

THE CHIEF CHARACTERISTICS AND USES OF SIX NEW GUINEA TIMBERS.

J. L. d'Espeissis, B.Sc., B.Sc.For., Dip.For.

Several New Guinea timbers have achieved a certain prominence during the last two or three years. The most outstanding of these is Laup, or New Guinea Walnut (*Dracontomelum mangiferum*). This walnut is the mainstay of the timber industry at present and it comprises the bulk of the timber exported. It is now creating a considerable amount of interest for veneer purposes in the United Kingdom, the United States of America and also in Australia. In fact exporters find it hard to cope with orders. The main difficulty with regard to the marketing of this species is one of supply. This is due to several reasons, namely, the scattered occurrence of the species, which calls for selective logging which, in order to be economic, requires greater mobility on the part of the logging organizations than the present conditions would appear to permit, a lack of sufficient shipping space, which temporarily prohibits an increase in output, while lastly, susceptibility to damage by internal borers, which necessitates the rejection of many logs for export purposes. However, in view of the increasing demand for walnut, it may be confidently expected that these difficulties will be overcome in time.

Erima (*Ocoteles sumatrana*), which is suitable for veneers, plywood and general purposes is, after walnut, probably the best known New Guinea timber. It is being exported in small but steady quantities. Another fine cabinet type of timber, which is just beginning to receive attention, especially for veneers, is Irotu, or Bush Calophyllum (*Calophyllum* sp.). These three timbers, particularly walnut and erima, may be said to have been exported more than any other species.

Two timbers well known here, Kwila (*Afzelia* (*Intsia*) *bijuga*) and Kamarere (*Eucalyptus deglupta*) are the most favoured local hardwoods for constructional purposes throughout the Territory. These timbers, due to sea freights, cannot stand competition with equally good, if not superior, hardwoods overseas. Consequently, it would seem that the future for these timbers would lie in the supply of the local demand and, even for this purpose, it is probable that conservation of existing supplies will be necessary.

A widely spread and well-known timber deserving greater attention is Toan (*Pometia pinnata*). Due to the more frequent occurrence of this species as compared with others, throughout the coastal forests of the Territory, this timber must some day be of considerable commercial importance. Already limited quantities have been used locally and exported to Australia. It is not to Australia, however, with its plentiful supply of some of the world's best hardwoods, that one must look for the establishment of Toan as an export timber, but rather to New Zealand, South Africa and the East. Toan is somewhat similar in its main characteristics to Philippine Mahogany, or red Lauan, and consequently in time, with careful treatment, it must build up for itself a reputation as a fair general utility type of medium hardwood.

The following notes on the characteristics of these timbers will serve to give some idea of their real and potential uses:—

LAUP OR NEW GUINEA WALNUT (*Dracontomelum mangiferum*, Blume).

Colour ..	..	Sapwood white; truewood grey-brown.
Grain ..	..	Generally interlocked.
Figure ..	..	Attractive black stripe on the quarter, and also ribbon, due to interlocked grain; on the back face often without particular distinction.
Texture ..	..	Fairly coarse; slightly more open than Queensland walnut.
Weight ..	..	Approximately 47 lb. per cubic foot at 12 per cent. moisture content. Logs sometimes sink.
Seasoning ..	..	Seasons rapidly without degrade.
Workability ..	..	Light and easy to work under hand or machine tools. Nails easily; glues readily; suitable for both peeled and sliced veneers.
Finishes ..	..	Fairly coarse texture, requires filling, gives an attractive finish in natural colour.
Sizes ..	..	Available in full range of boards and joinery sizes and as veneers and plywoods.
Uses ..	..	A valuable walnut type for all high-grade cabinet manufacture. Particularly suitable for sliced veneers.

ERIMA (*Octomeles sumatrana*, Miq.).

