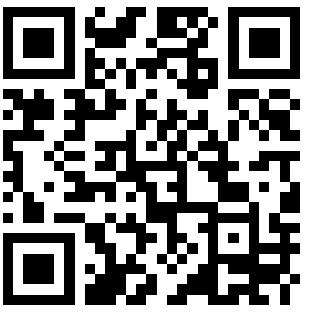
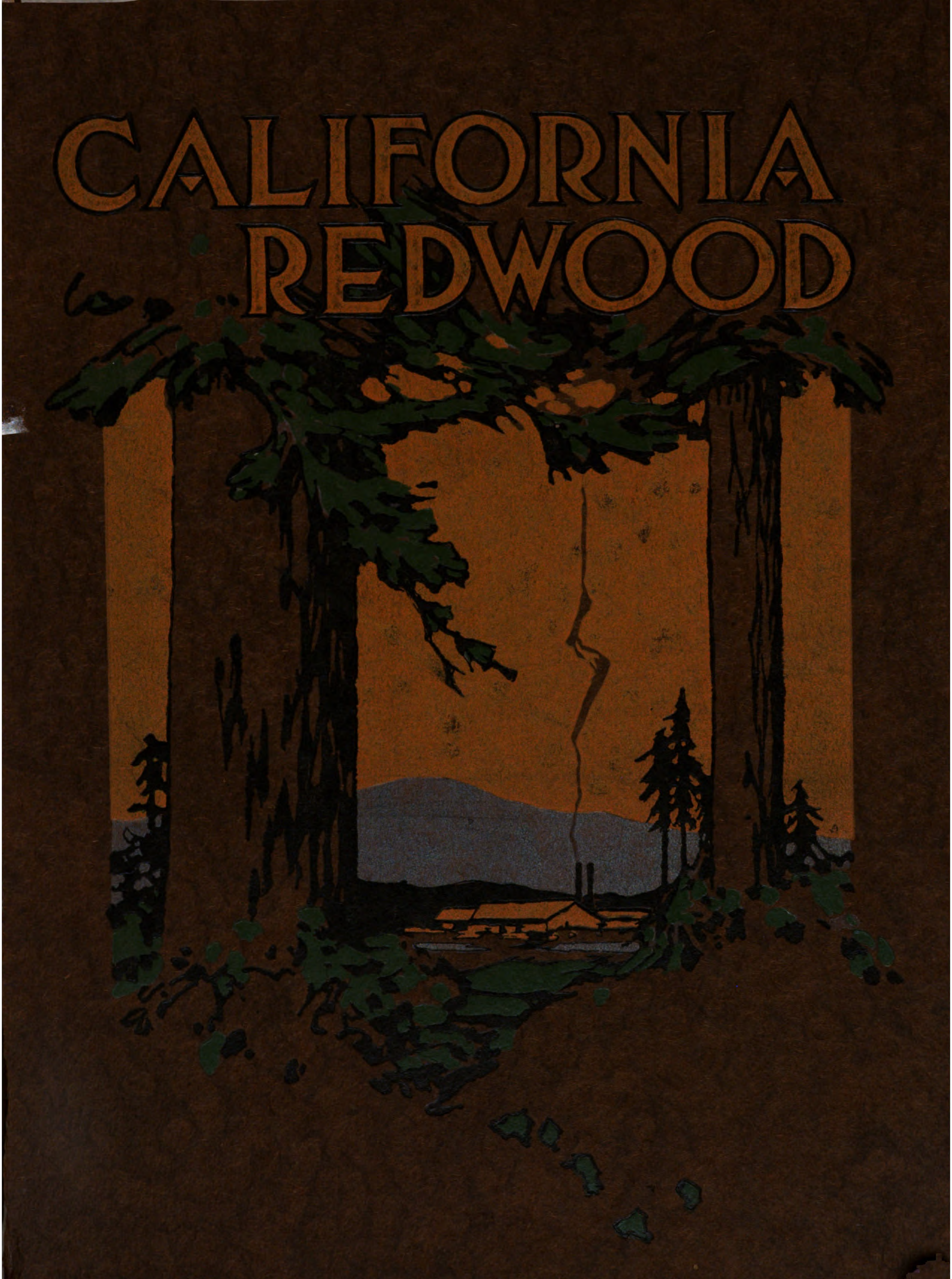


CALIFORNIA REDWOOD



CALIFORNIA REDWOOD

In the Redwoods

By A. D. NORDHOFF

AS IN some vast cathedral, one looks up
Through columns, carved and tinted deep by time,
Up, up to where the light grows faint; and where
Through windows, made by dust of ages dim
A few pale sunbeams strive to force their way;
So in the redwoods. Midst the columns vast
Of nature's great cathedral, gazing up
One finds the same dim distance and the same
Pale sunbeam and the same dim, far-off light;
But in the place of windows, filmed by time,
Great interlacing branches, tier on tier,
Set in a frame-work of the fern-like leaf;
And in between, faint glimpses of deep blue,
As if some master-hand, with earnest touch,
Had painted every space, 'twixt leaf and branch,
With tender color, like the Heaven's own.

CALIFORNIA REDWOOD

IT IS, indeed, "as in some vast cathedral" that one is impressed by the giant Redwood Forests of California. None but can feel the grandeur and sublimity of these mighty trees, though few perhaps can put their feelings into words as has the writer of this verse.

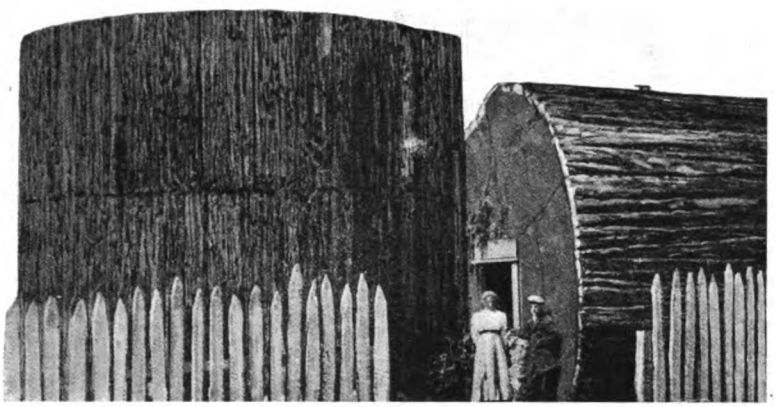
Many 2,000 Years Old

Many of these very Redwoods that one sees today were standing when the Wise Men of the East followed the brilliant star two thousand years ago.

Enormous in Size

The enormous size that makes them so impressive is hard to realize. They vary from 150 to 350 feet in height and from 3 to 15 and even 20 feet in diameter.

Living in the hollow of a tree might not be so bad as it sounds—if it were a Redwood tree. You could enjoy your regular bed—you could have tables and chairs—everything, just as you do at home. The illustration shows a home made entirely from a Redwood log.



House Made from Redwood Log

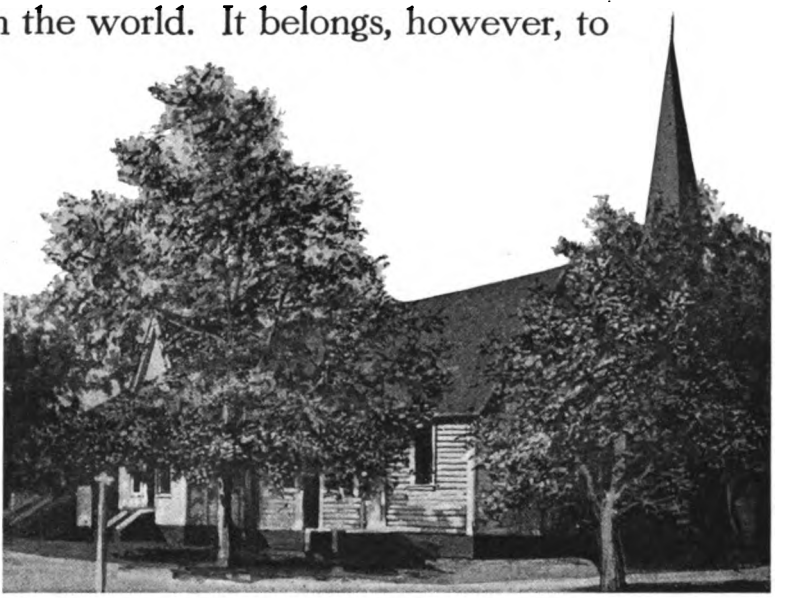
Taller than the Statue of Liberty

One of the monster Redwoods, hollowed out, would make an unbroken elevator shaft for the Flatiron Building in New York City. It would tower fully 50 feet above the torch of the Statue of Liberty. Out in Santa Rosa, California, there is a church, seating 500 persons, built—seats, pulpit and all—from the lumber of one Redwood tree—78,000 feet, plus several thousand shingles.

The Two Kinds of Redwoods

In speaking of the Redwood we refer always to the Sequoia Sempervirens, the tree that grows in extensive commercial quantities, as distinct from the Sequoia Gigantea, or so-called "Big Tree" Redwoods that grow only in scattered patches in the Sierra Nevadas.

The Redwood, then, is essentially a California tree, except for a few hundred acres in Oregon, and is found nowhere else in the world. It belongs, however, to the same general family as the Southern cypress and Western red cedar, and possesses many qualities in common with these woods. It is confined for the most part to the



Church at Santa Rosa, California, Made from Lumber from Single Redwood Tree

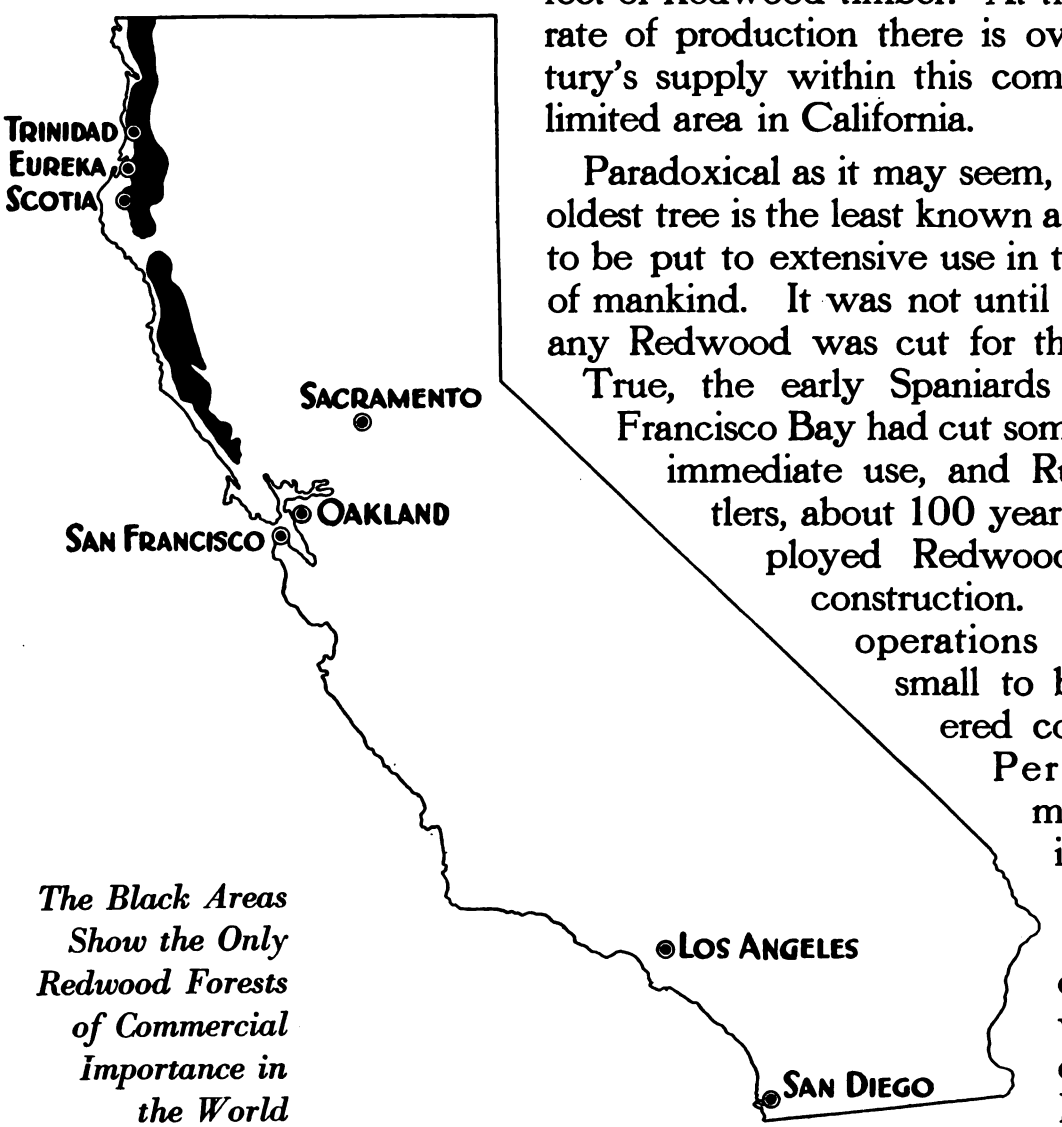
Where the Redwood Grows

Northern Counties—Del Norte, Humboldt and Mendocino. Growing on the Pacific Slopes of the Coast Range, the Redwood, as shown on the map, forms a narrow strip along the Pacific varying from 10 to 35 miles wide and some 300 miles long. The other isolated patches further south are not of commercial importance.

