By G. J. RODGER

TIMBER GETTING . . .

Australia's oldest industry

Timber, the first natural resource to be used by Australia's early settlers, today constitutes one of the nation's largest and most important industries.

FROM the time of early settlement to the present day, timber and other forest products have played an important role in Australia's development. They have provided material for food and shelter, for use in mining, agriculture, various forms of transport and industry, and for the manufacture of an increasing number of articles which have become normal requirements to the high standard of living of our present day.

Land settlement in many parts of Australia is not yet stabilised and forest inventories are not complete, but in any case the forest resources of a country are always difficult to assess with any degree of accuracy. They include all the land carrying trees, whether as dense forests of valuable sawmilling timber, or as open forest, savannah woodland and mallee in drier regions. Moreover, forest resources are not necessarily confined to the actual product of the trees. They also include all the other benefits enjoyed as a result of tree growth, such as forest grazing, protection of the soil, amelioration of climatic con-

G. J. Rodger, author of this article, is Director General of the Commonwealth Forestry and Timber Bureau, Canberra, A.C.T.

litions, recreational facilities and aesthetic values.

It has been estimated that, excluding the scattered tree growth on savannah woodland, there are about 117,500,000 acres of land in Australia on which tree growth is the dominant vegetation. This, however, includes large areas of mallee and other forest areas too low in quality or too inaccessible to be economically exploited.

Hardwoods occupy approximately 97 per cent of the total forested area of which the genus Eucalyptus covers about 94 per cent. Eucalypts provide timbers, many of which are of considerable value on account of their strength and resistance to decay, termites and other wood destroying agencies.

The Eucalypt attains its best development in the higher rainfall areas such as occur on the eastern coast, the highlands of southern New South Wales, Victoria and Tasmania, and the south-western corner of Western Australia. This forest type is generally characterised by a profuse undergrowth which adds considerably to its aesthetic attractiveness. The more important commercial species in these regions include the blackbutt, tallowwood, flooded gum and red mahogany of New South Wales and Queensland, the alpine ash of Tasmania, Victoria and New South Wales, the mountain ash, messmate and blue gum of Victoria and Tasmania and the karri of Western Australia. For height and grandeur, the mountain ash of Victoria and Tasmania and the karri of Western Australia are unequalled among the hardwoods of the world, and are excelled in these directions only by a few softwood species in North America. Hardwoods other than Eucalypts also found in this type of forest on the eastern coast are turpentine — a valuable pile timber very resistant to the attack of teredo beetle—and brush box.

In the drier coastal regions where the rainfall is too low for the former type to flourish, the Eucalypt forest contain many durable species such as the ironbarks, grey gums and bloodwoods of the east coast and the jarrah and tuart of Western Australia. The spotted gum of New South Wales and Queensland is another example.

Inland, along most of the rivers and streams and over the annually flooded low lying adjacent areas, occurs a riverain forest in which the main species is river red gum, a very durable hardwood which has supplied large volumes of sawn timber, railway sleepers and fence posts for local use.

In areas receiving an average annual rainfall in the vicinity of 20 inches per annum, or even considerably less where the annual rainfall is regular, as it is on the goldfields of Western Australia, the Eucalypts occur in open forests and savannah woodland. These have a local value which in some places is very considerable.

In areas receiving a rainfall of 10 to 20 inches per annum, but subject to periodic dry conditions, is found the mallee — dwarf, multiple-stemmed Eucalypts — which, by reason of the development of large woody swellings (mallee roots) just below the surface of the soil, are able to successfully withstand severe drought and fire. The mallee is of particular value for firewood and the leaves of some species provide valuable essential oils.

Adjoining the mallee areas occur open plains carrying scattered small trees, amongst which are to be found a number of acacias such as brigalow, gidgee, myall, mulga and the raspberry jam of Western Australia. Sandalwood is also found in this type of country.

Rain forests cover a little over 3 per cent of the total forested area of Australia. The rain forest is of two main types — the tropical and the sub-tropical rain forest on the coast of New South Wales and Queensland and the temperate rain forest of southern Victoria and Tasmania.

