by the Department under specific instructions to the Conservator to meet particular needs of the Government, may have seemed at the time to be a desirable expedient, but there can be no question of the risk to the security of the timber industry involved by such action.

As an expediency and as a purely temporary measure, the practice has recently been introduced of selling parcels of logs by direct conversion to augment the log supplies of city mills in temporary difficulties. This has much to commend it, but any attempt by the mills to obtain more than a comparatively small percentage of their requirements from this source, or to draw such logs for more than a short period, should be resisted.

It is inevitable that the Forests Department will be beset with applications for additional timber from Crown lands, although it is to be expected that there will be a lessening of interest in local demand as production increases.

The importance of the reduction measures in the interests of long term yield which has been the policy of the Forests Department for a quarter of a century cannot be over emphasised, although it must be expected that the steps required will give rise to complaints.

There is still a considerable volume of timber on private property, though by reason of its scattered nature, any attempt to assess its economic potentialities must be highly speculative. Nevertheless it will provide for many years an output of sawn timber. An influence of importance in this direction will be the refusal of the Forests Department to make Crown timber available to private property mills.

If the growth rate in the forest can be improved by good silviculture and good forest management, the allowable yield or cut will be consequently increased. Conversely any cutting capacity will be exhausted because of unusual demands at any time can only be made at the expense of the future output from the forests.

Forest Administration.

For administrative purposes, the forests of the South-West are divided into blocks of roughly 5,000 to 10,000 acres each, and as the work in a district intensifies, these blocks are further divided into compartments, which range generally from 500 to 750 acres in extent. Direct administration of the forests comes from divisional headquarters.

Each division consists of a varying number of districts under the charge of district foresters and foresters, under whom are assistant foresters. Assistant foresters act as tree markers and timber inspectors, and are also engaged on fire control work and the supervision of the work of gangs of forest workmen. Gangs are under the direct charge of overseers, who with their gangs may reside at district headquarters. In the native forest an overseer has charge of a number of blocks. On plantations there is an overseer to each block. Forest assistants, in charge of the clerical staff in district offices, are also engaged in fire control work.

The administrative subdivision is largely decided by the amount of sawmilling or plantation operations, or in some cases, the extent of fire control responsibility.

Each year the sawmiller submits his proposals for a cutting coupe and roading to the district forester, who approves or requires amendment as may be considered necessary.

Trees to be felled are marked with an axe head brand by Departmental tree markers, but fellers are controlled by the sawmill bush boss. Tree markers are required to assess every quarter the areas they have marked, in order to ascertain the amount of material left behind in felling operations. Constant supervision of the tree markers by experienced professional foresters is necessary to ensure maintenance of standards.

Working plan control is maintained at head office. All operations are recorded on progress plans, and at the end of every quarter, the volume taken off the area is related to the acreage cut over. As the assessments made by the tree markers are not necessarily on good samples of the forest, the volume remaining is not related to the area cut over, although in some Divisions, assessment lines used by the tree markers are located upon and become the permanent assessment lines.

During the post war period a number of Divisions were either eliminated or combined as an economy measure. Up to six additional Divisions are now required in the hardwood areas and plans are in hand for the establishment of two new plantation Divisions. In view of the expansion of work,
funds need to be made available for the maintenance of these additional Divisions. A consequential increase will be required in the number of districts.

The rate of forest assessment and determination of increment needs to be increased. This involves considerable computation and calculation in the office, necessitating the employment of appropriate staff in a Statistical Section, and there is need for a special officer in the Management Branch to take charge of the Department’s assessment work.

3. Forest Policy, including the Granting and Conditions of Existing and Future Permits. (Term of Reference 7.)

The forest policy of a State should take into account the whole of the forest resources, present and potential, of that State, and make adequate arrangements for their protection, management and utilisation in the interests of the community as a whole.

The forest policy of the State of Western Australia as expressed in the Forests Act, 1918, is broadly as follows:

1. There shall be a Forests Department, which, under the direction of the Minister, shall have, inter alia, the exclusive control and management of all matters of forest policy and of all State forests and timber reserves and the forest produce of other Crown lands.

2. There shall be a Conservator of Forests appointed by the Governor for terms of seven years who shall be the permanent head of the Department, directly responsible to the Minister for the management and control of State forests, timber reserves and the administration of the Department generally.

3. No officer shall be appointed to the Department without reference to the Conservator and no person shall be appointed or promoted to an office in the professional division unless he has the Degree of Diploma of a Forestry School recognised by the Governor, and no person shall be appointed or promoted to an office in the general division unless he has passed such examination as may be prescribed.

4. The forest lands of the State shall be classified.

5. Any Crown land may be dedicated State forest by the Governor and such dedication can only be revoked by a resolution of both Houses of Parliament.

6. Any Crown land may be reserved from sale as a timber reserve by the Governor, and such reservation shall not be revoked until a report on the proposal to revoke has been obtained from the Conservator.

7. Working plans shall be prepared to regulate the management of each State forest and timber reserve for periods not exceeding 10 years at a time. Such plans, after approval by the Governor, shall not be altered except upon the recommendation of the Conservator.

8. The Conservator may grant—

(a) Permits which shall confer on the holder exclusive rights to the forest produce specified therein from the area therein defined, and unless the aggregate royalty payable under the permit does not exceed £10, shall be submitted to public auction or tender and the royalties shall be thereby fixed; or

(b) Licences, which shall authorise the licensee in common with others to take and remove forest produce specified therein at a prescribed royalty.

(c) Leases over State forests, with the approval of the Minister, for terms not exceeding 20 years, for purposes not opposed to the interests of forestry.

9. Three-fifths of the net revenue of the Department in every financial year shall be placed to the credit of a fund for the improvement and reforestation of State forests and the development of forestry. The fund may be expended by the Conservator without any other authority than the approval of the Minister, provided that a scheme for such expenditure shall be submitted annually to and be subject to the approval of Parliament.

10. The Governor may declare that certain species or classes of timber shall not be exported until the permission of the Conservator to the export has been obtained.

11. If any area of not less than 10 acres is planted with trees approved by the Conservator and at a density of not less than 500 trees per acre, any increase in the value of such land by reason of the trees so planted shall not be taken into consideration in computing the rateable value of the land for local Government purposes.

12. The purchaser of land under conditional purchase shall use an area of not less than 2 per centum of such land for the growth of timber or other forest produce.

13. The planting of trees approved by the Conservator of not less than five acres on any land acquired under conditional purchase shall be deemed an improvement within the meaning of the Land Act and the conservation and improvement to the satisfaction of the Conservator of indigenous timber already growing on any such land may be deemed an improvement within the meaning of the Act.
The Sandalwood Act, 1929, empowers the Governor to limit the quantity of sandalwood that may be removed from alienated land during any period, and forbids the pulling and removal of sandalwood from such lands unless a licence to do so has been granted by the Conservator of Forests.

The Land Act provides that land may be alienated, with the timber reserved to the Crown.

In short, the forest policy of Western Australia is that the forest resources of the State shall be controlled and managed by a Department staffed with officers with adequate forestry qualifications and led and directed by a Conservator appointed by the Governor for terms of seven years. The Conservator is solely responsible for the management and control of State forests and timber reserves and the administration of the Department generally, and may expend on forestry three-fifths of the net revenue of the Department.

Protection is afforded the forest lands of the State by dedicating them State forests or reserving them as timber reserves, and some provision is made to prevent unnecessary destruction of forest resources on alienated lands, while encouragement is offered for the planting of forests and the conservation of timber on alienated land.

The Government is assured maximum value for the forest produce of the State by the provision that any considerable exclusive right shall be disposed of, by the Conservator, under permits sold by auction or tender.

Provision is made for requiring a satisfactory standard in any timber exported from the State.

It will be seen that this policy makes provision for the protection, management and utilisation of the forest resources of the State in the interests of the community as a whole. It does not deal to any great extent with private forests, but it is not considered that the time has arrived when it is necessary or practicable for the Government to take any further decisive action in this direction.

It is my opinion that the forest policy of Western Australia is sound in principle and has so far been soundly administered.

It is believed that Western Australia has insufficient timber resources to meet the requirements of its probable future population. Therefore all the forest area economically suitable for devotion to the production of timber in perpetuity should, as far as possible, be dedicated State forest and all areas of Crown lands carrying sawmilling timber should be reserved from sale until the timber has been removed. Maintenance of the programme of afforestation needs to be ensured.

In the less well-forested regions of the State, it is necessary to give consideration to the conservation and extension of existing tree growth, not only to provide timber for local use when it is economically possible to do so, but also for the purpose of conserving the soil and maintaining its fertility.

Apart from the requirements of Western Australia, there is also a national and even an international responsibility to attempt to satisfy the needs of other States and countries which are unable to provide themselves with material of the type produced in Western Australia for their essential purposes. The import and export of timber must therefore also be given consideration in the forest policy of the State. This aspect is referred to in the section under "Demands on the Forest Resources."

Within the powers, authorities and duties provided by the Forests Act, the policy of the Forests Department has been stated by the Conservator of Forests as follows:—

To provide as far as possible a continuous yield from our forests, not only to supply timber, which is a basic raw material, but also to ensure stability and long life in the timber industry which, as a rural industry, has provided employment for thousands of people, and has meant so much to the development of the State.

The Conservator further stated that the Department has endeavoured to maintain stability in the industry by—

1. Adhering to the provisions of the long term working plan, which provides that as far as possible when the allowed cut on a milling area has been exhausted, another area will be approved for sale for a mill of equivalent capacity in order to provide continuity of output and employment.

2. Maintaining the equivalent positions of the various organisations in the industry as far as possible.

3. Avoiding undue multiplication of small mills, which must inevitably result in a demand for additional cutting to allow them to develop.

One witness contended in evidence that the aims expressed in 1 and 2 above are inconsistent. I do not agree, as although the Department may endeavour to maintain the equivalent positions of the various organisations in the industry as far as possible, it is not able to guarantee a new permit to any particular company until the area has been submitted to auction or tender and the company concerned has justified its claim by its bid or tender, as the case may be.

From the evidence submitted on the subject of the granting and conditions of existing and future permits, it was obvious that there were two sections of opinion in the sawmilling industry—those who were reasonably satisfied with their present rights and those who were not.

Under the Forests Act, 1918, the term of a permit shall not exceed 10 years, but may be renewed. Permits are often sold over areas carrying sufficient timber to keep a mill of the stipulated capacity supplied for many years, but the practice has always been adopted by the Forests Department of actually issuing the permit for 12 months at a time and renewing it annually until the permissible cut on the permit is exhausted.
Some witnesses contended that in view of the considerable capital expenditure involved in the construction of mills and the erection of housing and other facilities, permits should be issued for longer periods than 12 months.

As far as the Forests Department is concerned, it is undoubtedly of value to be able to issue permits annually, in that it brings every permit up for review at regular intervals, facilitates the introduction of any additional conditions and the revision of royalties, and has a general effect upon permit holders which is believed to be beneficial.

Since the Conservator has the right to cancel permits for breach of conditions, and can agree with the holder of a permit for the imposition of new conditions at any time, it would appear that there should be no very serious objection to a permit being issued for the full time for which it is advertised, or the 10 years provided under the Act, whichever is the shorter. In the event of a sawmiller being unsatisfactory in his operations at any time, the Conservator would have ample justification under the conditions of the permit and the regulations to either cancel his existing permit or agree with him to a reduction of the term of the permit to an annual basis until operations were again satisfactory. In the case of a new permit, it would also be reasonable to decide that it should not be issued other than on an annual basis until the mill was actually in satisfactory operation. In the case of permits issued for longer periods than 12 months, it would be essential to insert a condition that the Conservator could at any time vary the royalty rate in conformity with any general re-appraisal of royalties that might be decided upon.

Normally there would have been no question of permits not being renewed annually until the permissible cut on the permit was exhausted, so long as the permit holder made a reasonable endeavour to comply with the conditions of his permit.

The case has, however, lately arisen where certain permit holders would not agree with the Conservator to the inclusion in their permit of new conditions which they believed to be impracticable. In consequence, up to the time of the Commissioner's hearing, these permits had not been renewed, although the mills were still in operation on the areas concerned. The position naturally gave rise to some concern, and in the circumstances, there is logic in the claim by sawmillers that they should receive more than an annual permit when their capital expenditure has been considerable and their fulfilment of the permit conditions satisfactory. It is not considered, however, that such extended terms would really confer any considerable advantage on the sawmiller.

Some witnesses expressed criticism of the fact that some of the larger mills were only operating to part capacity, and advanced the opinion that the building of new mills on some of the larger permits was being unnecessarily delayed. It was suggested that in such cases the permits should be cancelled and the areas made available to existing mills, which were short of log supplies. The case most frequently criticised was that of a permit issued to Whittaker Brothers over an area in the Chittering district, portion at least of which could assist to provide the requirements for some time of the many small mills which have been erected in and about the metropolitan area of recent years, without adequate log supplies. The facts in the case are that when the permit area was originally granted them, Whittaker Brothers had reasonable expectations of purchasing an existing mill. Eventually these negotiations fell through, and some delay occurred until they succeeded in leasing a mill. Meantime they had commenced the assembly of the material and equipment for a new mill. At the time of my investigation, the leased mill was working to capacity, and the company was ready to commence immediate erection of the new mill as soon as agreement had been reached between themselves and the Conservator with regard to the site.

As they had each year been granted exemption from working conditions following the Conservator's examination of the position, it is not considered that it would be reasonable to cancel this permit now, but in view of its proximity to the city area, it is considered that an assessment should be made of the log volume on the area as early as possible, in order to ascertain if there is any excess on the volume prescribed in the sale, from which case an area might be excised and made available for sale to other mills in the metropolitan area.

I am satisfied from my further examination that there is still less reason to disturb the existing tenure of other sawmilling permits, that any such action would have little, if any, beneficial effect upon timber production, and that it would, in the long run, be detrimental to the interests of the sawmilling industry as a whole, and to forestry.

All sawmillers, practically without exception, appear to believe that they deserve "special consideration" when approaching the exhaustion of the permissible cut on their permit areas. Since mills established under the provisions of the working plan should have recouped all the capital cost involved in their establishment by the time the permit cut is exhausted, it cannot be contended that such mills have any particular claim to special consideration if they are unable to maintain their place in the industry in competition for further areas.

A suggestion was made that when an area is sold for an existing mill and the owner of such mill is unsuccessful, the successful tenderer should be required to compensate the original owner for the value of his plant and buildings. While the suggestion is probably economically sound, it is considered that there would be great difficulties involved in its practical application as a legal measure.

In the case of mills granted permits outside the provisions of the working plan, no provision is possible for a permanent supply to
them under such category, and there can be no guarantee that further areas will be available when the existing permit area is exhausted.

The small sawmills' association submitted a case for the provision of permit areas for small mills whose supplies are approaching exhaustion, either on Crown lands or private property. A sawmiller who is approaching exhaustion of his log supplies may deserve sympathetic consideration by the Forests Department, but the Forests Department cannot provide cutting for every person who establishes a mill, with inadequate log resources behind him, and there can be no question of there being any obligation upon the Department to provide timber supplies for all mills.

Certain witnesses strongly contended that they had been promised particular further areas by the Conservator of Forests. In no case did they prove the allegation.

One witness submitted as evidence to this effect a letter dated 28th August, 1946, from the Conservator of Forests to the local managing director of the Kauri Timber Co. Ltd., in which it is stated—

This Department attaches great importance to the continuity of operations of the Nannup mill, insofar as production of timber, continuous employment for the people and assistance in the development of the South-West are concerned. The Department will be glad to submit to auction or tender, in accordance with the terms of the Forest Act, the further area at Darradup which could be logged by your mill. It is not desired to introduce an additional mill into the industry, and normally the further area would be advertised when your existing permit area is about to be completed.

The same witness handed in, as evidence to the same effect, copy of a letter addressed to E. K. Horne, Esq., M.L.A., dated 30th March, 1949, a copy of which had been forwarded to the local managing director of the Kauri Timber Co. Ltd., for his information. An extract from this letter reads—

The policy of the Forests Department has been that when permit areas are cut out, wherever additional forest is available, a new area shall be submitted to sale for a mill of similar size and capacity. In this way maintenance of output and employment for the people is ensured. It is natural to suppose, of course, that a mill which has been in existence for many years in the neighbourhood and whose capital is largely written off is in a very favourable position at such subsequent sales. It can be understood also that a mill which is approaching exhaustion of its log supplies on its existing permit area will tend to increase its degree of utilisation on such area to lengthen its life.

The Kauri Timber Co. Ltd. approached the Hon. the Minister for Forests some time ago in this connection and was promised that the Forests Department would make a survey of forest west and south-west of Nannup as aerial photographs became available. This study is at present in progress. Only very tentative estimates can be made at this stage, but it is believed that there is sufficient timber to provide 25-30 years' life for a mill approaching the intake of the Nannup mill.

Strong competition by other sawmills at the sale of this timber can be expected, but as pointed out, the Kauri Timber Co. Ltd. has a decided advantage at auction or tender.

The statements contained in these letters from the Conservator are not at variance with all the statements made by him on this subject which were brought under my notice. It will be noted that in both letters the Conservator referred to the necessity for sale by auction or tender, and there was therefore no reason to assume that the Kauri Timber Co. Ltd. was being promised a permit on the area. The provisions of the Forests Act, 1918, make it quite clear that the Conservator cannot guarantee or promise to allot an area to anybody without the area having been first submitted to auction or tender.

There have been occasions when adjustments have been made to permit areas without reference to auction or tender, and although this may not be provided for in the Act, such cases as have come under my notice have obviously been in the interests of all the parties concerned, and involve transfers or subdivisions and not the issue of cutting rights over new country. In such cases only comparatively small parcels of timber were concerned, whereas the Darradup involved 350,000-700,000 loads, depending upon the area envisaged, and was sufficient for a separate mill.

Certain millers have at times requested the right to establish and/or operate additional mills on their permit areas. While it is considered that this might be permissible in a case where a mill of another type is able to utilise material too short in length or too inferior in quality for the existing mill, it is generally undesirable, and I consider it would be a circumvention of the provisions of the Act to allow an additional mill to cut timber for the cutting of which the permit was originally let to a particular mill, as this would shorten the life of the mill originally approved for the permit. If timber cannot be hauled to the approved mill from any special part of the permit area, or if the volume of the timber on the permit area is in excess of the requirements of the approved mill, then it is considered that the excess area should be excised from the permit, and when the time is suitable, re-submitted for sale by auction or tender. Special consideration might be given to cases where surplus timber resulted from particularly intensive cutting on the part of the sawmiller.

The suggestion was made that wherever possible, areas which might be called buffer areas, should be established between sawmilling permits, so that if the volume of timber originally assessed was not realised on one sawmilling permit area, the total volume originally assessed could be made up out of the buffer areas, and in cases where mills overcut at the request of the Government, and so shorten the life of their mills, such mills could be compensated by being allocated an additional area from the buffer strips.

The suggestion has something to commend it, and it is believed that consideration should be given to such action in cases where it is found that an area has more timber on it than was originally assessed, and it is decided to excise the surplus area, but it is not considered that it would be advisable to make
such provision in designing new permit areas, as the existence of such buffer strips would tend to encourage sawmillers to work over their areas more rapidly and less intensively than is desirable.

The general practice of the Department is to sell small parcels of timber by auction, and entire sawmilling areas by tender. With one or two exceptions, this system has worked well in the past.

Some witnesses advanced the opinion that the Conservator should have power to allocate areas of forest for special or urgent purposes. It is considered that such power is unnecessary, and more liable to lead to difficulties than sale by auction or tender.

Several witnesses suggested that there should be a board charged with the responsibility of allocating permits, and in some cases, assessing royalties, the purpose of the suggestion being largely to avoid the system of auction and tender.

In general, it did not appear to be recognised by sawmillers that the highest or any other tender need not necessarily be accepted, and that if just cause existed, there should be no reason why the permit should not be allotted to other than the highest tenderer, even though the condition might be imposed that the successful applicant should pay the royalty of the highest tenderer if it were considered reasonable.

All private property production, including forest produce, is sold competitively. As a matter of sound business, there appears to be no reason why the product of Government forests should be sold differently, particularly in the case of larger quantities. It is considered to be in the interests of the sawmilling industry itself that the forests of the State should be managed on businesslike lines, and the production sold to those firms who have the most efficient organisations, staffs, plant and equipment, in both production and sales. The system of auction or tender has been generally satisfactory in the past, and it is considered that the present practice of competitive sale of the Government's assets in forest produce is superior to and less liable to abuse than disposing of them by arbitrary allocation and fixation of prices.

