

CHAPTER XXII.

FORESTRY.*

§ 1. General.

1. **Objects of Forestry.**—Forestry is a profession based on science, art, economic and business principles, which aims to protect and treat forests as restorable resources to provide their maximum direct and indirect benefits to a country.

The direct benefits lie in the providing of essential commodities such as structural timber, poles, piles, sleepers, pulpwood, firewood, tans, oils, resins, etc.; the provision of an avenue for the healthful employment of labour in the rural forestry and sawmilling industry as well as in the transport of timber by rail, road, and water, and in numerous industries directly dependent on forest produce as a raw material. The history of all countries shows that these direct benefits are never fully appreciated until they are seriously reduced following reckless exploitation and absence of conservation measures.

The indirect benefits include regulation of stream flow from catchment areas, for a forest cover provides ideal conditions for the maximum penetration into the soil of rainfall and other precipitations which then become available for the perennial flow of streams. As a result, surface run-off after heavy rain is reduced and therefore floods are minimized in number and severity and as a corollary, the ill effects of reduced and/or intermittent flow of streams in the non-rainy season are minimized. Consequent on their action in reducing surface run off in the rainy season, forests have very marked effect in minimizing the ravages of water erosion. The presence of forests in drier wind swept areas also lessens the ill effects of æolian or wind erosion. As with the direct benefits, the indirect benefits of forests unfortunately are seldom appreciated until disastrous floods, siltation of rivers and reservoirs, washing away or blowing away of the topsoil, landslides, tearing of gullies out of hillsides and deposition of stones, rocks and other debris on fertile lands following the destruction of forests, becomes a matter of public concern.

Australia has a particular interest in water and soil conservation for several reasons. The area suitable for agricultural and pastoral development is not so large that material reduction in extent or deterioration of productive capacity cannot but limit expansion and retard development; the topographical soil and climatic conditions of many parts of Australia render them potentially highly susceptible to water and wind erosion; to ensure successful cropping of very large areas of land in Australia, millions of pounds have been spent on water conservation and irrigation schemes but in the last analysis these water conservation schemes are dependent upon regular stream flow and the minimum of siltation.

Forestry aims to protect existing forests from the ravages of fire, insect, fungus and destructive agencies generally; to improve the quality and condition of forests by carrying out judicious fellings; to control exploitation so that the forest increment and not the forest capital is removed; to regenerate cut over areas; to afforest with native or exotic species denuded lands, or those which for protection or other reasons are from a national point of view better under forest than under any other crop.

2. **General Account of Forests and Timbers.**—Compared with Australia's land area of approximately three million square miles, the area of forest land capable of producing commercial timber has always been very small, occupying in the main the wetter belts of the coastal areas and the near coastal highlands. In the early days of settlement the forests, however, appeared to the small population to be practically inexhaustible. In those early days timbers were exploited chiefly on account of their accessibility, ease of working and general utility regardless of their intrinsic merits, and so it was that what are now regarded as superlative furniture and cabinet timbers were often put to quite inferior

* A specially contributed article dealing with Forestry in Australia appeared as part of this chapter in *Official Year Book No. 19* (see pp. 701-12 therein). 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 1947, "Timbers and Forest Products of Queensland" by E. H. S. Swain, published in 1928 and "Australian Standard Nomenclature of Australian Timbers" published by the Standards Association of Australia.

uses. Clearing of forest land by axe and fire stick to make room for crops and pastures has bitten deeply into the original forest estate which has been further degraded by recurrent forest fires. In retrospect, the damage and waste of the past is appalling, but it marked a phase of forest and timber loss which has been paralleled in the vigorous pioneering activity of the early history of many countries.

Predominantly the forests of Australia consist of relatively coarse bluish green foliated evergreen hardwoods. The characteristic genus is *Eucalyptus*, embracing five to six hundred species, which with few exceptions are endemic to Australia. The genus includes such species as the white mountain ash (*E. regnans*) of Victoria and Tasmania, and karri (*E. diversicolor*) of Western Australia, both of which for height and grandeur have few equals in the world. At the other end of the scale of size of species of this genus are dwarf types, including the small multiple stemmed species collectively known as the "mallees", which thrive in some of the drier belts. Probably not more than 80 to 90 of the eucalypts are used for sawmilling in Australia and, for one reason or another, not more than 30 to 40 are extensively exploited.

Among these outstanding eucalypts are—

- Blackbutt (*E. pilularis*) of New South Wales and Queensland ;
- Tallowwood (*E. microcorys*) of New South Wales and Queensland ;
- Spotted Gum (*E. maculata*) of New South Wales and Queensland ;
- Ironbarks (*E. spp.*) of New South Wales, Victoria and Queensland ;
- Alpine Ash (*E. gigantea*) of New South Wales, Victoria and Tasmania ;
- Redgum (*E. camaldulensis*) of New South Wales, Victoria and South Australia ;
- Mountain Ash (*E. regnans*) of Victoria and Tasmania ;
- Messmate, Stringybark or Tasmanian Oak (*E. Obliqua*) of New South Wales, Victoria and Tasmania ;
- Jarrah (*E. marginata*) of Western Australia ;
- Karri (*E. diversicolor*) of Western Australia.

The range and properties of eucalypt timbers are very great indeed. They fulfil all Australia's requirements where strength and durability are required, for example in such uses as railway sleepers, poles, piles, beams, girders, telegraph crossarms, waggon scantlings, posts, house blocks, wheelwright timber as well as for fuel, etc. In large measure they also meet general building requirements and, to a lesser extent perhaps, export packaging requirements. In recent years certain of the eucalypts have been extensively pulped for paper-making and, less widely, for the manufacture of hardboard.

A large number of other genera represented in the Australian forest flora also produce commercial hardwoods. Among the outstanding furniture cabinet and veneer timbers 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 palmerstoni*), blackwood (*Acacia melanoxylon*), rose mahogany (*Dysoxylum fraserianum*), etc. Turpentine (*Syncarpia laurifolia*) ranks with the world's best as a harbour piling timber and swamp box (*Tristania suaveolens*) is almost as good. Coachwood (*Ceratopetalum apetalum*) came into prominence for rifle furniture and for aircraft ply during the last war. The foregoing are but a few examples indicating the range of use of the timbers of the Australian hardwood forests.

Indigenous softwood resources have never been large and are now seriously depleted. A remnant only remains of the forests of hoop pine (*Araucaria cunninghamii*), bunya pine (*Araucaria bidwilli*) of New South Wales and Queensland, kauri (*Agathis spp.*) of Queensland, and huon pine (*Dacrydium franklinii*), celerytop pine (*Phyllocladus rhomboidalis*) and King William pine (*Athrotaxis selaginoides*) of Tasmania.

There are still considerable areas of the slow-growing but useful white ant resisting cypress (*Callitris spp.*) in the forests of the inland areas of Queensland, New South Wales and Victoria, but many of them are being overcut and in some localities regeneration of the forests presents difficulties.