A Century's Supply

Redwoods grow very close together and thus, with their enormous size, the average will run from 75,000 to 100,000 board feet per acre. A single acre of these forests has yielded as high as 1,000,000 board feet.

It is estimated that there is standing today about 75 billion feet of Redwood timber. At the present rate of production there is over a century's supply within this comparatively limited area in California.



The Black Areas Show the Only Redwood Forests of Commercial Importance in the World

Paradoxical as it may seem, America's oldest tree is the least known and the last to be put to extensive use in the service of mankind. It was not until 1850 that any Redwood was cut for the market. True, the early Spaniards near San Francisco Bay had cut some for their immediate use, and Russian settlers, about 100 years ago, employed Redwood in their construction. But these operations were too small to be considered commercial. Perhaps the most prominent of the early lumbering enterprises was that of the Redwood

Lumber Manufacturing Company, formed in 1850 and incorporated in 1853. It was managed by Henry Meiggs, who brought machinery around the Horn and started logging and milling at the mouth of the Big River. Heretofore all lumber used in California had been brought from the Eastern States and Europe by way of Magellan Straits. Consequently, it was very expensive. It was this fact that prompted Meiggs—a man of large ideas—to develop a local supply.

First Commercial Logging 1850

The account of the difficulties that were met with and overcome in establishing this mill and getting it started, reads more like one of Fennimore Cooper's romances than the story of a business enterprise.

From this small beginning the industry has grown steadily. Today there are 18 or 20 large mills with a total annual output of some 550 to 600 million feet.

Output Now 600,000,000 Feet Yearly

In those parts of California where Redwood grows it was originally, and in fact still is, used for general building purposes, including studding, joists, flooring, inside and outside finish, but as people generally got better acquainted with the individual characteristics of Redwood lumber, they appreciated the fact that it had peculiar qualities fitting it for certain uses in a degree not possessed by other woods or other materials. In other words, Redwood is a *specialty wood*, and it is the purpose of this book to explain these properties of Redwood, and suggest uses to which it should be put.

Qualities Not Possessed by Other Materials

In California these facts are commonly known, but east of the Rocky Mountains and in foreign countries trade has developed slowly, due both to lack of knowledge and poor transportation facilities. In spite of this, the extreme beauty and durability of the wood has partially overcome these disadvantages, and even now eastern and foreign shipments amount to about 150 million feet annually, divided about equally between this country and abroad. With the new facilities for rail and water transportation described later in this book, Redwood becomes easily available in every part of the world, and the natural merits of the wood will now win for it the recognition it deserves.

Properties of Redwood

Light and Easily Worked

Redwood is light and soft, yet firm. It works easily and holds nails well. Dry weight of wood, 26.2 pounds per cubic foot. (Any wood under 30 is regarded as light. Cypress is 27.6).

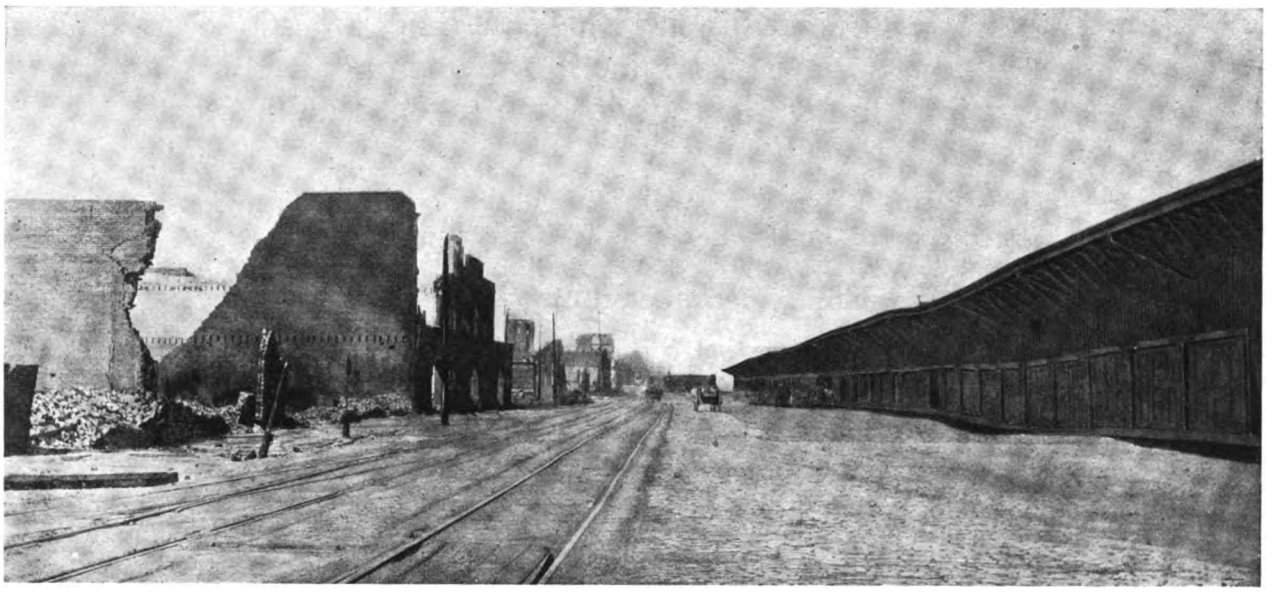
Does Not Shrink, Warp, or Swell, When Properly Dried

One of the greatest problems that the Redwood manufacturer has had to solve has been that of proper seasoning. Redwood, like all other woods, will shrink when green, but unlike others, there is practically no shrinkage, warping, or swelling when it is thoroughly dry. This "staying put" quality makes it extremely valuable for many particular and exacting uses, such as pattern work, organ pipes, incubators, silos, etc. A detailed description of one of the best methods of seasoning Redwood will be found later in this book.

Resists Decay

Redwood is not susceptible to rot influences, resisting the action of weather, water and underground conditions as few other woods do. In Humboldt County, California, a Redwood log was found bound down by the roots of a spruce tree that had just been cut. The annular rings of the spruce

Buried 600 Years— Makes First Class Lumber



Townsend Street, near Sixth, San Francisco, Looking East. Redwood Warehouses Unharmed by Fire Which Raged Across the Street

tree showed it to be 600 years old. The Redwood log had remained buried all that time. It was dug out, sent to the mill and sawed into first class lumber. One of the reasons for this resistance to decay is assumed to be the peculiar acid found both in the bark and in the wood itself. This repels the fungi that cause decay. Another is the extremely slow development of the tree, even with the damp, rainy conditions under which it grows.

Erected in 1811. In Constant Use Today

Buildings made of Redwood erected at Fort Ross, California, by Russian settlers in 1811 are still in an excellent state of preservation and are in constant use. Redwood fence posts dug up after being in the ground anywhere from 75 to 100 years were found to be in good condition.

Made Fire Resistant by Nature

Redwood Contains No Pitch

Redwood, containing as it does no pitch or other resinous substances, is slow to ignite, and offers unusual resistance to fire. Forest fires sweeping through the underbrush leave the Redwood trees unharmed.

As Redwood absorbs water readily, fire can be quickly extinguished once it has taken hold. At many places in the great San Francisco fire, in 1906, the conflagration was stopped where Redwood houses faced the flames.

San Francisco Fire Furnishes Proof

Just following the fire, the Building Committee appointed by the Mayor to determine the character of building materials to be permitted in the work of reconstruction, adopted the following resolution:

"RESOLVED that no permits shall be given at the present time for the construction of any buildings in San Francisco, but owners of property will be allowed to proceed and erect upon their premises one-story buildings constructed of galvanized iron or Redwood without a permit."

P. H. Shaughnessy, Chief Engineer San Francisco Fire Department, writes:

Burns Much Slower— Easier to Extinguish

"After an extended experience of more than 22 years in active connection with the San Francisco Fire Department, the results of my observation convince me that under similar conditions of heat exposure Redwood lumber ignites much less quickly and burns much more slowly than pine or other kinds of resinous, soft building woods with which I am familiar, and I am also convinced that when Redwood becomes ignited the fire is much more easily extinguished than in the combustion of..... or other soft building woods. The reason for these differences, I think, is largely owing to the fact that Redwood is well known as a non-resinous wood."

Twentieth Street, Between Mission and Lexington, San Francisco. The Fire Stopped at These Redwood Houses
The Telephone Poles Are Also Redwood

Government Tests

IN STRENGTH and stiffness, Redwood compares favorably with other lumber. Government Bulletin 108, Department of Agriculture, entitled "Tests of Structural Timbers," says: "Redwood is one of the most desirable species from which heavy structural timbers may be secured."

Following are figures gathered from tests made with different kinds of lumber by the United States Forest Service experts:

Modulus of Rupture (breaking strength when tested as a beam): 8,000 pounds per square inch on pieces 2x2x30, at moisture of 15.7% (Forest Service). This is 62% that of white oak.

Breaking Strength

Breaking Strength of various woods:

Redwood	8,000	pounds
Western Red Cedar	10,500	"
Southern White Cedar	6,300	"
Northern White Cedar	7,200	"
Cypress	7,900	"

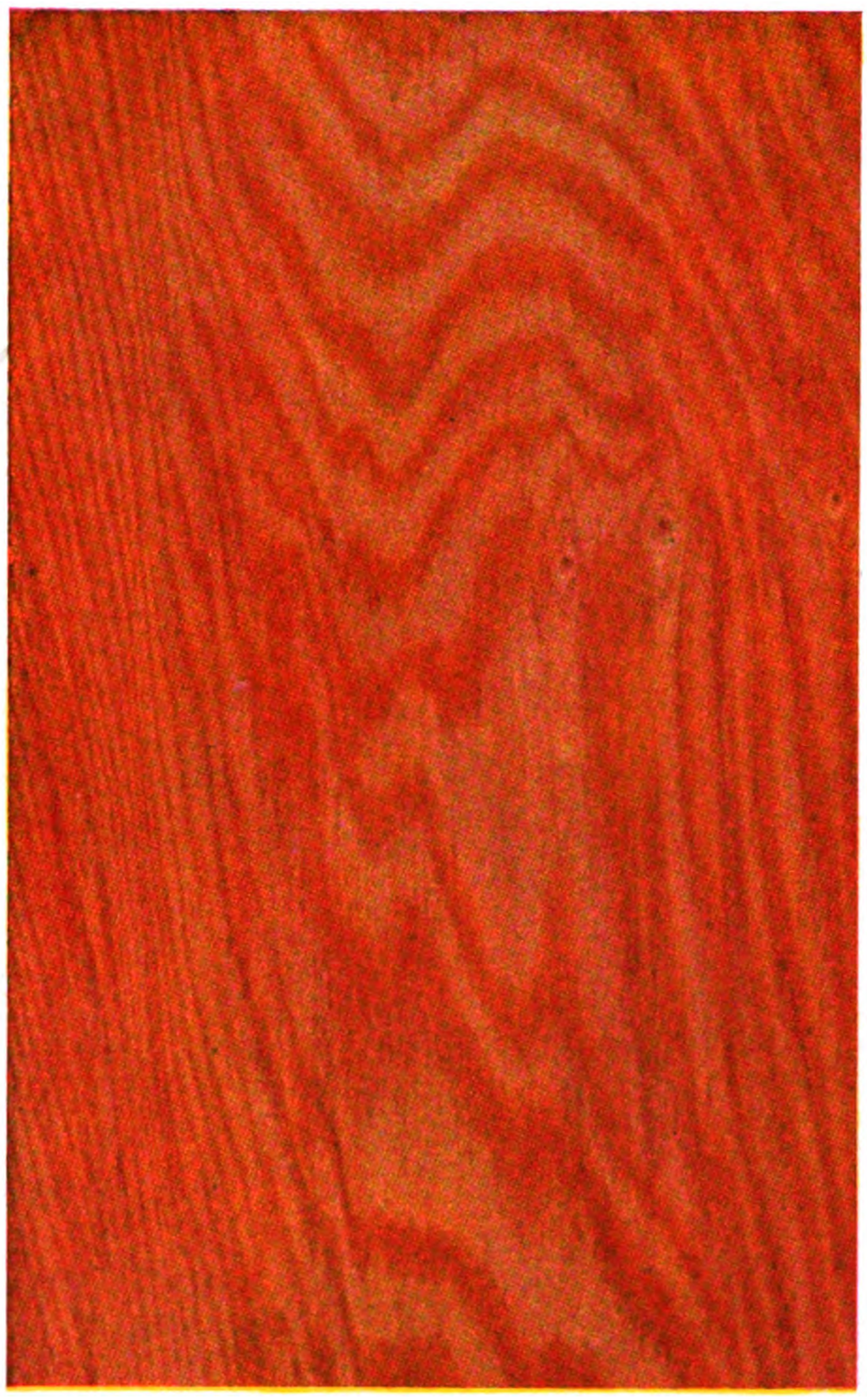
Factor of Stiffness

Factor of Stiffness (resistance to deformation):

Redwood	1,140,000	pounds	square	inch
Western Red Cedar	1,460,000	"	"	"
Southern White Cedar	910,000	"	"	"
Northern White Cedar	750,000	"	"	"
Cypress	1,240,000	"	"	"

Redwood is equal in strength to cypress, slightly stronger than Eastern cedars and slightly weaker than Western cedars.

