CHAPTER XXIV.

FORESTRY.*

§ 1. General.

NOTE.—Values of Australian oversea trade shown throughout this Chapter are expressed in £A f.o.b., Port of Shipment, except where otherwise indicated.

1. Objects of Forestry.—The main object of forestry is to manage the forests of a country in the way that will provide the maximum benefits, both direct and indirect. Direct benefits include the provision of essential commercial commodities such as structural timber, pulpwood, plywood, veneers, firewood, bark products, tars, oils and resins. Indirect benefits include protection of soil and stock from wind and exposure, regulation of stream flow, and aesthetic effects.

Forestry aims to improve existing forests and woodlands by properly controlled exploitation, by protection from destructive agencies such as fire, and by inducing natural regeneration where it is desirable. Forestry also aims to provide a partial tree cover on denuded lands when such cover is necessary for protective purposes, and a complete cover when the land is better under forest than under any other crop.

2. General Account of Forests and Timbers.—The area of land in Australia suitable for the production of commercial timber as the primary crop is very small in comparison with the size of the continent. It is concentrated mainly around the wetter coastal belts and the eastern highlands and it includes the bulk of the land suitable for intensive development by agricultural or pastoral undertakings.

The allocation of land for agricultural and pastoral purposes led to the clearing of much of the original forest of Australia, particularly of the more readily accessible parts. In the early period of agricultural and pastoral expansion, only the best timbers found their way into commerce, and species now prized as providing high quality woods were often put to inferior uses. During this period the forest resources of the country were considered by the majority of the people to be inexhaustible, and relatively little care was taken to prevent the degradation of the remaining forests by fire and uncontrolled grazing. This state of affairs is rapidly changing; it is now recognized that the remaining forest land must be protected and properly managed in the interests of the community.

The trees which make up the forests of Australia are mainly evergreen hardwoods. The characteristic genus is Eucalpytus. There are over six hundred different kinds of eucalypts and with few exceptions the natural occurrence of all of them is restricted to Australia. The genus includes such species as the mountain ash (*Eucalyptus regnans*) of Victoria and Tasmania, and karri (*E. diversicolor*) of Western Australia, which are the tallest-growing hardwoods in the world. At the other end of the scale there are many eucalypts which do not grow to tall trees, including the species collectively known as the "mallees". The mallees develop a number of small stems from an underground structure called the "mallee root".

A specially contributed article dealing with Fore-try in Australia appeared as part of Chapter XIX in Official Year Book No. 19 (see up. 201-12 threin). See also "The Commercial Timbers of Australia, Their Properties and Uses" by I. H. Boas, published by the Council for Scientific and Industrial Research in 1047, "Timbers and Forest Products of Queensland" by E. H. S. Swain, published in 1925 and "Australia.

Less than 100 eucalypts are used for sawmilling and not more than 30 to 40 are exploited extensively. The main commercial eucalypts were listed in Official Year Book No. 39 and earlier issues.

The eucalypts satisfy the Australian requirement for timbers having great strength and durability. They also provide a large proportion of the building timber and some of the wood required for packaging. In recent years some eucalypts have been used extensively for papermaking and for the manufacture of hardboard and fibreboard. The species most commonly used for pulping are mountain ash (*E. regnans*), alpine ash (*E. gigantea*), and messmate, stringybark or Tasmanian oak (*E. obliqua*).

A large number of other genera represented in the Australian forest flora also produce commercial hardwoods. Among the outstanding furniture cabinet and veneer timbere are red cedar (*Cedrela toona var. australis*), Queensland maple (*Flindersia brayleyana*), Southern and Northern silky oak (*Grevillea robusta* and *Cardwellia sublimis*, respectively), Queensland walnut (*Endiandra pulmerstoni*), blackwood (*Acacia melanoxylon*), rose mahogany (*Dysoxylum fraseranum*), etc. Turpentine (*Syncorpia laurifolia*) ranks with the world's best as a harbour piling timber. Coachwood (*Ceratopetalum apetalum*) came into prominence for rifle furniture and for aircraft plywood, during the 1939-45 War.

The foregoing are but a few examples indicating the range of use of the timbers of the Australian hardwood forests.

The most important indigenous softwood resources of Australia were in the forests of hoop pine (*Araucaria cunninghamii*) of Queensland and New South Wales. These forests occurred on rich land suitable for intensive agriculture. The greater part of the original hoop pine forest has gone but the wood removed made an important contribution to the Australian timber industry. Some areas of the hoop pine forest have been replanted with this species in Queensland and, to a lesser extent, in New South Wales.

There are still considerable areas of the useful white-ant resisting cypress pine (*Callitris spp.*) in the inland areas of Queensland and New South Wales. They have been seriously overcut but are gradually being brought under management.

Other native softwoods which have played a useful but minor part in the Australian timber industry include bunya pine (Araucaria bidwilli) and kauri (Agathis spp.) of Queensland, and huon pine (Dacrydium franklinii), celerytop pine (Phyllocladus rhomboidalis) and King William pine (Athrotaxis selaginoides) of Tasmania.

The savannah woodlands of the interior of Australia yield commercial commodities such as sandalwood, tanbarks and essential oils. They also have an important function in providing fuel and rough timbers for the development of agricultural and pastoral holdings.

3. Extent of Forests.—According to data assembled for the Sixth British Commonwealth Forestry Conference held in Canada in 1952, the total area of forest in Australia is estimated at 159,751 square miles, or about 5.4 per cent. of the total land area of the continent. The estimated forest area is distributed amongst the States as follows (the proportion of forest land to the total area of each State is shown in parenthesis) :--- New South Wales and the Australian Capital Territory, 47,356 square miles (15 per cent.); Victoria, 26,236 (30 per cent.); Queensland, 22,300 (3 per cent.); South Australia, 10,311 (including 4,600 square miles of mallee suitable for firewood only) (3 per cent.); Western Australia, 41,256 (4 per cent.); and Tasmania, 12,292 (47 per cent). The areas given are rough estimates only and are considerably in excess of those which are both suitable for reservation and likely to be maintained for timber production. Considerable areas of low grade forest which, in many cases, are suitable for little more than the production of firewood are included. It is doubtful if the remaining prime native forest area of Australia exceeds 20,000 square miles. The proportion of Australia carrying commercial forests is therefore very low and apart from forests on the coastal fringe of the continent, the tree density is very low.

