COMMONWEALTH OF AUSTRALIA.

COUNCIL FOR SCIENTIFIC & INDUSTRIAL RESEARCH.

DIVISION OF FOREST PRODUCTS.

MONTHLY NEWS LETTER No.129.

1st June, 1944.

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The Monthly News Letter of the Division of Forest Products was first issued in January 1932. Distribution continued unbroken until December 1942 when pressure of urgent war work permitted numbers to appear only at irregular and increasing intervals.

The News Letter in the past has performed an important function in keeping timber men and others in touch with the work of the Division and in assisting in the dissemination of information on Australian and overseas developments likely to be of value in the industry. In response to requests for a continuance of the News Letter, issue has again been commenced and it is hoped to maintain it regularly.

Never before has it been so important that Australia should use its timber wisely, and that it should employ the best practices possible so that seasoning and other losses can be kept to a minimum. The war has been responsible for Australian timbers being called on to fill many new uses and many people are being asked to work with timbers quite unknown to them. New glues for plywood and timber fabrication and new preservatives to protect against tropical conditions are rapidly being introduced.

The success of such innovations depends on knowledge, and one of the objects of the News Letter is to ensure that the large bank of knowledge of both Australian and overseas timber which has accumulated in the Division in the 16 years of its existence is made available as fully as possible. Apart from the data which have been built up by experiments in the Division itself, and in cooperation with Australian industry, the officers of the Division have maintained contact with developments abroad by means of correspondence, reports and publications and by personal visits overseas. Where advice on specific problems is required, the Division welcomes enquiries by personal visit, by telephone or by postal means.

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CLEANING VENEER LOGS.

Removal of bark and cleaning the surface of veneer logs preparatory to peeling has been a problem for many years.

In these days of manpower difficulties, a machine to carry out this task should appeal to the plywood manufacturer. Such machines are being built at the present time. A log of average size can be cleaned in approximately two minutes. One man can operate the machine to give a surface far superior to that which can be produced by hand labour.

As well as resulting in a saving of manpower, machine cleaning gives a better veneer and longer knife life due to the complete removal of extraneous matter which is easily missed when cleaning by hand.

In the early days of veneer peeling, bark was removed in a veneer lathe which was used solely for this purpose. This was a standard rotary lathe without some of the refinements as used for actual veneer cutting. This method was rather expensive because a large amount of good sapwood veneer was frequently removed in addition to the bark.

At a later date in U.S.A., attempts were made to adapt one of the methods of barking logs used in pulp plants. In this method the logs are put into a mechanical device and fed past stationary cutterheads by means of teeth on revolving discs. The mechanical operation of this system is somewhat similar to the conventional corkscrew. This was a labor saving device but, again, resulted in a rather large loss of sapwood. This method operated successfully on straight logs 8' - 10' long but was not at all satisfactory on short or crooked logs.

Shortly afterwards a method of cleaning was developed in Australia which subsequently became standard practice in the Douglas fir plywood industry. This machine with modifications is the type that is being built at the present time.

In this machine, the log is revolved on centres in a lathe with a balanced cutterhead following the contour of the log. This results in a saving of good sapwood veneer when compared with the previous method.

In the U.S.A. the use of high pressure water for barking has been tried out on a small scale and a full scale unit is being installed. Water is used at a pressure of 1200 lb./sq.in. and due to the fact that a considerable amount is necessary to remove any worth-while quantity of bark a 1000 h.p. motor is required to operate the unit. Such a unit would hardly be suitable for an ordinary veneer mill. We can thoroughly recommend, however, the machine as described in the previous paragraph as an essential item of equipment for any modern veneer plant.

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THE CARD SORTING TYPE OF IDENTIFICATION KEY.

This very simple type of indentification key has been applied for a number of years now by the Division of Forest Products to the identification of timbers from all parts of the world. It can be applied equally well to the identification or sorting of numerous other materials. It is essential to have a number of cards which have been perforated along all edges giving a series of holes very close to the edge. These holes can be numbered and then coded against the particular description or anatomical features which are likely to be encountered in the examination of the material at hand. For example, in the case of timber, the physical properties such as colour, weight, hardness, etc. and all the possible variations in anatomical structure are coded against the various numbered holes. The next step is to record on a perforated card the properties and features observed in any particular timber, tree, plant or whatever is being investigated. This recording is done by the simple procedure of notching by means of a V punch the particular perforations corresponding to the features observed. In timber identification, if this can be once again used as the illustration, a heavy red timber would be notched at the perforations coded for heavy and for red and so on. Gradually, with the examination of numerous specimens the number of notched cards grows until all the available possibilities have been covered. At this stage the cards may be used as an identification key. An unknown specimen is examined and its features recorded. To obtain a clue to its identity the notched cards are sorted by running a long

needle through the holes corresponding to a feature that has been observed. All cards representing species with this feature will drop out and these cards can be sorted again on another positive feature and so on until only one or two cards remain. At this stage, a check with the specimens represented by the remaining cards will almost certainly reveal the identity of the unknown.

Sets of these identification cards can be developed for various subjects of interest to the individual. For example, a small set might cover the forest trees in one area, another might refer to the grasses in a district, another might refer to the timbers of a particular area and so on. The Division of Forest Products has developed several of these sets, in most cases with certain refinements in that the various features, anatomical and physical, are printed on the cards against the various perforations so that sorting is simplified. These sets cover (i) an all embracing set of cards for the timbers of the world; (ii) the eucalypts; (iii) timbers of New Guinea and the S.West Pacific area. Other sets can be readily developed.

The great advantage of this method of identification is that a new card, suitably notched to cover all the features present, can always be introduced into the scheme and this introduction makes the system more effective rather than spoiling it as in any other type of identification key. In addition, the sorting need not follow any definite order; the most outstanding features can be used in the first sortings.

Information regarding the card sorting scheme for identification may be had on application to the Chief, Division of Forest Products, 69 Yarra Bank Rd., South Melbourne.

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A NEW WOOD BORER REPORTED.

Assistance Required in Controlling Spread.

The Division of Forest Products recently received specimens from North Queensland of a small wood borer that had not previously been reported on the Australian mainland and is anxious to obtain information that might lead to detection of attacks in any other districts, so that control measures can be attempted before it becomes widespread.

Only scanty information as to the life history of this borer is available but it is believed to be limited by climatic conditions to tropical and sub-tropical areas. It is believed, however, that in these areas it may attack either hardwoods or softwoods in growing trees, freshly sawn timber or possibly partly dry or dry timber.

The insect is brownish black, about ½ to 2/3 the size of the powder post borer (lyctus) or the furniture borer (anobium). Like these borers, the first evidence of attack is the frass or powder coming from the flight holes as the insect emerges after developing from the grub which does the damage.

Anyone in the North of Australia noticing attacks that seem to correspond to the above is invited to send any specimens that can be collected to the Chief, Division of Forest Products, 77 Yarra Bank Rd., South Melbourne, Vic. Insects should be sent in small bottles of methylated spirits or in sealed tins. Samples of the attached timber should be sent in sealed tins and any notes on the attack that might be of assistance should be forwarded.

The borer has probably been introduced in timber from the Pacific Islands or timber that was infested while passing through the tropics and it is hoped that the case located

may be an isolated one. Vigilance at this stage, however, may prevent the spread of another serious pest.

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TEGO VENEER TAPE.

One of the difficulties associated with the use of the conventional types of veneer tape is that the tape cannot be applied with safety on cross-bands where it remains inside the assembly after pressing. The possibility of faulty adhesion over the tape is always present. Also, there is a tendency for the tape to show through thin face veneers which, in addition, may be sanded through.

The need for a tape that can remain within the assembly without the possibility of future trouble has been met - as far as the manufacture of hot press panels is concerned - by the production of Tego Veneer Tape by the Resinous Products & Chemical Co., Philadelphia Pa., U.S.A.

Essentially, Tego tape is Tego resin glue film which has been coated with a specially designed resin to provide good initial adhesion, excellent wetting characteristics and high enough tensile strength to permit handling of the patched veneers. It is supplied in 500' rolls 1" wide. In the un-cured state it is water sensitive and exhibits the adhesive strength necessary to hold firmly together the adjacent edges of splits or cracks in veneers. It is used in the same manner as the conventional types of veneer tape. A strip of tape is moistened by passing the coated side over a dampened sponge or cloth and then pressed firmly along the split. It should be pressed down with a wooden paddle or roller making certain that good contact is assured.

In the subsequent hot pressing operation, the Tego tape bonds in the same manner as the ordinary Tego film. There is no possibility of faulty adhesion and when used with thin veneers there is a minimum tendency to "strike through".

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THE PROPERTIES OF AUSTRALIAN TIMBERS.

CROW'S ASH No. 129.

Crow's ash is the standard trade common name for the timber known botanically as Flindersia australis R.Br. This timber is commonly known as teak in New South Wales; the genus Flindersia produces such well known timbers as Queensland maple, silver ash, etc. It is most closely related to hickory ash (F.ifflaiana F.v.M.), its North Queensland equivalent, the two timbers being somewhat similar in appearance and properties.

Distribution: Crow's ash is a species with a somewhat limited range, being confined to South Queensland and Northern New South Wales; from Gladstone, through the Manango, Killarney and Mary valley districts to the coastal ranges of north eastern New South Wales. It is found as a scattered tree of limited abundance often in association with Hoop and Bunya pine, preferring heavier rainfall jungle.

Habit: Crow's ash is a large tree attaining a height of 120 ft. with a clear bole of 50-60 ft. and a diameter, breast high, of 3-4 ft. The trunk is not buttressed and the bark is rough and scaly of a greyish purple colour.

Timber: The truewood of crow's ash is deep yellow in colour with a greasy surface and has a distinctive odour when freshly sawn. The sapwood is narrow (1"-1½") and whitish in colour. The grain of this timber is somewhat interlocked and sometimes wavy, making it non-fissile; the texture is fine to medium having no pronounced figure, though on backsawn faces bands of soft tissue are noticeable. Crow's ash is a moderately heavy to heavy timber having an average density of 57 lb. per cu.ft. at 12% m.c. and a normal range of 49-65 lb./cu.ft.

In drying from the green condition to 12% moisture content, the average shrinkage of this timber is 4% in a tangential direction (backsawn) and 3% in a radial direction (quartersawn). Little, if any, collapse occurs during drying.

This Division has, as yet, done little work on the seasoning of crow's ash, but according to Swain's 'Timbers and Forest Products of Queensland' it seasons slowly but well, warping and shrinking but slightly, but becoming somewhat brittle when dry. Crow's ash has good mechanical properties but is only a fair bending timber. It is rather difficult to machine and dress and does not hold nails well due, to some extent, to the greasy nature of the wood. The truewood is naturally durable either exposed to the weather or in the ground; and has good wearing properties. The sapwood, however, is susceptible to Lyctus borer attack.