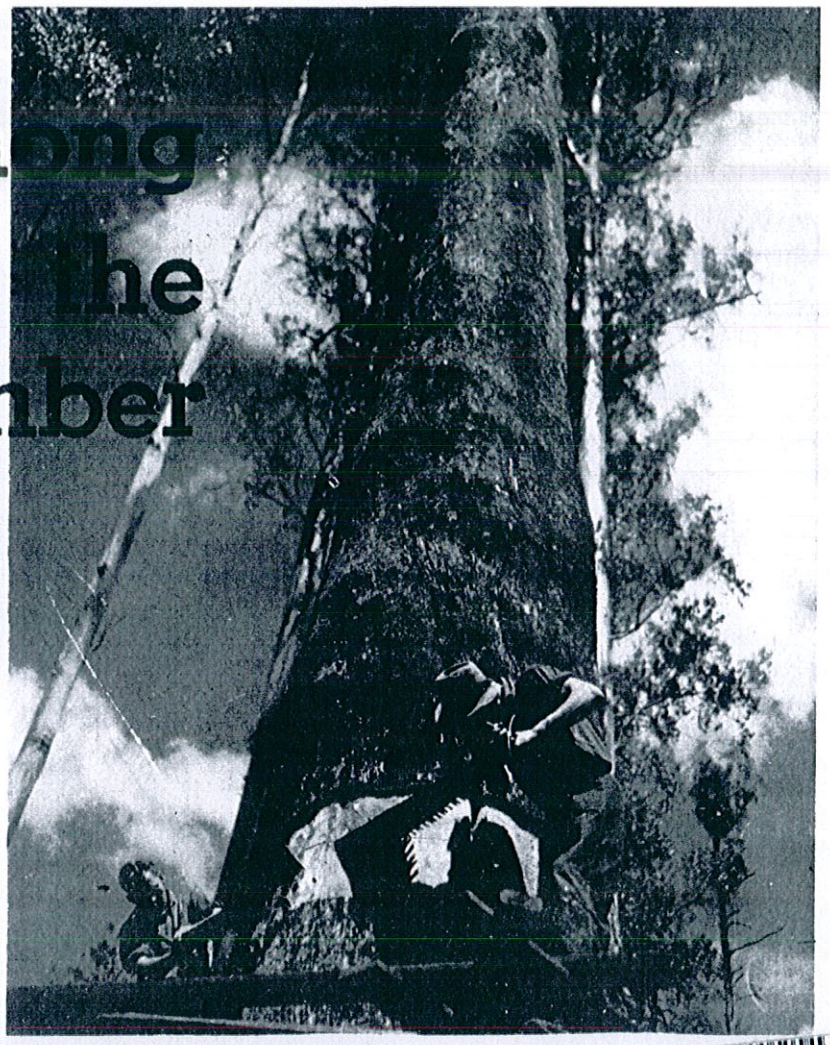
The tropical and sub-tropical rain forest along the eastern coast is an extension of the Indo-Malayan flora which has apparently replaced the original dominant Eucalypt vegetation, and is characterised by the multiplicity of species it contains. Tropical rain forest occurs in northern Queensland in the vicinity of Cairns and on the Atherton Tableland, providing such well known cabinet woods as Queensland maple, Queensland walnut and silky oak. The Queensland kauri pine is found in this forest. The sub-tropical rain forest is found in southern Queensland and northern New South Wales and supplies such timbers as crow's ash, black bean, red cedar and coachwood. Associated with this forest are the hoop and bunya pines.

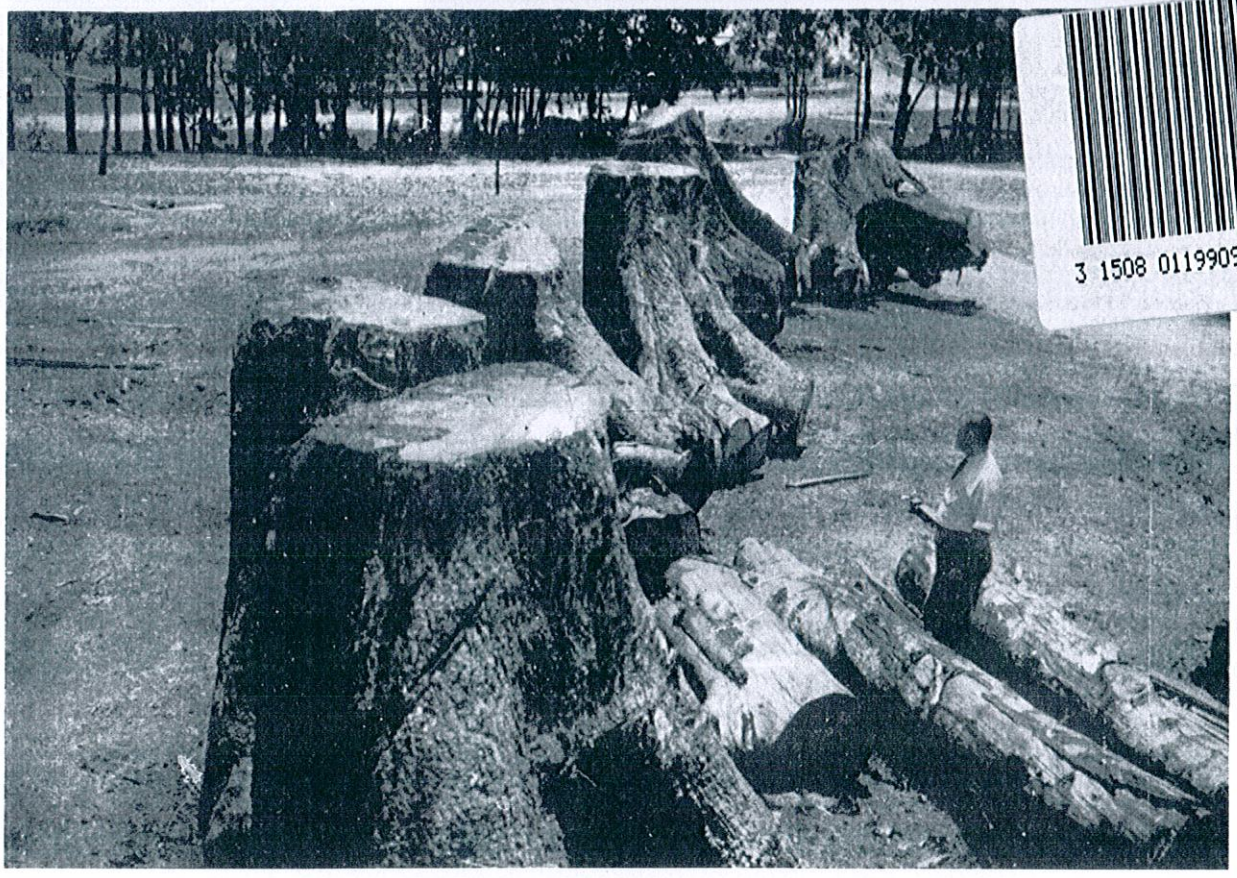
Temperate rain forest which is to be seen in the more southern parts of Victoria and western Tasmania consists mainly of myrtle beech, and also produces southern sassafras and blackwood. Associated with it are the three Tasmanian native conifers — celery top pine, huon pine and King William pine — although supplies of the latter two species now are practically exhausted.

