

The Utilization of Oregon Hardwoods
in Furniture Manufacturing

by

Fremont McComb

A Thesis

Presented to the Faculty

of the

School of Forestry

Oregon State College



In Partial Fulfillment
of the Requirements for the Degree
Bachelor of Science
June 1938

Approved:



Professor of Forestry

SCHOOL OF FORESTRY
OREGON STATE COLLEGE
CORVALLIS, OREGON

Table of Contents

Introduction:

Purpose of the paper-----	Page 1
Importance of the problem-----	" 1
Review of related previous studies-----	" 4
Methods of procedure and sources of data--	" 4

Principal Oregon Hardwoods:

Red Alder-----	" 6
Bigleaf Maple-----	" 10
Black Cottonwood-----	" 15
Oregon Ash-----	" 18
Oregon Oak-----	" 19

Specialty Woods:

Oregon Myrtle-----	" 21
Madrone-----	" 22
Oregon Furniture Manufacturers-----	" 23
Summary-----	" 26
Bibliography-----	" 28
Illustrations-----	" 29

INTRODUCTION

Purpose of this paper

Although furniture manufacturing in Oregon is a secondary wood-using industry, its value and continuation are not to be over looked. On the present 26,100,000 acres of forested land in Oregon there is 396,000,000,000 board feet of timber. Scattered throughout this timber and covering much of burned-over area in the Douglas fir region are the hardwoods. It is the purpose of this paper to present the picture of these hardwoods in their uses and values to the state.

Importance of the problem

The importance of Oregon's hardwoods in the lumber industry as a whole is not particularly great. The furniture industry here could probably be pushed aside in favor of some other coniferous wood using industry, but it would not point towards complete forest utilization. The main hardwoods used are secured from trees growing either in mixture with conifers or in pure stands as a temporary type on old burns. If these trees were not cut for manufacturing purposes it would mean that their value would soon be lost because of their short lives.

In addition to the utilization standpoint there is the financial aspect to be considered. The furniture manufacturing industry in Oregon has grown at approx-

imately the same rate as the industry throughout the United States. For example, the physical volume of output of furniture roughly doubled between the years 1919 and 1927.

Undoubtedly the expansion in the purchasing power of the American people over the past decade has been responsible for the rapid advancement of the industry. Of course, at the present time and since 1929 the purchasing of furniture on either the western or eastern markets have been somewhat curtailed because of a comparatively low purchasing power in the lower class of people. It can be seen, therefore, that since furniture is somewhat of an " optional purchase ", that increases in prosperity and purchasing power bring a larger proportionate increase to the semi-luxury industries as flour milling and meat packing.

Because of the comparatively narrow character of the western market for first quality and period (Renaissance, Jacobean, etc.) antique, and modern furniture, it can be seen that it is difficult for the Pacific coast furniture manufacturers to compete with their eastern rivals who are able to adopt large scale production because of large centers of population. The best furniture sold in the western states is produced in Grand Rapids and other eastern wood

working centers.

Nevertheless, under the pressure of such competition, western manufacturers are constantly improving the quality, style and appearance of their products. The general grades of furniture have been raised. The location of Portland, Oregon, in reference to cheap power, ample labor supply, water transportation and availability of a local supply of raw material has made this city a center of wood working industries in the state.

In 1923 the furniture industry in Oregon gave employment to 2200 persons and has an investment of \$6,000,000 in land, buildings, and equipment. At that time the industry included twenty-four factories exclusive of ten chair factories. For a comparative chronological value we have the following information:

Year	Value added in manufacture (not adjusted for price inflation)	Price index of furniture (1926-100%)	Value added in manufacture adjusted to 1926 prices
1899	\$136,000	29.8%	\$ 456,000
1904	452,000	36.1%	1,252,000
1909	610,000	41.3%	1,476,000
1914	791,000	70.6%	1,120,000
1919	1,961,000	114.7%	1,709,000
1921	2,246,000	129.9%	1,729,000
1923	3,233,000	116.7%	2,770,000
1925	4,110,000	104.6%	3,929,000
1927	3,938,000	97.6%	4,034,000

Table 1. Time-value of furniture industry in Oregon. (10)

From the above figures it can be seen that furniture manufacturing in the state has increased, and that it

is still increasing at the present time.