As provided in the Forests Act, an experienced Conservator of Forests, who is responsible for the management, protection and production of these forests, and for the expenditure and revenue of the Department, is the most suitable individual to grant permits and determine royalties, with due regard to the welfare of the interdependent industries of forestry and timber. Occasions will undoubtedly arise, however, when his decisions will be questioned, and it is considered that there should be a competent committee to hear appellants in such cases, and to recommend final action. In the constitution of any such appeals committee, the Forests Department is the organisation that will vitally concern in every case and should be represented by the Conservator or his nominee.

There is considered to be sound justification for another member to be a representative of the sawmillers, but such an appointment would need to be clear of any suggestion of political favour or interest, and I am unable to suggest a practical means of ensuring the selection of a suitable individual from the industry by ballot. There is no common association of sawmillers in Western Australia which could be invited to nominate a representative, and the interests of individual firms vary from time to time to such an extent that it would be extremely difficult to provide equitable voting rights. Moreover, any representative elected would need to be changed every time his own or the interests of any of the firms with which he was connected were affected. In the circumstances, it is suggested that the second member should be a person from outside the Public Service and the industry who, by his knowledge and experience, should be capable of assisting in considerations of either or both the practical and financial aspects of the sawmilling industry, preferably a member of the Institution of Engineers, or in the event of a suitable person not being available from that source, a practising member of the Institute of Chartered Accountants.

It is suggested that the third member, and chairman, should be a person of judicial capacity, such as a magistrate.

It is not considered that the lack of direct representation of the sawmilling industry on such a committee need be detrimental to its efficient functioning if it is incumbent on such a committee to hear every applicant for the permit in question who may be desirous of giving evidence.

4. Forest Utilisation and Harvesting of Timber Crops including Dead Timber. (Term of Reference 5.)

In 1950-51 the forests of Western Australia, both State and private, produced a total of 722,090 loads of saw logs. Firewood at about 400,000 loads, excluding sawmill waste, was the next highest item of production to saw logs, although considerably less in value. The production item of next greatest volume was wandoo for tannin extraction, about 37,000 loads, followed by mining timber, 14,000 loads, with piles, poles and round and split fencing material at a probably somewhat similar figure in total. All the other items of forest production are of comparatively minor importance from a quantity aspect.

The sawmilling industry is therefore the mainstay of the forest industry, as is practically always the case, and the main object of management of the forest should consequently be the production of sawmill logs. All other requirements in forest produce can generally be met incidental to the production of sawmill logs.

The main species utilised in saw log production in 1950-51 were jarrah, which comprised 76 per cent., followed by karri, 17½ per cent., and plantation-grown pine, nearly 1½ per cent. The remaining 5 per cent. consisted of wandoo, blackbutt, tuart, marri, sheoak and other species in still smaller quantities.
The proportion of jarrah and karri utilised over the last 20 years by the sawmills of Western Australia has fluctuated largely according to the location of the logging operations of the mills in the mixed jarrah and karri forest.

Over the last 10 years there has been a noteworthy increase in the production of saw logs of marri and plantation-grown pine, although the total quantities are still small.

After jarrah and karri, marri is the most abundant species of sawmilling size in Western Australia, and its utilisation is of considerable practical importance to Western Australian forestry and sawmilling. Sawmillers are not keen to mill it when they can more readily obtain other cleaner and consequently more economic species to mill, but apart from the need to fully utilise the forest production and increase the supply of saw logs, marri has certain characteristics which also justify the Forests Department in making special endeavours to increase its use. The heartwood is comparatively durable and its strength is greater than that of jarrah, while the sapwood has been for some years used in case manufacture. With increasing availability of labour, and an increasing appreciation by the sawmiller of the value to the life of his mill of maximum utilisation of the timber on his permit area, it may not be long before marri is much more generally cut than at present. Powellised marri sleepers laid in the railway line in 1912 gave a life as long as jarrah, and more recently tests have been laid down with the idea of investigating the life of marri sleepers treated with creosote and untreated. The Forests Department has built several cottages of marri to demonstrate the suitability of the timber for building purposes.

The increase in the utilisation of yarri, or blackbutt, is also of interest, but supplies of these species are far less extensive than are those of marri.

It is noted that the cut in sheoak has suffered a fluctuating, but gradual, diminution over the last 19 years. This timber is used in the furniture industry and is particularly useful for certain purposes, such as the cooperage trade, for which it has a specially high value. It is also reasonable to expect that it may have a particular silvicultural value in its association with the other species with which it occurs. This aspect should be studied by the Forests Department, and the growth of sheoak encouraged.

The additional cut of plantation-grown pine is the result of the early trial plantings of this genus, and increasing quantities should continue to become available in the future.

The use of wandoo for tannin extract is a matter of considerable interest. The company concerned in this industry, in addition to holding permits to remove, from Crown lands, wood unsuitable for sawmilling, has purchased the timber on large areas of private property, and has taken every reasonable opportunity of safeguarding its future supplies of raw material. A representative of the company expressed concern at the inability of the company to keep pace with the peeling operations of the sawmillers on Crown lands within economic distance of the tannin extract plant, and the consequent drying out and loss to the tannin extract industry of much of the material left in the field following sawmill logging operations. The Forests Department has this aspect under consideration, and in the interests of maximum utilisation, attention should be given to ensuring that further permits to cut wandoo for sawmilling purposes are, as far as practicable, integrated with the operations of the tannin extract company, particularly in view of the increasing shortage of tanning materials in the world.

The Forests Department does not encourage the cutting of plies and poles on State forests or Crown lands owing to the present need in the forest for these sizes to provide the future requirements of the sawmilling industry. As the supplies on private property disappear, the Forests Department should be able to meet requirements in plies and poles from the thinning operations which will be necessary in regenerated forest areas.

Peeling logs are generally the production of highest value in forestry. The peeling and plywood industry has been established in Perth, and one firm has entered into arrangements with the Forests Department for the supply of a minimum of 2,500 cubic feet and a maximum of 5,000 cubic feet per week of karri logs suitable for peeling. To date this contract has not been fulfilled by the Forests Department. For the nine months ending April, 1951, the average volume supplied was only 2,285 cubic feet per week, and it would appear that more vigorous action should be taken to meet the commitment, or an endeavour made to enter into some other more suitable arrangements.

It is a condition of all permits that the holders shall assist in the supply of peeling logs as required by the Conservator. A witness on behalf of the plywood company concerned asked that all sawmilling firms operating under permit in karri forest should be required to supply a quota of karri peeling logs to his company. It is considered, however, that it would not be very practicable to allocate such a small quantity amongst all the karri sawmillers and expect to get logs satisfactory for peeling purposes. It would obviously be preferable for one mill to become proficient in selecting the type of log required and to supply as much as possible.

Most of the peeling logs so far supplied have come from the operations of the State Saw Mills, as the original negotiations for the supply of these logs were conducted between the State Saw Mills and the company in question. However, it is not to be expected that the State Saw Mill management would be keen to supply the best of its logs to another organisation, particularly while forest labour for the production of logs is in short supply, and the Conservator of Forests has at times found it necessary to
have officers on the mill log skids to obtain even the limited quantities that have been made available. During the present difficult period it is considered that it would be reasonable for the Conservator to require some of the other large mills operating in karri to supply, under a similar arrangement as with the State Saw Mills, a proportion of the total required to provide the peeling company's requirements. The industry is of considerable importance to Western Australia, which otherwise would have to purchase the bulk of its requirements from inadequate supplies available in other States and from overseas.

The Department also supplies pine logs for peeling to a firm in the furniture industry. The pine peeling logs available are in very short lengths, but the company concerned has succeeded in satisfactorily using the small length material. This company has been receiving about 300 cubic feet per week, but would be prepared to take 1,000 cubic feet if the pine logs were available. Supplies of this material should gradually increase.

The possibility of pulping Western Australian timbers has been investigated. The eucalypts of Western Australia, like all other members of this genus, will make only a short fibred pulp. Jarrah is not particularly suited for the purpose, and karri, although probably as suitable as any other eucalypt timber, is an unsuitable colour, the bleaching of which would add considerably to the cost of production.

I agree with the Conservator that, particularly in view of the high quality of their timber for other purposes, these species are not likely to be used for pulping in the near future. Later when small thinnings are available in quantity from young stands and research and investigation elsewhere have overcome some of the present difficulties, they may be found useful for pulping, particularly if softwood plantations have been established to provide a mixture of long fibred pulp.

In an endeavour to alleviate the shortage of skilled labour for logging, the Forests Department recently instituted schools for fallers, each of which lasted about three months, and in which trainees were taught the care and maintenance of tools, the selection of trees, technique of felling, etc. Courses were given for returned servicemen and later for New Australians. At the end of each course, the men generally required only more practice to make them thoroughly proficient, and they were eagerly sought after by sawmillers. Endeavours to continue this training work have failed through lack of men.

New men to the industry usually receive their training by working alongside experienced workers, but the damage that can be done in the forest by an inexperienced faller is such that it is considered the Forests Department is justified in continuing to conduct these schools. Unfortunately applications to attend such schools are likely to be few and far between while ample work is available elsewhere at high wages.

In most of the logging operations on State forests the trees to be felled are marked in advance by an experienced forest officer. This is essential to ensure the reservation of sufficient vigorous trees for the next cutting cycle and the maximum utilisation possible of the inferior trees. Sawmillers who were not originally attracted by the idea of tree marking now appreciate that although a few good trees are reserved which they would like to fell, they obtain more timber to the acre than formerly, thus adding to the volume of merchantable timber in the forest and increasing the life of their mills. The effect upon the economics of logging and sawmilling of the increased demand for their products is considerably facilitating the acceptance of lower standard logs by the sawmilling industry.

One witness stated that the Conservator had repeatedly alleged that his company did not take logs down to the same standard as other mills. The witness insisted that such allegations were incorrect and produced in evidence letters which had passed between his company and the Conservator of Forests in May and June, 1949. The first from the company claimed that an unnecessary number of trees over 90in. G.B.H. were being retained by the Department. The Conservator in reply stated that the results of an assessment on the area cut over by the company showed that four loads per acre were not being marked, as they were below the standard the company would take, although they would be acceptable to most other mills. In its second letter, the company strongly denied the allegation. The concluding reply by the Conservator of Forests indicated that he would make a personal inspection of the area at an early date.

I have perused the files of the Forests Department on the subject and am satisfied that for some years, and at least as far back as 1938, the Conservator of Forests insisted that the company concerned was not prepared to take logs of a standard as low as that accepted by most other companies.

My inspection of areas operated over in the past by this and other companies has satisfied me that the opinion of the Conservator was justified. As a result of inspections of more recent operations, I am, however, also satisfied that the company is at present operating its areas as intensively as most other companies, and has been doing so for the last 12 months. Any difficulties that existed in this matter between the company and the Forests Department appear to have been dissipated.
One witness suggested that where a sawmill has fulfilled the conditions of his permit, cut over areas should not be excised therefrom. One reason for this suggestion is that, if economic conditions permit, the sawmill could go back over the area and remove the inferior trees not previously economically marketable, thus prolonging the life of his mill. The other reason was that at the end of the normal 30 year life of sawmilling areas under the working plan, the whole of the permit area would be available to the same mill to be worked over on a second cutting cycle, even though it would be necessary to again secure the area at auction or tender. Both reasons are economically sound, and it is believed that in practice, serious consideration should be given to the suggestion in certain cases. Nevertheless, the plan to allow cut over areas from a permit is such a strong inducement to thorough utilisation in the first instance that this power should not be removed, and when the permit holder has not, in the opinion of the Conservator, removed all the merchantable timber, the cut over areas should be excised so that in the interests of regeneration the Department may proceed with the utilisation of the lower standard trees rejected by sawmillers. Where in the course of silvicultural operations it is necessary to carry out felling, this work should be done by the Forests Department, and any logs resulting sold to existing mills as portion of their permissible quota in order to avoid increasing the total cut. Departmental logging may also be justified in the case of log supplies for small sawmilling units where the sawmiller is unable to maintain bush oversight. The conversion and sale by the Forests Department of short piles and poles in the course of silvicultural treatment is also considered to be necessary.

Although the use of the axe for felling is still general, the use of power-driven saws has made considerable advance. These power saws not only improve the felling rate but also save considerable timber as trees are felled much closer to the ground than is usual when hand tools are employed. Some sawmillers are showing commendable enterprise in providing these saws, and in such directions as the development of portable electricity generating plants to supply electric power for them. Usually it has not been found satisfactory to supply fellers with mechanical saws and expect them to be entirely responsible for their maintenance. If these saws are to give satisfaction, it will generally be necessary for sawmillers to provide the necessary servicing in the way of repairs, overhauls and sharpening. To achieve satisfaction in this direction means a considerable investment in spare machines and spare parts.

Most mills take a minimum log length of 14-16ft. but some not less than 30ft. Efforts should be made to reduce the minimum length of log acceptable and to utilise crown logs down to a diameter of about 10in.

In the case of the larger mills, log extraction has usually been by rail, as they have been established in districts where roads are few and far between. Once the main ways have been prepared and rails, locomotives and rolling stock purchased, this form of transport probably continues to be the cheapest available, but in these days of rising costs, shortages of steel and improved facilities for road construction, there is a definite trend to the use of motor trucks for the transport of logs from the forest to the mill.

The undulating nature of most of the forest country in the South-West and the open nature of the forest permits logging trucks to be taken close to the stump in many cases.

Firewood is in keen demand from any forest area within 70 miles of Perth, and in country centres where industries such as butter factories, electric power plants, etc., are established. The charcoal iron industry at Wundowie also provides a market for low-grade produce. Such markets for firewood and low-grade produce should eventually be of considerable value to the forest in obtaining maximum utilisation of the forest growth, provided they are restricted to material for which they can pay the value, and the forests or the economics of the forest are not jeopardised to keep such industries in operation during unfavourable financial times.

Dead Timber.

Statements have been made with regard to the desirability of salvaging dead logs in the forest on account of the added volume they will provide and the belief that they will produce timber dry enough for immediate use or at least considerably shorten the period normally required for drying sawn timber.

As a result, various trials have been made by Western Australian sawmillers with this class of material over the last 60 years. The conclusion generally reached has been that the timber was seldom dry enough to enable it to be used for any purpose where shrinkage was an undesirable factor and that owing to the deep cracking in the wood towards the interior of the log and the liability to extensive pinhole attack and rot in the centre, the milling of such timber was uneconomic. Sawmillers therefore are generally averse to milling logs from trees which have been dead for any considerable time. They will accept them if they are apparently sound but not if they show deep cracking or abundant pinhole attack on the outside.

The Manager of the Railway Mill at Banksiadale (Huxtable, R.H.) has taken a particular interest in the possibilities of milling and utilising this class of material. He has used the product satisfactorily as boards and for joinery work and it has shown very little shrinkage.

Evidence on his work made the following points:

1. The supply of dead timber in the forest suitable for sawmilling is limited, as also are the purposes for which it can be used.

2. Logs from dry standing dead trees are preferred to logs which have been lying on the ground.
3. The presence of dry rot and pinhole borer attack results in a reduced recovery and generally precludes the production from dead logs of large sizes or select material.

4. The product has been used satisfactorily as boards and for joinery work in short lengths, and has shown very little shrinkage.

5. The timber should be stacked out for approximately three months to obtain the best results.

6. The cost of milling dead logs is higher than the cost of milling green logs.

In the case of such of this material as I sawn, the recovery was obviously well below average. The total intake of dead logs into the Banksiadale mill during the year 1949-50 was only 1.4 per cent. of the total intake.

Since 1947 the Forests Department has carried out a limited series of tests with dead logs chiefly in connection with sawn recovery, moisture content and rate of drying of the sawn timber. The work is still proceeding and the results to October, 1951 are as follows:

It has been found that—

1. The recovery in sawn timber from trees which have been dead for years is much lower than from living or only recently dead trees.

2. The moisture content of the sawn timber at various distances in depth from the outside of a dead log varies considerably, but generally it is difficult to obtain timber from such logs with a moisture content as low as 20-25 per cent., the stage at which it is considered ready for the kiln seasoning used to reduce it rapidly to the "air dry" condition for Perth of 11-12 per cent.

Beyond about 6in. from the surface of the log the moisture content rises gradually until beyond 12in. It is often almost as high as in logs from standing living trees.

The difference between the time required by timber from trees long dead and timber from living trees to reach 25 per cent. moisture content was generally about a month during the summer time but as long as five months when the sawing was done just prior to the winter.

3. As was to be expected, the lower the initial moisture content of the logs the less the shrinkage experienced, and although considerable variation occurs in individual cases, there can be no doubt that in some instances shrinkages would be very little and even scarcely appreciable. It cannot be claimed, however, that all timber from logs which have been dead for years is dry and that no shrinkage will occur after sawing.

Jarrah in the far south is not generally as sound as that grown towards the northern end of the jarrah belt and consequently defects are likely to be more pronounced in dead logs of this species in the south than in the north. It can also generally be said that in the case of dead standing jarrah trees butt logs are liable to be less sound than top logs, while in karri the reverse is likely to be the case. Dead karri trees which are a common feature in paddocks in the karri region and which may be quite sound at the butt are not infrequently found to be seriously attacked by fungi above the first log length.

The moisture content and behaviour of timber sawn from dying trees and trees so recently dead that the finer twigs which carry the leaves had not fallen were found to be little different from that of timber sawn from logs from living trees.

Sawmillers generally raise objections to sawing small logs from trees that have been dead for years as the deep surface cracking in such logs allows the recovery of very little timber.

It is considered that the utilisation of dead trees should be required wherever practicable, but the comparatively small saving in drying time, the cost of segregation in stacking necessary to take advantage of this, and the loss in recovery generally associated with the sawing of logs from trees which have been dead for years does not justify any particular direction to sawmillers to utilise such logs.

5. Sawmilling and Fire Prevention and Protection. (Term of Reference 6.)

The sawmills of Western Australia can be divided into three classes:

(a) General purpose mills—designed to produce for the general timber trade and sometimes producing some sleepers and cases in addition.

(b) Sleeper mills—designed to produce railway sleepers and often some scantling and occasionally some cases from the offcuts.

(c) Case mills—designed essentially to produce cases. These mills can also be considered in two groups:

(i) Crown land sawmills—which obtain their log supplies from State forests, timber reserves, other Crown lands and timber reserved to the Crown on alienated land.

(ii) Private property sawmills—which obtain their log supplies from private property owners.

Sawmill design in Western Australia is basically of the one pattern, using twin circulars or rarely a vertical frame, or in one or two cases, band saws for breaking down followed by dimension cutting on one or more breast benches.
The general purpose mills number about 150 and with a total intake capacity of over 1,000,000 loads, range in log intake capacity from 240 loads to 50,000 loads per annum.

Mills with an intake capacity of 15,000 loads or more per annum are generally referred to as "large" mills. They are solidly constructed, of a permanent nature, and for the haulage of logs are usually equipped with a railway system, steam locomotives and log trucks or with high powered motor trucks and trailers requiring the construction of solid road formation. They have to provide housing and the other amenities of a settlement for their employees.

In addition to the usual production of building timbers, etc., they can produce long length and large sectional timbers required for heavy construction and for re-sawing in other mills. They are the main producers of the State's supply of dry timber of flooring and joinery quality for the production of which they usually maintain large drying yards and seasoning kilns.

Provided sufficient timber is available, the large mills with an intake capacity of 21,600 loads and more are considered the most effective and economic type to operate and they are the only ones suited to deal adequately with the more remote areas of virgin forest where a complete settlement has to be established and the locality developed by the construction of expensive roading or railway systems.

Where the quantity of timber available does not justify the capital expenditure involved in the construction of a large mill and its attendant facilities, "medium" mills, with an intake of around 9,000 loads per annum are common. These mills are reasonably economically operated but they make a relatively high demand upon the limited pool of experienced workers available, and their power, equipment and design do not usually enable them to handle long lengths or produce very large dimension timber.

With an intake of below about 7,000 loads per annum are the "small" mills. They are cheaply constructed and expensive in their requirements in key mill personnel but as they are usually owner operated, they are often economically successful. They are generally established near towns and settlements and continuity of their operation is of less importance than in the case of the larger mills, as when the log supplies of these small mills are exhausted, other employment should be available locally for their employees.

The major part of the output of the small mill in the metropolitan area is in small dimension timber, such as scantlings, pickets, cases, etc. As a ready market exists for this class of material in the metropolitan area, there has been a marked increase in the number of small mills in the city during recent years.

