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DEPARTMENT OF COMMERCE AND LABOR
BUREAU OF CORPORATIONS

LUTHER CONANT, Jr., Commissioner

THE
LUMBER INDUSTRY

PART I
STANDING TIMBER

JANUARY 20, 1913



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LETTERS OF TRANSMITTAL.

DEPARTMENT OF COMMERCE AND LABOR,
OFFICE OF THE SECRETARY,
Washington, January 20, 1913.

SIR: I have the honor to transmit herewith Part I of the Report of the Commissioner of Corporations on the Lumber Industry. This part deals with the quantity of merchantable standing timber in the United States, the concentration in the ownership of such timber, and some of the causes which have been chiefly responsible for such concentration of ownership.

Very respectfully,

CHARLES NAGEL,
Secretary.

The PRESIDENT.

DEPARTMENT OF COMMERCE AND LABOR,
BUREAU OF CORPORATIONS,
Washington, January 20, 1913.

SIR: I have the honor to transmit herewith the full text of Part I of a Report on the Lumber Industry, made to the President under your direction, and in accordance with the law creating the Bureau of Corporations. This part deals with the quantity of merchantable standing timber in the country, the concentration in the ownership of this timber, and some of the causes which have led to such concentration of ownership.

I desire to mention as especially contributing to the preparation of this part of the report Messrs. Wm. Boyd Hunter, Charles E. Edger-ton, and Walter Y. Durand, of this Bureau.

Very respectfully,

LUTHER CONANT, JR.,
Commissioner.

To HON. CHARLES NAGEL,
Secretary of Commerce and Labor.

LETTER OF SUBMITTAL FOR FULL REPORT.

DEPARTMENT OF COMMERCE AND LABOR,
BUREAU OF CORPORATIONS,
Washington, January 20, 1913.

SIR: I have the honor to submit herewith the full text of Part I of the Report of the Bureau of Corporations on the Lumber Industry.

The essential facts contained in this report were set forth in a letter of submittal and summary by the former Commissioner, Hon. Herbert Knox Smith, on February 13, 1911. The report shows a marked degree of concentration in the ownership of standing timber in the United States. The area covered by the Bureau's investigation contains about 80 per cent of the privately owned timber of the country. In this area 3 holders have 14 per cent of the privately owned timber, 90 have two-fifths, and 195 have nearly half. Marked concentration in the area outside the Bureau's detailed investigation also is indicated. Since the amount of standing timber is steadily diminishing and its value rapidly increasing, this concentration involves problems of far-reaching public importance.

In view of the facts already published, no extended comment appears necessary at this time. It seems proper, however, to emphasize that the present conditions of timber ownership are largely due, as clearly set forth in this report, to the land policy of the Federal Government, especially the great Federal land grants to railroads and the faulty operation of some of the general land laws. Instead of securing a wide distribution of the public domain in the hands of a vast number of independent owners, as apparently contemplated, the practical result of this legislation, at least so far as timberlands are concerned, has been a high degree of concentration of ownership. The report shows that the great land grants have directly resulted in enormous single holdings, while other great tracts of standing timber, transferred from the public domain in small parcels to private interests, and usually with no important return to the public treasury, have been gathered into large holdings by timber speculators. Concentration in the ownership of this timber, moreover, tends constantly to increase.

The national-forest policy inaugurated in the nineties, and now in successful operation, marked a fundamental change in the ideas which had formerly prevailed as to the handling of public timberlands. The basic principle of this policy is the retention of the fee title to the land and the sale from time to time of the timber only, with a view to the wisest use of the supply and to its proper conservation. By this policy the Government is able to secure for the public the full market value of this timber at the time of cutting, and at the same time to retain the land itself for reforestation or for such other use or disposition as may later seem advisable.

Attempts, however, are still made to secure the transfer of public timberlands to private owners under the same pleas of settlement which in the past often proved wholly specious and insincere. Much of the timberland still remaining in public ownership is adapted only for timber purposes. All that could be properly asked by a bona fide settler is the surface of arable land after the timber has been removed, but too frequently back of the argument made in the name of the "settler" is the desire to acquire the timber or other natural resources rather than the soil itself. It seems desirable, therefore, to direct public attention to the fundamental difference between disposing of agricultural lands to actual settlers whose industry contributes directly to the material and social upbuilding of the community, and the alienation of virgin timberlands, which do not require, and indeed hardly permit of, improvement by private owners, and the value of which is rapidly rising because of reduction in the supply and the increase in population. The public service involved in the mere speculative holding of this timber for an advance in price, under present conditions of settlement of the country, is practically negligible. When, moreover, such lands become concentrated in a comparatively few hands, there is, instead of a public service, a serious public danger.

Without entering into a discussion of possible solutions of certain grave problems involved in the present concentration of timber ownership, it may be pointed out that the Government to-day still owns, exclusive of the forests of Alaska, about one-fifth of the country's total supply of merchantable standing timber. It is the agency best adapted to practicing reforestation on a large scale. Recently, important suits for forfeiture of extensive timberlands have been brought by the Government on the ground of nonfulfillment of conditions imposed in the grants by which these lands were alienated from the public domain. For these reasons, it would appear, therefore, that the Government may later be able to materially strengthen its relative position as a timber owner.

The facts set forth in this report clearly point to the desirability of maintaining the integrity of the national forests and of extending

to other publicly owned timber, including forests in Alaska and timberlands that may be recovered in forfeiture suits now pending or subsequently instituted by the Government, the cardinal principle of the national-forest policy, namely, the retention of the fee to such lands at least until the timber is removed. Decision will then have to be made between retaining such lands for reforestation and disposing of the surface for agricultural purposes. It seems clear, moreover, that the fundamental principle to be followed in the sale of the timber itself is that the terms of sale should be such as to insure to the public treasury substantially the full stumpage value at the time that such timber shall be actually cut.

Very respectfully,

LUTHER CONANT, Jr.,
Commissioner of Corporations.

The PRESIDENT.

LETTER OF SUBMITTAL OF FEBRUARY 13, 1911.

DEPARTMENT OF COMMERCE AND LABOR,
BUREAU OF CORPORATIONS,
Washington, February 13, 1911.

SIR: I have the honor to submit herewith Part I of a Report on the Lumber Industry of the United States. This Part deals with the amount and ownership of standing timber. It does not treat of combinations in the manufacture or sale of lumber (as distinguished from ownership of standing timber), a discussion which is reserved for a further part.

The foremost facts shown are:

(1) The concentration of a dominating control of our standing timber in a comparatively few enormous holdings, steadily tending toward a central control of the lumber industry.

(2) Vast speculative purchase and holding of timberland far in advance of any use thereof.

(3) An enormous increase in the value of this diminishing natural resource, with great profits to its owners. This value, by the very nature of standing timber, the holder neither created nor substantially enhances.

These are the underlying facts, of tremendous significance to the public welfare. They are primarily the results of our public-land policy, long continued. The laws that represent that policy are still largely operative. The past history and present status of our standing timber drive home upon us the imperative necessity of revising our public policy for the future management of all our remaining natural resources. That history is here outlined.

FROM GOVERNMENT TO PRIVATE OWNERSHIP.—Only 40 years ago at least three-fourths of the timber now standing was (it is estimated) publicly owned. Now about four-fifths of it is privately owned. The great bulk of it passed from Government to private hands through (a) enormous railroad, canal, and wagon-road grants by the Federal Government; (b) direct Government sales in unlimited quantities at \$1.25 an acre; (c) certain public-land laws, great tracts being assembled in spite of the legal requirements for small holdings. Such laws

were wholly inappropriate to forest regions; but, though vigorously condemned in several public reports, they are still largely in force. In theory, they were intended to distribute the public lands in small tracts as homes for freeholders. In fact, they actually furthered timber concentration in vast holdings. The 1,802 largest holdings of timber (as compared with a vastly wider distribution of public lands in nontimbered agricultural sections) involve 79,092,000 acres of timberland (including a considerable acreage of timber rights in the Southern Pine Region) and in addition some of these holders own 10,652,000 acres lying in timbered parts but not now bearing merchantable timber.

During this interval, and chiefly in the latter half thereof, the value of standing timber has increased tenfold, twentyfold, and even fiftyfold, according to local conditions. The present annual growth is only about one-third of the present annual cut. Replacement by new growth is very slow.

Examples of the increase during this interval are: From \$5 to \$30 an acre, \$7 to \$40, \$20 to \$150, \$1 to \$13, \$4 to \$140, \$1 to \$50. Specific tracts have been sold first for \$24,000, and later for \$153,000; \$10,000, and later \$124,000; \$240,000, and later \$2,500,000; \$23,000, and later \$500,000; \$25,000, and later \$1,125,000. These examples illustrate the remarkable profit made by certain individual holders.

What did the Government get for the timber? Of the southern pine sold for \$1.25 an acre, much is now worth \$60 an acre. Large amounts of Douglas fir in western Washington and Oregon, which the Government gave away, or sold at \$2.50 an acre, now range from \$100 to \$200 per acre. The great redwood belt in California was alienated on similar terms, and some of it is now worth hundreds of dollars an acre. Practically none of the great forests in the public-land States was sold by the Government for more than \$2.50 an acre. The great increase of value gives grave importance to the concentration of ownership.

The former Chief of Field Service of the General Land Office, H. H. Schwartz, stated officially (1909) that the timber and stone act—

has resulted in the sale of over 12,000,000 acres of valuable timberlands, of which fully 10,000,000 acres were transferred to corporate or individual timberland investors by the entrymen. These lands brought to the people or General Government a gross sum of \$30,000,000. At the date of sale they were reasonably worth \$240,000,000. The profit of over \$200,000,000 went not to the needy settler engaged in subduing the wilderness, but to the wealthy investors. Not over a fractional part of 1 per cent of the timber purchased from the United States under this act is held, consumed, or even cut by the men and women who made the entries.

An effective illustration of what has happened under our land laws appears in the report of the United States Forester for 1910:

An investigation emphasizes the probability that heavily timbered lands, if opened to entry, would pass into the hands of large owners of timber. Of 705,000 acres eliminated from the Olympic National Forest in 1900 and 1901 on the ground that the land was chiefly valuable for agriculture and that the settlement of the country was being retarded, 523,720 acres passed ultimately into the hands of owners who are holding it purely as a timber speculation. Three companies and two individuals own over 178,000 acres, in holdings of from 15,000 to over 80,000 acres each. Of timbered homestead claims on this eliminated area, held by 100 settlers, the total area under actual cultivation is only 570 acres, an average of but 5.7 acres to each claim. It will be seen that the original purpose of the elimination was defeated, and that bona fide settlement was not materially advanced.

CONTROL OF THE TIMBER CONTROLS THE WHOLE INDUSTRY.—Whatever power over prices may arise from combinations in manufacture and distribution (as distinguished from timber owning), such power is insignificant and transitory compared to the control of the standing timber itself or a dominating part thereof. The Senate and House resolutions, to which this investigation is responsive, ask for the causes of the high prices of lumber and the effect of combination upon such prices. The resolutions, therefore, required determination of both the amount and the control of standing timber.

AMOUNT OF STANDING TIMBER.—There is now left in continental United States about 2,200 billion board feet of privately owned standing timber, of which 1,747 billion is in the "investigation area," covered in great detail by the Bureau. This area includes the Pacific-Northwest, the Southern Pine Region, and the Lake States, and contains 80 per cent of all the private timber in the country. In addition, there are about 539 billion feet in the national forests and about 90 billion feet on other nonprivate lands. Thus, the total amount of standing timber in continental United States is about 2,800 billion board feet. The present annual drain upon the supply of saw timber is about 50 billion feet. At this rate the timber now standing, without allowance for growth or decay, would last only about 55 years.

The present commercial value of the privately owned standing timber in the country, not including the value of the land, is estimated (though such an estimate must be very rough) as at least \$6,000,000,000. Ultimately the consuming public will have to pay such prices for lumber as will give this timber a far greater value.

This is the first comprehensive and methodical investigation of the amount and ownership of our standing timber. It rests on the best information obtainable from records of timber owners or the

knowledge of men in the industry, information which daily forms the basis of actual business dealings. (A physical canvass of the forests was out of the question.) The data collected by field work in about 900 counties, assembled, mapped, checked, and weighed in the office, are reliable within a relatively small margin of error. All figures relate to merchantable saw timber, in terms of lumber yield. The unit "board foot" is a foot square and an inch thick.

CONCENTRATION OF TIMBER OWNERSHIP.—Three vast holdings alone, the greatest in the country, those of the Southern Pacific Company, the Weyerhaeuser Timber Company, and the Northern Pacific Railway Company (including their subsidiary companies) together have 238 billion feet, or nearly 11 per cent of all our privately owned timber. They have 14 per cent of that in the "investigation area." With the five next largest they have over 15 per cent of the total privately owned timber and over 19 per cent of that within the investigation area. Finally, nearly one-half (48 per cent) of the private timber in that area is held by only 195 great holders. The term "holder" covers any single interest—individual, corporate, or group—which is so united as to be under one control.

