

## CHAPTER XXIII. FORESTRY.\*

### § 1. General.

1. **Objects of Forestry.**—Scientific forestry aims at the preservation and development of existing forest areas by safeguarding them against fire, pests and destructive agencies generally by expert supervision of the removal of timber, by judicious thinning and by reforestation of denuded areas with suitable forest growths of local or exotic origin. It provides also for the continuance of this indispensable form of national wealth by the afforestation of available bare lands proved capable of producing various timbers. Only small areas of virgin forests still remain in Australia, as extensive inroads have been made by timber-getters, by agriculturalists, and by pastoralists—who have destroyed large areas by “ring-barking”—and it is not unlikely that climatological changes have resulted therefrom. It is recognized that beneficial consequences follow on the planting of trees on denuded lands, or along eroding coasts, and that a forest covering tends to regulate to the best advantage the effects of rainfall. The existing virgin forests consist of hardwood jungle, or brush, with very little softwood, and the need for extensive softwood planting is urgent.

Efficient forestry is of particular interest in connexion with the Murray River Basin, where a large expenditure from the public funds has been incurred in the provision of locks and weirs and in the formation of irrigation settlements in the lower course of the river. The stability of flow of this river in so far as it can be assured by forest plantation may be regarded as of national importance.

Successful planting of exotics in various parts of Australia has demonstrated that both climate and soil are suitable for the cultivation of a number of highly serviceable softwoods.

2. **Extent of Forests.**—(i) *Australia.* The bulk of the present local timber supply comes from the thickly forested areas in the 30-inch and over rainfall belt south of the tropics, and the 70-inch and over rainfall belt within the tropics. The total forest area included in the divisions specified is comparatively small, and is confined to the following regions :—(a) The coastal belt in the extreme south-west of Western Australia, from a little north of Perth to Albany; (b) the Otway country in the south of Victoria, and the whole of the south-eastern portion of that State; (c) the mountain forests of Victoria and New South Wales; (d) the coastal districts of New South Wales and Queensland; (e) the greater portion of Tasmania; (f) the forests on the Murray River near Echuca; and (g) the cypress pine belt from the Murray northward to Queensland and westward of the coastal belt.

Over 90 per cent. of the timber trees of Australia consists of hardwoods belonging to the genus *Eucalyptus* (Gum Trees). Including the mallees over 400 species are now recognized, but the chief commercial varieties are confined to about 50 species.

In addition to the hardwood forests and the cypress pine belt the coastal strip in Queensland and northern New South Wales provides “rain” or “brush” forests. These tropical forests furnish the serviceable hoop pine and furniture timbers such as black bean, Queensland walnut and maple, silkwood, etc.

The drier wooded area of the continent contains a large number of xerophilous trees and woody shrubs which thrive in regions receiving less than 10 inches of rain per annum. Country devoid of tree growth is rare. Unsuitable soil conditions such as basalt formations, clay pans, rock exposures or sand dunes are as a rule more responsible for treeless areas than lack of rainfall. The 300-mile stretch of the Nullarbor Plain is a treeless area where the non-retentive limestone foundation accentuates the effects of a low rainfall. While, however, the major portion of Australia carries trees, and may be said to be wooded (the term “desert” applying to relatively small areas only), dense forest is confined to a very narrow fringe. The savannah forests of the interior yield

\* A specially contributed article dealing with Forestry in Australia appeared as part of this Chapter in Official Year Book No. 19 (*vide pp. 701 to 712 therein*).

minor products such as sandalwood and tan barks, but do not produce timber. These open, park-like formations carry scattered trees of low habit only. Practically the whole of Papua and New Guinea carry or has carried dense forests, the exceptions being certain small dry belts where the rainfall is less than 70 inches. Norfolk Island was originally covered with a thick jungle.

Special articles relating to Australian Eucalyptus timbers and the chemical products of Eucalypts will be found in Official Year Book No. 10, pp. 85-98.

Scientific surveys of the forests of the various States have not yet been completed and there are, in consequence, conflicting reports regarding the total forest area of Australia. At the Interstate Conference on Forestry, held at Hobart in April, 1920, it was resolved that a forest area of 24,500,000 acres was necessary to provide for the future requirements of Australia. This area was subsequently adopted at the Premiers' Conference held in May of the same year. Expert foresters, however, consider that approximately 19,500,000 acres represent the possible limit for permanent reservation in Australia. The distribution of the latter area throughout the States was estimated as follows:—

## ESTIMATED FOREST AREA.

State.	Total Forest Area.	Percentage on Total Area.
New South Wales .. .. .	4,000,000	2.02
Victoria .. .. .	5,500,000	9.78
Queensland .. .. .	6,000,000	1.40
South Australia .. .. .	500,000	0.21
Western Australia .. .. .	3,000,000	0.48
Tasmania .. .. .	500,000	2.98
Australia .. .. .	19,500,000	1.02

(ii) *Comparison with Other Countries.* The table hereunder shows the absolute and relative forest areas of Australia and other countries, and the respective areas publicly and privately owned.

The figures are based on information supplied to the International Institute of Agriculture and are the latest available. Comparisons of the returns for different countries are, however, subject to the qualification that the significance of the term "forest" is not identical in all cases. In older countries, and chiefly in Europe, scientific forestry has been practised for centuries, whereas in newer lands, such as Australia, Canada, etc., it is of comparatively recent application. Moreover, considerable areas included as forests in the newer countries contain indigenous growth of little or no commercial value, and effective comparisons cannot, therefore, be made with countries where efficient forestry has been practised for many years.