From this table it will be noted that the 60 smallest mills constituting 40 per cent. of the total number of general purpose mills in the State, were of little practical importance in either capacity or production, and that about two-thirds of the total number of mills, those with an initial capacity of less than 7,000 loads per annum, only produced 14 per cent. of the total production. The medium mills with an intake capacity of around 9,000 loads per annum intake played a very important part in production for the year. The large mills, constituting about 15 per cent. of the total number of mills, produced 57 per cent. of the total number of mills, produced 57 per cent. of the total production, on new permits issued in 1944 a number were only just coming into production, and in addition, three old established large mills had been destroyed by fire and had to be rebuilt.

Practically all the large mills are Crown land mills and to effect the largest and most rapid increase in the State's production of sawn timber, every encouragement and assistance should be given these mills to achieve maximum production.

It is of interest that whereas the mills registered in 1947 and earlier years produced 65.8 per cent. of their registered capacity in 1949-50, those registered during 1948, 1949 and 1950 produced only 32.4 per cent., 21.6 per cent. and 10.2 per cent. respectively of their registered capacity, indicating the long drawn out delay common in mill erection.
They were originally developed to deal with small parcels of timber on private property. In its endeavours to improve utilisation, the Forests Department has provided for the establishment of a limited number on Crown lands. They have proved superior to the hewer in economy of timber and particularly useful in utilising logs which are too short for the general purpose mills. Logs for these mills are sent to sleeper length in the bush and from the stump are usually loaded, by hand winch or truck power, crosswise on the table top trucks, thus reducing to the minimum the expenditure necessary in hauling equipment.

(c) Case Mills.

There are about 50 case mills established in the State. Their average intake capacity is only about 5,400 loads per annum. In 1949-50 their production was 38,485 loads, or 41 per cent. of their registered capacity. They are able to use logs of a lower standard and shorter length than the sleeper mills. They have a particular value in certain types of forest and the Forests Department has freely made areas available for them in forest from which general purpose mill requirements have been removed.

It is necessary to emphasise the fact that the total capacity of all the mills in the State is much greater than the available supplies of suitable log timber and while there is a limited place for each type of mill, it is considered that from both the forestry and production aspects, priority should at present be given to mills in the following order:—

Large general purpose mills.
Sleeper mills.
Case mills; and
Other small mills.

Mill Production.

The main deterrent to increased production appears to be the shortage of labour in the large mills. It was noted that wherever adequate housing and other amenities were available, there appeared to be no shortage of labour. It was commonly stated in evidence that the only New Australians who stayed in the industry were the married men. In many instances they also induced others from their homeland to join the mill staff if housing were available.

The Housing Commission has assisted some mills to provide housing and it is believed that an extension of such assistance, by the provision of houses and hostels in central mill towns such as Manjimup and the provision of bus services from the towns to the surrounding mills, would be a direction in which the Government could effectively assist to increase production.

Sawmillers appreciate the need for accommodation for married families and the provision of all the amenities of a township. In the more recently erected large mills, no cause for criticism was found in this direction.

There is room for improvement in the general design and practice of many of the mills, but it is believed that efficiency and production could be considerably improved with attention to such matters as increasing the speed of log carriages, improving the log carriage set works to permit more accurate sawing, the use of band saws in re-sawing, the use of sorting tables, increased mechanisation in moving the timber through the mill, the use of fork lift trucks and straddle carriers in the stacking yards and the use of step grate and other improved features of furnace design to permit the use of sawdust for fuel.

Many of the larger mills were designed in pre-war days primarily to produce timber of large dimensions for the export trade. With the present necessity to concentrate upon the supply of building timbers for the domestic market, much more re-sawing is necessary. This must result in a reduction in man-hour output and consequently during a period of labour shortage, in overall production. Under present conditions, output could probably be increased by the inclusion of more benches for the smaller cutting.

It is appreciated that in many cases it has not been possible with the labour shortage to man sufficient recovery benches to achieve maximum recovery and that in some mills the power plant must impose limits in this direction, but the present average recovery in general purpose mills of about 35 per cent. on the true volume of the log is considered to be far too low, especially as some mills are able to show a recovery of around 50 per cent. with an average class of log or even worse.

One obvious method of increasing overall output while the labour shortage exists is to confine cutting, as far as possible, in the country mills to large dimension timber and re-saw it in Perth where labour is more readily available.

The expensive drain upon the labour pool, particularly experienced labour, by the small mills is obvious. The difference a good benchman can make to the output of a small mill is such that he has a much higher value proportionately to the remainder of the crew than in a large mill.

Some of the smaller mills have adopted simple systems of incentive payments which it was claimed had resulted in a remarkable improvement in production. While the introduction of incentive payments may be more difficult in the large mills, it is considered that very serious consideration should be given to including employees in the financial benefits resulting from improved effort and output.

One witness drew attention to the fact that some sawmillers with large permits were required to establish mills at such distances from rail that they were obliged to provide their own railway connection to the Government Railways, that at present the Railway Department could give very little indication to sawmillers of the probable truck supply,
and it is therefore impossible to work out any reasonable running schedule for the mill trains. In the circumstances, it was considered that such sawmillers should receive some consideration in the matter of demurrage charges, by being given a special loading time allowance of at least 16 hours in lieu of the present eight hours. In view of the distance which has to be travelled in the case of some mills to pick up empty and return loaded trucks to the railway siding, the request does not appear unreasonable, but it is considered to be a matter for decision by the Railways Commissioners, the only other party concerned being the Conservator of Forests, as where a sawmill in a particular area is unable to avoid additional costs, it must be reflected in the royalty he can pay for the timber.

Government Sawmilling.

The question was raised in evidence of the desirability of the Government actively participating in the sawmilling industry. There should be no insuperable difficulty in the Government operating such mills economically and no criticism was offered regarding the efficiency and administration of the State Saw Mills and the Railways Mill. It was pointed out, however, that the capacity of Government sawmills was now about one-fifth of the total capacity of all the general purpose sawmills in the State, that the Railways Department controlled over 130,000 acres of the State's best jarrah forest at a practically nominal royalty, that Wundowie Charcoal Iron Industry had recently opened a general purpose mill, that a further mill was being erected at Kent River, and that the State ventures were not subject to taxation and that consequently Government sawmills possessed unfair advantages over private enterprise mills.

The extent to which the Government enters the sawmilling field is entirely a matter of Government policy, but if Government mills are to sell their product on the open market in competition with private enterprise, it would appear reasonable, in view of the large volume of Government requirements, for the private enterprise timber trade to be given the opportunity of competing against Government mills for all Government requirements in timber.

The Wood Distillation and Charcoal Iron and Steel Industry Act provides that authority necessary to maintain and carry on sawmills to prepare wood for the production of charcoal. If in preparing wood for charcoal production there is an incidental production of timber surplus to the requirements of the industry, there would appear to be no sound reason why it should not be sold in the best market available. The Act gives no authority for the industry to erect, maintain or carry on sawmilling for the express purpose of producing timber for sale. I do not consider that the present sawmilling operations of the industry are of sufficient volume to justify concern.

The Kent River mill was erected by the Government in an endeavour to meet a threatened serious shortage in the State's requirements in fruit cases. In deciding to erect a special case mill of large production capacity the Government had good reason to believe that this was the only practical solution of the problem. Complaints were received in evidence that the private sawmilling industry had not been afforded the opportunity of securing the permit area and erecting such a mill, and that erection by the Government had resulted in wasteful expenditure in that the mill was badly located and had certain weaknesses in design.

Inquiries revealed that the mill was designed and erected by the Department of Industrial Development. Its erection commenced before it had secured the permit upon which it is to operate. When a permit area was advertised for a mill of the estimated capacity of the Kent River mill, other sawmilling enterprises had some reason to believe that no matter what other tenders might be received, directions would ultimately be issued to the Conservator of Forests to grant the permit to the Kent River mill. Inspection showed that the mill was being erected upon the edge of a swamp and was consequently badly located. There also appeared to be certain weaknesses in the design, notably in the lightness of the breaking down equipment, and in the provisions made for flow and disposal of material and products.

At the same time, the fact remains that the permit area was open to public tender and that it still has to be proved that any weaknesses in the mill design are of such a nature that they cannot be reasonably readily remedied during the running-in period which is necessary in all new mills to enable final adjustments to be made.

In any case it is appreciated that the officers responsible for designing the mill were hampered by changes made from time to time in the classes of material to be sawn and produced.

The assistance of other sawmilling organisations was sought on various points connected with the design, but in view of its lack of experience in sawmilling, it should have been of considerable advantage if the Department of Industrial Development had submitted its final plans for the site and design to an established sawmilling authority such as the State Saw Mills before commencing erection.

It should be of advantage if all Government mills were subject to one central technical supervising authority so that they might receive the benefit of the best skill and experience available.

Fire Prevention.

Western Australia has suffered considerable losses over recent years through fires in mills. No less than 14 mills have been totally destroyed within the last 10 years.

The Forest Department has made a practice during safe weather of burning belts of forest around mills and mill settlements to
protect them from uncontrolled forest fires, and forest fire fighting units are usually stationed in localities where they are available for the protection of mills in the event of an internal fire arising. Mill fires have generally been found to occur outside normal hours of working, and the fire has usually assumed large proportions so quickly that it has been impossible to cope with it by the time men and equipment were available. The cause of these fires is seldom ascertainable, but the reason for their rapid development is usually the accumulation of highly inflammable bark, small edgings, sawdust and wood powder. The fire chutes which are present in the case of practically all country mills are an obvious source of danger.

Early in 1951, regulation 137A under the Forests Act was gazetted providing for certain precautions to be taken in all mills against the outbreak of fire. This regulation provided that mills shall provide efficient fire fighting equipment and appliances, maintain it in good order, train a team of fire fighters to work such equipment and appliances, provide a sufficient supply of water to be used by the equipment and appliances, keep the mill cleared of inflammable material, carry out all burning of debris beyond one and a half chains from the nearest part of the mill, or in an incinerator approved by the department, arrange periodic inspections during non-working hours, and damp down with water the interior of the sawmill, and an area having a perimeter of 10 feet from the sawmill immediately after operations cease on each working day. These regulations were recommended by the industry and are considered to be adequate; in fact the only suggested amendment is that the provision should be carried out to the satisfaction of the Conservator of Forests or his representative. In this connection it is of importance that water hydrants shall be a sufficient distance from the mill to enable them to be manned during a fire.

In certain cases, such as on the eastern fringe of the jarrah belt where water supplies are extremely limited, and have sometimes to be carted a considerable distance, it would constitute a severe drain upon the economics of a small mill if the provision of watering down in and around the mill had to be carried out every day throughout the year. In such cases, it might be sufficient if the mill were exempted from the necessity for damping down each evening, on certain other conditions laid down by the Conservator being fulfilled, such as sweeping of all debris from the mill.

6. Forest Valuation and Finance. (Term of Reference 3.)

The value of a forest estate consists of the aggregate value of the land, the fixed capital improvements and the forest capital or the stocking in trees. The determination of the value of extensive forest areas in this manner is not a simple matter owing to the varying productive capacity, condition and distance from market of different portions of the forest. There is insufficient information available to enable the value of the forests of Western Australia to be so determined.

It might be claimed that the value of a forest could be established by calculating the average annual costs of replacement, protection, management, depreciation and/or maintenance on any fixed capital improvements and any interest charges payable on capital expenditure, deducting such costs from the annual gross return and capitalising the difference.

In the year 1950-51 in the case of the native forests of Western Australia, the total of the above costs, excluding any depreciation or interest charges, was about £300,000 and the gross return about £370,000, the difference of £70,000 at 5 per cent. representing a capital value of £1,400,000. However, the cut in logs from the native forests of the Crown for that year was only about 500,000 loads. If the cut in logs can be increased to and maintained at 700,000 loads per annum, and royalty charges increased 25 per cent. to an average of say 11½ per load, the annual gross revenue could be expected to rise to about £600,000. If, on the basis of present day rates, the annually recurring costs also rose to £400,000 in order to cover the development and protection of the whole of the forest area, the capital value represented by the native forest would be about £4,000,000. However, in view of the inability, at the moment, of determining and applying a sustained cut, such calculations are of little more than academic interest.

The same applies to the softwood plantations. The total expenditure upon these plantations for the year 1950-51 was about £157,000 and the revenue therefrom was about £11,000. A large proportion of the expenditure was invested in establishment and most of the plantations have not yet reached the age when even remunerative thinnings are obtainable from them. It is believed that with due care in the selection of sites in the light of the knowledge already gained, and provided that no untoward fire losses or epidemics are experienced, these plantations should eventually be capable of repaying all costs.

It is my opinion that the operations of the Forests Department of Western Australia have always been and are still being conducted as economically as those of any other Forests Department in Australia. In making any comparisons between the expenditure and revenue of the Forests Department it needs to be appreciated that although the whole of the forest area has not yet been brought under adequate management, the Forests Department is endeavouring to rehabilitate large areas of forest which were cut over and neglected for many years before any forest management was practised in the State.

It has also to be recognised that forests have values which are not readily assessable in terms of money. They assist the development of the country by providing a basic raw
material essential to the welfare of the State, by providing employment, by the building of mill towns, and by the provision of roads and railways. Other values include the provision of shelter, the conservation of soil, the protection of water catchment areas and the preservation of flora and fauna, while their recreational and aesthetic values are also very considerable.

The actual extent to which expenditure on the management and protection of the forests of the State is justified should not therefore be entirely dependent upon the revenue received.

The total expenditure of the Forests Department for the year 1950-51 was as follows:—

<table>
<thead>
<tr>
<th>From Consolidated Revenue Fund</th>
<th>£</th>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salary of Conservator</td>
<td>1,583</td>
<td></td>
</tr>
<tr>
<td>Salaries and incidentals in the administration of the Timber Industry Regulations Act</td>
<td>2,083</td>
<td></td>
</tr>
<tr>
<td>Other salaries</td>
<td>48,843</td>
<td></td>
</tr>
<tr>
<td>Firewood conversion operations by the Department</td>
<td>43,380</td>
<td></td>
</tr>
<tr>
<td>Softwood conversion operations by the Department</td>
<td>34,193</td>
<td></td>
</tr>
<tr>
<td>Incidents</td>
<td>9,992</td>
<td></td>
</tr>
<tr>
<td>Audit fees</td>
<td>120</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>130,194</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>From Forest Improvement and Reforestation Fund</th>
<th>—</th>
<th>—</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forest works and plant</td>
<td>274,808</td>
<td></td>
</tr>
<tr>
<td>Commonwealth Aid Roads Grant</td>
<td>38,113</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>312,921</strong></td>
<td></td>
</tr>
</tbody>
</table>

| From Loan Fund —                               | — | — |
| Softwood plantations                           | 157,088| |
| Mallet plantations                             | 10,101| |
| Housing                                        | 36,347| |
| **Total**                                      | **203,536**| |

| **£846,651** | |

Section 41 of the Forests Act states that the revenue of the department shall include all royalties and proceeds of the sale of forest produce, license fees, rents and damages awarded for offences against the Act, and provides that all the revenue of the department shall be paid into the Treasury and that three-fifths of the net revenue shall in every financial year be placed to the credit of a special fund for the improvement and reforestation of State forests and the development of forestry. The balance of the revenue of the department shall be paid into the Consolidated Revenue Fund.

No definition is given in the Act of what constitutes net revenue, but in practice it has been accepted that it is gross revenue less any payments to or on behalf of the department from the Consolidated Revenue Fund, such as the salaries of officers under the Public Service Act. Such items as the cost of the administration of the Timber Industry Regulations Act and the working capital employed in firewood conversion by the department are excluded from the calculations.

When the Forests Act was passed, it was no doubt intended that the Forest Improvement and Reforestation Fund would provide some security of finance in the interests of continuity of forest policy. At that time it was probably believed that the revenue of the Department would come almost entirely from royalties, license fees, rents, etc., the collection of which would require very little, if any, expenditure beyond that provided from the Consolidated Revenue Fund in salary payments, and that the whole of the Forestry Fund would be available for expenditure on reforestation, forest improvement and the development of forestry generally. It was probably not appreciated that in the course of the reforestation and improvement work it would be necessary to expend moneys in the erection of houses and the salvaging of timber which would otherwise be lost, and the position has now arisen where the Department has spent money from the Forestry Fund for purposes such as these which involve a considerable expenditure for the return of a comparatively small net revenue.

The opinion has been advanced that this was not intended when the original legislation was passed, and with ministerial approval, despite opinions from the Crown Solicitor, and requests from the Auditor General, it has become the practice for the Reforestation Fund to be recouped directly with the revenue from certain expenditures, such as house rents. The action taken by the Department in this matter appears to me to be sound and reasonable.

The method of arriving at the three-fifths net revenue to be paid to the Forest Improvement and Reforestation Fund and the additional amounts required to supplement the fund are clearly shown in the annual reports of the Forests Department. During 1950-51, £150,314 was paid into the fund as three-fifths of the net revenue for that year, an amount of £38,113 was added to the Fund from portion of the Commonwealth Aid Roads Grant, a further £112,000 was added in the form of a Treasury grant, £7,007 was added as direct credits from certain items of revenue and £5,000 was added as a Motor Vehicle Depreciation Account, a total of £312,454 against an expenditure from the fund of £307,921, plus £5,000 for the purchase of motor vehicles from the Depreciation Account, a grand total of £312,921, reducing the credit of the account from £947 at the 1st July, 1950, to £460 at the 30th June, 1951.

Should it prove possible to increase the annual production from the forest and royalty charges to provide a total revenue of £600,000 per annum, and should the provision of £84,732 from the Consolidated Revenue Fund have to be increased to £100,000, the net revenue will then increase to £500,000, but even so the contribution to the Fund from this source will be only £300,000, no more than sufficient to meet present-day expenditure and with no provision for the finance necessary for the development and protection of the remainder of the forest area in the extreme south.
It is estimated that the development of road and fire control in the virgin forests of the far south at current costs would require the expenditure of about £1,500,000. If these works are spread over 10 years, an amount of £150,000 per annum would be required over and above present expenditure. Under these conditions it would be necessary to replenish the Fund annually as follows:

<table>
<thead>
<tr>
<th></th>
<th>£</th>
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</thead>
<tbody>
<tr>
<td>Three-fifths net revenue</td>
<td>300,000</td>
</tr>
<tr>
<td>Treasury and other grants</td>
<td>200,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>£500,000</strong></td>
</tr>
</tbody>
</table>

Until the stage has been reached where the net revenue amounts to £300,000, it is desirable that Treasury and other grants should be increased to provide for the expenditure of a total of at least £500,000 per annum from the Forest Improvement and Reforestation Fund.

In 1950-51, expenditure from Loan Funds was £203,536. Without this fund, virtually no afforestation or housing could have been undertaken unless additional grants had been provided from the Treasury.

On the assumption that unit costs will remain as at present, it is considered that a total of about £300,000 per annum will be required for these works in the future, according to the programme approved in the pine working plan and an estimated total requirement of about £500,000 for housing, spread over some years.

All the above suggestions with regard to future money requirements are necessarily based upon the assumption that increases will have to be effected in the figures given if costs continue to rise. It is estimated that on the basis of present day unit costs, the total expenditure of the Department should be approximately as follows:

<table>
<thead>
<tr>
<th></th>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consolidated Revenue Fund</td>
<td>150,000</td>
</tr>
<tr>
<td>Forest Improvement and Reforestation Fund</td>
<td>500,000</td>
</tr>
<tr>
<td>Loan Fund</td>
<td>300,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>£950,000</strong></td>
</tr>
</tbody>
</table>

Although this may appear to be a considerable increase on the expenditure for 1950-51 of less than £650,000, it needs to be appreciated that considerable additional work is involved, and that the performance of such works is essential if the existing forests are to be properly managed and protected, and reasonable provision made for the production of the timber needs of the future population of Western Australia.

In comparison, it is interesting to note that whereas it is proposed that Western Australia with 4,000,000 acres of State forest should spend £950,000 per annum on forestry, Queensland and New South Wales with 4,000,000 and 5,400,000 acres of State forest respectively, each spent approximately £1,500,000 on forestry, excluding utilisation works such as logging and sawmilling during the year 1950-51.

Forestry is a business and should be conducted on sound economic lines. It has already been stated that the returns from the sale of the produce of the native forests are insufficient to pay for the cost of adequately developing and protecting them. Capital improvements, such as permanent housing, road and the establishment of softwood forests may reasonably be paid for out of loan moneys, but the interest charges thereon, the costs of maintenance of such improvements and the cost of protecting and managing the forests are charges which must be met annually. The necessary moneys should be provided either by the consumer of the forest produce or in part by the consumer and in part by the State as a whole. The extent to which the cost of growing and protecting the forest produce should be met by the consumer is considered to be a matter for decision by the Government.