The Pacific-Northwest.—Five-elevenths of the country's privately owned standing timber is in the Pacific-Northwest (California, Oregon, Washington, Idaho, and Montana), 1,013 billion feet. One-half of this is now owned by 37 holders; many of these are closely connected. The three largest holders (named above) alone have nearly one-quarter. This section now furnishes only one-sixth of the annual cut. Thus its timber is being largely held for the future, and the large owners there will then be the dominating influence in the industry.

The Southern Pacific Company holding is the greatest in the United States—106 billion feet. This is about 6 per cent of the private timber in the investigation area, and 10 per cent of that in the Pacific-Northwest. It is difficult to give an adequate idea of its immensity. It stretches practically 680 miles along that railroad between Portland and Sacramento. The fastest train over this distance takes 31 hours. During all that time the traveler thereon is passing through lands a large proportion of which for 30 miles on each side belongs to the railroad, and in almost the entire strip this corporation is the dominating owner of both timber and land.

The second largest holder is the Weyerhaeuser Timber Company (including its subsidiary companies), with 96 billion feet. This does not include further very extensive timber interests of the Weyerhaeuser family and close associates.

These two holdings would supply the 46,584 sawmills in the country for four and a half years. They have one-eleventh of our total private timber.

The third largest, the Northern Pacific Railway Company, has 36 billion feet.

These three holdings have enough standing timber to build an ordinary five or six room frame house for each of the 16,000,000 families in the United States in 1900. If sawed into lumber and placed in cars, their timber would load a train about 100,000 miles long.

The holdings of the two railroad companies are Government grants, and 80 per cent of the Weyerhaeuser Timber Company holding was bought from the Northern Pacific grant. Many other large holdings (here and in other regions) were mainly purchased from some land grant.

Southern Pine Region.—In the Southern Pine Region there are 634 billion feet of privately owned timber. Concentration in total timber is much less than in the Pacific-Northwest. There is, however, a high concentration in the more valuable species, longleaf yellow pine and cypress. Sixty-seven holders own 39 per cent of the longleaf yellow pine, 29 per cent of the cypress, 19 per cent of the shortleaf and loblolly pine, and 11 per cent of the hardwoods.

The Lake States.—In Minnesota, Wisconsin, and Michigan there are 100 billion feet of privately owned timber. In Wisconsin 96 holders have three-fourths of all the timber. In Michigan 110 holders have 66 per cent. In Minnesota 6 holders have 54 per cent of the very valuable white and Norway pine, 16 per cent of the other conifers, and 2 per cent of the hardwoods. Taking all three States, 215 holders have 65 per cent of all the timber.

EFFECT OF CONCENTRATION.—Such concentration in standing timber, if permitted to continue and increase, makes probable a final central control of the whole lumber industry. A few strong interests, ultimately holding the bulk of the timber, can set the price of timber and its products. The manager of the National Lumber Manufacturers' Association recently said to lumbermen on the Pacific coast:

The day of cheap lumber is passing and soon will be gone, but the men who make the money will be those who own timber and can hold it until the supply in other parts of the country is gone. Then they can ask and get their own price.

Certain further factors, not exactly measurable, increase still more the real concentration. First, a further interweaving of interests, corporate and personal, connects a great many holdings which the Bureau has treated as separate; second, there are very large totals of timber so scattered in small tracts through larger holdings that they are substantially "blocked in" or "controlled" by the larger holders; third, the concentration is much higher in the more valuable species.

General information obtained indicates a very high concentration in timber ownership outside the investigation area.

POLICY OF GREAT HOLDERS.—The largest holders are cutting little of their timber. They thus reserve to themselves those incalculable profits which are still to accrue with the growth of the country, the diminishing of timber supply, and the further concentration and control thereof. Many of the very men who are protesting against conservation and the national forest system because of the "tying up" of natural resources are themselves deliberately tying them up far more effectively for private gain.

The fact that mature timber is thus withheld from use is clear evidence that great additional profits are expected to accrue through further increase in value.

LAND MONOPOLY.—Standing timber is not the only question. When the timber has been cut the land remains. There has been created, therefore, not only the framework of an enormous timber monopoly, but also an equally sinister land concentration in extensive sections. This involves also a great wealth in minerals. The Southern Pacific has 4,318,000 acres in northern California and western Oregon, and, with the Union Pacific, which controls it, millions of acres elsewhere. (The Government, however, is now suing to annul title to the Southern Pacific lands in Oregon for noncompliance with the terms of the original grants.) The Northern Pacific owns 3,017,000 acres of timber land and millions more of nontimbered land. The Weyerhaeuser Timber Company owns 1,945,000 acres. In Florida, three holders have 4,200,000 acres, and the 182 largest timber holders have over 16,990,000 acres, nearly one-half the land area of the State. In the whole investigation area the 1,802 largest holdings of timber involve 79,092,000 acres of timberland (including a considerable acreage of timber rights in the Southern Pine Region), and in addition some of these holders own 10,652,000 acres lying in timbered parts, but not now bearing merchantable timber (not including Northern Pacific and Southern Pacific lands in nontimbered regions).

Finally, to timber concentration and to land concentration is added, in our most important timber section, a closely connected railroad domination. The formidable possibilities of this combination in the Pacific-Northwest and elsewhere are of the gravest public importance.

THE FUTURE.—These are the facts of the lumber business in its most important feature, the natural supply. The paramount consideration remains still to be stated. There are many great combinations in other industries whose formation is complete. In the lumber industry, on the other hand, the Bureau finds now in the making a combination caused, fundamentally, by a long-standing public policy. The concentration already existing is sufficiently

impressive. Still more impressive are the possibilities for the future. In the last 40 years concentration has so proceeded that 195 holders, many interrelated, now have practically one-half of the privately owned timber in the investigation area (which contains 80 per cent of the whole). This formidable process of concentration, in timber and in land, certainly involves grave future possibilities of impressive monopolistic conditions, whose far-reaching consequences to society it is now difficult to anticipate fully or to overestimate.

Such are the past history, present status, and apparent future of our timber resources. The underlying cause is our public-land policy, resulting in enormous loss of wealth to the public and its monopolization by a few interests. It lies before us now as a forcible object lesson for the future management of all the natural resources still remaining in the hands of the Government.

Very respectfully,

HERBERT KNOX SMITH,
Commissioner of Corporations.

The President.

REPORT OF THE COMMISSIONER OF CORPORATIONS ON THE LUMBER INDUSTRY.

Part I.—STANDING TIMBER.

SUMMARY.¹

FUNDAMENTAL IMPORTANCE OF CONTROL OF STANDING TIMBER.

This Part of the report on the lumber industry treats of the amount of merchantable saw timber now standing in the country, the concentration in the ownership of it, the rapid increase in its value, and the operation of the Government's land policy. Subsequent Parts will deal with concentrating ownership in particular areas, the cost of manufacturing lumber from standing timber, the price of lumber, and the competitive conditions in the marketing of lumber.² Certain basic facts in the lumber industry are as follows:

First. The remaining supply of standing timber in continental United States (excluding Alaska) is now about 2,800 billion board feet, of which about 2,200 billion is privately owned. (The unit "board foot" is a foot square and an inch thick.)

Second. There has come about, and there is still proceeding, a very remarkable concentration in the ownership of this remaining standing timber in the hands of a comparatively few interests. This concentration results chiefly from the speculative holding of timber lands for future profit, primarily made possible by our long-standing public-land policy.

Third. From the time when the vast majority of our present timber supply left the hands of the one great original owner, the United States, till the present there has been an enormous increase in the value of standing timber. This increase has varied greatly according to local conditions, but practically everywhere it has been many-fold—sixfold, tenfold, twentyfold, thirtyfold, and in some cases fifty-fold. The present commercial value of the privately owned standing timber in the country, not including the value of the land, is

¹ Since this summary first appeared, under date of Feb. 13, 1911, it has been revised in a few particulars. Thus, the map showing timber concentration in a portion of Louisiana, which was inserted in the summary for purposes of illustration, has been withdrawn to be used in a later part of the report. Some revision has also been made of the figures on stumpage values and on concentration in ownership of land.

² For a more detailed statement as to matters to be taken up in subsequent parts, see p. 32.

estimated (though in the nature of the case such an estimate must be very rough) as at least \$6,000,000,000.

These conditions must be considered in the light of the further facts that standing timber is a natural resource created almost exclusively by nature; that, where it has not been destroyed, it is substantially in the same condition as when it left the hands of the Government; that human effort, or the private owners that hold and have held it, have added practically nothing to it; that while a certain amount of reforestation is possible, standing timber is a resource similar, in a large measure, to our ore and coal deposits; that the present annual consumption of timber is about three times the annual growth, and the demand is steadily increasing; that speculative holding of timber land for future rise in no way improves the character of the timber and does not give such public service as is given by those who acquire lands for actual present use and improvement. While the profits of speculative timber holding have been enormous, as will be hereafter shown, the risks of such holding and the services rendered by the holders are peculiarly small in comparison with those profits.

These great facts have brought about certain results of tremendous significance from the standpoint of the public welfare. The timber supply is a diminishing natural resource. Its increasing concentration into a comparatively few strong hands has conferred upon those strong holders a vast power over the lumber industry and over prices therein, and has itself greatly accelerated the enormous rise in timber values.

This investigation has been conducted in response to certain resolutions of the Senate and House, as follows:

SENATE RESOLUTION.

Resolved, That the Secretary of Commerce and Labor be, and he is hereby, authorized and instructed immediately to inquire, investigate, and report to Congress, or to the President when Congress is not in session, from time to time as the investigation proceeds, as to the lumber trade or business of the United States which is the subject of interstate or foreign commerce and make full inquiry into the cause or causes of the high prices of lumber in its various stages of manufacture from the log; and the said investigation and inquiry shall be conducted with the particular object of ascertaining whether or not there exists among any corporations, companies, or persons engaged in the manufacture or sale of lumber any combination, conspiracy, trust, agreement, or contract intended to operate in restraint of lawful trade or commerce in lumber or to increase the market price of lumber in any part of the United States.

That the Secretary of Commerce and Labor be required to make the said investigation at his earliest possible convenience, and to furnish the information above required from time to time and as soon as it can be done consistent with the performance of his public duties.

HOUSE RESOLUTION.

Resolved, That the Secretary of Commerce and Labor be, and is hereby, requested to investigate the causes of the high prices of lumber in the various stages of manufacture and sale, and the said investigation shall be conducted with the particular object of ascertaining whether or not these high prices have resulted in whole or in part from any contract, agreement, or combination in the form of trust or otherwise, or conspiracy in restraint of commerce among the several States and Territories or with foreign countries; also whether the said prices have been manipulated in whole or in part by any corporation, joint stock company, or corporate combination engaged in commerce among the several States or with foreign nations, and if so, to investigate the organization, capitalization, profits, conduct and management of the business of such corporations, companies, or corporate combinations, and make early report of his findings according to law.

Both resolutions call, in substance, for information on the causes of the high prices of lumber, and whether or not these high prices have resulted from any contract, agreement, or combination in restraint of commerce.

At the start of the investigation it was clear, in view of the facts above stated, that the vital public problem was the ownership and control of the raw material, the standing timber, or, as it is called in the trade, the "stumpage." No answer to the request of the resolutions as to the course of prices, or the existence of combination and its effect on the lumber business and the public, could safely be made without first determining approximately (1) the amount of the remaining supply of standing timber, and (2) the degree of concentration in the ownership thereof. These facts are basic.

The rapidly increasing concentration of control of the lumber industry is not due to any particular economy of large manufacturing plants. Conditions are such that the output of the most efficient plant is small compared with the total output. The largest sawmill in the country cuts less than one-half of 1 per cent of the total annual output of lumber. Four-fifths of the output comes from mills each cutting less than 25 million board feet, or about one-twentieth of 1 per cent of the annual cut. A recent report of the Bureau of the Census gives the lumber cut of the United States for 1909 as 44,509 million board feet, sawed by 46,584 sawmills.

The conditions of the lumber industry do not favor such enlargement of individual plants as is advantageous in the refining of petroleum, for example, or the making of steel. The bulk and weight of timber are great in comparison with its value. The relative cost of transporting logs for considerable distances is great, except in the few localities where it is possible to float them. Moreover, a large part of the log is waste. There is a great saving in cutting up the log close to its point of origin and shipping out only the valuable parts.

It is therefore impracticable to establish a few great central sawmill plants, and bring timber long distances to these from the forests. A sawmill of small size and small investment can manufacture economically and compete in the industry. To work most economically, a mill, in many localities, should have a logging railroad; but a mill of very moderate size will justify such a road, and the economical maximum will still be rather closely limited by transportation costs. A sawmill can not be moved without loss of most of its investment. Its term of activity must be long enough to allow it to pay for its cost. The larger the mill, the farther it is apt, within a given period, to have to bring its logs; and the growing cost of transportation will soon counterbalance any saving in manufacturing cost which might be attained by great size.