Uses: Crow's ash is used extensively in Queensland in coach building and Railway carriage construction for flooring, pillars, sheeting and underframing and for shafts and poles. In shipbuilding it is locally substituted for teak in decking; also for keels and under water bearings. It is also suitable for tool handles, shovel, spade, hoe, fork and rake, though not as good as some other timbers such as Alpine ash or spotted gum. In mining, the durability of the truewood and its strength is utilized in the form of underground slabs and sleepers and round props. On account of its greasy nature and hardness, it is used for rollers in rope mills, bushings for bearings and pulleys. It has also been used for stereo blocks in the printing trade.

Availability: Crow's ash is in only moderate to small supply, being available as sawn timber in moderately large sizes and lengths.

COUNCIL FOR SCIENTIFIC AND INDUSTRIAL RESEARCH

DIVISION OF FOREST PRODUCTS

MONTHLY NEWS LETTER No. 130.

July, 1944.

LAMINATING OF WOOD.

The laminating of wood to obtain a material with properties superior to those of the component parts is not a new-fangled idea.

It was used in the time of the Pharoahs. Today, it offers un-limited possibilities in the field of timber utilisation. Why is this so? What are the developments which support this statement?

The progress in the art of laminating has not been a steady one. The development of the veneer lathe in the early 1880's gave an impetus to the manufacture of plywood. The advent of starch adhesives and at a later date the more water resistant casein and blood albumin glues, assisted in popularising the use of laminated materials. Soya bean glues also played a prominent part, particularly in the phenomenal expansion of the Douglas fir plywood industry.

Laminated material has always possessed one major drawback. The adhesives used have been, at the most, only water resistant and under exposed conditions eventually fail due to the attack of moulds and bacteria, by chemical action and by mechanical disintegration due to swelling and shrinking of the individual laminations. What has been needed for many years is an adhesive preferably applied cold which will have no deleterious effect on timber and which will not be affected by moulds and bacteria, by weathering, or by immersion in water.

The development of Tego film in the early part of the 1930's provided an adhesive which partially met the requirements. It provided fungus, weather and waterproof bonds, but unfortunately it was necessary to apply a temperature of 280-300°F. at the glue line to set the glue. Very high pressures were also necessary.

Immediately prior to the War, urea-formaldehyde glues showed promise, but again the ideal had not been reached. These glues could be used hot or cold, but when applied cold the high degree of acidity necessary to set the glue affected the timber. It has been shown also, that it eventually affected the glue itself. In addition these glues tended to "craze" and disintegrate when used in a thick glue line. These disabilities have been overcome to a certain extent.

A number of new adhesives or modifications of old adhesives which approach very closely to the ideal, has been developed since the beginning of the War. Such materials are being used with every satisfaction in the construction of the famed P.T. boats, surf landing barges, pontoons, sheathing for huts and last but not least, in the construction of the deadly Mosquito aircraft.

Parallelling the development of these new adhesives has been the development of new techniques for the rapid setting of glues and the application of pressure. Much has been written on the "plastic moulded airplane." Such an aircraft has never been built. Portions of aircraft, however, have been manufactured out of plywood using a special technique for the application of heat and pressure and special methods of laying-up the veneer. Varying techniques employing high frequency infra red and resistance strip heating have all been utilised to set the new adhesives. In the case of high frequency heating, assemblies up to two feet thick, have been glued in a very short length of time. One of the latest methods for rapidly setting the glue is by the addition of a conductor of electricity to the adhesive itself.

The information gained by these war-time developments will be available for peace-time uses. The success of the pre-fabricated house will depend to a large extent on the new adhesives and techniques which have been developed. The fabrication of laminated beams and arches will play an important part in enabling wood to compete with its rival structural materials. Furniture design and construction will be influenced considerably. Certain types of boat and aircraft construction will also benefit.

The importance of these new developmentsis well recognised at the Division of Forest Products. A considerable amount of work is being carried out by the Section which was formed some years ago when it became evident that the laminating of wood was going to play such an important part in timber utilisation. In addition, efforts are being made to keep abreast with overseas developments, so that when called upon, the latest information will be available on new methods and techniques for the laminating of timber.

PROGRESSIVE V COMPARTMENT KILNS FOR DRYING VENEER.

We were approached recently by a plywood manufacturer for suggestions as to how his veneer drying capacity could be increased. He favoured compartment type kilns even though the progressive or tunnel type kilns had been operated in the past.

The relevant sections of our reply might be of interest to other manufacturers confronted with a similar problem:-

"No doubt you have given the matter of the relative merits of progressive and compartment kilns some thought. Furthermore, no doubt your opinion of the performance of progressive kilns has been influenced by the performance of the progressive units at your plant. I feel sure you will agree that your present units are not as efficient as they might be and do not reflect fully the performance of a unit which has been properly designed and carefully constructed.

Personally, I favour the progressive unit for drying veneer, but of course I do not know all the factors influencing your decision. Perhaps the following remarks which indicate the relative advantages and limitations of the two types of kiln will be of some interest.

A. Compartment kilns.

Advantages. 1. After the kiln has been loaded, no labour, other than that of the kiln operator, is needed at the kiln until the charge is dry.

2. Different thicknesses can be dried in successive charges without difficulty.

3. Temperature and humidity control can be more precise.

4. Each truck remains stationary in the kiln.

Limitations.

1. Owing to the rapidity with which veneer dries, the kiln operator almost invariably fails to operate to a proper drying schedule. This is due to the fact that where he has a number of kilns to watch he has insufficient time to attend to the loading, unloading, keeping of records etc. and also make the necessary alterations to control valves and settings (and check these) at the required times. As a result some of the advantages that the compartment kiln normally offers are not availed of.

2. There is a tendency for the veneer to be left in the kilns longer than necessary with a resultant loss in output.

3. Somewhat more skill is required for proper operation than is necessary with a progressive kiln.

B. Progressive (or Tunnel) Kilns.

Advantages. 1. The drying schedule is maintained automatically i.e. once conditions are set at the "dry" end no further changes in control valve settings are necessary.

2. The progressive nature of the system ensures that output is kept at a maximum.

3. Less space is necessary for wet and dry storage than is required with compartment kilns.

Limitations.

1. Labour must always be in attendance while the kiln is working.

2. The process is only satisfactory for stock of uniform thickness and constant species. Where the variation in thickness is large, it becomes necessary to decide on a basic thickness, say 1/16" or 1/20" for a given kiln. This will determine the drying time and hence the rate of movement through the kiln. All other material put through this kiln must be dried in thicknesses or multi-thicknesses of a total thickness equal to the basic thickness.

From the above it is obvious that for veneer drying while there are advantages and limitations with each type of kiln, the progressive seems the better proposition. I should say the progressive or tunnel kilns would be much more satisfactory, provided they are still intended only for drying veneers or re-drying plywood. They will not be satisfactory for drying or re-drying solid timber, or veneered panels. For this latter purpose compartment kilns are to be preferred."

EDGE GLUING OF VENEER.

In the early days of plywood production in Australia, there was little need for the edge gluing or splicing of veneer. Good quality more or less defect-free hoop pine logs provided the bulk of the raw material and the small volume of "narrows" and slightly defective veneer was used for centres. Small splits on the ends of the sheets were sometimes taped before pressing, the tape being removed subsequently by steaming or sanding.

With the extension of use of a lower grade raw material and the necessity for providing plywood to meet fairly rigid aircraft and marine plywood specifications it became necessary to clip out defects and edge join the narrow widths thus obtained into full size sheets. Edge gluing of the core material also became essential when gluing high grade plywood to specifications calling for an absence of gaps or overlaps in the core.

Tapeless splicing machines for edge gluing veneer have been in use in Australia for many years. Animal glue or a Printers Roller gelatine is the adhesive customarily used. This is applied to the book of veneer immediately after jointing. It is allowed time to set before the join is made by passing through the edge gluing machine. A roller applies formalin solution to the edges to be joined prior to the veneer passing under the heater bar.

Two main types of edge gluing or splicing machines are in use. In one type, toed-in rollers placed above the veneer push the edges together while the stock is carried through on a conveyor chain below the table. Heat to set the joint, is applied from an electrically heated pressure strip above the veneer.

In the second type, the veneer is carried through the machine by means of converging endless conveyor chains. In one case the centre sections of the upper and lower feed chains are electrically heated, while in the other, two solid steel, tapered, heater bars hard chrome plated and polished are used in direct contact with the glue line.

The machines described are particularly suited to the gluing of hardwood veneer not above 1/8" in thickness. They are seldom used on thicker veneers, although one maker claims that 3/16" material can be successfully edge glued. The operating speeds range from 20 to 120 feet per minute depending on the thickness of the veneer being glued.

A recently developed machine, the Miller Edge Gluer, is finding increased use particularly in the Douglas fir plywood industry, for edge gluing thick veneers, principally 1/8", although it is stated that veneers from 1/12" to 1/4" can be successfully handled. The veneers are fed sidewise into this machine as contrasted with the lengthwise feed of the machines as described previously. They pass between two series of belts the top revolving at a faster speed than the bottom. This causes the strips, previously jointed and spread with a quick setting adhesive to be butted together and also gives pressure on the joints. The strip of veneer then passes around the periphery of a drum about 6' in diameter heated electrically to a temperature of about 410°F. The speed of revolution of the drum is regulated according to the thickness of the veneer being edge glued. The veneer is held tightly against the drum by a series of long springs spaced about 2½" apart along the length of the drum.

After leaving the drum the veneer passes along an outfeed table about 15' long through an automatic air operated clipper which can be adjusted to cut any width from 4" to 110".

The average capacity of the machine is 60,000 - 70,000 sq. ft. of 1/10" veneer per 8 hour shift. This is equivalent to a glue line footage of approximately 50,000 lineal feet. This is considerably more than could be obtained from the edge gluing machines as described previously.

It is doubtful, however, whether the Miller Edge Gluer will find any application in Australia where in normal times the bulk of the veneer handled is 1/16" thick.

One other development is worthy of note. It is considered in America that animal glue does not possess sufficient water resistance for exacting uses and thus very rapid setting urea formaldehyde glues have been formulated. The adhesive may be applied either at the jointer or at the splicer itself. The former course is favoured as the latter in some cases tends to cause clogging on, or fouling at the heater bar.

PERSONAL.

Mr. A. Gordon, officer in charge of the Utilisation Section of the Division of Forest Products, has recently returned to Melbourne after six months investigations in New Guinea.

Dr. H.E. Dadswell left Melbourne recently for New Guinea in connection with the identification of New Guinea timbers. He will be absent for about a month or 6 weeks. The difficult problem of identifying New Guinea timbers has now been overcome by the issue by the Division of Forest Products of punched card sorting keys which enable rapid recognition of unknown timbers.

One of the officers of the Division of Forest Products, Mr. J.T. Currie, is continuously located in Sydney at the National Standards Laboratory, University Grounds, City Road, Chippendale. Besides carrying out certain investigations, Mr. Currie acts as a Liaison officer in N.S.W., to bring people with problems in touch with the Division. At the moment the problems he is handling include seasoning, veneer and gluing, improved wood and preservation.

THE PROPERTIES OF AUSTRALIAN TIMBERS.

ROSE MAHOGANY - No.130.

