FOREIGN WOODS UTILIZED IN MAINE - 1969

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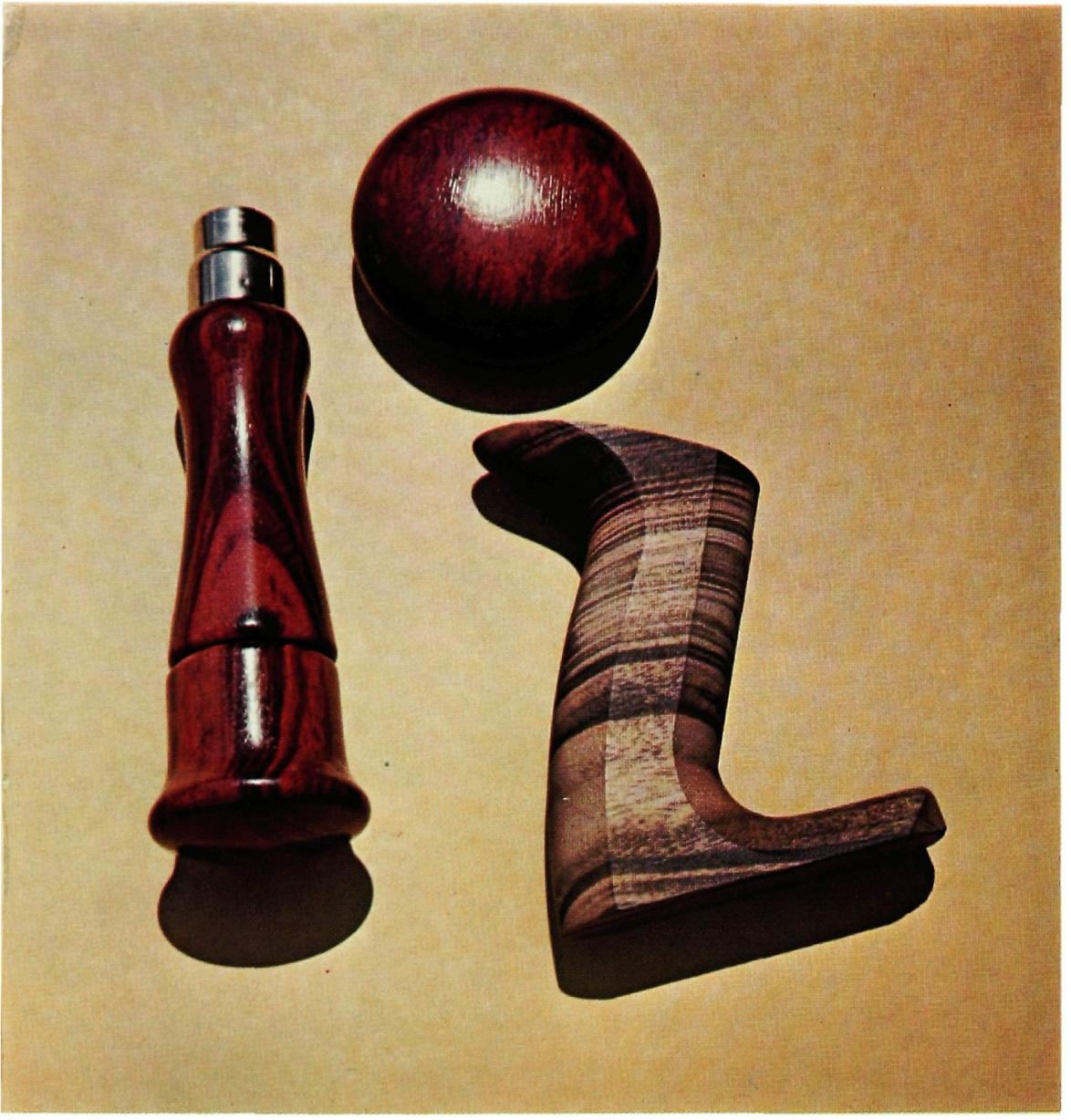

UNIVERSITY OF MAINE AT ORONO

Acknowledgment

The authors wish to gratefully acknowledge the review of this bulletin by Dr. Harold A. Core, Professor of Forestry, University of Tennessee, Knoxville, Tennessee.

Cover Photograph: Goncalo alves is currently being machined into plane handles (lower right, unstained), brace handles (top, stained) and drill handles (left, stained).

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FOREIGN WOODS UTILIZED IN MAINE — 1969[1]

N. P. Kutscha[2] and L. L. Emery[3]

Introduction

Over the past decade, there have been definite trends toward increasing importation of foreign woods into the United States. The form in which foreign woods are imported has varied over this period with the current emphasis being on veneer and plywood, followed by lumber. Roundwood importation has been dropping off primarily because of the importance being placed on primary and secondary processing by the developing nations which supply much of this material. As the demands in this country for veneer, plywood, and lumber continue to rise above domestic supplies, we will have to turn more and more to foreign sources, such as the tropical hardwood forests of Latin America, Africa, and Southeast Asia. The purpose of this study was to: (a) evaluate the extent to which foreign woods are utilized in the State of Maine, (b) to see if any problems exist in the utilization of these woods, (c) to compile information on the characteristics of the species utilized and provide this information to the users by supplying them with a copy of this bulletin, and (d) to provide for a better understanding of the significance of foreign wood utilization in the state.

Procedure

A questionnaire was prepared and sent to every secondary processor of forest timber products in the state. The source listing for these processors was the *Maine Buyers' Guide and Directory of Maine Manufacturers,* published by the Department of Economic Development, Augusta, Maine. The questionnaire was designed to obtain information as to species of foreign wood used in 1969, volume used, products manufactured from these species, possible technical problems associated with their use, and producer attitude towards foreign timber imports. A copy of the questionnaire and letter of transmittal are shown in appendix I.

The questionnaire was sent to 222 firms in the state. The method used to select the firms was relatively simple, the only criterion being that they were the type of businesses that might use a foreign timber species. Based on existing knowledge, it was expected that many of the firms would not respond because they were not using such species and

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were not interested in using such species. Responses were received from 114 firms of which 57 did not use foreign timber and were not interested in using such material, 20 firms had not used them but were interested and 37 firms did use such species.

The firms responded to the question: "What species of foreign or tropical woods are you using or have you used in the past?" with 20 commercial names of a general nature. After referring to current literature, these 20 commercial names were expanded to 44 possible commercial names of a more specific nature, and to approximately 74 possible scientific names of species. This phenomenon illustrates one of the problems in dealing with foreign woods, that of nomenclature. Obviously, the variability in properties between species of wood can contribute to unsatisfactory production results when several species are treated as one material. Since a commercial name can include many genera and species from different parts of the world, all purchase orders for such material should specify the scientific name of the species desired. A list of possible species and commercial names corresponding to the 20 reported commercial names is shown in appendix II. It was not within the scope of this study to obtain wood samples from the various firms and carry out the involved microscopic procedure required for exact species identification.

The total volume of foreign woods utilized in the state during 1969 is shown in appendix III. The numerical values reported in this table are considered only as approximate since not all firms kept exact records as to volume used for each wood. The volumes are reported in board feet, cubic feet, square feet, and tons, for easy comparison. It is felt that this table readily indicates that a rather significant amount of foreign wood is being used in the state.

An attempt was made to determine the economic value of the reported woods by contacting a number of importers and other groups. It was felt that an aggregate dollar—volume value for each species would weight the physical volume reported in appendix III as to economic importance. However, price information was not available for enough woods to make a valid comparison and henceforth this data is not presented. From the information obtained along these lines it seems quite apparent that the prices paid for foreign timber species seems to be highly arbitrary and evolves from the relative bargaining power of buyer and seller. Some factors that contribute to price include: species, physical form, port-of-entry, source, quality or grade of material, volume desired, and current availability.

The products manufactured by the 37 firms using foreign woods include: boat and yacht components such as decking, planking and finish work (fig. 1, 2, 3), tool handles (cover photograph), dowels,

FIGURE 1. Many boats such as this one are constructed each year along the Maine coast and require outstanding craftsmanship. Often these boats utilize such woods as Burma teak for decking and Philippine mahogany for planking, as well as a number of other foreign and native woods.

FIGURE 2. A strip of one-eighth inch African mahogany veneer laid over part of the form for construction of a Trimaran. The hull is constructed by covering the form with three layers of African mahogany, each layer being oriented in a different direction.