Review of related previous studies

Probably the most important studies have been by Herman M. Johnson of the Pacific Northwest Forest Experiment Station. He is the author of a government publication (U.S.D.A. Circular No. 225) entitled "Utilization of Bigleaf Maple of the Pacific Northwest", and published in 1932. He is also joint author of another government publication (U.S.D.A., Dept. Bulletin No. 1437) entitled "Red Alder of the Pacific Northwest", which was published in 1926.

The former publication deals with the importance, range, annual production and consumption, properties, utilization by industries, seasoning, methods of lumbering, value, and uses of bigleaf maple (Acer macrophyllum); the latter publication gives the same information concerning red alder (Alnus rubra).

Numerous small items have appeared in trade journals from time to time, and material pertaining to the Oregon hardwoods has been compiled by Edward H. Vogt and Norman Speck, former Oregon State College students. Methods of procedure and sources of data for this thesis

The procedure in securing data for this report was, in the main, to obtain the desired information or related information from trade journals, newspapers,

government and college pamphlets. Some material was secured from the Pacific Northwest Forest Experiment Station. Manufacturers were also contacted.

A thorough search was made for all pertinent data and recorded by the card system so that it could be classified according to subject matter. After all data was secured it was merely necessary to blend the information with local knowledge into a presentable form.

Volume, growth, and consumption relationships.

The volume, growth, and consumption of the hardwood in Oregon is important because of its definitely revealing of the status of these woods. For illustration, consider the following tables;

Table 2. Volumes: M board feet--1936

Species	Volumes
Red alder	1,496,343
Oregon white oak	88,321
California black oak	63,635
Canyon live oak	3,344
Tan oak	439,465
Cotton wood and aspen	106,659
Bigleaf maple	488,325
Madrone	247,127
Oregon ash	30,851
Chinquapin	66,852

Table 3. Current Annual Hardwood Growth M bd. ft.

Unit	Acres	Growth
Columbia River	65,716	2,585
Willamette River	122,105	5,140
Oregon Coast	226,000	40,500
Umpqua River	77,000	6,450
Southern Oregon Coast	119,480	2,890
Rogue River	150,190	280

Table 4. Hardwood Lumber Production M bd. ft.

Species	1925	1927	1929	1931	1935
Ash	787	1,035	400	127	5,752
Cottonwood	1,102	1,534	2,011	950	3,190
Maple	2,091	2,596	2,866	3,094	3,112
Oak	295	59	77	4	
Alder	5,643				12,960
All other	2,507	1,322	2,596	4,630	8,383
Totals	12,425	6,546	7,950	8,305	33,397

Of the native hardwoods in Oregon there are five outstanding in their use in the furniture industry today. Those five, in the order of their importance, are, Red alder (Alnus rubra), Bigleaf maple (Acer macrophyllum), Black cottonwood (Populus trichocarpa), Oregon ash (Fraxinus oregona), and Oregon white oak (Quercus garryana).

There are two other specialty hardwoods worthy of mention; they are Oregon myrtle (Umbellularia californica), and Madrone (Arbutus menziesii).

PRINCIPAL OREGON HARDWOODS

Red Alder (Alnus rubra)

Range and Supply

Red alder is probably the most conspicuous hardwood of the Pacific coast region. Its range is from southeastern Alaska to southern California, but its

commercial range is limited to the moist areas in the lowlands and canyons of western Oregon and Washington, and southwestern British Columbia. On the lower slopes of the coast mountains in Oregon it is found in pure stands of fairly large size. Particularly heavy stands may be found in western Lincoln, Tillamook, and Lane counties on areas which have been burned-over or logged and where coniferous reproduction has been slow to become reestablished. The alder is also found in mixture with Douglas fir, western hemlock, Sitka spruce, western red cedar, white fir, bigleaf maple, and cottonwood.

The merchantable supply of red alder in Oregon is estimated at slightly over one billion board feet. The commercial stands are situated in a strip about thirty miles inland from the Pacific ocean. The commercial timber occupies an area of about 75,000 acres.

Properties

The wood of red alder shows no marked contrast between the heartwood and the sapwood; it is nearly white and of high moisture content when freshly cut. Soon after cutting, the wood turns to a light reddish-brown, or sometimes to a light golden color. The grain is straight and of uniform texture, the narrow

band of summer wood appearing only as fine lines in the radial section. When properly handled red alder wood will not warp, check, shrink, nor swell to any appreciable degree. It turns well and takes a fair polish. It also takes glue, paint, and enamel well, and when stained it resembles mahogany or black walnut. Oil or alcohol stains are particularly adaptable to alder. It is moderately light in weight, being lighter than any other western hardwood except black cottonwood. In comparison to competing woods which are used in furniture, such as red gum, yellow poplar, basswood, etc., red alder has been found to be as desirable as any of them. Red alder is adaptable to all types of glue, and no difficulty is experienced in making the joints as strong as the wood itself.

