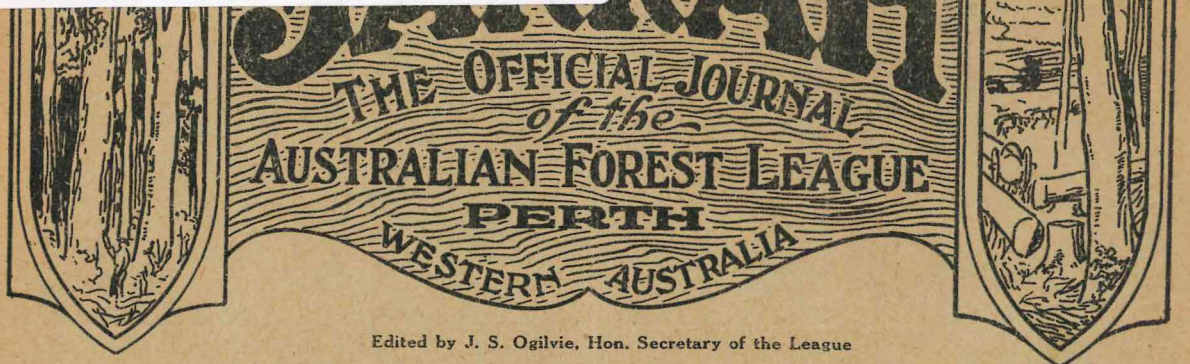




**JARRAH : THE OFFICIAL JOURNAL OF
THE AUSTRALIAN FOREST LEAGUE,**

2 (Aug 1918)

DEPT OF BIODIVERSITY, CONSERVATION & ATTRACTIONS



Edited by J. S. Ogilvie, Hon. Secretary of the League

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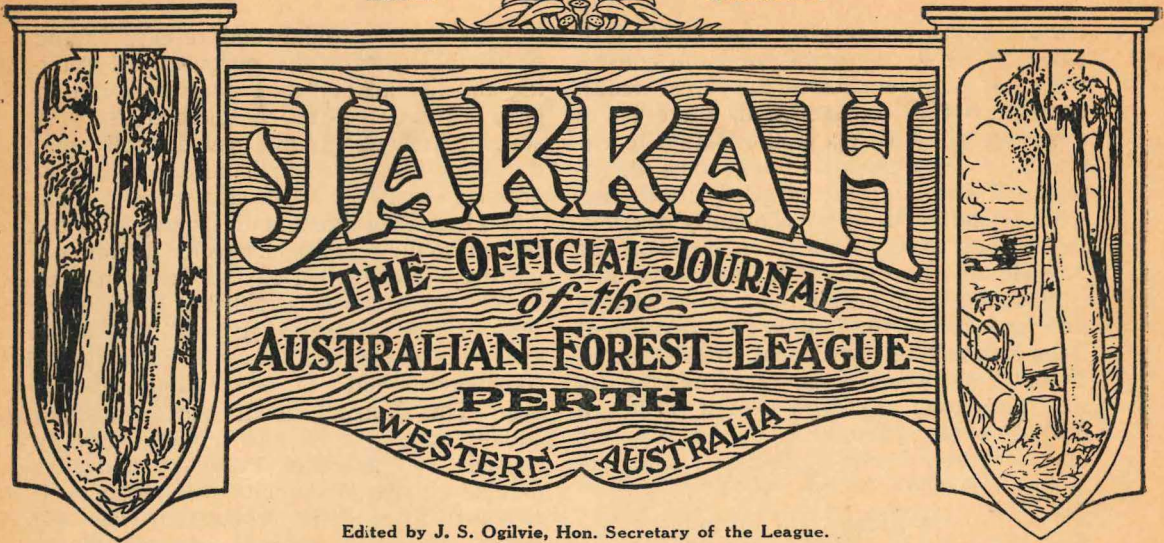
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QUARTERLY



Edited by J. S. Ogilvie, Hon. Secretary of the League.

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AUGUST, 1918.

No. 2.

Jarrah

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Correspondence and contributions on forestry matters are invited from members of the League and others interested in forestry and cognate subjects. "Jarrah" has no politics. It knows only forests and forestry, but it will gladly welcome the assistance of patriotic politicians in its propaganda. Questions on matters relating to forestry are invited and will be answered, and suggestions for increasing the usefulness of "Jarrah" will be carefully considered. No responsibility is accepted for opinions expressed or conclusions arrived at by contributors or correspondents.

All communications should be addressed to:

THE EDITOR, "JARRAH,"
 WEST AUSTRALIAN CHAMBERS,
 ST. GEORGE'S TERRACE,
 PERTH.

A Matter of Urgency.

THE time appears to have passed when opinion is divided as to the necessity for effective control and management of the forests of the State. It is recognised all round that some system must be put into operation, without delay, whereby the best may be made of our forest resources, in the interest, not only of the present, but of future generations. The bald but unsatisfying

assertion that something must be done comes trippingly from the tongue, but measures for the purpose of translating desire into accomplishment are not so easy as the average unenlightened citizen is apt to imagine. However clearly the Minister for Forests recognises the position, however wholehearted and earnest his efforts, however zealous and capable the Conservator of Forests may be, and however ready his officers to assist him, really effective action at the present time is impossible. The Department of Woods and Forests is practically helpless, for it has no sufficient machinery at its disposal for carrying into effect adequate schemes for the conservation and improvement of the forests under its care. At the present moment, and ever since its inception, the Department has been endeavouring to carry out its responsible duties without that Legislative enactment which is absolutely necessary for the work. The Department of Woods and Forests in this State conducts its business under certain clauses, tacked on, as a kind of after-thought, to the Lands Act. Under these clauses, regulations have been framed for the supervision of the business of the converter, whether he be sawmiller, sleeper-hewer, or firewood-getter. But when questions of policy such as reserves, regeneration of


cut-out areas, planting of new woods suitable for the local market, and the conservation of what remains of the forest wealth come up for consideration, there is in existence no sufficient authorisation to enable these very essential things to be undertaken. What this State urgently needs, and what friends of forestry clamantly demand, is a Forest Act, to confer powers on the Minister for Forests and his executive officers, such as will enable them to do what is necessary to put the forests on a permanent basis as a source of national wealth. Other States have moved or are moving in this direction. In New South Wales, a couple of years ago, such an Act was put on the Statute Book, its purposes being set out as follow:—

“To consolidate and amend the law relating to forestry; to provide for the dedication, reservation, control, and use of State forests, timber reserves, and Crown lands for forestry and other purposes; to appoint a commission to administer the Act, with power to sell and convert timber and products, and to purchase and sell horses, cattle, and sheep to be depastured on State forests and timber reserves.”

Under the powers conferred upon it by this Act the Forestry Commission of New South Wales is rapidly placing the forest resources of the Mother State upon a sound footing. Victoria is moving, and it is understood that the necessary Bill is in course of preparation. With a Forest Act defining and setting out the lines on which the Department must work, a new era would dawn in the life-history of the forests of this State. Mis-directed political influence and unwise political interference, than which nothing can be more disastrous, would entirely cease, or would be so emasculated as to be capable of little harm. Of the two curses which have afflicted the forests of Western Australia—self-seeking politicians and reckless exploitation—it is difficult to say which has been the more calamitous. It would be as easy to quote instances of the ghastly damage done by the vote hunting politician as it is to point to cruel ravages by the reckless exploiter. A number of years ago, when sandalwood began to get scarce in the farming districts, it occurred to the Department of Woods and

Forests that a sandalwood reserve should be established for the purposes of studying the life-history of sandalwood and of growing the tree for commercial use. A suitable area was found near Pingelly, and the work was taken in hand and was progressing very well indeed, when a local Ahab happened along, and, looking over the fence into the reserve, he coveted it for cow pasture. He applied in the usual manner for the land, and was told that it had been reserved for a specific purpose. But Ahab knew his game, and also the local politicians, and he did a bit of cunning engineering. The Forest Department put up a gallant fight, and its efforts were strongly backed by practical and patriotically-minded citizens, but political influence carried the day, and the reservation was cancelled, and Ahab, having won, turned his cows, sheep, and goats into the reserve to browse on the young sandal and whatever else it contained. Other instances might be quoted, but why continue the painful catalogue? A Forest Act would prevent such vandalism as took place at Pingelly. Until such an Act is in force the efforts of the friends of forestry are likely to be nullified by the soulless politician, whose only aim is to secure votes and keep his job—perish the country so long as votes and seats are secure! It is understood that a Forest Bill is to be introduced into Parliament during the next session. The public, who are the owners of the forests, will watch the passage of that Bill with the deepest interest, and will not fail to observe who, among its representatives, are animated by a genuine desire to put the welfare of the country before every other consideration.

Shipbuilding.

 THE old and honoured craft of shipbuilding, at one time the principal secondary industry in this State, is to be re-established, and before another issue of “Jarrah” reaches the public, there is every likelihood that keels will have been laid in the upper end in the harbour of Fremantle and that, day by day, the old music of the mallets will float over the river. There are several very weighty

reasons why the building of ships should be established in this State. Firstly, there is the dire necessity for more tonnage created by a unprecedentedly disastrous war. It is over a year since in Canadian ports and rivers the cry was heard "Ships, and more ships, to save England." The Canadians lost no time in responding, and already hundreds of wooden vessels, built in Canadian yards, are doing their destined work. Australia's response to the call has, through special circumstances, been delayed, but there is reason to believe that it will be none the less hearty, and that each of the States will do its share. Another reason for the construction of vessels here has reference to the State's own necessities. One of the lessons unmistakably taught by the war is that, when the days of reconstruction come, the task is likely to be easiest in that country which most fully utilises its own natural resources, and instead of depending upon the manufactured products of outsiders makes the best use of its own raw materials. The one great, tangible asset of Western Australia is its timber. In the early days of the Colony, before wool had been grown to any appreciable extent, and when all the wheat that was raised went into local consumption, timber was the only thing which the Colony had to send away to pay for its imports. Timber in those old times was the mainstay of the State, and it is making no wild essay in prophecy to suggest that, in the days that will follow the war, timber will again occupy a foremost place in the work of nation-building.