The savannah forests of the interior yield minor products such as sandalwood and tan barks, and the leaves of some of the mallees are used for oil distillation.

3. **Extent of Forests.**—According to data submitted by State Forestry authorities for the Empire Forestry Conference in 1947, the total area of forest is 119,402 square miles, or about 4 per cent. of the total land area of Australia. This forest area is distributed between the different States as follows :—

	Square miles.
New South Wales and Australian Capital Territory ..	19,364
Victoria	27,025
Queensland	27,050
South Australia	(a) 5,909
Western Australia	27,154
Tasmania	12,900
Total	119,402

(a) Excludes 4,600 square miles of mallee containing firewood only.

The South Australian authorities especially emphasize that, after excluding the mallee firewood areas, the percentage of the remaining forest comparable with even mediocre forest land in other States is so small as to be almost negligible. Apart from this specific case it seems clear that there is considerable variation in the standards adopted for the definition of forest land. Also it should be emphasized that the figures given are stated to be rough estimates only. Furthermore, it is generally agreed that the figures for forest areas given are often far in excess of those which are both suitable for reservation and likely to be maintained for timber production. Considering these facts the percentage of Australia carrying commercial forests is very low. On the other hand it should be noted that approximately 68 per cent. of the area of the continent is practically uninhabited and carries less than one person in every eight square miles.

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

CLASSIFICATION OF FOREST AREA : AUSTRALIA.

(Square miles.)

Class of Forest.	State Forest.	Communal Forest.	Private Forest.	Total.	
				Area.	Percentage of Total Forest Area.
Exploitable—					%
Softwood	3,858	16	1,832	5,706	4.8
Mixed wood	1,033	..	94	1,127	0.9
Hardwood	32,016	780	13,146	45,942	38.4
Total	36,907	796	15,072	52,775	44.1
Potentially Exploitable—					
Softwood	200	..	278	478	0.4
Mixed wood	100	..	..	100	0.1
Hardwood	16,853	141	7,848	24,842	20.9
Total	17,153	141	8,126	25,420	21.4
Other Land Classified as Forest	34,798	..	6,409	41,207	34.5
Grand Total	88,858	937	29,607	119,402	..
Percentage of Total Forest Area	74.3	0.8	24.9	..	100.0

The bulk of the softwood forest areas of approximately 4,000 square miles are in Queensland and New South Wales. The softwood forest areas given for these States represent natural forest, a large proportion of which consists of slow-growing native cypress (*Callitris spp.*) in low rainfall areas, and the per acre volume of which is comparatively low.

4. **Forest Reservations.**—The rate at which the original forest estate was being diminished had exercised the minds of far-sighted individuals as long ago as the eighties of last century and it was about that time that the first large forest reservations were made. Over the years recognition that forest reservations were inadequate became more general. It was not, however, until an Interstate Forestry Conference was held at Hobart in 1920 that a specific target to be aimed at was mentioned. The figure then agreed upon was an area of 24½ million acres of indigenous forest, which it was considered should be permanently reserved to meet the future requirements of Australia.

The forest reservations in Australia at 30th June, 1948 totalled 26,403,762 acres of which 19,437,384 acres are described as Dedicated State Forests and 6,966,378 acres as Timber and Fuel Reserves. The distribution of these areas is shown by States in § 4. 2 hereafter.

In general the timber and fuel reserves are temporary only 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: a good proportion 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 of which our needs have to be largely met by softwood timber imported 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 estimate 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 per capita consumption of different classes of timber, and the future population. It would appear, 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, if provisional, estimate of forest resources.

5. **Plantations.**—The inadequacy of indigenous softwood supplies has been referred to. This fact has long been recognized by the various forest authorities and considerable progress has been made in experimental planting of exotic conifers and also some substantial progress made in the establishment of commercial plantations. 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 and it now has the largest plantation area. For some years South Australia has been exploiting considerable quantities of timber from its plantations and these quantities will increase very substantially during the next decade.

According to statements provided by State authorities, the total effective area of plantations in Australia as at the 30th June, 1948 was 265,356 acres. Details by States are given under § 4. 3.

§ 2. Forestry Activities of the Commonwealth.

1. **General.**—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 a substantial forest resource. 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. **Commonwealth Forestry Bureau.**—In 1925 the Commonwealth Forestry Bureau was instituted and the Commonwealth Forestry Adviser became the Inspector-General of Forests. At this stage it was considered that the most useful contribution that the Commonwealth could make to Australian forestry was: (a) to provide better facilities than then existed for the higher training in forestry for recruits to the professional ranks of the State services and for forestry research workers; and (b) to initiate research into problems connected with silviculture, forest management and forest protection, which fundamentally were common to most, if not all of the States.

By deciding to build, equip and staff the Australian Forestry School on its own Territory the Commonwealth Government ended a long standing controversy as to the site of a National School which successive Interstate Forestry Conferences had unanimously resolved was necessary. All States sent students to the Australian Forestry School when its career commenced in Adelaide in 1926, pending completion of the school in Canberra in the following year. At this time also a nucleus of selected and qualified officers was sent abroad to undergo special courses of instruction and to obtain experience for the purpose of staffing the research side of the Bureau, which received statutory powers by an Act passed in 1930. These powers and functions, subject to the regulations and the direction of the Minister, were as follows:—(a) advising the Administrations of the Territories on all matters pertaining to the management of forests; (b) the management of forests placed under its control by the Governor-General; (c) the establishment of experimental stations for the study of silviculture, forest management and forest protection; (d) the provision of educational facilities for the training of professional foresters; (e) the establishment and awarding of forestry scholarships; (f) the collection and distribution of forestry information; (g) the publication of reports and bulletins dealing with forestry; and (h) such other functions as are prescribed.

3. **Wartime Control of Timber.**—Because of its importance to the war effort of Australia, the supply of timber immediately on the outbreak of war in 1939 came under the control of the Commonwealth Department of Munitions. With the increasing importance of timber as a raw material in the production of munitions and for defence, a Controller of Timber was appointed in April, 1941 to plan and co-ordinate the supply of timber. Under an order of 8th October, 1941, the Controller of Timber was given power to prohibit the cutting of timber, to determine the priority of orders and to collect returns from persons dealing with timber.

On 23rd March, 1942, these powers were extended by the National Security (Timber Control) Regulations to cover all phases in the production, treatment and use of timber. From time to time orders were issued restricting the use of certain timbers.