Government Circular 193, Department of Agriculture, Forest Service, entitled "Mechanical Properties of Redwood," says: "In bending and compression at right angles to the grain, Redwood is about four-fifths as strong as Douglas Fir, while in shearing strength and compression parallel to the grain for small, clear specimens, the two species are practically equal."



WAX FINISH: In this as in all other finishes, first carefully scrape and sandpaper surface of wood until grain is perfectly smooth. Then apply two coats of any good wax thinned out, 1 pound of wax to 1 gallon of turpentine. Allow 24 hours for drying between coats. When last coat is dry, rub up carefully and thoroughly with a stiff brush and finish with a cloth. Where a uniform color-effect is desired, add to the wax ½ ounce ground burnt sienna and ¼ ounce Van Dyke brown ground in Japan.

JAPANESE BROWN: Burn surface of wood evenly with a painter's lamp until it is all thoroughly charred. Clean off with stiff brush and wash with alcohol. No wax, varnish or shellac should be applied. This also produces a beautiful effect on vertical grain stock.

Different effects can be produced by va
well to experiment on sample pieces

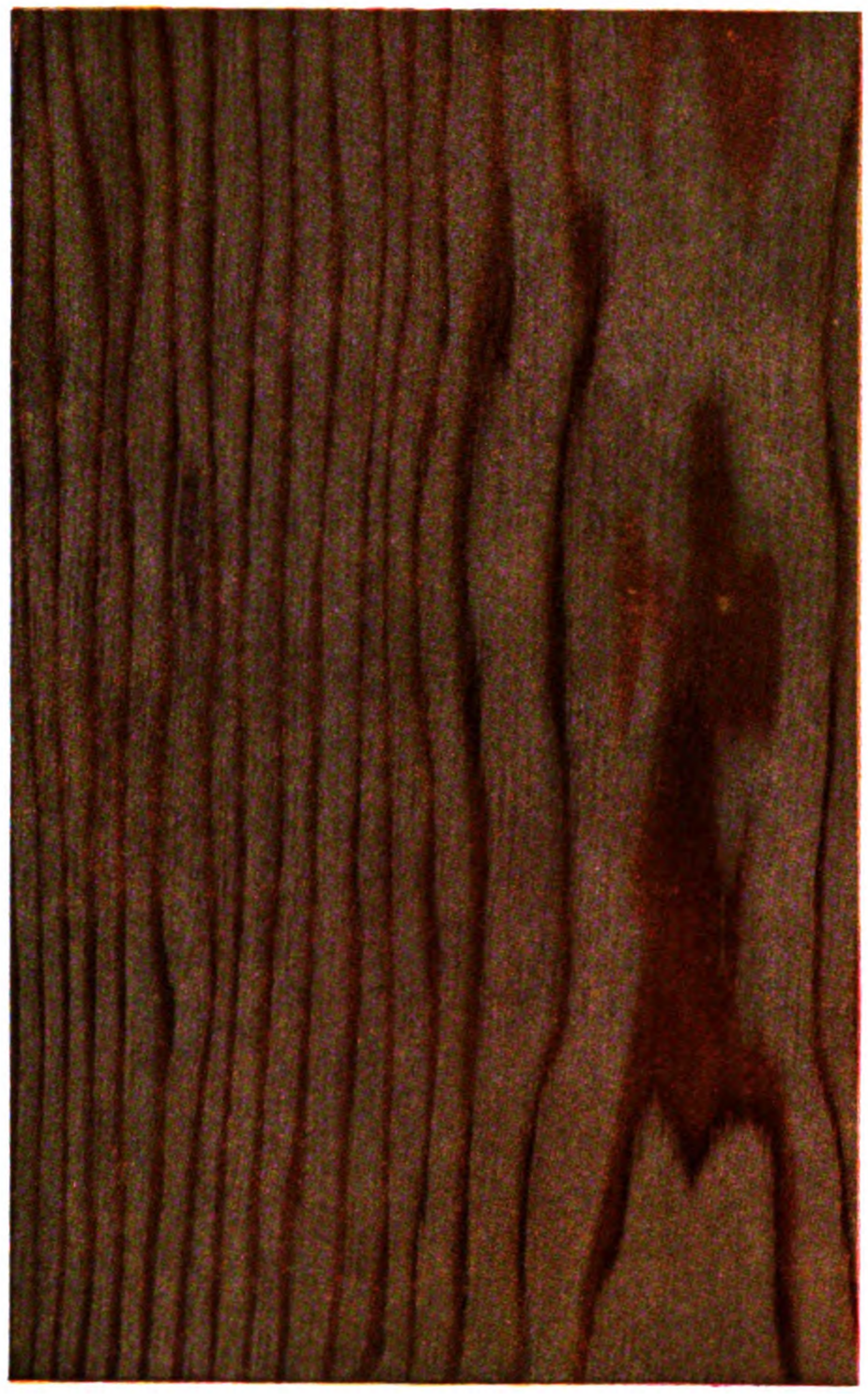
A Wonderful Interior Finish

REDWOOD is particularly adapted for all classes of interior work, from the simplest to the most ornate, from the modest bungalow to the costly mansion. It is exceptionally valuable for paneling and doors, for it does not swell, shrink, warp or crack. Doors made of this lumber are light, strong and practically impervious to changes of climate.

Clear Redwood is remarkable for its even grain and freedom from knots or blemishes, so that it is unnecessary to select special pieces in order to achieve a handsome effect.

COROT BROWN: Gives best results on hard slash grain material. Carefully smooth the surface, then saturate 1 quart 26-degree crude ammonia with 4 ounces tannic acid powder, shaking powder into ammonia until precipitate forms in bottom. Follow one application with a coat of bichromate of potash wash (1 ounce bichromate in 3 pints of water). Wax same as natural finish.

proportions of the mixture and it is
lying these formulas on an entire room.



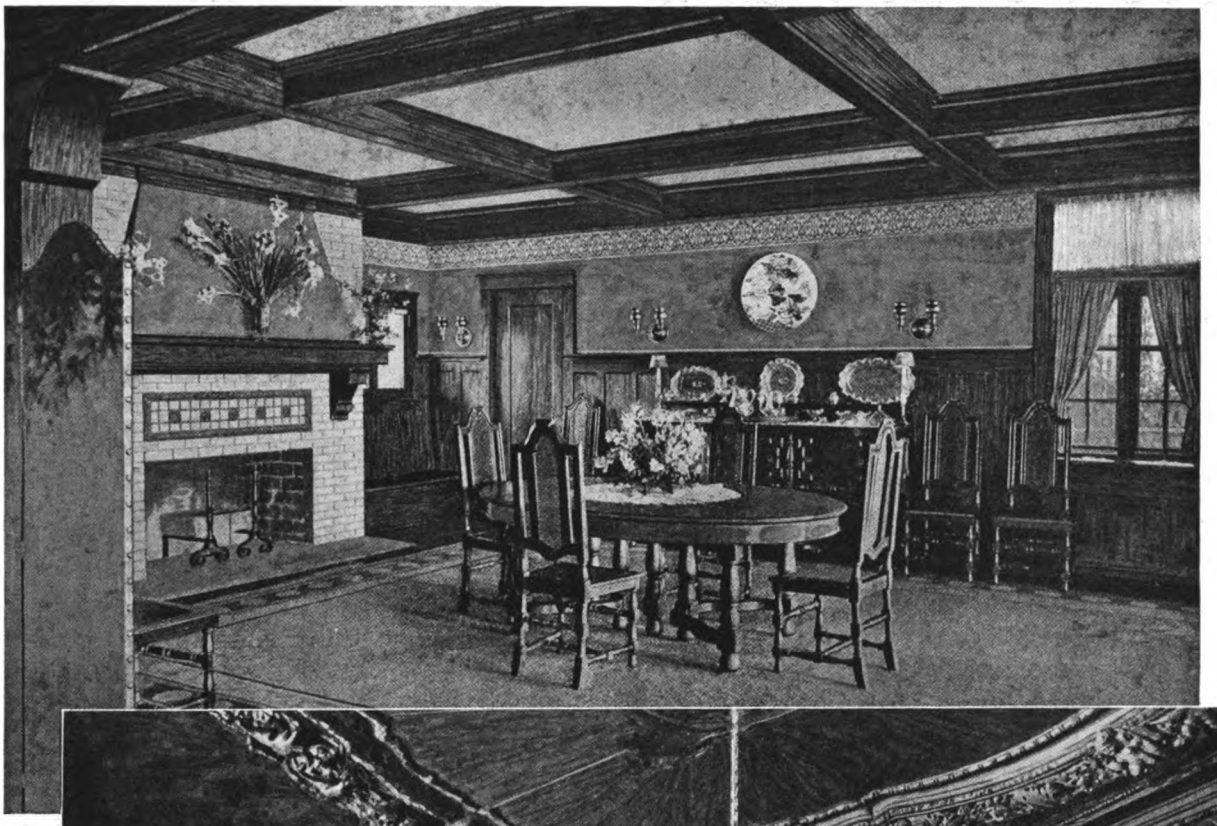
SILVER GRAY: Prepare the surface of the wood carefully. Apply one coat of solution made as follows: Bring to a boil 4 ounces verdigris powder with ½ gallon strong cheap vinegar or dilute acetic acid. Bring to a boil 2 ounces nutgall powder with ½ gallon of water. Mix the two and add 10 ounces soapstone powder. Keep stirred while applying. When dry if effect is not gray enough add another coat. When dry brush off all loose powder and wax as directed for natural finish. Then putty all nail-holes, mixing the putty three shades darker than the wood color. Use plaster of paris to stiffen the putty and let it dry for 24 hours before applying a second coat of the wax.

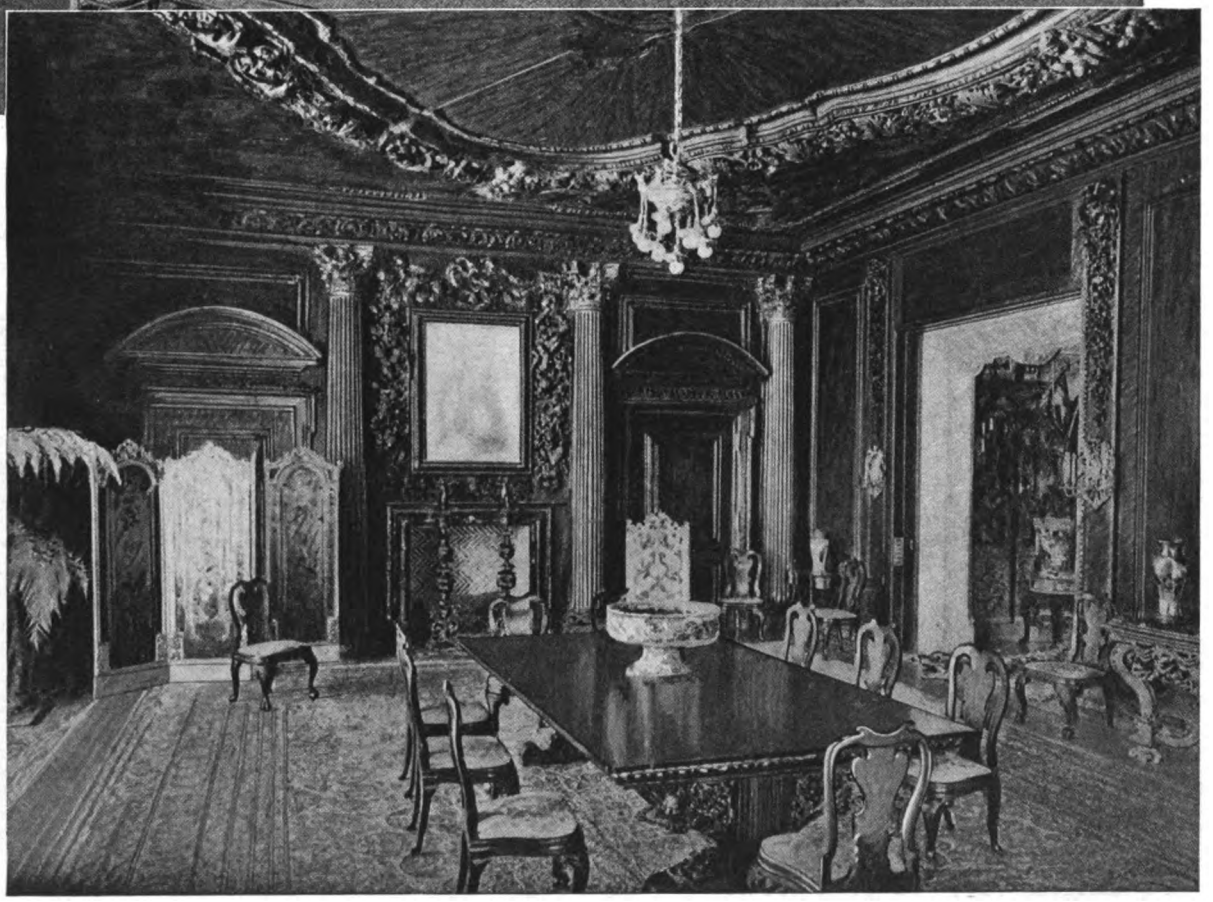
Any Style Finish Obtainable

A great variety of grains are obtainable, ranging all the way from the plain grain of the straight logs to the curly grain of the stump-wood and roots, and the complicated and beautiful burls. These grain effects, taken with the range of color from light cherry to darkest mahogany, provide the builder with an almost infinite number of combinations.