## FORESTS.—AREA AND OWNERSHIP, VARIOUS COUNTRIES.

Country.	Forest Area.	Per cent. of Total Area.	Publicly Owned.	Privately Owned.
	sq. miles.	Per cent.	sq. miles.	sq. miles.
Soviet Union .. .. .	2,589,880	63.3	2,589,880	..
Canada .. .. .	1,151,402	32.8	1,040,867	110,535
United States of America .. .. .	733,539	24.7	(a)	(a)
India .. .. .	307,928	27.5	253,816	54,112
Nigeria .. .. .	234,990	63.8	8,486	226,504
Finland .. .. .	97,538	73.5	39,733	57,805
Sweden .. .. .	89,500	56.5	21,390	68,110
Japan .. .. .	87,678	59.5	51,332	36,346
Germany .. .. .	48,857	27.0	23,541	25,316

(a) Not available.

FORESTS.—AREA AND OWNERSHIP, VARIOUS COUNTRIES.—*continued.*

Country.	Forest Area.	Per cent. of Total Area.	Publicly Owned.	Privately Owned.
	sq. miles.	Per cent.	sq. miles.	sq. miles.
France .. ..	39,873	18.7	(a)	(a)
Poland .. ..	34,531	23.0	11,603	22,928
<b>Australia (b)</b> .. ..	<b>30,469</b>	<b>1.0</b>	(a)	(a)
Yugoslavia .. ..	29,289	30.5	19,545	9,744
Norway .. ..	28,955	24.2	5,646	23,309
Turkey .. ..	28,703	9.7	27,100	1,603
Rumania .. ..	27,544	24.2	7,929	19,615
Italy .. ..	21,309	17.8	(a)	(a)
New Zealand .. ..	20,778	20.2	15,033	5,745
Spain .. ..	18,965	9.7	(a)	(a)
Czechoslovakia .. ..	18,003	33.2	5,595	11,892
Union of South Africa .. ..	15,958	3.4	1,231	14,727
Algeria .. ..	12,257	10.7	9,195	3,062
Austria .. ..	12,112	37.4	2,925	9,187
Dutch East Indies .. ..	11,737	23.1	(a)	(a)
Bulgaria .. ..	11,143	28.0	3,043	8,100
Greece .. ..	9,291	18.5	6,442	2,849
Latvia .. ..	6,874	27.1	5,568	1,306
Great Britain .. ..	4,745	5.4	493	4,252

(a) Not available.

(b) Estimate of forest area possible for permanent reservation.

3. **Requisite Proportion of Forest Area.**—It is generally held that when the forest area in any country falls below 0.86 acres per head of population, that country will be obliged to import timber. Australia possesses 3.19 acres of forest per head of population, and normally the excess of imports of timber over exports amounts to approximately 28,000,000 cubic feet. There are two reasons for the excess. In the first place, the area of 19,500,000 acres given as the wooded area comprises all forest lands, reproductive or otherwise. The bulk of this area consists of cut-over forests swept by fire at frequent intervals, and the area of really productive forests has not been ascertained. Secondly, Australia does not possess a sufficient supply of softwoods, and must, therefore—with the exception of a small quantity produced in Queensland and New South Wales—import the bulk of its requirements from overseas. Provided that the area of 19,500,000 acres considered possible of permanent reservation by foresters were yielding under silvicultural treatment its maximum of hard and soft woods the timber supply of Australia would be sufficient for a population of 22½ millions.

## § 2. Forestry Activities of the Commonwealth Government.

Forestry was not included amongst the matters transferred from the States to the control of the Commonwealth, and federal supervision, therefore, is restricted to the forests in the Commonwealth Territories. These territories (including Papua, New Guinea and Norfolk Island) cover a large area, and, with the exception of the Northern Territory, are capable of sound forestry development. It is only within comparatively recent years, however, that any attempt has been made to take stock of the forestry position. The Commonwealth Forestry Bureau was instituted in 1925 to initiate silvicultural and other forest research work and to take charge of the education and training of the professional staffs required by the Commonwealth and the State services. The Bureau received statutory powers under an Act passed in 1930. In the meantime, the Australian Forestry School was established in 1926, and not only was the training of the State forest officers begun, but a nucleus of qualified officers was sent abroad to undergo special courses of instruction with the object of staffing the research side of the Bureau. The financial situation since 1930 has delayed progress on the research side, and the educational work of the Australian Forestry School is at present the Bureau's main activity.

The forest resources of the Territories of Papua, New Guinea, Norfolk Island, and the Federal Capital have been investigated, and reports in connexion therewith have been published. In the case of the Federal Capital area an active forest policy has been inaugurated.

The investigation of the dead product of the forests is entrusted to the Council for Scientific and Industrial Research, which has established a Forest Products Division. Research work is being carried out by this institution in regard to various matters, e.g., paper pulp, seasoning, preservation, tan barks, the chemistry of woods, and the utilization of forest products generally, including the substitution of local for imported woods for such purposes as butter boxes and fruit cases.

### § 3. State Forestry Departments.

1. **Functions.**—With the exception of Queensland, the powers and functions of State forest authorities are laid down under Forestry Acts and Regulations. In each State there is a Department or Commission specially charged with forestry work. The functions of these administrations are as follow :—(a) 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, marketing and economic utilization of forest produce ; and (e) The establishment and maintenance of coniferous forests to remedy existing deficiency in softwoods.

Annual reports are issued by each State forest authority.

In Victoria a forestry school has been established at which recruits are trained for the forestry service of the State.