Uses

As previously stated, red alder is used mainly in the secondary wood-using industries in Oregon. The greatest portion of it goes into the manufacture of furniture. Northwest shops use alder in fine cabinets. Framing for overstuffed furniture is almost entirely of alder. For exposed parts in lower grade furniture alder is used in legs, chair backs, and arms. It is

used in drawer bottoms, backs, and sides. Turned legs, lamps, and cross-members are also made of alder. Office desks, tables, telephone stands, and waste baskets are also made of alder. The greatest use of the wood is for cores and cross-banding of built up plywoods which are faced with oak, walnut, mahogany, and other fine woods.

Consumption

At present, alder is the most valuable hardwood in the state and by far the most abundant. It is principally upon this wood that the furniture industry on the Pacific Coast owes its early success. Data from 1923 shows that at this time most of the alder (70%) was sawed by independent mills and sold to the factories; this practice, however, has been discontinued, and manufacturers now buy logs and do their own sawing and kiln drying. Lumber production amounted to 5,734,000 board feet in 1932; 12,724,000 board feet in 1933; and 7,050,000 board feet in 1934.

Costs

In 1923 good sized stumpage, located close to transportation sold from \$2.00 to \$3.50 per thousand board feet. Green alder lumber at this time sold for \$30.00.

to \$35.00 per thousand. Log scale prices for alder in 1928 were \$28.00 to \$30.00 per thousand; 1929, \$22.00; 1930, \$28.00; 1931, \$28.00; and 1936, \$30.00. Alder logs are usually cut by farmers or small logging operations. The U.S. Forest Service is at present conducting an alder sale on the Siuslaw National Forest near Hebo, Oregon; the stumpage is being sold at \$2.00 per thousand board feet.

Bigleaf Maple (*Acer macrophyllum*)

Range and supply

Best development is reached in the moist regions of the coastal area in western Oregon and Washington. Although pure stands are sometimes found, bigleaf maple is usually found in small clumps or in mixture with Douglas fir (*Pseudotsuga taxifolia*), western red cedar (*Thuja plicata*), western hemlock (*Tsuga heterophylla*), lowland white fir (*Abies grandis*), red alder (*Alnus rubra*), black cottonwood (*Populus trichocarpa*), and Oregon ash (*Fraxinus oregona*). On some good sites the trees are often 100 feet high and forty inches in diameter, but the boles are generally crooked or limby. In dense stands the boles are comparatively clear of branches from one-half to two-thirds of their height.

Statistics of 1936 indicate a volume of 488,325,000 board feet (Scribner rule) of bigleaf maple within the state.

Properties

If one were to look at a cross-section of the trunk of a bigleaf maple tree, he would see no distinct deviation between heartwood and sapwood; both are nearly white and of high moisture content. When the wood is fully seasoned, its surface is light brown with a slight reddish tint. The finished color after seasoning is somewhat desirable since most of the wood used for exterior purposes is stained to imitate either black walnut or mahogany. The grain of the wood is usually straight and of uniform texture. Curly and bird's eye figures occur less frequently than in the eastern maples; most of the figured material is obtained from burls. The wood weighs about the same as the silver and red maples; it is stronger than silver maple, and weaker than either red or sugar maple. In hardness it ranks harder than silver maple and softer than either red or sugar maple.

In furniture construction it is found that the wood is quite satisfactory in its ability to be worked or shaped. It turns and otherwise works well with

tools, glues very satisfactorily, and takes a good polish. It also takes paint and enamel well and makes an excellent imitation mahogany or walnut when stained. If properly dried and cared for, bigleaf maple does not shrink, swell, check, or warp seriously in place.

Year	Volume
1925	2,691
1926	2,643
1927	2,596
1928	4,824
1929	2,866
1930	5,830
1931	3,044
1932	1,804
1933	2,955
1934	3,955
1935	3,190

Table 5. Bigleaf maple lumber production in M board feet. (6)

Of the 4,824,000 board feet of bigleaf maple lumber consumed in 1928, 3,667,000 feet was produced by the industry itself from purchased logs. The remainder was purchased in form of rough lumber, most of it in a green condition.