Even in its natural state Redwood makes a beautiful finish, and by waxing, its natural color may be preserved. The fibre of the wood and entire absence of pitch permit it to take and hold the stains and varnishes through which the great variety of finishes may be obtained.

A few of the popular finishes are shown here, but it is





Above—Dining Room Wainscoted and Beamed in Redwood—Residence of Charles Pillsbury, Lake Minnetonka, Minnesota. Edwin H. Hewitt, Architect
Below—Dining Room Finished Entirely in Redwood—"Darlington," Residence of Emerson MacMillan, Ramapo Hills, New Jersey. James Brite, Architect

impossible to reproduce the full values of the finishes themselves. This particular use of Redwood is a subject of such magnitude that it requires treatment in a separate book, which will be sent upon request.

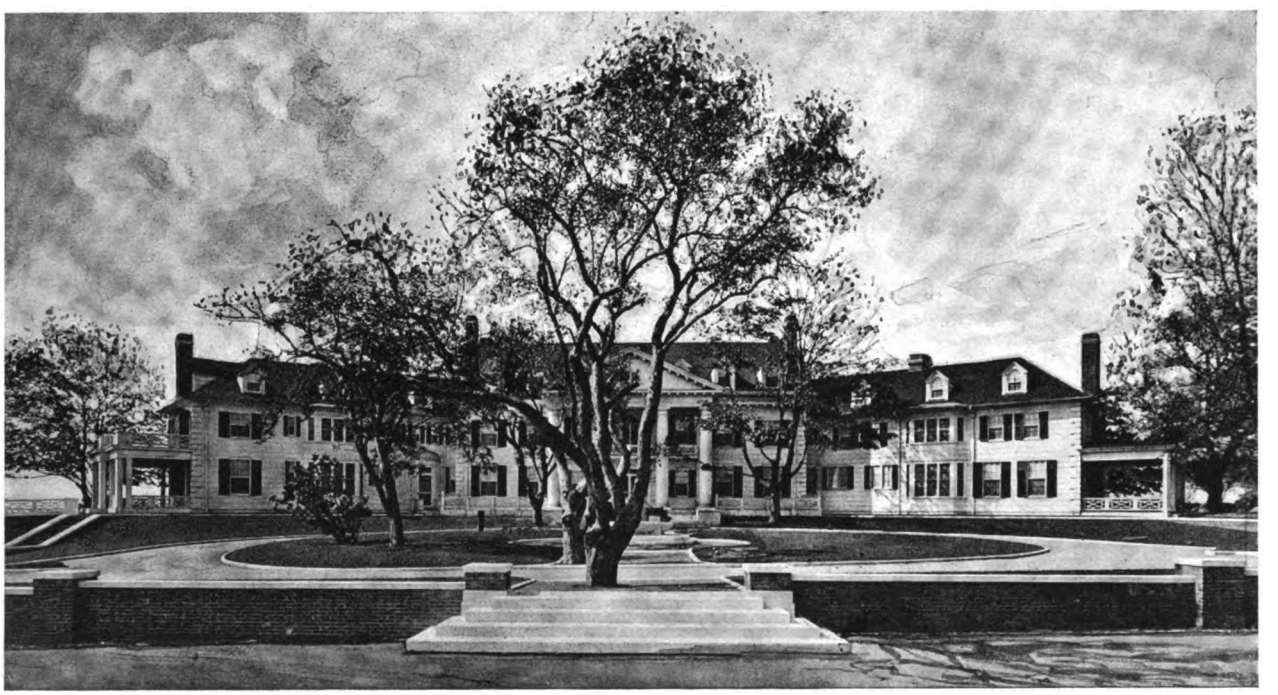
Redwood Finish Book

Illustrations are also given of Redwood interiors. Among the best examples of the great variety of finishes that may be obtained with Redwood are the offices of The Pacific Lumber Company, occupying the seventeenth floor of the Hobart Building, in San Francisco. See pages 31 and 32.

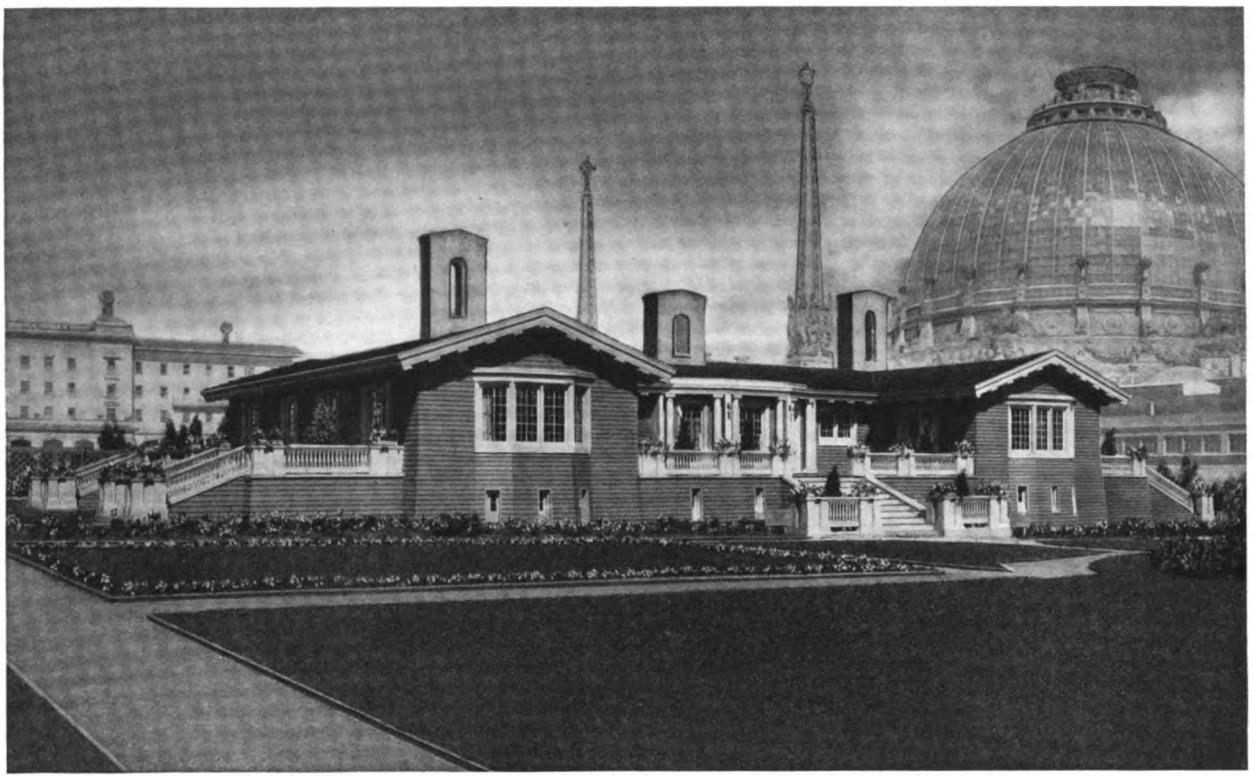
For All Kinds of Exterior Work

So durable is Redwood that shingles and siding made of this wood frequently wear out before they rot. At the World's Fair in Chicago, in 1893, were exhibited shingles from the roof of the old quarters of General Grant at Fort Humboldt, Eureka, California, in 1853. When General Grant was first stationed there the shingles were in service, and 40 years afterwards were still in use—sound, although worn thin by wind-driven sand. The Redwood door and window frames of the old fort building were still well preserved after more than 60 years' exposure.

Redwood Shingles and Finish in Use Sixty Years and Still Sound



A Redwood Exterior—Residence of W. W. Fuller, Briarcliff Manor, New York. Arthur T. Remick, Architect



"The Home of Redwood," at Panama-Pacific International Exposition, San Francisco, 1915. Louis C. Mullgardt, Architect

In First Class Condition After 42 Years' Service

This paragraph, from a letter from A. Cottrell, Eureka, California, gives another interesting instance:

"In the winter of 1870 I shingled my house at Eureka with Redwood shingles. They were not painted at that time. They were first painted about the year 1880, and again about 1895. The shingles were not removed from the roof of the house until September, 1913. They were in service 42 years, and on being taken off the roof were found to be in first class condition. Had they been painted when first laid and kept painted every few years, I believe they would have been good for twice that length of time."

No Lumber Can Fully Take the Place of Redwood

Practically every part of a house can be built of Redwood to advantage, but it is especially desirable for foundations and all exterior work, such as siding, shingles, cornices, gutters, porch floors, columns, etc. Durable, proof against decay, resistant to fire, free from shrinkage and swelling—this wood seems ideal. For those places that are most exposed to rain and weather, such as railings, columns and floors of porches, and for use where there is contact with the ground, such as sills, there is no lumber that can fully take the place of Redwood.

The following extract, from a letter from Whiting Wrecking Co., Los Angeles, refers to a typical case:

Remarkable Lasting Qualities of Redwood for Foundations

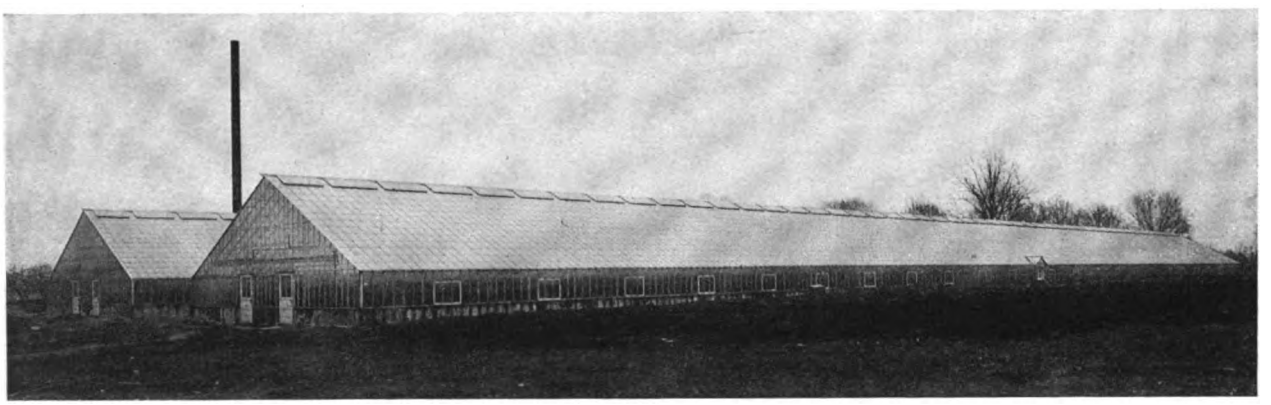
"Regarding the lasting qualities of Redwood, when laid upon the ground for foundation work, or any other place where it is exposed, I believe the same will outlast any other lumber. As an illustration: Last year we wrecked some old buildings where the new annex of the Hotel Alexandria is built. I was informed upon good authority that the buildings had been there for the past thirty-five years. The foundations which these buildings rested upon was 3x12 Redwood plank simply laid on the surface of the ground. There were at least 25% of these planks that were entirely sound. I do not think there were more than three or four planks that were decayed more than 25% of the thickness, notwithstanding that they were exposed to the dry and damp weather for that number of years."

It may be interesting to note, in this connection, that this 3 x 12 plank was afterward ripped into 3 x 4 and cut into short lengths for fence posts, performing the work fully as satisfactorily as new lumber.

Pergolas and Greenhouses

Repairs Are Avoided When Redwood Is Used

Redwood pergolas, summer houses and fences, whether unpainted or painted, will outlast many years those made of other woods not possessing similar qualities. No better lumber exists for use in greenhouse construction. It is not affected by the wet earth in the "benches," or by the difference in temperature between the outside and inside atmosphere at any time of year. Constant repairs due to decay, warping and twisting are avoided when the greenhouse is built entirely of Redwood.



Redwood Greenhouses Erected by King Construction Co., at Newton Falls, Ohio. Each 400 Feet Long by 50 Feet Wide

Redwood on the Farm

The Ideal Material for Silos

In addition to shingles, siding and all 'round use in the construction of farm buildings there are several special farm uses that call unmistakably for Redwood.