More than a year has passed since the question of building wooden ships here was first brought up for consideration. The credit of making the suggestion and of carrying it through to successful realisation belongs entirely to the Minister for Industries, the Hon. R. T. Robinson, K.C. Having made himself acquainted with the past history of shipbuilding in this State, and being fully convinced that the future held work for wooden vessels, Mr. Robinson threw himself enthusiastically into the scheme. In his patriotic endeavour he has been ably assisted by the Conservator of Forests, Mr. C. E. Lane-Poole, whose energy and intimate knowledge of timbers became the happy complement of the

Minister's enthusiasm. There have been many difficulties to overcome and not a few discouragements, but, at last, the sponsors of the project have the satisfaction of seeing their efforts translated into accomplishment. The fight was an uphill one, for, verily, the pessimists in Western Australia are many and loud of voice. They have in this shipbuilding matter roosted on the office tables of leaders of opinion and of controllers of finance, and have croaked and croaked and prophesied disaster with an earnestness that seemed to imply that prosperity and a busy time are the very last things they desire to see in this State. Western Australia has had, and still has, much to contend with, and much stern work that will tax the energies and abilities of her best and ablest citizens. And not the least of her troubles is the pessimist, the sour-souled individual who rolls calamity as a sweet morsel under his tongue.

A shipbuilding company has now been formed with a capital of £30,000, divided into 30,000 shares at £1 each. This capital has been already fully subscribed by citizens who have faith in the country and its future. Contracts have been entered into between the company and the Federal Government, under which six vessels of 2,300 tons each are to be built in this State, at a cost of something like £64,000 each. The Federal authorities made it a condition of the contract that a capital of £60,000 should be at the disposal of any company building Federal vessels. The State Government, also fully convinced of the soundness and wisdom of this venture, has therefore arranged to interest itself to the extent of £30,000 in the scheme, and thus the requirements of the Commonwealth as to capital have been met. A site has been found on a very suitable piece of land on the north side of the river immediately under the Railway Bridge at Fremantle. This ground contains space for at least three keels, and vessels leaving the ways will slip into water 30ft. in depth. The timber to be used in the construction will be mainly jarrah, and, as it is estimated that each vessel will require about 1,500,000 feet of timber, it is not difficult to understand how greatly the timber-getting industry in the forests will benefit. The company does not by any means con-

template ceasing operations when the six Federal ships have been completed. It is intended that shipbuilding shall be a permanent industry here, and in its permanence lies its great value in the national economy. The wooden ship, whether depending wholly on canvas or with some form of auxiliary power, will have work to do in the days to come. Many of our ideas have been revolutionised during the past few years, and one of them that has undergone drastic alteration is the notion that everything must be hurried across the seas, irrespective of cost. There are many cargoes whose value is not dependent upon their catching a market on a certain date—wool, wheat, and timber may be instanced as cases in point—and for these cargoes the wooden vessel with its cheaper freight is indicated rather than the high prices through speedy ocean-liner.

Our Vacant Spaces.

(By the Hon. Walter Kingsmill, M.L.C.)

THE purposes and functions of a properly constituted and energetic Department of Woods and Forests are many and varied.

In Australia the title borne by the official departmental head in most of the States, "Conservator of Forests," seems to express the idea that the chief object of these departments is rather to foster, maintain and possibly develop the areas of forest land already existing, than to attempt to create new woodlands. In the future, however, the problem of utilising to their fullest extent the many and extensive areas of lands not likely to be used for agricultural or pastoral purposes is an important one and not too easy of satisfactory solution. In this vast State of ours, embracing practically one-third of Australia and stretching through a large portion of both temperate and tropical zones, we have, if anything, more than our fair proportion of lands which may be classed under the above heading, and it is hard to believe that the ever onward march of science will not bring to us a knowledge of how to turn to better account than hitherto

lands which at present are but little thought of, and the productive capacity of which is meagre in the extreme. We have in front of our Forestry Department, after the many years of waste and neglect which we have seen, a task of considerable difficulty in creating order out of disorder and system out of confusion, but in spite of the magnitude of this sphere of work it is well to remember that the science of forestry must play an important part in garnering for the State a harvest of gain from what are now the vacant spaces on our map.

In Western Australia these vacant spaces may be roughly classified under three heads, the coastal hills, the so-called "sand-plains" of the Southern portion of the State, and lastly, dwarfing the other two classes by the vastness of its extent, the dry parts of Western Australia beyond our wheat belt and running to our eastern boundary. There is in existence in our State a sub-committee of the Advisory Council of Science and Industry whose special care is defined as the "Acclimatisation of Plants of Economic Value." This sub-committee has prepared and submitted to headquarters a scheme bearing very directly upon the utilisation of these waste lands of ours, which scheme it is understood is regarded with a not unkindly eye by those in authority. So far, however, even the extremely small amount of money required to carry out the very modest suggestions of the sub-committee is not forthcoming, and the sub-committee is in, so to speak, a state of suspended animation until such time as it may be revived by furnishing it with the means of putting its proposals into practical effect.

The first class of our vacant lands, the coastal hills, is, perhaps, the most promising. From the experiments already made by the Forestry Department and others in the South-West, there seems but little doubt of the fitness of the majority of this land to grow certain classes of pines, so long as the danger of fire can be effectually dealt with, and there is a possibility by fostering this industry of making these hitherto valueless lands at least as productive as many parts of the State at present more highly esteemed. The second class


above mentioned, the "sand plains," do not offer as attractive a proposition, but there can be found by research through other countries of the world possessing similar country some far more profitable use than is at present being made of these rolling downs of ours. A typical example of this sort of country may be seen between the Midland Railway and our western seaboard, a very large proportion of which area is unoccupied, and under present conditions likely to remain so. At a slight expense experimental plantations of trees (such for instance, as *Pinus Canariensis*) likely to succeed in such a class of land could be made either under the control of the Commonwealth or, preferably, administered by our own State Forestry Department, which should go far to ascertain the future value of these so far almost useless portions of our heritage. There remains the consideration of the enormous area of land comprised in our third class. Much of this area is held under pastoral lease, and the difficulty of dealing with this class of country is recognised by the low rental demanded and the lightness of the conditions of tenure imposed upon those who hold these lands. Experiment in improving the productivity of this part of the State is rendered comparatively easy by the fact that most of our goldfields are situated in this zone.

Every centre of population possessing a school, a post office, or even a lock-up, offers a possibility of experimental plots at a minimum of cost by utilising the services of those, to be found in every community, however small, who take an interest in the enriching of the districts where their lot in life has found them, and who are willing to that end to help and encourage judicious effort. In these scores of thousands of square miles of sparsely stocked and still more sparsely populated lands any improvement in the stock-raising capabilities of the country means an immense addition of wealth to the community, and those who even initiate such improvement will have done much to carry out what should be an ideal to all of us, to leave the world the better for our life and work. It may be argued that the subjects dealt with in this very sketchy article can

scarcely be legitimately assigned to the care of a Forestry Department, but a little reflection will show that amongst the numerous branches of the State service there does not exist one more suited for the purposes indicated. The main essential in this regard, as indeed is the case with most of the objects of scientific forestry, is, first of all, to define a wise and suitable policy, and men to take such steps as will ensure that this chosen policy shall be continuous. Our vacant spaces offer a problem to us that is most interesting; its solution must necessarily be slow and tedious. So much the greater, therefore, is the need that an early start shall be made with our task of solving it.

A Forest Act for Western Australia.

(By C. E. Lane-Poolo, Conservator of Forests, W.A.)

 **T**HE three main principles on which a sound forest policy depends can only be established and maintained by the aid of a legislative enactment. The three principles are:—

1. Demarkation and permanent reservation of the prime timber country.
 2. The regulation of the cutting of timber so that only that quantity is cut annually which can be replaced by the natural growth of the forest.
 3. The improvement of all cut and semi-cut out areas with a view to assuring the regeneration of the best species for future cutting.
1. It is clear that unless power exists under an Act it is impossible to reserve permanently any forest country.
 2. While a forester may to-day lay down in a "Working Plan" the maximum annual output of a forest, what is to prevent the powers that be from altering that working plan and increas-



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ing the output to such an extent as to destroy the forest? A special section is required under an Act to protect the forester's working plan.

3. To improve the cut-out areas and assure if possible a better supply of timber in the future, money is required. The revenue of the forests which up to now have been engulfed by the Treasury must go back into the Forests to make up the wastage of the saw-miller.

A Forest Act is required to make the appropriation of the necessary funds for forest work possible.

OUTLINE OF A FOREST ACT.

The Act may be divided under the following divisions:—

- a. Reservation.
- b. Forest Authority.
- c. Forest Working Plans.
- d. Financial.
- e. Offences.
- f. Repeal of old Acts and protection of existing rights.
 - a. The reserves may be divided under two heads:—Permanent Reserves and Temporary Reserves.

The first are reserves made in the prime timber country about which there can be no shadow of doubt that they are required for forestry purposes for all time. These reserves must be protected by the full force of law, and only by the will of both Houses of Parliament should their cancellation be possible.

The temporary reserves will consist of country on the edge of the main timber belts—country which, while carrying marketable timber to-day, will be required for agricultural purposes once the timber is removed. These reserves do not need the same protection, and should be revocable by the Governor-in-Council on the recommendation of the forest authority. The classification of the forests which is now in

progress has for object the delimiting of the Permanent and Temporary Reserves; until this classification is completed the whole forest belt of the South-West should be declared a temporary reserve.

b. Forest Authority.

Once the forest assets of the State are reserved and protected they must be vested in a Responsible Minister of the Crown, who would also have charge of the administration of the Forest Act. He will require a forest department composed of a number of trained foresters—a department, in fact, capable of undertaking the work of putting the forest assets to rights and assuring the future of the timber industry. The importance of continuity of policy is greater in the science of forestry than in any other. It takes a very long time for a forest to grow, and changes in the policy during the growth of the forest generally result in disaster. Ministers of the Crown hold the reins of office for only very short periods of time when compared with the life of a forest, and it is essential, therefore, that the permanent head of the Forest Department be so appointed that possibility of changes in the Government affecting his forest policy be made as remote as possible.

c. Working Plans.