In view of these considerations, and especially the great number of sawmills and the absence of any one or any few plants of dominating size, it is apparent that the economic conditions in the manufacture of lumber (as distinguished from the ownership of standing timber) are not exceptionally conducive to concentration.

A somewhat similar condition exists with respect to the distribution of lumber, whether wholesale or retail, although here the opportunities for combination are more nearly comparable with those in most other industries.

Certainly, therefore, any combination in the lumber industry proper, whether in manufacturing or distribution, must be of far less fundamental import than an effective control of standing timber. If the ownership of this raw material itself could be controlled by a few interests, these would naturally dominate all branches of the industry. They could refuse to sell this raw material to outsiders, and thus actually monopolize and conduct the lumber business, or they could put such a price on the standing timber as virtually to control the price of the manufactured product. The price of lumber, of course, is determined, not by the cost of cutting the trees and converting them into lumber, but by the supply offered and the demand of consumers. An excessive price would naturally be exacted if comparatively few interests were able to control the timber supply.

Indeed, it is almost axiomatic that a real control of the raw material of any great industry is the most effective means of combination or monopoly.

STANDING TIMBER A DIMINISHING NATURAL RESOURCE.

The foregoing facts assume added significance because the annual consumption of timber is very much greater than the growth of the country's forests, which constitute, as stated, a natural resource of much the same character as coal, iron ore, or any other raw material found in a state of nature. It is true that man can not add a single ton to the earth's natural deposits of minerals, whereas the supply

of standing timber can be increased by planting; but practically no effort of that kind has so far been made. Even the possibilities of such increase by planting are limited, and the time required for it is very great. Up to the present, all the standing timber of the country, except a negligible fraction, has grown in a state of nature. In these virgin forests growth is balanced by decay, and it will be many years before an increase resulting from either natural or artificial reforestation will offset the annual consumption. The present annual growth is estimated by the Forest Service at only about one-third the annual cut.

Because of this fact that standing timber is a natural resource constantly diminishing in amount its value would naturally tend to increase, even if there were no pronounced concentration of ownership. The certainty of such increase is clearly recognized by timber owners. Thus the manager of the National Lumber Manufacturers' Association, which embraces the most important mills of the country, said, in August, 1910, in addressing a meeting of lumbermen on the Pacific coast:

The day of cheap lumber is passing, and soon will be gone, but the men who make the money will be those who own timber and can hold it until the supply in other parts of the country is gone. Then they can ask and get their own price.

If, in addition, the ownership of this natural resource be further concentrated in a comparatively few hands, the opportunity for the control and raising of prices will be immensely increased. The inducement, therefore, to bring about such concentration of ownership is very strong. As shown in this report, a marked degree of concentration has already taken place and conditions are now ripe for further concentration on a very large scale.

The investigation of the Bureau of Corporations has therefore been largely concerned with the ownership of standing timber. It was necessary to arrive at an approximate idea of the amount of standing timber in the country, since no reliable information whatever on this point had ever been gathered. The lumbermen themselves have urged the Government to determine the supply of timber, in order that private owners might manage their properties in the light of that information. In May, 1907, the National Lumber Manufacturers' Association passed a resolution stating that "in view of our rapidly decreasing forest resources it is of the greatest importance that an accurate determination be made of the kind and quantity of standing timber in the United States, in order to secure a sound basis for plans for forest management and utilization."

This Part of the Bureau's report comprises two distinct features:

1. A determination of the amount of standing timber in the United States.
2. A study of the concentration of ownership of that timber.

AMOUNT OF STANDING TIMBER IN THE UNITED STATES.

There is a total of about 2,800 billion board feet of standing timber in the country. Of this about 2,200 billion feet is privately owned, about 539 billion feet is in the national forests, and about 90 billion feet is on the unreserved public lands, national parks, State lands, and Indian reservations. This total is on mill output basis. (See p. 60.)

The Bureau's investigation has been concerned only with privately owned timber suitable for sawing. Of the total of about 2,200 billion feet so owned, 1,747 billion feet, or 80 per cent, was covered by an elaborate investigation by the Bureau within a so-called "investigation area," which embraced the principal timber regions of the country. This "investigation area" is as follows: (1) California, Oregon, Washington, Idaho, and Montana; (2) the parts of Virginia, North Carolina, South Carolina, and Georgia east and south of the hardwood forests of the Appalachian Mountains; Florida, Alabama, Mississippi, Louisiana, Texas, Arkansas, and the southeast corner of Missouri; (3) Michigan, Wisconsin, and Minnesota. For ease of reference these three divisions are called the Pacific-Northwest, the Southern Pine Region, and the Lake States, respectively. For those States not entirely within the investigation area, the counties included are shown in the full report. All privately owned merchantable saw timber in the investigation area was included in the inquiry, so that the data in this report are complete for the timber in that territory. No canvass has ever been made of the privately owned timber in the United States outside of this area, but it has been roughly estimated by the Forest Service at 450 billion feet. The Forest Service has also estimated the amount of standing timber owned by the Federal Government and by the various States, and that on Indian reservations, at 629 billion feet.

The results of the Bureau's investigation of the amount of standing timber in continental United States (excluding Alaska) may therefore be summarized as follows:

Grand total.....	Billion feet. 2,826
Privately owned timber.....	2,197
In "investigation area".....	1,747
Pacific-Northwest.....	1,013
Southern Pine Region.....	634
Lake States.....	100
Outside of "investigation area" ¹	450
Total owned by Federal Government in national forests ¹	539
Total otherwise owned by Federal Government, owned by States, and on Indian reservations ¹	90

¹ Estimates furnished by Forest Service. In this connection see p. 66.

This total of about 2,800 billion feet, it should be repeated, is the total for merchantable saw timber only; that is, timber of such size and quality as to be suitable for the use of a sawmill under present conditions in the industry. It does not include timber suitable only for posts, small poles, and similar purposes, or firewood.

The great loss involved in turning the tree trunk into the products of the mill makes the "board-foot" measurement very different from the cubic contents of the tree. The Bureau's estimates of standing timber are for the amount of lumber that would be sawed from the timber if cut according to present methods.

The above figures on the standing timber of the country represent the first comprehensive and methodical investigation that has ever been made. While estimates of the timber supply have been put out from time to time during the past twenty years, these were little more than guesses. The figures now given by the Bureau are considerably above any previous "estimates." Forest Service Circular 97, issued April 24, 1907, presents the principal estimates made up to that time. Only two of them have sufficient basis to make comparison worth while. One is presented in the circular as based on the returns of the Twelfth Census (1900), and the other is attributed to Fernow, as of 1902. Not allowing for timber cut during the intervening years, the figure now established by the Bureau of Corporations is more than twice the former, and 40 per cent above the latter.

The Forest Service estimates the yearly drain on the saw timber of the country at about 50 billion board feet. Without allowing either for new growth or for any increase in the rate of consumption, therefore, the Bureau's total for all timber in the United States (2,800 billion feet) would represent about 55 years' supply, and that for privately owned timber alone (2,200 billion feet) only 44 years' supply. The actual duration, of course, can not be estimated, on account of the unknown changes in rate of consumption and the possibilities of reforestation.

BUREAU'S METHOD OF DETERMINING TIMBER SUPPLY.

The results established by the Bureau for the investigation area—constituting 1,747 billion feet, or 80 per cent of the grand total of 2,200 billion feet privately owned—were compiled chiefly from facts furnished by the timber owners themselves. A physical canvass of the forests of the country would have been wholly impracticable; it would have required enormous expense and a great length of time. Nearly all important timber owners, however, have had fairly good estimates of their timber made at some time or other. Such estimates are made by experts known as "cruisers." Sometimes the cruisers have made only a general survey, by going

about through a large forest tract. In other cases they have gone carefully over the ground, back and forth in parallel paths, noting a separate estimate for each 40 acres, for each 10 acres, or even for each 2½ acres. Sometimes the trees on small typical tracts, say an acre each, have been counted, and the results applied to much larger areas. In this and other ways timber owners generally have come to have a very definite opinion as to the amount of timber in their holdings. Such estimates vary considerably even for the same tract, while estimates for different tracts of a generally similar character may differ very widely. But, by long experience, men learn to form judgments which on an average come fairly near the mark. There is, however, a general tendency of cruisers to underestimate, since their employers, who buy on their estimates, naturally desire conservative figures.

The work of the Bureau is based, therefore, on estimates made chiefly by or for the owners. The Bureau, however, did not merely get a single estimate from each owner and then compile these; it endeavored to get as many estimates as possible on each tract. Thus, an estimate on the holding of a given lumber company might be obtained from the company's headquarters, say, in Minneapolis; another estimate from a local agent, say, in Oregon; and still another, perhaps, from a cruiser at another point. Moreover, men in the timber business are often familiar with holdings in which they are not directly interested, and also with the average stands of timber over a large area, such as a township or even a county. Again, in some States of the Pacific-Northwest, notably in Washington, estimates have been made by public officials for purposes of taxation.

Agents of the Bureau were first sent to the principal lumber centers to secure the location of and estimates for some of the largest timber holdings. Then agents were sent into every one of about 900 timbered counties in the investigation area to get all available information from every responsible source. They were instructed to obtain a separate report for each holder who had as much as 60 million feet of timber, and such general estimates as were possible for the aggregate of smaller holdings; in some cases individual reports on holdings of less than 60 million feet were obtained. The limited time and money available made it necessary to adopt a minimum below which the holdings should not be separately ascertained. The limit of 60 million feet was fixed merely from the point of view of the extent to which the investigation could be carried. It is not a division between small investors and large investors. Holdings of 60 million feet in valuable timber, ranging in price from \$10 per thousand down, are naturally the property of wealthy individuals or corporations of considerable size. Eighteen hundred and two holdings, each having 60 million board feet or more, were found in the investigation area. The amount of timber in these holdings is shown by 10 size groups

for each State (p. 23). The total of all timber privately owned in holdings of less than 60 million board feet is shown for each State in a single group, "group 11."

These estimates when secured were very carefully studied, and checked in every possible way. Where serious doubt existed of their correctness, further field investigation was made.

In this work the Bureau secured the exact location of nearly all holdings of more than 60 million feet in the entire investigation area, with the exception of Virginia, the Carolinas, Georgia, and Texas, where the absence of the rectangular Government survey made the matter of securing locations extremely difficult. By having the exact location of holdings the danger of duplication of lands was practically eliminated, since the different holdings were all brought together graphically on plats. Again, the area accounted for in these separately reported holdings gave a good check on estimates of miscellaneous holdings in the unplatted area.

INCREASE MADE BY BUREAU IN ESTIMATES.

Practically all the estimates obtained were on the basis of "log scale"; that is, while they referred nominally to the quantity of lumber obtainable from the given tracts, they were based actually on certain "log rules," by which logs of given dimensions are reduced to a supposed equivalent in sawed lumber. The measurement of the logs by these conventional rules almost invariably falls below the quantity of lumber finally obtained. Moreover, as already shown, the natural tendency of cruisers and others is to underestimate their timber, even on a log-scale basis. It was necessary, therefore, to increase the estimates gathered by the Bureau to allow for the admitted "overrun at the mill," and for the general underestimation. This allowance, while necessarily somewhat arbitrary, was made only after a careful study of the best available information. The percentages of increase used by the Bureau were as follows: California, 10 per cent, except redwood, for which 30 per cent was used; Oregon, 10 per cent; Washington, 20 per cent (except for 6 of the largest holdings, for which only 15 per cent increase was made, and a seventh for which the increase was only 10 per cent); and Idaho, Montana, the Lake States, and the entire Southern Pine Region, 25 per cent.

While increasing considerably the total amount of timber over that indicated by the original estimates themselves, these percentage increases do not affect the degree of concentration of ownership in any region, as they were applied alike to all groups, including group 11.

It should be remembered that the Bureau's figures take account only of such timber as is suited for manufacture into lumber.

The Bureau's figures on the amount of standing timber, therefore, rest on a collection and verification of the best information now

existing on standing timber; namely, the estimates which form the basis of actual dealings in timber property in the ordinary course of business. The figures published by the Bureau for the investigation area are reliable within a relatively small margin of error.

GENERAL DISTRIBUTION OF STANDING TIMBER IN THE UNITED STATES.

From the table already given (p. 6) it is apparent that the two great sources of timber supply, so far as privately owned timber is concerned, are the Pacific-Northwest, with 1,013 billion feet, and the Southern Pine Region, with 634 billion feet. Moreover, 82 per cent of the standing timber owned by the United States Government is in the Pacific-Northwest, and nearly all the remainder is in other States of the Rocky Mountain region. Most of that owned by the States and nearly all that on Indian reservations is also in the Pacific-Northwest. Out of the grand total of about 2,800 billion feet for the whole country, no less than 1,512.9 billion feet, or about 55 per cent, is in the five States comprising that timber region. The total, by States and by form of ownership, is as follows:

TOTAL STANDING TIMBER IN THE PACIFIC-NORTHWEST.