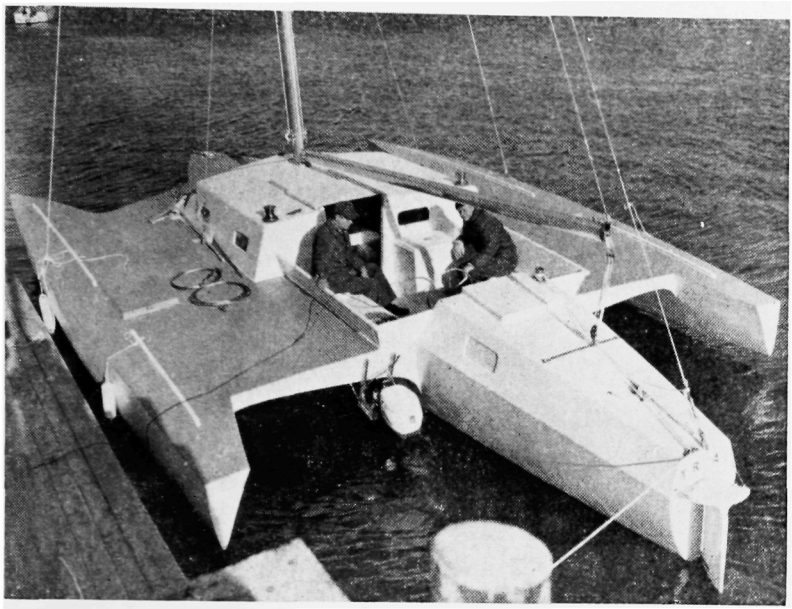

FIGURE 3. Completed Trimaran whose basic hull is composed of three layers of one-eighth inch African mahogany veneer.

patterns, millwork, furniture and furniture components, cases and cabinets, core stock for decorative paneling, wood carvings, cutlery handles (fig. 4), knife blocks (fig. 5), brace heads and handles (cover photograph), gavels, and duck calls. The largest group of firms in number is the boatbuilders. The wood accounting for the largest volume is Philippine mahogany for use as core stock in decorative paneling.

Few technical problems were reported. It appears that the manufacturers are able to rely on experience in modifying factors of production to overcome initial difficulties encountered with an unknown species. If a new species gives too much difficulty, it is usually rejected as an unsuitable material. In general, the firms responding indicated that their individual cost estimates, prejudice against foreign materials, knowledge of, or ignorance of, foreign timber working properties, and supply of suitable domestic material determines their use or non-use of foreign woods.

A description of the species listed in appendix II is contained in appendix IV which also contains the definitions for terms used throughout the appendix. The species descriptions are arranged by commercial name as supplied by the firms responding. Each description is a separate page and pertains to one species, or one genus, if the species comprising

FIGURE 4. A load of Bubinga which has been shipped in by rail in twenty-foot lengths and was subsequently bucked into short lengths. End checking indicates that a certain amount of waste, upon resawing, can be expected. The wood will primarily be used for knife handles.

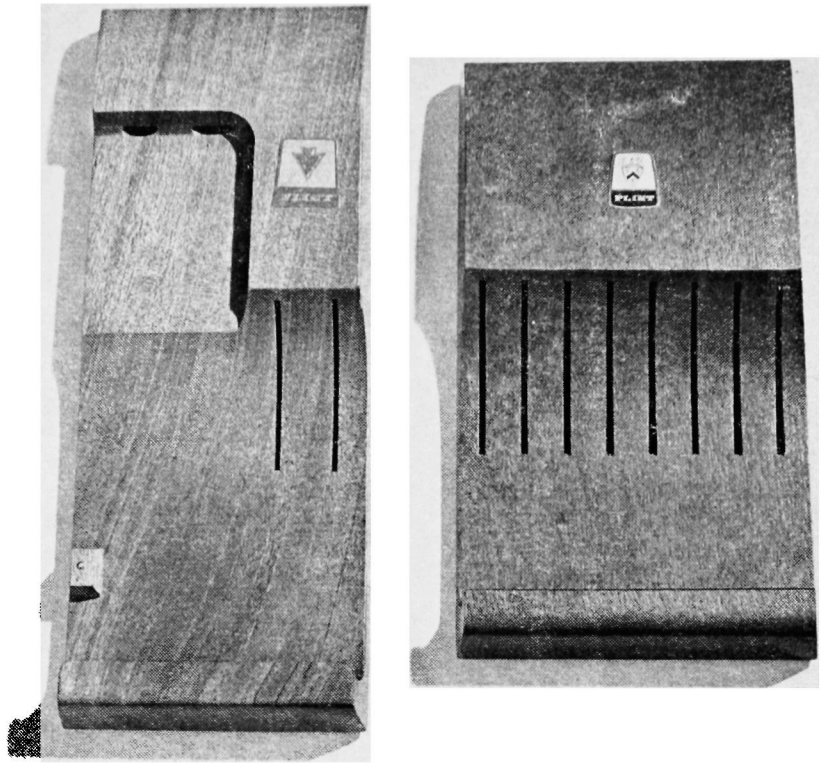

FIGURE 5. Genuine mahogany can be readily sculptured into attractive knife blocks.

the genus are not normally separated in the literature. The information contained in appendix IV was drawn from many sources but the bulk of the information was taken from the following references:

Commercial Foreign Woods on the American Market
David A. Kribs
Dover Publications, Inc., New York. 1968

Timbers of West Africa
B. Alwyn Jay
Timber Research and Development Association
Bucks, England. 1955.

Timbers of South America
R. P. Woods
Timber Research and Development Association
Bucks, England. 1951.

Timbers of Southeast Asia
Gerald Hart
Timber Research and Development Association
Bucks, England. 1955.

Timbers of the World
Alexander L. Howard
Macmillan & Co., Ltd., London. 1951.

Timbers of the New World
Samuel J. Record and Robert W. Hess
Yale University Press, New Haven. 1943.

Commercial Timbers of the World
F. H. Titmuss
The Technical Press, Ltd., London. 1965.

Much research has been conducted throughout the world on the species listed in this bulletin as well as on many other foreign woods. Unfortunately, there is at present no central clearing house where this information is available. It is available in the form of books, journal articles, trade bulletins, etc., which can be obtained from various institutes, laboratories, and other organizations. This situation, in general, makes obtaining this type of information rather difficult. Appendix V is a bibliography of selected publications which illustrate the type of information that is available. These references were largely obtained through *Forestry Abstracts* which is published by the Commonwealth Forestry Bureau, Oxford, England. These *Abstracts* cover all aspects of forestry and also contain a species index.

One of the most recently available sources for information on foreign woods is the *Proceedings*[4] of the Conference on Tropical Hard-

[4] Copies of these *Proceedings* are available from Coordinator of Continuing Education, State University College of Forestry, Syracuse, New York, 13210 at a cost of $10.00

woods held on August 18-21, 1969, at the State University College of Forestry at Syracuse, New York. This conference dealt with such aspects as properties of major species, comparison of tropical versus native hardwoods, uses, research needs, foreign trade, and sources of information. On substituting foreign woods for native species, some examples of which were listed, it was pointed out that suitable substitutes will rarely substitute for the native wood in every respect and prospective users are urged to correspond with the appropriate research organization about any foreign wood which they contemplate using. Uses for various foreign woods were also discussed at the conference for such categories as furniture manufacture, paneling and plywood manufacture, flooring, turnings, and marine uses.

Conclusions

Results of this study indicate that foreign woods have been, and will probably continue to be, important production materials in the state's forest products industry. However, this study, as well as the Conference on Tropical Hardwoods mentioned earlier, has pointed out that there is a definite lack of information in particular areas and that certain definite problems exist:

a) information on the current and future availability of foreign timbers in commercial quantities is needed.

b) identification, nomenclature, and marketing problems exist due to the confusion of common names.

c) information on importing firms handling these materials is inadequate and the pricing mechanism does not allow the purchaser any good means to compare prices or to develop cost estimates.

d) there is a lack of international standards for units of measurement, sizes of material, mechanical testing procedures, specifications, and grades.

e) more basic technical information is needed in terms of dimensional stability, seasoning characteristics, decay resistance, allergenic qualities, and strength in order to determine the suitability of various woods for manufacture and service.

f) additional processing information is needed regarding machining, gluing, and finishing which are greatly influenced by such factors as silica content, density, degree of interlocked grain, and presence of tension wood.

g) a convenient and reliable source for the above type of information is needed.