The continuity of forest policy is further assured by the inclusion in the Act of a section which safeguards the forester's "working plans." A Forest Working Plan is a written detailed scheme, setting forth the method and procedure to be adopted in working a piece of forest country, be it cutting, planting, thinning, or fire-breaking. A "Working Plan" once laid down must continue in force until the permanent head advises some revision. In practice the plans are laid down for the duration of one revolution of the forest, that is to say, for a period equal to the time it takes a seedling to become a mill log, while revisions are provided for every 10 years. While the Forestry Department may revise a "Working Plan" it should be made as difficult as possible for any outside influence or interest to alter the provisions of such a plan.

d. Financial.

Up to date the forests of Western Australia have yielded close on half a million pounds' net revenue. Not a penny has been spent on the forests. The Forest Department as it exists is a mere tax-gathering machine. This suicidal policy must cease, and in the future sufficient percentage of the revenue must be appropriated for forestry work to enable the department to lay down and carry out working plans and so maintain principle "three" of the Forest policy. Also, since Western Australia possesses no forests of soft woods, it will be necessary to provide an annual appropriation to cover the cost of planting a sufficient area to meet the requirements of the State. The funds for plantation work must not, however, come out of the revenue derived from the jarrah and karri forests, but should be provided from loan monies. Plantations of pines are most certainly "re-productive works"; they are fine investments, and are, therefore, beyond doubt loan estimate items.

e. Offences.

The greatest forest offence is setting fire to the forest, and this should be treated as an indictable offence. A man burns a shed in your back yard, and he is charged with arson; he sets fire to a square mile of forest and destroys thousands of pounds' worth of State property, and he is fined 5/. The penalty for the careless use of fire to a forest should be made as heavy as possible, while the deliberate fire-setter should be charged with arson. Other offences are all of the nature of infringements of the rules under which the forest produce may be removed, and require no special comment.

f. Repeal of old Acts with protection of Existing Rights.

While it must be admitted that the system of granting timber concessions, leases, and permits in the past was a very unsound one, it would be a breach of faith to interfere with the existing rights of the conces-

sionaire, lessee, or permit holder. Their rights must subsist until they expire by the effluxion of time. The Forest Act should contain a section repealing all previous Acts, but safeguarding the rights of those who still hold timber land under the repealed Acts.

A Few Figures About Western Australian Forests.

The Forestry Department of Western Australia is one which has contributed handsomely to the revenue of the country. Separate accounts of revenue and expenditure of the department have been kept since 1865, and every year since then, without a single exception, the Department has handed over a handsome balance to the Treasury. In 1865, the balance of revenue over expenditure amounted to £2067, and it has risen rapidly year by year until 1914, when the credit balance was £40,946. Even in war times the department has liberally contributed to the Treasury needs. In 1915, it handed over a net amount of £36,856, and in 1916, £20,245. Since its establishment the Forestry Department has paid into the consolidated revenue a sum close on half a million pounds sterling. But the forests themselves have not had a penny expended on them in the way of regeneration work or conservation of the kind that is absolutely necessary if they are to become a permanent source of wealth to the country.


Some idea of the money value of the timber taken annually from the forests will be conveyed by the following figures:—

In the year ended December, 1916, there were milled 6,242,600 cub. ft. of timber, and the hewn total was 728,350 cub. ft. To that must be added round poles, piles, and beams, which contributed 91,600 cub. ft. to the total. Mining timber must also be added, and the total of this produced in the year, including fuel wood, was 698,519 tons, and to this must still be added domestic firewood used in Perth and other towns, and the mining timber used on the Collie coal-fields.

The Shipworm and the Timber of Ships and Jetties.

(By Professor Wm. J. Dakin, D.Sc., F.L.S.,
University of W.A.)

II.

 **I**N the last number of "Jarrah" reference was made to the three ways in which attacks by the shipworm might be met. They were as follows:—

1. The timber might be covered with some material which could not be penetrated by the shipworm.
2. The timber might be made unpalatable or even poisonous to the shipworm.
3. The shipworms might be poisoned in their burrows by substances added to the seawater.

Now, it might be imagined that some kinds of timber were too hard or too compact for the burrowing of the shipworm. So far as I am aware, this has never yet been found to be the case. If the wooden jetty piles in any harbour remain free from this ardent burrower, it is either because the conditions in the water are detrimental to the life of the animal or else the composition of the timber chemically is a deterrent. Naturally a soft wood will be penetrated more easily than a hard wood, but the jarrah piles are easily tunnelled by the pests. Harbours with polluted water, especially if the waters are very muddy, will be more or less free from shipworm, and for this reason the mollusc gives practically no trouble to the dock engineers of the Mersey Docks and Harbour Board, Port of Liverpool, England. Calm, clear waters of high salinity, and especially of warmer seas, favour the development of *Teredo* and its allies.

The following data indicate how short the life of an unprotected jetty pile may be:—

New York Harbour: Pile on record destroyed inside 8 years.

Charleston, S.C.: Dangerous after 18 months.

Savannah, Ga.: Deserved replacing after one year.

Florida Coast: Various places, last from only 7 months to 20 months.

New Orleans: Piles known to require replacing inside one year.

Galveston, Texas: Complete failure in six months.

The timber used in the above harbours was not detailed. So far as W.A. is concerned, I believe jarrah piles have had to be replaced within six years in the N.W., whilst at Fremantle they last about twelve years.

Since the quality of timber is related to the intensity of shipworm attack, a great saving in money and time would result from a series of complete observations and analyses of wood affected and immune. Data, however, are still unavailable, although it has been noticed at Fremantle that one piece of jarrah may be badly attacked whilst another adjacent piece placed in position at the same time is almost unaffected. What are the differences between the two pieces of jarrah, and what has occasioned these differences? This is one line of investigation which might be taken up seriously in this State.

Now, if it is true that the natural chemistry of the timber may render it immune to the *Teredo*, there is ample reason for believing that some artificial treatment should be able to produce satisfactory preventive qualities, especially when it is remembered that all the wood borings must pass through the animal's body. Various lines of treatment have been suggested and experimentally tested, the most elaborate tests having been set going by the U.S.A. Forest Service. Up to the date of my last communications with the United States Forest Products Laboratory (1914), the most successful treatment for timber against the shipworm had been impregnation with coal-tar creosote. In order to determine the value of the different constituents of commercial coal-tar creosote, this substance has been redistilled at different temperatures as enumerated below, and experiments have been made with the products:—

Fraction 1: Light oils and tar acids, contained all distillate to 205 C.

Fraction 2: Contained most of naphthalenes, distilled between 205 and 250 C.

Fraction 3: Known as dead oil, distilled between 250 and 295 C.

Fraction 4: Contained substances distilled over between 295 and 320 C.

Fraction 5: Residue above 320 C.

In addition to the above substances, water-gas-tar creosote (sp. gr. 1.07) was tried, and also wood tar made from the destructive distillation of hardwood. Copperised oil has been used in a similar manner. Wood impregnated with these solutions was submerged in a teredo zone together with untreated timber to control the experiment. The results showed that after two years the timber treated with wood-tar creosote had failed altogether. No timber had resisted all attacks, but some samples were practically quite sound, that is but very slightly infested. These were the samples protected by permeation with coal-tar creosote Fractions III., IV., and V. Fractions I. and II. were failures. Copperised oil showed possibilities. The wood used was pine. Jarrah would not be attacked so easily, but on the other hand there would be a greater difficulty in forcing the preservative into it. It must be remembered that a perfectly protected surface layer of wood would be effective in stopping teredo attacks provided that there was no danger of this outer layer being damaged and removed.

It is stated that some creosote piles have withstood attacks for 10 to 20 years where untreated piles lasted only a year or two.

At Fremantle the treatment of jetty piles has been carried out under Mr. Bennett, who has been keenly interested in the matter and has carried out several experiments. As a result of his observations the treatment of jetty piles with boiling tar has been the chief method of protection, and up to date this method seems to be the simplest and most effective that we have in this State. The piles are first heated so that the surface is charred all over. The charcoal is then scraped off and the piles dipped for 20 minutes into crude tar kept at a high temperature in a long tank. The

crude tar is obtained from the Gas Works here and at Melbourne.

A number of other chemical formulæ have been suggested to me from time to time in this State, but it would serve no purpose to give them here, since they are to be used for impregnation of the wood, and tests on a reasonable scale of their usefulness have yet to be made. So much for wood treatment. In leaving this section of our subject, we might refer to an old suggestion—that of hammering a large number of iron nails or copper nails into the surface of a pile. Whilst this would act partly as an actual barrier, it has been supposed that the formation of iron rust from the iron nails would provide a protective layer on the wood between the nails. No definite records of the amount of protection so conferred have ever been published, so far as I am aware, although the method was recommended so far back as 1812.

Reference has already been made to the use of Muntz metal as a sheathing for jetty piles and wooden ships. This is, of course, an effective preventive although costly. Naturally the protective sheathing must remain unbroken, or else trouble will occur. During recent years concrete encasements have been used for surrounding jetty piles, and this method has been utilised at Fremantle for the vertical timbers. It is not altogether a success unless utilised together with chemical treatment of the timber, and an inspection of the encased piles made by me some years ago showed that the concrete casings too often cracked and broke away, setting free the sand immediately surrounding the timber and initiating a state of affairs which was serious, considering the cost of the material. The concrete encasement method requires further elaboration by qualified engineers, but a cheap and efficient process of chemical treatment of timber would probably be far better in any case.

Finally, the question of killing the Teredo by adding poisonous substances to the water surrounding the piles might be considered. This would have to be done continuously or periodically. In large harbours open to the sea with moving waters it is extremely doubtful whether any method could be devised whereby poisonous

waters of sufficient concentration could be brought into contact with the burrowers, although a method was suggested some few years ago. It is possible that by passing an electric current into a jacket of seawater retained around a pile by concrete encasement a solution of substances poisonous to shipworms and their young stages could be cheaply obtained. This, however, is a question for the physicist and the chemist. Like many other suggestions put forward, no practical tests have ever been made, nor even critical calculations by competent scientists.

To sum up, it would appear that the easiest, cheapest, and most efficient defence against the shipworm consists in soaking the timber in hot creosote or crude coal tar. There is, however, plenty of room for improvement, and Western Australia is a State where experiments could and should be continued on a large scale to find the best method. In countries where timber for piles is more expensive—perhaps has to be imported—it is likely that, instead of making experiments, wooden piles will be given up and replaced by reinforced concrete. We have suitable timber for piles, and it is our duty, therefore, to see that the best methods of protection are discovered. From the simple point of view of cash saved (a point of view that should appeal to the man in the street who has no special interest in timber or jetties), experiments and tests would repay the State.