Colour ..	..	Sapwood light yellow; truewood light brown to greyish yellow.
Grain ..	..	Generally interlocked.
Figure ..	..	Striped figure due to interlocked grain on the backsawn face; ribbon figure on quarter-sawn face due to the same reason, also fine flakey figure. Similar to white Lauan or white Pacific Maple.
Texture ..	..	Fairly coarse.
Weight ..	..	Approximately 23 lb. per cubic foot at 12 per cent. moisture content.
Strength ..	..	A fairly soft timber. Modulus of rupture about two-thirds that of Douglas Fir and about half as stiff. Compressive strength a little lower than Douglas Fir. Low in impact strength.
Seasoning ..	..	Seasons rapidly without degrade.
Borer susceptibility ..	..	Pore size and starch content of sapwood suggest probable susceptibility to Lyctus attack.
Workability ..	..	Light and easy to work under hand or machine tools. Nails easily; glues readily; suitable for rotary peeling.
Finishes ..	..	Treatments suitable for Pacific Maple should be applicable.
Sizes ..	..	Relatively large size of logs yields full range of boards and joinery sizes, particularly wide boards. Is available as veneers and plywood.
Uses ..	..	Should be suited to all purposes now served by white Pacific Maple. It should find use for carpentry, coffin boards, corestock, furniture, mouldings, plywood, veneers, shelving and box manufacture.

IROTU (*Calophyllum* sp.).

Colour ..	..	Pink.
Grain ..	..	Fairly straight.
Figure ..	..	Attractive figure on the backsawn face, or rotary peeled veneer, due to fibres interlocked in bands tangentially—similar to <i>Calophyllum costatum</i> of Queensland, which is known under the name of Red Touriga. On the quarter it is without distinction.
Texture ..	..	Fairly coarse.
Weight ..	..	Approximately 40 lb. per cubic foot at 12 per cent. moisture content.
Seasoning ..	..	Seasons readily.
Workability ..	..	Relatively easy to saw and dress; nails and glues readily. Suitable particularly for peeled veneers.
Finishes ..	..	Attractive finish in natural colour.
Sizes ..	..	Should be available in full range of boards and joinery sizes, and as veneers and plywood.
Uses ..	..	Appears to have possibilities for interior finish, such as moulding, skirting, architraves, and for joinery, such as doors and stairways. In the furniture trade it should be suitable for cabinets, tables and chairs. It makes particularly attractive plywood when peeled and logs of this species are symmetrical and of suitable form for this purpose.

KWILA (*Azelia bijuga*, A. Gray).

Colour ..	..	Yellow-brown when fresh, turning dark brown with age; sapwood light buff to pale yellow.
Grain ..	..	Slightly cross-grained.
Figure ..	..	Without distinction.
Texture ..	..	Moderately coarse; pores large, some contain conspicuous sulphur-yellow deposits.
Weight ..	..	Approximately 58.7 lb. per cubic foot at 12 per cent. moisture content. Logs sink.
Strength..	..	A hardwood with static bending strength greater than Teak and Douglas Fir. Modulus of elasticity greater than that of oak; compression strength also greater.
Seasoning	..	Seasons readily with little degrade.
Workability	..	Easy to work, saws well, mortises cleanly.
Finishes ..	..	Takes glossy finish under tools, and high finish when polished.
Sizes ..	..	Available to order, locally, in full range of boards and constructional sizes.
Uses ..	..	Very resistant to insect and fungal attack, therefore durable when exposed to weather and in the ground; not, however, very resistant to teredo attack, therefore unsuited for marine work unless protected; corrodes steel. Particularly suitable for high-grade heavy constructional work, also for furniture and cabinet making.

KAMARERE (*Eucalyptus deglupta*, Blume).