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The table below shows a classification of the estimated total forest area referred to above :—

Class of	Forest.		State Forest.	Communa] Forest.	Private Forest.	Total.	Proportion of Total Forest Ares
Exploitable— Softwood Mixed wood Hardwood			4,157 729 41,020	5 74	1,072 11,050	5,234 729 52,144	% 3·3 0.5 32.6
Total]	45,906	79	12,122	58,107	36.4
Potentially Exp Softwood Nived wood	ploitable- 		156		78	234	0.1
Hardwood			15,063		12,877	27,940	17.5
Total			15,219		12,955	28,174	17.6
Other Land Forest	Classed	as 	67,294	450	5,726	73,470	46. 0
Grand T	'otal		128,419	529	30,803	159,751	100.0

CLASSIFICATION OF FOREST AREA : AUSTRALIA (a).

(a) Based on the 1950 classification of forests.

State forests accounted for 80.4 per cent. of the total forest area, private forests for 19.3 per cent. and communal forests for 0.3 per cent.

The bulk of the softwood area of approximately 5,468 square miles is in Queensland and New South Wales and consists principally of natural forest, a large proportion of which is slow-growing cypress pine (*Callitris spp.*) in low rainfall areas. The volume of this species per acre is comparatively low.

4. Forest Reservations.—The first attempt to determine the forest area which should be reserved solely for purposes of timber production was made at an Interstate Forestry Conference held at Hobart in 1920. This Conference decided that an area of $2.4\frac{3}{2}$ million acres of indigenous forest should be permanently reserved. According to statements furnished by State and Commonwealth authorities, reservations of forest areas in Australia at 30th June, 1954, totalled 31,932,993 acres of which 20,970,361 acres were Dedicated State Forests and 10,962,632 acres were Timber, Fuel and Other Reserves. The distribution of these areas is shown by States in $\frac{5}{4}$, para. 2 of this chapter.

In general, the Timber Reserves are temporary and are liable to be alienated after the timber on them has been exploited. Some of these areas contain land of high value for forestry purposes, but the greater part does not justify permanent reservation.

If the permanently reserved areas were all of good quality, accessible, and fully productive forests supplying the class of timber required, they could be regarded as adequate for a much larger population than exists in Australia at the present time. Actually, however, a considerable proportion is in inaccessible mountainous country and many of the forests contain a mixture of species, some only of which are at present of commercial value: much of it consists of inferior forest and a large proportion of the whole has been seriously degraded by recurrent fires. Also the indigenous forest does not contain adequate supplies of softwoods producing commercial timbers and Australia's requirements of these have to be met largely by imports from other countries. It is freely acknowledged by Australian forestry authorities that information on forest resources is very imperfect. It is not possible at present to give a reliable e-timate of the forest areas needed to meet all future demands because of the number of unknown variables involved; in particular the yield capacity per acre, future consumption of different classes of timber per head, and the future population. It appears however, that all available potentially good forest country, including adequate areas for plantations of conifers, will need to be reserved, protected and systematically managed, if Australia is to approach the goal of self sufficiency in timber supplies in the future. One of the most urgent requirements in this connexion is a comprehensive estimate of forest resources.

5. Plantations.—Reference has been made to the inadequacy of indigenous softwood supplies, but, as a result of the planned policy of the forest services of the States and the Commonwealth and, to a less extent, of several private commercial organizations, the area of softwood plantations, mainly of exotic species is steadily increasing. It was natural that this aspect of forestry received earliest attention in South Australia as it is the State most poorly endowed with natural forest. This State now has a larger area of planted softwoods than any other State in Australia, and for some years has been exploiting considerable quantities of timber from these plantations. The total production is now in the vicinity of 100,000,000 superficial feet and this quantity is expected to be increased very substantially during the next decade. Production is also increasing in the other States and first thinnings from their plantations are already supplying a significant portion of the requirements of the case-making industry.

The total net area of Commonwealth and State softwood plantations at 30th June, 1954, was 310,669 acres. In addition, the area of privately owned plantations was about 58,000 acres. Hardwood plantations (mainly *Eucalyptus spp.*) comprise a much smaller area and the total acreage is about 30,000 acres, nearly two-thirds of which is mallet (*Eucalyptus astringens*) which has been established in Western Australia for tan bark production.

6. Fire Protection.—Fire control measures in Australia are the responsibility of the individual State Governments, and the provision of adequate fire protection is one of the main problems facing forest authorities at the present day. In each State a Bush or Rural Fires Act provides the main legislative basis for the control of forest fires.

The responsibility for the protection of private property outside urban areas rests with volunteer bush fire brigade organizations which are co-ordinated in each State, by a committee or board carrying out functions of an advisory or educational nature and fostering the growth and organization of the bush fire brigade movement. Throughout the main agricultural and forest areas of Australia there are over 4,000 registered volunteer bush fire brigades with a membership exceeding 150,000. Although both forest and rural fire organizations are entirely separate entities, a high degree of co-operation and liaison is maintained.

In addition to the Forest Service and rural organizations, various private and semi-Governmental bodics in each State maintain fire protection organizations, which are generally concerned with the protection of private forestry operations and hydro-electric and water catchment areas.

The annual cost of protecting from fire 23.6 million acres of dedicated and reserved forest over the three year period 1952 to 1954 has been estimated at $\pounds_{1,150,000}$ or about 11.7d. per acre annually. The cost of rural fire control as a whole cannot be estimated with any degree of accuracy owing to the fact that by far the greatest contribution comes from the personal efforts of volunteer brigade members.

The Australian fire season is very variable, with a particularly bad fire season every seven years or so. Such years were 1926, 1939, 1944 and 1952, and they account for a large proportion of the average area burnt each year which, for the period 1945 to 1955, amounted to 2.16 million acres or 2.3 per cent. of the total forested area, both Crown and private, in Australia. In disastrous fire seasons, such as 1938–39 and 1951–52, the acreage burnt on protected forest areas may rise to as high as 15 per cent.