In spite of these problems and lack of information, foreign woods are becoming increasingly important for wood-using industries. By supplementing the domestic supply of decorative and other fine hardwoods they can help conserve our own valuable native hardwoods. The

great diversity in appearance and properties of these foreign woods provide additional opportunities for improving the competitive position of wood with other materials, for developing new areas of wood use and for opening new markets.

Appendix I

March 17, 1970

Dear Sir:

I am attempting to evaluate the extent to which foreign or tropical wood species are being utilized as components of domestic wood products in the State of Maine.

The enclosed questionnaire was designed to obtain the required information. Specific information related to your firm's activities will be held in strict confidence.

The results of this survey will dictate research which will best serve the interests of firms, such as yours, in the State of Maine with respect to the utilization of foreign or tropical woods.

Thank you very much for your cooperation.

Respectfully,
(signed)
Larry L. Emery
Graduate Research Assistant
in Wood Technology

Appendix I, continued

FOREIGN WOOD UTILIZATION QUESTIONNAIRE

1. Are you presently utilizing or have you ever utilized any foreign or tropical wood species?

   Yes ..... No .....

2. If the answer to question 1 is no, skip to question 7.

3. What species of foreign or tropical woods are you using or have you used in the past?

   Names of Species

   ....

4. What was the approximate volume of each species used in 1969?

species	bd.ft. or cu.ft.	
.....	.....	.....
.....	.....	.....
.....	.....	.....

5. What products were manufactured from these species?

6. Are you experiencing any specific technical problems with the species used?

   Machining ..... Seasoning ..... Gluing ..... Other .....
   Explain:

7. If you are not presently using foreign or tropical woods, do you believe that you could use them?

   Yes ..... No .....

8. Do you have any additional comments?

9. ....
   Name of Firm Address

Appendix II

Possible species corresponding to twenty reported commercial names for woods utilized in Maine.

Reported Commercial Name	*Preferred and Other Possible Commercial Name(s)*	*Scientific or Species (spp.) Name*
1. African mahogany	Khaya	Khaya spp.
2. Balsa	Balsa	Ochroma pyramidale
3. Beefwood	Bulletwood	Manilkara spp.
	Bulletwood, Asian	Mimusops elengi Roxb.
4. Brazilian mahogany	Andiroba	Carapa spp.
	Albarco	Cariniana spp.
	Vinhatico	Plathymenia reticulata Benth.
5. Bubinga	Bubinga	Guibourtia spp.
		Didelotia africana Baile
6. Goncalo alves	Goncalo alves	Astronium spp.
7. Greenheart	Greenheart	Ocotea rodiaei (R. Schomb.) Mez.
	Dika	Irvingia gabonensis Baill.
	Guayacan, Bethabara	Tabebuia spp.
	Okan	Cylicodiscus gabunensis Harm
8. Imbuya	Imbuia	Phoebe porosa (Nees & Mart) Mez.
9. Mahogany, genuine	Mahogany	Swietenia spp.
10. Obeche	Obeche	Triplochiton scleroxylon K. Schum.
11. Okoume	Okoume, Samara	Aucoumea klaineana Pierre
12. Peroba	Peroba rosa	Aspidosperma peroba Fr. Allem.
	White peroba	*Paratecoma peroba* (Rec.) Kuhl.
13. Philippine mahogany	Almon, Philippine mahogany, light red	Shorea almon
	Bagtikan, Philippine mahogany, light red	Parashorea plicata
	Mayapis, Philippine mahogany, light red	Shorea palosapis (Blco.) Merr.
	White lauan, Philippine mahogany, light red	Pentacme contorta Merr. & Rolfe.
		Pentacme mindanensis
	Red lauan, Philippine mahogany, dark red	Shorea negrosensis Foxw.
	Tanguile, Philippine mahogany, dark red	Shorea polysperma (Blco.) Merr.
	Guijo, Philippine mahogany, dark red	Shorea guiso (Blco.) Bl.
	Lumbayau, Philippine mahogany, dark red	Tarrietia javanica Blume
	Maranggo, Philippine mahogany, dark red	Azadirachta integrifoliola Merrill

Appendix II, continued

Reported Commercial Name	*Preferred and Other Possible Commercial Name(s)*	*Scientific or Species (spp.) Name*
14. Ramin	Ramin (Borneo), Melawis (Malayan)	Gonystylus bancanus Baill.
15. Rosewood	Brazilian rosewood	Dalbergia nigra Fr. Allem
	Honduras rosewood	Dalbergia stevensonii Standl.
	Amazon rosewood	Dalbergia spruceana Benth.
	Cocobolo	Dalbergia retusa Hemsl.
	Brazilian tulip wood	Dalbergia aff. frutescens (Vell.) Britt
	East Indian rosewood	Dalbergia latifolia Roxb.
	Amyris wood	Amyris spp.
	Rosamay	Dysoxylon fraseranum Benth.
	Tracwood	Dalbergia cochinchinensis Pierre
16. Sapele	Sapele	Entandrophragma cylindricum Spr.
	Sipo	Entandophragma utile Spr.
17. Spanish cedar	Cedro	Cedrela spp.
18. Teak, genuine	Teak	Tectona grandis L.
19. Wenge	Wenge	Millettia laurentii Willd.
20. Zebrawood	Okwen	Brachystegia spp.
	Balaustre	Centrolobium spp.

Appendix III

Aggregate Volumes of Foreign Woods Utilized in Maine—1969[1,2]

Reported Commercial Name	*Board Feet*	*Cubic Feet*	*Square Feet*	*Tons*
African mahogany	305,050	25,319	813,568	494
Balsa	50	4	133	0.02
Brazilian mahogany	3,000	249	8,000	4
Bubinga	192,771	16,000	514,120	400
Goncalo alves	30,000	2,490	80,010	83
Greenheart	350	29	933	1
Mahogany, genuine	88,353	7,333	235,637	143
Obeche	8,500	706	22,670	8
Okume	37	3	100	0.04
Peroba	1,000	83	2,667	2
Philippine mahogany	3,775,799	313,391	10,070,058	6,236
Ramin	100	8	267	0.17
Rosewood	10,000	830	26,670	21
Spanish cedar	100	8	267	0.14
Teak, genuine	28,550	2,370	76,143	47
Wenge	10,000	830	26,670	25

[1] Exact volumes for Beefwood, Zebrawood, Sapele, and Imbuya were not reported and personal communication indicated that these volumes were relatively small.

[2] Conversion factors used exclude kerf and other machining loss; were used for approximate volume comparison only:

1 board foot = 0.083 cubic feet = 2.667 square feet (assuming 3/8 inch thick basis)

1 ton = 2000 pounds; pounds per cubic foot for each wood was estimated from data in Appendix IV.

Appendix IV

Definition of Terms

Color—indicates the color of the wood as it is commonly used, commercially.

Luster—is the ability of a longitudinal face of the wood to reflect light or exhibit sheen.

Specific Gravity—is a measure of the amount of wood material present; it is the ratio of its ovendry weight to the weight of the water displaced by the wood at a given moisture content (air dry, green, or ovendry).

Grain—refers to the alignment and arrangement of the cells in a piece of wood.

Straight grain—is present when the cells are aligned parallel to the long axis of the piece of wood.

Spiral grain—is present when the cells are aligned in a helical orientation around the axis of the stem.

Interlocked or interwoven grain—is the result of an alternate orientation of cells in successive layers of growth increments; radial sawn boards from wood with interlocked grain demonstrates a ribbon figure or pattern.

Curly or wavy grain—results in a piece of wood when the cells undulate more or less abruptly to the left and right, repeatedly, from the normal vertical direction of cell alignment.

Silver grain—is that grain pattern resulting from the presence of conspicuous woods rays in radial-sawn material.

Texture—refers to the relative cross-sectional size of the wood cells present; small diameter cells would result in a fine texture, large ones in a coarse texture.

Appendix IV, continued

Species Descriptions

AFRICAN MAHOGANY
(Family—Meliaceae)

Species

Khaya ivorensis A. Chev.
K. klainei Pierre
K. grandifoliola C. DC.
K. senegalensis A. Juss.
K. anthotheca C. DC.

Commercial Name

Khaya

Other Names

African mahogany

General Characteristics

Color—pale rosy red to dark reddish brown, often with a purplish cast
Luster—high and golden
Specific Gravity—0.46 to 0.80 (air dry)
Weight—28 to 50 lbs. per cu. ft.
Grain—straight but often roey producing a ribbon figure
Texture—medium

Reported Working Properties

Works easily with a high lustrous finish, seasons well but somewhat prone to warp, heart shakes may occur extensively.