Colour ..	..	Red brown.
Grain ..	..	Generally straight.
Figure ..	..	Characteristic stripe or ribbon on quarter-sawn face due to interlocked grain; back-sawn face without character.
Texture ..	..	Fairly coarse.
Weight ..	..	Approximately 52 lb. per cubic foot at 12 per cent. moisture content.
Strength..	..	A moderately hard wood, with static bending strength slightly greater than Toan, as also are its modulus of elasticity and its compressive and impact strengths.
Seasoning	..	Readily seasoned.
Workability	..	A firm timber relatively easy to saw, but difficult to dress on the quarter-sawn face without tearing the interlocked grain. Mortises cleanly and produces sharp edges in moulding or shaping. Nails easily.
Finishes ..	..	Gives attractive finish in natural colour resembling a red Pacific Maple when quarter cut.
Sizes ..	..	Available in full range of boards and joinery sizes.
Uses ..	..	It should prove to be a substitute for red Pacific Maple for many purposes. Appears to have possibilities for all forms of interior finish such as flooring, lining, moulding, skirting, architraves; for joinery such as doors, stairways, and also for house frames. In the Territory of New Guinea it is the most-used local hardwood for general building purposes. In the furniture trade, also, it should be found useful. It is too hard, however, for satisfactory veneering.

TOAN (*Pometia pinnata*, Forst.).

Colour ..	..	Pink to light red brown.
Grain ..	..	Usually straight, but may be interlocked.
Figure ..	..	Usually without character, but sometimes has attractive broken stripe due to interlocked grain; pores prominent.
Texture ..	..	Fairly coarse.
Weight ..	..	Approximately 41 lb. per cubic foot at 12 per cent. moisture content.
Strength..	..	A moderately hard wood with static bending strength slightly less than Douglas Fir. Modulus of elasticity about equivalent to that of oak. Compression strength about equal to oak. Impact strength low.
Seasoning	..	Readily seasoned.
Workability	..	A firm timber relatively easy to saw, but sometimes difficult to dress without tearing the interlocked grain. Mortises cleanly and produces sharp edges in moulding or shaping. Bends particularly well. Nails easily. Glues readily.
Finishes ..	..	Gives attractive finish in natural colour, somewhat resembling Queensland Maple. Amenable to the same range of finishing treatments as Queensland Maple.

Sizes	..	..	Should be available in full range of boards and joinery sizes and as veneers and plywoods.
Uses	..	..	Should prove a substitute for Lauan (red Pacific Maple, or Philippine Mahogany). Appears to have possibilities for all forms of interior finish such as floorings, lining, moulding, skirting, architraves; for joinery such as doors and stairways, and for house frames. In the furniture trade it should find use in cabinets, tables, chairs, household furniture, and especially in bent work. It makes attractive plywood.

New Guinea coastal forests, like most tropical rain forests, are characterized by the great number of tree species represented. The six species dealt with above are by no means the only species with commercial possibilities. Several other species have proved themselves to be most satisfactory for local use; while in addition to these, without considering the highland species, numerous other timbers of potential value occur in the more accessible coastal areas. However, the timber export industry is a comparatively new one, and due to the difficulty of placing new untried timbers on a fastidious market in competition with well known established species, the six timbers described here are the only ones to have obtained any prominence as yet. There is the possibility now, however, since war-time conditions have seriously restricted the importation of softwoods from America and Baltic countries, that the demand for this type of timber in Australia will give this Territory an opportunity to develop its light-coloured, light-weight timbers of the coastal forests as softwood substitutes. So far they have received little attention; and due to difficulties, such as blue staining caused by fungal attack, the small quantities exported in the past have not been favorably received. These difficulties, however, can be overcome; and it is hoped, with the demand which has arisen, and which is increasing, that these types will come into their own, and that the New Guinea timber trade will become firmly established; for it is only by more thorough utilization, that the present expensive selective logging can be avoided and the industry established on a really economic basis. Incidentally, such a development would give the newly inaugurated forest department greater opportunity to establish sound forestry practice in this country.

REFERENCE LITERATURE.

- Turnbull, R. F.—“Notes on the Properties and Uses of Three New Guinea Timbers.”—*The Australian Timber Journal*, Volume 4, No. 5, May, 1938.
- Mann, James.—“Papuan Timbers: Some Properties of Six Species.”—*Proceedings of the Royal Society of Victoria*, Volume XXIV. (New Series), Part I.
-