4. **Forestry and Timber Bureau.**—(i) *General.* At the end of the war the war-time organization of Commonwealth Timber Control lapsed and the direction of timber supplies within the boundaries of each State became the responsibility of the respective State Governments. The Commonwealth Government decided, however, to continue certain advisory functions previously 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 from Forestry Bureau to Forestry and Timber Bureau, its administration was placed under the charge of a Director-General in lieu of an Inspector-General of Forests, and the powers and functions of the Bureau were extended to embrace

the following :—(a) Collecting statistics and information regarding timber supplies and requirements in Australia, and formulating programmes in respect of the supply, production and distribution of timber in Australia, and the importation into, and exportation from, Australia of timber; (b) advising the Government of the Commonwealth or any instrumentality of that Government, or, when so requested, the Government of any State, or any instrumentality of the Government of any State, or any body or person, on matters relating to the supply, production and distribution of timber in Australia, and the importation into, and exportation from, Australia of timber; and (c) carrying out investigations and research relating to the supply, production, distribution and use of timber. The activities of the Bureau under its statutory functions are summarized below under four main headings.

(ii) *Forestry Education—Australian Forestry School.* The genesis of the Australian Forestry School situated in Canberra in the Australian Capital Territory, which was established by the Commonwealth Government primarily to meet the demand of the States for an institution which would give professional training at least equal to that given by the recognized Forestry Schools abroad, has been referred to in (2) above.

For enrolment at the School a student must possess (a) a satisfactory degree of a University; or (b) a certificate from a University that he has satisfactorily completed the two years' pre-requisite course together with a certificate from an approved Forest Authority that he has satisfactorily carried out a minimum of twelve weeks' practical forest work.

Students may enter the School (a) as nominees of a State or Commonwealth Forestry Service, (b) by the award of a scholarship issued by the Commonwealth Government, (c) as assisted students under the Commonwealth Rehabilitation Scheme for ex-servicemen, or (d) as "free lance" students meeting the prescribed school fees themselves.

Ten Forestry Scholarships are made available each year by the Commonwealth Government for award to selected students. The scholarships are tenable at an Australian University for the whole or part of the pre-requisite two years' course leading to the diploma course at the Australian Forestry School and/or the diploma course at the School. The scholarships are valued at £150 per annum for the first two years while attending a University and £175 per annum during the two years at the Australian Forestry School.

A Board of Higher Forestry Education was established in 1944 under the Forestry Bureau Act 1944. Membership of the Board comprises the Director-General of the Bureau and one representative of each of the State Forest Services and Universities respectively. The powers and functions of the Board are generally to advise regarding the maintenance of the standard of the diploma course of the Australian Forestry School and matters associated therewith including the staff required for lecturing and instructional purposes, and regarding the pre-requisite University courses leading to the diploma course of the School.

Students who have passed the approved two-year preliminary science course at the Universities of Adelaide, Melbourne, Western Australia, Queensland, Sydney or Tasmania 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.

For various reasons the number of students attending the School each year almost since its inception has been well below the number which events have since shown were necessary to meet the demand for trained personnel. This position was naturally aggravated during the six years of war, while demands for timber and the need for expansion in all phases of forest developmental work, better protection, transport and more intensive management, have accentuated the shortage of trained staffs. The attendance at the Australian Forestry School has consequently increased substantially to nearly 50 students during 1948. It is anticipated that during the next few years the annual attendance at the School will be between 70 and 80 students. In order to meet the future requirements of professional foresters in Australia, it has been estimated that the annual attendance at the School for some years to come should be at least 40 to 50 students.

(iii) *Silvicultural Research.* Although a considerable amount of research work had been carried out by the Forest Services of the States, it was recognized that there existed a wide field of research in problems of the living tree and the forest crop which could be most usefully undertaken by the Commonwealth.

The Bureau was accordingly charged with the responsibility of initiating research into problems connected with silviculture, forest management and forest protection. However, the financial situation in the years immediately following the constitution of the Bureau delayed development in these activities, but some progress was made by the establishment of a small Central Research Station at Canberra. Experimental forest research stations were also established at Mt. Burr in the South-east of South Australia and in Tasmania on a co-operative basis with the Forest Services of those States.

The impact of the 1939-45 War further retarded progress and resulted in the temporary closure of the Tasmanian station which had been established at Launceston.

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 envisaged over the next few years as suitable trained staff becomes available.

The activities of the Central Research Station will be expanded and in addition to the re-opening of the Experimental Forest Research Station at Launceston, it is proposed to extend the field of this class of work by the establishment of further Research Stations in other States and Papua-New Guinea, in co-operation with the respective Forest Services.

(iv) *Timber Supply.* The value of reliable statistical data covering availability of timber and timber requirements was so forcibly demonstrated during the recent 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, necessitated 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 housing and other constructional projects; (b) the quantity of timber that should be imported to assist in meeting such requirements; (c) the extent to which exports of timber and related products might be allowed without detriment to local needs in order to maintain overseas markets; and (d) distribution of timber within Australia from those States having surplus production to those with insufficient production.

A commencement has been made on investigations into timber requirements of the many industries dependent on timber, and it is hoped that this work will be further extended as suitable staff becomes available.

(v) *Research and Investigation regarding Forest Resources.* Production of timber from native grown species has considerably increased since 1939 in order to assist in meeting the heavy demands, firstly for war purposes, and more latterly for building and other constructional projects of the post-war era.

The extent to which the present rate of production can be continued is dependent upon our forest resources. In the national interests it is essential that overcutting of our 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.

5. **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 special section of the Australian Capital Territory Administration under the Department of the Interior. Further information is contained in Chapter X.—The Territories of Australia.
- (b) *Northern Territory.* The forests of the Northern Territory are administered by the Administrator of that Territory under ordinance. The native forests of the Territory are very limited, consisting only of a limited area of rain forest in the North, patches of cypress pine, river fringing forests of paper bark, titree and savannah woodland. A Forestry Officer has recently been appointed to the Territory and efforts are to be made to protect and extend the forests.
- (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-New Guinea.* The forests are under the control of a Forestry Department and administered under ordinance of the Territorial Administration. Forestry in the Territory of Papua-New Guinea commenced with the appointment of two Forestry Officers to the Administration of New Guinea in 1938. However, the invasion of the Territory by the Japanese in 1942 resulted in the loss of all records and quantitative information regarding the forests of the Territory is largely lacking. Further information is contained in Chapter X.—The Territories of Australia.

6. **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 chemistry of wood, tans, etc.

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

§ 3. Forest Congresses.

Reference to the various forestry conferences held in Australia and elsewhere is given in Official Year Book No. 22, page 742. The first British Empire Forestry Conference was held in London in 1920. Subsequent conferences were held in Ottawa in 1923, Australia, 1928 and South Africa, 1935, but the Fifth Conference which was to have been held in India in 1940 was postponed because of the war. The Fifth Conference was eventually held in London in 1947, at which statements were presented on a more uniform basis than formerly by the various forest authorities of the British Commonwealth of Nations. These statements included references to the part played by forestry in the different parts of the Empire in the war effort. Publications issued in connexion with these conferences are available on application to the various State and Commonwealth forestry authorities.