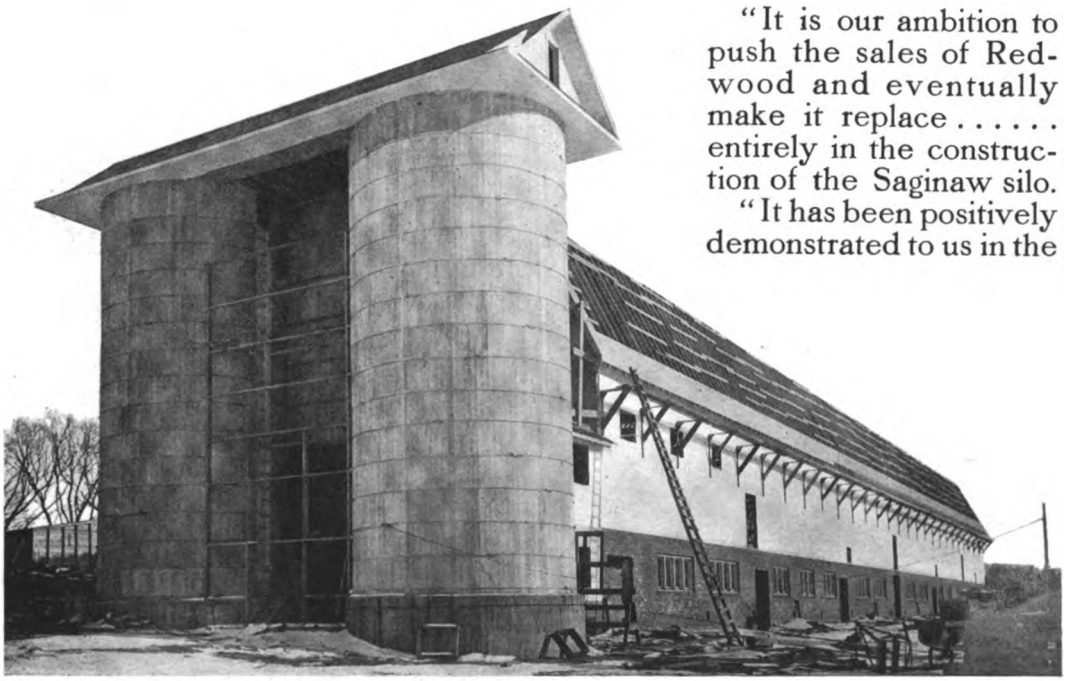
Redwood Lasts Longer —Keeps Silage Better

The most important of these, or the one growing in importance most rapidly, is silo construction. A wooden silo is the most economical, and if made of the right lumber, the best form of construction. The trouble with wood silos has been that they require the most attention when empty in summer time, when they are most liable to be neglected. The hot weather shrinks the staves and the hoops get loose, sometimes causing the silo to "fall to staves." When Redwood is used this trouble is entirely avoided, for this lumber is not affected by any changes or extremes in temperature or moisture. Neither is Redwood affected by the chemical action of the silage, as are other woods and cement.

Following are extracts from a letter from a prominent silo manufacturer, the McClure Company, Saginaw, Mich.:

"It is our ambition to push the sales of Redwood and eventually make it replace . . . . . entirely in the construction of the Saginaw silo.

"It has been positively demonstrated to us in the



Redwood Silos on Farm of Henry Ford

actual use of Redwood silos that Redwood makes the ideal silo material. The fact that Redwood does not shrink or swell, is possibly the greatest advantage in silo construction. Then again, there is the permanency of the structure, due to the rot-resisting quality of the wood.

"We are enthusiastic about Redwood; our salesmen are enthusiastic about it, and they are pioneering in sections of the country that have never heard of Redwood."

Fences, particularly the posts, should be made of Redwood because of its imperviousness to all forms of decay. Hitching posts of Redwood will not be gnawed by horses on account of the acid which the wood contains. This also renders it immune to the attacks of insects.

Among special uses for Redwood on the farm may be mentioned greenhouses, hot bed sash, bee hives, and incubators. For the latter it is now more generally used than any other wood, because the contrast between the heat inside and cold outside does not cause it to shrink, swell or split.

Special Uses on the Farm

For Containers of All Kinds

Being unaffected by exposure to weather and water or contact with the ground, Redwood has proved its worth for wells, tanks, water and feed troughs, flumes, pipes, drains, culverts and cesspools. For instance, bored Redwood logs used as water mains at Fort Bragg, California, are still sound and tight after thirty-five years' service. The Spring Valley Water Co., supplying the city of San Francisco, is still carrying water through flumes built of Redwood, 30, 40 and 50 years ago. One large manufacturer of Redwood stave pipe says

Redwood Water Tank

Redwood Pipe Perfect After 35 to 50 Years of Service

that this form of pipe will last 30 to 40 years. Many railroads, particularly in the West, use Redwood almost entirely for water tanks. In the oil fields it is used for oil storage tanks very successfully.

For Containers of All Kinds—Free from Stain, Taste or Smell

The California Wine Association, as well as the independent wineries, use Redwood tanks exclusively for storing and ageing all their wines. This proves conclusively that there is absolutely no taste, stain or smell to Redwood after it has been seasoned and washed. (All Redwood tanks after erection should be filled with water and allowed to stand for 24 hours, then this water drawn off and refilled for another 24 hours. This will remove any trace of coloring due to the preservative acid found in Redwood alone.)

It is also particularly adapted to water tanks, tanning vats and leaches, brewers' tanks and vats, cyanide plants, acid tanks and dyeing works.

Tanning Vats in Perfect Condition After 55 Years

Redwood plank was used to build tanning vats erected by the Krieg Tanning Company of San Francisco in 1859. Hot water and tannic acid are not conducive to longevity in most woods, but when some of the planks were removed from one of the vats after 55 years of continuous service (above ground, not buried as is often the case), they were found good for many a year more. President McKay of the Krieg Tanning Company writes:

"We found the Redwood of which these vats were constructed to be perfectly sound, and we are, therefore, continuing to use the rest of the vats that were put up at the same time."

Railroad Construction

For any type of construction that is much exposed to the elements, such as bridges, culverts, telephone poles and railroad ties, where water and earth conspire to produce decay, Redwood is the first choice of those who understand its exceptional qualities.

The bridge shown in the photograph on the next page is built entirely of Redwood. It is 640 feet long, 144 feet high, and was constructed in 1906. A former bridge of the

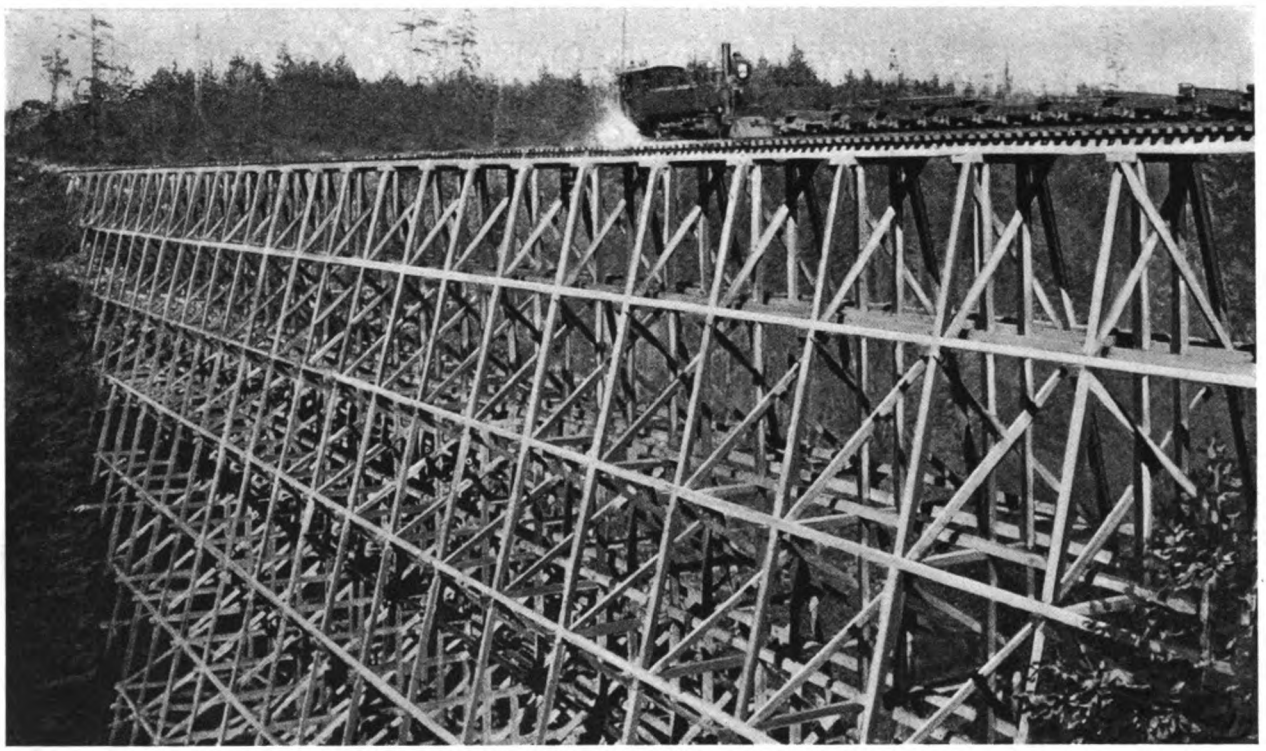
same dimensions, also of Redwood, was built on the same spot in 1884, and was wrecked by earthquake in 1906. At that time after 22 years' service the bridge was in good condition.

Redwood Ties Famous the World Over

The fame of Redwood railroad ties has spread all over the world. They are used in England, on the Continent of Europe, in India, China, the Philippine Islands, in South Africa, in Mexico, and in South America. This may seem strange to the uninformed, and it is due not only to the extraordinary durability of the wood, but to its freedom from attack by destructive insects, such as the white ant.

On this subject the Peruvian Corporation, Ltd., Lima, Peru, says:

"I have the pleasure of informing you that California Redwood sleepers or railroad ties are in general use on the railways of the corporation, and have given distinctly satisfactory results. In so far as the climatic conditions to which the sleepers are subjected are concerned, I would say that these vary very much on the different railways; in some cases the sleepers are subjected to excessive dryness, and in others to perpetual moisture. In some instances these conditions are observable on the same railway, where a portion of the line is situated in a region in which it never rains at all, whereas another portion is almost always snow-covered."



Railroad Bridge, 640 Feet Long, 144 Feet High, Built Entirely of Redwood

From Southern Pacific Railroad of Mexico:

Immune from the Attacks of White Ant

"The white ant is found on that part of the Southern Pacific Railroad of Mexico traversing the State of Sinaloa and the Territory of Tepic. Through this State and Territory we have used the Redwood ties in considerable quantities, but so far we have observed no destruction by the white ant. In fact, we believe that the Redwood tie is immune from the workings of this insect.

"As to the non-inflammability of Redwood, it is a well-known fact that it will char under intense heat, but that it does not burn readily."

After experimenting with all kinds of woods, some of them even imported, two great transcontinental systems, the Southern Pacific and the Santa Fe, have selected Redwood in preference to all other woods, where freight is not prohibitive. Read this letter from the Southern Pacific Company:

Ties Laid 25 Years Ago Still in Service

"As indicating the great life of this timber against ordinary decay, I have pleasure in informing you that we have today left in side tracks, not very much used, some Redwood ties which were put into service in 1855. On other parts of the line we have in service many ties that were laid from 20 to 25 years ago.

"For the siding and roofing of cars, for the foundations, siding and roofing of buildings, and for water tanks, this timber is the most durable of any that I know of, and when used for building purposes it has the very valuable quality of not being easily set on fire, and when set on fire it burns very slowly."

The following from E. O. Faulkner, Manager of the Tie and Timber Department of The Atchison, Topeka and Santa Fe Railway System, is of special interest:

"Until the last year or two our use of Redwood for ties has been confined to the Valley and Los Angeles Divisions, our experience on the latter, as you know going back to the construction of the road over 26 years ago. On the Visalia branch there are thousands that have been in 16 or 17 years, and the last time I saw them they were still in good shape.

Worn Ties Serviceable for Fence Posts

"Of our Redwood ties taken out after long service, fully 80 per cent are for mechanical wear, and of these not less than, say, 40 per cent are still of service for fence posts, and when we do not need them for this purpose, there is a good market outside for them at from 10 to 12 cents each, which, of course, reduces the cost per tie-year to that extent; .... The Redwood tie does not need treating, and it generally lasts its mechanical life without this, which is again a saving.

"We have had a lot of Redwood ties in service on our main line Mountain Divisions, with big tie plates of course, and I expect shortly to advise their more general use on the main line, with tie rods, on curves, and thus cut out our expensive hard woods. ..... after using other switch ties at a very much higher value, and to less profit, we are now coming back to the Redwoods, and our old section foremen are much pleased with the change."

Commenting on this letter, Mr. A. G. Wells, General Manager of the Santa Fe Railway, says that it

"so fully covers the ground as to leave me nothing to say, further than that I endorse his statements, and besides being able to produce ties which have been in the track twenty years, I could find some on our Fallbrook Branch which have been in track twenty-five years and are still good."

Miscellaneous Uses—Patterns, Musical Instruments

Pattern makers like Redwood because it is possible to get wide, clear pieces free of defects, and use it because it is easy to work and does not warp, shrink or swell. Likewise on these accounts and because of its tonal qualities, this lumber is used in musical instruments—for veneer cores, piano cases, the wind chests and pipes of organs, for violins and harps.