Normally the value of the produce standing in the forest is the difference between cost of conversion from the standing tree to the finished article and the price obtainable for the latter. In Western Australia this value is determined by the auction or tender method of selling forest permits. It has been claimed by some witnesses that this has sometimes resulted in the bidding or tendering of uneconomically high prices at sales of forest permits. However, with progressively increasing prices, this has seldom, if ever, proved to be the case in practice.

The lowest stumpage charged in Western Australia is 4s. per load 250 miles from the Perth market. In at least one other State in Australia under similar conditions as regards quality of timber and road haulage, this price would permit delivery of the sawn timber into the capital city from a distance of roughly 500 miles, and the price charged 250 miles from the capital would therefore be 4s. per load plus the cost of freight for 250 miles.

As the maximum prices that can be charged for the finished articles are at present fixed under a price control system based upon costs, the conclusion is inescapable that the Forests Department should increase its base royalties in accordance with the increased costs applying to the Department, and the Prices Commissioner should take such increased royalties into consideration in fixing the price of the finished article.

It is also necessary to appreciate that anomalies exist in the prices paid for different permits, in some cases as a result of economic changes which have taken place since the older permits were let and in other cases as a result of instructions from the Government to assist certain organisations or industries. There is, for instance, the case of the Railways Department mill at Banksiadale which pays a royalty of 2s. 1d. per load for log timber to be sawn for railway use and the equivalent of about 3s. 2d. per load in the log for any sawn timber sold elsewhere. It has been claimed that much higher returns
could be expected if these royalties were reappraised on the basis of present day values. Similarly in the Goldfields, particularly low rates are paid by some companies for firewood.

If as a matter of Government policy, concession rates are to be continued, then as a matter of business accounting, forestry should be compensated by an equivalent Treasury grant. It is considered, however, that the most equitable method of overcoming such difficulties is by means of a general reappraisal of royalties on a uniform basis. The work of appraising royalty values can best be done by the Forests Department, which is responsible for the cost of production and should have a wide knowledge of the variations in value due to logging difficulties, forest conditions and log quality in different parts of the State.

It is considered reasonable, however, that permit holders dissatisfied with a decision of the Department in the case of a general reappraisal of royalties should have a right of appeal, and for this purpose it is recommended that a similar body to that proposed as an appeal body in connection with the allocation of permits should be set up, namely, a person with judicial capacity as Chairman, the Conservator of Forests or his representative as a second member, and a member of the Institution of Engineers or a practising member of the Institute of Chartered Accountants as a third member.

The Forests Department is a business undertaking engaged in a works programme and in the sale of goods. It is important that the unit costs of the various operations carried out on each forest area should be available for regular examination by the Conservator and other responsible officers. The financial accounts of the Forests Department are, however, kept by the Accounting Branch of the Department of Lands, which is probably not engaged in business to the same extent as the Forests Department and consequently the extent to which unit costs can be obtained from these accounts is limited. Efforts are made by the Department to maintain a record of costs in connection with certain works, but the costs are not related directly to actual expenditure and the officers concerned in keeping such records are not experienced in cost accounting. It is considered that it would be preferable for the accounting business of the Department to be under the control of the Conservator of Forests, provided a capable accountant is placed in charge. This suggestion is not intended to imply any reflection upon those at present responsible for the accounting activities of the Department. The Accounts Officer of the Department of Lands in charge of Forests Accounts provided me with all the information and explanations I requested, except the details of the unit costs which he is not required to keep. Apart from that aspect, the accounts appeared to be very well kept.

7. Administration of the Forests Department. (Term of Reference 10.)

The Forests Act, 1918, provides that there shall be a Forests Department having under the direction of the Minister the powers, authorised and duties provided by the Act, and that the permanent head of the Department shall be a Conservator of Forests appointed for a term of seven years and eligible for re-appointment, and who shall be directly responsible to the Minister for, inter alia, the administration of the Department generally.

Some witnesses suggested in evidence that certain changes in the administration of the Forests Department were desirable. In one case it was suggested that the determination of royalties, the allocation of permit areas and matters of finance should be separated from the strictly technical side of forestry.

Another suggestion was to set up a board similar to the Land Board, on which sawmillers would have representation, to allocate permit areas and determine royalties.

A further suggestion received was that a committee or board of five members should be appointed to allocate all permit areas, the board to consist of a magistrate as chairman, the Conservator of Forests, a representative of the large mills, a representative of the small mills, and a representative of the Returned Sailors, Soldiers and Airmens Imperial League of Australia.

Another witness suggested an administrative commission to investigate the resources of the forest and the timber industry, and to make recommendations to the Minister on the allocation of permit areas and the determination of royalties, and in all matters affecting the timber industry, the commission to consist of a full-time chairman and two part-time members, but to be entirely divorced from the office of the Conservator of Forests, who would attend meetings of the commission in an advisory capacity only. The witness concerned was not prepared to publicly state his ideas of the qualifications to be required of the members of the commission.

All the witnesses referred to above were representatives of sawmilling organisations. It is only natural for the buyer to wish to have as large a share as possible in the allocation of the material to be sold and the price to be charged, but apart from this aspect, it is not considered that any of the suggestions has any other particular value. They indicate a lack of appreciation of the fact that forestry is a business in which the technical side cannot be successfully practised without constant reference to the economic side, and vice versa, and the witnesses appeared to be influenced in their opinions only by the economics of the timber industry.

Certain forest services maintain a central marketing branch to deal with the administrative side of such matters as the determination of royalties and the allocation of permit areas, but such bodies cannot successfully function without constant advice and recommendation from the technical forester...
in the field with regard to local costs and the comparative value of the forest stands concerned. In such circumstances, the central branch is little more than a co-ordinating body. The practice of forestry cannot be successfully separated from matters concerned with the sale of the produce of the forest.

I have not been satisfied that there is necessarily a sound case for the inclusion of a member of the sawmilling industry on a board which is to determine such matters, just as it is not usual to include on a Land Board representatives of those organisations who are to buy the produce of the settlers.

Forest management and forest utilisation are so dependent upon each other that they must be under the one administration, and it would be wrong in principle to set up anything in the nature of an independent body to allocate permits or determine royalties except possibly as an appeal body.

It is considered that the Conservator of Forests and his staff, who by the energy and finance they expend, are responsible for the produce of the forest, and who are trained in all aspects of the profession, are the persons most likely to consider impartially the allocation of permit areas and the sale of public assets in the best interests of the people, forestry and the timber industry.

The Honourable the Minister suggested a Forestry Board of three members, the Conservator to be a member and the other two members to be appointed on the nomination of the Minister for such period and on such terms and conditions as the Governor may determine, the Governor to appoint a member of the board to be chairman. The reason given for the suggestion was that it was considered that no individual can undertake the administrative and technical side of a large department, such as the Forests Department of Western Australia. It was suggested that the board should be in line with the boards operating in South Australia, Victoria and New South Wales.

Under the Forestry Act, 1916, of New South Wales, the Governor shall appoint a Commissioner who shall constitute the Forestry Commission and hold office for a term of seven years and be eligible for re-appointment for a further like term. The Commissioner shall vacate office on attaining the age of 65 years. The Commissioner is constituted a corporation sole under the name of the Forestry Commission of New South Wales with perpetual succession and a seal of office. The Commission has the administration of the Act, the control of officers and other persons appointed or employed under the Act and the control and management of State forests and timber reserves and of flora reserves and catchment reserves, but is subject to the direction and control of the Minister. The Commission may dispose of timber and products of any State forest, timber reserve, flora reserve or catchment reserve, and, inter alia, take and sell such timber into logs or hewn merchantable article and sell same.

Every sawmill in New South Wales has to be licensed. The term of such sawmill license cannot exceed 10 years but may be renewed for a like term. In practice, licences are issued for a maximum term of one year and renewed annually.

In the case of an application for a licence to operate a sawmill on Crown timber, the applications are first screened by an internal committee of the Commission, which recommends through the Division of Economics and Marketing to the Commission the applicant it is considered should be selected.

If the Commission refuses an application for a saw mill licence, the applicant has the right of appeal to a Sawmill Licencing Advisory Committee. This committee consists of a representative of the Forestry Commission, a representative of the Department of Conservation and a representative of the Housing Commission. The representative of the Commissioner of Forests on this Committee has to be endorsed by the Minister for Forests. The representative of the Department of Conservation is nominated by the same Minister, and the representative of the Housing Commission is nominated through the Minister for Housing to the Minister for Forests.

Upon the recommendation of this committee, the Commission may, if it so decides, reverse its previous decision and allot the licence. The Commission, however, is not bound to accept the recommendation of the Sawmill Licencing Advisory Committee.

In the matter of the issue of a special licence conferring on the holder exclusive rights to certain forest products, the district forester furnishes a report on the matter to the Commission, where it is referred to the Division of Economics and Marketing. This division may refer the matter to the Division of Forest Management for consideration of any working plan obligations involved. Finally the Commission makes a decision on the recommendation of the Division of Economics and Marketing.

Under the Conservation Authority of New South Wales Act, 1949, the Governor may from time to time appoint two Assistant Commissioners to assist the Commissioner in the exercise and discharge of his powers, authorities, duties and functions under this or any other Act. The Minister may from time to time, after consulting the Commissioner, allot the duties of the Assistant Commissioners respectively. Each Assistant Commissioner shall hold office for a term not exceeding seven years and shall be eligible for re-appointment.

It will be noted that the position in New South Wales is almost identical with that in Western Australia where the Conservator is a body corporate and two Assistant Conservators have been appointed to assist him.

In view of the fact that the area of forest and the annual expenditure and revenue and the staff employed in the New South Wales Forestry Commission are all considerably greater than in the case of the Western Australian Forests Department, I am unable to
agree with the Minister that the duties and responsibilities of the position of Conservator of Forests in Western Australia are too much for one man to carry.

Under the Forests Act, 1928, of Victoria, the Governor in Council may appoint three persons to be members of a Forests Commission and may appoint one of the Commissioners to be the chairman. No person may be appointed a Commissioner for a term exceeding five years, but any Commissioner may be re-appointed.

The Commission is a body corporate under the name of the Forests Commission and has perpetual succession and a common seal.

The Commission is independent of Ministerial control and has, inter alia, the control and management of all State forests and the produce of other Crown lands. The Commission may, inter alia, permit the taking or converting of any timber or other forest produce in any State forest, take and sell timber or forest produce in any State forest and convert any such timber into logs, sawn timber or merchantable articles and sell the same. The power to sell includes the power to sell by public auction or tender. Subject to such covenants, terms and conditions and the payment of such rents, fees, royalties or charges as are prescribed, the Commission may grant to any person for any term not exceeding three years a licence or a permit to, inter alia, occupy a special area (not exceeding 5,000 acres) for the exclusive cutting of timber on any Crown land within any reserved forest. The Governor in Council may grant to any person for any term not exceeding 12 years a lease of any Crown land within any reserved forest, inter alia, of such area (not exceeding 7,000 acres) for saw-milling purposes as on the recommendation of the Commission the Governor in Council by order determines.

The Forestry Act, 1950, of South Australia, provides that it shall be administered by the Minister of Forests, who shall be a body corporate with perpetual succession and a common seal. The Act provides that the Conservator of Forests shall have certain forestry qualifications, and that he shall be the principal administrative officer of the Minister for the purposes of the Act. Provision is made for the appointment of a Forestry Board of three members, of whom the Conservator of Forests shall be one. The other two members are appointed on the nomination of the Minister for such periods and on such terms and conditions as the Governor determines, and the Governor appoints one of the members to be chairman. The Act provides that the Minister shall control and manage every forest reserve.

The Minister may not grant any interest over any forest except upon the recommendation of the board and subject to such terms and conditions as the board may recommend, except that licences for the use and occupation of forested land may be granted upon the recommendation of the Conservator. The Minister also may not establish, maintain or operate mills, plant and machinery for the milling and treatment of trees and timber or sell or otherwise dispose of any trees or timber except upon the recommendation of the board and upon a certificate from the Conservator that the trees or timber concerned are available or can properly be made available.

Beyond providing technical advice and assistance in forestry and operations and problems, such as fire control, the Forestry Board has no power under the Act except such as may be delegated to it by the Minister. The purpose of the board under the Act appears to be mainly advisory.

The Act makes no provision for security of tenure of forest lands or continuity of forestry policy and forest management or the provision of forestry funds.

It is not considered that the provisions of this Act are suitable for the conditions obtaining in Western Australia.

From the duties which the Minister suggested should be assigned to a Forestry Board in Western Australia, it would appear that it was to be concerned largely with the allocation of permit areas and sawmill licences. At the same time one of the members was required to be an administrator who would deal with such matters as the overall position with regard to the allocation of permits, the pay of the department, the labour employed by the department, hiring and firing, workers' compensation, and the detailed work of some of the other officers. The Minister was careful to explain that he had not decided whether the administrator would be the chairman of the board. It was obvious from his evidence that he considered it most unlikely that a good technical man would be a good administrator.

No virtue can be seen in the appointment of such a board unless it is to have power of action to manage the forests and dispose of their products independent of any political control other than that imposed by the availability of funds.

Inquiries were made with regard to the efficiency of the various forms of forest administration in force throughout Australia. There can be no doubt of the benefit of freedom of the forest service administration from direct political control for extended periods. In such cases, however, it has practically always been considered necessary to provide for a Commission of three members to administer the forest service. It has been claimed that a multiple Commission of this nature provides the administration with a more informed and balanced outlook and strengthens it against hostile political and industrial pressure groups. On the other hand, it is almost inevitable that the members of such a Commission will not be in agreement on a number of matters. The result is likely to be that either one member assumes virtual control and forces decisions by strength of personality or much time is spent in collecting and compiling information to support or demolish the opinions of individual members in the considerations and discussions of the Commission. At times sharp conflicts of opinion are likely to occur,
particularly if one member has been endeavouring to advise the Minister or others on the likely opinions and decisions of the Commission in some matter of urgency. When such differences develop to the stage of conflicts of personality, the position can become extremely difficult and disturbing to the morale and efficiency of the service as a whole.

A single administrator on the other hand provides the opportunity for much quicker decisions and the allocation of responsibility. The conclusion could not be escaped that there is no benefit to be gained by a commission, board or committee control of forestry in Western Australia, but on the other hand, a considerable risk of inefficiency arising from the circumlocution and consequent loss of time which must take place when the chairman, who is automatically held responsible in the first case for providing the Minister and others with the opinions of the Commission, has first to make up his own mind and then endeavour to make up the minds of the other members. It is not considered that the possible advantages of a multiple Commission outweigh the advantages of a single Commissioner or Conservator, to whom the same freedom from political control could be given.

Examination of the work of the Forests Department in Western Australia and the evidence presented both in public and in camera by the timber industry and the Forest Service generally, except in one or two individual cases, has convinced me that the administration of the department is giving every satisfaction, and although the opinion was expressed by certain witnesses from the timber industry that that industry should have some part in the allocation of permits and the determination of royalties, it was evident in examination that such opinions were often based upon inadequate, and at times, erroneous information as to existing conditions. It is not believed that at the present time there is any justification to change the present system of administration for one by a multiple board or commission.

If, despite the above facts, it is decided to appoint a multiple board or commission, it cannot be too strongly urged that the necessary legislation should provide that at least two members should be highly qualified foresters of considerable experience, and that one of these two should be the senior member of the Commission.

Evidence given suggested that some witnesses were of the opinion that it was difficult to obtain the qualities of a good technician and a good administrator in the one person. I am unable to agree with this opinion and would point out that every forest service in Australia is administered by technically qualified foresters.

The difficulties that witnesses experienced in endeavouring to describe the qualifications and functions of an administrator exemplified the danger of placing the forest service under the control of any but a highly qualified forester. An administrator in charge of a purely technical service has too often proved to be a person with a particular flair for political considerations, and that in all other directions he has to rely entirely upon the advice of his technical staff.

The Forests Act, 1918, provides that the Forests Department shall, under the direction of the Minister, have certain powers, authorities and duties, and in certain matters such as the classification of forest lands, the granting of forest leases and the expenditure of the Forest Improvement and Re-forestation Fund, action by the Conservator of Forests is subject to the approval of the Minister. At the same time the Act gives the Conservator certain powers without specific reference to the Minister, e.g., the training of officers, the preparation of working plans, the granting of permits, the issuing of licences and the determination of royalties. The fact that the Conservator is appointed for a term of seven years by the Governor and not through the normal processes of Public Service appointments would appear to indicate that in his administrative and executive functions he is expected to assume responsibilities unusual for a head of a department.

In recent years, however, directions have been given the Conservator with regard to the allocation and conditions of permits which have tended to interfere with the forest working plans and the long term forest policy of the department. The reason for these instructions has, in general, been the endeavour of the Government to meet the urgently needed requirements of the State in housing timbers. The Forests Department is within the same portfolio as the Department of State Saw Mills and the Housing Commission, and it must be extremely difficult for a Minister to make decisions in the best interests of each of these departments, which, although complementary in their functions, have such conflicting interests in certain directions. For example, in connection with conflicting recommendations from the Conservator of Forests and the manager of the State Saw Mills, the Minister in evidence stated "it puts me in a difficult position as Minister for Forests and at the same time Minister for State Trading Concerns."

Demands for increased timber supplies by builders and sawmillers, if acceded to, can do much in a short period to nullify a state of equilibrium and balance between the forest, the timber industry and timber users which may have taken years to achieve. These are matters which it is believed deserve the serious consideration of the Government.

Another matter of some consequence in the present administration is the existence within the Forests Department of the position of Co-ordinator of Timber Supplies, the occupant of which, as a result of being consulted by the Minister, has direct access to him, while still holding the position of Senior Assistant Conservator of Forests. Although it is not uncommon for Ministers to interview senior officers within a department other than the head of a department, such conversations are usually carried out with the knowledge of the head of the department,
and if possible, in his presence. Generally it is only necessary where the senior officers concerned are technical men and the head of the department purely an administrator.

It is a matter for consideration as to whether in all the circumstances it would not be preferable either to separate the position of Co-ordinator of Timber Supplies from the Forests Department or ensure that all discussions and submissions from the department to the Minister proceed per medium of the Conservator of Forests.

It is only natural to expect that experts will disagree on some matters, and it must add still more considerably to the difficulties of the Minister to have to endeavour to reconcile conflicting viewpoints of officers within the same department. It is considered that the Conservator of Forests should be the Government’s adviser in all matters dealing with the Forestry Industry.

Undoubtedly faults can be found with the administration of the Forests Department, but this applies to any administration, as if progress is to be made, decisions have often to be arrived at on incomplete information. The main criterion of any administration is the progress which it makes and the efficiency and economy with which such progress is effected.

Despite shortages in staff, the department has made very considerable progress during the last 10 years. In that time approximately 500,000 acres of forest have been cut over under tree marking and regenerated.

Forest assessment and mapping from aerial photographs are now proceeding steadily.

Fire control has been extended to cover an additional 600,000 acres, 10 fire towers have been established, 4,000 miles of roads and tracks have been constructed and telephone and radio communications have been considerably extended.

In an endeavour to attract and retain the necessary labour, 80 houses have been erected in the last six years and a further 122 houses are under construction, while accommodation in huts has been very considerably increased. Water supply and electric light facilities are being gradually provided at various centres.

A small research laboratory has been established in Perth in association with the biometrical branch, and a research station has been established in the Jarrah forest at Dwellingup in co-operation with the Forestry and Timber Bureau of the Commonwealth.

Outstanding advances have been made in investigations into the nutrition of the pine and nursery and pine establishment problems, making possible the establishment of pine plantations in Western Australia on soils which were previously regarded as waste land.

Afforestation with softwoods, which had to practically cease during the war years, has again been developed, until in 1951 the record planting of 1,768 acres was effected, bringing the total area under such plantation to 15,346 acres.

To encourage tree planting, particularly in the wheat belt, the Department has assisted the establishment of a number of arboreta, issued directions and advice, and raised and distributed large numbers of trees.

The Forests Department of Western Australia is as economically managed as any other Forest Department in Australia and the only bar to further progress appears to have been lack of staff and limited financial provision, although in recent years the latter has been increased considerably.

The personnel of the Forests Department is divided into professional, general and clerical divisions. The Forests Act, 1918, provides that no person shall be appointed to an office in the professional division unless he has obtained the degree or diploma of a forest school recognised by the Governor, and that no person shall be appointed or promoted to an office in the general division unless he has passed such examination as may be prescribed a qualification for such office.