[In billions of board feet. Thus, 1,512.9=1,512,900,000 board feet.]

State.	Total.	Not privately owned.	
		Pri- vately owned.	National forests. All other. ¹
Pacific-Northwest.....	1,512.9	1,013.0	440.8
California.....	381.4	248.1	114.4
Oregon.....	545.8	398.1	135.8
Washington.....	391.0	294.6	81.6
Idaho.....	129.1	50.4	71.0
Montana.....	65.6	21.8	38.0
			59.1

¹ Includes national parks, military reservations, unreserved public lands, Indian reservations, and timberland owned by the States.

The predominating species of timber in the Pacific-Northwest is Douglas fir, which alone constitutes 52 per cent of the total privately owned. Western pine constitutes 15 per cent and redwood 10 per cent, the three species together aggregating 77 per cent. No other single species contributes as much as 6 per cent. By far the heaviest stands occur on the Pacific slope west of the Cascades. Thus, of the 1,013 billion feet of privately owned timber in the entire Pacific-Northwest, 867 billion feet (85 per cent) is west of the Cascades in Oregon and Washington, and in California, leaving only 146 billion feet for the eastern portion of this region.

In the Southern Pine Region the total of 634 billion feet of privately owned timber is distributed as follows:

	Billion feet.	Billion feet.	
Louisiana.....	119.8	Georgia (part).....	46.0
Mississippi.....	95.3	North Carolina (part).....	42.9
Arkansas.....	78.7	South Carolina (part).....	30.7
Florida.....	73.9	Virginia (part).....	14.5
Texas.....	66.0	Missouri (part).....	9.9
Alabama.....	56.3		

Of this total it will be seen that 293.8 billion feet, or nearly one-half, is in three States—Louisiana, Mississippi, and Arkansas. Florida, Texas, and Alabama, the next three States in order, together have 196.2 billion feet, or over 30 per cent of the total. As noted in the table, the figures for the other States are for portions of these States only. (See p. 6.)

The predominating species in this Southern Pine Region is yellow pine, which contributes 384.4 billion feet (232.3 billion feet longleaf and 152.1 billion feet shortleaf and loblolly) to the total of 634 billion feet; cypress, 40.4 billion feet; and all hardwoods together, 209.2 billion feet. The hardwoods include the least valuable timber in this region.

In the Lake States the total of 100 billion feet of privately owned timber is distributed as follows:

	Billion feet.
Michigan.....	47.6
Wisconsin.....	29.2
Minnesota.....	23.2

The Lake Region is the least important of the three in quantity of timber, but much of its timber is exceedingly valuable.

CONCENTRATION OF THE OWNERSHIP OF STANDING TIMBER.

SUMMARY OF PRINCIPAL HOLDINGS.

The Bureau's investigation has disclosed a remarkable concentration of the ownership of the country's standing timber. A general indication of this great concentration is afforded by the following tables, in which the timber holdings of the country are arranged by groups of holders according to size of holding in the investigation area; the figures in all cases are for privately owned timber.

Group 1 contains the timber holdings of the Southern Pacific Company, the Weyerhaeuser Timber Company, and the Northern Pacific Railway Company. The other groups contain the holdings ranging between the limits shown below:

- Group 2: From 13,000,000,000 feet to 25,000,000,000 feet.
- Group 3: From 5,000,000,000 feet to 13,000,000,000 feet.
- Group 4: From 3,500,000,000 feet to 5,000,000,000 feet.

- Group 5: From 2,000,000,000 feet to 3,500,000,000 feet.
 Group 6: From 1,000,000,000 feet to 2,000,000,000 feet.
 Group 7: From 500,000,000 feet to 1,000,000,000 feet.
 Group 8: From 250,000,000 feet to 500,000,000 feet.
 Group 9: From 125,000,000 feet to 250,000,000 feet.
 Group 10: From 60,000,000 feet to 125,000,000 feet.
 Group 11: Less than 60,000,000 feet.

For the entire investigation area the extent of concentration, by these groups, is as follows:

CONCENTRATION OF TIMBER OWNERSHIP BY GROUPS IN ENTIRE INVESTIGATION AREA.

Group.	Number of holders.	Amount of timber owned, in billions of feet.	Per cent of total.	Group.	Number of holders.	Amount of timber owned, in billions of feet.	Per cent of total.
Total.....	1,802	1,747.0	100.0	Groups 1-10—Continued.			
Groups 1-10.....	1,208.8	1,208.8	69.2	Group 6.....	105	149.2	8.5
Group 1.....	3	237.5	13.6	Group 7.....	190	132.4	7.6
Group 2.....	5	102.0	5.8	Group 8.....	273	96.4	5.5
Group 3.....	14	119.5	6.8	Group 9.....	489	84.8	4.9
Group 4.....	26	115.3	6.6	Group 10.....	655	55.5	3.2
Group 5.....	42	116.2	6.7	Group 11.....	.....	538.2	30.8

In the following table the facts are set forth in cumulative form, so that the amount of timber, and the proportion of the whole, controlled by a given number of groups in order, is at once apparent.

CONCENTRATION OF TIMBER OWNERSHIP BY GROUPS, SHOWN CUMULATIVELY, IN ENTIRE INVESTIGATION AREA.

	Number of holders.	Amount of timber owned, in billions of feet.	Per cent of total.		Number of holders.	Amount of timber owned, in billions of feet.	Per cent of total.
Total.....	1,802	1,747.0	100.0	Groups 1-6.....	195	839.7	48.0
Group 1.....	3	237.5	13.6	Groups 1-7.....	385	972.1	55.6
Groups 1 and 2.....	8	339.5	19.4	Groups 1-8.....	658	1,068.5	61.1
Groups 1-3.....	22	459.0	26.2	Groups 1-9.....	1,147	1,153.3	66.0
Groups 1-4.....	48	574.3	32.8	Groups 1-10.....	1,802	1,208.8	69.2
Groups 1-5.....	90	690.5	39.5	Group 11.....	.....	538.2	30.8

From these tables it will be seen that 3 holdings include no less than 237.5 billion feet, or nearly 11 per cent of the privately owned timber in the entire country, and over 13.5 per cent of the privately owned timber in the investigation area. These 3 holders are the Southern Pacific Company, the Weyerhaeuser Timber Company, and the Northern Pacific Railway Company. Five other holders rank-

ing next in importance own in the investigation area an aggregate of 102 billion feet, or 4.6 per cent of the total privately owned timber of the country and 5.8 per cent of that in the investigation area. Thus the 8 largest holders together own approximately 340 billion feet of timber, or 15.4 per cent of the total privately owned timber of the country and 19.4 per cent of that in the investigation area.

Twenty-two holders own 26.2 per cent of all the timber in the investigation area; 195 holders own 48 per cent. Stated in another way, more than one-eighth of the total timber in the investigation area (this representing 80 per cent of the total privately owned timber of the United States) is owned by only 3 holders; more than one-fourth is owned by only 22 holders. Almost one-half in this area is owned by 195 holders.

The most marked concentration is in the hands of the comparatively few large holders of the upper groups; the lower groups control a much less important percentage. Thus, while the 385 holders in groups 1 to 7, inclusive, control 55.6 per cent of the timber in the investigation area, the 273 holders in group 8 control only 5.5 per cent, the 489 holders in group 9 only 4.9 per cent, and the 655 holders in group 10 only 3.2 per cent.

Furthermore, these 10 groups, 1,802 holdings, embrace nearly 70 per cent of the total timber in the investigation area, while group 11, the remaining holdings, aggregating unnumbered thousands, have in all only 538.2 billion feet, or 30.8 per cent of the total.

This pronounced concentration is discussed in detail later. At the moment it is essential to point out a few general considerations as to the significance of these figures.

DEFINITION OF THE TERM "HOLDER."

The concentration of ownership shown in this report is a minimum only. Through the interweaving of interests, the interrelations of the individuals and corporations holding title to the timberland, there is a concentration of control far beyond what is shown by the listing of nominal or legal owners. The owners embraced in very many important groups of this kind avoided furnishing the specific information necessary to determine the real control.

The effect of these interrelations does, to some degree, appear in the Bureau's figures. Some corporations gave the names of their stockholders and the amount of stock owned by each, and also the amount of stock owned by the corporations themselves in other timber-owning companies; some individuals stated, apparently in good faith, their stock holdings in corporations connected with the lumber industry; and from independent sources some specific facts and much general information were gathered. This evidence was carefully considered, and where it was sufficient to show a common control of nominally separate holdings these holdings were combined and considered as

one. Such combinations were not made because of mere common management or harmonious operation. The test was that of actual control, through the ownership of more than half the stock by the interest in question. If an individual owning timber had more than half the stock of a timber-owning corporation, the two holdings were combined as one. A corporation was combined with others in which it held a majority of the stock. It frequently happened that one or a few individuals appeared in several corporations, holding half or more of the stock in each, and these corporate holdings were combined as one.

Thus, wherever the Bureau secured information showing that the same interest owned half or more of the stock of two or more owners of record, these holdings were combined and counted as one. But undoubtedly a large number of such cases exist which were not revealed by the very limited information obtained. Furthermore, there is a vast amount of interrelation short of actual control through the ownership of half or more of the stock, but still of high practical effectiveness; and the interrelation of this sort, even so much of it as is shown by the information at hand, could not be presented in the tables. In many cases corporations are practically under the same control, although the common holding may be less than half of the stock of some of them; and even where strict control does not result, the interrelations through minor holdings of stock serve to establish a very important general condition of harmonious operation. There are also in such interrelations significant possibilities for future additional concentration.

The following are examples of the possibilities and limitations of such combining of interests: The Southern Pacific holding, as stated in this report, is made up of the timber of the Oregon and California Railroad Company and of the Central Pacific Railway Company—subsidiaries of the Southern Pacific Company. Similarly, the holding of the Weyerhaeuser Timber Company includes not only the timber of that concern, but that of its direct subsidiaries, the Clarke County Timber Company, the Weyerhaeuser Lumber Company, the Weyerhaeuser Land Company, the Pokegama Sugar Pine Lumber Company, the Pelton-Reid Sugar Pine Lumber Company, and the Weyerhaeuser Realty Company. On the other hand, the Weyerhaeuser Timber Company holding does not embrace the interests of the Weyerhaeuser family or their associates in other extensive timber holdings not known to be so controlled that they will be managed as a unit with the holdings of the Weyerhaeuser Timber Company itself. The holdings of the Northern Pacific Railway Company are chiefly held direct, a relatively small amount being owned by a subsidiary concern, the Northwestern Improvement Company.

Another important factor still further enhances the actual concentration of timber control to a degree much greater than the figures of

ownership alone suggest. This is the fact that a very large amount of timber in the aggregate is so scattered in small holdings that it is readily controlled by larger timber owners immediately adjoining. For instance, the holder of a small tract of timber which is completely surrounded by the lands of a large holder must as a rule sell to him, and practically on his terms. A timber company which owns land giving the only practical outlet for other timber lying back of it may be said to "control" that timber. If a small holding is a long distance from a railroad or a stream, it is substantially impossible for the owner to go to the expense of getting a right of way or of constructing a logging railroad. Therefore it frequently happens that the only disposition that such a "blocked-in" small holder can make of his standing timber is to sell to one of the larger holders near him. This does not necessarily mean that the small holder is entirely at the mercy of the larger one, since these small holdings are almost inevitably affected, at least in some degree, by any general rise in timber values. Information gathered by the Bureau, however, very clearly shows that as a rule the market values of relatively small holdings are proportionately much less than the values of large and compact tracts in the same vicinity. The small holder, therefore, is a less important factor in the timber and lumber business from a commercial standpoint than even the small size of his holding would indicate. This fact is very generally recognized by timber interests. It is a common thing for large timber holders to speak of the amount of timber of others which they "control," in addition to what they own, because it is blocked in or bottled up in the manner described. This is an important consideration which should be kept in mind in judging of the marked degree of concentration here set forth.

TIMBER HOLDINGS OF THE SOUTHERN PACIFIC COMPANY, THE WEYERHAEUSER TIMBER COMPANY, AND THE NORTHERN PACIFIC RAILWAY COMPANY.

Keeping in mind the foregoing explanatory statements, it is now proper to proceed with the details of timber concentration.

The three largest holdings of standing timber in the United States are those of the Southern Pacific Company, the Weyerhaeuser Timber Company, and the Northern Pacific Railway Company (including their subsidiary companies). As already stated, they aggregate the enormous total of 237.5 billion feet, or practically 11 per cent of the total privately owned timber in the United States and over 13.5 per cent of the privately owned timber within the Bureau's investigation area. In the Pacific-Northwest, where the whole of these holdings lie, they represent almost one-fourth of the total privately owned.