Rose mahogany is the standard trade common name for the timber known botanically as Dysoxylum fraseranum Benth. This timber is also known as Rosewood in New South Wales. This genus is represented also by another species similar in appearance and properties, Miva mahogany (D. muelleri Benth.)

Distribution.

Rose mahogany is found in the coastal brush forests and jungle formations of Eastern New South Wales and Queensland from south of Newcastle through the Dorrigo plateau and Macpherson range to the Killarney district of South Queensland. It is found in association with hoop pine and other brush forest timbers such as white birch, white beech, brush mahogany etc. Its chief requirements are a continual minimum monthly rainfall of 1.5 inches and an annual rainfall of 40 - 60 inches, and it prefers a deep loam and alluvials with a high humus content.

Habit.

Dysoxylum fraseranum is a fairly large tree with a total height of 80 to 140 feet and a diameter breast high of 3-5 feet. The trunk is more or less buttressed.

Timber.

The truewood of Rose mahogany is a very deep pink or red-brown, sometimes weathering to a rather orange colour, with a distinctive rose-like fragrance, usually persistent.

The timber has a fine and fairly uniform texture, characterized by a fine tracery of soft tissue on backsawn faces and by a glistening of minute gum deposits in the vessels. The sapwood is often wide and conspicuously lighter in colour than the truewood and is susceptible to lyctus borer attack.

The truewood is moderately light in weight having an average density of 45 lb/cubic foot at 12% moisture content and a normal range of 40-50 lb/cubic foot. In drying from the green conditions to 12% moisture content, the average shrinkage of this timber is 4.5% in a tangential direction (backsawn) and 2.5% in a radial direction (quartersawn). This Division has not had extensive experience on the seasoning of this timber but according to Swains Timbers and Forest Products of Queensland, it requires careful and slow seasoning and quartersawing, being recommended to give little shrinkage and warping. Our experience has been that while it is not a difficult timber to season, reasonable care is necessary during the drying process particularly in the early stages, to avoid surface checking. If seasoned carefully the timber may be dried free from this form of degrade. The sepcies collapses to a minor degree only, insufficient in extent to warrant a reconditioning treatment. In general it warps but little , the exception being some figured stock. It is a fairly slow drying timber.

The truewood is naturally durable either exposed to the weather or indoors. The woodworking qualities of this timber are excellent and it takes a high finish and polishes well. A small percentage of timber has a tendency to "sweat" causing a dull and blotchy finished surface, due to the presence of drops of free aromatic oil. Steaming or sponging of such timber with alcohol will remove this.

Rose mahogany is a somewhat brittle timber and thus has not good bending properties. It also tends to split in nailing owing to a certain freeness in the grain.

Uses.

Rose mahogany is essentially a cabinet timber, though somewhat on the heavy side. Owing to the ease of working it is suitable for interior moulding, turnery and carving and also for printers blocks.

It makes excellent furniture with a very fine polished finish. It is used locally also for all interior joinery, flooring, lining and for shop and office fittings, and is also peeled to a small extent for veneer.

Availability.

Rose mahogany is only in moderate supply, being available as sawn timber is most sizes and in small quantities locally as veneer.

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TIMBER DEVELOPMENT.

For many years timber has suffered as a result of propaganda by those interested in the sale of substitutes. This propaganda not only stressed the virtues of substitute materials but also any shortcomings of timber, with the result that steel, concrete and other materials have made incursions into fields where timber could be used to advantage. To meet this timber interests for a long while did very little, but largely as a result of the formation of Timber Development Associations, organizations interested in the establishment of timber in its proper place in the national economy, the use of timber is now being fostered.

The Timber Development Association set up in Great Britain did a great deal of useful work before the war. Britain's example was followed in Australia, particularly in New South Wales where by lectures, articles in newspapers and periodicals, competitions in design of wooden houses and other ways the very strong Association has promoted utilization of timber. Victoria followed suit but has not been as successful in arousing interest in its work. The other States also came into line and finally an Australia wide organisation was set up. This has already held interstate conferences in Sydney and Melbourne at which interesting papers were read and useful discussions followed. In October of this year the third of such Conferences is to be held in Sydney but difficulties of transport are likely to restrict attendances from other States.

The outbreak of war naturally led to a considerable reduction of Timber Development Association activities. Temporarily the problem moved from protection of timber against unwarranted substitution to the organisation of supplies to meet an unprecedented demand. In addition the principal promoters were fully occupied in various wartime activities.

In Victoria the Association has not functioned for some years, but at a recent meeting of delegates from ten timber producing or using organisations, it was resolved to revive the work. A committee is at work reviewing the constitution and it is hoped to have an active association at work shortly. Mr. I.H. Boas, formerly Chief of the Division of Forest Products C.S.I.R., has been elected Chairman of this State Branch.

At the moment and for some years after the war, there will be no problem in disposing of all the timber that can be produced but it is very necessary now to prepare to meet the period when there will be a struggle with substitute materials which have been introduced of recent years. This will need a wide campaign of education to eliminate the fallacious and often untrue beliefs about Australian timbers in particular and timber in general, so widely disseminated by its competitors, and it is gratifying to note that the industry is realising this in good time.

There is a fine field of work for the T.D.A. and in developing this, it will not only be working in its own interests but in that of the community generally.

NEW WOOD MATERIAL FOR PICKING STICKS. TEXTILE INDUSTRY BENEFITS.

Although only a small quantity of wood is used in textile manufacturing machines, wooden components such as picking sticks which throw back and forth across the loom shuttles carrying weft thread are of fundamental importance to weaving. A broken picking stick stops production whilst being replaced and the quality of the cloth may be affected.

Since 1941 supplies of picking sticks, which by custom were made from hickory imported from America, have been difficult to obtain and when Japan attacked Pearl Harbour the shortage became acute. Sticks made from Australian timbers were then used but these were not uniform in quality, many sticks being inferior to hickory normally supplied.

When this Division was approached for assistance in the solution of the problem, causes of failure were investigated. It was found that sticks made from wood which was brittle or not straight grained broke after very short periods, and furthermore stress concentrations in badly shaped or roughly finished sticks hastened their failure regardless of the mechanical suitability of the wood. If proper selection of wood had been made in the first place and sticks had been well shaped and smoothly finished, more uniform results would have been obtained.

Of the sticks which were not initially defective, wear at the top and splitting were the principal causes of failure. It was reasoned therefore, that sticks made from material laminated so that splitting would be unlikely and which would be resistant to wear at the picker should provide a solution to this important problem affecting the durability and quality of textiles. Our experience at the Division of Forest Products in the manufacture of improved wood (laminated and compressed wood bonded with resin) which taught that, within limits, any desired mechanical properties can be obtained, suggested that sticks suitably constructed of this material should be satisfactory.

Arrangements were subsequently made for loom tests to be carried out using sticks made from materials specially prepared with properties thought to make them suitable for successful use as picking sticks. One lot, a densified resin impregnated product made from scented satinwood (coachwood) veneers by a commercial manufacturer of improved wood had a density of 62 lbs./cu.ft. The second material made in this laboratory from spotted gum veneers was bonded with Tego film at high pressure to give a density of 82 lbs./cu.ft. The service operation of these sticks gave an average life of 1,000 hours for the former and 1,500 hours for the latter including one which lasted more than 2,000 hours. These materials were infinitely superior to the wooden sticks then being used by this firm which were giving an average loom life of 25 hours. The laminated sticks were discarded only when worn so much at the picker they were no longer serviceable. No splitting or mechanical failure occurred during the periods of normal operation. The difference between the life of sticks made from the two materials appears to be related to the density and resistance to wear, the denser material giving the longer period of service. Following this satisfactory performance, the weaving firm sought the names of potential manufacturers and is now installing throughout its plant sticks made by a Sydney manufacturer to this Division's specification. Other Australian firms making improved wood have equipment suitable for making picking sticks and each is a potential manufacturer. The cost of a laminated stick is more than that of a local wooden stick but in terms of hours of service is many times cheaper.

The Weaving Manager of the plant where loom tests were carried out recently approached this Division with a request that as the shortage of hickory sticks is now causing concern amongst textile manufacturers in U.S.A., information on the methods now being adopted in Australia should be sent to America to help relieve the picking stick shortage.

PRESSURE IMPREGNATION OF TIMBER.

The first full scale pressure impregnating plant in Australia for the preservative treatment of timber has been erected at Putney, Sydney N.S.W. and is now in operation.

The treating cylinder has a diameter of 7ft.6in. and is approximately 30 ft. in length. It can be used under a vacuum or at pressures up to 90 lb. per square inch. The maximum pressure is rather low but this is due to the fact that the cylinder was converted from an existing autoclave to meet an urgent war requirement. The equipment includes an air compressor, a storage and heating tank, a vacuum pump and steam pumps for handling the preservative and applying pressure to the cylinder. A steam boiler and cranes and trucks for handling timber are also provided.

The timber can be incised before treatment by a special machine fitted with two cylinders having projecting teeth like knife blades. The timber is passed between the rollers and receives a number of incisions about 4" or 5" apart longitudinally and an inch or so apart transversely. These incisions, which can be made up to ¾" deep facilitate the penetration of the preserving fluid.

At the present time Douglas fir (oregon) is being treated in sizes up to 12 in. x 12 in. These are first incised on 4 faces then loaded on trucks and run into the cylinder. A vacuum is drawn to remove air from the cells of the wood. The cylinder is then filled with hot creosote and pressure is applied. When the treatment is complete the pressure is released, the cylinder emptied of creosote and a short final vacuum is drawn to make the surface of the timber clean to handle. If the timber is high in moisture content, the treating schedule is varied somewhat to provide drying and so improve the penetration.

Australian timbers generally are difficult to penetrate, but a number of species of low durability can be made suitable for adverse conditions by proper treatment. This plant, therefore, opens up possibilities for improved utilisation of these timbers.

PERSONAL.

Mr. G.W. Wright, Officer-in-Charge of the Seasoning Section recently visited Sydney in connection with the installation of veneer driers for a firm peeling veneers for aircraft and other essential purposes.

Mr. P.H. Sulzberger, Officer of the Timber Physics Section spent a few days in Sydney investigating the use of hoop pine and kauri battery separators.

Mr. N. Tamblyn, an officer of the Timber Preservation Section spent several weeks in Western Australia inspecting various installations to determine the effectiveness of preservative treatments on Western Australian timbers and the durability of untreated timbers for fence posts and railway sleepers.

Mr. L.N. Weston, Senior Timber Inspector, W.A. Forests Department visited the Forest Products Laboratory and discussed the durability of jarrah and of fluarised and powellised karri railway sleepers in different areas of Western and South Australia, particularly on the Transline from Kalgoorlie to Cook.

TERMITE SHIELDS.