The first session of the Food and Agriculture Organization of the United Nations held at Quebec in 1945 drew attention to the need for statistics on forest resources and the supply of, and demand for, forest products; sound forest policies; sound forest management; afforestation; forest research; forest education; integration of forest industries and avoidance of waste; and forest products research, particularly in the direction of extending utilization to little known woods.

At the second session held at Copenhagen in 1946, the Director-General of the Forestry and Timber Bureau attended the conference as alternate delegate and adviser in forestry matters for the Commonwealth.

§ 4. 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 to control forestry work. The functions of these administrations are as follows:—(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.

In Queensland, forestry is a sub-department of the Department of Public Lands.

Annual reports are issued by each State forest authority; that for Queensland being included with the report issued by the Department of Public Lands.

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

2. **Forest Reservations.**—As mentioned in § 1. 4 *ante*, State forest authorities agreed that, in order to secure Australia's future requirements, an area of 24½ million acres should be permanently reserved. In June, 1948 the area of State forests reserved in perpetuity totalled 19,437,384 acres or 79 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 control 6,966,378 acres recorded as 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.

In the following table details of forest areas as recorded by State Forest Authorities, distinguishing between Dedicated State Forests and Timber and Fuel Reserves, are given for each State as at 30th June, 1948.

AREA OF FOREST RESERVATIONS, 30th JUNE, 1948.
(Acres.)

Particulars.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tasmania.	Total.
Dedicated State Forests ..	5,350,638	4,939,493	3,777,913	(a) 252,320	3,399,799	1,717,221	19,437,384
Timber and Fuel Reserves ..	1,297,660	(b)	3,140,272	..	2,150,302	(c) 378,144	66,966,378
Total ..	6,648,298	4,939,493	6,918,185	252,320	5,550,101	2,095,365	26,403,762

(a) Includes Timber and Fuel Reserves. (b) Not available. (c) Excludes Fuel Reserves.
(d) Incomplete.

3. **Reforestation, Afforestation, etc.**—In the table below details are given of the area of indigenous forest improved or regenerated, the area of forest plantations and the number of persons employed by Forestry Departments for the year 1947-48.

FORESTRY : AREAS, AND NUMBERS EMPLOYED BY FORESTRY DEPARTMENTS,
1947-48.

Particulars.	N.S.W.	Vic.	Q'land.	S. Aust.	W. Aust.	Tas.	Total.
Total area of indigenous forest improved or regenerated .. acres	1,468,741	1,071,691	485,153	9,928	527,357	(a)	3,562,870
Total area of effective plantations—							
Hardwoods acres	665	2,767	3,103	3,862	17,345	(b) 2,727	30,469
Softwoods "	31,268	48,620	35,289	106,553	13,157	..	234,887
Number of persons employed in Forestry Departments—							
Office staff No.	(c) 382	201	159	74	55	69	940
Field staff "	182	354	1,715	549	(d) 361	(e) 301	3,462

(a) Not available. (b) Includes 173 acres of nurseries. (c) Includes Wood Technology staff totalling 34. (d) Includes 257 other employees. (e) Includes 227 other employees.

4. **Revenue and Expenditure.**—The revenue and expenditure of State Forestry Departments for the years 1938-39 and 1943-44 to 1947-48 are shown below.

In New South Wales, Victoria and Tasmania, expenditure has exceeded revenue in each of the years shown. The excess of income over expenditure recorded annually since 1941-42 in South Australia indicates the successful development of the afforestation policy adopted in a State which is less endowed in natural forest resources than any of the other States. In Queensland, where surpluses were recorded previously, deficits occurred in 1946-47 and 1947-48, whilst in Western Australia in each of those years, the income received was greater than the amount expended.

STATE FORESTRY DEPARTMENTS : REVENUE AND EXPENDITURE.

(£.)

State.	1938-39.	1943-44.	1944-45.	1945-46.	1946-47.	1947-48.
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REVENUE.

New South Wales ..	224,266	530,£20	572,316	525,594	582,737	758,182
Victoria ..	198,157	838,729	817,036	883,376	641,405	594,923
Queensland..	764,557	1,094,325	1,155,425	914,824	988,910	1,006,797
South Australia ..	101,312	319,300	336,934	359,861	399,208	465,012
Western Australia ..	145,724	227,350	265,034	244,408	302,789	300,199
Tasmania ..	32,765	48,524	55,043	57,417	70,570	81,574
Total ..	1,466,781	3,059,048	3,201,788	2,985,480	2,985,619	3,206,687

EXPENDITURE.

New South Wales ..	250,355	598,969	590,280	595,400	958,765	1,255,602
Victoria ..	406,175	1,306,750	1,416,800	1,310,882	2,034,714	1,756,462
Queensland..	764,545	845,572	857,368	904,860	1,160,882	1,303,869
South Australia ..	182,633	308,372	312,181	324,198	369,024	442,660
Western Australia (b)	164,943	262,000	286,813	262,342	203,658	245,583
Tasmania ..	71,437	59,062	66,975	135,000	236,000	239,424
Total ..	1,840,088	3,380,725	3,530,417	3,532,682	4,963,043	5,243,600

(a) Includes expenditure from Relief Works, £167,611. (b) Includes expenditure from General Loan and Trust Funds, 1938-39, £136,254; 1943-44, £124,894; 1944-45, £115,423; 1945-46, £111,317; 1946-47, £119,602; 1947-48, £168,311.

§ 5. Forestry Production.

1. **Timber.** Particulars of logs treated and the production of rough sawn timber by sawmills and other woodworking establishments are shown by States in the following table for the year 1947-48. The information published in the corresponding table of issues prior to No. 37 was restricted to establishments classified as Forest Sawmills. In order not to omit the output of other mills not included under this classification, the table has been amended to include all mills as described above.

OUTPUT OF NATIVE TIMBER : ALL MILLS, 1947-48.
('000 sup. feet.)

Particulars.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	Total.
LOGS TREATED, INCLUDING THOSE SAWN ON COMMISSION.(a)							
Hardwood ..	369,458	382,325	169,131	8,586	304,231	202,923	1,436,654
Softwood.. ..	129,929	22,884	193,510	66,866	5,782	6,841	425,812
Total ..	499,387	405,209	362,641	75,452	310,013	209,764	1,862,466
SAWN TIMBER PRODUCED FROM LOGS ABOVE.(b)							
Hardwood ..	248,616	246,183	108,559	6,222	129,158	105,755	844,493
Softwood.. ..	83,975	14,319	126,655	41,478	2,439	3,954	272,820
Total ..	332,591	260,502	235,214	47,700	131,597	109,709	1,117,313

(a) Includes logs used for plywood and veneer production. (b) 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 1943-44 to 1947-48.

OUTPUT OF NATIVE TIMBER : ALL MILLS, AUSTRALIA.