Southern Pacific Company' holding.—The holding of the Southern Pacific Company (including subsidiaries) amounts to 105.6 billion

feet. This is the largest single holding in the United States. It exceeds the total of all private timber in Michigan, Wisconsin, and Minnesota. It represents nearly one-twentieth of the total privately owned timber of the country, practically 6 per cent of the total in the investigation area, and over 10 per cent of all the privately owned timber in the Pacific-Northwest. About 71 billion feet of the Southern Pacific's timber is in Oregon and about 35 billion feet in California.

It is difficult to give an adequate idea of the immensity of this holding. It stretches practically all the way from Portland, Oreg., to Sacramento, Cal., a distance of 682 miles. The running time of the fastest train between these two points is thirty-one hours; yet during all that time the traveler is passing through lands a large proportion of which for 30 miles on each side of him belongs to the corporation over whose tracks he is riding, and in almost the entire strip, 60 miles wide and 682 miles long, this corporation is the dominating owner of both timber and land. This holding consists of the unsold part of Government land grants in Oregon and northern California held by the Oregon and California Railroad Company and the Central Pacific Railway Company, subsidiaries of the Southern Pacific Company.

A very significant fact in connection with this enormous holding is that the Southern Pacific Company is not selling its timber, but is holding this valuable supply, evidently in the confident hope of a further great advance of price.

Weyerhaeuser Timber Company holding.—The holding of the Weyerhaeuser Timber Company (including its directly owned subsidiary concerns) is the second largest in the United States, amounting to 95.7 billion feet. This is only about 10 billion feet less than that of the Southern Pacific. Most of this timber—nearly 77 billion feet—is in Washington; about 18.7 billion feet is in Oregon, and an insignificant fraction in California. It is chiefly Douglas fir.

It should be repeated that this holding, enormous as it is, includes only the timber directly owned by the Weyerhaeuser Timber Company and its subsidiary corporations. It does not include further very extensive timber interests of members of the Weyerhaeuser family and their close associates. This great holding, also, is nearly all being held off the market for the future rise in timber values.

The timber in these two largest holdings, those of the Southern Pacific Company and the Weyerhaeuser Timber Company, therefore, reaches the enormous total of 201 billion feet, or one-fifth of the total timber in the Pacific-Northwest, and almost exactly one-eleventh of the privately owned timber in the United States. At the present rate of cutting the timber in these two holdings would supply the 46,584 sawmills in the United States for 4½ years, and would supply all the sawmills in Washington, Oregon, and California for no less than 29 years.

Northern Pacific holding.—The timber holding of the Northern Pacific Railway Company, which ranks third in importance, amounts to 36.2 billion feet. This, it will be seen, is much less than either the Southern Pacific or the Weyerhaeuser holding. Most of it is owned by the Northern Pacific Railway Company directly, but a small part is owned by a subsidiary concern, the Northwestern Improvement Company.

Summary.—These three holdings together contain 238 billion feet, or nearly one-fourth of all the privately owned timber in the five States of the Pacific-Northwest, the most important remaining source of timber supply for the United States; they contain three-eighths as much as all the timber in the Southern Pine Region.

An impression of the vast amount of timber represented by these combined holdings may perhaps be given by the statement that if it were sawed into lumber it would load a train about 100,000 miles long. Or, again, these three holdings have enough standing timber to build an ordinary 5 or 6 room frame house for each of the 16,000,000 families in the United States in 1900.

These three principal holdings based upon Government land grants.—Before proceeding to discuss the question of concentration of timber ownership further, it is worth pointing out that these three immense holdings were virtually made possible by the land grants of the Federal Government to great railroad corporations.

Under these grants enormous tracts of land were acquired by some of the leading transcontinental railroads. Thus, there had been patented to the subsidiaries of the Southern Pacific Company, in Oregon and California, up to June 30, 1910, no less than 12,180,000 acres of land—not all timbered, of course—while the Central Pacific Railroad Company, one subsidiary, had secured in the States of Idaho, Nevada, and Utah 4,878,000 acres more. The Union Pacific, which now controls the Southern Pacific,¹ has also secured patent to no less than 19,136,000 acres of land in various States, while there have been patented to the Northern Pacific the enormous total of 32,664,000 acres. This is a total acreage patented to the Northern Pacific and to the several railroads now in the Union Pacific-Southern Pacific system of 68,858,000 acres, or over 107,000 square miles, an area nearly as large as the land area of the six New England States and New York. Furthermore, lands are still being patented in large amounts, especially to the Northern Pacific.

It is not to be inferred that these railroads still own the acreage noted above as patented to them. In various financial reports and unofficial manuals, however, it is stated that the present land holdings of these railroads are as follows: Union Pacific, 975,128 acres; Southern Pacific, 13,879,932 acres; Northern Pacific, 9,949,985 acres.

¹ On Dec. 2, 1912, the Supreme Court of the United States declared the Union Pacific-Southern Pacific merger illegal.

These published reports do not state whether the acreage given includes all lands transferred by the railroad corporations to any subsidiary land corporations of their own, nor whether it includes any lands owned that were not acquired under land grants. (See p. 233.)

A very large amount of the land granted to these railroads is not timberland, and much of it lies outside the investigation area. Thus little of the 19,136,000 acres secured by the Union Pacific had any timber, and little of the 4,878,000 acres patented to the Central Pacific in Idaho, Nevada, and Utah. Furthermore, of the 12,180,000 acres patented to the Southern Pacific and its subsidiaries in California and Oregon, much lies in nontimbered regions; the same is true of the immense grant to the Northern Pacific. Since, as stated above, much of the land of these railroad corporations lies outside the special area of investigation, the Bureau is not prepared to make any statement of the total timbered area still held by them. Within the investigation area of the Bureau, however, the timbered acreage of the Southern Pacific reaches the very large total of 3,842,000 acres, not including about 130,000 acres in Texas and Louisiana, in which the Southern Pacific has an interest. The unsold timbered acreage of the Northern Pacific within the investigation area, including a considerable proportion of lands claimed by it but to which patent has not yet been secured, is 3,017,000 acres.

Practically all of the acreage of the Southern Pacific Company was secured through Government land grants. The enormous holding of the Weyerhaeuser Timber Company, aggregating 1,945,000 acres, is based on the Northern Pacific land grant, no less than four-fifths of it having been bought from the Northern Pacific. In 1900 a single block of 900,000 acres was thus acquired at \$6 an acre. Further purchases from the Northern Pacific brought up the total thus acquired to about 1,525,000 acres. In the main purchase the Weyerhaeuser Timber Company selected the best of the Northern Pacific's timberland in western Washington.

In addition to the very extensive acreage thus sold to the Weyerhaeuser Timber Company, the Northern Pacific has also sold a vast amount of timberland to a subsidiary of the Amalgamated Copper Company and smaller yet important tracts to other large companies, in many of which the Weyerhaeuser family and their associates are interested. Notwithstanding the fact that the timberland which it now retains is thus but a remnant of its original holding, the company nevertheless ranks third in the list of the country's timber owners.

The character of the Northern Pacific's timber, and, in consequence, that of the Weyerhaeuser Timber Company, was considerably improved through the "forest lieu" legislation. This was a provision included in an appropriation act of June 4, 1897, which allowed a settler or owner (thus including land-grant railroads) whose lands fell

within the boundaries of a forest reserve to exchange such lands for an equal area to be selected from unoccupied and nonmineral lands anywhere in the public domain; these selections were subsequently restricted to surveyed lands. Under this legislation (since repealed) the Northern Pacific made very extensive relinquishments of poor land within the national forests, securing an equal acreage, selected especially for timber value, elsewhere in the public domain.

A special lieu-selection law affecting the Northern Pacific was passed in connection with the creation of Mount Rainier National Park by act of March 2, 1899. This provided for the relinquishment of the Northern Pacific lands within the national park area and within the Pacific Forest Reserve, giving the railroad the privilege of selection of surveyed or unsurveyed nonmineral lands in any State into which it extended. Under this act the railroad relinquished about 450,000 acres, obtaining in exchange heavily timbered lands in other portions of the Northwest, of which at least 300,000 acres was sold to the Weyerhaeuser Timber Company and to other companies in which the Weyerhaeuser family is interested.

This forest-lieu legislation was intended to enable the Government to regain as much land as possible for reservation in compact blocks, and to enable settlers within the forest-reserve limits, who so desired, to relocate where the settlement of the country would not be arrested by such wholesale withdrawals. By the actual working of this legislation, however, a large amount of comparatively worthless land was returned to the Government by the Northern Pacific Railway Company, which obtained in exchange an equal amount of excellent timbered land. Thus, while the land-grant legislation largely made possible such immense single holdings as those of the Southern Pacific, Weyerhaeuser, and Northern Pacific Companies, this forest-lieu legislation resulted in improving the character of the Northern Pacific lands (including those sold to the Weyerhaeuser Timber Company and other companies in which the Weyerhaeuser family is interested), and consequently increased their value, through the privilege of making selections in heavily timbered regions on the relinquishment of much less valuable land, or even comparatively worthless land, within forest-reserve limits.

CONCENTRATION IN PACIFIC-NORTHWEST.

All the timber of the three largest holders just discussed is in the Pacific-Northwest, where these three holders own no less than 23.5 per cent of the 1,013 billion feet of privately owned timber. Aside from these three great holdings, there is a further very marked concentration of ownership in this region. This is illustrated by the following table. The group limits in this table are the same as in the preceding tables.

In this table and in those to follow on the Southern Pine Region and the Lake States, each holding is grouped according to its total size in the investigation area. Some holdings are thus counted in each of two or three divisions. This method does not always bring together the holdings which include the most timber in a particular geographic division, and does not show, for any division by itself, the full concentration of ownership which has been reached there.

CONCENTRATION OF TIMBER OWNERSHIP BY GROUPS, SHOWN CUMULATIVELY, IN PACIFIC-NORTHWEST.

	Number of holders.	Amount of timber owned, in billions of feet.	Per cent of total.		Number of holders.	Amount of timber owned, in billions of feet.	Per cent of total.
			Number of holders.	Amount of timber owned, in billions of feet.			
Total.....	.....	1,013.0	100.0	.....	Groups 1-6.....	663.8	65.6
Group 1.....	3	237.5	23.5	.....	Groups 1-7.....	723.0	71.4
Groups 1, 2.....	8	336.9	33.5	.....	Groups 1-8.....	757.3	74.8
Groups 1-3.....	20	436.3	43.1	.....	Groups 1-9.....	789.1	77.9
Groups 1-4.....	38	507.3	50.1	.....	Groups 1-10.....	807.4	79.7
Groups 1-5.....	64	571.9	56.5	.....	Group 11.....	206.6	20.3

The pronounced concentration of timber ownership in the Pacific-Northwest is at once apparent from this table. The 3 largest companies own over 23 per cent of the total, or almost one-fourth, while 5 more own 10 per cent, these 8 holders having a little more than a third of the total for this region. The next 12 holders own over 9 per cent, giving the 20 principal holders 43 per cent of the total. The next 18 own 7 per cent; thus no less than 50 per cent of the total privately owned timber in this vast region is in the hands of 38 holders. The next 6 groups, comprising 673 holders, together own less than 30 per cent of the total.

Moreover, under the method of grouping explained in the paragraph preceding this table, two holdings which lie chiefly in the South, but partly in the West, are counted in group 4 in both regions. This tends to understate the actual concentration of ownership in the Pacific-Northwest. If one western holding from group 5 were substituted for these two, one-half of the total privately owned timber in the Northwest would appear in the hands of 37 owners instead of 38.

A few of these 37 holders own additional timber in the Southern Pine Region and in the Lake States.

CONCENTRATION IN SOUTHERN PINE REGION.

The extent of concentration of timber ownership in the Southern Pine Region is similarly brought out in the following table, using the cumulative form. The group limits are the same as before.

CONCENTRATION OF TIMBER OWNERSHIP BY GROUPS, SHOWN CUMULATIVELY,
IN SOUTHERN PINE REGION.

	Number of holders.	Amount of timber owned, in billions of feet.	Per cent of total.		Number of holders.	Amount of timber owned, in billions of feet.	Per cent of total.
Total.....		634.0	100.0				
Group 1.....				Groups 3-6.....	67	152.9	24.1
Group 2.....				Groups 3-7.....	159	211.6	33.4
Group 3.....				Groups 3-8.....	307	262.9	41.5
Groups 3, 4.....	3	22.1	3.5	Groups 3-9.....	558	304.9	48.1
Groups 3-5.....	11	54.8	8.7	Groups 3-10.....	925	336.3	53.0
	29	102.7	16.2	Group 11.....		297.7	47.0

There are no such enormous single holdings of timber in the Southern Pine Region as in the Pacific-Northwest. Group 1 and group 2, consisting of holders of 13 billion feet or more, are not represented here. Nevertheless, taking this region by itself, concentration of ownership has made great progress. Thus, the first 29 holders—these being included in groups 3 to 5, inclusive—own 16 per cent, or nearly one-sixth of the total standing timber in this region; the first 67 holders own 24 per cent; the first 159 holders own a third; while 558 holders own nearly one-half of the total in this region.