Casket Shells and Boxes

Californians have realized for years that Redwood was the most satisfactory wood for casket work. It is light, dry, free from odor or stain of any kind, does not shrink or swell, is easily worked to any pattern, lasts indefinitely in the ground, and a good quality is obtainable at a reasonable price. Eastern manufacturers are beginning to use it now and appreciate that they can buy it cut to exact size, in stock widths or put together on the Linderman machine, avoiding all waste.

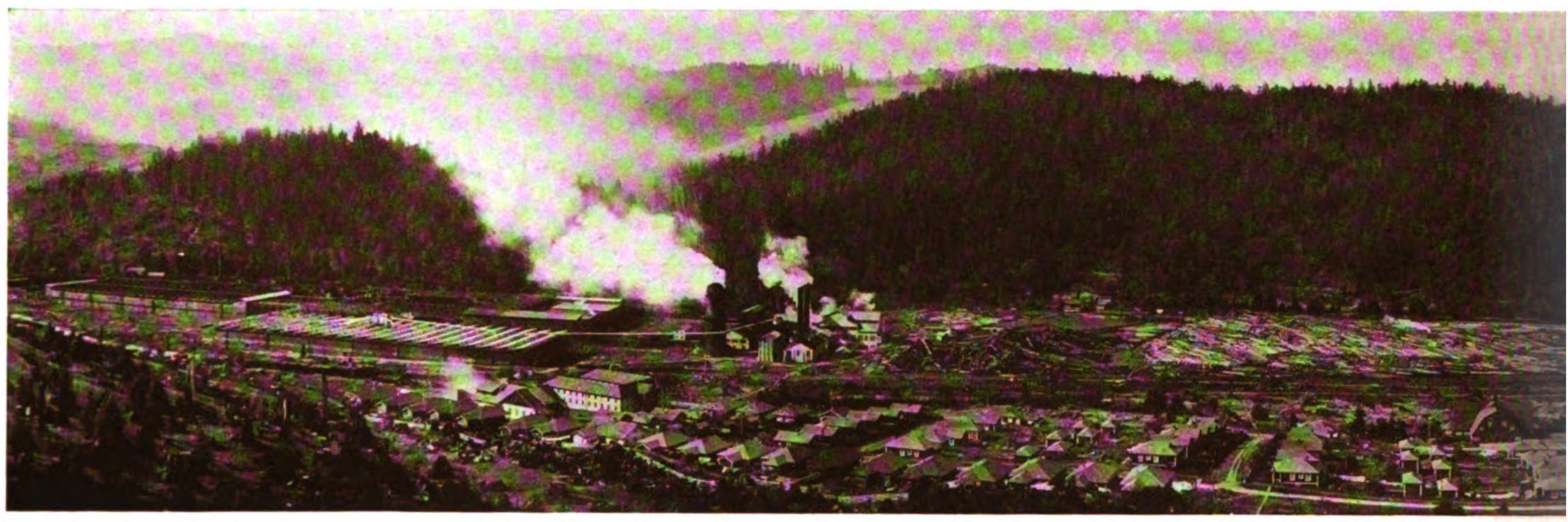
Veneer Cores

Manufacturers of doors, furniture, and other veneered work, and pianos use Redwood shorts for cores, on which to apply veneers. Its freedom from warping and shrinking, the fact that the grain will not raise, and its relatively low price compared with other less desirable woods are the reasons. These cores can also be had worked on the Linderman machine.

Cigar Boxes and Pencil Stock

Redwood is rapidly coming into favor for cigar boxes. The color of the wood closely approaches that of Spanish Cedar, and where vertical grain stock is used the resemblance is remarkable. Redwood is free from taste or smell, and thus makes an ideal container for cigars.

In many ways Redwood is similar to Red Cedar, and among other uses to which it has been put, both here and abroad, is pencil stock. It is furnished in slats of the standard sizes, largely vertical grain, and, except for the cedar smell, it is difficult to tell the woods apart.



Plant of The Pacific Lumber Company at Scotia,

THE PACIFIC LU

AT SCOTIA, up in Humboldt County, California—30 miles south of Eureka and 265 miles north of San Francisco—is located the largest Redwood plant, the mills of The Pacific Lumber Company. In these mills the Company produces some 125 million feet a year, or over 20 per cent of the total annual Redwood cut.

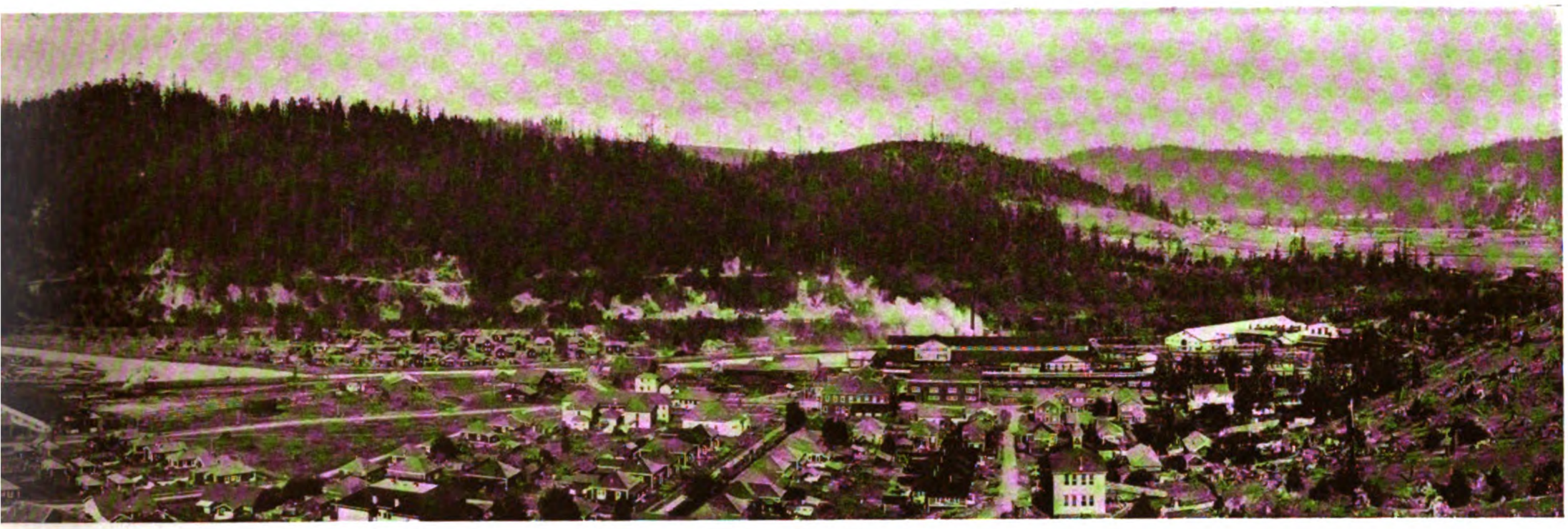
Organized in 1869— Paid Capital $9,133,000

The Pacific Lumber Company is one of the oldest concerns in the Redwood business, having been originally organized in February, 1869. It has today a paid capital of $9,133,000, owns thousands of acres of Redwood timber, and the entire city of Scotia, which through the Company's operations has come to be known as the "Home of Redwood."

Planing Mill Covers 3½ Acres

The two great 3-band saw mills at Scotia and the mammoth planing mill, covering 3½ acres, are equipped throughout with the most modern machinery and appliances. The Redwood is handled entirely by an electrical monorail and crane system which reaches every section of the great air-drying yards, the Leaver Dry-Curing Kilns and the big storage and shipping shed where 12½ million feet of lumber may be stored at one time.

Railroad Roundhouse and Oil Supply Tanks | General Office Building | Lodging House, Cook House and Cottages for Mill "A" | Stores and Warehouses | Sawmill "A", output 250 M ft. per day of 10 hours | Dry Lumber Storage Shed, 2,000 M ft. capacity | 8 Leaver Patent Lumber Dryers, capacity 600 M ft. weekly



County, California, in the Heart of the Redwoods

MBER COMPANY

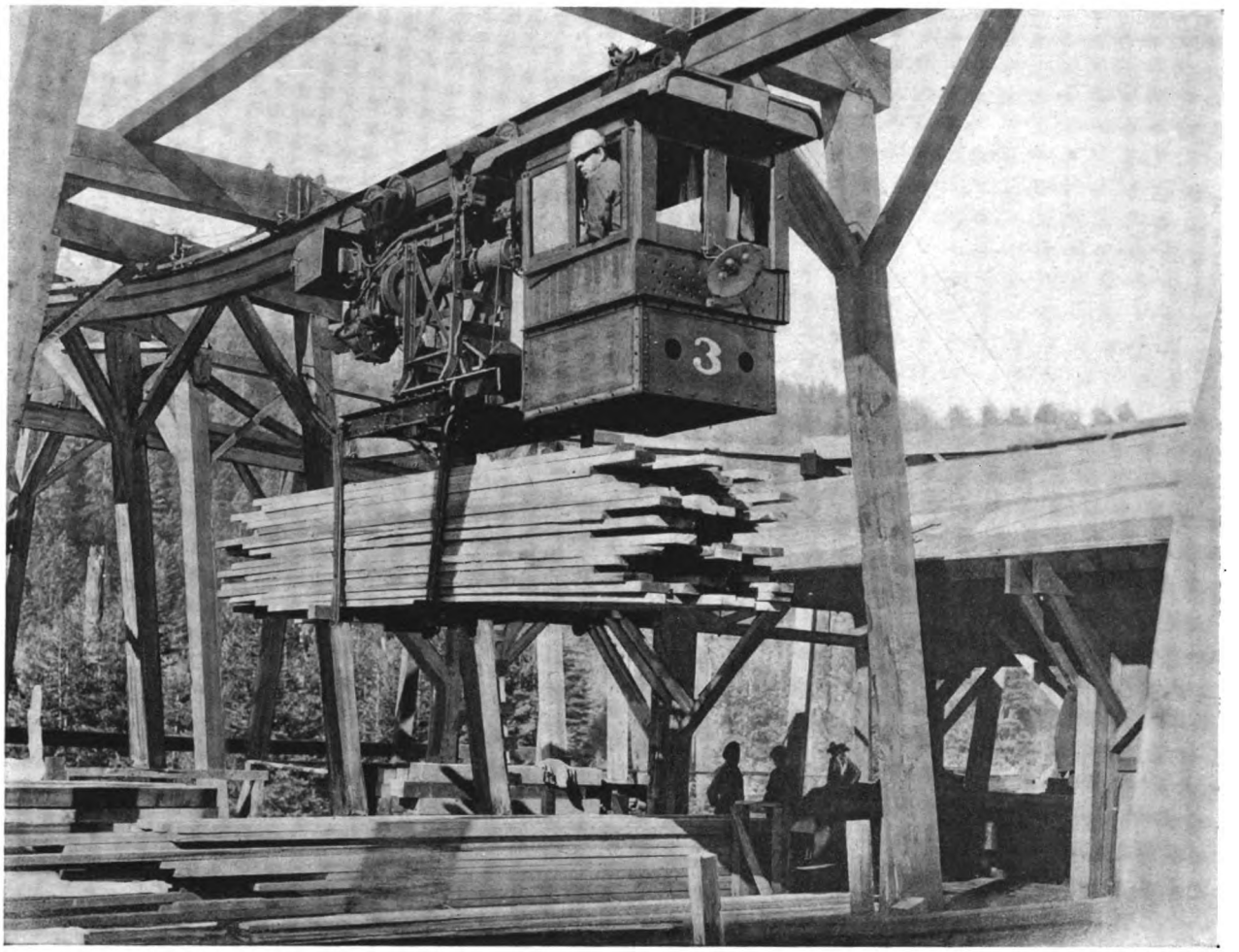
Electric Monorail and Crane System

The electrical monorail and crane system of lumber handling has been adopted more completely by The Pacific Lumber Company than by any other lumber manufacturer on the Pacific Coast. Everything is done mechanically, and it is the perfection of this method which, among other things, has brought about such enormous economies in the Company's production.

Lumber Handled by the Unit

The lumber comes out of the mill on endless carriers and passes to the traveling sorting table. Here it is graded and chalk-marked, and traveling further along is thrown off in a pile with lumber of the same grade and size. The completed pile, now known as a "unit," is picked up by the traveling crane and carried to a flat car for shipment, or to the monorail yard, whence it can be moved to any part of the mills by one of the several electric monorails.