Recent work in America has raised some interesting questions in regard to termite shields. These shields form the most effective type of protection against termite (white ant) attack in buildings. They are familiar objects in certain parts of Australia, notably in the North where termites abound. The type of shield most commonly seen is a cap of galvanised iron, round or square, placed over a house stump to prevent termites reaching the bearer resting on the stump. These caps are usually bent downwards all round, at an angle of 45°. The metal may project for an inch or two away from the edges of the stump in a horizontal direction before it inclines downwards.
usually held

This bend is usually held to be an essential feature of the shield. For masonry and brickwork continuous metal strip has been developed. This is installed around the foundations beneath the bearers and inclined downwards at an angle of 45°. The inclined lip is usually 1½-2" in width in all types of shields

No satisfactory explanation has ever been given of the manner in which termite shields prevent termite attack. They have been used however for many years and it is generally assumed that they are effective, and their use in some tropical countries has become standard practice. Termites do not appear to be able to construct communication tubes around the edges of the shields without considerable difficulty, although it is known that they do not give perfect protection even when they are applied according to the best recommended practice.

The American work was carried out to investigate the effectiveness of shields and to discover if possible the factors which influence it. The results indicate that termites, or at least the American species tested, will not readily build communication tubes over smooth metal surfaces although they are by no means unable to do so, and for this reason emphasis is laid on the value of regular inspection of building foundations in termite infested areas. In the American work similar results were obtained with horizontal and inclined shields.

As far as the Division of Forest Products can determine however cases of termite attack on buildings fitted with caps are very rare in Australia. A test similar to that carried out in America was planned before the outbreak of war and might be undertaken in modified form at a later date. One point worth investigation is the reluctance or inability of termites to build communication tubes along a steel rod, such as the shank of a ½" bolt. In the northern areas of Australia advantage is taken of this peculiarity to fasten bearers to stumps by bent bolts which do not pierce the caps. Another mysterious feature of termite behaviour worth investigating is the readiness with which in some areas they will build communication tubes over concrete.

NEW GUINEA TIMBERS.

Dr. H.E. Dadswell, Officer-in-Charge, Wood Structure Section of the Division of Forest Products has returned from New Guinea after holding classes in wood technology for members of various Australian and American units engaged in forestry and sawmilling activities there. He was accompanied by Mr. C.T. White, Queensland Government Botanist who gave instruction in forest botany. Opportunity was taken to make a collection of interesting timbers in the districts visited and these will be valuable additions to the samples of New Guinea timbers already at the Forest Products Laboratory.

THE PROPERTIES OF AUSTRALIAN TIMBERS.

CHEESEWOOD No. 131.

Cheesewood is the standard trade common name for the timber known botanically as Sarcocephalus cordatus Miq. This timber derives its name from its colour and the soft greasy nature of the wood when cut. It is also known as yellow cheesewood, canary wood and Leichhardt pine.

Distribution: In Australia cheesewood occurs in Coastal Queensland from Rockhampton north to Cooktown and is most prevalent in the Mackay district. It also occurs in coastal Northern Territory. Outside Australia it is fairly widely distributed in New Guinea and Papua where it occurs on low lying ground in mixture with other rain forest species. It is also recorded from Burma, Philippine Islands and the Dutch East Indies. In Australia cheesewood is found as occasional trees in mixture with other jungle species along water courses preferring deep alluvial loams.

Habit: Cheesewood may grow into a fairly tall tree 90 ft. overall, with a slender bole 8 ft. in girth and a merchantable length up to 60 ft. but is usually smaller. The stem is not buttressed. The outer bark is brown to dark brown, very pustular and crumbling and ridged. The yellow corky textured inner bark has a bitter taste.

Timber: The truewood of this timber is bright yellow to orange yellow when freshly cut, fading a little with age. The sapwood is ill-defined being pale yellow or white to dark yellow. The timber is moderately fine in texture, and generally fairly straight grained. Cheesewood is a moderately light timber having an average density at 12% m.c. of 39 lb./cu.ft. and a normal range of 35-44 lb./cu.ft.

This Division has no information on seasoning and shrinkage of this timber. In North Queensland the truewood is reputed to be fairly resistant to termite attack and has good durability out of the weather. Its working properties are excellent cutting easily and cleanly both with and against the grain and finishing to a smooth surface. When cut across the grain it has a distinct "choosy" feel.

Uses: The chief advantages of cheesewood appear to be its comparative lightness and good cutting properties which make it an easy timber to work and make an ideal turnery timber and for carved work. It is used mainly for lining and interior work, ceilingsand flooring. In the Philippines and Ceylon it is used for furniture and cabinet work and to some extent also for boat building.

Availability: Utilization of this species is only on a small scale and the timber produced is utilized almost entirely for local consumption.

COMMONWEALTH OF AUSTRALIA.

COUNCIL FOR SCIENTIFIC & INDUSTRIAL RESEARCH.

DIVISION OF FOREST PRODUCTS.

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POST WAR RECONSTRUCTION.

Education for Wood Working Trades.

With rapid Allied advances on all war fronts the planning of improvements in post war technical training for the wood working trades with particular reference to the rehabilitation of service men is receiving attention by the Division of Forest Products, C.S.I.R. At the request of the Principals' Association of the Victorian Technical Colleges, the Division has for some time been considering the question of a suitable course of training in the elements of timber technology and allied topics insofar as the subject is of importance to carpenters and other wood workers in Australia. It is felt that such a subject, if included in apprenticeship courses would give the tradesman a valuable background which would enable him to use timber intelligently, taking advantage of its virtues and allowing for its peculiarities and so obtain the best possible results of its use.

The course would comprise about 40 lectures adequately illustrated with film strips and demonstration material. It would cover such aspects of timber as its supply and conversion, structure and defects, physical properties, seasoning, strength, grading, circumstances of decay or insect attack and its preservation against adverse conditions, glues, gluing and plywood, the problems involved in the painting and finishing of wood, modern trends in timber construction, developments in bench tools, the supply, use and limitations of the various Australian timbers, the place of common overseas timbers in our economy, the organization of the timber industry in this country and finally, sources of information on the various practical problems related to timber.

In the meantime however, another and more urgent matter, the question of training certain classes of men being released from the services for employment in the building trade, has arisen. The Division of Forest Products is cooperating with the Department of Labour and National Service in the preparation of a training manual for carpenters and joiners. This will be one of a series for the use of trainees in the reconstruction scheme, a number of which have already been prepared. The Division is providing material for the first section of the manual for the building trades and this will form a background of fundamental information on the following topics:

1. Conversion of timber from the log. Methods of breaking down logs and rosewing to sawn timber; quartersawing and backsawing; hardwood and softwood.

2. Seasoning. The meaning of seasoning; the reasons for seasoning; equilibrium moisture content; methods of measuring moisture content; how dry wood should be; shrinkage; collapse; circumstances and methods of seasoning.

3. Decay in timber. Causes; method of detection; importance and methods of prevention.

4. Termites and borers. Termites; description; habits; preventive measures; eradication. Lyctus, Anobium and pin hole borers: practical importance, methods of prevention and eradication; notes on habits

5. Grading. Why timber is graded; definitions; development of grading rules; grading practices in Australia.

6. Strength and factors affecting Strength. Definition of terms and ideas relating to strength of wood; the strength of wood under various types of loading; the effect of defects on the strength and the relationship between density and moisture content and strength.

7. Glues and gluing. Consideration of the characteristics, advantages and disadvantages of different types of glues and methods of application.

8. Wooden Construction. Recently developed types of construction- e.g. timber connectors; glued laminated constructions; stressed skin house construction; nailed timber trusses.

9. Organization of the Timber Industry and Sources of Information.

The training course, which will be given in the various Technical Colleges throughout the country, will cover a period of 6-9 months.

The Department of Labour and National Service, on learning of the proposals following the approach by the principals of the Technical Colleges has suggested that the Division prepare the larger scheme of 40 lectures in the form of a manual for use in apprenticeship carpentry courses throughout Australia. This is now under consideration and if it is decided to undertake this the authorities dealing with technical education in the various States will be contacted to obtain their cooperation in the scheme.

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CHAIN SAW FOR CROSSCUTTING VENEER LOGS.

The Division of Forest Products, C.S.I.R. is now using an electrically driven chain saw for crosscutting logs into peeling blocks for its experimental rotary veneer lathe.

The saw, donated to the Division by an English manufacturer and his Australian agent, is greatly appreciated by the staff because of its ease of operation and its fast rate of cutting through logs.

VISITORS.

Three New Zealanders recently visited the C.S.I.R. Forest Products Laboratory. They were

Mr. W.C. Ward
Mr. P.J. O'Hara
and Mr. A. ("Jock") Hammersley

Mr. Ward, as assistant to Mr. A.R. Entrican, has been fulfilling the functions of Timber Controller for New Zealand.

Mr. O'Hara is the Timber Officer for the New Zealand Government Railways.

These officers are concerned with the purchase of hardwoods for New Zealand. Mr. Ward stated that eventually New Zealand would be able to supply Australia with large quantities of exotic softwoods (Pinus radiata) but that for the present the quantity would be somewhat restricted because of lack of sawmill machinery and manpower shortage.

Mr. Hammersley stated there has been a large increase in the number of kiln-drying plants in New Zealand in the past two or three years and most of the bigger timber firms are now equipped with modern timber drying kilns. The usual kiln unit consists of two 34 ft. chambers and the cost of such a unit completely installed with equipment, buildings, boiler etc. is approximately £10,000. Such a unit working 2 shifts of 40 hours per week dries approx. 1,000,000 s.ft. of building timber (general N.Z. species and sizes) green off the saw (approx. 100-110% m.c.)

At the present time, the New Zealand Government have gone much further than the Australian Government in regard to the planning of post war housing.

All joinery, doors etc. have been standardized and manufacture strictly controlled on these lines. This also applies to furniture.

Several large groups of 300 houses have recently been completed by the prefabrication method. It has been found that this method was much too expensive and it is now thought that "Pre Cutting" on the job will be the preferred method of construction.

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Mr. E.E. Huddleston, Senior Research Officer, Division of Wood Technology and Mr. R. Cook, Senior Timber Inspector of the New South Wales Forestry Commission visited Melbourne to attend a meeting on the use of timber in small craft construction at the Forest Products Laboratoy.

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MOISTURE DISTRIBUTION IN WOOD CONTAINERS FOR WATER.

An experiment recently conducted at the Division of Forest Products C.S.I.R. will be of interest to manufacturers and users of wood pipe and containers such as vats or casks for water or watery liquids and to boatbuilders. As little information was available on the moisture absorption and distribution of moisture content in Australian timbers used as a partition between water and air, an experimental container incorporating five Australian timbers (karri, celery-top pine, blackwood, mountain ash, Queensland maple) and Douglas fir (oregon) was filled with water for thirteen months to provide some knowledge of the subject.

The walls of the container were of "air-dry" timber dressed to 2 in. thickness, but moisture contents determined for strips cut from the end of each board before assembly of the box, showed a variation from 11 to 21%.

The container was kept in a warm room throughout the period of experiment and when dismantled the average temperature was 68°F. and the relative humidity 68%. The free moisture on the inner faces of the boards was removed with an absorbent cloth and ten sections of equal thickness were cut from each piece. The moisture content of each strip was obtained by oven drying.

The results show that

(i) the moisture content of the outer section (exposed to the air averaged 14% (only slightly higher than the moisture content of a piece of wood freely exposed to the air)

(ii) the moisture content of the inner section had reached a very high figure approximating to the green moisture content of the wood in each case.