Pine Planting.

An Arresting Object Lesson

A PRACTICAL object lesson is often more effective than pages of explanation and exhortation. Through the courtesy of Mr. Walter Gill, Conservator of Forests, South Australia, "Jarrah" is able to put before its readers an arresting set of figures regarding the profits that are to be had from the planting of pines. The attention of farmers and others having suitable land is

directed to these South Australian figures. Few crops raised by the farmer show a profit of over £10 per acre per annum. The farmer who puts in a fair patch of pines is doing a very wise thing. The man with a family is providing marriage portions for his daughters when he plants pines on a block of his land.

ESTIMATED COST AND PROFIT PER ACRE PER ANNUM FROM PLANTATION OF PINUS INSIGNIS CARRYING 100,000 SUPER FEET PER ACRE, OF ROUND, MARKETABLE LOGS, SUITABLE FOR CONVERSION INTO CASE TIMBER.

Value on trucks at £1/13/6	
per hundred super feet	£838 0 5
Value of land per acre	5 0 0
Cost of formation per acre	10 0 0
Cost of maintenance per acre per annum	0 1 0
Cost of conversion (at 13/11 per 100 super, 100,000 super, per acre, and 50 pct. recovery per acre, including cartage to rail) £347 18 4	
Cost of oversight, at 1/4 per 100 super	33 6 8
Interest on capital outlay (5 pct. of £1110) at 7d. per 100 super	14 11 8
Depreciation of plant (5 pct. of £1110)	14 11 8
	410 8 4
	£425 9 4

On a rotation of 33 years and carrying compound interest at 4½ pct. the profit on the plantation will be value of timber on truck per acre . . . £838 0 5

Less—

Value of land per acre	£21	7	4
Cost of formation per acre	42	14	9
Cost of maintenance per acre	3	7	0
Cost of conversion per acre, including cost of oversight, allowance for depreciation of mill plant and interest on outlay for mill plant	£410	8	4
			476 17 5

Profit per acre after 33 years £361 3 0

Profit per acre per year £10 18 10

(a) The amount given as value of land, viz., £5, is an outside valuation.

(b) The amount given as cost of formation per acre, viz., £10, is equal to the highest paid by the Department for the work.

(c) The percentage of waste timber is less than 50 pct., being probably not more than 40 pct.


This gives the highest record attained, and shows what may be reasonably expected with similar conditions, but it must be stated that where inferior land has been planted the returns have decreased in proportion to the inferiority of the land and the unsuitability of the conditions.

Canary Pine.

(*Pinus Canariensis*.)

(By Dr. G. V. Perez, Tenerife.)

(Translated from an extract from "Le Bulletin de la Societe Nationale d'Acclimatation de France." August, 1917.)

 **T**HIS pine, which is deservedly esteemed for its magnificent wood, is destined to have a great future in the many countries where conditions are favourable, that is to say, in those regions which border the Mediterranean and, in particular, in the north of Africa, from

Egypt to Morocco; Englishmen, with their practical good sense have formed, during recent years, large plantations of this conifer in South Africa, where it prospers admirably. Mr. D. E. Hutchins, who has done much for the development of forests in the Cape of Good Hope, has contributed more than any other to the introduction there of this pine, which on account of the durability of its wood will be of the greatest service for railway tracks and all kinds of constructional purposes in countries naturally sparsely endowed with forests. That eminent forester, after retiring from the service, came to see for himself the famous Canary Pines in their native surroundings, and he tramped over the dry arid mountains and slopes of the southern end of the Island of Teneriffe in order to make himself fully acquainted with the appearance and remarkable qualities of the few venerable specimens still left. The destroying hand of the wood-cutter, since the conquest of this island, has made upon these pines a war to the death. There remain few of these magnificent old trees, with trunks measuring as much as two metres in diameter, and which has successfully resisted the climate of the higher zones of the Canaries, and particularly that of Teneriffe, where few forests of the larger flora are able to live. There occur some remarkably hot days with an exceedingly dry atmosphere, followed by cold nights, when it freezes often as much as 10 deg. C. below zero. Near the village of Vilaflor, to the south of the Peak of Teneriffe, there still exists a small patch of these pines at an altitude of 2000 metres, and at a little distance from the village a venerable tree has attained almost 50 metres in height and 8 in circumference.

"The old balconies of houses exposed to the summer suns and winter rains show how perfectly this wood (known locally under the name of Tea) resists extremes of temperature. The wood is never painted, and in old houses the beams are never tarred. One can see timber that has been in position for two or three centuries, and it looks as if it had been put there yesterday.

"Old wine presses made of this wood and exposed to the sun present to the traveller a pleasing object-lesson. Their enormous levers of Tea, after being used for

many generations, show no symptoms of decay. The wood, when well cut and polished by modern carpentry methods, makes splendid parquet, equalling that of the best Chinese work. I have seen at La Laguna, in one of the old houses, a parquet floor which was worthy of a palace in London or Paris. The old carpenters who built these houses of Tea greatly damaged the planks by using large nails.

"It is a very hard wood, very difficult to work, but as a material for buildings and for purposes requiring durability it has no equal. In the ground it has the resistance of iron.

"The account of it, given in an admirable bulletin of the Forest Department of Chili, a publication very little known in France, as it is written in Spanish, has so inspired me with enthusiasm that I think of using extracts from it for articles for the 'Bulletin de la Societe Nationale d'Acclimatation de France.' I shall not here quote the numerous tables of figures and growths (height and diameter), which have been prepared year by year, and I limit myself to giving a short summary of the careful observations recorded by the Chilean Forest Expert, who, it may be mentioned, has made the service of which he is in charge a model, worthy of being imitated by other nations. I very much doubt whether the very complete work done in forestry in Chili has been equalled in any other country. There is certainly much to learn from what M. F. Albert has published; in these later years especially about the climatic conditions in North Africa. M. Albert gives the preference to our pines above all those which have been tried on the southern coast lands of the Mediterranean. The mean annual growth of Canary Pines exceeds there one metre in height and one centimetre in diameter; thus, in 20 years the height of one of these trees will reach 20 to 30 metres, and the diameter will vary from 20 to 30 centimetres.

"Every soil is suitable to Canary Pines, from the sea shores up to an altitude of 1500 metres.

"It stands irrigation better than any other pine and does not weaken, and also

it thrives well among other species. Strong winds, drought, and slight frosts do not harm them. Indeed, even strong gales do not uproot them, as is the case with other varieties.

"After being felled the trunks re-shoot, a phenomenon very rare among pines.

"The trees can be planted at very little distances from one another—1^m25 x 1^m25 and often 1^m x 1^m in very dry ground; such has been the experience of M. Albert.

"Like the *P. longifolia*, it is a species which gives the greatest cover to the ground, because of the closeness of its long branches. It is, therefore, of a high value in preserving coolness of the ground in dry climates.

"Its growth is slow in the first years (8-10), but afterwards it surpasses that of all the other pines introduced into Chili, with the exception of Monterey and Himalaya, but when older its growth surpasses, in Chili, that of the Monterey.

"One other quality of this tree is that it grows a good trunk, even when it grows isolated. Lastly, M. Albert estimates that its thick bark prevents ground fires from penetrating to the tree. Before closing this note, let me remark that in many distant countries, such as Australia and New Zealand, this tree does very well, and there are now in existence very fine specimens of it in central France and in Italy.

"After the present terrible war, the economic question will force itself upon several countries. Reforestation is of the utmost importance, in order to furnish timber for many purposes; this means enormous richness for the country where Canary Pine is grown, and its cultivation should not be neglected by the Governments. We know that barren regions, such as were formerly the Landes, have been thus increased in value. The example given should be followed in such countries as Egypt, Tripoli, and Morocco. The account of the results obtained in Chili is for me a great encouragement, and makes me certain that *Pinus Canariensis* will be an ideal forest species in temperate regions, where it would do better than other pines known in Europe. These can not be compared with it in its exceptional resist-

ance to dryness and in other of its qualities."

* * * *

In his "Tree-Planting," published in 1899, Mr. D. E. Hutchins, writing of *Pinus Canariensis*, says:—"A native of the high desolate regions of Teneriffe, from 4,000 to 5,000 feet. It forms there a belt above the zone of evergreen forest, and in a scattered state extends to sea level. Its timber is highly prized for its durability, strength, and good working qualities. It is known to have lasted in houses for three centuries. Its timber is highly spoken of at Madeira. Sir Joseph Hooker describes this pine as still existing in Morocco. It has only recently been grown on a large scale in Cape Colony. So far it seems quite hardy in the Southern districts and Knysna, though it prospers most in mountainous districts. In the Cape Peninsula it has a growth about half that of the Cluster-pine. It is easily recognised by the whitish blue appearance of the seedlings and the long leaves (needles) of the older trees. It is hardy in most parts of S. Africa, but especially at some elevation, and it deserves the special attention of tree-planters, on account of the superiority of its timber to that of all the other common naturalized pines. Clean seed averages 266 to the ounce."

* * * *

This pine is admirably adapted to suitable climatic areas of this State. It has already been grown here to some extent, and some very fine specimens may be seen, particularly one at Bengel Siding. It will be seen, from what has been said about it, that it is partial to ironstone soils and the gravelly slopes of hills. It should, therefore, do remarkably well in the jarrah districts of Western Australia. The attention of farmers might well be directed to it, not only as its timber is of high commercial value, but as a shade tree and a break-wind it stands almost unrivalled. The tree attains a height of 150 feet. An unusual feature about this species is worthy of note, and that is that, when the tree is felled, the stump sends forth sucker shoots. The Forestry Department raises the Canary Pine in its Nursery at Hamel, so that farmers and others who wish to plant it will have no difficulty in procuring young trees.

Avenues of Honour.