2. **Forest Reservations.**—At the Interstate Forestry Conference held in Hobart in 1920, the State forestry authorities agreed in regard to the necessity of reserving an area of 24,500,000 acres of indigenous forest lands in order to meet the future requirements of Australia but, as previously mentioned, it is the considered opinion of expert foresters that 19.5 million acres only are possible for permanent reservation. This area was distributed among the States as set out in Section 1, 2 *ante*.

Having been endorsed by the Premiers' Conference held later in the same year, this area was adopted as the Australian forest requirement towards the permanent reservation of which the authorities are now aiming. The progress made in the various States to the end of June, 1934, is set out in the following table :—

AREA OF FOREST RESERVATIONS, 30th JUNE, 1934.

Particulars.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Australia.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
Dedicated State forests ..	5,115,080	3,956,952	2,287,010	(a)265,710	3,093,697	1,481,730	16,200,179
Timber and fuel reserves ..	1,387,537	735,848	3,474,529	..	1,873,134	950,000	8,421,048
Total ..	6,502,617	4,692,800	5,761,539	265,710	4,966,831	2,431,730	24,621,227

(a) Includes Timber and Fuel Reserves.

In addition to the work of permanently reserving their respective areas the State foresters are endeavouring to survey all timbered lands with a view to the cutting out of all 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 area of State forests reserved in perpetuity amounted in June, 1934, to 16,200,179 acres, or 83 per cent. of the area considered possible for permanent reservation in Australia. Of this area a considerable proportion consists of inaccessible mountainous country and cut-over lands, while the Australian area recommended refers to merchantable forest only. The foresters of Australia are, therefore, faced with a difficult task in improving and preserving the existing forests, and in securing the reservation of further suitable forest country to ensure a permanent supply.

The Forestry Departments also control 8,421,048 acres of temporary timber and fuel reserves, but, while these areas contain some land of high value for forestry purposes, the greater part does not justify permanent reservation.

3. **Sylvicultural Nurseries and Plantations.**—Recognition of the necessity for providing by systematic sylviculture for the future softwood timber needs has led to the creation in all of the States of a number of nurseries and plantations. A brief statement showing the locality of these establishments and the nature of their activities will be found in the previous issues of the Official Year Book. (See Official Year Book No. 6, pp. 451-3.) Details regarding forest plantations and the number of persons employed are given hereunder:—

**FORESTRY.—AREAS AND EMPLOYMENT, 1933-34.**

Particulars.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Total.
Total area of indigenous forest improved or regenerated acres	1,103,292	678,812	109,361	8,255	244,340	..	2,144,060
Total area of Effective Plantations—							
Softwoods .. acres	38,683	39,353	10,505	60,673	8,257	1,150	158,621
Hardwoods .. acres	..	2,500	1,012	4,755	..	..	8,267
Number of persons employed in Forestry Departments—							
Office Staff .. No.	55	38	65	33	34	4	229
Field Staff .. No.	82	132	465	423	(a) 1,155	14	2,271

(a) Including casual hands.

4. **Revenue and Expenditure.**—The revenue and expenditure of State Forestry Departments from 1929-30 to 1933-34 are given below:—

**STATE FORESTRY DEPARTMENTS.—REVENUE AND EXPENDITURE.**

State.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.
REVENUE.					
	£	£	£	£	£
New South Wales ..	128,795	88,548	104,674	139,211	166,014
Victoria ..	128,645	74,583	77,189	126,058	179,150
Queensland ..	336,762	174,106	162,246	235,440	293,991
South Australia ..	48,423	33,437	83,714	62,766	82,888
Western Australia ..	173,219	94,895	57,267	65,875	89,895
Tasmania ..	10,545	10,616	8,584	13,229	17,445
<b>Total ..</b>	<b>826,389</b>	<b>476,185</b>	<b>493,674</b>	<b>642,579</b>	<b>829,383</b>
EXPENDITURE.					
	£	£	£	£	£
New South Wales ..	183,720	121,009	(a) 114,151	(a) 132,814	(a) 213,067
Victoria ..	220,875	267,055	152,820	136,677	(a) 256,195
Queensland ..	209,170	140,800	(a) 160,311	(a) 175,073	(a) 232,930
South Australia ..	141,633	111,759	117,882	183,866	158,788
Western Australia ..	142,376	93,974	(a) 93,151	(a) 158,748	(a) 171,798
Tasmania ..	10,091	13,480	8,764	6,777	8,978
<b>Total ..</b>	<b>907,865</b>	<b>748,077</b>	<b>647,079</b>	<b>793,955</b>	<b>1,041,756</b>

(a) Including expenditure from Unemployment Relief Funds as follows:—1931-32—New South Wales, £7,782; Queensland, £22,650; and Western Australia, £45,454. 1932-33—New South Wales, £25,109; Queensland, £8,515; Western Australia, £134,097. 1933-34—New South Wales, £106,370; Victoria, £93,050; Queensland, £27; Western Australia, £141,520.

**§ 4. The Australian Forestry School.**

The Australian Forestry School situated at Canberra in the Federal Capital Territory was established in 1926 by the Commonwealth Government to meet the demand of the States for an institution which would give a professional training at least equal to that afforded by the recognized forestry schools abroad.