Reported Uses

Boatbuilding, furniture, cabinets, piano cases, interior finish, millwork, patterns, exterior use, musical and scientific instruments, turnery and sculpture, veneer, plywood, and gunstocks, also, used as a substitute for genuine mahogany.

Sources

Ghana, Ivory Coast, Gabon, Cameroon, Nigeria, Sudan, Uganda, and Democratic Republic of the Congo

Appendix IV, continued

BALSA
(Family—Bombacaceae)

Species

Ochroma pyramidale

Commercial Name

Balsa

Other Names

Gonote, Maho

General Characteristics

Color—white, cream or pale brown, sometimes with a pinkish cast
Luster—high and silky
Specific Gravity—0.12 to 0.20 (oven dry)
Weight—7 to 12 lbs. per cu. ft.
Grain—straight
Texture—coarse

Reported Working Properties

Easy to work and finishes with a high luster.

Reported Uses

Life preservers, ring buoys, life rafts and floats, aquaplanes, core material in sandwich construction, insulation of all kinds, sound deadening in house construction, model airplanes, and toys.

Sources

Mexico, Central America, Brazil, Bolivia, Peru, Ecuador, and Venezuela

Appendix IV, continued

BEEFWOOD
(Family—Sapindaceae)

Species

Manilkara bidentata (A. DC.) Chev.
M. huberi (Ducke) Standl.
M. jaimiqui (C. Wr.) Dubard
M. emarginata (L.) Britt. & Wils.

Commercial Name

Bulletwood

Other Names

Beefwood

General Characteristics

Color—uniformly light red, dark red, or dark reddish brown
Luster—low
Specific Gravity—0.90 to 1.20 (air dry)
Weight—56 to 75 lbs. per cu. ft.
Grain—straight
Texture—fine

Reported Working Properties

A very hard material which is difficult to nail without splitting and difficult to work but finishes smoothly with a high polish.

Reported Uses

Boatbuilding (frames and keels), general construction, flooring, tool handles, posts, cross ties, mill rollers, beaters, agitator bars, pickersticks (looms), furniture, cabinets, violin bows, and turnery.

Sources

Florida, West Indies, Costa Rica, Panama, Colombia, Venezuela, Guyana, Surinam, Brazil, and Peru

Appendix IV, continued

BEEFWOOD
(Family—Sapindaceae)

Species

Mimusops elengi Roxb.

Commercial Name

Bulletwood, Asian

Other Names

Bukal, Kabiki

General Characteristics

Color—deep red to dark reddish brown, often with darker streaks
Luster—low
Specific Gravity—0.80 to 1.02 (air dry)
Weight—50 to 63 lbs. per cu. ft.
Grain—straight to irregular or slightly roey
Texture—fine

Reported Working Properties

None reported.

Reported Uses

Heavy construction, piles, bridges, posts, shipbuilding, tool handles, flooring, and turnery.

Sources

Philippines and India

Appendix IV, continued

BRAZILIAN MAHOGANY
(Family—Meliaceae)

Species

Carapa guinanensis Aubl.
C. nicaraguensis C. DC.
C. macrocarpa

Commercial Name

Andiroba

Other Names

Crabwood, West Indian mahogany, Surinam mahogany, Andiroba mahogany

General Characteristics

Color—pale brown or light to dark reddish brown
Luster—golden
Specific Gravity—0.60 to 0.90 (air dry)
Weight—37 to 56 lbs. per cu. ft.
Grain—straight to roey
Texture—medium

Reported Working Properties

Works easily with a lustrous finish.

Reported Uses

General construction, boatbuilding, flooring, furniture, cabinets, interior finish, veneer and plywood.

Sources

West Indies, Central America, Guinea, Surinam, Colombia, Venezuela, Ecuador, Peru, and Brazil

Appendix IV, continued

BRAZILIAN MAHOGANY
(Family—Lecythidaceae)

Species

Cariniana pyriformis Miers.
C. legalis (Mart.) Kuntz

Commercial Name

Albarco

Other Names

Brazilian or Colombian mahogany, Bacu

General Characteristics

Color—yellowish brown, pinkish brown, or dark reddish brown sometimes with purplish tinge or darker streaks
Luster—medium to high
Specific Gravity—0.50 to 0.70 (air dry)
Weight—31 to 43 lbs. per cu. ft.
Grain—straight to roey
Texture—medium

Reported Working Properties

Easy to work with a knife, holds its shape well when manufactured, takes a smooth glossy finish, dulls saws due to the presence of silica deposits in the parenchyma cells, experience with other timbers demonstrates that silica content does not interfere seriously with the manufacture of sliced or rotary cut veneers.

Reported Uses

Furniture, cabinets, interior finish, and general construction.

Sources

Colombia, Venezuela, and Brazil

Appendix IV, continued

BRAZILIAN MAHOGANY
(Family—Leguminosae)

Species

Plathymenia reticulata Benth.

Commercial Name

Vinhatico

Other Names

Brazilian mahogany, Brazilian yellow wood

General Characteristics

Color—yellow to golden brown sometimes with darker streaks and turning deep russet with age
Luster—high and satiny
Specific Gravity—0.56 to 0.65 (air dry)
Weight—35 to 40 lbs. per cu. ft.
Grain—straight to roey
Texture—medium

Reported Working Properties

Works easily, finishes with a high golden sheen, fairly resistant to decay, seasons readily, holds its place well when manufactured.

Reported Uses

General construction, millwork, boatbuilding, furniture, cabinets, interior finish, parquet flooring, veneer, and plywood.

Sources

Brazil

Appendix IV, continued

BUBINGA
(Family—Leguminosae)

Species

Guibourtia tessmanii J. Leonard (Copaifera tessmannii Harms)
G. ehie J. Leonard
G. arnoidiana (Dewilld.) J. Leonard
Didelotia africana Baile

Commercial Name

Bubinga (red), Benge (brown)

Other Names

African rosewood, Eban, Kevazingo

General Characteristics

Color—light red, brown or violet with fairly evenly spaced purple stripes of varying widths, somewhat resembling growth rings
Luster—high
Specific Gravity—0.80 (air dry)
Weight—50 lbs. per cu. ft.
Grain—wavy or roey
Texture—medium

Reported Working Properties

Machines without difficulty taking a lustrous finish and veneers well, rotary-peeled veneer is denoted as Kevazingo.

Reported Uses

Furniture, cabinets, interior finish, pianos, brush backs, knife handles, hand-carved woodware, and as a substitute for rosewood.

Sources

Cameroon, Gabon, and Ivory Coast

Appendix IV, continued

GONCALO ALVES
(Family—Anacardiaceae)

Species

Astronium fraxinifolium Schott.
A. obliquum Gris.
A. LeCointe Ducke
A. Graveolens Jacq.

Commercial Name

Goncalo alves

Other Names

Kingwood, Zorrowood, Tigerwood, Zebrawood, Mura

General Characteristics

Color—light golden brown to reddish brown with blackish brown streaks of variable spacing producing a beautiful striped or mottled figure
Luster—dull to medium
Specific Gravity—0.85 to 1.28 (air dry)
Weight—53 to 80 lbs. per cu. ft.
Grain—wavy or roey
Texture—fine

Reported Working Properties

A material very similar to American dogwood, works with difficulty, suitable for cutting into veneers, turns readily, takes a high polish, should be seasoned at a slow rate to avoid excessive warping and checking.

Reported Uses

Boatbuilding (keels), general construction, exterior use, furniture, cabinets, flooring, shuttles and bobbins, substitute for dogwood, turnery, veneer and plywood.

Sources

Guyana, Colombia, Ecuador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Peru, Salvador, and Trinidad

Appendix IV, continued

GREENHEART
(Family—Lauraceae)

Species

Ocotea rodiaei (R. Schomb.) Mez.

Commercial Name

Greenheart

Other Names

Bebeere, Bebeeru, Beeberoe, Beberuboom

General Characteristics

Color—light to dark olive usually with a lighter and darker areas intermingling and frequently with dark olive to black streaks
Luster—medium
Specific Gravity—1.05 to 1.23 (air dry)
Weight—66 to 77 lbs. per cu. ft.
Grain—straight to roey
Texture—fine

Reported Working Properties

A material noted for its strength and durability, difference in radial and tangential shrinkage is exceptionally low, difficult to season, splits may occur in transit, partial air drying before kilning is advised, works with difficulty but takes a high polish, dust may be irritating to mucous membranes.