Uses

Bigleaf maple is used chiefly for a medium grade living-room, dining-room, and bedroom furniture of both plain and fancy designs, finished in walnut, mahogany, or enamel--ordinarily for cross-banding and backing in such built-up flat parts as tops, panels,

and drawer ends. In living-room furniture finished in walnut or mahogany its use is mostly confined to such solid parts as legs, stretchers, rails, and slides of tables. Some pieces of living-room furniture such as bookcases, rockers, benches, stools, and radio tables are made entirely of bigleaf maple.

Living-room tables are occasionally so made also, except that the tops are of built-up construction and faced with walnut or mahogany veneer. In dining-room furniture finished in walnut or mahogany, bigleaf maple is used for legs, stretchers, and rails of tables; all parts of chairs, but especially legs, stretchers, backposts, and other turned parts; and the legs, stretchers, crown rails, and mirror frames of buffets. Small dining tables, enameled breakfast tables and tea wagons are sometimes made entirely of bigleaf maple. Just how bigleaf maple will be used in bedroom furniture depends upon the finish which is to be applied to the pieces. When finished in walnut or mahogany, it is used for legs, front rails, side rails, mirror posts, and mirror frames of dressers, chiffoniers, and dressing tables; when under enamel finish it is used for all exposed parts of chiffoniers, dressers, bureaus, and vanity tables and also

legs, stretchers, back posts and seat frames of chairs. Sound-knotted stock is suitable for enamel finish, except in parts requiring maximum strength.

About one-tenth of the bigleaf maple consumed in furniture manufacturing goes into the production of overstuffed and upholstered articles such as davenports, beds, benches, footstools, and living room chairs. The wood is in demand for the frames of overstuffed furniture, especially parts subject to strains, such as back frames, back posts, and legs; also for exposed parts, such as front rails, arms, and molding. If chairs are made with upholstered seats and backs, the wood is used in such parts as back posts, legs, stretchers, arms, arm posts, and seat frames. About 241,000 board feet of bigleaf maple was consumed in the manufacture of chairs in Oregon and Washington during 1928.

Stumpage, log, and lumber values.

If bigleaf maple stumpage is found in small, poorly located units with scattered timber, it may sell for as low as \$0.75 per M feet, but if stumpage contains a high percentage of logs suitable for veneer, it may bring up to \$5.00 per M. Ordinarily stumpage will be found to sell for between \$2.00 and \$4.00 per M.

Logs are usually sold on a camp-run basis (Table 6). Customarily, when logs are purchased, the size and quality of the logs are taken into consideration, but the location of the mill with reference to the timber and transportation facilities largely fixes the price.

Location of mill	Average	High	Low
In timber	\$08.00	\$10.00	\$07.00
On highway	16.00	18.00	15.00
On tidewater	20.00	22.00	16.00
On railroad	22.00	24.00	17.00

Table 6. Camp-run prices of maple logs per thousand feet board measure, delivered to mills, 1928.(6)

Veneer logs, of course, sell for somewhat higher prices. In 1928 veneer logs yielding highly figured stock sold for \$40 to \$60 per M.

Because of the relatively small amounts of bigleaf maple cut no logs grades have been established. The timber is usually sold "mill run with culls out". Most manufacturers prefer to buy the wood in logs or cants and dry the stock in their own kilns. Because of this method when kiln dried material is sold it may bring as much as \$45 to \$60 per M in small quantities.

Black Cottonwood (Populus trichocarpa)

Range and supply

Black cottonwood is a tree of moist sites and low

elevations. Its chief commercial range is along the Columbia River and through the Willamette Valley.

Large stands may be seen along the Willamette River near Eugene and on the alluvial soils in this area.

The present volume throughout the state is estimated at 106,659,000 board feet (Scribner Rule). (For volume by counties see Table 7).

County	Volume
Benton	1,500 M
Clackamas	12,951
Columbia	19,660
Hood River	8,311
Jackson	3,780
Lane	17,019
Linn	11,921
Marion	12,681
Multnomah	11,720

Table 7. Volume in M board feet of Black Cottonwood in Oregon. (10)

Properties

This wood is light in weight, dull brown in color with a narrow band of nearly white sapwood. After the wood has been kiln-dried, it turns a gray-white color. The durability rating is very low; when the wood is air-dried it is seldom allowed to stand in the yard more than thirty days because of its high susceptibility to wood-rotting fungi and stains. The dry wood is soft,

has a high shock resistance, and takes glue and stains very well. It is adaptable to bending or turning.