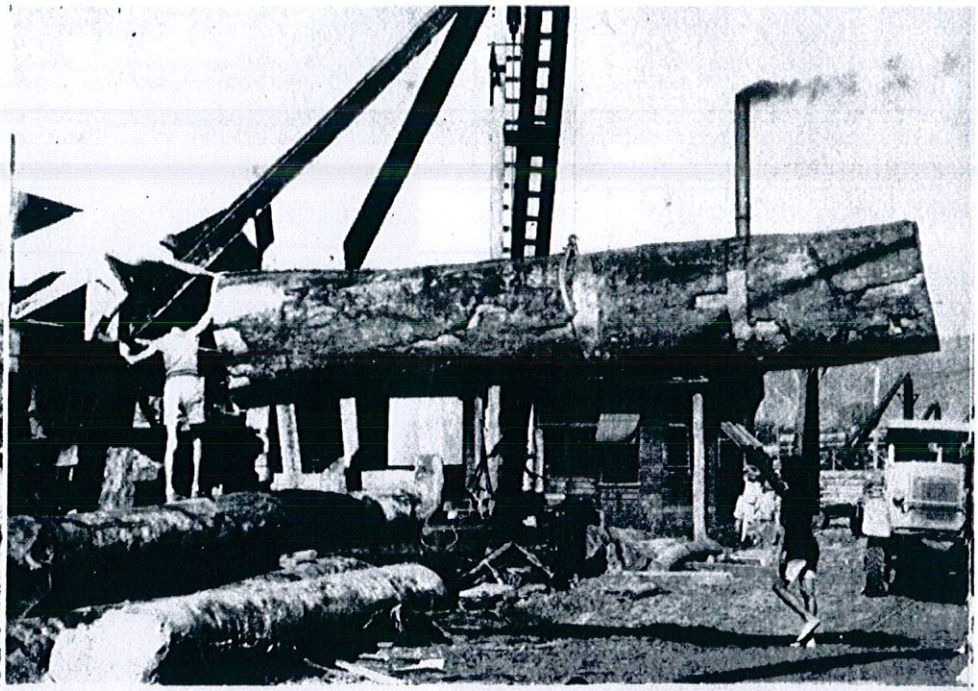
Cypress pine is widely spread throughout Australia, but the main cypress pine forests of commercial value occur in New South Wales and southern Queensland west of the Great Dividing Range, and cover about 2.5 per cent of the total forested area of Australia. The trees are comparatively small but the timber has a particular value owing to its durability and resistance to termites. It is suitable for use as scantlings, floorings, linings, weatherboards, poles and posts. It has been heavily cleared

Among the tall timber

FROM the tropical forests of Queensland to the tree-clad slopes of the Australian Alps and the dense stands of jarrah in the south-west, Australians are at work hauling out timber in ever increasing quantities for the needs of industry. It is a major activity employing over 100,000 workers in forest services, milling, marketing, and manufacturing. Value of all products is estimated at about £165 million annually. The photos show (top) timbermen felling a mountain ash in Victoria, and (below) walnut stumps from the Atherton Tableland, Queensland.