The full significance of the concentration in the Southern Pine Region, however, does not appear in these percentages, for it depends largely on the different values of different species. The most valuable timber in this region is yellow pine and cypress, and the least valuable is hardwoods. In fact, a large proportion of the hardwoods of the Southern Pine Region has until recently been regarded as only an incumbrance upon the land. It is significant that the greatest degree of concentration is shown in longleaf yellow pine and cypress, while hardwood shows the lowest. Sixty-seven holders, each having more than a billion feet, own 39 per cent of the valuable longleaf yellow pine, 19 per cent of the shortleaf and loblolly pine, 29 per cent of the cypress, and 11 per cent of the hardwoods. Considering holders each having more than 60 million feet, 925 own 73 per cent of the longleaf yellow pine, 46 per cent of the shortleaf and loblolly, 72 per cent of the cypress, and 32.5 per cent of the hardwoods. Thus while concentration in this southern region is less pronounced than in the Pacific-Northwest, it is most marked in the most valuable species, and lowest in the hardwoods, the least valuable species.

CONCENTRATION IN THE LAKE STATES.

The Lake States show a somewhat higher degree of concentration than the Southern Pine Region. This can readily be seen from the following table. Group limits are the same.

CONCENTRATION OF TIMBER OWNERSHIP BY GROUPS, SHOWN CUMULATIVELY,
IN LAKE STATES.

	Number of holders.	Amount of timber owned, in billions of feet.	Per cent of total.		Number of holders.	Amount of timber owned, in billions of feet.	Per cent of total.
Total.....	.....	100.0	100.0	.....	.....	23.0	23.0
Group 1.....	.....	.....	.....	.....	17	37.5	37.5
Group 2.....	.....	.6	.6	.....	44	48.3	48.3
Groups 2, 3.....	.....	.6	.6	.....	78	59.3	59.3
Groups 2-4.....	4	12.2	12.2	.....	147	65.1	65.1
Groups 2-5.....	10	15.9	15.9	.....	215	34.9	34.9
					Groups 2-6.....		
					Groups 2-7.....		
					Groups 2-8.....		
					Groups 2-9.....		
					Groups 2-10.....		
					Group 11.....		

To avoid misunderstanding it is well to note that the total amount of timber shown above is 100 billion feet, and consequently the figures of absolute amount and of percentage are the same.

Concentration in the Lake States, as in the southern pine belt, is most marked in the most valuable species. Thus, in Minnesota 6 holders have no less than 54 per cent of the very valuable white and Norway pine, together with 16 per cent of the other conifers, but only 2 per cent of the hardwoods. Thirty-two holders (each having 60 million feet or more) own 77 per cent of the white and Norway pine, 27 per cent of the other conifers, and only 11 per cent of the low-value hardwoods. In other words, over three-fourths of the white and Norway pine and over one-fourth of the other conifers in the State of Minnesota are owned by only 32 holders. In Wisconsin 10 holders have 24 per cent of all the timber, and 96 holders (each having 60 million feet or more) have three-fourths of it. In Michigan 12 holders have 28 per cent of all the timber, and 110 holders (each having 60 million feet or more) have two-thirds.

Taking the three Lake States together, 4 holders have 12 per cent of the timber, 17 holders have 23 per cent, 44 holders have 37 per cent, and 215 holders (each having 60 million feet or more) have 65 per cent.

RELATIVE CONCENTRATION IN THE THREE PRINCIPAL REGIONS.

The following table brings together the figures previously shown for the investigation area, and also shows the distribution of the timber in each group by States. The entries in italics opposite "Investigation area" show the number of holders in each group, and the entries in *italics* opposite each of the three geographic divisions show the number of the holders in that group who own in that division. These figures for a geographic division do not show the number of holdings of that size in that division, but rather the number of holdings of that size in the investigation area, all or a part of which is in

that division. Because of this distribution of some holdings between two or more divisions, the totals of the entries in italics for the three divisions are greater than the corresponding entries for the investigation area. In a few cases, chiefly in the Southern Pine Region and in the Lake States, where the portion of a holding in that division is less than about 15 per cent of the minimum limit of the group, the holding has been excluded from the count for that division. (See p. 106.) This was done in order to keep these insignificant parts of certain holdings from obscuring the important holdings in the group in that region.

HOLDINGS OF STANDING TIMBER IN THE INVESTIGATION AREA, GROUPED BY SIZE. [In billions of board feet. Thus, 237.5=237,500,000 board feet. Each holding is grouped according to its total in the investigation area. See p. 11 for description of the groups, and footnote to Table 20.]

	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Group 11.	Total.
Investigation area.....	5	14	86	42	105	190	273	489	655	1,802		1,747.0
	237.5	102.0	119.5	115.3	116.2	149.2	132.4	96.4	84.8	55.5	1,208.8	538.2
Pacific-Northwest.....	5	12	18	36	67	86	96	176	242	711		1,013.0
	237.5	101.4	97.4	71.0	64.6	91.9	59.2	34.3	31.8	18.3	807.4	205.6
California.....	35.2	49.0	24.9	27.5	21.2	26.4	12.4	5.2	4.2	3.3	206.3	38.8
Oregon.....	89.2	34.6	33.3	26.7	24.4	39.9	23.3	13.7	12.7	7.6	305.4	92.7
Washington.....	102.1	14.8	11.8	14.1	16.8	22.9	21.8	12.3	13.8	6.8	237.2	57.4
Idaho.....	4.5	3.0	19.1	1.0	2.0	2.7	1.6	2.3	1.1	.3	37.6	12.8
Montana.....	6.5	8.3	1.7	.2	.1	.8	.1	.8	.1	.3	17.9	3.9
	3	8	18	38	92	148	251	367	485		634.0	
Southern Pine Region.....	22.1	32.7	47.9	50.2	58.7	51.3	42.0	31.4	336.3	297.7		9.9
	3.1	1.2	1.7	.4	.9	.7	5.2	4.7				78.7
Missouri (part).....	2.9	3.5	6.1	8.3	7.8	5.2	4.1	37.9	40.8			66.0
Arkansas.....	11.2	3.6	6.0	.6	4.9	4.2	3.3	2.7	36.5	29.5		119.8
Texas.....	3.7	15.2	14.8	15.8	11.4	9.4	7.5	5.0	82.8	37.0		95.3
Louisiana.....	6.5	4.3	7.9	7.7	4.6	7.2	5.5	4.1	47.8	47.5		56.3
Mississippi.....	1.0	.9	2.6	7.4	3.6	3.8	2.4	21.7	34.6			73.9
Alabama.....	.7	7.4	11.9	13.6	10.0	8.4	5.6	58.2	15.7			46.0
Florida.....	2.2	1.1	.2	3.2	1.9	2.3	10.9	35.1				30.7
Georgia (part).....	3.3	.4	3.1	2.0	2.2	2.1	13.2	17.5				42.9
South Carolina (part).....	4.9	.3	2.4	2.9	3.2	3.0	1.7	18.4	24.5			14.5
North Carolina (part).....	.1	1.3	.4	.6	.3	.7	3.7	10.8				
Virginia (part).....												
	4	6	7	27	34	69	68	215				100.0
Lake States.....	.6	11.6	3.7	7.1	14.5	10.8	11.0	5.8	65.1	34.9		47.6
	.2	6.0	1.6	3.4	6.4	5.0	5.8	2.8	31.2	16.4		29.2
Michigan.....	.6	2.1	2.0	5.9	4.8	4.4	2.2	22.0	7.2			23.2
Wisconsin.....	.4	5.0	1.7	2.2	1.0	.8	.8	11.9	11.3			
Minnesota.....												

The Pacific-Northwest contains the country's great reserve supply of timber, and it is here that the concentration of ownership is most marked. Fifty per cent of all the timber in this great region is in

the hands of the first 4 groups, which comprise only 38 holders. The first 4 groups of the Lake district hold but 12.2 per cent, and practically all of this is held by 4 holders in group 4, the holdings in the Lake States of owners large enough in the investigation area to be placed in the first 3 groups being insignificant. While, therefore, concentration in the Lake States is very marked, it is much less pronounced than in the Pacific Northwest. In the Southern Pine Region the first 4 groups of holders own but 8.7 per cent of the total; and the first 2 groups, comprising the largest holders, do not appear there.

One reason why concentration is less marked in the Southern Pine Region than in the Pacific-Northwest is that no railroad grant in the South compares in size with the grants in the Pacific-Northwest. Such grants are very largely responsible for the tremendous concentration in the Pacific-Northwest. A further reason is that the density of stands is very much less in the South than in the West. A stand of 8,000 to 10,000 feet per acre is considered large in most of the Southern Pine Region, though 15,000 and 20,000 feet to the acre, and even more, may be found within comparatively small areas in Louisiana, eastern Texas, and lower Mississippi. But stands of 100,000 feet or more to the acre are common on the Pacific slope, and in exceptional cases, as in the redwood belt of California, selected acres have been reported with 1,000,000 feet each. Moreover, the lumbering operations of many years have brought most parts of the South to a condition unfavorable to assembling immense holdings. Large buyers, whether they plan to establish a mill or to sell their timber standing, prefer solid blocks of virgin forest. The parts of the South where considerable areas of such forest still exist are comparatively restricted.

These differences of stand, whether due to nature or to lumbering operations, have affected the desirability of the timber for speculative purposes, and so have affected the proportions of the timber of different regions which wealthy speculators have bought up. A more important point, however, has been the price at which the timber could be bought. It is true that vast tracts of land in the South were sold at low prices by the Government many years ago; but when investors began to assemble very large holdings, the timber in the Pacific-Northwest could be bought at a lower price, compared with its probable future price, than that in the South. This was the chief additional influence, after the enormous land grants to the Pacific railroads, which contributed to the phenomenal concentration of ownership in the western part of the country.

VALUE OF STANDING TIMBER.

The existing widespread speculative holding of timberlands has been referred to. The fact has been pointed out that such holders add little or no improvement to such timber; that their risks in-

curred and public services rendered therein are practically negligible in comparison with the great profits received from the rise in timber prices.

It is desirable, therefore, to indicate concretely and in some detail this rise in price that has taken place during the period of concentration, and thus to give some suggestion of the profits which have thereby accrued to the private holders of timber.

The value of timber varies so extremely, according to location, species, quality, and stand, that it is impossible to measure accurately the average amount of the advance. For the purpose of this report it is not necessary so to measure it. The comparative figures hereafter given are not intended to represent the average values of any kind of timber or to establish in any sense a timber price. The danger of using any of the following figures to establish an average price can be best illustrated by a single example. In Washington a lumber company paid about \$3.25 per thousand in 1906 for a certain piece of timber. But this same company refused in the spring of 1909 to pay more than 22 cents a thousand for another piece in the same township of similar timber but less favorably situated for logging. This shows the danger of using these figures for any other purpose than that for which they are here given. That purpose is simply to demonstrate a movement of price, rather than the average price of any class of timber; and for that purpose they are conclusive.

That the increase has been nothing less than enormous is recognized by the men most familiar with the business. In speaking of the rise of prices in the last twenty years they refer to changes from 12½ cents to \$4 per thousand; from 10 cents to \$3 a thousand; from \$5 to \$20 an acre; 300 per cent in ten years; from \$1.50 to \$20 an acre; from 50 cents to \$3 per thousand. These figures are for southern pine. In cypress: From 15 cents to \$5 a thousand. In the Lake States men in the business similarly speak of increases from "no market value" (hemlock and hardwoods) to \$4 to \$10 a thousand; from \$2 to \$6 a thousand (hardwoods). In the Pacific-Northwest similar general statements are made of rises in value, such as 15 cents to \$2.50 a thousand; 10 cents to \$2.50 a thousand; "no market value" to \$2.50 a thousand; 75 cents to \$2.50 a thousand.

While these statements give no accurate measure of the general rise of stumpage values, they do show that, according to the reports of lumbermen, such rise during the last twenty or thirty years has been enormous.

These general statements can be best substantiated by citing a number of particular tracts of timber which have been sold twice during this period and comparing the two prices.

PRICES OF IDENTICAL TRACTS OF TIMBER AT DIFFERENT DATES.