The professional division consists of the Conservator, Assistant Conservators, Divisional Forest Officers, Assistant Divisional Forest Officers and certain specialist officers.

The general division consists of the Chief Timber Inspector, District Foresters, Foresters and Assistant Foresters.

Prior to World War II, the forest area of the State was divided into 11 Divisions (including the Inland Forests) of which nine were under the charge of Divisional Forest Officers (professional staff) and two were under the charge of Senior Foresters (general staff). A Senior Professional Forester was also in charge of Fire Control.

The work in the divisions in the far South-West was inspected regularly by the Senior Assistant Conservator and that of the divisions in the north by the other Assistant Conservator. These officers were empowered to give high level approval in all phases of work.

Since that time the Department has lost to other organisations the services of a Conservator of Forests and five other Senior Professional Officers, and the Senior Assistant Conservator has been engaged upon control and co-ordination of timber supplies and has been largely unable to carry out field work. Losses have also occurred in the junior professional staff: amongst the probationers to that staff, which have been only partially remedied by recruitment. In addition, the expansion of the operations of the Department now require the establishment of at least three more divisions.

In consequence, the second Assistant Conservator has had to take charge of the Narrogin and Mundaring Divisions, and supervise the work of the Metropolitan Division and the Inland Forests.

The Fire Control Officer has had to include in his duties the senior administrative work of the Collie Division.

The remaining divisions have been combined into two groups. One of the three remaining Senior Professional Officers has
been given charge of the southern group, and another the northern group, and the other has been appointed Management Officer.

The inspectorial work in the forests of the South-West previously carried out by the two Assistant Conservators has had to be taken over by the Conservator himself. It has only been possible for him to carry out his task by continuous work without regard for hours or week-ends, and considerable additional responsibility has been placed upon all the professional field officers.

It is essential that as far as the professional staff is concerned, the position should be remedied as early as possible. It is summarised in the following table:—

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<thead>
<tr>
<th>Position</th>
<th>Required</th>
<th>Present</th>
<th>Deficiency</th>
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<tbody>
<tr>
<td>Conservator</td>
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<td>1</td>
<td>—</td>
</tr>
<tr>
<td>Assistant Conservators</td>
<td>2</td>
<td>2</td>
<td>—</td>
</tr>
<tr>
<td>Inspectors</td>
<td>2</td>
<td>2</td>
<td>—</td>
</tr>
<tr>
<td>Divisional Forest Officers</td>
<td>14</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>Assistant Divisional Forest Officers</td>
<td>8</td>
<td>6</td>
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<tr>
<td>Fire Control Officer</td>
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<td>1</td>
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</tr>
<tr>
<td>Assistant Fire Control Officer</td>
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<td>Management Officer</td>
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<tr>
<td>Assistant Management Officer</td>
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<td>Research Officer</td>
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<td>Assistant Research Officer</td>
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<tr>
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<td>34</td>
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In addition, the position with regard to the work of the general staff is gradually changing. In the past these men have been recruited from the ranks of the timber workers, who with the wide practical experience of timber and the assistance of men trained at the former Ludlow Forestry School have played a most important part in the control of trade operations.

When the main work of the officers of the general division was timber inspection and tree marking, there were strong reasons for recruiting the general staff from the timber industry. However, in the future, tree marking will cover more and more of the second growth forest requiring a much greater knowledge of silviculture and forest management than in the past, and it is considered that the time will come when the present Forester grade will be more adequately filled by a trained Forester than by a timber worker.

Consideration should therefore be given to the appointment of students from the Australian Forestry School immediately after their graduation to positions in the general division. The experience they would gain as field officers under senior officers of the general division would be of great value in preparing them for the higher grades of the professional division.

The Fire Control Officer should be relieved of divisional administrative duties as early as possible, and provided with an assistant, so that he may devote his full time to the organisation and development of fire control measures, the training and examination of staff, the testing of equipment and the investigation of possible improvements in fire control equipment and technique.

The most important personnel in the service are those who are directly engaged in the protection and management of the forests, but in any forest service, provision must be made for such specialised services as working plan control, utilisation and research.

The Management Officer needs assistance to enable him to prepare information required for the compilation and revision of working plans, as well as for their control. A commencement has been made with the rebuilding of a Utilisation Branch. At the present time officers of the general division, through the Chief Timber Inspector, are endeavouring to meet the position, but arrangements are being made for a junior professional officer to be trained in this field. If practicable, it would be advantageous for him to receive a short period of training at an institution such as the Forest Products Division of the Commonwealth Scientific and Industrial Research Organisation.

The interest and enthusiasm of a small number of officers in investigation and research has been long sustained in Western Australia, and some very noteworthy work has been carried out which has received wide recognition. Success in research depends largely upon the individual and suitable officers can only be identified by trial and experience. The condition of the jarrah forest presents many difficult and important problems for the Forester, and much remains to be done in the way of botanical, genetical and pathological studies in the native forests.

Despite the success which has accompanied research into the growth of the pine in Western Australia, continuing research is essential into the many problems which keep arising in any large scale afforestation work. It is considered that a second joint experimental station should be established at a suitable centre, such as the pine forests near Gnangara, in order to pursue this side of the work.

A small research unit is also necessary in close association with the administrative headquarters to direct and initiate research, to collate and review the work, to maintain liaison with the universities and research laboratories in associated fields, and to advise the administrative staff on problems and matters relating to research.

It is most important that adequate renumeration should be available for the professional staff if they are to be recruited to and retained in the service. In this connection it is desired to draw attention to the salary of the Conservator of Forests.

The Forests Act, 1918, provides that the Conservator shall receive such salary as may be fixed from time to time by the Governor. The salary of the Conservator of Forests used to be one of the highest in the Forest Services of Australia, but of recent years it
has been reduced to the level of a clerical under-secretary with a permanent appointment. In view of the special responsibilities placed upon the Conservator by the Forests Act, the very limited period of his appointment and the great value of the assets under his charge, it is considered that this matter should be given early attention by the Government. It is to be expected that recruitment to the profession would be adversely affected by the relatively low salary status which must be given senior officers of the Forests Department as a result of the low salary paid the Conservator of Forests.

8. Forest Legislation and Regulations. (Term of Reference 8.)

Existing legislation in the State of Western Australia relating to forestry is as follows:—

- Forests Act, 1918-1931 and Regulations thereunder.
- Sandalwood Act, 1923-1934.
- Timber Industry Regulation Act, 1926-1950 and Regulations thereunder.

_The Forests Act, 1918-1931._

The above Act is considered to be an admirable piece of forest legislation which has operated fairly and satisfactorily over the years. No changes are considered necessary in it at the present time.

The only faults claimed by witnesses were the following:—

Section 32 confers upon the Conservator the power to grant permits and issue licenses to take, and contract for the sale of, forest produce on Crown land within a State forest, timber reserve, or other Crown land.

It was claimed by one witness that the Minister should also have power to allocate forest permits. Other witnesses suggested that a board or commission should be set up and that one of its duties should be the allocation of sawmill permits. Forestry is a long-term business which depends for its success upon continuity of policy and stability in the timber industry. For this reason, forest legislation usually provides that the management of the forests and the sale of their produce shall be matters for decision by the permanent head of the forest service. It is most important that the established forest policy in these matters shall not be unnecessarily disturbed by successive Ministers, who, acting in all good faith but without sound knowledge of or experience in forestry, could do irreparable harm to both the forestry and timber industries by their instructions in these matters. The fact that the Conservator of Forests is appointed for terms of only seven years, although eligible for re-appointment, and that he may not be removed from office during his term of seven years except for misbehaviour, incompetence, bankruptcy or incapacity, makes it clear that the purpose of the Act in this direction was to achieve continuity of policy in such matters. I am of the opinion that there is no reason to make any change in this connection.

Section 34 (2) of the Act provides that every permit under which the aggregate royalty exceeds £10 shall be submitted to public auction or tender and the royalties to be paid shall be thereby fixed.

Some witnesses claimed that this leads to the bidding or tendering of uneconomic prices, particularly in times of shortage like the present. However, the Conservator does not necessarily have to accept the highest or any other bid or tender, and in the interests of both forestry and the timber industry, he would have nothing to gain by accepting an uneconomic price. The competitive system of selling forest produce is well established throughout the world, and is regarded as one of the best means of encouraging efficiency and economy, as well as of indicating the value of an article and obtaining the best return for it. Decisions with regard to whom a permit can be let may admittedly be difficult under certain circumstances, and for this reason it is suggested that a board of appeal should be set up to make recommendations in cases where appeals against a decision of the Conservator are received.

Section 41 (2) of the Act provides that three-fifths of the net revenue of the Department in every financial year shall form a fund for the improvement and reforestation of State forests and the development of forestry.

The purpose of this section is to provide the Forests Department with a guaranteed fund in the interests of that continuity of policy and management so essential to sound forestry. It is to be expected that there will be times, as at present, when the whole of the revenue from the sale of forest produce may be insufficient to meet the cost of the full programme of desired forest works, and as some security against such times, one witness suggested that the whole of the forest revenue should be placed to the credit of this fund. However, provided the fund is capable of supplying the moneys required for the protection of the forests and their replacement as cut, it is not unreasonable to expect that the Government will provide, as opportunity offers or as the need calls, the additional moneys required for forest expansion and improvement.

_Regulations under the Forests Act, 1918-1931._

The Act provides that the Governor, on the recommendation of the Conservator, may make regulations for purposes associated with the carrying into effect of the objects of the Act. To date 154 regulations have been gazetted.

Regulation 33A provides that by agreement with the permit holder, whether expressed or implied on any renewal of permit or on the acceptance of the conditions of any tender or public auction, the Conservator may, where and to the extent that he considers the circumstances of any particular permit so required, alter or add to the conditions of any permit.

Regulation 47 provides that notwithstanding anything herein contained, but subject to the Act, the Conservator may enter into any agreement with the holder or intending holder of a permit or license with the object of imposing any other conditions, in addition to those herein provided for, which may be deemed advisable, and such condition shall be deemed...
to be prescribed by these regulations, and the conditions and terms of the permit or license may be so altered or framed as to give effect to such agreement.

Regulation 47A provides that on an application for a renewal of a sawmilling permit the Conservator may agree with the holder or applicant that the permit shall be renewed upon and subject to the condition, inter alia, that the holder of the permit shall, during each month of the term of any renewal of the permit, fell, cut, remove, saw and treat not less than 75 per centum of the maximum quantity of log timber which the holder of the permit is permitted to fell, cut and remove each month during the term of the permit.

Regulation 54(a) provides that every sawmilling permit granted under the Act after the making of this regulation shall be deemed to be granted subject to the condition that the holder of the permit shall, during each month of the term of the permit, commencing one month after the granting thereof, fell, cut, remove, saw and treat at least 75 per centum of the maximum quantity of the log timber which the holder of the permit is permitted to fell, cut and remove each month during the term of the permit.

Regulation 55 provides that if the holder of a permit commits a breach of or fails to observe any of the conditions of the permit, the Conservator may, by notice in writing given to the holder, cancel the permit, which shall thereupon cease to have any further force or effect.

Regulations 47A, 54 and 55, which were gazetted on 25th August, 1950, were considered by several witnesses to be unduly harsh, particularly when considered in conjunction with the fact that it is the practice of the Forests Department to issue permits for periods of 12 months and renew them annually until the total of the timber tendered for has been cut. It was claimed that regulations 47A and 54 were impracticable, in that no mill designed to saw and treat the maximum amount of log timber allowed annually could be expected to produce 75 per centum of the monthly maximum intake during the months in which Christmas, New Year and the Easter holidays occur. In this connection it was claimed that regulation 57 should be adequate to meet the desires of the Government.

Regulation 57 provides that in the event of the permit holder failing to maintain his log intake as set forth in his permit, he shall nevertheless be required to pay at least 60 per centum of the royalty computed on his authorised log intake; and, further, if in the opinion of the Conservator the permit holder fails to maintain his authorised log intake for what the Conservator in his discretion considers an unreasonable period, the Conservator may reduce the area of the permit proportionately.

The Conservator of Forests, however, advised that legal opinion is to the effect that the words "authorised log intake" are applicable to any portion of the authorised log intake, no matter how small, and cannot be regarded as applicable only to the maximum authorised log intake and that therefore this regulation in effect has no force.

I am of the opinion that although it may reasonably be expected that the Conservator of Forests and the Government will administer the provisions of the Act and regulations fairly and reasonably, there does not appear to be much value in regulations which are, from a practical aspect, incapable of application in practically all cases.

It is suggested that regulations 47A and 54 (a) might be cancelled and the conditions contained in regulation 57 amended to provide that the words "authorised log intake" apply to the maximum authorised log intake.

Regulation 137A provides that the owner of every sawmilling permit shall take certain prescribed steps to prevent the outbreak of fire and protect his mill against any such outbreaks as might occur.

This matter has been referred to in the section dealing with sawmilling, particularly with regard to the difficulty of small mills in the drier areas fulfilling some of the conditions.

The Sandalwood Act, 1929-1934.

This Act, which is to be read as one with the Forests Act, 1918, provides that the Governor may from time to time by Order in Council limit and restrict the quantity of sandalwood that may be pulled or removed from Crown land and alienated land during any particular period. It also prescribes the conditions under which the pulling or removal of sandalwood shall be permitted and for regulations to be made under the Forests Act, 1918.

There appears to be no call for any amendment of this Act.

Timber Industry Regulation Act, 1926-1950.

This Act provides for the inspection and regulation of the timber industry, largely in the interests of safety and well being of employees. It was amended in 1937 to provide for the registration of sawmills.

Section 12A (1) of the Act provides ... it shall not be lawful for the owner of a sawmill to use the same in the timber industry unless such sawmill is duly registered and in accordance with the regulations made under this Act . . .

The owner of every sawmill which complies with the regulations under this Act for the time being in force shall be registered subject to application being made in the prescribed forms.

Regulation 85A under the above Act provides that applications for registration of a sawmill pursuant to section 12A of the Act shall be made to the controlling officer and shall be in writing, in accordance with form 8 in the appendix to these regulations.

The Conservator of Forests has been appointed controlling officer under this Act.

In the interests of stability in the timber industry and employment therein, it is considered that section 12A should be amended to read that no sawmill shall be registered unless the owner can satisfy the Conservator of Forests that he has adequate log supplies available for the support of the new mill.

There has been no suggestion put before the Commission of the need for any other amendment to the above Act.


This Act is administered by a Minister of the Crown for the time being charged with the administration of the Forests Act, 1918-1931, and provides for the protection of wildflowers and native plants indigenous to
Western Australia. There have been no suggestions made to me with regard to the need for any alterations to the provisions of this Act.

9. Demands on Forest Resources of Western Australia from within and without the State, and the Extent to which, and the Manner in which, such Demands should be Met. (Term of Reference 2.)

Evidence was submitted to show that in 1950-51, production in the main items of forest produce in Western Australia was as follows:

- Logs for sawing and hewing—722,090 loads.
- Logs for peeling—2,837 loads.
- Piles and poles—over 800,000 lineal feet.
- Mining timber (round)—23,374 tons.
- Firewood—300,000 tons approximately.
- Wandoo for tannin extraction—65,970 tons.
- Mallet bark—760 tons approximately.
- Sandalwood—394 tons.

The production in sawn and hewn timber for the year was 251,456 loads. The distribution of this timber within and without Western Australia is given in the following table:

<table>
<thead>
<tr>
<th>Destination</th>
<th>Sawn timber other than sleepers</th>
<th>Sleepers sawn and hewn</th>
<th>Total</th>
<th>Percentage of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remaining within Western Australia</td>
<td>188,077</td>
<td>15,930</td>
<td>204,007</td>
<td>81</td>
</tr>
<tr>
<td>Exported to South Australia</td>
<td>15,088</td>
<td>9,172</td>
<td>24,260</td>
<td>13</td>
</tr>
<tr>
<td>Exported to Victoria</td>
<td>323</td>
<td>336</td>
<td>659</td>
<td>72</td>
</tr>
<tr>
<td>Exported to New South Wales</td>
<td>72</td>
<td></td>
<td>72</td>
<td>72</td>
</tr>
<tr>
<td>Exported to Northern Territory</td>
<td>11,255</td>
<td>3,701</td>
<td>14,956</td>
<td>6</td>
</tr>
<tr>
<td>Exported Overseas</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>222,317</td>
<td>29,139</td>
<td>251,456</td>
<td>100</td>
</tr>
</tbody>
</table>

The difference between the above total of 180,000 loads and the figure shown in the preceding table of 188,677 loads remaining in Western Australia is of little consequence as the above figures of consumption are only very rough estimates in most cases.

In addition, 8,707 loads of sawn timber were imported, of which 680 loads were hardwood from the Eastern States and Tasmania, the remainder being softwood from overseas.

Although it is known that the demands for sawn timber in Western Australia were not fully met during the year 1950-51, it is impracticable to assess the extent to which the total effective demand was unfulfilled owing to the many unassessable factors involved. These factors include the extent to which timber could be used as a substitute for other materials in short supply.

It has been estimated, for instance, that in the year 1938-39, there were 1,300 brick and 700 timber framed houses built. In the last six months of 1950, despite a stated increase in production of bricks of 28 per cent. as against an increase in sawn timber, excluding railway sleepers, of only 22 per cent., compared with the 1938-39 figure, there were 1,007 brick and 1,588 timber framed houses built, representing an increase in the rate of building brick houses of 55 per cent. and in timber framed houses of over 350 per cent. The position is further obscured by the desire of the timber and wood using industries to build up stocks.

It is considered, however, that there should have been sufficient rough sawn timber available to meet all reasonable requirements, and that any actual shortage was almost entirely confined to seasoned timber.
Very large stocks of seasoned timber were held by timber organisations in Western Australia in 1930. The financial situation after that time did not permit stocks being maintained at that level, and the stock position had not been recovered at the beginning of World War II. The demand for special cutting for war purposes, particularly in small dimension timber, resulted in the disappearance of practically all dry timber stocks in Western Australia by the end of the war. The slow recovery of the industry and the heavy demand for timber in small building sizes since that time has retarded the accumulation of stocks.

The position is, however, improving, and during the first three months of 1951, there was an increase of at least 27 per cent. in the production of timber for seasoning as compared with the average production for the first four months of 1950, the average being obtained from a four month period in 1950 as the Easter holidays fell in April of that year. The total production of such material for 1950 was about 23,000 loads, so that if the increased rate is maintained for 1951, the production of such material this year should be about 30,000 loads.

Evidence submitted indicated that the anticipated annual requirements in sawn timber other than sleepers in Western Australia by 1955 will be approximately as follows:

**Building Industry**
- Housing, 9,500 buildings: 120,000 loads
- Public Works: 9,000 loads
- Railway Department: 1,200 loads
- Other buildings (industry and farming), (rough estimate): 24,000 loads
- Repairs and additions (rough estimate): 20,000 loads
- **Total:** 174,200 loads

**Government Works other than Buildings**
- W.A. Government:
  - Railways: 7,500 loads
  - Public Works Department: 2,300 loads
  - Main Roads: 1,000 loads
  - Metropolitan Water and Sewerage Board: 700 loads
  - Other Government undertakings: 1,000 loads
  - **Total:** 12,500 loads

**Commonwealth Government**
- Works and Housing Department: 3,250 loads
- Commonwealth Railways: 50 loads
- F.M.G. Department, including 750 loads of cross-arms: 1,000 loads
- **Total:** 4,300 loads

**Local Government Bodies** (rough estimate)
- **Total:** 4,000 loads

**Other Industries and Miscellaneous**
- Case making: 21,000 loads
- Furniture: 7,000 loads
- Mining: 2,000 loads
- Miscellaneous: 15,000 loads
- **Total:** 45,000 loads

**Total requirements for 1955:** 240,000 loads

The above figures include some rough estimates, and it is possible that certain of the authorities giving evidence may not have made full allowance for likely expansion of activities if ample supplies of timber are available. At the same time, apart from restriction of credit and other financial factors, the extent to which timber can be consumed depends largely upon the supply of labour available to wood-using industries and the position with regard to the supply of complementary materials. The figure of 240,000 loads given above as the total estimated consumption of sawn timber, other than sleepers, is equivalent to a per capita consumption of 230 super feet, and experience indicates that it is most unlikely that actual consumption of hardwood alone would be likely to exceed this figure.