(iii) as the distance from the wetted face increased moisture content dropped rapidly, being at fibre saturation point approximately ½ in. from the wet face for 4 species and ¾ in. for blackwood and Queensland maple.

From this experiment it may be concluded that if air dry timber be used as a barrier between water and air a very high moisture gradient will be set up across the partition, but for more than half the thickness of a 2 in. piece the moisture content will be below fibre saturation point.

Arrangements are now being made for a further experiment, using green timber instead of "air dry" to be conducted along similar lines to determine if the ultimate moisture distribution will be similar to that described above

MOISTURE DISTRIBUTION THROUGH WOODEN PARTITION WALL OF CONTAINER (2 IN. THICK) HOLDING WATER FOR THIRTEEN MONTHS. MOISTURE DISTRIBUTION SECTIONS EQUALLY SPACED THROUGHOUT THICKNESS OF PARTITION.

1	2	3	4	5	6
Species used in Container	No. of sections into which thickness of wooden partition was cut. (Numbered from face in contact with water to face in contact with air).	Moisture Distribution through thickness of wooden partition. Before filling Container with water i.e. at commencement of experiment	Moisture Distribution through thickness of wooden partition. After one face of the partition had been in contact with water and the other face in contact with air for 13 months.	Moisture increase or decrease in distribution section after 13 months.	Mean green moisture content of species
		%	%	%	%
Queensland maple	1	13½	160	+147½	
	2	13	80	+ 67	
	3	14	42	+ 28	
	4	14	37	+ 23	
	5	13½	27	+ 13½	
	6	14	24	+ 10	
	7	13	23	+ 10	
	8	12½	19	+ 6½	
	9	14	16	+ 2	
	10	14	14	+ 0	
Blackwood	1	12	124	+112	
	2	12½	118½	+106	
	3	12½	78	+ 65½	
	4	13	31	+ 18	
	5	13	24	+ 11	117
	6	12½	21½	+ 9	
	7	13	18½	+ 5½	
	8	13	16	+ 3	
	9	13	15	+ 2	
	10	13	12½	− ½	
Celery-top pine	1	13	110½	+ 97½	
	2	13½	26½	+ 13	
	3	14	22½	+ 8½	
	4	14	20½	+ 6½	
	5	14	18½	+ 4½	130
	6	14	17	+ 3	
	7	14	16½	+ 2½	
	8	14	15½	+ 1½	
	9	14	15	+ 1	
	10	13½	13	− ½	
Mountain ash	1	12½	100	+ 87½	
	2	12	32	+ 20	
	3	12	25½	+ 13½	
	4	11½	21	+ 9½	
	5	12	19	+ 7	101
	6	12	18½	+ 6½	
	7	12	18½	+ 6½	
	8	12	18½	+ 6½	
	9	11	15½	+ 4½	
	10	10½	13	+ 2½	

1	2	3	4	5	6
		%	%	%	%
Douglas fir	1	20½	81½	+ 61	
	2	21	42½	+ 21½	
	3	21	27½	+ 6½	Sapwood 117%
	4	21	24	+ 3	Heartwood 36%
	5	21	23	+ 2	
	6	20	21½	+ 1½	
	7	20	21	+ 1	
	8	19	20	+ 1	
	9	18	19	+ 1	
	10	15½	14½	- 1	
Karri	1	14	73½	+ 59½	
	2	13½	32½	+ 19	
	3	14	27	+ 13	
	4	14	25½	+ 11½	
	5	14	23	+ 9	
	6	14	21½	+ 7½	68
	7	14½	19	+ 4½	
	8	15	17½	+ 2½	
	9	15	16	+ 1	
	10	14	14½	+ ½	

THE PROPERTIES OF AUSTRALIAN TIMBERS.

ROSE MAPLE. No. 132.

Rose maple is the standard trade common name for the timber from trees known botanically as Cryptocarya erythroxylon, Maid. & Betche and C. patentinervis, F.v.M. This timber is also known in the trade as rose walnut and as pigeon-berry ash. The genus Cryptocarya is represented by other timbers such as bolly silkwood (C. oblata Bailey) and silver sycamore (C. glaucescens R.Br.)

Distribution: Rose maple is found in the brush forests of the east coast of Australia extending from the Hastings River in New South Wales to the Atherton Tableland in North Queensland. It is commonly found in association with rose mahogany, tulip oak, bolly wood, sassafras, yellow carabeen and white beech; its chief requirements being a minimum monthly rainfall of 1½ inches and an annual rainfall of 50-60 inches, and prefers the richer red or brown loams with a high humus content.

Habit: Rose maple is a large straight boled tree having a total height of 120 ft. and a diameter breast high of up to 4 ft. with a large heavy limbed crown.

Timber: The truewood of rose maple is a light pinkish brown when freshly cut but weathers to an orange shade; possessing a strong and distinctive odour said to resemble crushed celery. The timber has a moderately coarse but uniform texture with a sometimes interlocked grain, possessing a fine figure on backsawn faces due to bands of soft tissue. The sapwood of rose maple is fairly distinct from the truewood being lighter in colour. The sapwood is susceptible to attack by Lyctus borers.

The truewood is moderately light in weight having an average density of 43 lb./cu.ft. at 12% moisture content and a normal range of from 37-49 lb./cu.ft. In drying from the green condition to 12% moisture content, the average shrinkage of this timber is 6.7% in a tangential direction (backsawn) and 3.0% in a radial direction (quartersawn). This Division has had little experience on the seasoning of this timber but it is stated, in Swain's 'Timbers and Forest Products of Queensland' that it seasons without warping; also on account of its high tangential shrinkage surface checks are liable to develop unless care is exercised in drying. The truewood is durable exposed to the weather or used indoors. Rose maple is a fair bending timber and has mechanical properties commensurate with its density.

Uses: Rose maple finds its chief use in buildings for flooring, lining, internal fittings and panelling as well as framing. It also makes a useful furniture wood. It has been used fairly extensively in motor body building and also in horse drawn vehicles. Rose maple veneers are used to some extent for plywood, panelling and stitched wire case manufacture.

Availability: Rose maple is cut in relatively small quantities and consequently is not used to any extent away from areas where it is produced.

COMMONWEALTH OF AUSTRALIA.

COUNCIL FOR SCIENTIFIC & INDUSTRIAL RESEARCH.

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NEW GUINEA TIMBERS.

It is natural that at this time many timber merchants in Australia are thinking and thinking seriously of the possibilities of supplies of timber from New Guinea and other Pacific Islands after the war. There has, of course, been considerable publicity about the dense jungle of the islands and the large tracts of the rain forests and this has been supported by stories brought back by servicemen who have seen action in these areas. In addition, just prior to the war small quantities of New Guinea timbers were reaching the Australian market and were provoking interest. All these factors have, no doubt, influenced the thoughts of many timber-men and made them anxious to get into "the forest areas of the North" as soon as hostilities have ceased. Their interest is likely to be very keen as they have been told that there will be a shortage of timber in Australia after a number of years.

It is, therefore, wise perhaps to sound a few notes of warning. One outstanding feature of the New Guinea forests and for that matter the rain forests of any of the Pacific Islands is the great multiplicity of species. It is quite impossible to go into the rain forest with the idea of obtaining logs of only 2 or 3 species. Any enterprise that hopes to be successful must plan on taking logs of a large number of species, selecting, of course, those most likely to be of commercial value. There are quite a number of species that fall into this category. Then again, there is the matter of access to the various areas. Working close to the shore and in the neighbourhood of areas that have been opened up in the past may be alright in the early stages, but, unfortunately, these areas will cease to give commercial logs and there will be the necessity of going further inland. In such cases facilities for handling and shipping logs are all important. There are some roads that have been built for war purposes but such roads may not suit the logger; other roads will, therefore, have to be built and they are difficult to maintain in the conditions that exist in tropical areas. Further, a decision will have to be made whether to mill the logs on the spot and ship the timber out or whether the logs themselves should be shipped to a larger centre for milling and subsequent handling. If timber mills are erected in the islands then arrangements will have to be made for bringing the logs to the mills, and, if needs be, for shifting the mills quickly to other localities. These are all difficulties that have to be faced, but they are not insurmountable. It is well, however, for anyone to realise beforehand that there are certain difficulties and make their plans accordingly.

The Division of Forest Products will be in a much better position after the war to give advice on the timbers from the various islands. Prior to the outbreak of hostilities not very much was known of these timbers but now it can be said that practically all the likely commercial timbers of these areas are known to the officers of the Division. This has been the result of co-operation with Army Authorities from whom specimens of timbers from various areas have been received for identification and examination and of the visits of certain officers of the Division to areas in New Guinea. Advantage was taken of these visits to obtain as much information as possible on the timbers of the rain forests and their potentialities.

Anyone interested in the question of New Guinea timbers as a post-war project would be well advised to get in touch with the Chief, Division of Forest Products, 69 Yarra Bank Rd., South Melbourne.

CASEIN TYPE ADHESIVES FOR PLYWOOD MANUFACTURE.

Over 100,000,000 square feet of hoop pine plywood, the bulk of which is bonded with casein glue is produced in Australia annually. A small proportion is bonded with soya bean glue or casein-soya bean mixtures.

Casein is produced in Australia while the soya bean meal is imported.

Naturally, the plywood industry is vitally interested in casein supplies for any failure to meet the demand would result in severe dislocation within the industry. In addition, repercussions would be felt throughout a number of essential industries which in many cases are dependent upon continuous supplies of plywood. As a result, plywood manufacturers are interested in any substitute materials which might replace casein or which could be blended with casein to conserve supplies of this valuable material.

Soya bean flour provides a very good substitute, but as stated previously, it has to be imported. The Division of Forest Products, therefore, has endeavoured to find satisfactory substitutes of local origin which might replace casein, or be blended with it to eke out supplies if production should be curtailed in any way.

Some success has been obtained so that adequate supplies of glue should be available over the critical period during the winter months. Results of these experiments are discussed below.

Peanut meal ground to a fine flour has proved to be a fairly satisfactory substitute, but joints made with this material are about 50-70% as strong as those made with casein alone It has been recommended that peanut meal flour should be used as a 50:50 mixture with casein to give only slightly inferior joints to those made with straight casein. Supplies of peanut meal flour should be adequate to meet any demand that might arise.

It has been shown also that buttermilk can be added to casein in the proportion of 40:60 without any serious deterioration of the joint strength or water resistance of the joints. It should be possible to organise supplies of buttermilk from factories throughout Australia.

Milk albumen is another dairy product at present largely wasted that can be blended with casein in the proportion of 20:80 to give a satisfactory bond.

Other materials have been tried out but the three products mentioned above appear to be the most satisfactory.

Full details of the formulae to be used and the mixing directions can be obtained without charge by application to the Chief, C.S.I.R., Division of Forest Products, P.O. Box 18, South Melbourne, Vic.

A NEW TYPE OF IMPROVED WOOD.

A notable addition to the list of substances for "improving" wood has recently been announced by Dr. J.F.T. Berliner of du Pont de Nemours and Co., U.S.A. This substance, called methylol urea is a chemical compound obtained from the controlled reaction of urea and formaldehyde. It is soluble in warm water and is non-toxic.