THE question of the most fitting form in which those who, by one reason or otherwise, have been forced to remain at home can show honour and respect for the brave men who have gone forth to fight their countries' battles, many of them laying down their lives in the task, has been widely discussed. Memorial tablets, whether in stone or the more enduring brass, have been mentioned; but these must necessarily be placed in a position where they only meet the public eye when sought for. Memorial Halls and such edifices have a high value, but in them, too, there is something wanting to give the appeal, the weight, and continued publicity which is called for. No more appropriate suggestion seems to have been offered than that which urges that the memory of our heroes should be kept green in the minds of men by avenues of beautiful and stately trees. This idea, although something of a novelty in Western Australia, has, for generations, received favour and been acted upon in Continental countries. One may point to such splendid examples as are to be found in Paris and Brussels. Every visitor to these noble cities is struck by the numerous avenues of magnificent trees in the cities themselves or in the open suburban country. The wayfarer making enquiries on the subject will find that these avenues have another value to the citizens besides that of shade and beautifying the streets and environs. He will learn that each of these long, symmetrical lines of trees keeps green the memory of some great event in the National History, or is there as a living memorial to gallant deeds done by the country's sons.

In Western Australia the notion has already received some attention, and the King's Park Roads Board was happily inspired at a recent meeting when it was resolved to lay out and maintain an avenue of trees along the route of the May Drive, in memory of Western Australian heroes who have fought or fallen during the present war. The first section of the proposed

avenue will be about 3 miles in length, starting from the junction of the River road to May Drive. It will be divided into sub-sections, each of about 40 chains in length, with planting as follows:—

First sub-section: Oaks. The other sub-sections will be announced later, so that friends and relatives may order the trees they may select, and thus ensure their delivery at the appointed time. Any relative or friend of a deceased soldier may select and provide selected trees, and upon giving notice to the chairman of the Board will have allotted to him or her a position in one of the sub-sections. Application should be made as early as possible. Should a greater number of applications than 160 be made in respect to any sub-section, the opportunity to plant will be decided by ballot. Positions in the respective avenues will also be balloted for. Every tree must be provided with an indestructible plate, of a pattern which later on will be on view near the King's Park-road and Subiaco entrance gates, and such plate must, as far as is practicable, contain the name, rank (with honours, if any), age, place, and date of death of the deceased soldier, with the words: "Planted by —, August, 1919." The plate and the matter thereon must be provided at the expense of the relative or friend. The Board will endeavour to obtain prices for suitable plates and publicly notify same. The King's Park Board will clear the avenue and prepare the ground for planting, and will assist relatives and friends as far as possible as regards the watering and care of the trees when planted. A day in the month of August, 1919, approximate to the anniversary of the war will be set apart for planting, which date will be duly notified.

It is earnestly to be hoped that the example set by the King's Park Board will be widely imitated all over the State by Town Councils, Roads Boards, and other public bodies.

The Australian Forest League will be happy to advise prospective planters regarding the most suitable of the State's indigenous trees for planting.

Karridale—Its Story.

An Object Lesson in Forest Management.

(By J. T. Breen.)

THE ordinary citizen of this State is generally of the opinion that, except for a few original settlers, West Australia is new, and owes its existence to the discovery of gold about the year 1890. To those who have made the excursion to Augusta, and who have the observing faculty, there are evidences on the road of what might be almost termed a buried civilisation, which, on enquiry, is found to have existed prior to the advent of the gold-seekers. Many tourists on passing through Karridale may have thought of the place only as one of the many abandoned timber-mill sites, that unfortunately are to be found in our timber areas, owing to the want of that knowledge of how best to make the most of the great timber asset at one time existing in the South-West.

To one interested in past history, and capable of reconstructing the past from its relics, a visit to Karridale would well repay a few days' camp in the vicinity, more especially if the enquirers were accompanied by one of those who worked there in its palmy days. Those of the houses that escaped the forest fires, and there are yet a goodly number, recall the haunting lines:

"Year after year unto the silent door—
The changing seasons bring the blight and bloom,
But courtesy is cold and yesterday
Guards every silent room."

But sufficient remains of them to indicate that comfort and affluence were not unknown, and the glorious wealth of beautiful and graceful exotic flowers scattered through the overgrowth of native scrub shows to the observer that the soil is rich, as well as indicating that the æsthetic side of life was not neglected in those pioneering days.

If one can manage to find time to visit the magnificent Mechanics' Hall, one of the houses that has escaped destruction, the imagination can easily visualise some of

the pleasure there indulged in. The grand piano, still apparently in good order, numbers of decorative flags, the chairs, the fine stage and its decorations, the library books are there as they were in the days when the sounds of the engines, the saws, and the axes provided the music of the everyday life. Where life is simple and sane, as it was here, true pleasure accompanies it, as the fragrance does the uncultivated boronia. The life was hard, hampered, and wanting in many things ordinarily considered as of value, but, nevertheless, that rare plant, joy, flourished exceedingly.

In the vacant hall imagination easily pictures the story which probably symbolises the type of which the population was composed. A father of a family, now the grandfather of more than one of the Anzacs, who by an accident in the mill one afternoon lost three of his fingers, wrapped the stumps up himself, told no one of its being serious, and appeared at a send-off to one of his daughters that was taking place that afternoon in the hall, and successfully concealed the seriousness of his injury until her departure. A Spartan father, truly!

The loneliness of the hall soon sends one out into what was once a busy settlement, but is now only the skeleton of its old self. Gardens are overgrown with scrub, although the outlines of paths and many of the exotic plants are still to be found. Each one could no doubt tell its tale of the past to a sympathetic mind, but there is one conclusion that is conveyed to even a dull comprehension—that here was one place in Western Australia, probably typical of many others, where the situation, the climate, the personality, and the possibilities were such as to warrant the permanent establishment of a virile population. But the result is dry rot. Why? Because the timber which should have been the foundation and mainstay of the place for ever, and capable of supporting besides timber-workers quite a large agricultural population on those portions where timber is not the best product, has been used up, without any provision for the future. Nature planted a large store of wealth here, and lack of wisdom has destroyed what should

have been capital for future development, just as the spendthrift son of a thrifty father wastes in riotous living the whole of the old man's hard-earned wealth.

It is about 20 years since the place became deserted, and Nature is again endeavouring to regenerate the natural wealth. There are again many thousands of young Karri trees up to perhaps 130 feet high growing, indicating the future possibilities, but a good many years must yet elapse before the capital which beneficent Nature is storing up will begin to provide interest or may profitably be made use of. It may be hoped that the lesson at Karridale is one that will help to bring about a more enlightened idea in the future of how a natural forest wealth should be cared for, and made to produce an ever-increasing output of its natural timbers, instead of, as in the past, one crop only.

Forestry and Character.

(By Kingsley Fairbridge, Diploma of Forestry, Oxon.)

DR. Montessori has demonstrated the fact that vocation reacts upon the mind. So then the vocations of a number of individuals must react upon the collective life of the people; and vocations that demand wisdom, patience, and foresight will add to the sum total of the nation's good character. In the Spessart Mountains, in Bavaria, the rotation for the best oak forests—the timber from which the finest wine cask staves are split and hewn by hand—is no less than 200 years. The forester, planning his regeneration to-day, looks ahead two hundred years to the reaping of his crop. To at least some extent he must be imbued with the wisdom to understand that he is merely the trustee of Nature's bounty, with the patience that toils for its children's children rather than itself, and with the foresight that can shape ahead the destiny of the fruit of the soil for nearly seven generations of men. I venture to think that the character of the British Empire is still very much in the melting-pot.

The war may have a considerable effect upon us, though at present we are too near to it and too new to it to gauge its significance; but four years ago, when greed and folly were rampant and the word "patriot" was a synonym for "scoundrel," the middle-aged pessimist had some excuse for declaring that England was decadent and we were all going to the dogs. If nothing else, we were certainly blind to our own interests and our country's interests in the matter of our timber resources; England was importing annually £20,000,000 worth of softwood that she could have grown herself, Western Australia was busy buying Japanese oak and Yankee oregon when she contained one of the finest stands of timber in the world, Canada was burning up her pines to the tune of millions sterling, and South Africa, an almost timberless country, had shortened her forest rotations to suit the "demands" of an untutored electorate. These incidents, though they may appear insignificant to the lay mind, represent a ruthlessness unashamed; and it was with a feeling almost akin to jealousy that British foresters read in the early war communiques that "the Uhlans and German cavalry have strict orders not to tether their horses to wayside trees"—the reason being, of course, that the horses would nibble and chafe the bark and trample the rootstock, thereby causing a purposeless destruction which some ruthless Teuton in the higher command was anxious to avoid. One earnestly wonders if our own cavalry and scouts had similar orders.

A stratum of thoroughly trained foresters throughout the length and breadth of the Empire, and a properly organised and co-ordinated forest policy, would tend to give us as a nation both stability and the distant vision; but it is to be hoped that Australia will avoid the English mistake of decentralising forest education by having schools of forestry at a number of centres. The centralised system, one forest school for the senior officers and one for the junior, is in this case infinitely preferable. A glance at the curriculum of the premier British institution for senior officers, the Oxford School of Forestry, will show the expedience of consolidating the training


ground, and thus obtaining specialists in every department:—

1. General botany, 2 years.
2. Geology, 2 years.
3. Zoology, 2 years.
4. Chemistry, 2 years.
5. Forest botany, 1 year.
6. Forest engineering and surveying, 2 years.
7. Forest management.
8. Forest policy.
9. Forest protection.
10. Forest Utilisation.
11. Sylviculture.
12. One year's experience of working plans, methods, etc., in an actual working forest.

Most of the above subjects are, of course, followed concurrently, and the total course occupies three to four years. In Germany (and, I believe, France) the same course takes six to seven years. Specialisation, such as research in forest utilisation, is out of the question unless forest education is consolidated; and he would be either a very bold or a very ignorant man who would argue, in the light of recent events, that specialisation, either in forestry or otherwise, does not add power and ability to the nation that practises it.

A Dead Forest.

(By *W. Siebenhaar.*)

 **T**HE West Australian Bush has some of the qualities of the bull-dog, and should therefore appeal to Englishmen. Repellent and forbidding at first sight, it is in reality far more good-natured than the forests of most other countries, which are, as a rule, the haunts of dangerously hostile animal life. Those who do not fear it, and who trust themselves freely to its company, soon become aware, often with astonishment, of its friendliness, and in due course begin to love it. But its grip is tenacious, both in retaining our love and in resenting the ill-treatment of man. For the only time when it really becomes an abode of peril is when ruthless man has ringbarked or fired its giant columns.