Reported Uses

Marine construction such as piling, piers, sluice gates, shipbuilding, paving blocks, posts, fishing rods, and durable construction.

Sources

Guyana and Surinam

Appendix IV, continued

GREENHEART
(Family—Simarubaceae)

Species

Irvingia gabonensis Baill.

Commercial Name

Dika

Other Names

Dika-nut, Gabon chocolate, African or wild mango, Duika mahogany, Greenheart

General Characteristics

Color—uniform pale rose fading to grayish brown, yellowish brown, or dark yellow, sometimes with darker streaks
Luster—low
Specific Gravity—0.83 (air dry)
Weight—52 lbs. per cu. ft.
Grain—straight to interlocked
Texture—fine

Reported Working Properties

Information not available

Reported Uses

General construction, boat building (decking), bridge and mine timbers, posts and poles, cross ties, flooring, tool handles, agricultural implements and vehicles, sporting and athletic goods, turnery, and a substitute for persimmon and dogwood.

Sources

Senegal to Sierra Leone, Ivory Coast, Ghana, Dahomey, Nigeria, Cameroon, and Gabon

Appendix IV, continued

GREENHEART
(Family—Bignoniaceae)

Species

Tabebuia serratifolia (Vahl.) Nich.
T. ipe (Mart.) Standl.
T. chrysotricha (Mart.) Standl.
T. heterotricha (DC.) Hemsl.
T. rufescens J. R. Jonston
T. guayacan (Seem.) Hemsl.

Commercial Name

Guayacan, Bethabara

Other Names

Arcwood, Bastard lignum-vitae, Bethabara, Noibwood, Demerara or Surinam greenheart, Washiba, Guayacan

General Characteristics

Color—light to dark olive-brown, often with lighter or dark streaks
Luster—low to medium
Specific Gravity—0.95 to 1.25 (air dry)
Weight—59 to 78 lbs. per cu. ft.
Grain—straight to very irregular
Texture—fine

Reported Working Properties

A highly durable material difficult to work, inclined to be splintery, but takes a high polish, fairly easy to season.

Reported Uses

Agricultural implements and vehicles, boatbuilding (frames, keels), cross ties, flooring, marine piling and construction, exterior use, sporting and athletic goods, tool handles, professional and scientific instruments, general durable construction, furniture, cabinets, millwork, and turnery.

Sources

Mexico, Central America, Guyana, Surinam, Colombia, Peru, Paraguay, Brazil, Trinidad, and Venezuela

Appendix IV, continued

GREENHEART
(Family—Leguminosae)

Species

Cylicodiscus gabunensis Harm

Commercial Name

Okan

Other Names

African greenheart

General Characteristics

Color—lustrous golden brown with dark brown or reddish brown streaks
Luster—high
Specific Gravity—0.96 to 1.04 (air dry)
Weight—60 to 65 lbs. per cu. ft.
Grain—roey producing a ribbon figure
Texture—medium

Reported Working Properties

Works with difficulty, tends to check and distort in seasoning, very strong, very resistant to decay, takes a high lustrous finish.

Reported Uses

Heavy construction, marine piling and construction, agricultural implements and vehicles, carving, turnery, and a substitute for greenheart and lignum vitae.

Sources

Sierra Leone, Liberia, Ivory Coast, Ghana, Nigeria, and Cameroon

Appendix IV, continued

IMBUIA
(Family—Lauraceae)

Species

Phoebe porosa (Nees. & Mart.) Mez.

Commercial Name

Imbuia

Other Names

Brazilian walnut, Imbuya, Embuia

General Characteristics

Color—yellowish brown, olive brown, chocolate brown either plain or variegated
Luster—medium
Specific Gravity—0.70 to 0.76 (air dry)
Weight—43 to 47 lbs. per cu. ft.
Grain—straight to roey producing a ribbon figure
Texture—medium

Reported Working Properties

A highly durable material which works easily and holds its place well when manufactured taking a high polish, can be selected for color to match any kind of walnut, sawdust reported allergenic.

Reported Uses

Furniture, cabinets, millwork, flooring, veneer and plywood, and as a substitute for black walnut.

Sources

Brazil

Appendix IV, continued

MAHOGANY, GENUINE
(Family—Miliaceae)

Species

Swietenia mahagoni Jacq.
Sw. macrophylla King
Sw. humilis Zucc.

Commercial Name

Mahogany

Other Names

Cuban, Honduras, Mexican, Panama, Peruvian, Spanish, West Indian and True mahogany, Caoba

General Characteristics

Color—pale brown, pink, light red, dark red, or reddish brown
Luster—high and golden
Specific Gravity—0.40 to 0.85 (air dry)
Weight—25 to 53 lbs. per cu. ft.
Grain—straight to roey
Texture—medium

Reported Working Properties

A stable material, easy to work, seasons well, takes a high golden lustrous finish.

Reported Uses

Boatbuilding (decking, planking), furniture, cabinets, piano cases, interior finish, millwork, patterns, exterior use, musical and scientific instruments, turnery and sculpture, veneer, plywood, and gunstocks.

Sources

Florida, Central America, West Indies, Mexico, Colombia, Venezuela, Ecuador, and Peru

Appendix IV, continued

OBECHE
(Family—Sterculiaceae)

Species

Triplochiton scheroxylon K. Schum.

Commercial Name

Obeche

Other Names

African whitewood, Soft satinwood, Ayous, Wawa, Samba

General Characteristics

Color—uniformly cream, pale yellowish brown, or buff
Luster—high and satiny
Specific Gravity—0.36 to 0.40 (air dry)
Weight—22 to 25 lbs. per cu. ft.
Grain—straight to interlocked producing a ribbon figure on radial surface
Texture—medium

Reported Working Properties

Easy to work and takes a high satiny finish, seasons very rapidly and very well.

Reported Uses

Patterns, furniture, boxes and containers, interior finish, millwork, veneer and plywood, substitute for basswood, yellow poplar and white pine.

Sources

Guinea, Liberia, Ivory Coast, Ghana, Nigeria, and Cameroon

Appendix IV, continued

OKOUME
(Family—Burseraceae)

Species

Aucoumea klaineana Pierre

Commercial Name

Okoume, Samara

Other Names

Gaboon mahogany

General Characteristics

Color—salmon pink, pale pinkish brown, or reddish brown
Luster—high and satiny
Specific Gravity—0.40 to 0.50 (air dry)
Weight—25 to 30 lbs. per cu. ft.
Grain—wavy, curly, or roey producing an attractive figure
Texture—medium

Reported Working Properties

Easily converted into veneer (rotary or sliced), finishes smoothly with a satiny luster, seasons and glues well, difficult to machine because of the variability in grain and the silica deposits.

Reported Uses

Interior finish, door panels, furniture, shipbuilding, in place of mahogany for small boats and canoes, plywood for boxes, packing cases, trunks, cigar boxes, stage scenery, incubators, tubs, and dye vats.

Sources

Democratic Republic of the Congo, Republic of the Congo, Guinea, and Gabon

Appendix IV, continued

PEROBA
(Family—Apocynaceae)

Species

Aspidosperma peroba Fr. Allem.

Commercial Name

Peroba rosa

Other Names

Amarello, Amargosa, Bucheiro, Muirjussara, Palo rosa, Red peroba

General Characteristics

Color—light rose red often with yellow or darker red streaks, color fades to light golden brown with age
Luster—medium
Specific Gravity—0.70 to 0.85 (air dry)
Weight—44 to 53 lbs. per cu. ft.
Grain—straight to irregular or roey
Texture—fine

Reported Working Properties

Comparable in general utility to oak, works easily and finishes smoothly with high polish.

Reported Uses

Furniture, cabinets, interior finish, flooring, sills, sashes, and doors.

Sources

Argentina and Brazil

Appendix IV, continued

PEROBA
(Family—Bignoniaceae)

Species

Paratecoma peroba (Rec.) Kuhl.

Commercial Name

White peroba

Other Names

Ipe peroba, Peroba blanca, Peroba amarella, Peroba do campo, Peroba reseca

General Characteristics

Color—light olive with a reddish, greenish, or golden hue, occasionally with darker streaks
Luster—high
Specific Gravity—0.70 to 0.83 (air dry)
Weight—43 to 52 lbs. per cu. ft.
Grain—straight to wavy or curly
Texture—fine

Reported Working Properties

A highly durable material, works easily and finishes smoothly, if not properly dried it is likely to check when exposed to warm temperatures, dust may be allergenic.