Under existing arrangements the head of the State forestry service may nominate candidates for enrolment at the school. According to the system in vogue in each State,

the nomination may be made either at school leaving age or after the candidate has successfully completed the specified university course. In the first case, the youth is helped throughout his university career and is given employment in practical work during the long vacations to test his suitability as a forestry officer; in the second case he is chosen later, and the practical tests are not made until the long vacation immediately preceding his entry to the school. The possession of a nomination by a State government service is not, however, essential for enrolment, since any candidate possessing the necessary qualifications will be accepted for the diploma course, and in special cases applicants desirous of studying a particular branch of forestry will be required to follow certain lectures only. Refresher or post graduate courses are arranged to meet the needs of senior foresters.

A candidate for enrolment in the diploma course must possess—(a) a degree of a University, or (b) a certificate that he has completed the special two years' preliminary course at a University.

The qualifications for enrolment may be waived to assist an applicant of exceptional ability with a record of long service in a State Forestry Department, who has been specially recommended by the head of that service. Such applicants must show proof of education equal to that required for a school leaving certificate.

The course of instruction extends over three years, the first two of which are spent at the school, and the third in one of the forestry services of Australia.

The Commonwealth diploma of forestry is awarded to students on the following conditions:—(a) Successful completion of theoretical course; (b) Satisfactory field work during the course; and (c) One year's satisfactory practical forestry work following the school course.

Students who have passed the approved two-year preliminary science course at the Universities of Adelaide, Melbourne, Western Australia or Queensland, and two years of Diploma course at the School, may be granted the degree B.Sc.F. by their Universities, subject to certain conditions laid down, particulars of which may be obtained from the Registrar of the University concerned.

### § 5. Forest Congresses.

Reference to the various Forestry Conferences held in Australia and elsewhere will be found in Official Year Book No. 22, p. 743, but owing to limitations of space, the information cannot be repeated herein. The Third British Empire Forestry Conference was held in Australia and New Zealand in 1928. Publications issued in connexion with this Conference are available on application to the various State and Commonwealth forestry authorities.

### § 6. Forestry Production.

1. Timber.—Particulars regarding the production of sawn timber from forest sawmills in each State for the year 1933-34 are shown in the following table:—

SAWMILL OUTPUT OF NATIVE TIMBER, 1933-34.

Particulars.	N.S.W.	Vic.	Qld.	S.A.	W.A. (a)	Tas.	Total.
LOGS MILLED.							
Hardwood—							
Quantity cub. ft.	7,293,765	(b)	64,896,673	400,859	16,385,493	(b)	(b)
Value.. £	255,230	(b)	295,403	6,374	212,893	(b)	(b)
Softwood—							
Quantity cub. ft.	4,849,652	(b)	4,919,209	1,213,543	(d)	(b)	(b)
Value.. £	170,310	(b)	380,408	11,243	(d)	(b)	(b)
Total—							
Quantity cub. ft.	12,143,417	(b)	9,815,882	1,614,402	16,385,493	(b)	(b)
Value.. £	425,540	(b)	675,811	17,617	212,893	(b)	(b)

(a) Excluding timber amounting to 31,335,186 sup. feet, valued at £156,528, produced elsewhere than in forest sawmills. (b) Not available. (c) Including logs unspecified.

(d) Included with hardwood.

SAWMILL OUTPUT OF NATIVE TIMBER, 1933-34—*continued.*

Particulars.	N.S.W.	Vic.	Qld.	S.A.	W.A.	Tas.	Total.
<b>SAWN TIMBER PRODUCED.</b>							
Hardwood—							
Quantity sup. ft.	55,398,329	76,063,081	24,286,291	2,147,967	65,047,317	42,035,372	264,978,357
Value.. £	521,089	480,524	329,736	22,431	526,142	244,441	2,124,363
Softwood—							
Quantity sup. ft.	35,634,191	..	42,945,528	7,770,692	45,065	1,034,907	87,430,383
Value.. £	335,729	..	628,907	83,974	721	18,106	1,067,437
Unspecified—							
Quantity sup. ft.	..	5,015,476	7,811,185	..	..	4,661,468	17,488,129
Value.. £	..	31,334	166,062	..	..	61,532	258,928
Total—							
Quantity sup. ft.	91,032,520	81,078,557	75,043,004	9,918,659	65,092,382	47,731,747	369,896,869
Value.. £	856,818	511,858	1,124,705	106,405	526,863	324,079	3,450,728

The next table gives the sawmill output of native timber in each State for 1923-24, 1928-29 and for the last three years :—

## SAWMILL OUTPUT OF NATIVE TIMBER.

State.	1923-24.	1928-29.	1931-32.	1932-33.	1933-34.
	1,000 sup. feet.	1,000 sup. feet.	1,000 sup. feet.	1,000 sup. feet.	1,000 sup. feet.
New South Wales .. .. .	167,493	136,051	52,102	71,912	91,032
Victoria .. .. .	134,639	79,018	49,413	68,957	81,079
Queensland .. .. .	141,672	106,862	52,405	67,060	75,043
South Australia .. .. .	1,350	3,219	5,782	6,758	9,919
Western Australia .. .. .	161,749	145,043	40,859	46,812	65,092
Tasmania .. .. .	63,120	46,195	36,146	45,576	47,732
Total .. .. .	670,023	516,388	236,707	307,075	369,897

In addition to the sawn timber shown in the 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 outside forest sawmills, but the figures have not been included in the two preceding tables. The quantities so produced in the last five years were as follow :—1929-30, 36,071,054 sup. feet ; 1930-31, 38,158,959 sup. feet ; 1931-32, 16,831,214 sup. feet ; 1932-33, 12,441,946 sup. feet ; and 1933-34, 31,335,186 sup. feet. The annual reports of the Forest Departments in each State contain particulars concerning the output of timber from areas under departmental control, but owing to lack of uniformity in measurements accurate determination of total production cannot be made. Efforts, however, are being made to obtain more comparable information. Moreover, there is a fair quantity of hewn timber produced from privately owned land, but information regarding output is not available.