By conventional methods such as soaking or vacuum impregnation, an aqueous solution of methylol urea may be applied superficially or impregnated throughout a piece of timber. When this timber is dried and heated to 240°F or even kept at atmospheric temperatures for some time, the methylol urea resinifies and becomes hard and infusible conferring similar properties on the surface of the wood.

Timber treated in this manner is dimensionally more stable, harder, stronger and more resistant to wear, moisture, fire and insect attack than untreated wood. Furthermore, the natural colour of the wood is retained. However, it is stated that suitable dyes may be incorporated with the treating chemical to colour the wood throughout.

Veneers may also be treated with the chemical and may be used to form plywoods, or when sufficiently impregnated and dried they may be self bonded under heat and pressure to form high density boards. Treated timber takes a high polish and is dent and wear-resistant.

The parent American company suggests the following applications using either complete or surface impregnation and hardening: Treated veneers, flooring, sporting goods, rollers, shoe lasts, drawers, windows, furniture and textile and machinery parts.

The process is attractive since it makes possible the substitution of more available low cost timbers for rarer, high cost timbers. Softwoods may also take the place of hardwoods for certain uses. However, it should be realised that the exact conditions for the effective treatment of specific items and timbers can only be determined through practical tests and experience.

A small supply of the chemical has been obtained by the Division of Forest Products and initial trials with Australian timbers have commenced. It is difficult to assess its commercial possibilities in Australia until the tests have been more fully developed.

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PERSONAL NOTES.

Mr. S.F. Rust has recently returned from a brief visit to the Northern Territory and North Queensland after installing exposure tests of various types of adhesives. In addition, attention was given to various problems in connection with the use of plywood in those areas.

Mr. A. Gordon visited Sydney to attend a meeting of an Australian Standards Association Committee to discuss proposals regarding the standardisation of doors, windows etc.

Mr. H.B. Wilson, during the latter part of October, spent some time in Brisbane in connection with Preservation problems.

THE PROTECTION OF SPLIT RING TIMBER CONNECTORS AGAINST CORROSION.

Split ring timber connectors developed as a means of increasing the efficiency of timber joints during and after World War I have been used in Europe and America for many years with coniferous timbers. These softwoods have generally been seasoned before use and no serious weakening by corrosion has been experienced. In 1936 the Division of Forest Products, C.S.I.R. undertook a comprehensive series of strength tests on a variety of timber joints using green Australian hardwoods and split ring timber connectors and it was found that the behaviour of the rings in green hardwoods was different from that in dry softwoods.

Since many hardwoods when green have a very corrosive effect on unprotected steel normally employed in the manufacture of split ring connectors, a systematic series of tests was devised in 1938 to investigate the problem and develop a practical method of treating rings to prevent corrosion of the metal and consequent weakening of the ring.

Sixteen types of protective coats were used on the connectors assembled in green karri, a timber known to have a strong corrosive action. The corrosion of these was compared with that of untreated rings in 96 specimens. These specimens were placed in a cool store at 37-40°F. for three months, being watered each morning. For the next six months they were under hessian covers in the open, the covers being watered every morning, and twice weekly the specimens were sprinkled with salt. For the remainder of the period they were freely exposed to the elements.

Preliminary examination of half the specimens was made after twelve months but as the corrosion of untreated rings was not as severe as might have been expected these were re-assembled and examined (after a further twelve months). The remaining 48 specimens were left assembled for five years.

All the untreated rings were badly corroded and it was necessary to split the timber to release the rings. The corrosion products were chipped from the rings which were then weighed. The average loss of weight of the untreated was 14% after two years compared with 19% for five years. The products of corrosion provide a closely adherent cover which gives a partial protection against further corrosion and so the percentage loss by corrosion is not proportional to the time.

Of the protective materials applied hot dip galvanizing with zinc at the rate of 2 oz. per square foot in accordance with standard specifications was by far the best, no loss of weight occurring in rings exposed for 2 or 5 years, and it is recommended as a treatment for ring connectors to be used with green hardwoods in exposed conditions.

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PERSONAL:

Mr. A.J. Thomas, an officer of the Division of Forest Products, who has been temporarily seconded to Timber Control, recently returned from America where he spent several months on work associated with the importation of timber.

THE PROPERTIES OF AUSTRALIAN TIMBERS.

YELLOW BOXWOOD No. 133.

Yellow boxwood is the standard trade common name for the timber known botanically as Sideroxylon pohlmanianum Benth. & Hook. This timber is so named from its colour and from its resemblance in properties to the English and Turkish boxwoods of commerce (Buxus sempervireus). Yellow boxwood may also be known locally as Engravers wood.

Distribution: Sideroxylon pohlmanianum occurs between the Tweed River in New South Wales and the Cairns-Atherton district in North Queensland but within this range is fairly restricted in locality to regions of more or less continual rainfall with a minimum for the driest month of 1½", but is reported from the Yarraman and Bunya Mt. district of Sth Queensland. Yellow boxwood is found scattered as a sub-dominant species of the coastal jungles, preferring the moister alluvial soils of drainage basins.

Habit: Yellow boxwood is a small tree 60-80 ft. high with a diameter breast high of 16-20 in. but occasionally up to 2 ft. with an unbuttressed stem. The bark is smooth and persistent and exhibits a yellow blaze exuding a milky substance of reputedly evil taste.

Timber: The truewood of yellow boxwood is a light yellow-brown in colour without characteristic taste, odour or figure. The timber is straight grained and very fine intexture, some figure is apparent on tangential faces due to bands of soft tissues. Chips of this timber when shaken up with water produce an abundant froth, a characteristic of many timbers of the family Sapotaceae.

The truewood is moderately heavy having an average density of 57 lb./cu.ft. at 12% moisture content. In drying from the green condition to 12% moisture content, the average shrinkage is 5.5% in a tangential direction (backsawn) and 2.8% in a radial direction (quartersawn). Experience at this Division has shown that yellow boxwood seasons readily and can be dried in dimensions up to 2" thick readily from the green condition without checking or warping under a fairly severe schedule. Swain in his 'Timbers and Forest Products of Queensland' states that it requires long and careful seasoning under cover. Yellow boxwood has excellent working qualities under hand and machine tools, cutting sharply and cleanly with a very fine finish and dressing very smoothly.

Uses: Owing to the above qualities yellow boxwood may be used for many articles which previously were made from imported boxwood, such as rulers. It is also used for wooden household utensils such as bread boards, plates and platters, rolling pins, ladles and spoons. Yellow boxwood also finds a use in the sporting goods field, for croquet mallets, fishing rod butts and roller skates etc. Engravers and printers use this timber for wood cuts for printing and engraving blocks when the actual engraving is done on the cross section of the wood. Yellow boxwood has been acclaimed by many to have properties equal to imported boxwood when proper selection and seasoning is adhered to.

Availability: Utilization of this species is on a small scale as it is a special purpose timber. Sizes cut are small.

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COMMONWEALTH OF AUSTRALIA.

COUNCIL FOR SCIENTIFIC & INDUSTRIAL RESEARCH.

DIVISION OF FOREST PRODUCTS.

MONTHLY NEWS LETTER No. 134.

1944##134 November, 1944.

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HIGH FREQUENCY OR ELECTROSTATIC HEATING OF WOOD.

Heating by means of high frequency electric fields (diathermic or electrostatic heating) probably originated about 1928, and since then has been widely applied to therapeutic work. About 1936 efforts were begun overseas to construct large scale commercial plants for heating non-metallic materials, but it was not until some time later that the application to wood was attempted on the same scale. A good deal of success has recently been achieved; but high capital cost, depreciation, and comparatively low electrical efficiency still limit the number of economical applications.

The outstanding property of the electrostatic method is its ability to heat many materials which are ordinarily considered to be poor conductors of heat and electricity. The material is heated by placing it in a strong electric field alternating at millions of cycles per second. This field is generated between the metal plates of a condenser by connecting them to a source of high frequency power, such as an electronic radio transmitter. In practice the condenser plates may be the two plattens of a press (e.g. in the gluing of veneers to form plywood). The heat may be considered to arise from frictional forces between the molecules of the material as they are forced to vibrate by the applied field.

Since the electrostatic field extends uniformly throughout the material, heating will also be uniformly distributed for any reasonable thickness. Poor heating conduction, the limiting factor in conventional methods, therefore ceases to be a disadvantage.

By a suitable choice of generator, heating ordinarily requiring hours (as for thick wood) may be accomplished in a matter of minutes. Generally the speed of heating is limited only by the power available, that is by the size of the generator. In some cases however, because of inherent properties of the material, impractical voltages and frequencies would be required. Wood, resins, glues and moulding powders are readily heated.

Some applications of high frequency heating are

(1) manufacture of flat and curved plywood;
(2) production of laminated stock (e.g. aircraft spars and propeller blanks);
(3) accelerating the setting of glues in general;
(4) edge gluing;
(5) preheating moulded products; and
(6) timber seasoning.

The paramount reason for employing high frequency in these cases is the reduction which may be effected in production time. Also the quality of the product, particularly of moulded articles, is often improved.

Early in 1939 the Division of Forest Products, C.S.I.R. constructed a 400 watt experimental plant with which the practicability of electrostatic heating as applied to wood

was established by a number of successful gluing experiments. Laminated stock more than a foot thick was produced. Unfortunately these investigations were interrupted by the war, but a new programme of work has recently been initiated. This Division is prepared to advise the industry in this country in the application of high frequency to heating problems, particularly those associated with timber.

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BONDING METAL TO WOOD.

To satisfactorily bond metal to wood has always been a problem. In recent years fairly successful results have been achieved with certain adhesives by the use of high temperatures and pressures but this procedure has definite limitations particularly when laminating large areas. The contraction on cooling causes stresses in the glue line that fracture the bond, or result in warpage of the laminated sheet.

In a recent issue of the American journal "Modern Plastics" details are given of a newly-developed adhesive "Cordo-Bond" which can be used for obtaining excellent joints between metal and wood at room temperatures. Figures are given which show the strength of bonds obtained between the four timbers, birch, mahogany, oak and maple and the four metals, steel, stainless steel, iron and aluminium. They indicate that failure occurred principally in the wood.

Soaking in water for various periods up to 7 days does not appear to affect appreciably the shear strength of the joint. After 21 days immersion, 100% wood failure still occurs, but at a very much lower shear strength.

Alternate soaking in water for 16 hours followed by 8 hours drying at 170°F. for 10 complete cycles gave no evidence of bond failure although, as would be expected, the plywood was badly cracked.

To make the joint it is necessary to apply a priming coat to the metal and bake for 15 mins. at 250-300°F. This may be applied by brushing, spraying or roller coating. The joint is then completed by coating the wood and the primed metal with a resin which will set at room temperatures, allowing the resin to reach a tacky consistency and bringing the surfaces together at pressures varying from 50 to 200 lb./sq.in. A curing time of 24 hours is recommended.