Particulars.	Unit.	1938-39.	1943-44.	1944-45.	1945-46.	1946-47.	1947-48.
Logs used—							
Hardwood ..	'000 super. feet (hoppus measure)	1,015,136	1,086,595	1,043,744	1,140,719	1,333,098	1,436,654
Softwoods ..	" "	293,680	393,900	374,111	369,360	409,242	425,812
Total ..	" "	1,308,816	1,480,495	1,417,855	1,510,079	1,742,340	1,862,466
Sawn Timber Produced—							
Sawn equivalent of Timber Peeled or Sliced for Plywood and Veneers—							
Hardwood ..	'000 super feet	(a)	2,201	2,015	2,670	2,924	2,981
Softwood ..	"	21,639	18,389	18,051	18,968	24,362	27,629
Total ..	"	21,639	20,590	20,066	21,638	27,286	30,610
Used for other purposes—							
Hardwood ..	"	} 695,376	599,242	593,329	643,815	777,113	841,512
Softwood ..	"		246,436	228,559	224,517	242,683	245,191
Total ..	"	695,376	845,678	821,888	868,332	1,019,796	1,086,703
Total Sawn Timber—							
Hardwood ..	"	526,229	601,443	595,344	646,485	780,037	844,493
Softwood ..	"	190,786	264,825	246,610	243,485	267,045	272,820
Total ..	"	717,015	866,268	841,954	889,970	1,047,082	1,117,313

(a) Not available for publication ; included with softwoods.

The next table shows the sawn output of native timber in sawmills and other wood-working establishments in each State for the years 1938-39 and 1943-44 to 1947-48.

SAWN OUTPUT (a) OF NATIVE TIMBER : ALL MILLS.

('000 sup. feet.)

State.	1938-39.	1943-44.	1944-45.	1945-46.	1946-47.	1947-48.
New South Wales ..	179,350	259,035	245,975	252 108	300,945	332,591
Victoria ..	120,197	176,464	173,619	212,611	253,266	260,502
Queensland ..	193,250	204,201	194,138	189,912	219,745	235,214
South Australia ..	14,537	35,684	38,418	37,113	46,479	47,700
Western Australia ..	125,453	109,987	106,029	107,647	124,198	131,597
Tasmania ..	84,228	80,897	83,775	90,579	102,449	109,709
Total ..	717,015	866,268	841,954	889,970	1,047,082	1,117,313

(a) Includes the sawn equivalent of timber peeled or sliced for plywood and veneers.

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 five years shown in the preceding table were as follows:—1938-39, 35,862,540 sup. feet.; 1943-44, 11,698,704 sup. feet.; 1944-45, 10,216,392 sup. feet.; 1945-46, 10,348,458 sup. feet.; 1946-47, 15,604,008 sup. feet.; and 1947-48, 17,210,844 sup. feet. The annual reports of the Forest Departments of the States contain particulars of the output of timber from areas under departmental control, but owing to lack of uniformity in classification 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. Paper and Wood Pulp.—(i) *Tasmania*. The manufacture of paper from Australian-grown timber has been established in three States. In Tasmania two large mills are making paper from indigenous hardwoods. The first of these started production of paper from imported pulp at Burnie in August, 1938, and so continued until the pulp mill, using local hardwood, came into operation a few months later. At this mill, pulp is produced by the soda process and the caustic soda necessary for cooking the wood and chlorine for bleaching the pulp are produced by a separate plant located alongside the mill. Two paper-machines are operated. The larger machine has the capacity to produce paper 180 inches wide at 800 feet per minute, while the smaller machine is capable of producing paper 90 inches wide at about 400 feet per minute. The paper produced covers a wide range of high class printing, writing, drawing, duplicating and blotting papers. At Boyer on the Derwent River, near Hobart, production of newsprint commenced in February, 1941. The newsprint is manufactured from locally ground wood pulp to which is added a small proportion of sulphite pulp imported from Canada. The paper-making machine installed is capable of making paper 161 inches wide at the rate of 1,200 feet per minute, and when running at full capacity can produce about 540 tons of newsprint per week. At both these mills logs are taken from the forests by means of tractors and transported to the mills by rail. Power is supplied by the Tasmanian Hydro-electric Commission and hardwood not suitable for pulping is used as fuel. During 1948-49, 57,869 cords of pulp wood and 43,734 cords of firewood were delivered to these mills.

(ii) *Victoria.* In Victoria the production of wood pulp for paper-making commenced in January, 1937, with a pilot plant having the capacity of about 3,000 tons of air-dried pulp per annum. In October, 1939 the main plant at Maryvale, with a capacity of 27,000 tons of pulp per annum, commenced operations. Associated with the pulp mill is a paper-making plant capable of producing about 20,000 tons of kraft paper per annum. The timber used at this mill consists mainly of hardwoods at present unsuitable for other purposes. In addition, a small quantity of pine, mainly thinnings, mill waste and special softwood for production of cellulose is used. During 1947-48 the wood taken from Crown Lands for the production of wood pulp and cellulose amounted to 2,930,061 cubic feet of which 2,860,295 cubic feet were hardwoods and 69,766 cubic feet were radiata pine.

(iii) *South Australia.* In South Australia a pulp and paper board mill commenced operations during 1941-42 near Millicent. When completed and in full production the mill will use considerable quantities of softwoods from the Mount Burr and Penola pine plantations. During 1947-48, 16,242,000 super. feet of pulp wood were produced.

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 in all States, and much greater use has been made of local-grown timbers, both hard 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 and veneers for each of the years 1938-39 and 1943-44 to 1947-48.

PLYWOOD AND VENEER PRODUCED.

State.	1938-39.	1943-44.	1944-45.	1945-46.	1946-47.	1947-48.
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PLYWOOD ('000 SQ. FT., $\frac{3}{16}$ IN. BASIS).

New South Wales ..	24,194	12,999	15,844	19,545	22,323	23,726
Queensland ..	66,100	69,290	70,527	73,581	87,180	99,823
Other States ..	14,511	12,530	14,709	10,731	13,770	15,528
Total ..	104,805	94,619	101,080	103,857	123,273	139,077

VENEERS ('000 SQ. FT., $\frac{1}{16}$ IN. BASIS.)

New South Wales ..	18,993	14,880	10,747	12,431	17,700	48,571
Queensland ..	12,375	15,590	5,487	19,612	27,276	15,477
Other States ..	440	15,056	1,554	2,590	21,752	14,202
Total ..	31,808	45,566	17,788	34,633	66,728	78,250

(ii) *Charcoal*. With the availability of additional petrol supplies towards the end of the 1939-45 War, the production of charcoal, which previously had a wide use as a substitute fuel during the war years, was considerably reduced and is now little higher than normal.