2. *Other Forest Products.*—(i) *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 production and consumption of eucalyptus oil is not available, but large quantities are manufactured, particularly in Victoria. Oversea exports amounted in 1929-30 to £63,388 ; in 1930-31 to £47,090 ; in 1931-32 to £40,977 ; in 1932-33 to £40,075 ; and in 1933-34 to £41,010,

the bulk of the product being shipped from Victoria to the United Kingdom, the United States, and Germany. Large quantities of the crude oil are used locally in flotation processes in connexion with the recovery of gold and other minerals.

(ii) *Sandalwood and Sandalwood Oil.* The distillation of oil from Western Australian sandalwood has been characterized by improvement both in quality and in quantity within recent years. It is claimed that the Western Australian oil is at least as valuable medicinally as the well-known Mysore oil, besides having an extensive use in the manufacture of perfumes. Exports of essential oils from Western Australia amounted in 1929-30 to £77,510; in 1930-31 to £56,170; in 1931-32 to £59,301; in 1932-33 to £26,331; and in 1933-34 to £26,720. The bulk of the product consisted of sandalwood oil which was shipped principally to the United Kingdom, Eastern States of Australia, and Japan. In addition to its distillation quantities of sandalwood are gathered for export each year. Western Australia is the chief source of supply, followed by South Australia, while Queensland also produces a small quantity. In 1933-34, 3,953 tons valued at £114,301 were exported, the whole of which was shipped to the East; Hong Kong 2,300 tons and China 1,200 tons were the principal countries of destination. A table giving these details is included in § 8 hereinafter.

(iii) *Grass Tree or Yacca Gum.* South Australia is the chief State producing this gum which is used in the preparation of varnishes and lacquers. Quantities are also obtained in New South Wales and Western Australia but these are small. The average production in South Australia during the past five years amounted to 2,145 tons, whilst the exports from Australia averaged 2,116 tons valued at £14,166 during the same period.

(iv) *Tan 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. Although many of these species contain higher percentages of tannin than is found in the bark of oak, chestnut and hemlock, formerly the chief source of tannin material in the northern hemisphere, scattered distribution has resulted in the richest tan-bearing species only being used in Australia. These are:—Golden wattle (*Acacia pycnantha*), black or green wattle (*Acacia decurrens* or *mollissima*), and mallet (*Eucalyptus astringens*).

In pre-war days the production of wattle bark was more than sufficient for local requirements, and an export trade was built up. The supply diminished during the six years ending 1926-27, and Australia imported on the average about 2,900 tons each year from Natal, where the plantations were originally started from Australian seed. Since 1927-28, however, exports exceeded imports, averaging 3,447 tons valued at £33,987 during the five years ending 1933-34. The chief exporting States are South Australia and Western Australia. This matter is referred to in tables appearing in § 8 hereinafter. The other valuable tan bark, mallet (*Eucalyptus astringens*) of Western Australia, is not extensively used in Australian tanneries, but it is exported to Europe and other countries, where it is used for producing a tannin extract. A brief account of the work done by the Council for Scientific and Industrial Research in connexion with tanning materials will be found in Official Year Book No. 22, page 743. The production of extract from the bark of karri (*Eucalyptus 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 karri (*Eucalyptus calophylla*) bark is not yet complete. The production of tan bark in Australia is estimated at about 25,000 tons per annum.

3. *Value of Production.*—As the outcome of a series of conferences of Australian statisticians it is now possible to present the value of forestry production on a much more satisfactory basis than was possible hitherto. Provision is made for the inclusion of all phases of forestry output, including forest sawmills, the production of logs, poles, piles, sleepers and other hewn timber, firewood, sandalwood and gums and resins. It has not been possible within the time allowed to collect all of these items and consequently the values are understated in some of the States, but the deficiency is not serious.



## GROSS, LOCAL AND NET VALUE OF FORESTRY PRODUCTION, 1933-34.

State.	Gross Production Valued at Principal Markets.	Marketing Costs.	Gross Production Valued at Place of Production.	Value of Other Materials Used in Process of Production.	Net Value of Production.(a)
	£	£	£	£	£
New South Wales ..	1,842,000	105,000	1,737,000	..	1,737,000
Victoria ..	836,616	247,779	588,837	..	588,837
Queensland ..	1,524,214	190,126	1,334,088	..	1,334,088
South Australia ..	505,241	17,172	488,069	..	488,069
Western Australia ..	823,941	94,145	729,796	..	729,796
Tasmania ..	321,850	62,490	259,360	..	259,360
Total ..	5,853,862	716,712	5,137,150	..	5,137,150

(a) No account has been taken of maintenance costs and depreciation.

NOTE.—The relative proportions of marketing costs to gross production suggest that complete uniformity in method has not yet been attained.

4. **Employment.**—The number of persons employed in forestry operations as revealed by the Census of the Commonwealth of Australia at the 30th June, 1933, is shown in the following table:—

## EMPLOYMENT IN FORESTRY, 30th JUNE, 1933.

Sex.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Total. (a)
	No.	No.	No.	No.	No.	No.	No.
Males ..	6,446	7,225	4,054	1,549	4,189	2,376	25,839
Females ..	38	29	27	8	7	5	114
Total ..	6,484	7,254	4,081	1,557	4,196	2,381	25,953

(a) Not including Northern Territory, 11, and Federal Capital Territory, 152.