It is of interest to note that whereas the consumption for housing in 1950-51 constituted one-third of the total sawn timber consumed in the State, the estimated proportion for 1955 is about 50 per cent. Of the 120,000 loads required for housing in 1955, about 20 per cent. is estimated to be needed for fencing. It would, therefore, appear important to endeavour to ensure that material used for fencing should not absorb material of a quality suitable for general building. According to the evidence given, roughly 60 per cent. of the total requirements in 1955 will be needed in scantling sizes, 25 per cent. in dry material for flooring, joinery, weatherboards, furniture, etc., 10 per cent. in case material and 5 per cent. in large dimension sizes over 36 square inches sectional area.

Requirements in seasonal material in 1955 would therefore amount to about 60,000 loads without allowing for wastage if the estimated requirements of the house building programme for that year are to be met. With an output capacity of 370,000 loads per annum from the general purpose mills, it might not seem that there should be any great difficulty in providing 60,000 loads of dry timber per annum, particularly as about 40 per cent. of the output of some of the large mills is in this class of material. It needs to be appreciated, however, that log supplies are not available to maintain the maximum capacity output of the mills, even if it were otherwise practicable for the mills to maintain it. Moreover, many of the smaller mills sell their production green and produce practically no select or dry material. The bulk of this class of material must be produced by the large mills which have the quantity output necessary to permit a wide selection in quality and sizes to be economically made, and also generally have the capital necessary to cover prolonged stacking costs and the erection of seasoning kilns. It will be appreciated that it is only by the large mills attaining and maintaining an output approaching their maximum capacity that the requirements in dry material for flooring, weatherboards, joinery and furniture timbers can be met in 1955.
Cases.

Evidence submitted was to the effect that fresh fruit cases required about 14,000 loads of timber and other cases about 7,000 loads, a total of 21,000 loads, although the figure for other cases is a very rough estimate.

Shortages of fruit cases have been a cause for concern for the last 10 years. This particularly applies to apple cases. Half of the timber needed for the packing of the Western Australian fruit crop is required for apple cases, of which about two-thirds are exported each year. It is claimed that only good quality karri is suitable for apple export cases, and of the estimated average annual requirement of about 1,650,000 cases for apples, 1,450,000 must, for practical reasons, be of export quality. To add to the difficulties, the demand is seasonal and the crop varies in quantity from year to year.

For the 1946 season, the main sawmilling firms in Western Australia produced 780,000 cases. For the 1951 season they supplied only about 370,000 cases. The decrease has in part been due to the loss by fire of four important case-producing mills, viz., Argyle, Nannup, Jardee and Jarrahdale, and to the fact that as cases are about the least attractive of all mill production items and there has been a serious shortage of labour in the industry, sawmillers are not interested in installing new case benches or manning existing ones while the whole of the available strength is required to keep the remainder of the mill in operation.

Attempts have been made to meet the position by encouraging the establishment of special case mills. The Forests Department has made areas available for such mills, but in some instances there have been no applicants for them. Whenever possible the Case Distributors' Association has entered into contracts with existing case mills, but the quality of the production of such mills has not always been satisfactory, and to date it has only been possible to meet the deficiencies in local case production with imported softwood cases. The cost of the latter case is now claimed to be prohibitive and representatives of the Case Distributors' Association presented evidence with regard to the serious shortage that must be expected in the 1952 packing season unless local case production can be considerably increased. Only an adverse season and a substantial balance of cases remaining from the 1950 season enabled the position to be met in the 1951 season.

It is estimated that the actual case production for the 1951 season was as follows:

<table>
<thead>
<tr>
<th>Cases</th>
<th>Main mills</th>
<th>Other general purpose mills</th>
<th>Coppinup contract mill</th>
<th>Other contract mills</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>250,000</td>
<td>80,000</td>
<td>350,000</td>
<td>180,000</td>
<td>860,000</td>
</tr>
</tbody>
</table>

The deficiency was as far as possible made up from:

<table>
<thead>
<tr>
<th>Cases</th>
<th>Carried over by main mills from 1950 season, the equivalent of</th>
<th>Imported cases purchased from Apple and Pear Board carried over from 1950 season</th>
<th>Grand total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>120,000</td>
<td>286,000</td>
<td>406,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1,266,000</td>
</tr>
</tbody>
</table>

The above figures may not be quite complete, but with no cases remaining to be carried over from the 1951 season, it will be seen that unless some improvement takes place, there will be less than 1,000,000 cases available to meet an average crop requirement in 1952 of 1,650,000 cases. Should the season prove a heavy one, requirements will be still greater.

The Government has made earnest endeavours to assist the fruitgrowing industry.

The State Saw Mills in the 1951 season supplied 300,000 of the total of 370,000 cases supplied by the main sawmillers. In March, 1948, it was announced that the Government intended to establish a special case mill at Pemberton and for this purpose the Forests Department in the same month agreed to increase the permissible intake of the Pemberton mill from 43,200 loads per annum to 50,000 loads per annum. In October the same year, the Conservator of Forests advised that to compensate for this additional cutting, he was prepared to advertise a further permit area for which the State Saw Mills would be eligible to bid in competition. However, owing to the pressure for house building timber and labour shortages, the efforts of the State Saw Mills organisation were concentrated upon bringing the New Shannon River mill into production, and in January, 1950, it was decided that State Saw Mills would increase its existing case production by 350,000 cases per annum and a new case mill to produce 500,000 cases per annum would be built at Kent River by the Department of Industrial Development. The Kent River mill is about to commence production, and it is anticipated that the State Saw Mill at Pemberton will shortly be in production with its additional plant.

To be fully effective, case cutting for the apple season should commence in June, and except for the thicker end material, which takes time to dry, deliveries to packing sheds should commence almost immediately afterwards. By October the ends which were first cut should be dry enough for despatch, and all the bulk of the deliveries should be completed by the end of January. The remainder could then flow steadily and the whole be completed by the end of May. Owing to the Christmas and New Year holidays and other delaying factors, such as weather, this programme is only possible if there is a balance of cases carried forward from the previous season.
It was claimed by some witnesses that by its actions the Government had assumed responsibility for case production, and that the main sawmillers, expecting the Government to meet the position, had considered themselves released from the necessity to provide cases. One company, the Kauri Timber Co. Ltd., even sold all its dry case material to other industries and went entirely out of case production.

I have come to the conclusion, however, that the main reason for the decrease in case production in the main mills was their endeavour to meet the Government's request for priority in the production of housing timbers, despite the shortage of labour. It is reasonable to expect that as labour becomes available, the main sawmillers will, for economic reasons, again man the necessary recovery benches and return to a production level of from 750,000 to 1,000,000 cases per annum. This production, together with the production of the Kent River mill and the special case mills should adequately meet the position.

For the 1951 season, the State Saw Mills expect to produce 500,000 cases and the Kent River mill should make a contribution of at least 250,000 cases. Special case mills should also supply around 500,000 cases, leaving a deficiency of about 400,000 cases if there is an average crop.

It is believed that if the fruit growing industry or the Case Distributors' Association meets the main sawmillers and endeavours to expedite the installation and manning of case benches by the provision of labour or other means, the main sawmillers will do all that is practicable to meet the position.

To overcome any further deficiency, no alternative can be seen to importing cases, the cost of which, although high, would be of much smaller account if the costs of both local and imported cases were funded and an average price struck.

I am satisfied that the Government is aware of the position and is pushing on with plans for the completion of the Kent River mill and the extension of the State Saw Mills at Pemberton as fast as practicable.

In the circumstances, and in view of the other classes of material in which equally severe shortages exist, an interim report was not presented on the subject of fruit cases, as requested by one witness. It has, however, to be appreciated that the cutting of export cases calls for specialised cutting which is only possible in mills with good equipment, and the main mills and case mills specially equipped for such production are the ones which should be encouraged in this line of production.

If the present programme of afforestation with softwoods is maintained, these forests should in time be in a position to provide the whole of the case requirements of Western Australia.

**Interstate Requirements.**

There is an obligation upon each State of the Commonwealth to assist where possible in supplying any deficiencies in essential materials in the other States. In this connection it is of interest that Western Australia receives from the other States much larger quantities of such materials by both sea and rail than are exported interstate from Western Australia. One of the essential materials in short supply in the Commonwealth generally which is produced in Western Australia is timber. Some Western Australian timbers have special values for certain essential purposes. Particularly is this the case with jarrah, which, on account of its termite resistant qualities, is in keen demand for use in exposed situations. It is also considered that it is essential for Western Australia to maintain an interstate export trade in timber against the possibility of future surplus production in certain lines. The fact that the ports of Bunbury and Busselton depend to an important extent upon the maintenance of an interstate export trade is an added reason to be considered.

**South Australia.**

South Australia is a State which is almost deficient in native timbers, and although it has made valiant efforts to meet the position by extensive afforestation with softwoods, the established plantations are as yet far from having reached full production. Consequently that State is much more dependent upon imports of timber from other States and overseas than any other State of Australia. Importations of all goods into Western Australia from the Eastern States, both by sea and rail, are so much greater than exports to the east that there is little shipping space available for the transport of timber from the Eastern States to South Australia, but ample space from Western Australia to South Australia. The only difficulty in this direction is the reluctance of the shipping authorities to allow boats to remain long enough in Western Australian ports to take on a full cargo of timber.

Evidence given by sawmillers in Western Australia and the timber trade and other authorities in South Australia with regard to the total requirements of that State is that sawn jarrah and karri ranged from 70,000 to 90,000 loads per annum. There is little doubt that a total quantity of this nature could readily be utilised, and that it would result in a very valuable saving in dollars for Australia as a whole if it were available. South Australia has an import capacity of about 100,000 loads of Oregon. As far as end use is concerned, about 50,000 loads of this Oregon could be replaced by karri if the latter were available.

However, a close examination of various witnesses in South Australia with regard to the need for these timbers where other suitable timbers from other States or overseas were available, reduced the essential annual requirements in jarrah and karri to the following minima:
The quantities of the above requirements in large dimension timber, say with a sectional area of 6in. by 6in. and over, have been estimated as 1,500 loads of jarrah (600 loads for harbour works) and 500 loads of karri, the perhaps unexpectedly smaller requirements shown in large karri being due to the fact that certain overseas timbers, although considerably more expensive, will do much of the beam work for which karri is particularly sought. The timber trade of South Australia is, however, prepared to take a greater proportion in large sections and re-saw them in South Australia if it will assist production in Western Australia. If Western Australia is to produce her requirements in special timbers for such purposes as flooring, joinery and furniture, markets will be needed to dispose of the unavoidable surplus in scantling production.

Victoria.

In Victoria the shortage of sawn timber is generally far less serious than in South Australia. Prior to the war, Western Australia had a trade in both jarrah and karri with Victoria. Jarrah in particular found a ready market for use in exposed situations. In addition, certain industries in Victoria, such as implement making and motor body building, claim that for their requirements, karri is superior to all other timbers in certain directions. Some Western Australian sawmilling organisations have established timber yards in Melbourne and naturally desire to retain their connection in this market. In evidence they gave the Victorian requirements as 11,000 loads of jarrah and 7,500 loads of karri per annum. In 1950-51 Western Australia supplied Victoria with 6,300 loads of sawn jarrah and karri, other than sleepers.

It is not believed that the general position in Victoria justifies the export from Western Australia at the present time of a total of more than 6,000 loads per annum of green karri, mostly in flitches, 2in. to 6in. in depth and of random width and length, together with such wandoo, jarrah and karri telegraph crossarms as may become available surplus to the requirements of Western Australia and South Australia. The matter of crossarms is referred to again later.

Northern Territory.

The Northern Territory also is very deficient in natural timbers and although some supplies are obtained from New South Wales and Queensland, shipping space is so limited that advantage should be taken of any space offering for the carriage of timber to Darwin from Western Australia as well as from eastern ports. The quantity will in any case be very small. Timber exported to the Northern Territory during 1950-51 totalled only 72 loads.

Overseas Requirements.

Western Australian timbers have for many years been in demand by overseas markets. The expansion of the Western Australian sawmilling industry and the development of
much of the country in the South-West of the State has resulted largely from the cutting of timber for export overseas. Considerable sums of money have been expended in developing and maintaining the overseas market, and it is far from certain that Australia may not, in the near future be anxious to sell in such markets again, particularly when the more recently established mills in the lower South-West reach full production, and the present lag in the general development of this country has been overcome. The development of the softwood forests elsewhere in Australia may also depreciate the local value of much of our hardwood production compared with the value of the same material in overseas markets.

It is considered that the maintenance of a standing in overseas markets should be part of the forest policy of the State. For this reason the export overseas from Western Australia of 12,000 loads per annum, or about 5 per cent. of production is still permitted, despite local shortages. It is believed that this is the minimum quantity with which the necessary standing can be maintained, and that it should be continued for the time being.

**Railway Sleepers.**

The railway systems everywhere in Australia are experiencing the greatest difficulty in obtaining the supplies of sleepers required for essential maintenance and re-laying and new construction is almost impossible. In some States the situation is authoritatively described as serious. The Commissioners of Railways in Western Australia and South Australia have both so described the position.

The Commonwealth Railways Commissioner has expressed serious concern at the lack of sleepers needed to carry the coal required to meet the needs of the new power house being established at Port Augusta in South Australia.

Total requirements of railway sleepers in loads over the next few years have been given by the various authorities concerned as follows:

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>W.A. Government Railways</td>
<td>Maintenance</td>
<td>17,716</td>
<td>17,716</td>
<td>17,716</td>
<td>17,716</td>
<td>17,716</td>
<td>17,716</td>
<td>17,716</td>
</tr>
<tr>
<td></td>
<td>Relaying and new construction</td>
<td>8,270</td>
<td>11,105</td>
<td>10,912</td>
<td>7,402</td>
<td>5,552</td>
<td>4,309</td>
<td>3,901</td>
</tr>
<tr>
<td>W.A. Government Tramways and Ferries</td>
<td>Maintenance</td>
<td>83</td>
<td>83</td>
<td>83</td>
<td>83</td>
<td>83</td>
<td>83</td>
<td>83</td>
</tr>
<tr>
<td>S.A. Railways</td>
<td>Maintenance</td>
<td>11,159</td>
<td>11,159</td>
<td>11,159</td>
<td>11,159</td>
<td>11,159</td>
<td>11,159</td>
<td>11,159</td>
</tr>
<tr>
<td></td>
<td>Re-laying and new construction</td>
<td>7,085</td>
<td>7,085</td>
<td>10,000</td>
<td>10,000</td>
<td>10,000</td>
<td>10,000</td>
<td>10,000</td>
</tr>
<tr>
<td>Electricity Trust of S.A.</td>
<td>New construction</td>
<td>435</td>
<td>435</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adelaide Tramways Trust</td>
<td>Maintenance</td>
<td>350</td>
<td>350</td>
<td>350</td>
<td>350</td>
<td>350</td>
<td>350</td>
<td>350</td>
</tr>
<tr>
<td></td>
<td>New construction</td>
<td>350</td>
<td>350</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commonwealth Railways</td>
<td>Maintenance</td>
<td>7,381</td>
<td>7,381</td>
<td>7,381</td>
<td>7,381</td>
<td>7,381</td>
<td>7,381</td>
<td>7,381</td>
</tr>
<tr>
<td></td>
<td>Re-laying and new construction</td>
<td>9,000</td>
<td>9,000</td>
<td>1,500</td>
<td>1,500</td>
<td>1,500</td>
<td>1,500</td>
<td>1,500</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>61,829</td>
<td>64,664</td>
<td>59,191</td>
<td>55,591</td>
<td>53,741</td>
<td>52,558</td>
<td>52,690</td>
</tr>
</tbody>
</table>

It will be noted that the requirements for 1952 total 61,829 loads, of which maintenance requirements alone constitute 36,689 loads.

The above makes no provision to meet the proposals for standardisation of gauges.

In 1937-38 the production of sleepers amounted to 92,300 loads, of which maintenance loads were hewn and 40,800 loads sawn. However, with the advent of the war, the production of hewn sleepers commenced to fall, and in 1940-41 totalled only 25,700 loads, while the production of sawn sleepers in the same year was 46,600 loads. From that time, however, the production of both sawn and hewn sleepers fell, and although in 1942-43 the production of sawn sleepers was 38,700 loads, the production of hewn sleepers was only a little over 300 loads.

In 1950-51 the production of sawn sleepers dropped to the record low level of 29,000 loads, while only 23 loads of hewn sleepers were produced.

These reductions, which in the first place were due to the loss of manpower during the war years, have continued as a result of the general purpose mills giving priority in production to housing timber, and more recently to the sleeper mills being permitted to change to long length scantling production.

The hewer has now practically disappeared from the forests of Western Australia, and there appears to be little possibility of sleeper hewing again being of any consequence in that State.
The position is a very serious one for the Australian Railway Services, and they have all been making inquiries with regard to the possibilities of obtaining railway sleepers from overseas. Some supplies of steel sleepers have been arranged, and South Australia has placed orders in Portuguese Timor and in Trinidad. Prospects of supply are, however, very indefinite, and no quantities of any consequence have yet been received.

In the national interests, it is considered that all sleeper mills on State forests and Crown lands should be required to resume sleeper cutting as their main production line, and that the general purpose mills should be encouraged to increase their production in this class of material.

That a considerable increase in sawn sleepers is possible in a short time is shown by the fact that in 1938-40 production was around 26,500 loads, and in 1940-41, 46,100 loads were produced. It is considered that every effort should be made to obtain a production rate of at least 50,000 loads of sleepers per annum as early as possible.

It is considered that the programme of sleeper cutting for 1952 should be based upon the following allocation in loads:

<table>
<thead>
<tr>
<th>Authority</th>
<th>6 ft. 6 in. x 8 in. x 4 ft.</th>
<th>6 ft. 6 in. x 9 in. x 4 ft.</th>
<th>7 ft. 9 in. x 8 in. x 4 ft.</th>
<th>8 ft. 0 in. x 10 in. x 5 in.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>W.A. Government Railways</td>
<td>2,000</td>
<td>2,000</td>
<td>2,000</td>
<td>2,000</td>
<td>2,000</td>
</tr>
<tr>
<td>W.A. Government Trams and Ferries</td>
<td>800</td>
<td>800</td>
<td>800</td>
<td>800</td>
<td>800</td>
</tr>
<tr>
<td>S.A. Railways</td>
<td>1,500</td>
<td>2,000</td>
<td>2,000</td>
<td>2,000</td>
<td>2,000</td>
</tr>
<tr>
<td>Electricity Trust of S.A.</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>S.A. Municipal Trams Trust</td>
<td>2,500</td>
<td>2,500</td>
<td>2,500</td>
<td>2,500</td>
<td>2,500</td>
</tr>
<tr>
<td>Commonwealth Railways</td>
<td>80</td>
<td>80</td>
<td>80</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td>Total</td>
<td>3,750</td>
<td>3,750</td>
<td>3,750</td>
<td>3,750</td>
<td>3,750</td>
</tr>
</tbody>
</table>

Small quantities may be required for other authorities, such as the British Phosphate Commission, but the total in this direction should be of no practical significance.

The above will provide bare maintenance requirements for South Australia, a little more in the case of Western Australia and some additional contribution for the Commonwealth Railways in standard gauge. Two points in this allocation require some explanation. Firstly, the shortages in essential requirements of the Australian railway systems are considered to be so serious that despite the loss of valuable overseas markets that may result, no provision should be made in this direction at the moment. Secondly, some supply is recommended to South Australian and Commonwealth Railways while Western Australia is still considerably short of its total requirements, because the maintenance of the Commonwealth and South Australian Railway systems is considered to be not only essential from the national aspect, but also important in the interests of Western Australia. In 1948-49, 17,669 tons were carried by the Trans-Continental line westwards as against 4,270 tons eastwards, and in 1949-50, the respective figures were 15,632 and 3,272 tons.

The additional supplies proposed in standard gauge sleepers for the Commonwealth Railways are for the broadening of the gauge from the new power house being erected at Port Augusta to the Leigh Creek coalfields. It is considered that this supply of coal is an essential work of such national importance that its requirements in railway sleepers should have first priority after essential maintenance requirements are fulfilled. Should any delays occur in connection with the development of the Port Augusta power house, cutting can readily be diverted to produce the material badly required, firstly in Western Australia and secondly in South Australia.

The Commissioner for Railways in South Australia has strongly represented the importance of completing the broadening of the gauge in the south-east of that State, owing to, firstly, the very extensive replacement of narrow gauge sleepers which will otherwise be necessary, and secondly, because of the need on the northern lines for the narrow gauge rolling stock from the south-east. In view of the increase in forest and agricultural production which is taking place in the south-east of South Australia, I am impressed with the justification for the claims of the Commissioner for the South Australian Railways, but at the present time it does not seem practicable to meet his requirements without reducing the very limited quantities likely to be available for the broadening of the gauge from Leigh Creek to Port Augusta.