(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 production and consumption of eucalyptus oil is not available, but considerable quantities are manufactured, particularly in Victoria. The value of oversea exports of eucalyptus oil distilled in Australia amounted in 1938-39 to £86,714; in 1943-44 to £124,148; in 1944-45 to £136,297; in 1945-46 to £201,948; in 1946-47 to £408,451; in 1947-48 to £323,800; and in 1948-49 to £138,304. The quantities exported in the years 1946-47 to 1948-49 were 1,680,461 lb., 1,481,318 lb. and 765,195 lb. respectively. The bulk of the product is shipped to the United Kingdom and the United States of America, Victoria being the principal exporting State. Large quantities of the crude oil are used locally in flotation processes in connexion with the recovery of gold and other minerals.

(iv) *Sandalwood and Sandalwood Oil*. Most of the sandalwood is produced in Western Australia where considerable quantities are gathered each year for export to Asiatic countries. Small quantities are also produced in South Australia, Queensland and New South Wales. Details of exports of sandalwood are shown in paragraph 3 (ii), § 6. Oil distilled from Western Australian sandalwood has a medicinal value and is used extensively in the manufacture of perfumes. Quantities of this oil are exported annually to the eastern States of Australia and oversea countries, principally the United Kingdom. Oversea exports of Australian sandalwood oil amounted in 1938-39 to £13,964; in 1944-45 to £11,390; in 1945-46 to £19,560; in 1946-47 to £59,145; and in 1947-48 to £38,327.

(v) *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 production in South Australia during 1947-48 amounted to 1,120 tons, whilst the exports from Australia amounted to 798 tons valued at £12,314.

(vi) *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 are found in the barks 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*).

Up to 1913 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 ended 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. From 1927-28 to 1938-39 exports exceeded imports in every year except 1936-37, but since 1939-40 there has been a considerable excess of imports. The chief exporting States are Western Australia, South Australia and Tasmania. This matter is referred to in tables appearing in § 6 following. 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 work done by the Council for Scientific and Industrial Research in connexion with tanning materials is given in Official Year Book No. 22, p. 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 marri (*Eucalyptis calophylla*) bark is not yet complete. The production of tan bark in Australia approximated 25,000 tons per annum in the years prior to 1939. Since then production has declined and in 1945-46 reached the level of about 8,800 tons recovering to about 11,000 tons in 1946-47 and 1947-48. However, this diminution is offset by the increased use of vegetable tanning extract which rose from 3,686 tons in 1938-39 to 11,792 tons in 1947-48.

4. Value of Production—Gross and Net.—(i) *General.* The values of forestry production on a gross, local and net basis are shown in the following table for the years 1946-47 and 1947-48.

GROSS, LOCAL AND NET VALUE OF FORESTRY PRODUCTION.

(£.)

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)
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1946-47.

New South Wales ..	4,650,000	142,000	4,508,000	..	4,508,000
Victoria ..	3,840,530	390,427	3,450,103	504,209	2,945,894
Queensland..	3,547,000	510,000	3,037,000	..	3,037,000
South Australia ..	1,486,022	103,409	1,382,613	..	1,382,613
Western Australia	1,652,657	156,659	1,495,998	..	1,495,998
Tasmania ..	1,580,670	253,590	1,327,080	..	1,327,080
Total ..	16,756,879	1,556,085	15,200,794	504,209	14,696,585

1947-48.

New South Wales ..	5,928,000	187,000	5,741,000	..	5,741,000
Victoria ..	4,523,451	500,000	4,023,451	530,000	3,493,451
Queensland..	3,964,000	570,000	3,394,000	..	3,394,000
South Australia ..	1,802,185	101,912	1,700,273	..	1,700,273
Western Australia	1,824,300	218,913	1,605,387	..	1,605,387
Tasmania ..	1,977,180	143,730	1,833,450	..	1,833,450
Total ..	20,019,116	1,721,555	18,297,561	530,000	17,767,561

(a) No deduction has been made for depreciation and maintenance.

(ii) *States, 1938-39 to 1947-48.* In the following table the net value of forestry production and the net value per head of population are given by States for the years 1938-39 to 1947-48.

NET VALUE OF FORESTRY PRODUCTION.

Year.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tas.	Total.
NET VALUE.(a) (£.)							
1938-39 ..	2,261,000	1,067,732	2,362,000	542,465	1,147,335	399,500	7,780,032
1939-40 ..	2,347,000	1,108,864	2,531,000	605,419	1,087,734	452,520	8,132,537
1940-41 ..	2,576,000	1,355,402	2,734,000	693,162	1,322,138	516,000	9,196,702
1941-42 ..	3,159,000	1,594,643	2,423,000	879,332	1,272,606	722,100	10,080,681
1942-43 ..	3,155,000	1,858,326	2,328,000	1,011,491	1,422,782	813,940	10,589,539
1943-44 ..	3,285,000	1,952,278	2,822,000	1,028,671	1,372,336	764,010	11,224,295
1944-45 ..	3,321,000	2,171,841	2,516,000	1,069,188	1,364,960	816,230	11,259,219
1945-46 ..	3,745,000	2,411,229	2,502,000	1,170,398	1,458,773	973,100	12,260,500
1946-47 ..	4,508,000	2,945,894	3,037,000	1,382,613	1,495,998	1,327,080	14,696,585
1947-48 ..	5,741,000	3,493,451	3,394,000	1,700,273	1,605,387	1,833,450	17,767,561

NET VALUE PER HEAD OF MEAN POPULATION. (£ s. d.)

1938-39 ..	0 16 6	0 11 5	2 6 10	0 18 3	2 9 2	1 16 2	1 2 6
1939-40 ..	0 17 0	0 11 9	2 9 7	1 0 3	2 6 1	2 3 4	1 3 5
1940-41 ..	0 18 6	0 14 2	2 13 0	1 3 2	2 15 9	2 12 0	1 6 4
1941-42 ..	1 2 5	0 16 4	2 6 9	1 9 0	2 13 7	3 11 6	1 8 6
1942-43 ..	1 2 2	0 18 11	2 4 9	1 13 2	2 19 8	4 3 11	1 10 0
1943-44 ..	1 3 5	0 19 8	2 13 6	1 13 5	2 17 4	4 4 2	1 11 7
1944-45 ..	1 2 11	1 1 3	2 7 1	1 14 4	2 16 4	4 8 1	1 11 5
1945-46 ..	1 5 6	1 3 11	2 6 2	1 17 1	2 19 6	4 19 10	1 14 9
1946-47 ..	1 10 5	1 8 11	2 15 4	2 3 2	3 0 2	5 4 3	1 19 1
1947-48 ..	1 18 2	1 13 9	3 1 0	2 12 1	3 3 1	7 0 1	2 6 6

(a) No deduction has been made for depreciation and maintenance.

5. *Employment.*—(i) *Forestry Operations.* The estimated number of persons engaged in forestry operations as at June, 1948 is shown in the following table. These estimates, which have been based upon pay-roll tax and other data, include working proprietors but exclude those engaged in the sawmilling industry whose particulars are given in the next table.