Wharves and Storage Yard at Field's Landing, on Humboldt Bay, Showing Foreign Steamers Loading



Electric Monorail Carrying a Unit of Redwood Lumber

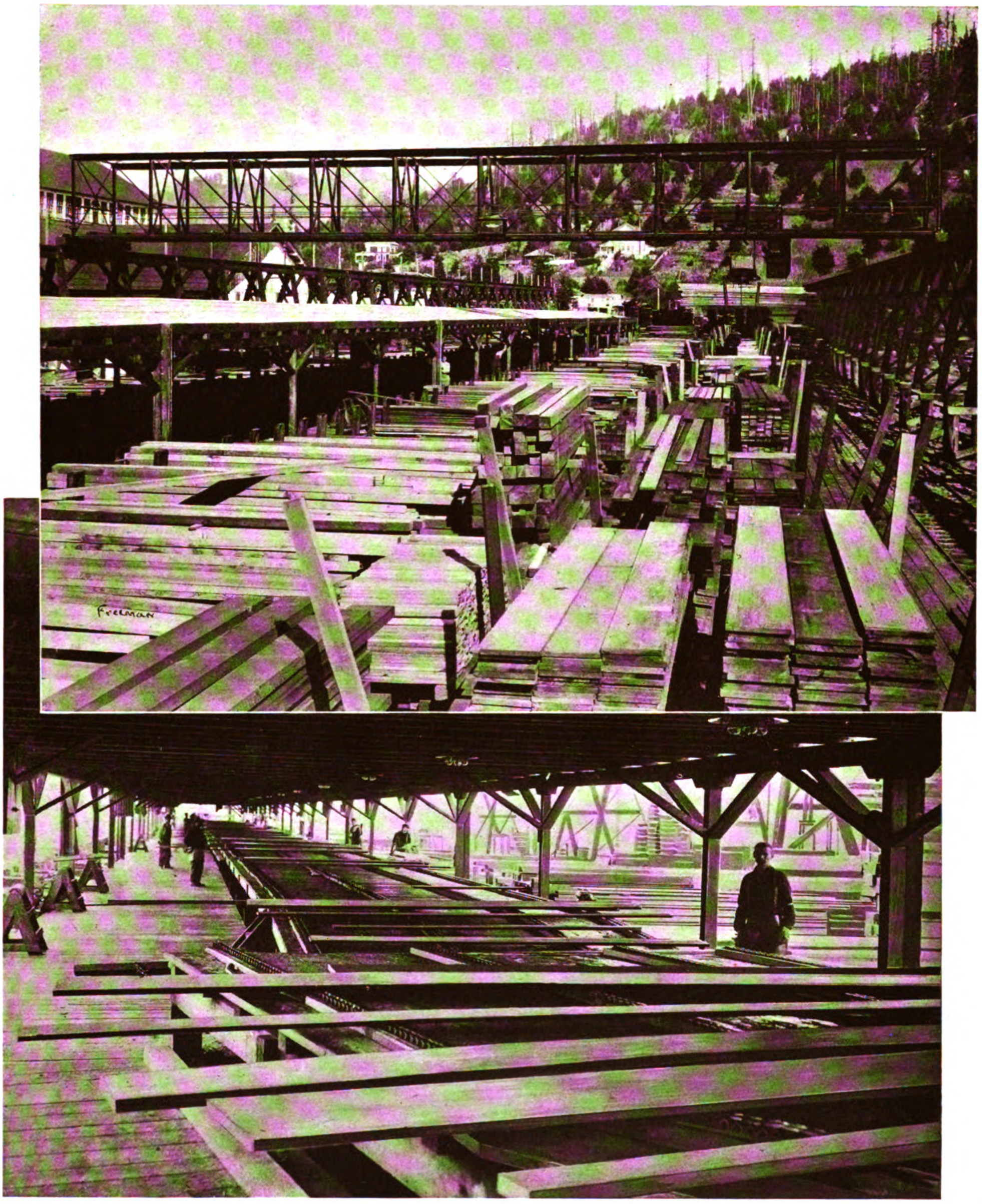
Leaver Curing Process

THE PACIFIC LUMBER COMPANY believes that its responsibility as a Redwood Manufacturer does not cease with the sawing of logs into boards.

It believes that a manufacturer should thoroughly season and dry his lumber before putting it on the market.

Thorough Seasoning and Drying Essential

This belief has become a creed with the Company, and it is for this reason it has worked out with such infinite care the special LEAVER Kiln-Curing Process with which every piece of T P L G Redwood is treated.



Above—Electric Crane

Below—The Sorting Table

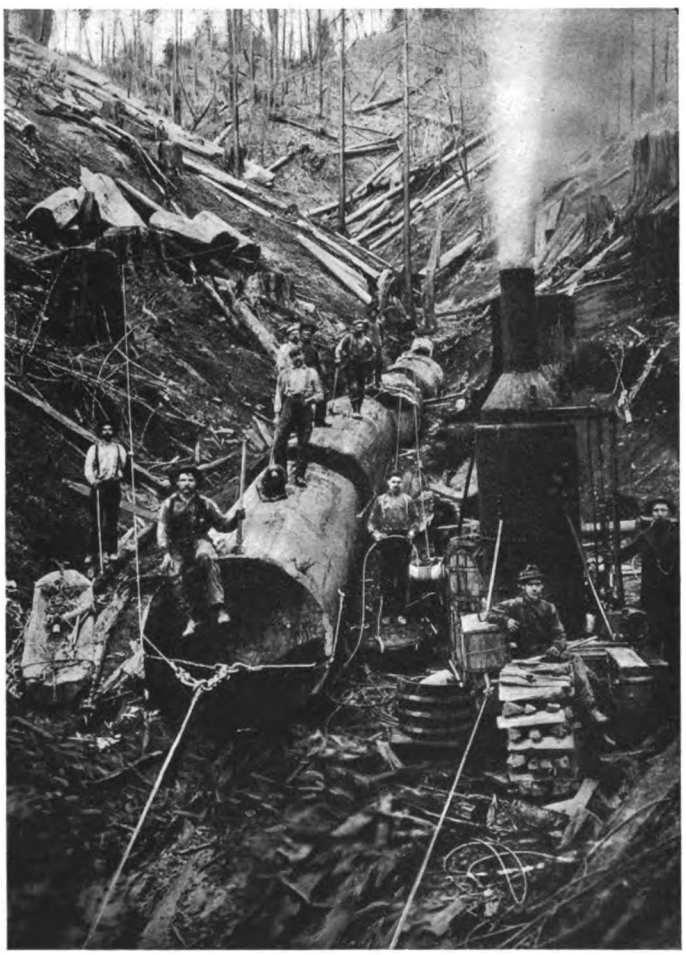
The Company has absolute faith in this process. It guarantees its Leaver cured product in every particular, for it knows that the finished wood can not be damaged by the change which occurs in Redwood during the passage from the green to seasoned, and the seasoned to dry state.

Exclusive with The Pacific Lumber Company

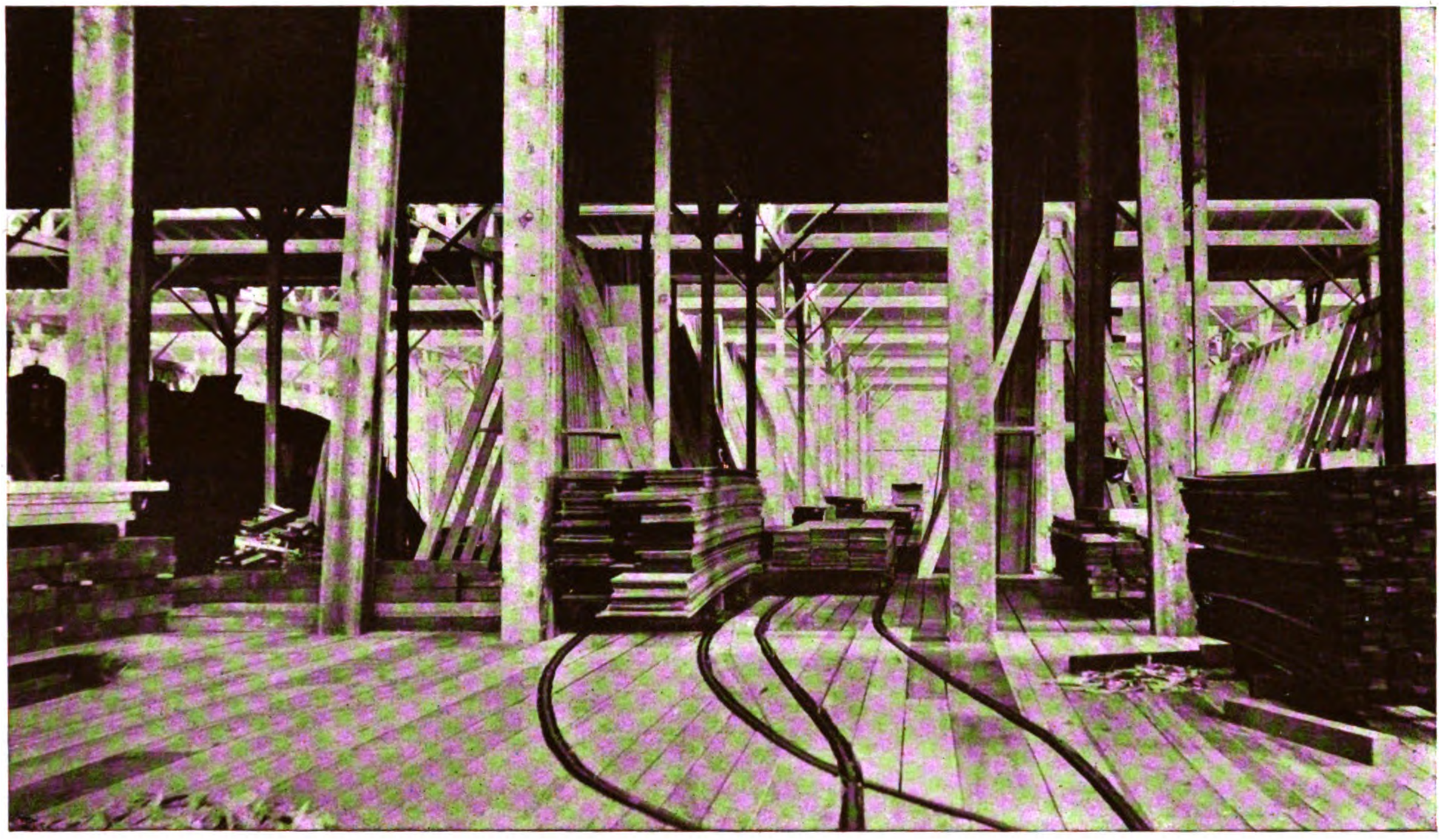
The Leaver Kiln Curing Process is used exclusively by The Pacific Lumber Company. It was conceived and invented by the man whose name it bears—an officer of the Company—and it is in the Company's own mills, at Scotia, that the process has been developed and perfected.

In this process the Company is carrying out an ideal for which it has so long contended—that Redwood can only be perfectly cured in the temperature and under the conditions of its native air. By the Leaver system the lumber is seasoned or dried in the natural out of door air from 60 to 90 days. Careful tests show that during this time 75% or 80% of the moisture is dried out of the lumber, and the drying process is so gradual that the wood is allowed to adapt itself naturally to the change without any warping or disrupting of the fibre, such as takes place when green lumber is dried out by the ordinary kiln-drying methods. After the wood fibre has been "set" in this

No Warping or Disrupting of the Fibre



Hauling Out the Logs



Alleys in Broken-Unit Shed, for Mixed Carload Orders. 80M Square Feet in Size, with 1800 Compartments for Separate Storage of Lengths, Widths, and Grades. Adjoining Is the Main Dry Shed, 110M Square Feet in Size, Capacity 12,500M Feet, where Full Monorail Units Are Handled

way, the curing process is completed in the Leaver Kilns where the chief disadvantage of out-door drying—extreme moisture from fog and rain—is eliminated and the precise conditions of temperature, moisture and circulation are carefully preserved.

A Distinct Improvement on Nature

In brief, the Leaver process is an exact imitation of nature in those respects in which nature facilitates good lumber drying, and a distinct improvement on nature in those respects where she is harmful.

At no time during the process of curing is the lumber subjected to a temperature greater than the heat of the sun's rays in the State of California—the Home of Redwood. The natural temperature at Scotia, in the direct rays of the sun during the best drying weather, does not exceed 140 degrees, and the heat in the Leaver process is never allowed to go above that point.