The successful bonding of large sheets of plywood and metal offers many interesting possibilities. For structural purposes, such a material should find many uses in the aircraft, motor body and truck manufacturing industries. It should find a widespread application in the post-war era in the decorative field and for kitchen and restaurant work. It should be well suited for the construction of cabinets, tables, benches, sinks etc. combining the appealing appearance and durability of stainless steel with the rigidity of plywood.

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TIMBER SEASONING.

KILN DRYING IN AUSTRALIA.

The most efficient type of compartment kiln in use today for the seasoning of timber, either in Australia or overseas, is undoubtedly the cross shaft internal fan type. Construction of the cross shaft type is usually of concrete, brick, timber or an equivalent substitute. The all concrete kiln (6 in. walls and 4 in. curved ceiling) gives the greatest life however, and is the most widely used. In brick construction 9 in. walls have proved satisfactory (the bricks being laid on edge, with a 3 in. cavity in the wall; and frequent headers to tie the wall together) provided cement (not lime) mortar is used. The interior face of the kiln is generally coated with a good bitumastic paint or equivalent. A concrete or timber ceiling is generally used in association with brick walls. Timber construction is convenient in some circumstances, but the kiln life is usually much less than that obtained with the other forms of construction.

In Australia the most favoured size for general use is a kiln 9 ft. wide, 11 ft. high and 32 ft. or 42 ft. long, taking a charge about 5 ft. 6 in. wide, about 6 ft. high and 30 ft. or 40 ft. long respectively.

The charge capacity of a kiln of the above cross section, using stacking strips $\frac{3}{4}$ in. or $\frac{7}{8}$ in. thick, is approximately

	32 ft. kiln.	42 ft. kiln.
(i) With timber $\frac{1}{4}$ in. thick	2,800 super ft.	3,500 super ft.
(ii) " " $\frac{1}{2}$ in. "	4,500 " "	6,000 " "
(iii) " " 1 in. "	5,200 " "	7,000 " "

In most cases the kiln charge is made up of two or more stacks, e.g. in a kiln 42 ft. long internally the following stack combinations may be used to fill the kiln, namely, two 20 ft. stacks; a 16 ft., a 14 ft. and a 10 ft. stack; two 14 ft. stacks and a 12 ft. stack; etc.

A number of variable factors such as the species of timber being dried, the thickness of the timber and the moisture content at which the timber goes into the kiln, affects the output of a kiln seasoning plant. Generally speaking, thin case stock, say $\frac{1}{4}$ in. or $\frac{3}{8}$ in. thick, is kiln dried from the green condition irrespective of whether it is cut from softwood or hardwood; whereas thicknesses above this are generally allowed to air dry for a short period, say 1 to 6 months depending on species and thickness, before they are placed in the kiln for final kiln drying. The exception is when weather conditions are such that "blue staining" of timber like hoop pine is likely to occur; in this case the timber is kiln dried from the green. The reasons for the preliminary air drying of the thicker stock are (a) total drying costs are reduced and (b) kiln output is increased. The following estimates will give an idea of the approximate times required to kiln dry various thicknesses of hoop pine (or radiata pine) and mountain ash (or similar hardwood).

Thickness	Hoop pine or Radiata pine		Mountain ash	
	Green Material	Partly air dried timber (say 25% to 30%)	Green Material	Partly air dried timber (say 25% to 30%)
$\frac{1}{4}$"	12-15 hrs.	-	20 hrs.	-
$\frac{1}{2}$"	2 days	-	3-5 days	2 days
1"	3 to 4 days	2 days	10-14 days	3 to 5 days

Note: Days referred to are of 24 hours duration

F.	STORAGE SHED. Per 100 sq. ft. of area	£40
G.	LEVELLING. Depends on site. Price per cubic yd.	4/-
H.	MOISTURE METER.	£27
I.	STACKING GUIDES. Per charge	£20
J.	STACKING STRIPS. Per 1,000 super ft. of timber stacked	£1

The Division of Forest Products, C.S.I.R. will be glad to assist in the design and layout of kiln installations, and is prepared to supply detailed plans for kiln construction on request. Requests should be addressed to the Chief, Division of Forest Products, C.S.I.R., P.O. Box 18, South Melbourne, Victoria.

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AN UNUSUAL FAILURE WITH TEGO-BONDED PLYWOOD.

The manufacturers of Tego bonded plywood in Australia have developed a high degree of efficiency in the production of this material. Faulty bonding is very rare. Occasionally it does occur, but in most cases the cause of the bad adhesion can be determined without difficulty. Recently however, a rather baffling series of failures occurred, but after careful consideration of all the stages of manufacture the cause of the trouble at once became apparent.

The faulty bonding occurred in a 5 ply aircraft plywood between the face veneer and the cross bands, for a narrow area each side of the edge-glued join in the crossbands. The adhesion of the crossbands to the core was excellent. The glue film in each case had adhered to the inner face of the face veneer but not to the core.

The moisture content of the veneer at the time of bonding appeared to be satisfactory as the film between the joint did not exhibit the characteristic appearance which results from the use of veneer which has been too wet or too dry. Tego film is rather critical in this respect. The moisture content of the veneer must be not lower than 8% or higher than about 13%. If it is lower, the film sets between the joint with very little adhesion to either veneer. If it is higher, the resin is absorbed by the timber and the paper carrier remains attached to one veneer with the greyish -white fibres plainly visible/and a faulty joint results.

The veneer at the join in each case did not appear to be of uneven thickness. Sometimes faulty bonding may occur at a join due to lack of pressure on one veneer caused by the use of a thin veneer. Judging by the adhesion of the crossbands to the core, adequate pressure had been evenly applied.

Thus the moisture content and thickness of the veneer and the bonding technique appeared to be satisfactory. Consideration was given then to the handling of the veneer since it entered the factory. It was found that a new edge gluer had been installed and that some veneers were being stained during passage through the machine. This stain had been removed by sponging with oxalic acid solution. The cause of the trouble

immediately became apparent. The oxalic acid had interfered with the setting of the resin which is an alkali catalysed material. A similar trouble was experienced some time ago at this laboratory* when tests were being carried out on the Tego bonding of veneer which had been treated with boric acid to prevent Lyctus (Powder Post Borer) attack. It was found that it was impossible to Tego bond veneer which had been treated in this way with an acid.

Care must be taken with the newer types of adhesives which set by a chemical action to ensure that extraneous materials are not present to interfere with this action. Another example is afforded by the urea formaldehyde cements which are set by the addition of an acid. The presence of an alkali such as caustic soda will interfere with the setting action. Once it has been completed however, the resultant joint is very resistant to moisture, bacteria, fungi and to chemicals of all kinds. It is only prior to, or during the setting period that care must be taken to ensure that extraneous chemicals do not come in contact with the adhesive.

* C.S.I.R., Forest Products Laboratory, 69 Yarra Bank Road, South Melbourne.

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THE PROPERTIES OF AUSTRALIAN TIMBERS.

KANUKA No. 134.

Kanuka is the standard trade common name for the timber known botanically as Tristania laurina R.Br. This species belongs to the same genus as brush box (Tristania conferta). Kanuka is also known as water gum, being found commonly on the banks of creeks.

Distribution: Kanuka occurs from S.E. Queensland in the Brisbane and Mary Valley districts to as far south as E. Gippsland, Victoria. The species reaches its best development in the Bellinger, Dorrigo-Manning River district of New South Wales. Kanuka requires continuity of rainfall, 1½" for the driest month, and reaches its optimum in sheltered coastal water sheds.

Habit: Tristania laurina is not a large tree, only reaching a total height of 60-80 ft. and a diameter of 20 in. - 26 in. above the spreading angled base. The stem is often irregular and somewhat channelled and the tree tends to branch low down and assume a spreading habit so that merchantable stems of any considerable length are not obtainable. The bark is grey and scaly or flaky.

Timber: The truewood of kanuka is dark reddish-brown in colour, the sapwood pale. It is hard, heavy, tough and uniformly fine textured. The timber is usually moderately straight grained, but may be interlocked. The logs usually produce a high percentage of clear timber. The truewood averages 55 lb./cu.ft. at 12% moisture content and has a normal range from 43-66 lb./cu.ft. In drying from the green condition to 12% moisture content, the average shrinkage is 14% in a tangential direction (backsawn) and 7% in a radial direction (quartersawn). Care is needed to season this timber satisfactorily, particularly in thicknesses greater than 1". Kiln drying from the green condition is not recommended, more satisfactory results being obtained by careful preliminary air drying. The timber is prone to warp, check and collapse and appropriate measures should be taken to minimise these risks.

Kanuka is a somewhat refractory timber to work under hand and machine tools. Kanuka is very tough and has fair strength properties, and is said to be durable.

Uses: This timber has rather limited uses which are more or less specialized. It makes excellent maul-heads and mallets, particularly when cross grained. It also finds a use in plumbers' and tin smiths' dressers and bending sticks. Kanuka has also been used for small tool handles such as chisel and file handles and carpenters' mallets. In the sporting goods field it may be substituted for persimmon in golf-club heads. It has also found limited use as a material for smokers' pipes.

Availability: Kanuka, although having a wide distribution, is limited in locality and sizes available are small.

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COMMONWEALTH OF AUSTRALIA.

COUNCIL FOR SCIENTIFIC & INDUSTRIAL RESEARCH.

DIVISION OF FOREST PRODUCTS.

MONTHLY NEWS LETTER No. 135.

1944##135 December 1944.

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SAVE THE FORESTS!

It is gratifying to note the quickening of public interest in the necessity for wise conservation of forests and trees to provide timber supplies and to prevent soil erosion and the siltation of reservoirs in Australia.

In the past settlers commonly regarded forests as an enemy to be destroyed, and, with the assistance of firestick and axe, made indiscriminate clearings often in prime forest land without regard for the value of trees. Many areas cleared were unsuitable for agriculture or pasture, were often overgrazed and, as erosion took its toll were ruined.

In addition to providing timber and preventing erosion, trees in forests, on farmlands and along watercourses serve many other useful purposes, giving facilities for sport and recreation, picturesque scenery for tourists, honey production, and shelter for native animals and beneficial insectivorous birds.

Active campaigns to arouse further public support have this year been launched in Victoria and New South Wales. In January 1944 a "Save the Forests Campaign" was launched in Victoria with the following objectives:

1. To arouse public interest in forestry and to enlist public assistance in preventing and in fighting bush and forest fires.

2. To build up an organization that will ensure the continuance of active public interest in our forests.

3. To take all possible action to ensure that the timber, water and soil resources of the State shall be fully conserved.

After several months' activity it promoted as "Forest Week" the last week in November to draw attention to the campaign in general and, in particular, to inspire a greater forest consciousness immediately before the Summer which promises to be a period of severe bush fire hazard. The activities for Forest Week included an Exhibition at the Melbourne Town Hall, shop window displays, and publicity through the press and radio, in the schools and at meetings.

In New South Wales a "Save the Trees - Conserve the Forests Campaign" sponsored by the Australian Forest League was recently inaugurated and its aims are similar to those for the Victorian campaign.