ESTIMATED NUMBERS ENGAGED IN FORESTRY, JUNE, 1948.

(Excluding Sawmilling Industry).

Sex.	N.S.W. (a)	Victoria.	Q'land.	S. Aust. (b)	W. Aust.	Tasmania.	Total.
Males ..	9,011	7,027	5,684	1,373	1,640	1,965	26,700
Females ..	13	14	5	16	10	4	62
Total ..	9,024	7,041	5,689	1,389	1,650	1,969	26,762

(a) Includes Australian Capital Territory.

(b) Includes Northern Territory.

(ii) *Milling Operations.* Details of the number engaged, including working proprietors, in the milling operations of sawmills are given in the next table. Further details regarding the operations of these mills are given in Chapter XXIV.—“Manufacturing Industry”.

SAWMILLS : NUMBER ENGAGED, 1947-48.

Sex.	N.S.W.	Victoria.	Q'land.	S. Aust.	W. Aust.	Tasmania.	Total. (a)
Males	7,893	5,346	5,604	1,533	2,549	1,983	24,908
Females	269	94	168	98	20	23	672
Total	8,162	5,440	5,772	1,631	2,569	2,006	25,580

(a) Excludes Northern Territory and Australian Capital Territory.

§ 6. Oversea Trade.

1. Imports.—(i) *Dressed Timber*. The quantities and values of timber imported into Australia during the years 1938-39 and 1945-46 to 1947-48 inclusive are shown in the following table according to countries of origin :—

DRESSED TIMBER : IMPORTS INTO AUSTRALIA.

Country of Origin.	Quantity ('000 sup. feet.)				Value (£).			
	1938-39.	1945-46.	1946-47.	1947-48.	1938-39.	1945-46.	1946-47.	1947-48.
United Kingdom ..	1	..	..	2	44	1	..	425
Canada	8,927	7,950	2,038	3,297	90,833	197,688	65,604	137,916
New Zealand .. ..	..	555	313	10	..	23,516	14,589	367
Other British Countries ..	3	..	1	145	21	..	..	5,746
Norway	4,209	..	43	2,094	43,297	..	1,106	90,924
Sweden	1,978	..	1,534	5,075	24,290	..	55,562	220,817
U.S. of America ..	2,242	2,179	1,153	2,245	22,029	74,349	61,253	122,060
Other Foreign Countries ..	418	..	..	103	6,163	..	..	4,057
Total	17,778	10,684	5,082	12,971	186,677	295,554	198,114	582,312

The figures in the table above exclude items such as architraves, veneers, plywood, staves, 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 £119,271 in 1947-48.

The bulk of the imports of dressed timber comes from Canada, New Zealand, Norway, Sweden and the United States of America. Practically the whole of this timber consists of softwoods used for lining, weatherboards, flooring, shelving, doors, etc.

(ii) *Undressed Timber*. Australian imports of undressed timber for the years 1938-39 and 1945-46 to 1947-48 are shown hereunder :—

UNDRESSED TIMBER (a) : IMPORTS INTO AUSTRALIA.

Country of Origin.	Quantity ('000 sup. ft.)				Value (£).			
	1938-39.	1945-46.	1946-47.	1947-48.	1938-39.	1945-46.	1946-47.	1947-48.
United Kingdom ..	115	209	199	103	9,984	11,410	16,397	24,014
Canada	296,948	70,171	87,853	48,148	1,115,562	806,425	2,311,521	1,423,466
Malaya (British) ..	165	..	41	312	1,264	..	1,595	6,311
New Zealand	11,193	5,037	7,199	13,956	157,967	98,544	123,772	342,614
Other British Countries ..	10,840	1,097	3,269	10,422	68,387	2,714	68,170	206,274
Japan	374	..	..	..	7,681	..	..	..
Netherlands East Indies ..	20	..	..	257	118	..	..	1,584
New Caledonia	1,671	..	..	6	5,796	17	..	55
Philippine Islands ..	6,879	3	..	2	66,371	35	..	34
Sweden	4,654	..	1,014	3,168	36,946	..	33,189	98,530
United States of America ..	12,245	26,814	22,348	57,735	191,221	432,476	477,264	1,453,164
Other Foreign Countries ..	2,994	81	3	296	27,027	6,372	2,149	29,106
Total	348,098	103,412	121,926	134,405	1,688,324	1,357,993	3,034,057	3,585,152

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

By far the larger proportion of the undressed timber imports consists of softwood such as oregon, redwood, hemlock, western red cedar and yellow pine from Canada and the United States of America; kauri, rimu and white pine from New Zealand and other softwoods from Sweden. Amongst the hardwoods imported are mahogany from the United States of America, teak from Burma and other hardwoods from the Pacific Islands.

2. Exports.—(i) *Undressed Timber (excluding Railway Sleepers)*. The quantity and value of undressed timber, exclusive of railway sleepers, exported during the years 1938-39 and 1945-46 to 1947-48 are shown below, together with the countries of destination.

UNDRESSED TIMBER (EXCLUDING RAILWAY SLEEPERS) (a) : EXPORTS FROM AUSTRALIA.

Country to which Exported.	Quantity ('000 sup. ft.).				Value (£).			
	1938-39.	1945-46	1946-47.	1947-48.	1938-39.	1945-46.	1946-47.	1947-48.
United Kingdom ..	11,750	4,287	6,372	8,247	137,927	130,841	198,559	296,810
Canada ..	223	336	296	382	4,723	9,541	10,066	14,531
Hong Kong ..	98	214	467	163	1,058	6,974	15,971	17,105
Mauritius ..	354	99	371	275	4,520	2,609	10,148	6,922
New Zealand ..	17,145	5,384	7,142	8,561	245,194	139,259	186,146	267,089
Pacific Islands ..	1,637	541	1,550	327	29,471	56,792	40,042	9,999
Union of South Africa ..	7,164	1,393	1,951	3,807	86,668	36,056	55,387	117,030
Other British Countries ..	643	275	503	1,022	6,862	29,217	12,912	54,179
Belgium ..	1,286	..	352	217	19,347	..	12,957	9,160
United States of America ..	867	56	390	409	26,506	1,947	14,409	18,500
Other Foreign Countries ..	2,630	86	202	403	32,470	2,555	3,346	19,047
Australian Produce ..	43,797	12,671	19,596	23,813	588,746	415,791	559,643	830,972
Other Produce ..	541	27	583	564	6,079	951	10,756	43,063
Total ..	44,338	12,698	20,179	24,377	594,825	416,742	570,399	874,035

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

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

(ii) *Railway Sleepers*. Particulars of the quantities and values of railway sleepers expored, which are excluded from the previous table relating to undressed timber, are shown below.

RAILWAY SLEEPERS : EXPORTS FROM AUSTRALIA.