During the post-war decade Forest Services greatly expanded their fire detection facilities and big advances were made in the use of power pumping equipment. Radio communication is now being used extensively by both Forest Services and rural organizations, and considerable progress has been made in the provision of legislative power for the rural bush fire movement, although the volunteer movement itself dates back to the turn of the century.

Recognizing that fire prevention is one of the most important aspects of the fire problem, intensive campaigns have been conducted to reduce the incidence of man-caused fires. A study of fire causes in recent years reveals that human agencies account for 95 per cent. of all fires, and of this figure at least 80 per cent. are preventable. Burning off, much of which is started illegally, accounts for 35 per cent. of all fires, smokers, hunters, fishermen and travellers cause 13 per cent. of all fires, whilst only 5 per cent. of fires in Australia are caused by lightning.

§ 2. Forestry Activities of the Commonwealth.

1. Prior to 1925.—When the Commonwealth of Australia was established on the 1st January, 1901, forestry was not included among the matters transferred from the States to the control of the Commonwealth, and Federal jurisdiction was therefore restricted to the then relatively unimportant forests of the Australian Territories. After the 1914–18 War these Territories (including Papua-New Guinea and Norfolk Island) covered a large area, and in the aggregate contained substantial forest resources. In the early twenties of this century a professional forester was appointed as forestry adviser to the Commonwealth Government, and he submitted preliminary reports on the forest resources of Papua-New Guinea, Norfolk Island and the Australian Capital Territory, with suggestions for future policy.

2. Forestry and Timber Bureau.—In 1925 the Commonwealth Forestry Bureau was instituted, and the Commonwealth Forestry Adviser became the Inspector-General of Forests. By an Act of 1930, the Bureau received statutory powers, and its functions included the advising of the various Territorial Administrations on forestry matters, the management of forests placed under its control, the establishment of experimental forest stations, the training of students in forestry, etc.

At the end of the 1939-45 War, the Commonwealth Government decided to continue certain advisory functions which during the War had been carried out by War-time Timber Control, and such functions were incorporated in the Forestry and Timber Bureau Act 1946, under which the title of the Bureau was altered to Forestry and Timber Bureau. The powers and functions of the Bureau were extended to embrace the collection of statistics and information, and advising the Governments of the commonwealth and the States or other interested bodies on matters relating to the supply, production, oversea trade and distribution of timber in Australia. The Bureau was placed under the administration of a Director-General.

The activities of the Bureau under its statutory functions are summarized below :---

(a) Forestry Education. The Australian Forestry School was opened at Adelaide University in 1926 in continuation of the School of Forestry of that University established in 1911. In 1927 the School was transferred to Canberra. The purpose of the School is to train students as professional officers to manage the forests of Australia. It also accepts students from overseas.

Training at the School covers the third and fourth years of a four-year course. The first two years are spent at an Australian University in a study of prescribed science subjects. Courses at the School lead to Commonwealth Diplomas in Forestry and in Forest Technology, and in the case of the former, can lead further to a Degree in Forestry of an Australian University. Applicants possessing a University Degree granted for approved natural science subjects, or applicants with academic qualifications accepted by the Director-General as equivalent, may also be admitted to this School and proceed to the Diplomas. Graduates or Diploma holders approved by the Director-General may be admitted to the School to take selected subjects or to carry out research work.

The Board of Higher Forestry Education advises regarding pre-requisite University courses leading to the Diploma courses and in regard to the maintenance of the standard of the School Diploma course.

In addition to students nominated by State Governments and other Australian and oversea authorities and organizations, private students are accepted at the School, and the Commonwealth Government offers up to ten forestry scholarships each year. These scholarships provide a salary allowance for the four years of the full Diploma course.

During 1950 the number of students enrolled reached 80, owing to the intake of ex-servicemen taking University courses under the Commonwealth Reconstruction Training Scheme. The normal capacity of the School is 40.

(b) Silvicultural Research. Research head-quarters and a Central Experimental Station have been established at Canberra. Other Forest Experimental Stations have been established at Mount Burr in the south-east of South Australia, in Tasmania, and at Dwellingup in Western Australia, on a co-operative basis with the Forest Services of those States. It is proposed to establish similar co-operative Experimental Stations in other States and Territories.

With its present limited staff, the research work of the Bureau has been concentrated largely upon studies of forest and climatic conditions, the genetical relationships and silvicultural requirements of various species, forest nutrition and the improvement of forest yields. A considerable expansion in the research activities is planned for the next few years as suitable trained staff becomes available.

(c) Forest Management Research.—In the national interest it is essential that overcutting of forests should be avoided and in consequence it is a matter of primary importance that reliable information be available as to the country's forest resources and potentialities. To this end a national forest stocktaking is being carried out by the Bureau in co-operation with the Forest Services of the States and, to assist in the work of forest assessment, special consideration is being given to the development of the use of aerial surveys.

Consideration is also being given, in co-operation with the State Forest Services, to the establishment of increased areas of plantations of exotic pines with a view to providing additional supplies of softwood timber to meet requirements.

The general economics of forest management are also being studied.

(d) Timber Supply. The value of reliable statistical data covering availability of timber and timber requirements was so forcibily demonstrated during the 1939-45 War that it was considered essential to maintain at least a skeleton organization against times of future national emergency. Apart from this, it became clear that for many years to come shortages of timber on the one hand and heavy post-war reconstruction demands on the other, accentuated by a rapidly increasing population, would necessitate assessment of requirements and availability of supplies being kept constantly under review as a basis for short and long term policies of timber supply and distribution.

Advice is currently provided to Government Departments and the trade in matters pertaining to timber supply, including—(a) the availability of total quantities and quantities of particular grades and specifications required to meet Australia's needs; (b) the quantity of timber that should be imported; (c) the extent to which exports of timber and related products might be allowed without detriment to local needs; and (d) distribution of timber within Australia. (e) Management of Forests. The Bureau manages the forests of the Australian Capital Territory and maintains a forestry officer in the Northern Territory. In addition, it is responsible for advising the administrations of the Northern Territory and the External Territories on the management of the forests under their charge.