## § 7. Commercial Uses of Principal Australian Timbers.

1. **General.**—The uses of the more important Australian timbers are many and various, and are indicated in previous issues of this work. (See Official Year Book No. 6, pp. 454-6; and Official Year Book No. 10, Section III, § 7 and 8.)

A list of Australian timbers best known on the local markets appeared in Official Year Book No. 20, p. 713. [Further references are made in "Timber and Forest Products of Queensland" (E. H. F. Swain), published in 1928.]

2. **Lack of Uniformity in Nomenclature.**—Unfortunately the vernacular names applied to the gums, ironbarks, etc., in the various States, and even in different parts of the same State, do not always refer to identical timbers. The resulting confusion has not only been productive of loss, but it has, to some extent, prejudicially affected the timber trade. This subject is referred to at some length in the special article "Australian Eucalyptus Timbers," in Section III., § 7 and 8, in Official Year Book No. 10. At the Forestry Conferences previously mentioned, the matter came up for special consideration, and steps were taken to establish a uniform nomenclature.

## § 8. Oversea Trade.

1. Imports.—(i) *Dressed Timber*. The quantity and value of timber imported into Australia during the four years 1930-31 to 1933-34 inclusive are shown according to countries of origin in the following tables:—

## DRESSED TIMBER.—IMPORTS, AUSTRALIA.

Country of Origin.	Quantity.				Australian Currency Values.			
	1930-31.	1931-32.	1932-33.	1933-34.	1930-31.	1931-32.	1932-33.	1933-34.
	sup. ft.	sup. ft.	sup. ft.	sup. ft.	£	£	£	£
United Kingdom ..	1,848	264	4,814	21,133	201	38	735	1,536
Canada ..	3,920,447	2,105,195	229,291	4,672,603	43,238	26,899	2,558	36,064
Other British Countries ..	92,498	25,116	35,454	10,246	982	248	370	94
Norway ..	3,200,306	1,712,394	5,457,889	4,510,936	34,836	15,936	44,446	42,499
Sweden ..	2,389,990	1,303,711	4,647,179	3,803,010	25,988	14,756	42,226	37,538
United States ..	3,952,219	53,001	763	1,105,408	34,978	1,359	41	8,334
Other Foreign Countries ..	285,008	165,327	709,255	1,019,977	5,902	3,524	9,203	13,733
Total ..	13,842,316	5,370,008	11,084,645	15,143,313	146,125	62,760	99,579	139,798

The figures in the table above are exclusive of items such as architraves, veneers, etc., quantities for which are either not shown, or are expressed in dissimilar units in the Customs entries. The total value of the items so excluded amounted to £57,437 in 1933-34 including plywood, veneered or otherwise, £9,501.

The bulk of the imports of dressed timber comes from Norway, Sweden, and Canada. Practically the whole of this timber consists of softwoods—deal and pine—used for lining, weatherboards, flooring, shelving, doors, box-making, etc.

(ii) *Undressed Timber*. Australian imports of undressed timber for the years 1929-30 to 1933-34 are given hereunder:—

## UNDRESSED TIMBER, INCLUDING LOGS.(a)—IMPORTS, AUSTRALIA.

Country of Origin.	Quantity.					Australian Currency Values.				
	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.
	'000.	'000.	'000.	'000.	'000.	£	£	£	£	£
	sup. ft.	sup. ft.	sup. ft.	sup. ft.	sup. ft.					
United Kingdom ..	97	1,635	72	131	218	9,591	13,283	8,211	13,931	19,567
Canada ..	43,716	21,300	75,835	135,016	184,869	305,569	95,504	352,720	569,313	610,096
India ..	62	30	38	42	17	2,647	2,124	1,695	2,124	863
Malaya (British) ..	169	101	93	131	99	1,452	878	849	1,128	779
New Zealand ..	37,173	15,918	23,177	25,653	26,784	459,095	215,809	296,538	314,909	326,102
Other British Countries ..	3,541	2,239	1,280	1,751	2,366	31,806	23,238	12,843	4,795	14,402
Japan ..	7,345	978	312	672	1,334	149,085	16,914	3,371	14,778	17,365
Netherlands East Indies ..	1,270	..	..	..	7	9,921	..	..	..	152
Norway ..	153	88	..	170	236	1,262	1,036	169	1,395	2,149
New Caledonia ..	1,182	912	140	..	..	11,622	11,710	1,557	..	..
Philippine Islands ..	5,780	433	93	716	2,702	79,219	6,620	670	6,432	21,384
Sweden ..	4,147	67	538	1,872	1,935	38,184	801	4,452	14,076	15,802
United States ..	233,538	61,562	18,586	20,841	21,390	1,811,759	312,623	110,034	159,233	212,520
Other Foreign Countries ..	288	1,235	1,408	1,668	1,730	4,407	9,596	9,161	5,611	14,895
Total ..	338,461	106,498	121,600	188,663	243,687	2,915,619	710,136	802,270	1,107,725	1,256,076

(a) Exclusive of timber not measured in super. feet.

By far the larger proportion of the undressed timber imports consists of softwoods such as oregon, redwood, hemlock, western red cedar and yellow pine from the United States and Canada; kauri, rimu, and white pine from New Zealand; and red and white deals from Norway and Sweden. Amongst the hardwoods imported the principal are oak from the United States of America and Japan, and furniture woods from the Pacific Islands.