Country to which Exported.	Quantity ('000 sup. ft.).				Value (£).			
	1938-39.	1945-46.	1946-47.	1947-48.	1938-39.	1945-46.	1946-47.	1947-48.
United Kingdom ..	1,438	497	194	739	14,467	14,034	4,683	29,956
Ceylon ..	5,334	540	..	2,705	53,339	12,902	..	109,366
Hong Kong ..	..	43	29	..	..	934	544	..
Mauritius ..	563	..	645	..	6,216	..	17,876	..
New Zealand ..	16,896	6,791	4,231	12,545	165,303	117,325	76,642	263,691
Pacific Islands (British) ..	201	138	180	341	2,341	2,440	3,160	7,808
Union of South Africa ..	4,941	841	614	873	49,412	23,975	16,725	37,352
Other British Countries ..	..	135	2,104	2,100	..	2,749	95,162	98,112
Egypt ..	4,798	..	..	..	41,986	..	..	..
Iran (Persia) ..	271	..	..	..	2,707	..	..	..
Iraq ..	165	..	..	..	1,696	..	..	..
Other Foreign Countries ..	29	98	342	42	291	1,096	5,606	787
Total ..	34,036	9,083	8,339	19,505	337,758	175,455	220,398	547,072
Number of Sleepers '000	1,268	363	332	773	..	..	..	..

3. **Classification of Imports and Exports.**—(i) *General.* The quantities and values of timber, according to items, imported and exported during the year 1947-48 are shown in the following table :—

TIMBER : ITEMS IMPORTED AND EXPORTED FROM AUSTRALIA, 1947-48.

Description.	Unit of Quantity.	Quantity.			Value (£).		
		Imports.	Exports.	Excess of Imports over Exports.	Imports.	Exports.	Excess of Imports over Exports.
Dressed (a)	'000 sup. ft.	12,971	42	12,929	582,312	1,744	580,568
Undressed—							
Railway Sleepers	"	(b)	19,505	..	..	547,072	} 2,235,272
Other (a)	"	134,410	24,377	..	3,576,206	793,862	
Plywood, veneered or otherwise	Sq. ft.	1,808	67,609	-65,801	19	5,789	- 5,770
Palings .. ..	"	..	..	..	..	..	..
Shingles	"	1,250	..	1,250	3	..	3
Staves—							
Dressed, etc.	No.	60,369	..	60,369	13,636	..	13,636
Undressed	"	3,254	..	3,254	604	..	604
Laths	"	..	104,177	-104,177	19	623	-604
Veneers	'000 sq. ft.	5,624	9,786	-4,162	80,189	93,204	-13,015
Spokes, rims, felloes, etc. ..	"	..	..	..	..	2,832	-2,832
Other .. ..	"	..	..	..	60,209	118,729	-58,520
Total .. ..	..	..	..	..	4,313,197	1,563,855	2,749,342

(a) Timber measured in super. feet only.

(b) Not recorded separately.

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

(ii) *Sandalwood.* A considerable quantity of sandalwood is exported, principally from Western Australia, to Singapore and Hong Kong, where it is highly prized and largely used for artistic and ceremonial purposes. Particulars for the five years 1943-44 to 1947-48 are compared with 1938-39 in the following table :—

SANDALWOOD : EXPORTS FROM AUSTRALIA.

Country to which Exported.	Quantity (Tons).						Value (£).					
	1938-39.	1943-44.	1944-45.	1945-46.	1946-47.	1947-48.	1938-39.	1943-44.	1944-45.	1945-46.	1946-47.	1947-48.
Hong Kong	806	..	..	45	676	49	18,709	..	..	2,250	66,083	11,428
India	25	..	..	..	25	..	842	..	..	..	1,500	..
Malaya (British)	97	..	..	85	70	15	3,149	..	..	4,750	12,200	3,790
Singapore .. ..	..	..	..	..	..	72	..	..	..	..	..	17,493
Other British Countries	17	..	..	13	25	11	545	..	..	584	2,730	2,860
China	686	..	..	..	325	..	18,511	..	..	..	27,741	..
Other Foreign Countries	17	..	..	..	..	..	574	..	..	..	13	..
Total	1,648	..	..	143	1,121	147	42,330	..	..	7,584	110,267	35,571

(iii) *Tan Bark.* Tan bark often appears both as an export and an import in the Australian trade returns. The following table refers to exports for the four years ended 1947-48, compared with 1938-39.

TAN BARK : EXPORTS FROM AUSTRALIA.

Country to which Exported.	Quantity (cwt.).					Value (£).				
	1938-39.	1944-45.	1945-46.	1946-47.	1947-48.	1938-39.	1944-45.	1945-46.	1946-47.	1947-48.
India ..	..	..	..	7,981	..	..	..	..	11,706	..
New Zealand ..	7,620	..	1	..	..	3,897	..	6	..	..
Other British Countries ..	40	..	..	522	..	27	..	..	768	..
Germany ..	8,251	..	..	..	..	3,582	..	..	..	..
Other Foreign Countries ..	2,309	..	..	1,170	..	1,124	..	..	558	..
Total ..	18,220	..	1	9,673	..	8,630	..	6	13,032	..

For a number of years prior to 1927-28 Australia had to import large quantities of tanning bark, but thereafter imports dropped to negligible quantities and exports rose annually to 89,061 cwt. in 1931-32. Since 1931-32 there has been a diminution of exports and by 1941-42 these had reached the low level of 421 cwt. The quantity imported did not rise appreciably until 1939-40 when imports were more than three times that of the previous year. Since that year there has been a considerable excess of imports, the Union of South Africa being almost the sole source of supply.

A comparison of the imports and exports of tan bark during 1938-39 and the five years ended 1947-48 is given in the following table :—

TAN BARK : IMPORTS AND EXPORTS, AUSTRALIA.

Particulars.	1938-39.	1943-44.	1944-45.	1945-46.	1946-47.	1947-48.
QUANTITIES—	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.
Imports ..	6,199	105,315	90,024	86,367	65,056	69,012
Exports ..	18,220	..	..	1	9,073	..
Excess of imports over exports ..	— 12,021	105,315	90,024	86,366	55,383	69,012
VALUES—	£	£	£	£	£	£
Imports ..	2,318	61,050	54,570	56,986	49,456	64,656
Exports ..	8,630	..	..	6	13,032	..
Excess of imports over exports ..	— 6,312	61,050	54,570	56,980	36,424	64,696

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

The imports 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. 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) the availability of native labour.

(iv) *Other Tanning Substances.* Considerable quantities of tanning substances other than bark are imported annually into Australia. The total value in Australian currency of the importations in 1947-48 was £472,525, and was composed as follows :—Tanners' Bates, £12,617; wattle bark extract, £401,344; quebracho extract, £660; other extract, £17,863; and volonia, myrobalans, cutch, etc., £40,041.

Exports of tanning extracts from Australia amounted to £212,553 in 1947-48.