3. Commercial Forests.—The forest areas under Commonwealth control include the following :—

- (a) Australian Capital Territory. The forests of the Australian Capital Territory are administered by a Division of the Forestry and Timber Bureau. Further information is contained in Chapter V.—The Territories of Australia.
- (b) Northern Territory. The forests of the Northern Territory are administered under ordinance by the Administrator of that Territory. The native forests of the Territory are very limited, consisting largely of open eucalypt forest in the North, with very restricted patches of rain forest along streams, river-fringing forests of paper bark tea-tree, patches of cypress pine, and elsewhere savannah woodland deteriorating to mallee and mulga in the interior. The Bureau maintains a forestry officer in the Territory for investigation and advisory purposes.
- (c) Norfolk Island. The forests of Norfolk Island are administered by the Administrator of that Territory. The area reserved for forest covers 1,037 acres, of which the main species is Norfolk Island pine.
- (d) Papua and New Guinea. The forests of the Territory of Papua and New Guinea are managed by a Forestry Department under the control of a Director, and are administered under an ordinance of the Territorial Administration. Forestry in the Territory commenced with the appointment of two officers in 1938. Further information is contained in Chapter V.—The Territories of Australia.

4. Forest Products Research.—Fundamental investigations connected with the properties and uses of timber and forest products generally are carried out by the Forest Products Division of the Commonwealth Scientific and Industrial Research Organization. These investigations cover a very wide field, e.g., pulp, paper, seasoning, structure and shemistry of wood, tans, etc.

Details can be obtained from the annual reports and publications of the Forest Products Division.

§ 3. Forest Congresses.

The first British Empire Forestry Conference was held in London in 1920. Subsequent conferences were held in Ottawa in 1923, Australia and New Zealand, 1928, South Africa, 1935 and again in the United Kingdom in 1947. In 1952 (the name of these conferences having been changed in conformity with the development of the British Commonwealth of Nations) the Sixth British Commonwealth Forestry Conference was beld in Canada. It is proposed to hold the next conference in Australia and New Zealand in 1957.

§ 4. State Forestry Departments.

1. Functions.—Except for Queensland, the powers and functions of State forest authorities are laid down under Forestry Acts and Regulations. In each State there is elepartment or commission to control and manage the forests of the State. The functions of these administrations are as follows:—(n) The securing of an adequate reservation of forest lands; (b) the introduction of proper measures for scientific control and management of forest lands; (c) the protection of forests; (d) the conversion, mar^{*} eting and economic utilization of forest produce; and (e) the establishment and maintenance of coniferous forests to remedy the existing deficiency in softwoods. Annual reports are issued by each State forest authority. In Queensland, forestry is a subdepartment of the Department of Public Lands. Victoria maintains a forestry school at which recruits are trained for the forestry service of that State.

2. Forest Reservations.—As mentioned in § 1, para. 4 above, State forest authorities agreed that, in order to secure Australia's future requirements, an area of $24\frac{1}{2}$ million acres should be permanently reserved. In June, 1954, the area of State forests reserved in perpetuity totalled 20,970.361 acres or 86 per cent. of the area recommended as the goal to be attained.

In addition to the work of permanently reserving areas in each State, foresters are endeavouring to survey all timbered lands with a view to the elimination of those unsuitable for forestry. Considerable areas have been revoked in certain States, while dedications of new areas have resulted in gains to the permanent forest estate. The Forestry Departments also usually control all timber on open Crown lands as well as over 10 million acres of Timber Reserves, National Parks, etc., but, while these areas contain some land of high value for forestry purposes, the greater part does not justify permanent reservation.

In the following table details of forest areas as recorded by State Forest Authorities, distinguishing between Dedicated State Forests, Timber Reserves and Other Forest Reserves are shown for each State as at 30th June, 1954. In addition, details of forest reservations in Northern Territory and Australian Capital Territory are shown.

			<u>`</u>	<u>Acits.)</u>			
State of	or Territor	y.		State Forests.	Timber Reserves,	Other Reserves.	Total.
New South Wales		• •		6,188,125	1,370,488		7,558,613
Victoria				4,466,704	716,633	(a)164,621	5,347,958
Queensland				4,666,786	3,223,340	(6)778,549	8,668,675
South Australia				261,428		103,600	455,028
Western Australia		• •		3,462,239	1,831,503	a1,024,763	6,318,505
Tasmania				1,918,179	137,028	1,039,107	3,094,314
Northern Territory				6,900		352,000	358,900
Australian Capital	Ferritory		••	••	••	131,000	131,000
Australia			••	20,970,361	7,278,992	3,683,640	31,932,993

AREA	0F	FOREST	RESERVATIONS,	30th	JUNE,	1954.
			(1 0 0 0 0)			

(a) Timber reserves under the Land Act. (b) National Parks.

3. Employment.—In the table below details are shown of the number of persons employed by State Forestry Departments, and by the Forestry and Timber Bureau in respect of the Australian Capital Territory and the Northern Territory, at 30th June, 1954.

PERSONS	EMPLOYED	BY FORESTRY	DEPARTMENTS,	AТ	30th	JUNE,	1954.

Occupational Group.	N.S.W.	Vic.	Qld.	S.A.	W.A.	Tas.	N.T.	A.C.T.	Aust.
Professional Staff	162	182	71	44	33	22	·	5	519
Staff	213	184 181	85	4	84	62			632 820
Extraction of Timber Milling of Timber		∫ 104 44	115	22 421	1	j∫		 	
Labour (forest workers, etc.)	۱,290 م	028	1,650	252	∫ ⁴⁵⁴	228		64	5,500
Total	1,980	1,623	2,076	808	626	365		79	7,557

FORESTRY PRODUCTION.

§ 5. Forestry Production.

1. Timber.—Particulars of logs treated and the production of rough sawn timber by sawmills and other woodworking establishments are shown in the following table by States for the year 1953-54.

OUTPUT OF NATIVE TIMBER : ALL MILLS, 1953-54. ('000 super. feet.)