Uses

Formerly, black cottonwood was quite extensively used in furniture manufacture, but due to the cutting out of stands close to transportation, its use has somewhat declined. Its main use today is in the cores for built-up panels. It is commonly found as a core in panels used for cabinet doors, bed-stands, dresser ends, radio cabinets, small table tops, book cases, magazine racks - in fact any piece of furniture in which plywood may be used. Some concerns use it for table tops where narrow widths are glued; it is also used in legs, backs, rungs and bottoms of many types of "breakfast-nook" furniture. Small magazine racks which are to be stained or painted by the purchaser are commonly built of plywood constructed entirely of cottonwood.

Stumpage and lumber values.

Because of its low durability and susceptibility to decay, black cottonwood does not bring high stumpage prices. Stumpage in 1932 was selling throughout the Willamette valley at about \$1.50 per M. A decrease in stumpage sales in the Columbia river area

has been caused by a recent insect infestation which has resulted in a degrade of all lumber coming from that area. All manufacturers are buying the material in log form (See table 8).

Year	Value
1929	\$11.35
1930	12.92
1931	8.13
1932	7.15
1933	8.00
1936	7.00

Table 8-Log prices for black cottonwood over a period of years.

Oregon ash (*Fraxinus oregona*)

Range and supply.

The range of this tree is very similar to that of black cottonwood; it is seldom found away from stream courses. The main commercial area is located in Lane, Linn, Polk, and Yamhill counties. A cruise made in 1936 placed the total amount of ash at 30, 851,000 board feet throughout the state.

Properties.

Oregon ash has large pores--a factor which inhibits its use for exposed areas because of the dif-ficulty incurred in covering the coarseness of the wood. It also expresses little figure attraction.

It is adaptable to bending after steaming.

Uses

From the best sources--the manufacturers--the author learned that at present Oregon ash is being used very little in furniture manufacturing. Its main uses are in corner braces (hidden) for desks, bureaus, and tables and for chair backs and arms. Only one firm, Beal and Son, Albany, Oregon, was found to be using this wood at the present time. They estimated that 200,000 board feet was used in their plant during the year 1937.

Stumpage and log prices.

No data was to be found on the present stumpage price, but it is estimated at \$1.00 per M board feet by Mr. Wheeler of Beal and Son Co. The author was unable to secure any data on log prices.

Oregon oak (*Quercus garryana*)

Range and supply.

It is most abundant in the Willamette, Rogue River, and Umpqua valleys of western Oregon. It is commonly found in Polk, Benton, Linn, and Marion counties. Present cruise figures place the amount of standing timber at 80,321,000 board feet (Scribner

rule).

Properties.

When compared with eastern white oak the wood is found to be quite similar. The heartwood is light yellowish-brown in color, but the narrow sapwood is nearly white. It is moderately strong, very hard, and has good shock resisting ability. Its one principle disadvantage seems to be that it is usually brashy. B.P. John and Co., Portland, Oregon have discontinued the using of Oregon white oak entirely because of its brashiness. It can be used where steaming and bending is employed.

Uses.

The present use of Oregon oak wood is confined mostly to chair backs and braces in which bending is employed. A small number of small table tops are also made. The furniture industry consumed approximately 23,000 board feet in 1933 and 50,000 board feet in 1937. Beal and Son, Albany, Oregon, is the chief user of Oregon oak. No doubt the main decline in the use of this wood (100,000 b.f. in 1928) can be attributed mainly to the destruction of the good stands. Present stands are confined to the less fav-

orable sites with the result that the timber is of poorer quality. Clear cuttings of sufficient size and quality are now rarely obtainable at reasonable cost.

Stumpage and log costs.

Present prices for stumpage suitable for clear lumber production are placed at \$8.00 per thousand. As in the case of the other woods it is found that Oregon oak is purchased in logs and sawed by the manufacturer. Present log prices of clear material are placed at \$40 to \$45 delivered at the plant. It cannot be overlooked that the use of Oregon white oak in furniture manufacturing is rapidly diminishing and that it probably will soon be discontinued entirely.

Specialty Woods.

Specialty woods are those which are not used in construction of chairs, tables, dressers, etc. Their main use is in novelty items such as fruit and nut bowls, cake plates, serving trays, candlesticks, powder bowls, flower vases, lamp stands, and similar items. Specialty items may be considered accessory to furniture. Of the specialty woods Oregon myrtle (Umbellularia californica) and Madrone (Arbutus

menziesii) are the most important.