At the same time, the urgent need for additional sleepers in Western Australia cannot be overlooked, and it is only reasonable to expect that this service will receive some priority in the supply of sleepers from the State which it serves.

In addition to the requirements given above, the Victorian Railway Commissioners are seriously in need of sleepers and would appreciate any assistance possible from Western Australia.

In view of the increased production in karri likely in the near future, it is possible that to obtain 50,000 loads of sleepers per annum it will be necessary to include some karri. This would require the erection of a treatment plant, as unless impregnated with some preservative, the life of karri in contact with the ground is usually so much shorter than jarrah that after a few years the annual requirements would be increased as a result of the more frequent replacements that would be necessary. The Forest Products Division of the Commonwealth
Transmission Crossarms.

Particular attention is drawn to the difficulty being experienced by the Commonwealth Postmaster General’s Department in obtaining supplies of crossarms. Each year it has been the custom of that Department to call for tenders for the supply of this material. Annual requirements from Western Australia have been rated as 800 loads for that State, 550 loads for South Australia, 1,000 loads for Victoria and 150 loads for Tasmania. The reason given by the Department for expecting Western Australia to contribute towards the requirements of Victoria and Tasmania is the fact that supplies of suitable timbers are much less readily obtainable in those States than in Western Australia.

For a considerable time the supplies provided have been inadequate to meet the full demands of even Western Australia. Crossarms should normally be seasoned before being used, as green timber introduces serious maintenance defects. Stocks have, however, been so inadequate of recent years that seasoning is out of the question, and at the present time there are actually no seasoned crossarms in stock.

The reason which has been given for the decrease in supply is that small sectional cutting of this nature utilizes considerably more manpower and slows up total produc-

Plywood.

During 1950-51, 2,664 loads of karri, 163 loads of plantation grown pine and 1,484 loads of imported logs were peeled in Western Australian ply mills. In addition, 1,257,493 square feet from the Eastern States and 26,529 square feet from overseas were imported, giving a total plywood consumption for the State of nearly 9,000,000 square feet, or approximately 15 square feet per capita, compared with an estimated per capita consumption for the whole of Australia of about 25 square feet. However, plywood is in greater demand in some of the other States than in Western Australia, owing to shortages in other timber lines, and although supply was insufficient to meet the 1950-51 demand in Western Australia, there should be little difficulty in meeting the State’s requirement in plywood insofar as local timbers are suitable.

For the year 1950-51, 1,192,010 square feet of veneer was imported from the Eastern States and 83,433 square feet from overseas. This requirement could not readily be met from Western Australian timbers.

Piles and Poles.

Annual requirements in Western Australia in piles and poles for the next few years have been given as follows:

<table>
<thead>
<tr>
<th>Authority</th>
<th>Piles</th>
<th>Poles</th>
<th>Stringers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Works Department</td>
<td>50,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main Roads Department</td>
<td>25,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>W.A. Electricity Commission</td>
<td>394,500</td>
<td>4,650</td>
<td></td>
</tr>
<tr>
<td>W.A. Government Tramways</td>
<td></td>
<td>25,000</td>
<td></td>
</tr>
<tr>
<td>Postmaster General’s Department</td>
<td>75,000</td>
<td>394,150</td>
<td>26,000</td>
</tr>
</tbody>
</table>

In addition, however, a considerable number of poles and some piles are required by local government authorities and private property owners.

Although the sale of piles and poles is very attractive to the Forests Department from the purely financial angle, there is a serious shortage in the forest of these sizes which are needed to produce the sawmilling logs of the future. Moreover these trees are often the elite stems in the forest and should be retained to play their part in regeneration. For these reasons the Department endeavours to force the cutting of piles and poles on to private property where they would otherwise be destroyed in clearing operations. Unless their removal is required for silvicultural reasons by the Forests Department, the cutting of piles and poles over 50ft. in length should not be permitted on State forests if it is possible to obtain them elsewhere or to employ substitutes.

Evidence was given of South Australia’s requirements in piles from Western Australia. These were estimated as follows:

<table>
<thead>
<tr>
<th>Authority</th>
<th>Lineal feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Australian Harbours Board</td>
<td>290,000</td>
</tr>
<tr>
<td>Electricity Trust of South Australia</td>
<td>100,000</td>
</tr>
</tbody>
</table>

In view of the difficulty in procuring piles in Western Australia for the more limited requirements of that State, it is not considered that any appreciable contribution of South Australia’s requirements in this class of material is practicable.
Miscellaneous Forest Produce.

Requirements in mining timber, fencing and other miscellaneous forest produce can, it is considered, be met without difficulty, incidental to the normal forestry and sawmilling operations.

Tanning Materials.

Although there has been a gradual decrease in the annual production of mallet bark, supplies still appear to be sufficient for Western Australia's requirements, and exports to the other States of Australia are still considerably in excess of the quantity of wattie bark imported from South Africa. South Africa now provides the total imports by Western Australia of both tanning bark and tanning extracts. In tanning extracts, the distillation of wandoo supplies a quantity which meets local demands and still permits the bulk of the production to be exported to all the other States of Australia and to many countries overseas.

No particular action is required in connection with the supply of tanning materials beyond reserving wandoo timber on Crown lands, integrating the wandoo sawmilling and distillation industries, and trial and investigative work by the Forests Department in connection with the economics and technique of the production of tanning bark.

SUMMARY OF FINDINGS AND RECOMMENDATIONS, INCLUDING REMEDIAL ACTION IN RELATION TO THE FOREGOING TERMS OF REFERENCE.

(Term of Reference 9.)

FOREST RESOURCES.

The forest resources of Western Australia as a source of sawn timber production are practically confined to the south-west corner of the State, where they occupy about 3,400,000 acres of State forest, 2,500,000 acres of other Crown lands and 200,000 acres of private property, and there are estimated to be about a further 1,000,000 acres of private property carrying scattered trees of sawmilling value. It is considered that further areas of Crown lands should be dedicated State forest, but it is believed that the total area of native forest in the South-West, worthy of dedication, will be found not to exceed 4,000,000 acres.

The volume resources of these forests are inadequately known. It has been estimated, however, that in all, both Crown and private, there are at the present day about 37,000,000 loads of merchantable jarrah, wandoo and karri mill logs in trees over 90in. G.B.H. (girth breast high) and about half that quantity in trees between 60in. and 90in. G.B.H., as well as a considerable, but unknown, quantity of good marri, and lesser quantities of other species, such as yarri, tuart and tingle. Very little is known of the total volume in trees under 60in. G.B.H., but it has been suggested that on 4,000,000 acres of State forest and Crown lands there are 3,000,000 loads of potentially merchantable jarrah, wandoo and karri log timber in trees between 25in. and 60in. G.B.H. In addition, on the same area, there is estimated to be a volume of doubtful merchantability at the present day of 8,000,000 loads in trees over 90in. G.B.H. and 3,000,000 loads in trees between 60in. and 90in. G.B.H. How much of the above quantities will be converted and utilised it is impossible to say at present, as beyond about 4,000,000 acres of State forests and Crown lands, much of it is likely to be burnt and cleared in the course of agricultural settlement before it can be utilised.

There is insufficient information available of the different types of forest, their stocking in trees of different sizes and their rates of growth to enable any useful figures of increment to be advanced, much less for any useful forecast to be made of their potential future growth. It is known that the rate of growth in the jarrah forest, which comprises the great bulk of the forest resources of the State, is at present generally very slow, but it is not known to what extent this may be due to unhealthiness and be capable of improvement under good forest management. Since about 1938 the Forests Department has been endeavouring to secure the necessary information by careful periodic measurements on a series of strips established at regular intervals over the whole of the forest area, but comparatively little progress has been possible owing to shortage of staff. This work should give much useful information in the near future, but quicker results are believed to be obtainable by the development of forest type maps from aerial photographs, and the measurement of selected samples in each type. A commencement has been made with this work.
In view of the increasing scarcity and value of tanning materials in the world, the Forests Department has for some years been reforesting areas along the eastern edge of the South-West forest region with mallet, a native species, of which the bark is particularly high in tannin content. To date 17,000 acres have been sown and healthy stands developed, but some years must elapse before the suitability or otherwise of many of the soil types can be adequately demonstrated.

In the inland forests of the Eastern Goldfields, there are 15,000,000 to 20,000,000 acres of eucalypt forest, carrying on the average about three loads of firewood per acre. These forests are remarkable for their development in a region receiving an average annual rainfall of only about 10in. They have been, and will continue to be, of very great local value in providing fuel and mining timbers. About 6,000,000 to 7,000,000 acres have been cut over, but it is estimated that there are ample supplies remaining in the virgin stands for at least another 50 years, after which time the cut over stands which have regenerated satisfactorily should meet future requirements.

North of these eucalypt forests are about 50,000,000 acres of mulga bush, the better stands of which yield from one to three tons of fuel and mining timber per acre. In addition to its value for this purpose, this bush is of considerable importance from the aspect of soil conservation. As a result of being cut for fuel, and of grazing, it is gradually deteriorating.

About 14,500 acres in the South-West have been planted with softwoods, and an approved working plan provides for the planting of 11,200 acres between 1950 and 1954, both years inclusive, as part of a scheme designed to provide an eventual softwood forest for the State of at least 100,000 acres. The species used has been mainly *pinus pinaster*, but other species have shown promise in certain localities. As a result of considerable investigation and trial, a technique has been successfully developed for the production of healthy stands of pines upon some very poor soils. The Forests Department is, however, experiencing considerable difficulty in securing areas suitable for the growth of softwoods to meet the requirements of its afforestation plans.

**Recommendations.**

It is recommended that:

1. The determination of the extent of the different forest types and the stocking, volumes and rates of growth in the forests of the South-West be vigorously pursued by the Forests Department, and that this work be regarded as a continuous task, owing to the constant changes taking place in the forest as a result of growth, trade operations and losses from such causes as fires.

2. All Crown lands, including forest reserves, carrying milling timber of good quality, or permanently required for other forestry purposes, be dedicated State forest and that all other Crown lands carrying milling timber in forest be reserved from sale until the timber is removed.

3. A committee consisting of the Conservator of Forests, the chairman of the Land Settlement Board, the Director of Agriculture and the Surveyor General, be appointed to consider and make recommendations in any cases where doubt exists with regard to the desirability of dedicating as State forest or reserving as timber reserves any land sought for this purpose by the Conservator of Forests.

4. An early decision be made with regard to the applications of the Conservator of Forests for the dedication of about 336,000 acres of jarrah and karri in the south and about 393,000 acres of wandoo and jarrah in the north, in order that any of these areas to be dedicated may be brought under forest management and adequate fire control.

5. In considering the desirability of dedicating or reserving from sale areas of wandoo forest, account be taken of the value of this tree for the production of tannin extract and honey, as well as timber.

6. Consideration be given to removing the reservation to the Crown of timber on alienated land which has been under established pasture for a period of five years.

7. The remaining virgin forest areas in the south be brought into production and under intensive fire control as early as practicable.

8. Special attention be given by the Forests Department to its study of the silviculture of jarrah, particularly to ascertain if the health of the forest can be improved and the rate of growth increased, and that the work include the possible effect of associated species.

9. The effect of a fast rate of growth upon the characteristics of jarrah as a timber be investigated.

10. Experimental planting of sandalwood and mallet be continued on a small scale by the Forests Department.

11. Encouragement of the conservation of the remaining stands of native tree species in the drier areas, and the establishment of additional areas by planting, be continued by the Forests Department.

12. The silviculture of the eucalypts of the inland forests be studied by the Forests Department with a view to the possible use of these species in treeless tracts elsewhere, as well as to their improved development in their native habitat.

13. The regeneration and development of the mulga be studied for the purpose of developing methods of cutting and
The approved softwood afforestation programme of 2,000 acres per annum be continued, and that a sufficient area of suitable land be dedicated to the forest administration. Each forest division is divided into three working plans:—

1. A plan for the operation of general purpose mills in jarrah, karri and wandoo, which, on the basis of a 30-year cutting cycle, provides for an average annual cut of approximately 600,000 loads of log timber from 1st January, 1945, to 31st December, 1974. The average annual cut from the 1st January, 1950, to the 31st December, 1954, has actually been fixed at 626,100 loads, and the plan is subject to review not later than 31st December, 1954.

2. A plan for the operation of sleeper mills in jarrah and wandoo, which provides for an annual cut of approximately 100,000 loads of log per annum from the 1st January, 1945, to 31st December, 1954.

3. A plan for the operation of case mills. This plan has not yet been completed, but tentatively the cut has been fixed at 30,000 loads of log timber per annum.

The purpose of these working plans is to stabilise and ensure a long life in the sawmilling industry in the interests of sustained output and employment, by providing that when a mill has exhausted its permissible cut another area, if available, will be sold for a mill of the same capacity.

Each plan makes provision for some additional cutting in certain circumstances, such as on areas too small to provide sustained cutting for a mill, or in cases where it is necessary to mill timber to avoid its destruction in clearing for agricultural settlement. The present maximum allowable cut can therefore be regarded as between 750,000 and 800,000 loads per annum.

The evidence available with regard to the stocking and present and potential increment of the forest is of little assistance in endeavours to determine the maximum cut of sawmilling logs that could be sustained. Such figures as are available suggest that the cut from State forests and the better forests on Crown lands, on present standards of log merchantability, should not exceed an average of 500,000 loads per annum. To this, however, might be added 300,000 loads of further cutting, to be obtained from a percentage of the logs of doubtful merchantability, Crown lands carrying poor jarrah forest, and the good marri scattered throughout the jarrah and karri forests, with a further 100,000 loads from private property, making a total annual cut for the State for some time of 900,000 loads.

At the present time the permissible cut under permits issued over State forests and Crown lands is over 1,000,000 loads per annum, and the registered intake of mills operating on private property is nearly a further 250,000 loads. Although it is not to be expected that all mills will, over any period of time, achieve a sustained maximum capacity intake, it appears inevitable that at some time there will have to be a reduction in the intake of mills operating upon State forests and Crown lands, and a very considerable and permanent reduction in the case of mills operating upon private property. Such reductions will be most economically effected, by reducing the number of mills in conformity with the provisions of the Forests Act and the working plans.

For forest administration purposes, the forest area of the State is divided into 11 divisions, which are at present directly under the charge of six resident professional foresters, one of whom is the officer in charge of the fire control directorate of the department. Each forest division is divided into a number of forestry districts under the charge of officers of the general division, district foresters and foresters, and the direct control of operations in the field is the charge of assistant foresters, who are also responsible for determining the trees to be removed, the trees to be retained in the course of logging operations. The number of professional foresters is far too low to provide adequate direction and supervision.

Recommendations.

It is recommended that:—

1. The total cut of all mills on State forests and Crown lands should not exceed 800,000 loads, pending the next revision of the working plans,
2. Any necessary reduction in supplies of logs from State forests and Crown lands be applied to mills for whom supplies are being provided outside the provisions of the working plans.

3. Every effort be made in time for the next revision of the working plans in 1954 to determine as accurately as practicable in the time the maximum sustained yield possible from the forests of the South-West.

4. Departmental tree marking be extended to all trade operations on State forests, in order to ensure the retention of sufficient volume for the next cutting cycle, and the thorough utilisation of all the marketable material that should be removed.

5. The bases of the estimates of volumes and allowable yields be clearly shown in the working plans in the future.

6. Additional forestry divisions be created and adequate professional staff provided to ensure that the objects and provisions of the working plans are fulfilled, particularly with regard to the retention of volumes and development of the forest needed to ensure the requirements of the next cutting cycle.

7. As the necessary staff becomes available, the working plans be extended or new ones prepared to define the policy of the Department with regard to all aspects of the management of the forests and to prescribe the means by which it is to be achieved on specific divisions of the forest.

FOREST POLICY.

The forest policy of Western Australia as expressed in the terms of the Forests Act, 1918, and other legislative enactments makes provision for the classification of the forest lands of the State, the dedication of forest areas as State forests, revocable only by resolution of both Houses of Parliament, and, in general, for the protection and management of the forest resources of the State by a Department with adequately qualified officers. In the interests of that continuity of policy so essential in forestry, it provides for the appointment by the Governor of a Conservator of Forests, who is directly responsible for the administration of the Department, the preparation of working plans for each State forest and timber reserves, and the management of the forests. It provides that the products of the forest shall be disposed of by the Conservator under conditions designed to ensure fairness in their allocation and the best possible returns to the State. Finally, to ensure funds for the reforestation and improvement of the forests, it provides that three-fifths of the net revenue shall be expended upon such forest works. In short, it provides for the protection, management and utilisation of the forest resources of the State in the interests of the community as a whole.

The forest policy of the State is considered to be sound in principle, and soundly administered. The policy of the Forests Department under the provisions of the Act has been stated as the provision, as far as possible, of a continuous yield from the forests in the interests of the requirements of the State in timber, and the stability of employment in the timber industry. The implementation and continuity of this policy is ensured by adherence to the provisions of the Forests Act and the working plans.

Under the working plans, the main forest area of the South-West is divided into sawmilling areas, each designed to provide for a mill of suitable capacity, sufficient timber to enable the cost of its establishment to be recouped. Upon the exhaustion of the available timber supply on one of these sawmilling areas, another area, if available, is submitted for sale for a mill of similar capacity.

Outside these provisions of the working plan are isolated areas too small to provide sufficient timber to maintain a mill, or which have to be exploited quickly in advance of clearing for agricultural settlement. Timber from such areas is made available to other existing mills. There is no possibility of timber supplies on State forests or Crown lands being reserved to provide the supplies necessary to keep such mills in continuous operation.

All sales of permits to log sawmilling areas on State forests and Crown lands, whether long term or short term, provided the aggregate royalty is in excess of £10, are made by auction or tender, as provided under the Forests Act. A condition of sale is always that the highest tender is not necessarily accepted, and other conditions are sometimes applied which limit the sale to certain existing mills. The general practice of the Department is to sell small parcels of timber by auction and entire sawmilling areas by tender. No instances were found of permits being let without their having first been submitted to auction or tender, or when less than two independent existing mills were able to bid or tender.

No matter what quantity of timber may be involved, it has always been the practice of the Department to issue permits for periods not exceeding 12 months, and to renew them upon expiry until the whole area has been cut over. Under the Forests Act, permits may not be let for a longer period than 10 years, but may be renewed.

It is considered that the above system of disposal of forest products has been fairly administered and generally satisfactory, and no adequate reason can be seen for changing it to a system of purely arbitrary allocation of permits.
Recommendations.

It is recommended that:—

1. The provisions of the Forests Act that all permits of a royalty value in excess of £10 may be submitted to auction or tender be retained.

2. The provisions of the Forests Act empowering the Conservator of Forests to grant permits be retained.

3. Where an unsuccessful applicant for a sawmilling permit which has been submitted to auction or tender requests it, a committee of appeal be constituted to hear his representations and those, if any, of other applicants desiring to give evidence, and that such committee submit a recommendation on each case.

4. The constitution of the appeals committee referred to in 3 above be a magistrate, or some other person of judicial capacity and standing as chairman, the Conservator of Forests, or his nominee, and a third member from outside the Public Service with suitable qualifications, such as a member of the Institution of Engineers of Australia, or a practising member of the Institute of Chartered Accountants in Australia.

5. In the case of holders of long term permits who have expended considerable sums on the establishment of their mills and mill facilities, including housing, and who have faithfully fulfilled the conditions of the permits, consideration be given to extending the terms of their permits for periods of more than 12 months, subject to their agreement to the insertion of a condition that the royalty may be varied by the Conservator at any time, in accordance with any general re-appraisal of royalties that may be determined, and that the permit may be reduced to an annual basis or cancelled by the Conservator for a breach of any conditions.

6. As early as practicable, a re-assessment be made of all long term permit areas, and that such areas be adjusted to ensure that they are sufficient and not more than sufficient to provide the life which was estimated when the permit was sold, and that such re-assessment be commenced in the vicinity of the metropolitan area and advanced gradually southwards.

7. In the case of an excision from a permit area as a result of action under 6 above, the excised area be firstly, applied to meet any deficiencies in adjoining permits, secondly, reserved as areas to be made available to adjoining permit holders when they exhaust their existing permit rights, and thirdly, where the second alternative may be unnecessary or undesirable, that they be made available by auction or tender to other existing mills in need of supplies. It should not, however, be overlooked that changed economic conditions could reduce present-day estimates of merchantable volumes on an area.