Particula	rs.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	T.,.5.	Aust.(a)
~	Logs	TREATED,	INCLUDE	NO THOSE	SAWN ON	Commissi	о».(b)	
Hardwood Softwood Total		482,665 98,151 580,516	525,563 46,764 57,377	337,894 137,153 46%,~47	8,642 106,370 115,712	481,260 7,161 418,111	222,562 5,772 228,334	2,051,586 401,374 2,152,960
		SAWN TH	BER PRO	DCCED FI	IN LOOS	ABOVE.(c)		
Herdwood Softwood Total		307,332 57,306 361,728	315,551 23,106 335,957	201,538 86,842 288,350	5,184 63,006 68,190	213,723 2,298 216,021	115,536 2,735 118,271	I,159,164 235,383 I,394,547

(a) Excludes Australian Capital Territory and Northern Territory details for which are not available.
(b) Includes logs used for plywood and veneers.
(c) Includes the sawn equivalent of timber peeled or sliced for plywood and veneers.

The following table shows logs used and the sawn timber produced in Australia for the years 1938-39 and 1949-50 to 1953-54.

OUTPUT OF NATIVE TIMBER : ALL MILLS, AUSTRALIA.(a)

Particulars.	Unit.	1938-39.	1949-50.	1950-51.	1951 - 52.	1952-53.	1953-54.
Loge used	·[
Hardwood	'ooo super feet (hoppus measure)	1,015,136	1,637.236	1,797,226	2,000,032	1,970,126	2,051,586
Softwood		293,680	415,712	300,052	363.829	369,881	401,374
Total	33 33	1,308,816	2,052.918	2,007,278	2,363.861	2,310,007	2,452,960
Sawn Timber Pro- duced— Sawn equivalent of Timber Peeled or Sliced for Diwood							
and Veneers	'ooo super. feet	21,639	26,046	27,322	29,159	21,606	28,545
purposes	,,	695,376	1,197,014	1,234,018	1,363,607	1,318,191	1,366,002
Hardwood Softwood		526,229 190.786	965.142 257,918	1,068,096 193,244	1,166,114 226,652	1,115.423	1,159,164
Total		717.015	1.223.060	1.261.340	1.392,766	1,339,747	1.201,547

(a) Excludes Australian Capital Territory and Northern Territory, details for which are not available.

The next table shows the sawn output of native timber in sawmills and other woodworking establishments in each State for the years 1938-39 and 1949-50 to 1953-54.

SAWN OUTPUT (a) OF NATIVE TIMBER : ALL MILLS. ('000 super. feet.)

State.		1938-39.	1949-50.	1950-51.	1951-52.	1952-53.	1953-54.
New South Wales	<u></u>	179,350	341,144	338,347	380,633	350,792	364,728
Victoria	••	120,197	308,790	329,640	348,478	322,209	338,957
Queensland		193,250	251,127	252,378	291,681	285,074	288,380
South Australia		14.537	56,775	59.393	67,121	68,500	68,190
Western Australia		125.453	138,077	156,810	178,290	203,314	216,021
Tasmania	••	84,228	127,147	124,772	126,563	109,908	118,271
Australia (b)		717,015	1,223,060	1,261,340	1,392,766	1.339.797	1,394,547

(a) Includes the sawn equivalent of timber peeled or sliced for plywood and veneers. (b) Excludes Australian Capital Territory and Northern Territory, details for which are not available.

In addition to the sawn timber shown in the preceding table, a large amount of other timber, e.g., sleepers, piles, poles, fencing material, timber used in mining, and fuel, is obtained from forest and other lands. Complete information in regard to the volume of this output is, however, not available. In Western Australia particulars are obtained of the quantities of timber hewn by contractors for the Railway Department, mines, etc., as well as of the quantities produced by other agencies, but the figures have not been included in the preceding tables. The quantities so produced in Western Australia in the six years shown in the preceding table were as follows : 1938 30, 35,862,540 super. feet; 1949-50, 16,823,566 super. feet; 1950-51, 19,396,134 super. feet; 1951-52, 21,156,790 super feet; 1952-53, 20,011,008 super. feet; and 1953-54, 24,979,694 super. feet. The annual reports of the Forest Departments of the State contain particulars of the output of timber from areas under departmental control, but owing to lack of uniformity in classifieation and measurement, accurate determination of total production cannot be made. Moreover, there is a moderate quantity of hewn timber produced from privately owned land, but information regarding output is not available.

2. Wood Pulp and Paper.—(i) Wood Pulp. The manufacture of wood pulp from Australian-grown timber was established in Australia in 1939, after years of experimentation with eucalypt hardwoods, production in 1938–39 being 6,165 tons of wood pulp. At the end of 1955, four wood pulp mills were operating in three States and production during 1953–54 was 83,624 tons of chemical pulp and 53,022 tons of mechanical pulp, a total of 136,646 tons.

(a) Victoria. In Victoria, Australian Paper Manufacturers Ltd. produce wood pulp at Maryvale in Gippsland by a chemical process known as the kraft or sulphate process. The timber used at this mill consists mainly of eucalypt hardwoods at present unsuitable for other purposes and, in addition, a small quantity of plantation pine thinnings and mill waste and special softwood for production of cellulose. During 1954-55 the wood taken from Crown Lands for the production of pulpwood and cellulose amounted to 4,523,375 cubic feet of which 3,882,199 cubic feet were hardwood and 641,176 cubic feet were radiata pine. Pine plantations are being established in Gippsland by A.P.M. Forests Pty. Ltd. The initial aim is 20,000 acres to provide a perpetual yield of 20,000 tons of long-fibred pulp per annum. Planting commenced in 1951 and by the end of 1955 it was estimated that 14,000 acres had been planted.

(b) South Australia. In South Australia a pulp and paper board mill operates near Millicent. This mill uses the mechanical or groundwood method of producing wood pulp from softwoods from the Mt. Burr and Penola pine plantations. Recently this mill has adopted a semi-chemical process for part of its production of wood pulp. During 1953-54, 6,134,099 super. feet of pulp wood were produced from South Australian forests.