Reported Uses

Furniture, cabinets, and interior trim.

Sources

Brazil

Appendix IV, continued

PHILIPPINE MAHOGANY
(Family—Dipterocarpaceae)

Species

Shorea almon

Commercial Name

Almon

Other Names

Philippine mahogany (light red)

General Characteristics

Color—uniformly pink or pale red with golden luster
Luster—high
Specific Gravity—0.48 to 0.64 (air dry)
Weight—30 to 40 lbs. per cu. ft.
Grain—roey producing a ribbon figure
Texture—medium

Reported Working Properties

Easy to work and finishes smoothly.

Reported Uses

Furniture, cabinets, interior finish, millwork, boatbuilding, boxes and crates, general construction, veneer, and plywood.

Sources

Philippines

Appendix IV, continued

PHILIPPINE MAHOGANY
(Family—Dipterocarpaceae)

Species

Parashorea plicata

Commercial Name

Bagtikan

Other Names

Philippine mahogany (light red)

General Characteristics

Color—pink or pinkish gray with a brownish cast
Luster—high
Specific Gravity—0.49 to 0.82 (air dry)
Weight—30 to 51 lbs. per cu. ft.
Grain—roey
Texture—medium coarse

Reported Working Properties

Works easily with a high lustrous finish.

Reported Uses

Furniture, cabinets, interior finish, millwork, boatbuilding, general construction, veneer, and plywood.

Sources

Philippines

Appendix IV, continued

PHILIPPINE MAHOGANY
(Family—Dipterocarpaceae)

Species

Shorea palosapis (Blco.) Merr.

Commercial Name

Mayapis

Other Names

Philippine mahogany (light red)

General Characteristics

Color—uniformly pink with golden luster
Luster—high
Specific Gravity—0.52 (air dry)
Weight—32 lbs. per cu. ft.
Grain—roey producing a ribbon figure
Texture—rather coarse

Reported Working Properties

Works easily with a high lustrous finish.

Reported Uses

Furniture, cabinets, interior finish, millwork, boatbuilding, boxes and crates, general construction, veneer, and plywood.

Sources

Philippines

Appendix IV, continued

PHILIPPINE MAHOGANY
(Family—Dipterocarpaceae)

Species

Pentacme contorta Merr. & Rolfe
P. mindanensis

Commercial Name

White lauan

Other Names

Philippine mahogany (light red)

General Characteristics

Color—pale grayish or yellowish brown with pinkish cast and silvery sheen
Luster—high
Specific Gravity—0.45 to 0.68 (air dry)
Weight—28 to 33 lbs. per cu. ft.
Grain—roey
Texture—medium fine

Reported Working Properties

Works easily with a high lustrous finish.

Reported Uses

Furniture, cabinets, interior finish, millwork, boatbuilding, boxes and crates, general construction, veneer, and plywood.

Sources

Philippines

Appendix IV, continued

PHILIPPINE MAHOGANY
(Family—Dipterocarpaceae)

Species

Shorea negrosensis Foxw.

Commercial Name

Red lauan

Other Names

Philippine mahogany (dark red)

General Characteristics

Color—red to dark reddish brown with distinct golden luster
Luster—high
Specific Gravity—0.50 to 0.80 (air dry)
Weight—31 to 49 lbs. per cu. ft.
Grain—roey producing a conspicuous ribbon figure
Texture—coarse

Reported Working Properties

Works easily with a high lustrous finish.

Reported Uses

Used for the same purposes as genuine mahogany.

Sources

Philippines

Appendix IV, continued

PHILIPPINE MAHOGANY
(Family—Dipterocarpaceae)

Species

Shorea polysperma (Blco.) Merr.

Commercial Name

Tanguile

Other Names

Philippine mahogany (dark red)

General Characteristics

Color—light to dark red or reddish brown and distinct golden luster
Luster—high
Specific Gravity—0.49 to 0.81 (air dry)
Weight—30 to 50 lbs. per cu. ft.
Grain—roey producing a conspicuous ribbon figure
Texture—moderately coarse

Reported Working Properties

Finishes smoothly with a high luster.

Reported Uses

Used for the same purposes as genuine mahogany.

Sources

Philippines

Appendix IV, continued

PHILIPPINE MAHOGANY
(Family—Dipterocarpaceae)

Species

Shorea guiso (Blco.) Bl.

Commercial Name

Guijo

Other Names

Philippine mahogany (dark red), Orion

General Characteristics

Color—light reddish brown with distinct golden luster
Luster—high
Specific Gravity—0.75 to 0.87 (air dry)
Weight—46 to 54 lbs. per cu. ft.
Grain—roey producing a ribbon figure
Texture—medium fine

Reported Working Properties

Easy to work and takes a high lustrous finish.

Reported Uses

Furniture, cabinets, interior finish, bridges and wharves, and general house construction.

Sources

Philippines

Appendix IV, continued

PHILIPPINE MAHOGANY
(Family—Sterculiaceae)

Species

Tarrietia javanica Blume

Commercial Name

Lumbayau

Other Names

Philippine mahogany (dark red)

General Characteristics

Color—uniformly medium to dark reddish brown
Luster—high golden
Specific Gravity—0.65 (air dry)
Weight—40 lbs. per cu. ft.
Grain—usually straight
Texture—medium

Reported Working Properties

Easy to work and takes a high lustrous finish.

Reported Uses

Furniture, cabinets, interior finish, boats, veneer, and plywood.

Sources

Philippines

Appendix IV, continued

PHILIPPINE MAHOGANY
(Family—Meliaceae)

Species

Azadirachta integrifoliola Merrill

Commercial Name

Maranggo

Other Names

Philippine mahogany (dark red)

General Characteristics

Color—uniform light to dark reddish brown with distinct golden luster
Luster—high
Specific Gravity—0.57 (air dry)
Weight—35 lbs. per cu. ft.
Grain—straight to roey producing a ribbon figure
Texture—medium

Reported Working Properties

Small sound knots of frequent occurrence producing bird's eye figure, but easy to work with a high lustrous finish.

Reported Uses

Furniture, cabinets, interior finish, musical and scientific instruments, and cigar boxes, and as a substitute for genuine mahogany.

Sources

Philippines

Appendix IV, continued

RAMIN
(Family—Gonystylaceae)

Species

Gonystylus bancanus Baill.

Commercial Name

Ramin (Borneo), Melawis (Malaysia)

Other Names

None reported.

General Characteristics

Color—whitish to pale yellow
Luster—not available
Specific Gravity—not available
Weight—42 lbs. per cu. ft.
Grain—straight to interlocked
Texture—fine to medium

Reported Working Properties

Machines without difficulty and seasons well in a kiln or with air dry procedures, subject to blue stain if not properly dried, takes stains and finishes readily.

Reported Uses

Furniture, flooring, plywood, and moldings.

Sources

Sarawak, Malaysia, and Borneo

Appendix IV, continued

ROSEWOOD
(Family—Leguminosae)

Species

Dalbergia nigra Fr. Allem.

Commercial Name

Brazilian rosewood

Other Names

Palisander, Pianowood, Caviuna, Jacaranda

General Characteristics

Color—various shades of brown and violet, with irregular black streaks
Luster—low to medium
Specific Gravity—0.75 to 0.90 (air dry)
Weight—47 to 56 lbs. per cu. ft.
Grain—straight to wavy
Texture—medium

Reported Working Properties

A very durable material not difficult to work, seasons well, dimensionally stable, sometimes brittle, usually takes a high polish, but sometimes too oily to take a high polish.

Reported Uses

Furniture, cabinets, interior finish, piano cases, knife handles, brush backs, turned articles, radio cabinets, and inlay work.

Sources

Brazil

Appendix IV, continued

ROSEWOOD
(Family—Leguminosae)

Species

Dalbergia stevensonii Standl.

Commercial Name

Honduras rosewood

Other Names

Nagaed wood

General Characteristics

Color—light brown with purple or darker brown streaks
Luster—low to medium
Specific Gravity—0.92 to 1.08 (air dry)
Weight—58 to 68 lbs. per cu. ft.
Grain—straight to slightly roey
Texture—medium

Reported Working Properties

A hard heavy material not difficult to work, finishes with a high polish, holds its shape well, but difficult to season.

Reported Uses

Cabinets, bars of marimbas and xylophones.

Sources

British Honduras

Appendix IV, continued

ROSEWOOD
(Family—Leguminosae)

Species

Dalbergia spruceana Benth.