Not many excursionists know the luxury of impression to be obtained from an itinerary through a dead forest. Nothing, perhaps, resembles it so nearly as some parts of Dante's "Inferno." Come with me, this cloudy, gloomy winter's day, on a short-cut pedestrian trip from Mundaring-Weir to Kalamunda. Have no fear that the road will be crowded. There will be no motor-hogs, no over-loaded, over-driven traps, no jaunty equestrians, no motor-bikes or pedal bikes; there is no fear even of our meeting our equal, the lonely pedestrian excursionist, for the track goes through wilderness and dead forest, and only attracts eccentric persons like you and me. Down to the Helena River by a crazy winding path, all ruts half a yard or more deep. Across the muddy bridge, and then over broken, mouldering timber up the winding incline of a long-neglected bush-tramway. Keep your eye on the leaning trees, and do not stumble over the fallen ones that cross your path. Also, look out for four-inch nails projecting from upturn sleepers, which may lacerate your boots or trousers, if not your feet and legs. Upward goes the track, through forest living, dying, and dead, a true battlefield, until we reach the crest of the hill; here we are on the plateau, in the midst of the "Greenmount State Forest." For close upon three miles, the tramway, where we can still recognise it, is our guide. The last time I visited the place, the solitude was suddenly broken upon, just for a fleeting moment, by the distant bounding past of a family of kangaroos, which vanished again into the Bush like a procession of ghosts.

And now we come to an open space, on which fresh vegetation is rapidly encroaching and making the human landmarks disappear. This was once the site of the mill. The last time but one I passed it there was a dilapidated cottage still standing, and the mother of a large family gave me most sensible directions for finding the right way: "Keep your eye on the new bread-cart-tracks," she said, "and you can't go wrong." Now all is desolation, and if its grandeur does not make you feel that it is a true bit of Shelley's "desolation deified," I must deny your claim to a poetic soul. The changes since my last visit make it already difficult to recognise the proper


exit from the space. But once more, this rainy season, a landmark on the further Bush-path, the huge puddle has gathered on which at one time the children from the cottage navigated, or rather rocked, their boat, consisting of a square table turned upside down: a scene of merry sailors' life in the midst of death.

From this point the giant vision of lifelessness is complete. Do not talk too much, or the similarity of the numberless tracks, now all long since deserted, will make us lose our way. Also, like myself, you would feel it an irreverence. Let us be respectful to the dead, especially those of them who are still standing upright, and might at any moment topple down on us. Our journey is not only a winding one, but one also of endless zig-zags, for the dead titans sprawling with huge limbs across the track necessitate an incessant series of roundabouts, with corresponding danger of losing our way. And, truly, it is the Black Death that has so ravaged this silent land, for nothing could be darker-hued than these massive lifeless trunks and straggling branches and twigs, all sere by the terrible fires that have gradually extinguished the last breath in them. They look grotesque, a colossal mockery of form, more terrible than skeletons, a moveless dance of death in a measureless graveyard. At a distance they all grin. It takes courage to approach them defiantly, and then the menace of their features proves wholly extinct, black, meaningless. Battlefield of the gods? Yes, that is exactly what it is. The gods of fire and storm have raged, and the titans have been defeated. It is later than the "twilight;" it is a veritable night of the gods, but night in the midst of day. A gloomy day, it is true; but even when the sky clears for a while, the ghastly effects are enhanced by the immense shadows the clouds cast on this gaunt, up-towering tangle of distorted, monstrous, moveless tentacles. If it seems weird and eerie, don't say so, but just pace on with me. We'll get to the end presently. Hark! what hollow reverberation rolls through these boundless halls of ruin and solitude? The shock is only momentary, for, a second after the sound, the distant presence of the axeman is realised, and not without a feeling of relief, for of all the sensations of

awful loneliness there can be few more oppressive than those in the dead forest. A graveyard covering miles of undulating tableland.

Then, suddenly, a wonderful light glimmers in the arboreal distance, a light of emerald glory that makes us doubt whether after all the Northern forests have more color-beauty. Clearer and clearer it grows, until we begin to distinguish the green, living Bush of the Valley of Kalamunda, and towering above it the verdure-clad hill beyond the gully. It is the return to life, the return from a visit to the grave, the return from the Kingdom of Death.

Farmers and Trees.

 **I**N many parts of the agricultural areas of this State the destruction of valuable timber that has gone on for years threatens to lead to serious results. In these districts many settlers have regarded the timber on their property as an enemy to be destroyed, and have treated it accordingly. Already many farmers are beginning to realise the folly of their course, for timber in some places has become so scarce that the farmer has difficulty in finding firewood on his own holding. Western Australia's experience in this direction is by no means singular. In the Eastern States the work of the destroyer in some districts has been so complete and the effect so disastrous that farmers are hastily planting trees. In some States the Forestry Department has been called upon to advise in the work. Unfortunately, there is no legal enactment in existence, either there or elsewhere, which compels farmers on freeholds to preserve a certain portion of timber on their properties, and they are permitted to go along their wasteful way until the evidences of their own foolishness are too apparent to be overlooked. In America and Canada the same thing happened, but there a better state of affairs has now come about, and the farmers tend their "wood lots" as carefully as they do their other products of the farm. Those of them who early recognised what timber on a farm may mean to a farmer are to-day

reaping the results of their foresight, as may be gathered from an article in a recent issue of a "Canadian Forestry Journal," which says, *inter alia* :—

"This is what has taken place in Ontario within the space of one life-time.

"The nature and extent of the change that has occurred were vividly called to mind on noting the results of the sale of part of a wood lot on a farm belonging to Mr. George Cain, in the Township of Clarke, a few days ago. Ten acres of bush were sold, at an average price of 100 dollars per acre. Part sold up to 200 dollars per acre. Some of the poorest, consisting of second growth measuring in circumference no more than the span of a man's arm, went well over 50 dollars.

"It was mixed timber—elm, maple, hemlock, and a few scattering small pine for the most part. None of it was equal, or anywhere near equal, to the original forest; a good deal of it would have been classed as underbrush by the pioneers. And still the timber, as it stood, sold at the prices noted.

"'A year ago,' said Mr. Cain, the owner of the place, 'I offered the whole 50 acres, land, bush, and a good barn, for 1800 dollars. Now I have sold ten acres of the bush alone for 1000 dollars, and I have four or five acres of standing timber left still. Seven or eight years ago I sold a block of timber, which was 100 per cent. better than that recently sold, for eight-tenths of the average price per acre.'

"That statement shows how timber has appreciated in value in the course of a few years. The extent to which timber values have changed in a rather longer period of time is still more strikingly shown by this statement.

"'As a lad,' said Mr. Cain, 'I helped to log up and burn in the fallow timber that was vastly better quality than that disposed of in either of my two sales.'

"And the man who has witnessed this sweeping change in conditions is still in the full vigor of his manhood. That wood fuel has become so scarce in Clarke in the course of one generation shows a grievous lack of foresight on the part of the past and passing generation, because there are thousands of acres in the township, unfit for agricultural purposes, that could have been made a permanent source of wood supply. That these waste areas are not being re-forested is a serious reflection on the present generation."

As matters are now conducted in the farming areas of this State, some of these areas promise to become at no distant date absolutely tree-less, and in other cases the timber has been destroyed to such an extent that trees for shade and break-wind


purposes have disappeared. Farmers who treated their timber in this reckless fashion display a serious want of appreciation of their own interest. There is one aspect of the question which deserves careful consideration on the part of the agriculturist. Tanning agents have become scarce, and after the war bark containing the requisite percentage of tannin will fetch a high price. There are few farms in Western Australia which have not some extent of land that cannot be classified as good for agricultural purposes, but much of it, and more particularly where the annual rainfall is 25 in. and upwards, may be suitable for the cultivation of wattle. There is money in wattle, and the farmer who has the land and puts in wattles to-day is making an investment which in a few years' time will yield him handsomest returns and continue to pay these returns year by year.

But farmers are not the only sinners in the matter of reckless tree destruction. Town Councils and Roads Boards have not always been too wise in the manner in which they have treated the timbers on the sections under their control. There is nothing which makes a township or a road so attractive as borders of handsome trees. The present seems to offer particularly favourable opportunities to public bodies for tree planting. It has become common in other communities, which, like this, have sent many of their sons to take part in their country's battles, to commemorate these heroes and their deeds by planting avenues of trees. The practice is a highly laudable one, for it at once serves utilitarian and æsthetic purpose, and at the same time tends to keep green the memories of gallant men and gallant deeds.

Wanton Tree Destruction.

(By J.M.L.)

"When we plant a tree we are doing what we can to make our planet a more wholesome and happier dwelling-place for those who come after us, if not for ourselves."—O. W. Holmes.

 **T**HE above extract from a writer whose love for trees was only second to his love for humanity might well be studied by a number of people whose one aim in life seems to be the destruction of all the na-

tive trees in their vicinity. Not only on their holdings but on the adjoining roadways they resent the very sight of a tree.

In our part of the country, the Eastern Districts wheat belt, where, owing to the small rainfall, the forests are not very dense nor the timber of great girth, and where the clearing in consequence is both easy and inexpensive, this wholesale destruction of trees has been most marked. Settlers' one idea seemed to be to get the maximum area of land cleared in the minimum of time, so trees were ringed and felled and burned with feverish haste. They lost sight of the fact that their stock would require shelter from the fierce rays of the sun during the long summer, as well as from the keen winds which prevail during the winter months. They also forgot that later on firewood would be needed and posts for fencing. Even old settlers who knew the needs of stock, when it was discovered that the land was good for wheat, cleared large paddocks, hundreds of acres in extent, of every vestige of foliage. (This writer has in mind one beautiful stretch of salmon gum forest through which it was a positive joy to drive. Alas! not a tree of it stands to-day.) I am glad to say that all the settlers have not sinned in this respect. One big holding in particular has belts of timber about five chains wide ranging from eighteen to forty chains long in most of the fields over a hundred acres in extent. These belts of timber are not only a boon to the stock, but also a pleasure to the traveller, lending as they do variety to the scenery and relieving the eye in summer by their welcome green from the intense monotonous glare of blue sky and sun-baked earth. The folly of indiscriminate clearing has come home to-day to these unwise settlers. Sad experience has taught them that man cannot live by wheat alone, that a little mutton and wool is necessary also, and mutton and wool when growing must have shade in summer and warmth and shelter in winter. To see sheep and other farm animals in a large bare field on a scorching January day seeking shade beneath a wire fence shakes one's belief that man is a reasoning being.