State.	Earlier sale.		Later sale.	
	Date.	Amount.	Date.	Amount.
SOUTHERN STATES.				
By tracts:				
Virginia.....	1895	\$ 3,500.00	(¹)	\$48,000.00
Georgia.....	1902	24,000.00	1906	153,000.00
Mississippi.....	1897	10,000.00	1907	\$ 124,000.00
Per acre:				
Mississippi.....	1900	15.00	1907	30.00
Louisiana.....	1899	17.00	1904	40.00
Do.....	1892	1.25	1909	59.50
Arkansas.....	1900	1.00	1904	13.50
LAKE STATES.				
Per acre:				
Wisconsin.....	1894	1.25-2.00	1908	30.00
Do.....	1891	5.00	1904	22.00
PACIFIC-NORTHWEST.				
By tracts:				
Washington.....	1901	127,500.00	1906	500,000.00
Do.....	1891	800.00	1908	18,500.00
Do.....	1899	10,000.00	1909	110,000.00
Do.....	1900	6,000.00	1907	96,000.00
Do.....	1900	11,840.00	1907	115,000.00
Idaho.....	1901	240,000.00	1909	2,500,000.00
Oregon.....	1892	24,000.00	1907	460,000.00
Do.....	1892	23,000.00	1908	1 500,000.00
Per acre:				
Washington.....	1882	20.00	1909	150.00
Oregon.....	1896	45.00	1908	108.75
Do.....	1900	8.00	1903	24.00
Do.....	1901-3	6.00-10.00	1907	20.00
California.....	1900	18.00	1908	1 100.00

¹ In these cases the sale was not consummated; but the owner offered to sell at the earlier date, or a buyer to purchase at the later date, at the price named.

² "Afterwards."

³ Contract to sell.

⁴ About.

⁵ Purchases made in various parcels.

Certain records of prices paid or received for timberlands during considerable periods of years have also been obtained by the Bureau. The table following shows purchases of "timber rights" which were made by one company in the North Carolina pine region from 1895 to 1909.

ESTIMATED COST OF STUMPAGE IN PURCHASES OF TIMBER RIGHTS BY A SOUTHERN COMPANY, 1885-1909.

Year.	Quantity (estimated).	Cost.	Cost per M feet (estimated).	Year.	Quantity (estimated).	Cost.	Cost per M feet (estimated).
	<i>M feet.</i>				<i>M feet.</i>		
1885.....	16,080	\$9,704	\$0.60	1903.....	26,301	\$29,857	\$1.14
1886.....	4,225	1,740	.41	1904.....	64,136	95,771	1.49
1887.....	87,455	35,135	.40	1905.....	53,889	111,933	2.06
1888.....	80,103	56,019	.70	1906.....	29,922	55,110	1.84
1889.....	107,910	82,740	.77	1907.....	12,150	22,444	1.84
1900.....	28,645	25,047	.87	1908.....	3,375	9,975	2.90
1901.....	9,316	8,701	.93	1909.....	2,965	7,828	2.62
1902.....	39,593	45,148	1.14				

In 1895-1897 this company made large purchases at an average cost of about 40 cents a thousand. During the next 4 years the average price was about twice as great; during the 3 years following, 3 times as great; during the next 5 years, 5 times as great. Moreover, the real increase was greater than this, because the timber obtained by the earlier purchases was much more than was shown in the estimates; the estimates of the earlier years were exceptionally "conservative."

The State of Minnesota has for many years kept a record of the amount of timber sold from State lands, the total price received, and the average price per thousand feet. These average prices from 1880 to 1909 have been as follows:

Year.	Average price per M feet.	Year.	Average price per M feet.	Year.	Average price per M feet.
1880.....	\$1.47	1890.....	\$2.25	1900.....	\$5.17
1881.....	1.62	1891.....	2.14	1901.....	5.93
1882.....	1.57	1892.....	1.89	1902.....	8.38
1883.....	1.77	1893.....	1.83	1903.....	6.02
1884.....	2.11	1894.....	1.80	1904.....	7.71
1885.....	1.73	1895.....	2.18	1905.....	7.18
1886.....	2.19	1896.....	2.06	1906.....	9.00
1887.....	2.35	1897.....	2.52	1907.....	7.83
1888.....	2.54	1898.....	2.86	1908 ¹.....	.....
1889.....	2.18	1899.....	2.64	1909.....	7.53

¹ No sales.

This table does not show the full increase of values, because the timber sold in successive years has been more and more remote. The offerings of 1907 could not have been sold in 1880 for anything like the price of the actual sales of 1880. Part of the decline from 1906 to 1909 was due to the increasing remoteness of the timber.

While it is exceedingly difficult to reach even rough conclusions from specific instances, owing to the peculiar influences which may have explained a particular rise in value, in a general way it may be said that stumpage values in the Southern Pine Region increased anywhere from threefold to tenfold during the 10-year period 1898-1908. The advance in the Pacific-Northwest may be roughly stated as about the same, although there were a very great number of instances of more marked advances in value in this region. A great deal of timber in the Pacific-Northwest which to-day has a high value had little more than a nominal value in the late nineties. In the Lake Region the advance has been rather less, say, in general, from twofold to fivefold.

CONCENTRATION OF THE OWNERSHIP OF LAND.

The facts here outlined with respect to concentration of timber ownership involve another problem of possibly even greater magnitude, namely, the ownership of the land itself. After all the timber has been cut from the great private holdings the value of the land alone will be enormous. Much of this cut-over land may be best adapted for new growth, in which case there may be a continuing concentration of timber ownership. A large part of the land, however, will be exceedingly valuable for agricultural purposes. Another important feature in connection with some of the land is the possibility of great wealth in minerals, oil, and gas (although under the terms of the grants mineral lands, except iron and coal, were excluded).

The original Federal grants to the Northern Pacific and to the railroads of the present Union Pacific-Southern Pacific system alone amounted to more than 90,000,000 acres of land; a small empire in itself. Of this, nearly 69,000,000 acres has already been patented and most of the remainder will ultimately be obtained. Much of the land received has, of course, been sold. The Weyerhaeuser Timber Company now owns 1,945,000 acres of land. In Florida 182 holders have 16,990,000 acres of land, of which 4,200,000 acres are owned by only 3 holders. Finally, the timber holdings of the 1,802 holders having each more than 60 million board feet in the investigation area involve 79,092,000 acres of timberland. Practically all that portion of this acreage which lies in the Pacific-Northwest, and, with comparatively unimportant exceptions, all that in the Lake States, is owned in fee. In the Southern Pine Region a considerable proportion is owned by these holders as timber rights; that is, they do not own the land, but have a certain period of years in which to remove the timber. In addition to the above acreage, these holders own in fee 10,652,000 acres of land which lies in the timber sections of the investigation area, but which does not now bear merchantable

timber. It is important to note that this figure does not include millions of acres of Northern Pacific and Southern Pacific lands in nontimbered areas. (See pp. 233-236.)

The possibilities of power involved in such a concentration of land ownership, irrespective of the timber, hardly require discussion. The danger of abuse of that power, in the absence of restrictive regulations, is obvious. This danger, moreover, is greatly increased because a few of the largest owners of this land also occupy dominating positions in railroad transportation over great sections of the country.

CHAPTER I.

INTRODUCTION.

Section 1. Importance of the lumber industry.

The total amount of standing timber in continental United States suitable for the manufacture of lumber under present standards in the industry is about 2,800 billion (2,800,000,000,000) board feet, of which about 2,200 billion, or 78 per cent, is privately owned. The statistics of quantity in this Part may be taken as of January 1, 1911, and the text is written as of that date.

The figures given are on mill-output basis and not log scale. A further explanation of the basis of this total of 2,800 billion feet is given on page 65.

The unit of measure of lumber and of the saw timber from which it is made is the board foot. This unit is commonly spoken of as 1 foot square and 1 inch thick. The board foot is so small a unit that price quotations are by the "thousand feet." A large part of the output of lumber is sawed "scant;" that is, of somewhat less than its nominal thickness. Such customs do not, however, affect the estimating of logs or timber. This is a determination, according to conventional rules, of the number of board feet of lumber 1 inch thick which the logs or the timber may be expected to produce. It is not a determination of cubic contents.

The present commercial value of the privately owned standing timber in the country, not including the value of the land, is estimated (though such an estimate must be very rough) as at least \$6,000,000,000. Ultimately, the consuming public undoubtedly will have to pay such prices for lumber as will give this timber a far greater value.

The Bureau of the Census reports the output of lumber by sawmills during 1909 as 44,509,761,000 board feet. So far as this figure may be in error, it is probably less than the true amount. Furthermore, there is some consumption of saw timber besides that cut by sawmills. The Forest Service estimates that the yearly drain on the saw timber of the country is about 50 billion board feet. The value at the mill of the lumber, lath, and shingles produced in the year 1909, according to the Census, was about \$725,000,000.

Section 2. Scope of the report and special principles involved.

This Part of the report on the lumber industry treats of the amount of merchantable saw timber now standing in the country, the concentration in the ownership of it, and the rapid increase in its value. It also takes up the enormous Federal land grants, especially to railroads, which have been the most important factor in bringing about existing concentration in ownership. Subsequent Parts will present ownership maps and detailed discussions of the concentration in the ownership of standing timber in certain large areas in southwestern Washington, western Oregon, northeastern California, the California redwood belt, north central Idaho, west central Louisiana, the Upper Peninsula of Michigan, and Florida. A marked concentration of land ownership in certain timber regions will also be brought out by this discussion. Also, as an illustration of the ways in which great forest areas have been transferred from the Government to large private holders, it is intended to present maps showing the present ownership of lands eliminated from the forest reserve in the Olympic Peninsula of Washington in 1900 and 1901 and the unwarrantable methods by which that elimination was accomplished. Other parts will deal with the price of lumber, the cost of manufacturing lumber from standing timber, and the competitive conditions in the marketing of lumber.

The trees of the forest are the raw material for the manufacture of lumber. In the trade, standing timber suitable for sawing into lumber is called "stumpage."

The forests of the country, public and private, now contain an amount of merchantable saw timber equal to about fifty-five years' supply at the rate of the present annual consumption. Practically all this, and practically all the timber used up to the present time, has grown without the aid of man. In the course of time, labor and capital will be used to grow trees; but even a period of thirty years would suffice to grow only timber of low quality, and to grow trees of some species as good as those now being used is utterly out of the question commercially, because of the long period required.

In the virgin forest the stand does not increase; growth is balanced by decay. Here and there the timber has been destroyed by windstorms or by fires. Where sufficient time has elapsed, some of these gaps have been so refilled that they can hardly be distinguished from the uninjured forest, and in others reforestation is now going on. In some parts the land cut over by the sawmills and left to the forces of nature is growing another stand of the same species; in other parts the second growth is of inferior species, sometimes unfit for sawing. But the total annual increment to the forest through growth of immature timber in the original forest and of new stands on the cut-over land is only a small part of the annual cut; the Forest Service

has estimated it at about one-third. On the other hand, the annual consumption of timber products has steadily increased, except in years of financial depression. The supply of timber available for the future is therefore decreasing year by year, and as a result the value of it steadily increases.

Standing timber, by reason of its character as a free gift of nature, its limited quantity, and the very long time necessary for its reproduction, has been up to the present and will be for a long time to come a natural resource of much the same character as coal, iron ore, or any raw material which man can not increase. Its market value is rapidly rising and must continue to rise. Here are conditions favoring a commercial monopoly.

A distinguishing characteristic of standing timber, as contrasted with such natural resources as iron ore, coal, or petroleum, is that no labor is required to discover it. Minerals are hidden in the earth, and so long as they remain hidden society can derive no benefit from them. Timber is conspicuous upon the surface, and could never fail of being turned to account for lack of knowledge of its existence. The search for most minerals is a real public service, whereas in the case of timber no public service of this sort is rendered. The gains derived from the mere holding of timber, therefore, are not properly to be judged by the same criterion as those derived from mining enterprises.

The processes of lumber manufacture are simple and well known, and the investment in even a first-class plant is comparatively small. It is the control of the standing timber that carries with it, as is more fully shown in section 6, the control of the lumber industry. In an investigation of the industry the amount and ownership of the standing timber become the central question.

Section 3. Economies of large plants not the basis for control of the lumber business.

The manufacture of lumber is clearly a business in which a monopoly or concentrated control can not be due to any economies arising from large-scale production at enormous plants. As described in section 4, the nature of the sawmill business makes the output of the largest mill very small compared with the total of the country. To extend beyond one mill is merely to build another a long distance away in some other tract of timber without any manufacturing advantages because of the two. Large sawmill companies own each a number of mills, and many of these companies are closely related. But final control of the lumber industry, as shown in section 6, must be based on the ownership of the timber; consequently the Bureau did not investigate the ownership and output of sawmills.

The size and geographical distribution of sawmills is shown sufficiently by the census report. The Census, however, gives no information regarding concentration in the ownership of sawmills; each mill being counted separately even though many be owned by the same company. Table 1 shows the number of active sawmills in continental United States grouped according to the amount of lumber sawed by the mills in each group during 1909.

TABLE 1.—NUMBER OF SAWMILLS AND OUTPUT OF LUMBER, GROUPED ACCORDING TO OUTPUT OF EACH MILL: 1909.