Commercial Name

Amazon rosewood

Other Names

Jacaranda, j. do Para, Saborana

General Characteristics

Color—golden brown with narrow red or purple stripes
Luster—medium
Specific Gravity—1.00 (air dry)
Weight—63 lbs. per cu. ft.
Grain—mostly straight
Texture—medium

Reported Working Properties

Works without difficulty and takes a high polish.

Reported Uses

Furniture, cabinets, and interior finish.

Sources

Brazil

Appendix IV, continued

ROSEWOOD
(Family—Leguminosae)

Species

Dalbergia retusa Hemsl.

Commercial Name

Cocobolo

Other Names

Nicaragua rosewood

General Characteristics

Color—orange, yellow, dark red, or reddish brown alternating with irregular black streaks, turning deep red or reddish brown with black streaks
Luster—low
Specific Gravity—0.99 to 1.22 (air dry)
Weight—60 to 77 lbs. per cu. ft.
Grain—straight to interwoven
Texture—medium to fine

Reported Working Properties

A very durable material, machines well, rubs to a fine polish without application of finishes, reported unsuitable for gluing, should be air seasoned prior to kiln-drying to reduce seasoning defect, dust arising in working may produce a rash or dermatitis resembling ivy poisoning.

Reported Uses

Knife handles, brush backs, tool handles, inlays, scales, musical and scientific instruments, and turnery.

Sources

Mexico, Salvador, Honduras, Nicaragua, Costa Rica, Panama, and Colombia

Appendix IV, continued

ROSEWOOD
(Family—Leguminosae)

Species

Dalbergia aff. frutescens (Vell.) Britt.

Commercial Name

Brazilian tulip wood, Tulip wood

Other Names

Pau rosa, Bois de rose

General Characteristics

Color—alternate stripes of bright yellow and red or violet
Luster—high to medium
Specific Gravity—0.90 to 1.10 (air dry)
Weight—56 to 96 lbs. per cu. ft.
Grain—straight to slightly roey
Texture—medium to fine

Reported Working Properties

A hard and splintery material not easy to work, but takes a high polish.

Reported Uses

Furniture, cabinets, flooring, inlays, brush backs, and turnery.

Sources

Brazil

Appendix IV, continued

ROSEWOOD
(Family—Leguminosae)

Species

Dalbergia latifolia Roxb.

Commercial Name

East Indian rosewood

Other Names

Bombay black wood, Malabar

General Characteristics

Color—light to dark violet brown to deep purple with fairly regular deep purple to black streaks resembling growth rings.
Luster—low to medium
Specific Gravity—0.84 (air dry)
Weight—53 lbs. per cu. ft.
Grain—irregular to roey
Texture—medium

Reported Working Properties

An exceptionally durable material difficult to saw, machines well, veneers well, seasons well, requires filling, but finishes smoothly and polishes well, sawing difficulty attributed to calcareous deposits, reported not to shrink on either way of the grain, retaining exact measurement after machining.

Reported Uses

Furniture, cabinets, sliced veneer, interior finish, piano work, and parquet flooring.

Sources

India and Ceylon

Appendix IV, continued

ROSEWOOD
(Family—Rutaceae)

Species

Amyris balsamifera L.
A. sylvatica Jacq.

Commercial Name

Amyris Wood

Other Names

Rosewood, West Indian sandalwood, Torchwood, Candlewood

General Characteristics

Color—pale yellow or pale yellowish brown, usually with darker streaks
Luster—medium to high
Specific Gravity—0.90 to 1.10 (air dry)
Weight—62 to 68 lbs. per cu. ft.
Grain—straight to irregular
Texture—very fine and uniform

Reported Working Properties

A very oily material highly resistant to decay, dimensionally stable when manufactured, turns and carves with a high polish, generally easy to work, but tends to be brittle.

Reported Uses

Cabinets, carvings, turnery, torches, and as a source of ethereal oil.

Sources

Florida, West Indies, Mexico, Central America, Colombia, Ecuador, and Venezuela

Appendix IV, continued

ROSEWOOD
(Family—Meliaceae)

Species

Dysoxylon fraseranum Benth.

Commercial Name

Rosamay

Other Names

Rosewood, Rose mahogany

General Characteristics

Color—uniformly deep pink to reddish brown
Luster—medium
Specific Gravity—0.72 (air dry)
Weight—45 lbs. per cu. ft.
Grain—roey producing a ribbon figure
Texture—medium

Reported Working Properties

A durable material resistant to white ants, not difficult to work, taking a smooth finish.

Reported Uses

Furniture, cabinets, interior finish, flooring, and veneer.

Sources

Australia

Appendix IV, continued

ROSEWOOD
(Family—Leguminosae)

Species

Dalbergia cochinchinensis Pierre

Commercial Name

Tracwood

Other Names

Tonquin rosewood

General Characteristics

Color—light to dark reddish brown with dark brown to almost black streaks resembling growth rings
Luster—medium
Specific Gravity—not available
Weight—not available
Grain—roey
Texture—medium

Reported Working Properties

Not too difficult to work, finishing smoothly.

Reported Uses

Furniture, cabinets, and turnery.

Sources

Indochina

Appendix IV, continued

SAPELE
(Family—Meliaceae)

Species

Entandrophragma cylindricum Spr.

Commercial Name

Sapele

Other Names

Scented mahogany, Sapele mahogany

General Characteristics

Color—light rosy red to dark reddish brown usually with a purplish cast
Luster—high and golden
Specific Gravity—0.60 to 0.85 (air dry)
Weight—37 to 53 lbs. per cu. ft.
Grain—straight to roey
Texture—medium

Reported Working Properties

Works without difficulty, glues easily, takes a high lustrous finish, but should always be quarter sawn if warping and splitting are to be minimized.

Reported Uses

Boatbuilding (decking and planking), furniture, cabinets, piano cases, interior finish, millwork, patterns, exterior use, musical and scientific instruments, turnery and sculpture, veneer, plywood, and gunstocks.

Sources

Ghana, Ivory Coast, Nigeria, and Democratic Republic of the Congo.

Appendix IV, continued

SAPELE
(Family—Meliaceae)

Species

Entandrophragma utile Spr.

Commercial Name

Sipo

Other Names

Sapele, Scented mahogany, Utile

General Characteristics

Color—light to dark reddish brown, often with purplish cast
Luster—high and golden
Specific Gravity—0.54 to 0.65 (air dry)
Weight—36 to 41 lbs. per cu. ft.
Grain—straight to roey
Texture—medium

Reported Working Properties

Works easily with a high lustrous finish

Reported Uses

Boatbuilding (decking and planking), furniture, cabinets, piano cases, interior finish, millwork, patterns, exterior use, musical and scientific instruments, turnery and sculpture, veneer, plywood, and gunstocks.

Sources

Ghana, Ivory Coast, Cameroon, Gabon, Uganda, Nigeria, and Democratic Republic of the Congo

Appendix IV, continued

SPANISH CEDAR
(Family—Meliaceae)

Species

Cedrela odorata L.
C. mexicana Roem
C. fissilis Vell.
Toona Calantas Merr. & Rolfe.

Commercial Name

Cedro

Other Names

Cedar (Cigar Box, Spanish, West Indian, Philippine), Kalantas

General Characteristics

Color—pale brown, pink to pale red or light reddish brown or dark reddish brown or dark red to maroon
Luster—high and golden
Specific Gravity—0.37 to 0.75 (air dry)
Weight—23 to 47 lbs. per cu. ft.
Grain—straight to roey
Texture—medium to coarse

Reported Working Properties

A strong material in proportion to its weight, highly durable, dries readily without warping or splitting, dimensionally stable when manufactured, easy to work, takes a lustrous finish.

Reported Uses

Cigar boxes, boatbuilding, general construction, exterior use, furniture, cabinets, millwork, patterns, lining for chests, musical instruments, veneer, and plywood.

Sources

West Indies, Central America, Guyana, Mexico, Ecuador, Surinam, Peru, Venezuela, Paraguay, Argentina, Brazil, and the Philippines

Appendix IV, continued

TEAK, GENUINE
(Family—Verbenaceae)

Species

Tectona grandis L.

Commercial Name

Teak

Other Names

Malaysian Teak, Burma Teak, Thai Teak

General Characteristics

Color—dark golden yellow turning dark brown or almost black with age
Luster—dull
Specific Gravity—0.55 to 0.70 (oven dry)
Weight—35 to 45 lbs. per cu. ft.
Grain—straight to wavy
Texture—coarse

Reported Working Properties

An easily worked material, with an oily surface, which shrinks little in seasoning.