(c) Tasmania. In Tasmania two large mills are making pulpwood from indigenous hardwoods. At Burnie on the north-west coast Associated Pulp and Paper Mills Ltd. use a chemical method, the soda process, to produce wood pulp for fine writing and printing papers from eucalypt hardwoods. This plant is of the most modern design and pulp and paper manufacture are combined with sawmilling and hardboard production. Offcuts and rejects from the timber mill are used as pulp wood as well as small trees removed in thinning the forests. A continuous digester has been installed at the Burnie mill, making it the only one in Australia using a continuous pulping process. Supplies of pulpwood for this mill are drawn from freehold and concession forest areas. The forests are managed on a permanent yield basis with regeneration of the eucalypts in all suitable areas. Some pine plantations have also been established to provide softwoods for pulping.

Australian Newsprint Mills Ltd. at Boyer, 20 miles from Hobart is the only producer of newsprint in Australia. Wood pulp is produced there by mechanical process from hardwoods drawn from State timber concession areas. This mill operates continuously, stopping only for maintenance. Eucalypts provide about 80 per cent. of its requirements for wood pulp, the remainder being imported long-fibred softwood pulp. A pulp and paper board mill was established at Launceston by Tasmanian Board Mills Ltd. but after operating for about a year it was closed down in April, 1955.

(ii) Paper and Paper Board. Paper and paper board are manufactured in all States but the industry is centred mainly in New South Wales, Victoria and Tasmania. At the end of 1955, sixteen paper mills were operating, six in Victoric, four in New South Wales, three in Tasmania and one each in Queensland, South Australia and Western Australia. Sixteen paper machines and eighteen board machines are installed in these mills, and it is planned to instal five additional paper machines and one new board machine in the next few years. Paper mills operate in conjunction with all wood pulp mills, and pulp produced in mills operated by Australian Paper Manufacturers Ltd. and Associated Pulp and Paper Mills Ltd. is used, together with some imported pulp, in other paper and board mills owned and operated by the respective companies. Other paper and paper board mills use imported pulp, waste paper, straw and processed waste. A wide variety of papers and paper boards is produced, the quantity and value of paper produced in 1953-54 being as follows :- newsprint, 60,406 tons valued at £4,179,250; blotting, 664 tons, £97,590; duplicating, 2,543 tons, £368,031; printing and writing, 29,530 tons, £4,483,843; kraft wrapping, 37,374 tons, £5,445,279; other wrapping, 3,103 tons, £480,570; felt and carpet felt, 3,323 tons, £339,434; and other paper, 22,173 tons, £2,105,670. In addition, 123,440 tons of paper boards worth £11,092,900 were produced in 1953-54.

3. Other Forest Products.—(i) Veneers, Plywood, etc. Cutting of timber for the manufacture of veneers, plywood, etc., has been carried out in most States for a number of years. Recently, however, this has been considerably extended, and much greater use has been made of locally-grown timbers, both hardwoods and softwoods. In recent years special attention has been paid to the selection of logs suitable for peeling.

The following table shows the production of plywood for each of the years 1938-39 and 1949-50 to 1953-54 :--

			<u> </u>		······································		
State.		1938-39.	1949-50.	1950-51.	1951-52.	1952-53.	1953-54.
New South Wales		24,194	28,008	32,287	31,784	22,557	28,601
Queensland		66,100	111,048	104,799	110.028	81,400	114,545
Other States		14,511	17,977	16,412	17,341	11,771	18,435
Australia		104,805	157,033	153,498	159,153	115,725	161,581

PLYWOOD PRODUCED. ('000 square feet & in. basis.)

Of the total plywood produced in 1953-54, 136,214,000 square feet $\frac{3}{16}$ in basis was classed as "Commercial", 21,593,000 as "Waterproof" and 3,774,000 as "Case."

During 1953-54, 393.8 million square feet ($\frac{1}{16}$ in. basis) of veneers were produced by the rotary process for the manufacture of plywood, and 119 2 million square feet ($\frac{1}{16}$ in. basis) were sold or added to stock, the bulk of which would eventually be used in the production of plywood. In addition, 22.4 million square fect of sliced veneers were produced.

(ii) Hardboard. The production in Australia from pulped wood of hardboard for building purposes has increased considerably in recent years. There were three factories producing hardboard in 1955 and during the three years ended 30th June, 1954, the following quantities and values of hardboard were produced in Australia:--1951-52, 10,089,000 square yards; $\pounds 1,787,000$; 1952-53, 12,150,000 square yards, $\pounds 2,472,000$; and 1953-54, 16,992,000 square yards, $\pounds 3,284,000$.

(iii) Eucalyptus Oil. Oil may be distilled from the foliage of all varieties of Eucalyptus, and several of them furnish a product widely known for its commercial and medicinal uses. Complete information regarding Australian predaction and consumption of cucalyptus oil is not available, but considerable quantities are manufactured, particularly in New South Wales and Victoria. The value of oversea

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exports of eucalyptus oil distilled in Australia was $\pounds_{45,206}$ in 1951-52; $\pounds_{215,283}$ in 1952-53; and $\pounds_{163,763}$ in 1953-54. The quantities exported in the years 1951-52 to 1953-54 were, 1,254,618 lb., 721,330 lb. and 504,628 lb. respectively.

(iv) Gums and Resins. Gums and resins are produced in most States of Australia, the main product being grass tree, or yacca gum. This gum which is used in the preparation of varnishes and lacquers comes chiefly from South Australia while small quantities are also produced in New South Wales and Western Australia. The recorded production of gums and resins in 1953-54 was 18 ewt. in New South Wales, 12,560 ewt. in South Australia and 2,816 ewt. in Tasmania, giving a total production of 15,394 ewt. in Australia. Exports of yacca gum from Australia during the same period amounted to 13,128 ewt. valued at £17,995.

(v) Tanning Barks. The forests of Australia are capable of yielding a wealth of tanning materials; many species of eucalyptus and other genera contain varying proportions of tannin, chiefly in the bark, but also in the wood and twigs. Scattered distribution however, has resulted in only the richest tan-bearing species being used in Australia. These are :-Golden wattle (Acacia pycnantha), black or green wattle (Acacia decurrens or mollissima), and mallet (Eucalyptus astringens). Mallet (E. astringens), of Western Australia, is not extensively used in Australian tanneries, but is exported to Europe and other countries. Reference to oversea trade in tanning barks is made in § 6, para. 3.