UTILISATION.

The sawmilling industry is the mainstay of the forest industry. In general, all other requirements in forest produce can be obtained in the course of the production of sawmill logs.

The main problem in forest utilisation in Western Australia is firstly, to ensure the retention of sufficient good healthy trees for the next cutting cycle and secondly, the thorough utilisation of all the material which should be removed from the forest. To achieve these ends, the Forests Department has adopted the system of marking all trees which it is considered should be removed. Sawmillers generally appreciate that this system has lengthened the life of their permit areas, by ensuring that the lower grade logs are utilised, while the better logs are available to make it economically possible to do so. About 1,000,000 acres have now been cut-over under tree marking.

The successful utilisation of marri is a problem of considerable importance in Western Australian forestry. Although it is, on the average, of inferior sawmilling quality, marri is present in the forest in considerable quantities, and it must eventually form an appreciable proportion of the saw log supplies of Western Australia.

Karri ply logs are being supplied by the Forests Department under contract to a peeling mill in Perth, but as yet, in insufficient quantities.

The utilisation of wandoo by distillation for the production of tannin extract is assuming a position of importance in forest industries. The quantity of wood used for this purpose in 1950-51 was roughly 5 per cent. of the total used by the sawmilling industry.

The cutting of piles and poles on State forests and Crown lands is not encouraged, owing to the need for such sizes to supply future crops of sawmill logs, and the importance of utilising all such material available on alienated land before it is destroyed in the course of clearing.

There appears to be no prospect at present of a wood pulp industry being established in the native forests of the State, but the development of softwood forests and further experience in the pulping of young hardwoods may make such an industry practicable in years to come.

The use of timber which has been standing or lying dead in the forest for years can provide a supply of partly dry timber, but the extent to which the moisture content of in-
individual logs varies and the low recovery obtainable in many cases owing to external checking, borers and interior rot, makes it doubtful if its utilisation is of any considerable importance, beyond the saving of timber effected.

Recommendations.

It is recommended that:—

1. The system of marking the trees to be felled be applied to all logging operations on State forests.

2. Every effort be made by the Forests Department to secure maximum utilisation by the sawmilting industry of short length logs, small diameter crown logs and logs of low standard.

3. Where a permit holder has, in the opinion of the Conservator, failed to remove all the merchantable timber available to him from a cut-over area, that area should be excised from the permit so that the Department may proceed to dispose of such trees.

4. When the Forests Department secures mill logs in the course of its silvicultural operations, they be offered in the first instance to local mills operating under the provisions of the working plan as portion of their permissible cut, and failing such sale, they be offered to any other existing mills.

5. Where a permit holder is unable to provide adequate supervision of its forest operations, the Conservator of Forests be empowered to undertake the logging for his mill, or such part of it as may be considered necessary.

6. Effective action be taken to provide the quantity of karri peeling logs which the Department has contracted to supply.

7. In considering the issue of permits for the logging of wandoo, due consideration be given to the desirability of integrating the operations of sawmillers with those of the tannin extract industry.

8. The investigation of the problems of selection, cutting and utilisation of species other than jarrah and karri, in particular marri, be continued by the Forests Department.

9. The cutting on State forests and Crown lands of piles and poles, particularly in the longer lengths, be discouraged as far as possible, except where the Department needs to remove them in the course of silvicultural treatment of the forest.

SAWMILLING.

There were 149 general purpose mills registered in Western Australia at the 30th June, 1950. Twenty-three of these mills had an intake capacity of 12,000 loads and over per annum. Their total registered capacity represented 56 per cent. of the registered capacity of all the general purpose mills in the State, and during the year 1949-50, they produced 57 per cent. of the actual production of such mills.

The 51 mills with an intake capacity of 7,000 loads and over per annum represented 80 per cent. of the total intake capacity per annum, and they produced 86 per cent. of the total production.

The intake capacity of the remaining 98 smaller mills represented 20 per cent. of the total intake capacity, and they produced only 14 per cent. of the total production of general purpose mills in 1949-50.

The registered capacity is not necessarily the permissible intake, but these figures indicate the importance of the large mills achieving increased production as rapidly as possible, particularly when it is appreciated that they are the main source of the flooring, moulding and dry timber supplies, materials in which shortages chiefly exist. The attainment of increased production by the large mills is largely dependent upon their ability to obtain materials and provide the housing and the township amenities necessary to attract and hold labour. There is reason to believe that some of the larger mills could reasonably have been expected to have made more determined efforts in the early years after the last war to complete the building of new mills and increase production, but at that time they were undoubtedly experiencing unusual conditions and difficulties in these directions which it took them some time to appreciate would not rapidly disappear. There is no sound reason to believe that they deliberately refrained from using their best efforts to increase production. I am satisfied that during the last two years they have in most, if not all, cases made every reasonable endeavour to meet the Government’s express desire for increased intake.

The Government has a State Sawmilling Department and the mills of this organisation, together with the mills of the Western Australian Government Railways and the Wundowie Charcoal and Iron Industry, and the recently erected Kent River mill, possess in total a capacity of more than 20 per cent. of the sawmilling capacity of all the general purpose mills in the State. In the circumstances, it is reasonable to expect that some difficulties will be experienced in any attempt to persuade the private enterprise sawmillers to discard their normal markets and adapt their plans to meet the ideas of other authorities with regard to what should constitute their production lines and their markets. Some unfortunate misunderstandings have occurred, but in general it is considered that the sawmillers of Western Australia have been very co-operative.

There were 43 sleeper mills registered at the 30th June, 1950. Some of these mills had been given permits on State forests and Crown lands for the purpose of converting
to sleepers short logs which the large mills did not desire to handle. Some of these mills have lately been permitted to increase their log lengths so that they might produce long length scantling. From the forestry aspect, their special value then disappeared, while the decrease in the production of sleepers is a matter of national concern.

As at the 30th June, 1950, there were 57 case mills registered. These mills have a particular value in forest from which general purpose mill requirements have been removed.

It is considered that the general provisions made in regulations under the Forests Act for precautions to be taken by sawmillers against the occurrence and spread of fires in mills will be generally satisfactory if adequately policed by the Forests Department.

Recommendations.
It is recommended that:

1. Any assistance practicable be given the sawmilling industry through Government agencies to procure supplies of essential materials and equipment which are in short supply, and to provide housing and township amenities at mills.

2. Consideration be given by the Government to building houses in towns in milling districts, such as Manjimup, and the provision of roads and bus services therefrom to milling centres.

3. The Forests Department continues to impress upon sawmillers the need for improvements in mill methods and plant, particularly in the direction of accuracy in sawing, speed in the movement of timber within the mill, mechanisation of timber handling equipment, improvement in sawn recovery from the log and avoidance of waste.

4. Sawmillers give serious consideration to the practicability and possible advantages of incentive systems for employees.

5. Consideration be given to requiring all mills to make reasonable provision to accept small logs down to 7ft. in length and 10in. minimum diameter produced in the course of normal logging operations.

6. Consideration be given by the Western Australian Government Railways to extending the period before which demurrage is charged upon railway trucks which have to be taken some distance by private line for loading at mills.

7. As long as Government mills compete with private enterprise in the open market, private enterprise be given the opportunity of competing against Government mills for Government requirements in timber.

8. One central authority, such as the State Saw Mills organisation, be required to provide technical supervision and sales co-ordination for all Government mills.

9. The Forests Department carefully police requirements of the regulations under the Forests Act in the matter of the prevention of fires in sawmills, and that particular care be given to the provision of sufficient hydrants in positions where they can be effectively operated in the event of a fire occurring in the mill.

10. Provision be made for alternative precautions, to the satisfaction of the Conservator, to be taken when any portion of the regulations is impracticable of application in the case of any particular mill.

**FOREST VALUATION AND FINANCE.**

Insufficient information is available with regard to the condition and stocking of the forests to enable their value to be reliably expressed in monetary terms, and in any case, forests have values which are never readily assessable in this form.

The total expenditure of the Forests Department in 1950-51 was £646,651, of which about half was invested in capital improvements, such softwood afforestation and housing. The gross revenue of the Department for the same year was £393,180.

The Forests Act makes provision for three-fifths of the net revenue of the Department each year to be placed to the credit of a fund which may be expended by the Conservator, with the approval of the Minister, on the improvement and reforestation of State forests, and the development of forestry. From the 1950-51 gross revenue, £157,321 was credited to the fund. The credits to the fund from this source are, however, far from sufficient to meet all the necessary forestry expenditure, and additional moneys to cover the 1950-51 expenditure of the Department were largely provided by Consolidated Revenue (£138,491), Treasury grants (£112,000), loan funds (£203,836), Commonwealth Aid Roads grant (£38,113). The funds available to the Forests Department have always been soundly and economically expended, but to enable the Department to provide protection and to develop and manage the whole of the forest area under its charge, to develop and maintain softwood plantations, and for the administration of the Department generally, additional moneys are necessary.

On the basis of present-day costs, it is considered that at least £1,000,000 per annum are needed for this purpose. This amount makes no provision for any unusual works, such as large departmental conversion or utilisation projects, from which, however, there should be a direct return, and which could therefore be financed upon a suspense account basis. Such moneys should be regarded as distinct from the normal financial provisions of the Department.
It is not reasonable to expect present-day consumers to pay a price for their requirements in forest produce sufficient to pay for repairing the neglect of past years, and the capital expenditure required for capital improvements from which future generations will reap the benefits, and therefore it is essential that if the forests are to be properly protected, managed and developed, moneys additional to those in the Forest Improvement and Reforestation Fund will need to be provided out of loan funds, Consolidated Revenue and other Government grants, although some added revenue may be expected from increased production and royalty charges.

It is considered that in view of the present-day values and costs, existing royalty rates are in many cases too low, and that the general re-appraisal which the Department had in hand when the Commission commenced should proceed without delay, in order to bring all royalty rates on to an equitable and adequate basis, having due regard in each case to the variations in such economic factors as quality of forest, accessibility and the cost of transport to market.

Recommendations.

It is recommended that:—

1. As the staff becomes available to provide the close direction and supervision necessary to ensure that the increased moneys will be soundly and economically expended, the annual financial provision for the Forests Department be increased upon the basis of present-day costs to a total of at least £1,000,000, to provide for the protection, development and management of the native forests, the establishment of softwood forests at the rate of 2,000 acres per year, and their protection and management, and the administration of the Department generally, and that special additional provision be made for any extensive unusual works required, such as conversion of forest products, by the Department.

2. The Conservator of Forests make a general re-appraisal of all existing royalty rates.

3. An Appeals Committee be appointed to investigate and make recommendations in cases where the holders of permits request revision of royalty rates determined as a result of any such general re-appraisal.

4. The constitution of such Appeals Committee be the same as, or similar, to that recommended to deal with appeals against the allocation of permits.

5. An accounting branch under a capable accountant be developed within the Forests Department, and a sound system of cost accounting and recording instituted for all forest works, according to specific areas.

ADMINISTRATION.

The administration generally of the Forests Department is handicapped by a serious shortage of professional foresters, but it is not considered that any extensive charges are necessary or desirable in the form of administration.

The Forests Department has of recent years lost the services of so many senior officers that there have been too many calls upon the Conservator for his attendance in the field, and for other senior officers to act as resident forest managers.

It is essential that every head of a forest service should keep himself informed of the work of his Department by personal inspection, but the direction of all the operations should not be dependent upon frequent inspections by the head of the service. Responsibilities and powers of direction for this purpose should be delegated to other senior officers.

Despite these handicaps, the Department has continued to make considerable progress, particularly in the extension of fire control, the control of trade operations, the provision of housing, the mechanisation of plant, the improvement of communications, afforestation with softwoods and research, and the actual administration of the Department has been generally satisfactory.

There is a need for an increase in departmental branches and field divisions, together with a consequent re-organisation of staff, but progress in this direction should be dependent upon the recruitment of additional professional officers.

Recommendations.

It is recommended that:—

1. The form of administration of the Forests Department as provided for under the Forests Act, 1918, be retained.

2. The Conservator of Forests be regarded as the adviser to the Government in all forestry matters, and that all communications from the Department to the Minister be forwarded through the office of the Conservator.

3. In view of the present shortage of professional staff and the increasing area under management, a programme of recruitment of such staff be approved, which will enable close supervision of forestry operations by resident officers, and provide an inspectorial staff to relieve the Conservator of Forests of the close attention to field work at present required of him.

4. Forestry graduates be appointed to the field staff immediately following graduation, so that they may be provided with security of employment and the opportunity of obtaining valuable field experience under senior field officers on the general staff, but that such appointments to
the field staff should not delay their normal appointment to the professional staff.

5. Additional specialist officers be appointed to the fire control management and research branches of the Department.

6. Consideration be given to increasing the remuneration of the position of Conservator of Forests and those of the senior professional officers of the Forests Department.

LEGISLATION.

The Forests Act, 1918-1931, is considered to be an admirable piece of forest legislation which has operated fairly and satisfactorily over the years. No changes in it are considered advisable at the present time.

The Forest Regulations are generally satisfactory, but regulations 47A and 54 (a) provide that the holder of a permit shall, during each month of the term of the permit, fell and remove, saw and treat at least 75 per cent. of the maximum quantity of log timber which the holder of the permit is permitted to fell, cut and remove each month during the term of the permit. This condition is considered to be generally impracticable insofar as each and every month in the year is concerned.

Slight amendments are considered desirable to the regulations governing the precautions to be taken against fire in sawmills.

The Timber Industry Regulation Act, 1928-1950, provides for the inspection and regulation of the timber industry. It provides that no mill shall be operated until it has been registered under the provisions of the Act, but it is not provided as a condition of registration that a mill shall be assured of adequate log supplies. The position has consequently arisen where numerous small mills have recently been erected and registered under the Act, particularly within and about the metropolitan area, which have not adequate supplies to keep them in operation. The result at times like the present is a temporary disorganisation of established industry by the increased drain upon the very limited pool of skilled sawmill personnel, embarrassment of the Government and the Forests Department by pressure for log supplies which are already in short supply for established mills, and their eventual closure.

It is considered that action to prevent the unrestricted establishment of such sawmills is desirable.

Recommendations.

It is recommended that:

1. Regulations 47A and 54 (a) under the Forests Act, 1918, be replaced by regulation 57 amended to provide that in the event of a permit holder failing to maintain the maximum log intake authorised under his permit, he shall be required to pay at least 60 per cent. of the royalty computed on the maximum log intake authorised, and further, that if in the opinion of the Conservator the present holder fails to maintain his maximum authorised log intake for what the Conservator in his discretion considers an unreasonable period, the Conservator may reduce the area of his permit proportionately.

2. Consideration be given to the desirability of amending regulation 137A of the Forests Act, 1918, to provide that in addition to the equipment and appliances approved by the Department as being deemed to be effective, it should be necessary for the operations required of sawmillers under this regulation being carried out to the satisfaction of the Conservator and that where the Conservator is satisfied that any requirement under the regulation is impracticable, he may provide for alternative precautions to be taken.

3. That the Timber Industries Regulation Act be amended to provide that no sawmill shall be registered unless the owner has satisfied the Conservator of Forests that he has adequate log supplies available for the support of the mill.

DEMANDS.

In the year 1950-51, Western Australia consumed 188,677 loads of sawn timber, other than sleepers, of which about 100,000 loads were used in the building industry, including about 60,000 loads in housing alone. Shortages experienced were largely in seasoned floorings, mouldings, joinery and furniture timbers.

From evidence given it has been estimated that in 1952 the requirements of Western Australia in sawn timber, other than sleepers, will be about 200,000 loads, and in 1955 may be as high as 240,000 loads, of which about 175,000 loads may be required for building, including 120,000 loads for housing. Whatever may be the requirement in any particular year it is not considered likely that the average annual requirement about 1955 will exceed the figure given above, and the capacity for consumption may prove to be less. Of the total quantity of 240,000 loads, it is estimated that owing to the high proportion to be consumed in the building industry, about 60,000 loads will be required in seasoned timber. This quantity can only be obtained by the large mills attaining and maintaining an output approaching their maximum permissible intake.

The production of cases, particularly apple cases, has been a matter of concern for some years, partly owing to the loss by fire of some important case producing mills and partly owing to the shortage of labour needed to man case benches in the main mills. For the 1952 apple season it is estimated that if an average apple crop requirement is to be met in local timbers, the main mills, other than the State Saw Mills, will need to pro-
It is considered that the main sawmillsers should be able to meet the greater part of this requirement, and possibly all of it, if the growers can assist with the supply of labour. Any deficiency can only be met by importation. With the full development of the Kent River mill in case production, and the expected increase in the output from the main sawmills, requirements should be fully met in later seasons.

Particular attention is drawn to the reduction in the supply of transmission crossarms in Western Australian sawmills and the need of the Postmaster General’s Department in this material.

It is considered that the maintenance of an export market in Western Australian timbers should be part of the forest policy of the State. Jarrah and karri have intrinsic qualities as hardwoods, which give them a particular value in certain interstate and overseas markets. The demand for particular types and species of timber is, however, largely dependent upon custom, and if the demand for timber in a market is to be retained, supplies of that timber must be maintained, or its place will be taken by substitutes which it will be found difficult to oust once their use has become custom.

It is also considered that there is adequate reason from the national aspect for Western Australia to endeavour to assist other States of Australia with supplies of timber of which they may be unduly short for essential purposes. While Western Australian production is insufficient to meet all her own requirements, it is considered that supplies of sawn timber other than sleepers should be provided for other markets at the following annual rates:

<table>
<thead>
<tr>
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<th>Loads</th>
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<tbody>
<tr>
<td>South Australia and Northern Territory</td>
<td>32,000</td>
</tr>
<tr>
<td>Victoria</td>
<td>6,000</td>
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<tr>
<td>Overseas</td>
<td>12,000</td>
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<td></td>
<td>50,000</td>
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The position with regard to the supply of railway sleepers is most serious. In the endeavour to meet requirements in housing timbers, the production of sleepers has gradually fallen, until in 1950-51 only 29,000 loads were produced in Western Australia against a requirement by the Western Australian, South Australian and Commonwealth Railways of 36,700 loads for essential maintenance alone, and a total requirement of nearly 62,000 loads. It has consequently been necessary to refuse the export of all sleepers to overseas markets, and the Australian Railway Services concerned have had to seek supplies from overseas, although without any worthwhile result. It is considered that every effort should be made to increase the production of railway sleepers to at least 40,000 loads in 1952, with an ultimate minimum annual target of 50,000 loads.

The total requirements in sawn timber and railway sleepers are estimated to amount to 290,000 loads sawn, requiring a log intake of about 870,000 loads in 1952, and about 340,000 loads sawn, or 1,020,000 loads of log timber, in 1955. The latter figure, although less than the total registered intake of all mills at the present day, is certainly higher than the information available suggests can be maintained in log supplies. In any case it is not to be expected that production, even at this figure, will provide in the exact proportions, each type of material required to enable all needs to be met, and for a time, if the housing programme submitted to me has to be met, some importation from overseas appears to be inevitable. It is considered that for the time being, first priority in production should be given to floorings, mouldings and joinery timbers and second priority to railway sleepers. It is considered that the capacity for the supply of such lines as furniture timbers, crossarms, cases and scantlings will be sufficient if the requirements in seasoned lines and railway sleepers can be met in full.

Recommendations.

It is recommended that:

1. The Forests Department after consideration of the log supplies available and the various classes of mills that can be supplied endeavour to arrange that the sawmilling industry of Western Australia cut to a programme aimed at the annual production by 1955 of as much flooring, mouldings and joinery timbers as practicable, and at least 50,000 loads of sleepers and 1,500 loads of transmission crossarms.

2. The export of sleepers be arranged to meet at least the essential annual maintenance requirements of the South Australian and Commonwealth Railways.

3. The annual export of transmission crossarms be arranged to the extent of at least 500 loads to South Australia.

4. The annual export of sawn timber, other than sleepers, be permitted to the extent of at least 32,000 loads to South Australia and the Northern Territory, 6,000 loads to Victoria and 12,000 loads overseas.

5. The Forests Department keep a close record from the returns received of the progress made towards meeting requirements, and provide the sawmilling industry with such information as may be necessary to keep it apprised of the general position.

In conclusion, it is desired to acknowledge the very valuable assistance rendered to me by the Secretary of the Commission, Mr. A. Howson, in arranging the travel and hearings of the Commission, the attendance of witnesses, and in assisting in the investigations and summarising of evidence, by Mr. F. Ackland, Counsel to the Commission, and by the members of the “Hansard” staff.

G. J. RODGER,
Commissioner.

14th December, 1951.