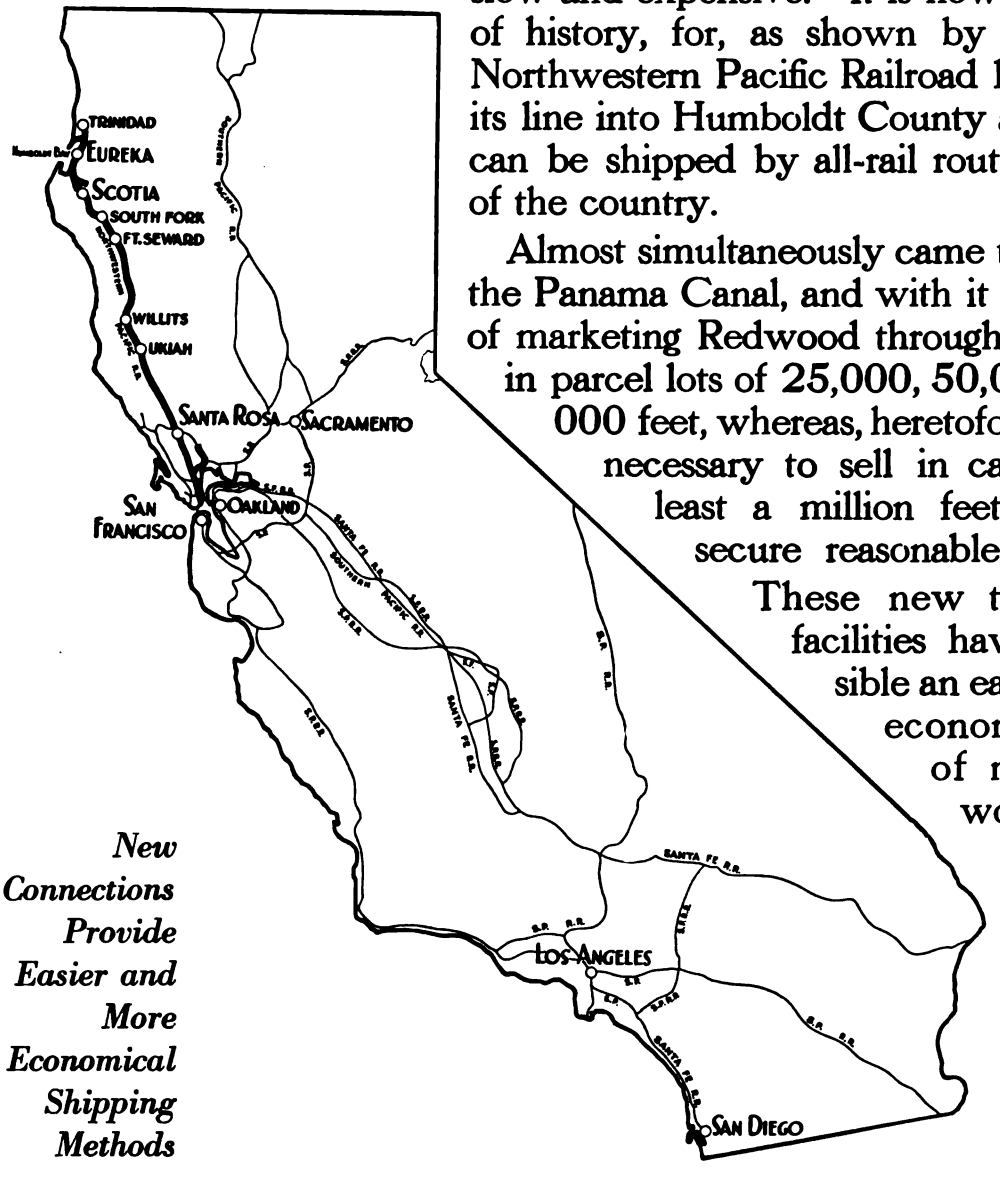
New Transportation Facilities

Make Redwood Inexpensive and Easily Available

Direct All-rail Routes

Up to 1915 there had been no direct rail connection with the Redwood region. The lumber could be placed on the eastern market only by water shipment to San Francisco and Los Angeles Harbor where it was rehandled and reloaded for rail transportation to eastern points. This method was slow and expensive. It is now only a matter of history, for, as shown by the map, the Northwestern Pacific Railroad has completed its line into Humboldt County and Redwood can be shipped by all-rail routes to any part of the country.

Almost simultaneously came the opening of the Panama Canal, and with it the possibility of marketing Redwood throughout the world in parcel lots of 25,000, 50,000 and 100,000 feet, whereas, heretofore, it has been necessary to sell in cargo lots of at least a million feet in order to secure reasonable freight rates. These new transportation facilities have made possible an easier and more economical method of making Redwood shipments to the East, as well as to foreign countries. They have brought Redwood into the



New Connections Provide Easier and More Economical Shipping Methods

world market and put it in the class of inexpensive lumbers. Placed thus within the reach of all, the natural and distinctive advantages of Redwood are certain to become better known, and, as it is more fully appreciated, Redwood will be used in ever increasing quantities for the many purposes for which it is so distinctly fitted.

Redwood Now Within Reach of All

Sales and Distribution

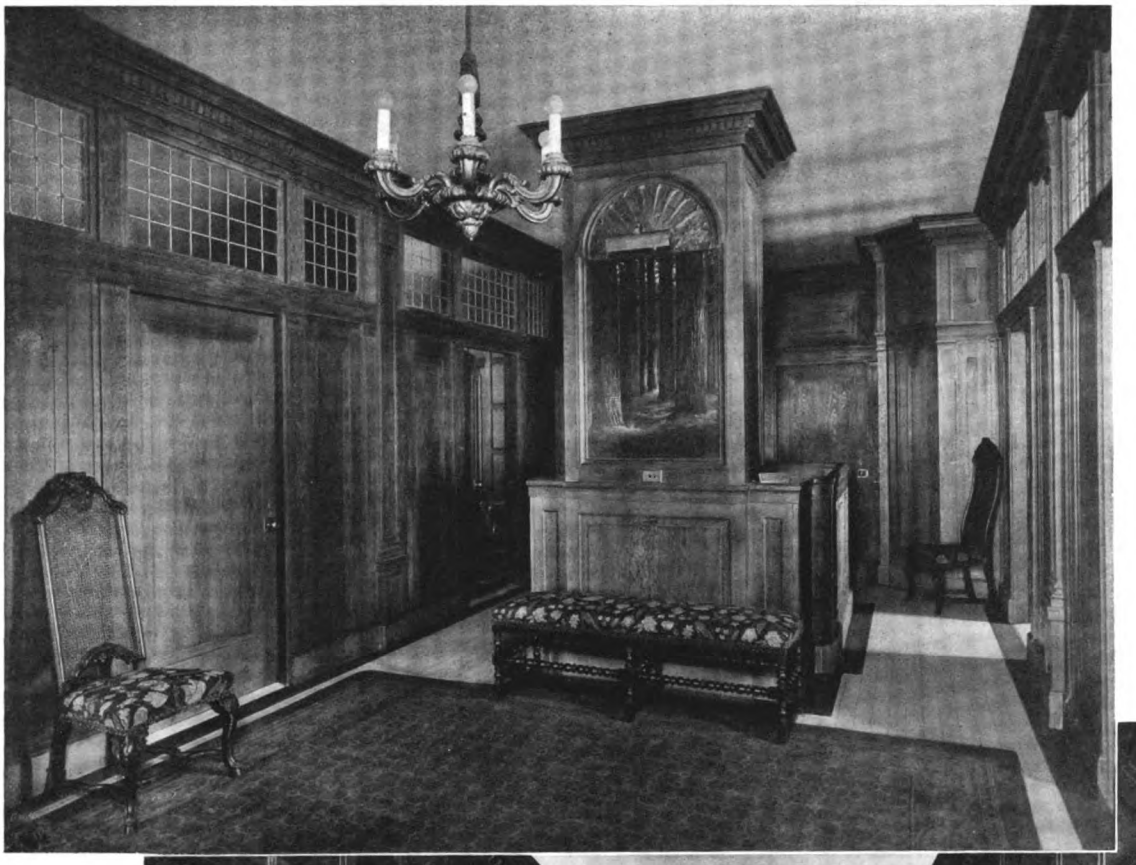
The General Sales Offices of The Pacific Lumber Company occupy the entire 17th floor of the Hobart Building, 582 Market Street, San Francisco. From here the general sales and distribution throughout the world are directed.

General Sales Offices

The Eastern Sales Office, conducted under the name of The Pacific Lumber Company of Illinois, is located in Chicago at 3612 South Morgan Street. The personnel of the Eastern Sales organization is the same as composed the John D. Mershon Lumber Company, until recently our exclusive Eastern Sales Representatives. There also is the Quick-Shipment Depot where all grades of Redwood are carried in stock and from which shipments in less than carload lots can be made on short notice.

Eastern Sales Office and Quick-Shipment Depot

Office of General Sales Manager, The Pacific Lumber Company



Above—Reception Hall, The Pacific Lumber Company

Below—Office of the President

Dealers are particularly invited to make use of the facilities of this Quick-Shipment Depot whenever they can not wait for a shipment to come through from the Coast, or when they wish to purchase small lots only. The establishment of this depot was due to the need of a place where small lots of Redwood could be obtained promptly, thus, to a certain degree, bringing the Redwood timber right to the doors of the eastern dealer.

Ready to Co-operate With Dealers

For the same purpose the Company has established branch Sales Offices in the following cities:

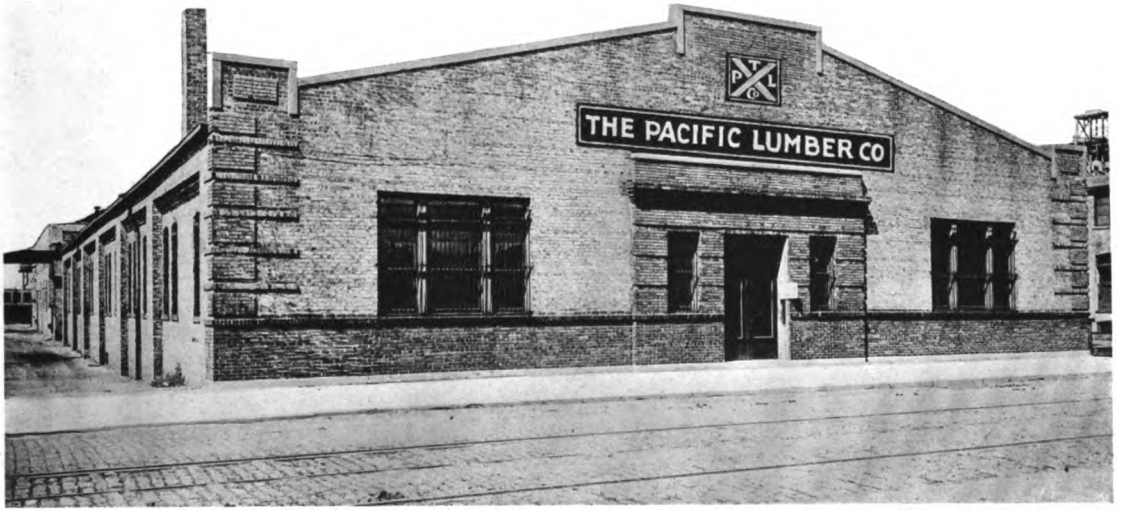
Branch Sales Offices

New York, Metropolitan Bldg. Kansas City, Mo., Reliance Bldg.
Saginaw, Mich., Bearinger Bldg. Worcester, Mass., 5 Lowell St.
Milwaukee, Wis., 767 Marshall St.

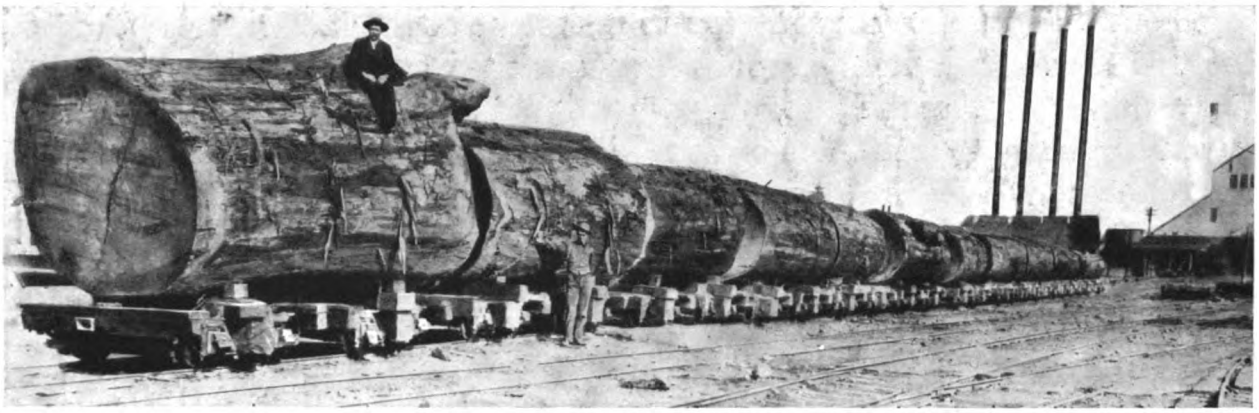
All stocks will be invoiced from the Chicago office, however, and all eastern accounts will be handled there. Correspondence should be addressed to the Chicago office or the nearest branch office.

The export sales of The Pacific Lumber Company are handled through the affiliated corporation of A. F. Thane & Co., with offices in the Hobart Building, 582 Market Street, San Francisco, California. A. F. Thane & Co. also maintain European offices at 607 Tower Buildings, Liverpool, England, and at 91 Bishopsgate, London, E. C. They are represented in Australasia by J. I. Falk & Co., Sydney, and have agencies at the principal ports in China, South Africa and South America.

Export Sales Offices



Eastern Sales Office and Quick-Shipment Depot, Chicago



A Train Load Cut from a Single Redwood

The T. P. L. Co. Trade-mark

For the Protection of Customers

The Pacific Lumber Company believes that a manufacturer should have confidence enough in his product to individualize it by the use of a trade-mark wherever that is practicable. Private brands are used in other lines of trade to distinguish the "better kind" from the "common variety," and to prevent customers being imposed upon through agents claiming to sell what they do not in reality handle.

Stands for High Grade Lumber, Honestly Sold

The copyrighted brand T P L G of The Pacific Lumber Company is used not only on all letter-heads, invoices, price-lists, etc., but on every bunch of shingles, every bundle of bevel siding, every moulding tag, every package of turned balusters, etc., and its use will be extended as rapidly as possible to include other products.

As the trade generally become more familiar with T P L G Redwood, they will understand that this mark means good stock, well manufactured, properly dried and honestly sold.

Trade-mark Reg. U. S. Pat. Off.