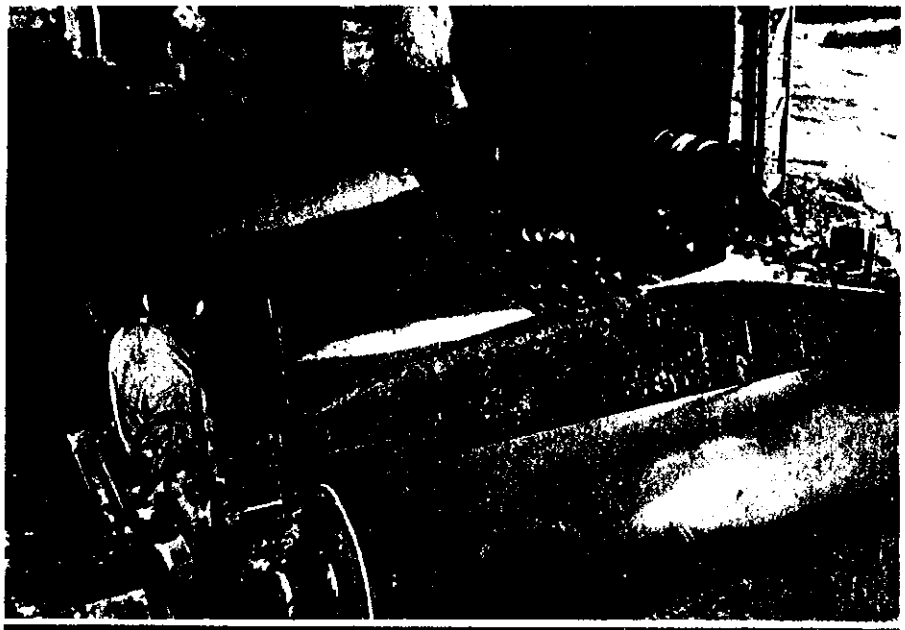


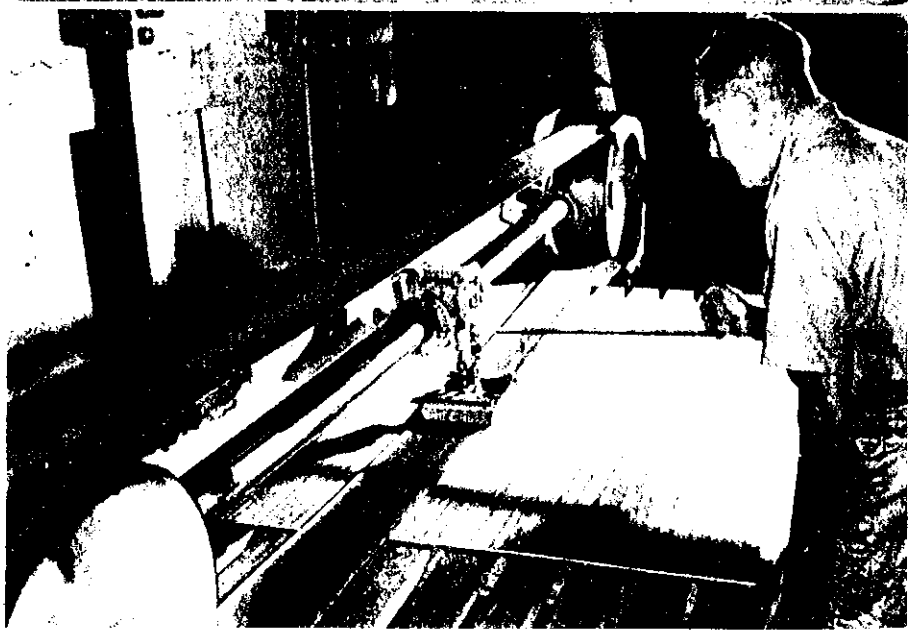


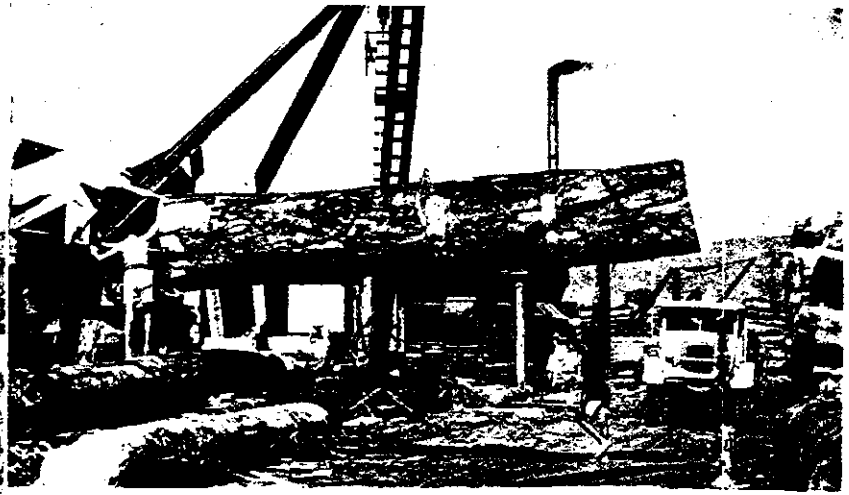


THE FINE timbers grown in Queensland are used extensively by furniture manufacturers as solid timbers and as ply and veneers. Cairns Timber Limited has established a well-equipped factory at Cairns, northern Queensland, to turn out both plywood and veneers. Timber is logged from stands a few miles out of the city and hauled to the factory by huge diesel trucks (left) and trailers, which traverse winding bush roads. When the trucks reach the mill, the logs are lifted (above) by cranes and stacked in piles in the yard (right) preparatory to being fed into the peeling lathe. Best known of the Queensland timbers are maple, walnut and silky oak, which grow in the tropical rain forests of the north. These forests are an age-old extension of the Indo-Malayan flora and have replaced the eucalypts which predominated originally. This applies also to the sub-tropical rain forests of southern Queensland and northern New South Wales, which produce such timbers as crow's ash, black bean, red cedar, coachwood, and hoop and bunya pines.

AS THE logs are needed, they are fed into the peeling lathe (right) at Cairns Timber Limited, and plys and veneers up to six feet wide, are stripped from them. After stripping, the veneers are trimmed to remove all defects and are then glued together (centre right) by an edge glueing machine to produce a perfectly matched sheet. A hot pressing machine then welds the veneer to a plywood base, and the surface is polished with a sanding machine (bottom right) before being despatched to the market.

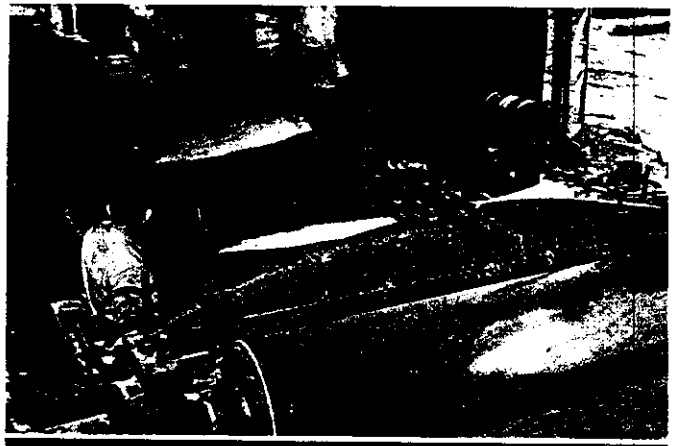