But the isolated man on the land is not alone in his desire to get rid of the trees;

this spirit of destruction pervades the roads boards also. In clearing a road no consideration is given to the fact that trees impart a beauty to a roadway. No judgment is shown as to the needs of the wayfarer, whether man or travelling stock, but every tree is felled with a ruthlessness which is as unnecessary as it is foolish. In this district almost every road has been denuded of trees and scrub for the whole width, viz., a chain. It was only through the intervention of one or two tree-lovers, who have fought hard to prevent the particular roads they travel from being made dreary and desolate, that every highway in this district has not been cleared out and out. Later on there will be a movement set on foot to plant all these roadways with trees, as has been already done in the other States and other countries. If people could only realise that in clearing holdings and roads discrimination should be used, and that wherever possible those "venerable columns" planted by a wise Providence and requiring so many years to attain height and girth and grace should be left untouched, it would be a benefit both to themselves and to the whole community.

Treasury versus Forestry.

By "Sawmiller"

WE have all experienced the Drunk who greets us in the morning with the old tale that he had no tea last night and had to sleep out on the river bank, and "for the love o' God, would yer give a bloke a couple o' bob to git a bit o' breakfust," and having received the two shillings, he immediately proceeds to give the lie direct to the old *Bulletin* story of the old Domain dosser who, in answer to his mate's enquiry of whether he had had any breakfast, replied—"not a drop!"

What has that got to do with our little publication *Jarrah*?

I will proceed to work out the analogy, and will own up for a start that I am a sawmiller and an interested party.

Jarrah, I understand, sets out to awaken a "Forest consciousness"—to tell people to rub their eyes and sit up, and take notice that Western Australia had and has

a valuable forest; that it is a disappearing asset, that the asset can be reproduced; that the reproduction needs skill and experience and money; that we have some degree of experience, and the sooner we start work on reproduction, the earlier we will get the necessary local experience; that arrangements have been made to get the money—in fact it is now pouring into the Department chest—and then *Jarrah* wakes up! and it is the word MONEY that gave it the necessary shock.

I was under the impression that money was being collected for and spent on Forestry—collected, yes; spent, no!—at least, I would like *Jarrah* to tell me where and how it is being spent, for there are not any outward or visible signs of it.

Several months ago—before *Jarrah* was born—I formed one, a very humble one, of a deputation to the High Panjandrum, the Right Hon. the Minister for Forests, to discuss and protest against certain alterations in the Timber Regulations, including the doubling of the royalties payable. It appeared to me to be an earnest deputation, full of discussion and protest; the members appeared to think they were having a rotten-enough time as it was without having a lot more expenses put on to them, and so on, and so on, for about an hour.


But the earnest deputation had met an earnest Minister, who had evidently been reading and learning things during his short time of office, and had also come to the evident conclusion that having a real, live full-blown Conservator of Forests on hand, the least he could do was to give that Official a chance of justifying his existence. He, therefore, shed some large tears over the state of the Timber Industry and those engaged therein, and told the earnest deputation all he and the Conservator were going to do with the money obtained from the extra royalties. The Ministerial reply was very earnest and was a liberal education to the ignoramuses before him . . . he was going to do real forestry work—I beg pardon, FORESTRY WORK, with large capitals, and "I give you my word of honor gentlemen, that the extra royalty to be collected under the amended regulations will be earmarked for Forestry Work, pure and simple," or words to that effect.

What do we find? Not a blessed copper being spent on the purpose for which it is being collected! Now, *Jarrah*, do you see the analogy? The Government asked for an extra "bob" to buy some breakfast (alias, do some Forestry work,) but the money has gone into the same drunk-fund—the general revenue.

I submit, *Jarrah*, if you wish to retain the love and respect of the sawmillers, you should obtain an Order of the Court that the money obtained thus under what has all the appearances of false pretences should be refunded to the sawmillers, or put to its proper use.

Other Trees Than Ours.

(By *W. C. Thomas.*)

 THE cobbler said there was nothing like leather. Lovers of our bushland think there is nothing like trees:—

The big trees, the little trees,
The sombre ones and gay,
That sing or murmur in the breeze
Through sunny hours and grey!

And when we have done extolling the charms of our own native trees, we can well turn for a moment or two and look with kindly eyes upon the splendour of exotic trees. The "something different" aspect of these trees of other climes, set in among our own, is always refreshing to the eye, and appealing to the aesthetic sense. In the way of comparison, too, it is well sometimes that in our day's march we drop across these trees of other climes flourishing among us, for then we visualise all the more the individual points of beauty about our own trees—and the practical forester picks up information as to how well or ill fares the exotic tree in our soil and shapes his policy accordingly. I have known people when viewing a robust, well-formed red-gum at some distance think how very like an English oak it is. There are some big, symmetrical red-gums on the flats around Pinjarra that always suggest oaks in English parklands, but there the likeness ends, and the red-gum loses nothing by comparison, for it is a "classy" tree and pleasing withal. One of the most striking

object-lessons of the charm of exotic trees flourishing within easy view of the city is at Darlington—that delightful hill-side resort on the brow of the ranges overlooking Perth, and to lovers of placid panorama affording an ideal example, the valley of the Helena granting a far-flung picture of foothills, river flats, and bushland, ever-spreading towns and villages, culminating in a commanding view of the metropolis itself on a distant ridge lined with a silvery band that tells you that there lies the Indian Ocean. And all this is available for you on the spot where John Allpike—of blessed memory, since his heart was generous and his purse-strings loose—planted an avenue of exotic trees and distributed others about his Leithdale property, high up above the village, and here, in the pulsating spring-time of the West, when the fresh, warm sun seems to compel life in the most indolent man or plant, you can see the coming of a new season and know for certainty that nature is rousing herself into new activities and gaieties once more; in the drowsy, languid days of summer there is deep, unbrageous shade, and in the autumn, those entrancing hues of old wine and russets and gold that seem like the fires of Time consuming the glory of spent nature. John Allpike combined the beautiful with the practical, but it is with the beautiful that this theme is associated, though the practical forester will tell you, as Hutchins has told us in his great work on West Australian Forestry, that these ornamental trees have a very practical issue and could be made of great commercial value to the State. Allpike planted several kinds of pines, and these are all in flourishing condition, their heads raised proudly above the road, and compelling attention for miles around; but there is novelty for the enthusiastic botanist in the way of some trees from Queensland, including a Bunya-Bunya (*araucaria Bidwilli*), and a Jacaranda (*J. mimosifolia*), a couple of English ash, the sight of one of which would make an enthusiast weep, for some vandal or other not long ago slaughtered the parent bole, and it is at present nothing but a series of suckers, though plentifully foliated and making a bold effort to look presentable. The bluey-green leaves of these ash are like a beautiful chord of music emerging from

an oddly-selected mass of discords—the color and sheen stand out so vividly among the quieter settings of the native shrubs and pines. The goldfields hibiscus here grows vigorously, and among other uncommon

sights is a Japanese holly which in the fruiting season makes a brilliant picture, and compels us to admit—

“What a master artist nature is.”



TO SUPPORT WEAK OR BROKEN LIMBS. (See next page)

To Support Weak or Broken Limbs.

By *W. Catton Grasby.*

IT occasionally happens that the limb of a large tree splits or threatens to do so unless supported. With a little care the weak member may be saved for many years. We recall a peach tree which split so that both halves fell back on the ground, but being lifted back and boled together it has healed, and is a vigorous flourishing tree now.

The illustration on preceding page, copied from the "Garden and Forest," illustrates the right and wrong way of supporting a weak branch. In Australia it is not an uncommon thing to see two branches held together by a piece of fencing wire being passed round both and then twisted until the two are brought into close contact. In the illustration an iron band has been used, and the effect is seen in the enlargement of the tree above the band. Through their very small root hairs and rootlets, trees take up from the ground water in which is dissolved food materials in minute quantities. This is carried up through the sapwood to the leaves where it undergoes processes which prepare it for making new plant tissue. In other words, water is drawn up from the ground into the leaves, and there in the presence of light by the aid of chlorophyll carbon is taken from the carbonic acid of the air and sap is formed.

This sap passes downwards between the bark and the wood, gradually forming new layers of wood and bark and so increasing the diameter of limb and trunk roots.

When the bark is unduly tightened by a band of iron, wire, or even string, the descending sap is obstructed and more wood will be formed on the upper side of the band than in other places, and the tree disfigured and injured. If the band is a thin one the wood will frequently grow entirely over it, and the only outward evidence will be an unsightly swelling.

Above the bend may be seen a simple iron bolt, with a large head and a large nut. All that is required is to bore the holes, insert the bolt, and screw up the nut until the parts are in position.

The rod should fit as tightly as possible into the hole, and it is a good plan to apply

a little tar or wax where it enters or leaves the bark, to keep out the wet. It will quickly heal over, and no further attention is required. Such a bolt will not depreciate or interfere with the functions of growth.

The tree represented is an American Linden or Basswood growing in a small front garden in Boston.

FIRE.

The Forest's Greatest Enemy.

(By *H. McCoy, Timber Inspector.*)

REPEATED fires destroy the growing forests in many ways; for instance, innumerable seeds are completely destroyed, seedlings and saplings are burnt periodically, and those that escape destruction have their crowns burnt, causing an excessive growth of limbs and bendy boles. Small trees suitable for telegraph poles are also spoilt. Gum veins are caused in the beautiful young red gums and jarrahs; and that pretty furniture wood—sheoak—fares worst of all. The ground herbage or forest food, too, is burnt.

The partly cut out forests could be protected from repeated fires if the Government would adopt the following methods:—

1. The standard girth restriction should be removed, and areas marked off should be cut out clean and as low to the ground as possible, except a few unmarketable trees for seed bearing. Clean cutting can be encouraged by increasing the price of sleepers to the hewer and small mill owners, and by buying the sleepers which are not quite good enough for export, for local railways and sidings. Then give the *cut-out* area *one* good burning over to produce a large stock of seedling regrowths.