Oregon myrtle is found only in southwestern Oregon; it is there that most of the wood is used in manufacturing. The wood is hard, heavy, and takes a very beautiful polish. French polish (oil and shellac) is usually applied to all turned material. The chief disadvantage is that it checks very severely; small pieces are usually used because of this factor. Professor Glenn Voorhies, Oregon State College, has been working on a seasoning process which has shown to reduce the checking to a minimum. If the wood can be kiln dried to prevent checking it may come into the field of rather important Oregon hardwoods since cruise figures for 1936 place the volume at 58,763,000 board feet.

Madrone is worthy of mention because of its specialty importance. Items similar to those manufactured from myrtlewood are produced, but its main value lies in the burls which are produced by the trees. The burls are used somewhat locally by specialty workers, but by far the greatest portion is exported to be made into face veneers. A 1936 cruise placed the standing volume of madrone at 247,127,000 board feet.

Most of the burls are secured in Douglas, Jackson, Josephine, and Curry counties.

Burl Exports.

Among the uses of the Oregon hardwoods is the production of face veneers from burls. Most of the burls are shipped by water to free ports in Europe (Havre and Genoa) where they can be processed for transshipment with little or no duty. The finely figured veneers produced are used by manufacturers of high grade furniture in eastern United States. Table 9 shows data concerning burl exports.

Species	Germany	France	Italy	Great Britain
Madrone	20,834	6,212	5,500	
Bigleaf maple	443,918	327,811	92,120	35,200
Oregon myrtle		3,278		37,488

Table 9-1934 burl exports from Oregon (figures represent number of pounds shipped). (12)

In 1937 bigleaf maple burls amounting to 788,000 pounds, myrtle 285,000 pounds, and madrone 253,000 pounds were exported.

Oregon Furniture Manufacturers.

Those who are responsible for the major utilization of Oregon hardwoods in furniture manufacturing are worthy of mention.

The largest furniture manufacturing concern in Oregon is the Doernbecker Manufacturing Company located in Portland. The firm was established in 1900 and is now headed by H.A. Green, president. Their main factory embraces an area of eight acres, with two main factory buildings, power house, and a battery of twenty dry kilns. They manufacture all standard styles of furniture as well as any specialty styles. Lumber is cut at their New Era (near Oregon City) sawmill and transported to Portland by rail. All kiln drying takes place at the Portland plant. The firm uses over 15,000,000 board feet of Oregon hardwoods each year. Red alder, bigleaf maple, and black cottonwood are the woods used, and red alder is chiefly used.

Another large Oregon firm is the B.P. John Manufacturing Co. located in Portland. Their principle products are bedroom, dining room, and living room furniture. The company was formed in 1903, and at the present time is headed by B.P. John. They use red alder, black cottonwood, and bigleaf maple. Alder and black cottonwood are used chiefly for core stock; bigleaf maple is used in turning stock. During 1935 they used 4,500,000 board feet of all species combined; 1936, 6,000,000 board feet; 1937, 9,500,000 board feet. All material is purchased in logs and

sawed in their Swedish gang mill. The valuation of their plant is placed at \$1,000,000. They employ 450 people exclusive of sales and have an annual payroll of \$550,000 (1937). Their furniture is shipped to all parts of United States.

The only firm using entirely Oregon hardwood material is Beal and Son Chair Co. located at Albany, Oregon. Their products are confined to chairs, tables, and small peices of furniture. Breakfast room chairs and tables are a specialty product. The woods chiefly used are red alder, black cottonwood and bigleaf maple. During 1937 they used 1,500,000 b.f. of black cottonwood, 1,500,000 b.f. of bigleaf maple, 250,000 b.f. of red alder, 200,000 b.f. of Oregon ash, and 50,000 b.f. of Oregon white oak. Logs are purchased from farmers and small logging outfits in the Lebanon and Sweet Home areas and are sawed at their plant. The lumber is air-dried until need for its use arises; then it is kiln dried in their battery of five kilns. Their trade is mostly on the Pacific Coast and to the Hawiian Islands. Eighty-five men are employed and receive an annual payroll totalling \$85,000.

Another Portland firm is the Portland Manufacturing Co. They use about twenty cars of red alder and

bigleaf maple annually. The wood is used mainly in frame-work for overstuffed furniture.

The St. Johns Manufacturing Co., Portland, uses about twelve cars of red alder annually. It is used for turning purposes.

West Made Desk Co., Portland uses 600,000 board feet of red alder unnually in cores for desk panels and tops.

The Sunset Furniture Co., Portland, uses madrone in face veneers and red alder for cores and hidden parts in dresser and bureau piece construction.