These and similar organizations striving to make Australians more forest conscious are highly commendable for, in the future, their efforts should be rewarded by greater national prosperity consequent on the amelioration of forest conditions, the building up of forest reserves and the practical elimination of bush fire and erosion problems.

As these are attained increased Australian timber production will be possible. This may be achieved not only because more trees will be available for cutting, but also through more complete utilization of those trees if integrated wood using industries are established. This would ensure trees would be converted to veneers, sawn timber, piles, poles, used for wall boards, pulp and paper or chemical industries, fuel or other purposes according to their suitability.

Well managed forests and permanent forest industries provide regular employment, good living conditions for workers and their families and are beneficial to the nation's economy. Let us therefore, develop strongly a forest consciousness, integrate our wood using industries and demand of everyone

"SAVE THE FORESTS!"

A.G.

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TIMBER STAINS ON HANDS - TIPS FOR CLEANING.

The following note received from North Queensland will undoubtedly interest many persons engaged in the production of sawn timber from green logs.

> "A short staffed sawmiller - straining every effort to achieve due deliveries to priority demand, found his men unwilling to cut ANY grey satinash logs (water gum) - and after a deal of persuasion obtained the information that "there's a dance on Saturday and we're not going with dirty hands".
>
> A promise - faithfully kept - saw large supplies of lemons and every other stain remover available at the mill for the employees' use at knock-off on Saturday - but the boys went to the dance with dirty hands - shamefacedly and cursing.
>
> The trouble recurred upon the approach of a further social appointment - and grey satinash logs were NOT cut for a fortnight prior to it - but a week or so following, with hands blackened from a continuous run of the staining species - the run of logs followed with a very wet silky oak -- to the marvel of all hands were immediately immaculate -- and the boss sawmiller NOW always keeps a good green silky oak log available for the final cut prior to week ends, and reports that deliveries of grey satinash are now never held up. Is there a chemical foundation for this?"

Very wet silky oak logs probably contain free acetic acid which reacts with the substance causing the stains on the hands and dissolves it. This free acetic acid is readily volatile and will rapidly be lost as the log or sawn timber is exposed to even mild drying conditions. These stains, so common on timber workers hands, arise from the reaction between tannic acid in the wood being sawn and iron from steel bench tops, saws etc. resulting in the formation of a substance similar to ink.

It should be of value to sawmillers to note that practically any dilute acid will react with the timber stains on hands and reduce staining to a minimum. A supply of oxalic acid solution or, if unobtainable, of dilute hydrochloric acid (spirits of salts) should be available for cleaning hands so that employees may be at their best at their social engagements! After washing in acid the hands should be thoroughly rinsed to remove all traces of acid. This precaution is specially necessary with oxalic acid which is poisonous if taken internally.

A.J.W. & A.G.

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SAVE THE FORESTS EXHIBITION.

To demonstrate how forests affect the home and the daily life of the citizen, and as a publicity measure to draw attention to the severe damage caused in Victoria by bushfires and indiscriminate clearing of forests the "Save the Forests Campaign" Council held an exhibition in the Melbourne Town Hall at the end of November.

Exhibits were shown by organizations engaged in the manufacture or sale of goods for which wood is the chief raw material, by Government Departments vitally concerned in the preservation of forests from aspects of conservation and utilization of timber, the prevention of erosion, and bodies who rely largely on forested areas for the provision of health and recreational pursuits.

Four main groups of exhibits were displayed comprising A. How forests affect the home, demonstrated by a timber and plywood house, wooden furniture and toys, rustic furniture for the garden. Other exhibits depicted the dependance of water supply and hydro-electric power on forested catchment areas.

B. How forests affect the daily life of the citizen, represented by wood pulp products for papers and packaging, displays of wooden equipment used in industry and by the Services, and illustrations of the use of forest areas for health and recreational pursuits.

C. Influences favoring forest preservation included displays of fire-fighting and radio communication equipment and insectivorous birds.

D. Influences endangering the forests were demonstrated by models of landscapes showing damage caused by bushfires, indiscriminate clearing, bad cultivation, overgrazing, and soil erosion.

An exhibit arranged by the C.S.I.R., Division of Forest Products excited particular interest. Prepared largely as an educational display it included equipment used in the manufacture of samples of waterproof plywood, a glue testing machine and an izod machine for determining the impact strength of timber. These were all operated as in normal laboratory research work, the izod machine being employed on the specification testing of specially selected timber to determine its suitability for use in aircraft construction.

A laboratory timber seasoning kiln, complete with accessories was displayed, together with electrical moisture meters used for determining the moisture content of timber.

Staff was provided throughout the exhibition to operate the machines and make available information concerning the remainder of the exhibits. These demonstrated a number of important uses of timber and timber products in industry and for service requirements. Improved or compregnated wood and its application to the manufacture of variable pitch wooden propellers for aircraft were strikingly featured. Components of textile machinery, plywood boxes and drums, wagon wheels, stages in the manufacture of tennis racquets and shoe heels, and a series of models of service equipment made from Australian woods demonstrated further uses.

An excellent series of photographs, specimens and labels illustrated the structure of wood in general and

gave some indication of variations of structure of Australian woods, especially the differences between hardwoods and softwoods.

A further exhibit labelled "Wood is a Chemical" demonstrated by equipment, descriptions and photographs the methods adopted in determining the chemical composition of a wood sample.

Such information on the chemical composition provides a valuable guide to the feasibility of using a timber species as raw material for manufacture of paper, artificial silk, lacquers, plastics etc.

A.G.

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PLYWOOD FOR RAILWAY FREIGHT TRUCKS.

The integrated use of plywood sheeting and steel and timber framing in the construction of new box cars for the Great Northern Railway in America was announced when the first delivery of 106 trucks from an order for 1,000 was made recently. These trucks, 40 ft. long and of 50 tons capacity, which incorporate the most modern development in springs and accessories, were found on test to be as sturdy as the conventional box cars.

The most outstanding feature however, is the reduction of two tons in weight compared with the previous cars. In addition, cargoes will be better protected from dirt and cinders as the use of large sized waterproof plywood panels reaching from the floor to roof in one piece for internal and external sheathing reduces to a minimum the number of joins.

In Australian railway systems plywood has been used to a modest degree in passenger cars but the wide field of use in all railway rolling stock has scarcely been touched. Post-war building of new trains here may however, see a more extensive use of plywood in truck and carriage construction.

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PERSONAL.

Mr. S.A. Clarke, Chief, Division of Forest Products, C.S.I.R., with several members of the Australian Council for Aeronautics visited Northern Territory where, as guests of the R.A.A.F. they inspected various Air Force establishments and examined operational facilities and repair and maintenance equipment.

Messrs. D.T. Christie and Skittrub from the Hastings, New Zealand spent several days in November at the Division of Forest Products, C.S.I.R. discussing problems associated with timber seasoning, bending, wood turning and the manufacture of furniture.

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AUSTRALIAN TIMBERS FOR TEXTILE ROLLERS.

Until recent years, the textile industry obtained almost all its requirements for wooden pressing rollers from overseas sources, American rock maple being considered the timber par excellence for spinning and drawing frame rollers.

Over recent years however, lack of shipping space in the Pacific Area seriously curtailed the quantity of rock maple that could be imported, and with the textile industry in Australia working at a much increased tempo, it soon became apparent that unless an Australian substitute for the imported timber could be found, serious consequences might result.

With the cooperation of a Victorian rope and twine manufacturer, the Division of Forest Products, C.S.I.R., commenced an investigation of possible Australian timber species, the principal properties of a suitable timber being

(a) uniform texture and medium density to give even wear free from fraying or raised grain
(b) freedom from tendency to chip or split and
(c) ability to provide a surface which will grip textile fibres sufficiently to draw them forward under pressure, and yet remain free from any tendency to "lick up" the fibres on to the roller.

To date some eleven Australian species, comprising white beech; red ironbark; Queensland maple; myrtle beech; yellow gum; greybox; celery top pine; ross mahogany; saffronheart; crow's ash and high density silver ash have been tested. Several of these gave very good performances, namely high density silver ash; saffronheart and grey box, and together with high density compregnated wood (compressed and resin bonded) can now be recommended for use.

..... G.W.W.

UNCONTROLLED TEST OF FIRE-PROOFED TIMBER.

An article in the "Southern Lumberman" reports a fire which demonstrated the effectiveness of the fireproofing of 50,000 s.ft. of timber stored in a timber yard at Madison, Wisconsin, U.S.A.

This material which was surplus to that for use in the construction of wooden hangars for U.S. Navy blimps had been supplied to the Forest Products Laboratory at Madison for research purposes. After a fire broke out in the timber yard where this was stored observations on this uncontrolled test revealed that whilst considerable damage occurred in the buildings and untreated timbers stored in the yard, only the ends and outer layers of the fireproofed stacks were charred in the three hour fire. Subsequent inspection showed that provided the charred ends were removed, the material was still suitable for the experiments originally intended.

The article suggests that firebreaks of treated timber should provide excellent barriers to the spread of fire in timber yards and proposes that buildings, bins and racks should be treated to prevent or delay their collapse in case of fires.

M.N.L. No. 135.

THE PROPERTIES OF AUSTRALIAN TIMBERS.

SILVER SYCAMORE. No. 135.

Silver sycamore is the standard trade common name for the timber known botanically as Cryptocarya glaucescens R.Br. This timber should not be confused with that of Evodia micrococea also known as silver sycamore. This timber is white or cream in colour. Silver sycamore belongs to the same genus as some others perhaps better known species, such as Bolly silkwood (C. oblata) and rose maple (C. erythroxylon). C. glaucescens is also known as brown beech, native laurel and as jackwood.

Distribution: Silver sycamore occurs in the coastal scrubs from Milton in New South Wales to Rockingham Bay in Queensland. It is a sub-dominant species occurring in mixture with other brush species such as white birch, yellow carabeen, scented satinwood (coachwood) etc.

Habit: Silver sycamore is a small tree attaining a total height of 70 ft. and a stem diameter of 12 to 18 inches and occasionally up to 20 or 24". The bark is brown with a brownish red blaze and is somewhat fissured.

Timber: The truewood of silver sycamore is light brown in colour with a fine texture. The grain is sometimes interlocked; what little figure present is due to fine concentric bands of parenchyma showing on backsawn faces. The wood of silver sycamore averages 39 lb./cu.ft. at 12% moisture content and has a normal range of from 31 to 47 lb./cu.ft. In drying from the green condition to 12% moisture content the average shrinkage is 7% in a tangential direction (backsawn) and 3% in a radial direction (quartersawn). The truewood of silver sycamore is not difficult to season and can be kiln-dried fairly rapidly without degrade. The truewood of silver sycamore has good working properties under hand and machine tools and takes a good finish. The sapwood is lighter coloured than the true-wood but is not sharply differentiated. The sapwood may be susceptible to Lyctus attack.

Uses: Silver sycamore finds its main use in box and case manufacture, for general interior joinery, mouldings and to a small extent, for furniture. It has been peeled for veneer and plywood manufacture. It can also be used for turned articles of various kinds.

Availability: Silver sycamore is fairly limited in availability (chiefly to New South Wales) and sizes available are generally small.

H.D.I.