2. Prevent extensive subsequent fires at all costs, by making fire-breaks three chains wide, and by having forest guards living on high ground near the centre of each area. They could have paths made on the spiderweb principle to enable them to reach an outbreak of fire quickly.

I have found the timber-worker a great lover of the forest, and I feel sure he

would assist the forest guard to extinguish a fire, providing he was recompensed for time lost. There are many miles of railway formation, and numerous bridges, some costing hundreds of pounds, in our cut-over or partly cut-out forests; therefore, if there is a continuance of fire the bridges will be burnt. These formations are good roads for fruit-growers, small sawmillers, pit sawyers, and hewers, and could also be utilised as fire-breaks.

In the meantime, fires could be greatly reduced if men would observe the following rules when in the forest:—(1) Do not light fires against logs, especially banksia or red gum; (2) see that the camp or other fire is extinguished before leaving; (3) care also should be taken not to drop hot ashes or a lighted match on dry debris.

I know little can be done where heavy mill log felling is in operation, but such felling is on a small area only. I would appeal to cattle owners to refrain from setting the bush alight, as the advantage to them is only temporary, because repeated fires burn the humus and regerate the zamia palms.

Forest fires are not difficult to extinguish at night. I am sure that if the public of Western Australia could only see the beautiful young jarrah and red gum forests (which are protected from fire by whim tracks) growing, and compare them with the desolate fire-swept areas near settlements, they would gladly supply the money to enable fire protective measures to be taken.

Books Received.

"An Australian Study of American Forestry," by E. H. F. Swain, Queensland Forest Service (Brisbane: The Government Printer).

Mr. Swain was wisely inspired when he decided to commit to print an account of American Forestry, as seen by an Australian with a knowledge of forestry and forest conditions as they exist in his own country. Much that he says will be new to the majority of forest officers within the

Commonwealth, and not a little of it will arouse in them admiration not only for American forestry methods, but for the breadth of outlook of a Government which is strong enough and capable enough to administer its forest asset for the benefit of the community in general, and does not permit itself to be influenced by political ambitions nor the views of interested parties. Mr. Swain sees much in American forestry that elicits his approval, and, as might be expected, he also sees some things that call for criticism. But his admiration of the American Forest Service is genuine and hearty, and it is evident he would like to see something on similar lines in existence in the Commonwealth. The methods of training in forestry in the United States appear to have specially impressed him, and these methods he has set out at some length. Altogether, Mr. Swain's book has a high value for Australian foresters, and there are few of them who read it who will not readily acknowledge that they have learned something. We gather that the author holds the views that forestry in Australia is a matter which should rightly come under Federal control. In this we agree with him. We recommend a study of Mr. Swain's book to all Australian forest officers.

We have been favoured with a copy of the June issue of "The Gum Tree," the journal of the Victorian Branch of the Australian Forest League. There is much in this issue that will deeply interest all lovers of forests, and in particular we would refer to the article "Forestry in Victoria," in which a full account of the proceedings at the annual meeting of the Victorian branch is given. The addresses delivered at the meeting are full of helpful suggestions, and rich in the kind of information that members of the League look for and prize. The illustrations in this number are of a very high order, and are indeed the best of the kind we have seen for a long time. "The Gum Tree" is fulfilling its mission in a highly-creditable manner.

The July number of "The Australian Forestry Journal" has reached us. In its 42 pages a great range of forestry subjects are included and a large number of

topical matters are discussed. The "Journal" continues to justify its title by the width of its survey, something having special reference to each State finding a place in its pages. Mr. Jolly's paper on "Forestry Training" is conceived on the soundest lines, and discusses in suggestive manner one of the greatest needs of Australian forestry. The cover design of the current number is arresting, and it and some other South Australian illustrations in the text show very effectively what can be done in Australia in the way of growing exotic pines.

Fiend o' the Forest.

The breath on the wings of the morning—
 Kind harbinger speeding before—
 Throws hot on our faces the warning,
 In our ears the dull crackling roar.
 The trees on the hillside quiver
 At the message presaging their fate;
 The life of the Bush seems to shiver
 With a fury of consummate hate,

As fierce up the valley raging,
 And laughing in evil glee,
 The Fiend o' the Forest is waging
 His war on the impotent tree.
 He seizes a forest giant
 In the vice of his fiery embrace,
 And hurling him down defiant,
 Leaps on in his blasting race.

His minist'ring demons dancing
 Spring forward from bough to bough—
 The scouts of his army advancing
 In flickering triumph now,
 As on to the smoke-filled distance
 He sweeps his relentless way,
 And mocks at the futile resistance
 Opposed to his murderous sway.

He leaves in the wake of his going
 A smouldering, blackened trail,
 With myriad fire-points glowing,
 Like an army camped in the vale.
 But the charred trees wait the reveille,
 Their gaunt limbs etched on the sky,
 While Night comes down on the valley,
 And cloaks Day's pitying eye.

—WINIFRED MAY.

Perth, July 23rd, 1918.

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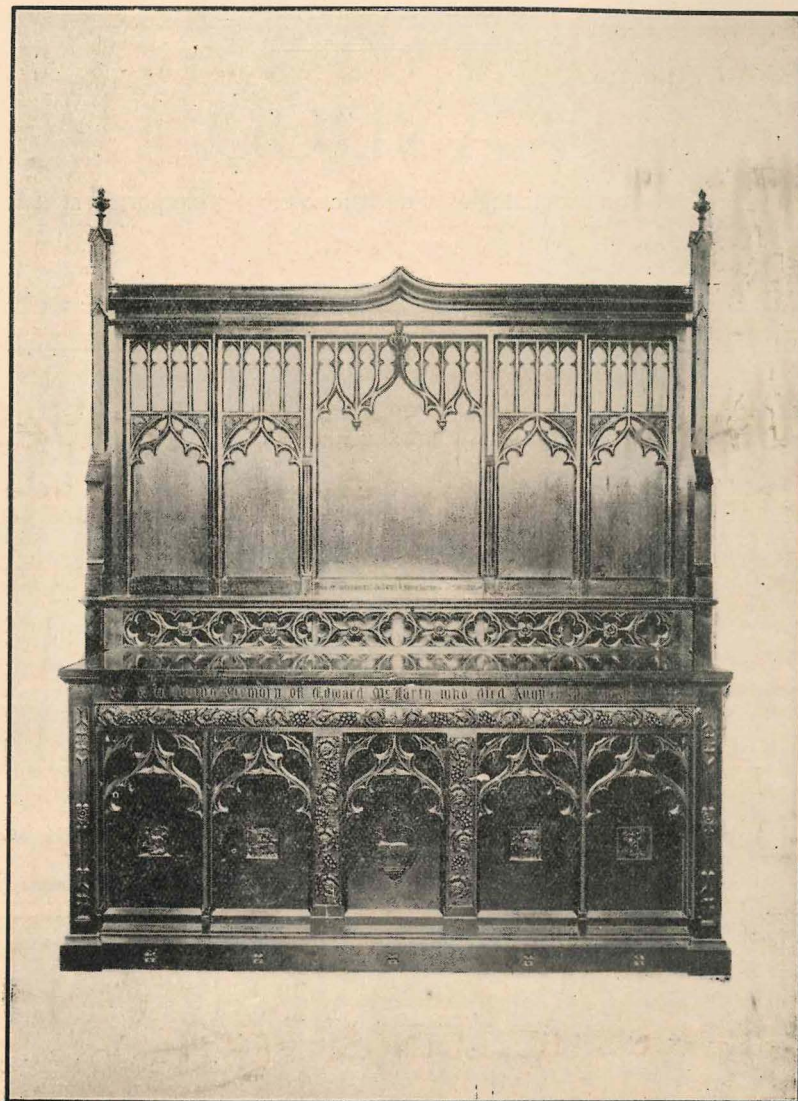
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A remarkably handsome memorial altar, just completed by William Sandover and Co. at their Newcastle Street factory, is worthy of appreciative mention in these columns, as it furnishes incontrovertible evidence of the splendid decorative quality of jarrah in the hands of competent craftsmen. The altar, which was designed by Mr. Herbert Parry, A.W.A.I.A., is to be dedicated to the memory of several mem-

bers of that well-known pioneer family the McLarty's of Pinjarra, and will be erected during the present month in the old Anglican Church at that town. The altar table and reredos are wholly of jarrah, and the beauty of the material is strikingly manifested in the massive panels completed in decorated Gothic and in the beautiful vine frieze. The work reflects the utmost credit on designer and manufacturer, whose efforts prove that our native wood compares more than favourably in æsthetic merit with the finest walnut and old oak.



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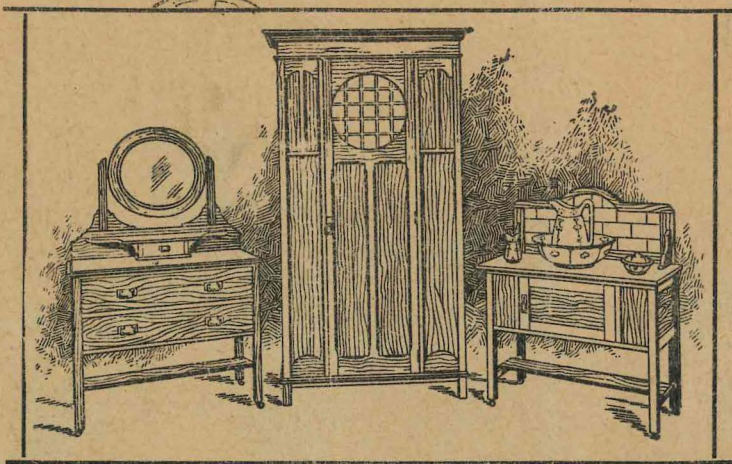
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Jarrah Bedroom Suite

Some people seem to have an idea that Jarrah is only useful for very massive furniture, but this little suite is proof that it is just as suitable and artistic for the modern bedroom as it is for period styles such as Jacobean. This bedroom suite is finished in what is known as "wethered" Jarrah, which is very beautiful. The round mirror of the Duchesse is uncommon, and the leadlight panel door of the Wardrobe adds distinction to a very pleasing design.

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