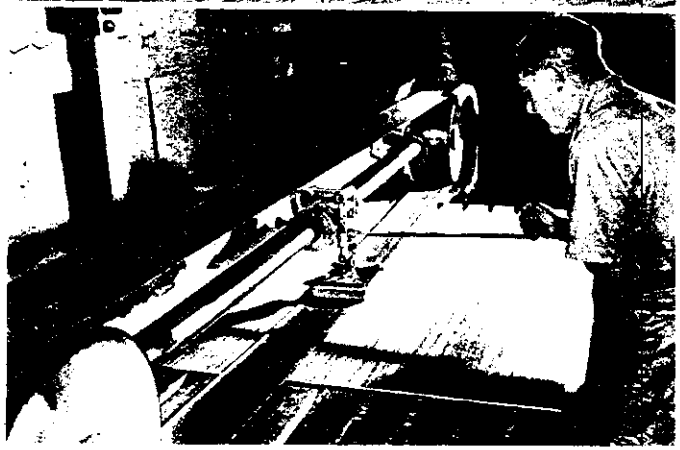




THE FINE timbers grown in Queensland are used extensively by furniture manufacturers as solid timbers and as ply and veneers. Cairns Timber Limited has established a well-equipped factory at Cairns, northern Queensland, to turn out both plywood and veneers. Timber is logged from stands a few miles out of the city and hauled to the factory by huge diesel trucks (left) and trailers, which traverse winding bush roads. When the trucks reach the mill, the logs are lifted (above) by cranes and stacked in piles in the yard (right) preparatory to being fed into the peeling lathe. Best known of the Queensland timbers are maple, walnut and silky oak, which grow in the tropical rain forests of the north. These forests are an age-old extension of the Indo-Malayan flora and have replaced the eucalypts which predominated originally. This applies also to the sub-tropical rain forests of southern Queensland and northern New South Wales, which produce such timbers as crow's ash, black bean, red cedar, coachwood, and hoop and bunya pines.

AS THE logs are needed, they are fed into the peeling lathe (right) at Cairns Timber Limited, and plys and veneers up to six feet wide, are stripped from them. After stripping, the veneers are trimmed to remove all defects and are then glued together (centre right) by an edge glueing machine to produce a perfectly matched sheet. A hot pressing machine then welds the veneer to a plywood base, and the surface is polished with a sanding machine (bottom right) before being despatched to the market.





and cut for sawmilling in the past and production from State forests is now strictly regulated.