The beaver Cabinet Works, Corvallis, and Olsen Cabinet Works, Eugene, use small amounts of red alder and bigleaf maple annually in cabinet work.

Myrtlewood Crofters, Inc., Marshfield, and Myrtle Point Novelty Co., Myrtle Point, are the main manufacturers of myrtlewood pieces.

There are numerous other smaller manufacturing and furniture repair shope located mainly in Portland, but the small amounts of native hardwoods used by them hardly makes them worthy of mention.

SUMMARY

From the facts presented in this paper one can readily see that the furniture manufacturing industry and its utilization of Oregon hardwoods is an import-

ant asset to the state. The industry has definitely been shown to have increased almost two-fold since 1923. Furthermore, with the cutting out of the more valuable eastern hardwood stands, Oregon can look forward to an increasing demand for the native hardwoods. The development of new methods of glueing, finishing, and styles are increasing the demand for these fine woods. We cannot overlook the value of an industry which has jumped two-fold in production and is maintaining its production against eastern industrial centers chiefly by using Oregon hardwoods.

-----0-----

BIBLIOGRAPHY

1. Burrell, O.K., An Industrial Audit of Oregon, July, 1930
2. The Coos Bay Times, New Era Edition, 1937, p. 52.
3. Gibbons, W.H. and Johnson, H.M., "Oregon and Washington Furniture Industry", The Timberman, April, 1925, p. 51.
4. Hanzlik, E.J., Trees and Forests of Western United States. Dunham Printing Co., Portland, Ore., 1929.
5. Johnson, H.M., Hanzlik, E.J., and Gibbons, W.H., Red Alder of the Pacific Northwest. U.S.D.A. Bul. No. 1437.
6. Johnson, H.M., Hanzlik, E.J., and Gibbons, W.H., Utilization of Bigleaf Maple of the Pacific Northwest. U.S.D.A. Circular No. 225, June, 1932.
7. "Wood Burl Exports Hold Their Parity", The Oregon Journal, Feb., 5, 1938, p. 12.
8. The Timberman, Sept. 1928, p. 74.
9. The Timberman, April, 1936, p. 46.
10. University of Oregon, Bureau of Business Research, Oregon Hardwood Industries, Dec., 1929.
11. U.S.D.A., Forest Service, Pacific Northwest Forest Experiment Station, Oregon White Oak, Forest Research Note No.11, May, 1932.
12. U.S.D.A., Forest Service, Pacific Northwest Forest Experiment Station, Burl Exports From Oregon - 1934.
13. U.S.D.A., Forest Service, Timber Used in Furniture Manufacture - 1933, State Tables, p. 62.



Fig. 1. A typical Douglas fir
hardwood mixture (Benton county).



Fig.2. Red alder suit-
able for saw logs.



Fig.3. Bigleaf maple
suitable for saw logs.



Fig.4. Oregon white oak being air-dried in yard of Beal and Son, Albany, Ore.



Fig.5. Typical stand of Oregon white oak on bottomland.

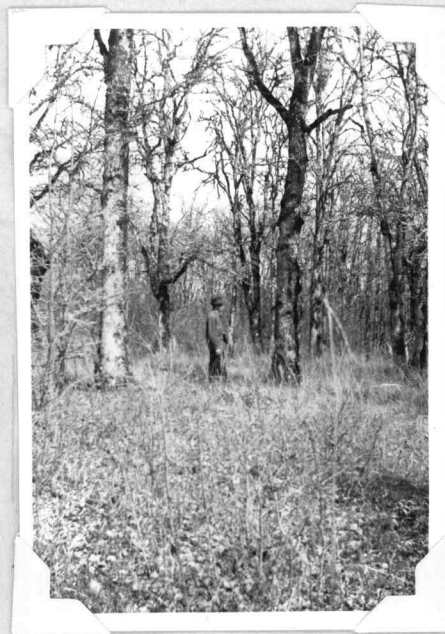


Fig.6. Typical stand of Oregon white oak on hill land (note comparative size).



Fig.7. Oregon ash near Mary's River, Benton County.