2. Exports.—The quantity and value of undressed timber exported from 1929-30 to 1933-34 are given below, the countries of destination being also shown:—

UNDRESSED TIMBER, INCLUDING LOGS.(a)—EXPORTS, AUSTRALIA.

Country to which Exported.	Quantity.					Value(b).				
	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.
	'000. sup. ft.	'000. sup. ft.	'000. sup. ft.	'000. sup. ft.	'000. sup. ft.	£	£	£	£	£
United Kingdom ..	11,722	12,399	13,173	8,020	8,298	127,469	141,746	153,315	110,640	101,727
Canada ..	212	125	40	33	156	5,087	2,498	682	560	2,539
Ceylon ..	12,013	10,328	6,700	2,454	1,184	120,873	104,668	65,952	21,930	12,311
Hong Kong ..	28	820	355	2,766	102	440	7,307	2,126	20,343	1,019
India ..	1,391	32	..	..	..	15,607	316	..	..	..
Malaya (British) ..	39	103	23	..	..	410	1,147	473	..	..
Mauritius ..	382	1,017	408	624	421	3,840	10,160	4,093	4,575	4,259
New Zealand ..	24,256	22,671	7,675	3,192	6,357	318,671	271,244	83,467	40,342	77,768
Pacific Islands—										
Fiji ..	1,297	813	510	494	455	21,834	12,987	7,408	6,913	6,424
Territory of New Guinea ..	356	92	420	109	139	6,269	1,293	4,772	1,237	1,916
Other Islands ..	840	624	316	400	445	14,496	9,284	4,848	5,811	5,058
Papua ..	149	80	105	190	105	3,197	1,223	1,932	2,312	1,541
Union of South Africa ..	17,447	5,843	8,646	3,403	2,914	188,678	65,972	83,187	38,092	33,285
Other British Countries ..	..	..	129	288	2	..	..	1,287	3,078	20
Africa—										
Portuguese East ..	..	..	193	1,096	1,294	..	..	2,343	11,844	14,372
Belgium ..	1,246	528	615	573	416	12,460	5,713	6,132	5,746	4,257
China ..	89	5,292	3,670	684	180	1,018	51,703	23,513	5,308	1,719
Egypt ..	1,039	..	..	138	28	10,385	..	..	1,378	322
Germany ..	..	..	176	142	165	..	..	1,869	1,462	1,767
Japan ..	50	..	38	..	..	768	..	801	..	..
Netherlands ..	..	..	1,036	716	375	..	..	10,491	6,942	3,894
Pacific Islands—										
New Caledonia ..	23	..	..	..	73	378	..	..	..	1,119
Other Islands ..	144	68	88	42	54	2,364	1,212	1,613	523	499
U.S. of America ..	5,737	1,332	3,039	406	916	85,860	22,897	42,453	6,464	18,875
Other Foreign Countries ..	3,901	1,000	54	1,125	49	42,569	11,581	421	11,320	631
Total ..	82,361	63,167	47,418	26,895	24,128	982,673	722,951	503,178	306,820	295,322

(a) Exclusive of timber not measured in sup. feet.

(b) Australian currency values.

The bulk of the exports of undressed timber was consigned to South Africa, New Zealand and the United Kingdom, and consisted largely of the Western Australian hardwoods, jarrah and karri, which have earned an excellent reputation for such purposes as railway sleepers, harbour works, wood paving, etc. Considerable quantities of pole, pile and girder timber are also exported from New South Wales to New Zealand.

3. Classification of Imports and Exports.—(i) *General.* The quantities of timber classified according to varieties imported and exported during the year 1933-34 are given in the next table:—

**TIMBER, VARIETIES IMPORTED AND EXPORTED.—QUANTITIES, AUSTRALIA, 1933-34.**

Description.	Unit of Quantity.	Imports.	Exports.	Excess of Imports over Exports.
Dressed .. .. .	sup. ft.	15,143,313	733,845	14,409,468
Undressed, including logs .. .. .	"	243,687,307	24,127,926	219,559,381
Architraves, mouldings, etc. .. .. .	lin. ft.	7,452	66,096	-58,644
Plywood, veneered or otherwise .. .. .	sq. ft.	1,263,882	(b)	(a)
Palings .. .. .	No.	..	102,720	-102,720
Shingles .. .. .	"	409,300	106	409,194
Staves—				
Dressed, etc. .. .. .	"	516,976	520	516,456
Undressed .. .. .	"	941,945	10,480	931,465
Laths—				
For blinds .. .. .	"	..	..	..
Other .. .. .	"	266,800	42,080	224,720
Doors .. .. .	"	31	(a)	(a)
Wood pulp .. .. .	ton	35,300	(b)	(a)
Veneers .. .. .	—	(a)	(b)	(a)
Spokes, rims, felloes, etc. .. .. .	—	(a)	(a)	(a)
Other .. .. .	—	(a)	..	(a)

(a) Quantity not available.

(b) Exports not recorded separately.

NOTE.—The minus sign (-) denotes an excess of exports.