Most of the Australian conifers are slow growing and their regeneration in forest would consequently be very expensive. Very successful plantings have, however, been made of hoop, bunya and kauri pines in southern Queensland, and some planting of hoop pine has been carried out in northern New South Wales. The pitch pines from the southern States of the U.S.A. and Pinus patula from Mexico have also been successfully planted in the subtropics. The main plantings of exotic species in Australia have been made in the temperate southern regions where Monterey pine, or Radiata pine, from California has given excellent results in growth rate, and produce a very fine general utility softwood. Coniferous plantations at present cover 356,500 acres or little more than 3 per cent of the total forested area of Australia.

Of the total estimated forested area of about 117,500,000 acres in Australia, about 73 million acres are capable of producing only mallee or other tree growth too low in quality to be economically exploitable except for firewood or mining and small round timbers, or else are either economically inaccessible or unavailable for exploitation by reason of their reservation in national parks, water catchment areas, etc. Consequently, there are only about 44 million acres which carry or have carried economically exploitable milling timber. A little over 20 million acres have been dedicated to forest production by State Governments and nearly another 10 million acres are reserved until the timber is removed. The remaining 14 million acres are largely either open Crown lands of insufficient forestry value to justify reservation or are private property. Little of the privately held forest land is managed or even protected, and most of it will probably eventually be cleared in the course of settlement.

It can therefore be considered that for all practical purposes, the commercial forest area of Australia will be between 20 million and 30 million acres, but it needs to be realised, that, in any large area of forest, considerable areas of poor quality forest, and even inaccessible and barren country, are unavoidably included. It is consequently generally believed that the area of prime commercial forest in Australia is unlikely to exceed about 15 million acres.

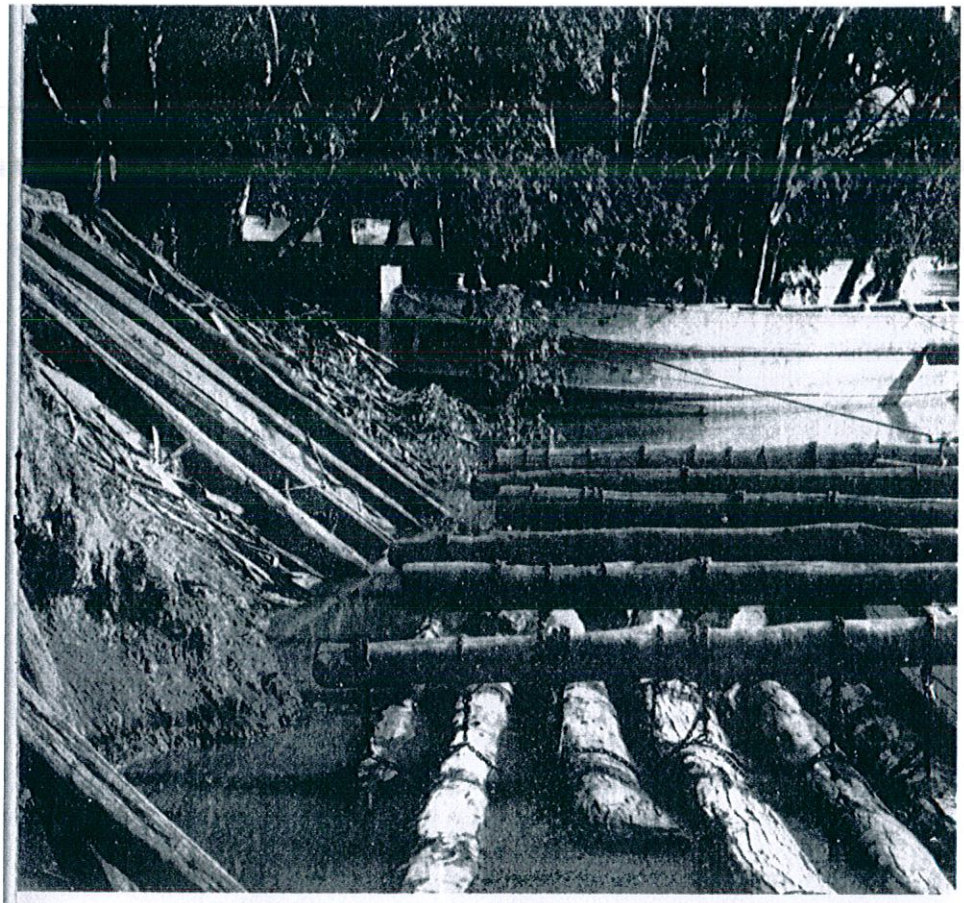
Although the native forests of Australia are mainly hardwood and include timbers unsurpassed for purposes where strength, durability and beauty are concerned, it is a fact that softwood is cheaper to grow and for the major portion of the uses for which timber is required it should be more economical to use than hardwood. Each Forest Service, therefore, has a programme of softwood forest establishment and private investors are also interested. Of the 356,000 acres of softwood plantation established to date, about 50,000 acres are privately owned. Some of the softwood plantations are 40 and more years of age, and their exploitation is becoming well developed. In addition to a number of large sawmills established or being established, one pulp and paper mill relying upon softwood plantations for its raw material has been established and in operation for some years.