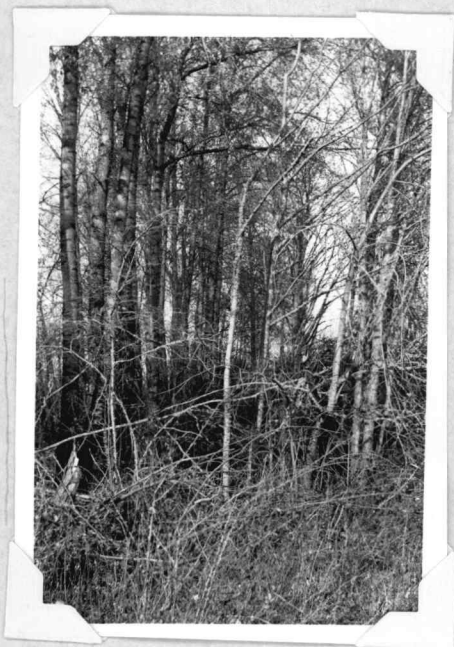


Fig.8. Black cottonwood on lowland, Linn County.

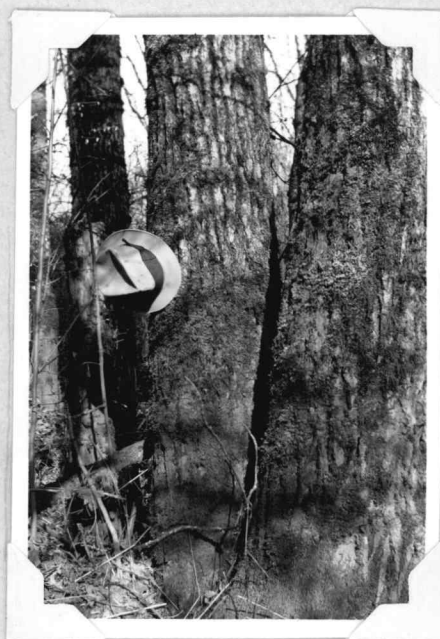


Fig.9. Close up of trees shown in Fig.8. Note comparative size.

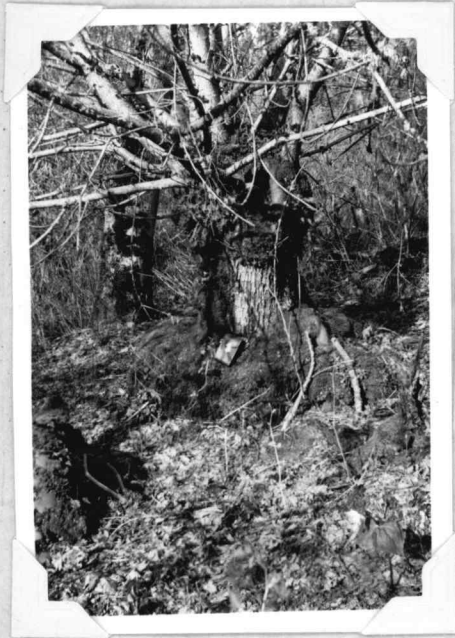


Fig.10. Bigleaf maple showing burl formation at base of tree.



Fig.11. Madrone. Axe head is resting on a burl.

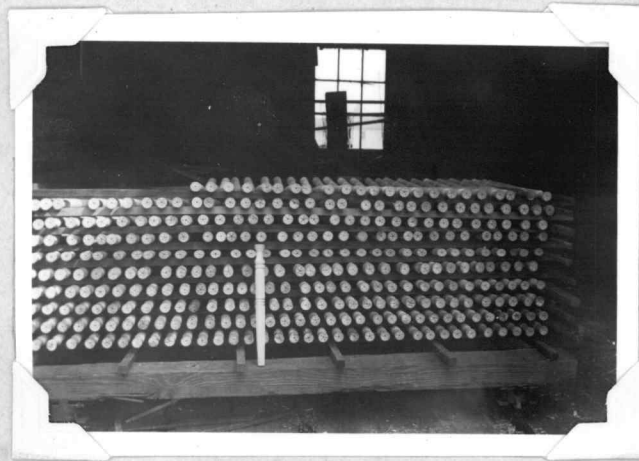


Fig.12. Chair legs made of bigleaf maple (Beal and Son, Albany, Ore.).



Fig.13. General view of yard and plant at Beal and Son, Albany. Note narrow piles.



Fig.14. Bigleaf maple (A) and black cottonwood (B) awaiting transfer to dry kiln (Beal and Son, Albany).



Fig.15. Piling black cotton-wood at Beal and Son, Albany.



Fig.16. Typical virgin Oregon ash, Benton County. Note comparative size.



Fig.17. Red alder along a stream in Clatsop Co. These trees are suitable for saw-logs.



Fig.18. Close up of trees shown in Fig. 17. Note comparative size.