Similar particulars relative to the values of imports and exports during the year 1933-34 are shown hereunder:—

**TIMBER, VARIETIES IMPORTED AND EXPORTED.—VALUES, (b) AUSTRALIA, 1933-34.**

Description.	Imports.	Exports.	Excess of Imports over Exports.
	£	£	£
Dressed .. .. .	139,798	8,944	130,854
Undressed, including logs .. .. .	1,256,076	295,322	960,754
Architraves, mouldings, etc. .. .. .	23	401	-378
Plywood, veneered or otherwise .. .. .	9,501	(a)	9,501
Palings .. .. .	..	1,001	-1,001
Shingles .. .. .	641	2	639
Staves—			
Dressed, etc. .. .. .	27,273	26	27,247
Undressed .. .. .	18,630	128	18,502
Laths—			
For blinds .. .. .	..	27	-27
Other .. .. .	333	54	279
Doors .. .. .	351	1,253	-902
Wood pulp .. .. .	427,309	(a)	427,309
Veneers .. .. .	18,113	(a)	18,113
Spokes, rims, felloes, etc. .. .. .	71	1,182	-1,111
Other .. .. .	1,976	..	1,976
<b>Total .. .. .</b>	<b>1,900,010</b>	<b>308,340</b>	<b>1,591,670</b>

(a) Exports not recorded separately.

(b) Australian currency values.

NOTE.—The minus sign (-) denotes an excess of exports.

(ii) *Sandalwood*. A considerable quantity of sandalwood is exported, principally from Western Australia to Hong Kong and China, where it is highly prized and largely used for artistic and ceremonial purposes. Particulars for the last five years are as follow :—

## SANDALWOOD.—EXPORTS, AUSTRALIA.

Country to which Exported.	Quantity.					Value.(a)				
	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.
	ton.	ton.	ton.	ton.	ton.	£	£	£	£	£
Hong Kong ..	2,482	2,510	1,286	3,481	2,309	57,688	62,741	38,068	95,575	64,735
India ..	288	81	209	144	203	9,437	2,585	6,270	4,311	6,216
Malaya (British) ..	63	26	115	99	168	1,716	770	3,370	2,623	5,115
Other British Countries ..	15	11	7	15	11	424	330	213	450	340
China ..	737	330	649	715	1,212	19,521	6,363	12,651	20,413	36,358
Other Foreign Countries ..	37	6	78	(b)400	(c) 50	641	180	2,342	(b)9,285	(c)1,537
Total ..	3,622	2,964	2,344	4,854	3,953	89,427	72,969	62,914	132,657	114,301

(a) Australian currency values. (b) Includes 386 tons £8,865 to Japan. (c) Includes 31 tons £953 to Japan.

(iii) *Tan Bark*. Tan bark figures both as an export and import in the Australian trade returns. The table hereunder refers to exports :—

## TAN BARK.—EXPORTS, AUSTRALIA.

Country to which Exported.	Quantity.					Value.(a)				
	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.
	cwt.	cwt.	cwt.	cwt.	cwt.	£	£	£	£	£
United Kingdom ..	..	1,138	2,298	..	..	..	510	978	..	..
New Zealand ..	22,038	14,415	41,260	35,795	26,387	14,109	8,100	19,570	17,777	13,636
Other British Possessions ..	..	..	20	2	..	..	..	9	1	..
Germany ..	41,567	30,059	35,441	21,333	3,206	21,266	14,097	17,133	10,041	2,273
Other Foreign Countries ..	6,433	24,745	10,042	19,464	11,757	3,226	10,527	4,599	8,073	5,340
Total ..	70,040	70,357	89,061	76,594	41,350	38,604	33,234	42,289	35,892	21,249

(a) Australian currency values.

The exports of tan bark from Australia during recent years consisted largely of mallet bark from Western Australia. The shipments of this bark are not so large as in pre-war days owing to the cutting out of supplies. A vigorous policy of reforestation was put into operation and, as a result, a considerable improvement in exports has taken place concurrent with a diminution of imports of similar materials. For the twelve years prior to 1927-28, Australia had to import large quantities of tanning bark, but since then imports have dwindled to a negligible quantity. During the five years shown in the above table the chief exporting States were Western Australia, South Australia and Tasmania, these States providing 58 per cent., 25 per cent. and 11 per cent. respectively of the total quantities shipped.

A comparison of the imports and exports of tan bark during the last five years is given in the next table :—

## TAN BARK.—IMPORTS AND EXPORTS, AUSTRALIA.

Particulars.	1929-30.	1930-31.	1931-32.	1932-33.	1933-34.
	cwt.	cwt.	cwt.	cwt.	cwt.
QUANTITIES—					
Imports .. .. .	1,936	596	21	200	1
Exports .. .. .	70,040	70,357	89,061	76,594	41,350
Excess of exports over imports	68,104	69,761	89,040	76,394	41,349
	£	£	£	£	£
VALUES (a)—					
Imports .. .. .	950	266	13	101	1
Exports .. .. .	38,604	33,234	42,289	35,892	21,249
Excess of exports over imports	37,654	32,968	42,276	35,791	21,248

(a) Australian currency values.

The imports consist almost exclusively of wattle bark from the plantations in South Africa. One variety of Australian wattle is found to flourish in the sandy belts near the coast, but it is the *Acacia decurrens*, var. *mollis*, which is chiefly relied upon for the production of wattle bark in the South African plantations. Seed has been tried from New South Wales, Tasmania and Victoria, but it is stated that most of the seed is 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) It is found that the treeless, grassy highlands of Natal are specially suitable for wattle culture, and the trees can therefore be grown in rows and economically attended to, while the necessary bark sheds and other appurtenances can be placed in the most advantageous positions ; and (b) there is an abundance of cheap and efficient native labour.

(iv) *Other Tanning Substances.* Considerable quantities of tanning substances other than bark are annually imported into Australia. The total value of the importations in 1933-34 was £40,240, and was composed as follows :—Wattle bark extract, £898 ; quebracho extract, £9,028 ; other extract, £7,600 ; and valonia, myrobalans, catch, etc., £22,714.