Since the States control the forests within their boundaries, there is no single national forest policy for Australia, but in general the forest policies of all States and Territories are similar, namely, to protect and develop their commercial forests to ensure the attainment of maximum sustained productivity.

The management of Australia's forest estate and the attainment of forest policy requires the economic application of scientific methods to forestry, which in turn entails fundamental research and a trained staff to apply results. Appreciating the national importance of forestry and the advantages of centralising matters of such common interest to the whole of Australia as forestry research, the Commonwealth Government has established the Forestry and Timber Bureau to provide these services. The Bureau maintains the Australian Forestry School at University standard, and has the advice of a Board of Higher Forestry Education, upon which each Australian University and Forest Service has a representative. Graduates from the Australian Forestry School are now employed in all the Forest Services of Australia and, to an appreciable extent in private forestry industries.

The nucleus of a Forestry Research Institute has also been established and four experimental stations are being operated in co-operation with State Forest Services. Already considerable advances have been made in improving methods of forest assessment, in the treatment of forest disorders and in studies of timber production, supply and usage. A Forest Products Division has been established within the Commonwealth Scientific and Industrial Research Organization to investigate matters of scientific and industrial interest relating to products of the forest. The work of this institution has resulted in considerable improvement in methods of conversion of forest products and the avoidance of waste.

Except for recurrent slumps and booms associated with domestic and international disturbances, the output from Australian forests has progressively increased and is



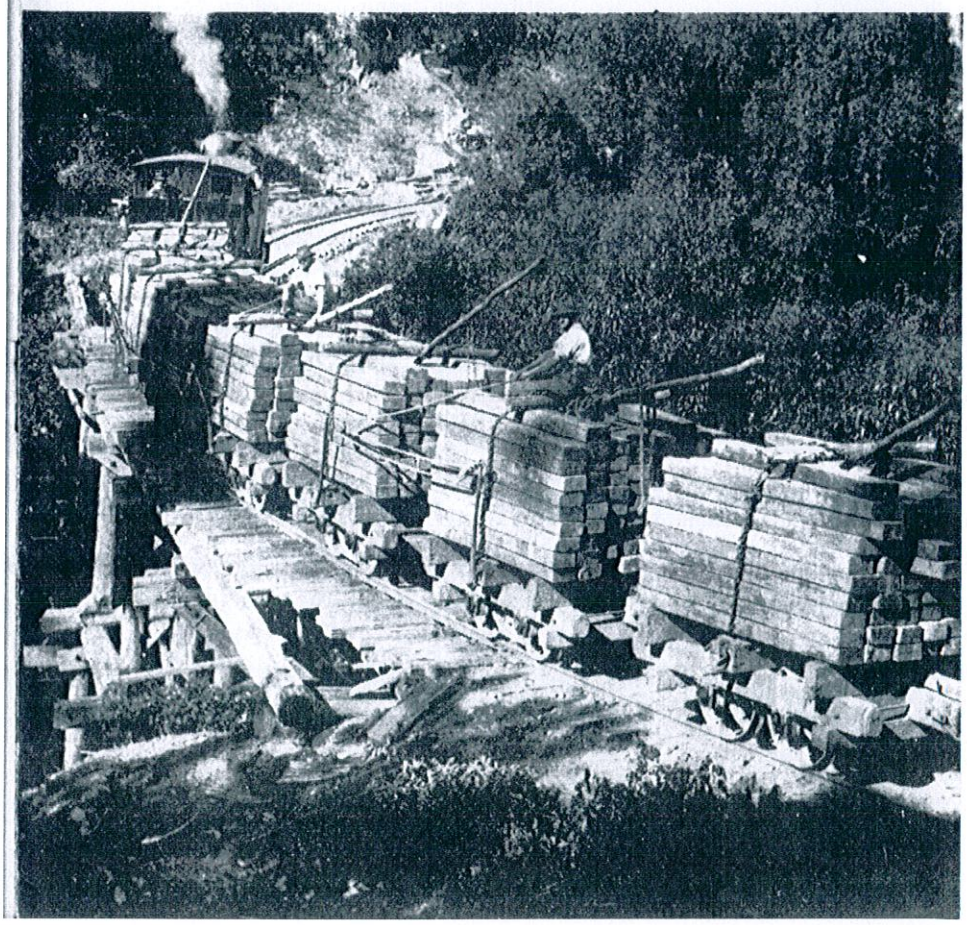
Much of the timber cut in the Murray Valley is transported by water.

now of very considerable proportions. For the year 1952/53 the output of round timber for all purposes was about 622 million cubic feet gross, true volume. The largest single item was firewood, about 300 million cubic feet, of which about one-sixth was used in industry. Eucalypt timbers provided the bulk of the firewood, but significant quantities of sheoak and wattle were also used. The second largest item was logs for sawmilling. Some 210 million cubic feet of hardwood logs and some 40 million cubic feet of softwood logs were used to produce sawn timber.