The production of extract from the bark of karri (*E. diversicolor*), of which very large quantities are available at karri sawmills, has passed the experimental stage, and private enterprise has started production on a commercial scale. The experimental work in kino impregnated marri (*E. calophylla*) bark is not yet complete. The production of tanning bark in Australia approximated 25,000 tons per annum in the years prior to 1930, but since then production has declined and in 1953-54 was approximately 7.000 tons. However, this decrease is offset by the increased use of vegetable tanning extract.

4. Value of Production.—(i) Gross and Local Values, 1953-54. The values of forestry production on a gross and local basis are shown in the following table for the year 1953-54.

State.		Gross Production Valued at Principal Markets.	Marketing Costs.	Gross Production Valued at Place of Production.	
New South Wales	•••	····	13,315	410	12,905
Victoria			10,190	715	9,475
Queensland	••		9,117	1,320	7,797
South Australia			4,509	136	4,373
Western Australia		••	3,839	224	3,615
Tasmania	••	••	4,085	530	3,555
Australia(a)	••	••	45,055	3,335	41,720

GROSS AND LOCAL VALUE OF FORESTRY PRODUCTION, 1953-54.

(£'000.)

(a) Excludes Australian Capital Territory and Northern Territory, details for which are not available.

No information is available on the value of materials used in the process of production or of depreciation and maintenance charges for 1953-54 and hence it is not possible to calculate net value of forestry production.

(ii) Local Values, 1934-35 to 1938-39 and 1949-50 to 1953-54. In the following table the local value of torestry production and the local value per head of population are shown by States for the years 1949-50 to 1953-54 in comparison with the average for the five years ended 1938-39. Local value is gross value less marketing costs and is the value at place of production.

FORESTRY PRODUCTION.

LOCAL VALUE OF FORESTRY PRODUCTION.

	· ·	· · ·			,	
Year.	1 N.S.W.	Victoria.	Q'land.	S. Aust. W. Aust.	Tas.	Aust.(0)
			<u>}</u>	<u> </u>	·	

LOCAL VALUE. (L'000.)

A verage, 19 to 1938-39	34-35 (b)	2,094	837	2,226	547	1,176	394	7.274
1949-50		7,185	5,570	4,020	2.300	2,021	2,099	23,105
1050-51		8,966	6,437	5,029	2,656	2,908	2,432	28,428
1951-52		12,461	8,479	7,040	3,179	3,689	3,057	37,905
1952-53		13.672	8,904	7,102	3,790	3,328	3,248	40,044
1953-54		12,905	9,475	7,797 1	4,373	3,615	3,555	41,720

LOCAL VALUE PER HEAD OF POPULATION. (£ s. d.)

Average, 1934- to 1938-39 (b)	-35	0	15	7	0	9	1	2	5	2	0	18	7	2	11	8	I	13	9	1	1	4
1949-50		2	5	8	2	II	3	3	8	6	3	6	3	3	14	2	7	12	11	2	17	11
1950-51		2	15	5	2	17	5	4	3	4	3	13	7	5	2	0	\$	11	7	3	8	10
1951-52		3	15	3	3	13	5	5	13	7	4	5	6	6	5	I	10	- 8	5	4	9	3
1952-53		4	1	4	3	15	I	5	11	8	4	18	11	5	- 8	II	1 10	1.4	8	4	12	2
1953-54		3	15	10	3	18	3	5	19	11	! 5	11	3	5	14	7	11	9	10	4	1.4	3

(a) Excludes Australian Capital Territory and Northern Territory, details for which are not available.
(b) Net value of production (i.e. local value less value of materials used in the course of production) has been included for certain years for Victoria and Western Australia.

5. Employment.—(i) Forestry Operations. The estimated number of persons employed in forestry operations at 30th June, 1954 is shown in the following table. These estimates, which have been based upon preliminary data from the 1954 Census, include working proprietors, but exclude those employed in the sawmilling industry, for which particulars are shown in the next table.

ESTIMATED NUMBERS EMPLOYED IN FORESTRY, 30th JUNE, 1954.(a)

Sex.	 N.S.W. and A.C.T.	Vic.	Q`land.	S. Aust. and N.T.	W. Aust.	Tas,	Aust,
Males Females	 4,659	3,902 16	3,837 11	921 16	1,005 7	955 1	15,279 67
Total	 4,675	3,918	3,848	937	1,012	956	15,346
	(a) Prelimina	ry 1954 (Census figu	es, subject	to revision.		

(Excluding Sawmilling Industry.)

(ii) Milling Operations. Details of the average number of persons employed, including working proprietors, in the milling operations of sawmills during the year 1953-54 are shown in the next table. Further details regarding the operations of these mills are shown in Chapter IX.—Manufacturing Industry.

SAWMILLS : AVERAGE NUMBER OF PERSONS EMPLOYED, 1953-54.

			1		1		1	
Sex.		N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tasmania.	Australia. (a)
Mal s		9,592	7,134	6,964	1,931	4,222	2,154	31,997
Females		355	189	287	1 135	36	35	1,038
Total	••	9,947	7,323	7,251	2,067	4,258	2,189	33,035

(a) Excludes Northern Territory and Australian Capital Territory, details for which are not available.

§ 6. Imports and Exports of Timber and Tanning Substances.

1. Imports of Dressed and Undressed Timber. The quantities of timber imported into Australia during the years 1950-51 to 1953-54 inclusive are shown in the following table according to countries of origin :---

IMPORTS OF DRESSED AND UNDRESSED TIMBER INTO AUSTRALIA : COUNTRIES OF ORIGIN. ('000 Super. feet.)

Dressed Timber (a) Undressed Timber.(b) Country of Origin. 1950-51 1951-52 1952-53 1950-51 1951-52. 1953-54 1952-53 1953-54 United Kingdom 143 2 7 101 57 41.928 43 696 132 77,168 26,351 34.083 Canada 250 85.083 93,230 21,984 39,648 9,193 New Zealand 1,981 10.709 8.565 3,235 12 1.004 40.1 140 Other British Countries 67 35 877 21,777 135 2,280 Indonesia 19 1,197 955 2,523 . . Norway 15,114 12,525 374 3.777 +79 395 26,768 53.018 58,815 Sweden 50.337 7.554 7,025 1.127 1.685 61,700 7,552 32.560 United States of America 115,576 67.498 Other Foreign Countries 4 021 15.786 611 2.017 50.776 7 170 17 8 35 47,671 Total 10,310 304.577 85,113 107,649 14,502 331,293 114,134 244,595 ..