Reported Uses

Boatbuilding (decking, planking, frames, keels), exterior use, furniture, cabinets, interior finish, millwork, general construction, flooring, carving, and turnery.

Sources

India, Burma, Malaysia, Java, Thailand, and Indochina

Appendix IV, continued

WENGE
(Family—Leguminosae)

Species

Millettia laurentii Willd.

Commercial Name

Wenge

Other Names

Pallissandre, Dikela, Kiboto

General Characteristics

Color—uniform dark brown to almost black in some specimens
Luster—low
Specific Gravity—0.96 (air dry)
Weight—60 lbs. per cu. ft.
Grain—straight to slightly roey
Texture—coarse

Reported Working Properties

A durable material with good resistance to bending and to shock, works easily, veneers well, but difficult to polish.

Reported Uses

Heavy construction, cross ties, flooring, tool handles, furniture, cabinets, interior finish, carving and turnery.

Sources

Democratic Republic of the Congo and Republic of the Congo

Appendix IV, continued

ZEBRAWOOD
(Family—Leguminosae)

Species

Brachystegia leonensis Hutch, & Davy
B. eurycoma Harms
B. nigerica Hoyle & Jones
B. boehmii Laub.
Microberlinia brazzavillensis A. Chev.

Commercial Name

Okwen

Other Names

Zebrawood

General Characteristics

Color—uniform cream, pale or golden brown to pinkish brown, usually with pronounced dark brown stripes
Luster—high
Specific Gravity—0.60 to 0.88 (air dry)
Weight—37 to 55 lbs. per cu. ft.
Grain—usually interlocked producing a ribbon figure
Texture—medium to coarse

Reported Working Properties

A durable material more or less termite proof, fairly easy to work, seasons well but slowly.

Reported Uses

Furniture, cabinets, millwork, flooring, general construction, veneer, and plywood.

Sources

Nigeria, Ivory Coast, Gabon, Cameroon, Tanzania, and Rhodesia

Appendix IV, continued

ZEBRAWOOD
(Family—Leguminosae)

Species

Centrolobium paraense Tul.
C. robustum Mart.
C. Tomentosum Guill.
C. orinocense (Benth.) Pittier

Commercial Name

Balaustre

Other Names

Zebrawood, Cartan

General Characteristics

Color—yellow, or orange, but usually variegated, yellow, orange, and red, some with purplish streaks and sometimes turning uniformly dark red with age
Luster—usually high
Specific Gravity—0.75 to 1.00 (air dry)
Weight—47 to 63 lbs. per cu. ft.
Grain—straight to roey
Texture—fine to coarse

Reported Working Properties

A hard, heavy material which holds its place when manufactured and is easy to work finishing smoothly to a good finish, said to be very durable.

Reported Uses

Furniture and cabinets, interior finish, flooring, tool handles, carving, turnery, veneer, and plywood.

Sources

Colombia, Panama, Venezuela, Brazil, Guyana, and Ecuador

Appendix V

Anonymous. 1964. Effect of fire-retardant treatments on bond strength using urea formaldehyde glues. Extr. from Rep. For. Prod. Aust. 1963/64: 44-45. (Tarrietia spp.)

Anonymous. 1964. World Timbers, No. 48, Suppl. to Wood 29(8). For. Prod. Res. Lab. Princes Risborough, Bucks. (Goncalo Alves)

Anonymous. 1964. World Timbers, No. 52, Suppl. to Wood 29(12). For Prod. Res. Lab. Princes Risborough, Bucks. (Tectona grandis)

Anonymous. 1966. World Timbers, Nos. 67, 69, Suppls. to Wood 31(3,5). For. Prod. Lab. Princes Risborough, Bucks. (Dalbergia latifolia), (Cedrela spp.)

Anonymous. 1966. World Timbers, No. 76, Suppl. to Wood 31(12). For Prod. Res. Lab. Princes Risborough, Bucks. (Paratecoma peroba)

Anonymous. 1967. World Timbers, Nos. 80, 81, Suppls. to Wood 32(4,5). For. Prod. Res. Lab. Princes Risborough, Bucks. (Shorea spp.)

Anonymous. 1968. World Timbers, No. 90, Suppl. to Wood 33(2). For. Prod. Res. Lab. Princes Risborough, Bucks. (Ocotea rodiaei)

Anonymous. 1969. Proceedings—Conference on Tropical Hardwoods. University Press, State University College of Forestry at Syracuse University, Syracuse, New York.

Anonymous. 1969. White Lauan—veneer cutting, drying, and gluing properties. Philipp. Lumberm. 15(4): 14,30,45.

Anonymous. 1966. Belt-sanding of Beach, Oak, Teak, and Palisander, (Dalbergia spp.). Traeindustrien. 16(6): 86-89.

Arkwright, P. 1965. Know your timber, No. 132. Woodwkg. Ind. 22(7): 49. (Gonystylus bancanus)

Arkwright, P. 1965. Know your timber, No. 137. Woodwkg. Ind. 22(12): 44. (Ocotea rodiaei)

Arkwright, P. 1966. Know your timbers, Nos. 146, 167. Woodwkg. Ind. 23(9): 41, 45. (Cedrela toona), (Dalbergia latifolia)

Arkwright, P. 1967. Know your timbers, Nos. 146, 147, & 150. Woodwkg. Ind. 24(1): 31. (Ocotea rodiaei)

Arkwright, P. 1968. Know your timbers, No. 166. Woodwkg. Ind. 25(5): 41. (Plathymena reticulata)

Bryce. J. M. 1966. Mechanical properties of Tanzania-grown Teak (Tectonia grandis L.). Tech. Not. Util. Sect. For. Div., Moshi, No. 34.

Appendix V, continued

Burgess, P. F. 1964. Wood anatomy of Parashorea. Malay. Forester 27(3): 272.

Carruthers, J. F. S., and Burridge, M. S. 1964. The drying of veneers in a fluid bed. For. Prod. J. 14(6): 251-253. (Khaya ivorensis, Fagus sylvatica, Triplochiton scleroxylon)

Chudnoff, M., Maldonado, E. D., and Goytia, E. 1966. Solar drying of tropical hardwoods. U. S. For. Ser. Res. Pap. Inst. Trop. For., Rio Pierdras No. ITF-2. (Swietenia spp.)

Gardner, J. A. F. 1965. Extractive chemistry of wood and its influence on finishing. Repr. from Official Digest, Federation of Societies for Paint Technology, Philadelphia 37(485): 698-706. (Dalbergia retusa)

Hansen, W. 1964. Wood finishes in furniture. Wood 29(12): 50-52. (Tectona grandis, Rosewood)

Hayashi, D., and Hara, O. 1964. Studies on surface sanding of lauan plywood. Wood Ind., Tokyo 19(9): 16-21.

McMillen, J. M 1967. Seasoning and handling of Ramin. U. S. For. Serv. Res. Note, U. S. For. Prod. Lab., Madison, No. FPL-0172.

Meniado, J., and Robillos, T. 1968. Silica in some Philippine woods. Philipp. Lumberm. 14(12): 24-26.

Patterson, D. G. 1964. The colour question in teak and similar timber. Wood 29(7): 47-48.

Peresram, D. H. 1964. The impact of one outstanding timber species (Ocotea rodiaei Mez.-Schomb.) on the timber industry of British Guiana. Commonw. For. Rev. 43(3): 250-255.

Phillips, E. W. J. 1966. Dermatitis caused by Rosewood substitute. Wood 31(9): 44-45. (Machaerium scleroxylon)

Prasad, B. N., and Jain, N. C. 1964. Preliminary studies of cutting resistance of a few Indian woods. Indian For. 90(10): 698-701. (Cryptomeria japonica, Quercus spp., Tectona grandis, Dalbergia latifolia, Ochroma spp., Dalbergia sissoo.)

Sekhar, A. C., and Sharma, R. R. 1966. Nails and screws holding power of some Indian timbers under dynamic conditions. Indian For. 92(7): 477-481. (Dalbergia sissoo, Tectona grandis, Shorea spp.)

Sono, P., and Rativanich, T. 1964. Comparative study on properties of plantation and natural grown teak in Thailand. Bulletin Royal Forest Department, Ministry of Agriculture, Bangkok No. R. 65.

Yarvorsky, J., Arostegui, A., and Sate, A. 1967. Gluing properties of wood of Tabebuia spp., Rev. For. Peru 1(1): 18-25.