It is of interest to note that the quantity of plantation grown softwood used for sawmilling has now reached the significant figure of 16 million cubic feet. This quantity may be expected to increase very considerably in the next decade and quantitatively, at any rate, will tend to compensate for the reduced production from the natural softwood forests of Queensland and New South Wales, notably hoop pine.

Some 25 million cubic feet of hardwood logs, mainly eucalypt timbers, were used for the production of sawn or hewn railway sleepers.

Pulpwood production represented about 20 million cubic feet of the total of production. About three-quarters of this was absorbed by the paper and paperboard industries, whose output includes newsprint, writing papers, wrapping papers and paperboard. Approximately two-thirds of the pulp used in these industries was produced from local timber, of which the major portion was of eucalypt species and about 750,000



Railway sleepers cut from Western Australia's jarrah forests are in wide demand overseas.

cubic feet of local softwood. The balance of the pulpwood locally produced was used for the manufacture of fibreboards.

The plywood industry used approximately 1,750,000 cubic feet of Australian grown hardwood logs and about two million cubic feet of softwood logs.

The remaining quantity of round timber produced was used for piles, poles, mining timber, fence posts, etc.

Some indication of the value of forests as a resource may be gathered from the fact that over £40 million has been invested by shareholders in Australia's sawmills, and plywood, paper and pulp mills, while total annual production from sawmills and plywood mills and paper and pulp mills is estimated to be worth £125 million.

Definite figures of value are not available for fibreboard production, sleepers, poles, piles and the numerous other forms of forest produce, but in the aggregate the value is very considerable, and has been very roughly estimated at £40 million, thus making a total for all products of about £165 million. In addition to the products itemised, there are a number of products of the forest such as bark and other tanning materials, sandalwood and sandalwood oil, other essential oils such as eucalyptus ti-tree and citron scented oils, honey, beeswax and lawyer canes.

The harvesting and production of all the various forms of forest produce creates employment and contributes to the national wealth. Forests are an important resource for the employment of labour. From the point of view of population distribution it is of interest to note that a large proportion of the labour is employed in a rural industry. The number of persons now engaged in the forest services and in felling, splitting, hewing and delivering timber to market is about 35,000 and the number employed in sawmills and plywood mills is about 40,000. Secondary industries using timber or other forest produce as a major raw material employ at least a further 35,000 persons.

When the natural forests receive the intensive protection and treatment that is becoming progressively more necessary, the number of persons productively employed in them will be very much increased, while an adequate area of plantations will require labour on a considerable scale. Actually, a complete plantation unit with planting, pruning, exploitation and protection in full swing, absorbs more men per unit of area than many forms of agriculture, and from this aspect is, under appropriate conditions, by far the best form of land settlement.

Since the very early days when shipments of New South Wales' timber were sent to H.M. Dockyards, some Australian timbers have gained a world wide reputation. For example, jarrah sleepers from Western Australia have been used in South Africa, Ceylon, Mauritius, Malaya, various Middle East countries and elsewhere; Tasmanian blue gum piles and New South Wales turpentine piles have been sent to many harbours throughout the world; jarrah and karri for wagon scantlings, mine guides, etc., have been eagerly sought on the United Kingdom and other European markets; New South Wales spotted gum and other mixed hardwoods are popular with the South African Railways; New South Wales ironbark is in keen demand for use in the construction of boats plying in sub-Arctic waters; New Zealand has always looked to Australia for supplies of sleepers, poles, piles, crossarms and harbour timbers, while many other islands of the Pacific are traditionally dependent on Australia for their essential timber needs; Queensland walnut, silky oak and Queensland maple are a few of the decorative timbers highly prized by overseas countries.

Owing, however, to the demands of local industry, exports of all timbers are on a reduced scale and generally are of the types and quantities surplus to domestic requirements, or for which interstate transport is not available to send the timber from locality of production to locality of demand. Nevertheless, in 1952-1953 over three million cubic feet of sawn timber, one million cubic feet of round timber and about 700,000 cubic feet of sleepers were exported from Australia, the f.o.b. value being about £3,800,000.

On the other hand, Australia has for over half a century imported considerable quantities of softwood timber. Wartime difficulties and post-war limitations in overseas credits, and particularly dollar expenditure, have undoubtedly led to a reduction in softwood imports and to a more extended use of local hardwoods compared with pre-war years, except for a temporary flood of imports about two years ago. In 1952/53, imports were about 10 million cubic feet, and it is interesting to note that the f.o.b. value country of origin of this timber was about £5,500,000. This quantity was, however, probably less than the average annual requirements.

With the growth of population and increased overall consumption likely, it appears that considerable imports will be required against the time when Australian softwood plantations cover a sufficient area and are old enough to produce the softwood needs of this country.

It is safe to say that important as Australian forests have been in the past as a source of forest products and the employment of capital and labour, they are destined to be far greater in the future if sufficient attention is given to their protection and treatment. **END**