(a) Excludes timber not measured in super, feet.

(b) Includes logs not sawn.

The figures in the table above exclude dressed and undressed timber such as architraves. veneers, plywood, staves, etc., quantities for which either are not shown, or are expressed in dissimilar units in the Customs entries. The total value of the items so excluded amounted to $f_{225,93}$ in 1053 54.

The bulk of the imports of dressed timber now comes from Sweden, Norway and New Zealand and consists of softwoods cut for making boxes, and tongued and grooved timber, weatherboards, etc. The total value of dressed timber shown in the table above **a**mounted to $f_{962,000}$ during 1953-54, the major items being timber for box making and tongued and grooved weatherboarding. Undressed timber imported totalled $f_{9,575,000}$ of which more than 80 per cent. was softwood. The principal undressed timber imported was oregon pine from Canada and the United States of America. The balance was mainly hemlock from North America, pines from New Zealand, Indonesia and the United States of America, and hickory from the United States of America.

2. Exports of Undressed Timber and Railway Sleepers.—The quantities of undressed timber and railway sleepers exported during the years 1950-51 to 1953-54 are shown below, together with the countries of destination.

EXPORTS OF UNDRESSED TIMBER (a) AND RAILWAY SLEEPERS FROM AUSTRALIA : COUNTRIES OF DESTINATION.

('000 super. feet.)

Country of Destination.	Undr	essed Tim Railway S	ber (exclu leepers).	ding	Railway Sleepers.					
	1950-51.	1951-52.	1952-53.	1953-54.	1950-51.	1951 52.	1952-53	1953-54		
United Kingdom Ceylon Mauritius New Zealand Union of South Africa Other British Countries Foreign Countries	7,266 7,526 2,854 2,657 695	4,849 187 14,507 1.258 2,966 105	8,2 ⁸ 9 5 409 26,344 2,880 1,927 7,638	5:424 299 449 15,121 2,897 3,058 2,594	325 346 5,059 1,401 120 268	217 4,148 97 286	8,136 214 17	 1,979 375 13,009 15 380 2,723		
Australian Produce Re-exports	21,537	23.872 124	47,492	29,842 514	7,519	4,748	8,367	18,.:81		
Total	21,836	23,996	47,723	30,356	7,519	4,718	8,367	12,481		

(a) Excludes timber not measured in super. feet.

Exports of undressed timber were consigned mainly to New Zealand and the United Kingdom, and consisted largely of the Western Australian hardwoods, jarrat and karri, which have earned an excellent reputation for such purposes as harbour works and wood paving, etc. The total value of exports of undressed timber, excluding railway sleepers, during 1953-54 was $\pounds 1,843,139$ (hardwood $\pounds 1,799,842$, softwood $\pounds 43,257$). Railway sleepers exported were valued at $\pounds 921,101$.

3. Classification of Imports and Exports.—(i) General. The quantities and values of timber, according to items, imported and exported during the years 1952-53 and 1953-54 are shown in the following table :—

		Imp	o r ts.		Exports.						
Item.	1952	2-53.	1953	-54.	1952	-53.	1953-54.				
	'000 sup. ft.	£A. f.o.b.									
Logs, not sawn-											
Softwood	3.567	70.888	2.606	53.020			60	2.200			
Hardwood	13.374	284.169	23,957	533,323	12,331	762,166	8,748	470,751			
Timber, undressed—	1 0.01										
Boxmaking timber	468	25,308	1,037	35,476							
Railway sleepers	981	34,894	3	89	8,367	355,047	18,481	921,101			
Other Undressed—											
Softwood	90,644	4,009,314	203,518	8,105,822	305	28,459	557	41,088			
Hardwood	5,099	318,931	13,474	847,195	35,087	2,461.330	20,982	1,329,091			
Timber, dressed-											
Bent or cut into shape	(a)	25,615	(a)	49,070	(a)	2,719	(a)	521			
Boxmaking timber	4,809	324,846	2,046	126,117	••		5	116			
Tongued and grooved		f _					_				
weatherboards	4,514	316,501	11,849	793,554	76:	43,626	926	89,871			
Other, dressed of						1					
moulded	987	81,447	607	42,167	(<i>a</i>)	272	(a)	3,104			
	000		1000		000		000				
******	sq. 11.		sq. 11.		8q. It.		sq. 16.				
veneers	3,073	54,347	6,905	134,500	4,740	71,991	2,840	48,010			
Piywood	914	37,646	1,552	39,548	1,101	41,123	907	47,494			
Total		5,583,906		10,759,95c		3,766,733		2,953,424			

TIMBER : IMPORTS AND EXPORTS, AUSTRALIA.

(a) Not available.

(ii) Tanning Bark. Imports of tanning bark have declined considerably in recent years from a record figure of 105,315 cwt. valued at £53,553 during 1943-44 to 2,634 cwt. valued at £5,245 in 1953-54. Exports, on the other hand, have expanded in recent years. In 1947-48, 1949-50 and 1951-52 exports were nil, but in 1953-54, 31,557 cwt. of tanning bark valued at £57,900 were exported.

The imports of tanning bark consist almost exclusively of wattle bark from the plantations in South Africa. One species of Australian wattle, Acacia mollissima, is chiefly relied upon for the production of wattle bark in the South African plantations, most of the seed being obtained from the best wattle bark areas in eastern Tasmania and western Victoria. Two reasons are given to account for the success of the industry in the Union of South Africa:—(a) The suitability of the treeless, grassy highlands of Natal; and (b) the availability of native labour.

(iii) Other Tanning Substances. Considerable quantities of tanning substances other than bark are imported annually into Australia. The total value in Australian currency of the imports in 1953-54 was £574,646, and was composed as follows:—tanners' bates, £5,831; wattle bark extract, £443,644; other extracts, £62,734; and valonia, myrobalans, cutch, etc., £62,437.

Exports of tanning extracts and other tanning substances from Australia amounted to £497,818 in 7953-54.