Group containing mills each cutting—	Mills.	Cut of lumber (M. feet).	Per cent of mills in each group.	Per cent of cut in each group.
Total.....	46,584	44,509,761	100.0	100.0
Less than 50 M. feet.....	4,543	124,966	9.7	.3
50-500 M. feet.....	26,459	5,582,738	61.1	12.6
500-1,000 M. feet.....	6,468	4,315,636	13.9	9.7
1,000-2,500 M. feet.....	4,198	5,996,043	9.0	13.5
2,500-5,000 M. feet.....	1,245	4,072,549	2.7	9.1
5,000-10,000 M. feet.....	783	5,291,606	1.7	11.9
10,000-15,000 M. feet.....	338	4,078,988	.7	9.2
15,000-25,000 M. feet.....	329	6,308,819	.7	14.2
25,000-50,000 M. feet.....	185	6,238,229	.4	14.0
50,000 M. feet and over.....	36	2,500,187	.1	5.6

The largest sawmill in the United States cuts less than one-half of 1 per cent of the total output; only one-fifth of the total cut is sawed by the 221 mills sawing each not less than 25,000,000 board feet (a minimum which is about one-twentieth of 1 per cent of the annual output of the industry). These data on the size of sawmills are sufficient to show that concentration of the lumber industry does not arise from economies possible only in plants of great size.

From Table 1 it will be noticed that the number of very small mills is great, but their output is relatively unimportant. The 33,002 mills in the first two groups are seven-tenths of the total number of mills but furnish only about one-eighth of the total cut, while the 550 mills in the last three groups are only one eighty-fifth of the number and furnish one-third of the total cut.

It should be noted, as stated above before the table, that these figures from the Census are for the number of separate plants and not the number of separate interests in the sawmill business.

Tables shown on pages 278 and 279 present for each State data corresponding to those shown in Table 1 for the United States.

Section 4. Relation of a sawmill to its supply of timber.

Portable mills and small stationary mills are moved about from place to place and thus saw up small tracts of timber on the ground.

But mills large enough to operate to the best advantage in the virgin forest under present conditions can not be moved without a loss of the greater part of the investment; consequently, these mills as a rule have logs delivered at one place until the exhaustion of the available timber ends their usefulness.

Logs and lumber are so bulky and heavy in proportion to their value that the facilities for transportation are of primary importance in shaping the conditions in the industry. A large part of the log is waste, and consequently there is great saving in sawing it into lumber comparatively near to its point of origin. In a few localities, such as the Upper Mississippi River region in earlier days and the Puget Sound region to-day, a large amount of timber stands close to cheap water transportation. In such localities, timber in comparatively small tracts may be cheaply logged and transported to any one of a considerable number of mills distributed along the water front; and, therefore, owners of such tracts can sell logs in the market, and the mills can buy current supplies of logs in the water or can buy isolated tracts of timber tributary thereto. But elsewhere either a small mill must be moved from tract to tract or the logs must be transported a long distance by land to a large mill. Under present conditions, it is impossible for a small mill to work far from a railroad, and sell in the general market, because of the expense of hauling out the lumber by wagon. In logging for a large mill, a low cost can be reached only by having a fairly compact tract of timber and building logging railroads through it. Under present conditions, it does not generally pay to build a large mill unless to cut a tract of timber already in possession.¹ The size of the mill is fixed with regard to the quantity of timber available, and is usually made small enough to give a probable life of at least 15 or 20 years, within which the cost of mill and logging outfit, less the removal value, may be written off. After a sawmill is once built some small tracts of timber will usually be tributary to it, and by buying these the life of the mill may be prolonged. Sometimes the cost of shipping logs even so far as 50 or 75 miles may be less than the loss involved in moving or abandoning the mill.

If there were any great gain in concentrating the manufacture of lumber, the cost of transporting the logs even longer distances might be overcome. But there is no such great gain. To enlarge a mill beyond a capacity of 20 or 25 million feet a year is to duplicate mechanical units, with small or doubtful advantage in manufacture, and with certain disadvantage in the cost of transporting logs. It is a matter of dispute among lumbermen whether a mill of 20 million

¹ But see pp. 179-180, where it is shown that this is due to the system of timber ownership itself, and not to conditions inherent in logging and manufacturing.

feet capacity, under the usual conditions of transportation in the southern pine territory, is not more economical than a larger one.

The conditions of the industry tend to keep the bulk of the production in plants of moderate size, say under 25,000,000 feet a year. If a single interest wishes to cut a large amount of timber, it is apt to build two or half a dozen mills, rather than one of extraordinary size. Except in the few localities where cheap and extensive water transportation makes it possible to establish a market for logs, large mills have followed large holdings; the large holdings have not arisen from any advantage of large mills.

The interest on the present value of a supply of standing timber for such a period as twenty or thirty years would be prohibitive, of course, were it not for the rapidly rising value of the standing timber itself. For many years the value of timber has been rising rapidly, so that it has been highly profitable to hold mature timber merely for the increase in price. As a result, capitalists have invested in large holdings of timber. Given the large holding, a rather large mill has apparently some advantage over several small ones of the same total capacity.

Practically all large manufacturers of lumber are large owners of timber. But owing to the profit in merely holding timber, many of the largest holders in the country manufacture either no lumber or an amount in no way commensurate with the amount of timber they own.

Section 5. Distribution of lumber.

A large proportion of the lumber produced—estimated by some as high as one-third for the virgin yellow pine—is sold by the manufacturers direct to large consumers, such as railroads, manufacturers of railroad equipment, and those engaged in the construction of buildings, bridges, and other structures requiring material in large quantities. The rest of the output is sold to wholesalers, brokers, and retailers; for the most part direct from the manufacturer to the retail yards. Many of the large manufacturers are retailers, either directly or indirectly through subsidiary corporations. Some manufacturers own as many as one hundred retail yards scattered through their marketing territory. A company owning many retail yards is called in the trade a "line-yard" company.

The sawmill operator thus acts in three or four capacities: First, owner of the raw material; second, manufacturer; third, wholesale distributor; fourth, retailer.

Effective restraint of trade in distribution of lumber might have arisen from discriminations in freight rates, because of the great weight of lumber in proportion to its value and the consequent im-

portance of any difference in transportation facilities; but any discriminations in freight charges that may have been made were not of such a character as to establish an effective control of the general market by a few favored corporations.

A comparatively small number of retailers handle the trade of a large city, and in the small centers of population there are only one or two retailers. Among such a small number of dealers an arrangement may arise at any time for an effective control, within certain limitations, of prices in the city and its neighborhood. Manufacturers who have many line yards have a strong motive for fostering such local arrangements. The restriction of competition in the retail trade, through the arrangement of prices by local dealers and the division of territory between distributing points, appears in all degrees. Conditions range from total absence of agreement to practically complete pooling, according to local trade conditions, the disposition of the local dealers, and the vigilance of prosecuting officers.

Whatever the conditions in the retail lumber trade, they are connected with conditions in manufacturing only so far as the manufacturers own the retail yards or cooperate with the retailers in establishing trade conditions. In both these ways, however, the manufacturers are to-day a powerful factor in the retail trade over a large part of the country.

Section 6. Excessive profits and power of combination rest on ownership of standing timber.

As shown in section 3, the manufacturing plants are relatively small, and the number of them is correspondingly great. The figures given represent the number of plants and not the number of separate manufacturers. The number of sawmills which single interests may own or control is not shown by the Bureau of the Census, and the question has not been investigated by the Bureau of Corporations because the investigation of the control of standing timber covers the fundamental fact from which the operation of a number of sawmills by the same interest arises. As the economically effective manufacturing plant is relatively small in size and in investment, and as there are no special circumstances in the mere manufacture of lumber from which a combination could easily arise, it follows that any effective combination must rest on some other basis than the merely technical conditions of manufacturing. If there is any condition in the industry to prevent the introduction of competition, that condition becomes the basis upon which those controlling it may combine. Such a potential condition is present in the ownership of the timber. Those who control the standing timber can control the manufacture of lumber; any permanently effective combination in

the manufacture of lumber or in the wholesale trade must almost certainly be a combination among timber owners; and to them will go any increase of profit which such a combination may secure.

The importance of control of standing timber is recognized by manufacturers themselves in the common saying, heard even among those who have made fortunes in the lumber industry, that there is no profit in the sawmill, that the profit is in the timber.

Mr. C. A. Smith, of Minneapolis, owner of great tracts of timber in Minnesota and on the Pacific coast, was quoted by a lumber paper in 1910 as speaking of "a mistaken belief that the manufacture of lumber is a profitable business," and adding, "the wealth of the lumberman has been made by an increase in the value of his timberlands.¹

Mr. W. I. Ewart, of Seattle, in an address before the Pacific Coast Lumber Manufacturers' Association at Tacoma, August 25, 1905, said:

The actual fact is that the manufacture of lumber in itself has never paid a very large profit; the fortunes which have been amassed by the lumber manufacturer have almost invariably resulted from enhanced values on reserve timberland holdings.

One of the largest timber-owning interests in the country says in its instructions for the preparation of the annual reports for its mills: "Stumpage will be credited as high as the business of the year will reasonably warrant."

The price of timber, like that of any other natural resource, is determined not by cost of production but by the market supply and the market demand. The market demand depends on the desires of consumers. The market supply is the amount the owners offer for sale.

A monopoly price may be exacted for a commodity of limited supply if a comparatively few individuals and corporations own enough to control the market. If the supply of such a commodity is known to be decreasing rapidly, as is actually the case with timber, much of the effect of a commercial monopoly may be produced even though the owners be somewhat numerous and even though no close or formal agreement exist among them. The persons who deal in timber know that its price has risen fast, and they expect that this rise will continue. If much of the supply is in strong hands, able and willing to wait, each will value his timber according to his opinion of the gain to be got by holding it. The strong hands will hold their timber off the market; and though there may be no actual commercial monopoly or combination, the course of prices may be much the same as if there were. As prices go up, the question becomes increasingly

¹ American Lumberman, Nov. 12, 1910, p. 79.

important whether timber owners, merely as such, are obtaining extraordinary profits without rendering any corresponding public service. There is the further question whether existing conditions are likely to give rise to a more complete combination of interests owning a large part of the forests, and to a consequent increase of their excessive profits. This Part shows the control of standing timber already accomplished by a relatively few owners; large-scale mergers of some of these great holdings have at times been planned, as in redwood, in cypress, and in southwestern yellow pine. A subsequent Part of this report, on competitive conditions, will further develop this subject in connection with less direct means of restricting competition.

If the price of lumber can be advanced by the manufacturer, it simply means a higher price for his timber. On a rapidly rising market, the price of timber does not keep pace with the price of lumber, and some extra profit goes to the manufacturer as such. The rise is soon reflected, however, in the price of timber. Speaking broadly, it may be said that the price of timber tends never to fall. A fall in the price of lumber is believed to be only temporary, and the strong timber owner therefore awaits the future profit. Any temporary recession of lumber prices appears as a deduction from the profits of manufacture and is balanced by the excessive profit made on a rapidly rising market. Thus during the boom years ending in the latter part of 1907, the manufacturer as such made high profits, for the price of lumber was considerably in advance of the price of timber. Timber did advance considerably, however, and during the business depression which began toward the close of 1907 there was much complaint that the manufacturers were losing money, because speaking generally timber prices did not fall, and the cost of manufacture was reckoned as including the timber prices established during the preceding boom in the market. Any manufacturer who had bought timber at those prices may have suffered an actual loss, through cutting timber when the margin left for it from the price of lumber was less than the price paid; but nearly all the mills of any importance were cutting timber which they had bought years before at low prices, and were losing only in the sense of making less than the boom had led them to expect.

That great profits should be made by artificially withholding a commodity from use is economically wrong; but such a withholding of the timber, for the very purpose of raising prices and increasing their own gains, is precisely the policy that the great timber owners are proposing. This is illustrated in the following statement by Mr. Leonard Bronson, manager of the National Lumber Manufacturers' Association, which has as its members thirteen associations of manu-

factors covering most of the important mills of the country. Mr. Bronson's statement was made in August, 1910, before a meeting of lumbermen on the Pacific coast, a region in which there has been an exceedingly rapid rise in the price of standing timber:

If I had my way it would be a crime to open another saw or shingle mill on the Pacific coast. There now are 50 per cent more shingle mills than there should be, and the lumber manufacturers here will not have things their own way until the supply of yellow pine is exhausted, which will not be for another decade. At the end of that time the entire United States will look to the Pacific slope for its lumber supply.

The day of cheap lumber is passing, and soon will be gone, but the men who make the money will be those who own timber and can hold it until the supply in other parts of the country is gone. Then they can ask and get their own price.¹

Mr. Edward Hines, president of the National Lumber Manufacturers' Association, made the following statement in July, 1910, before the semiannual meeting of the Yellow Pine Manufacturers' Association, which is a member of the National:

I feel, as far as the Yellow Pine Manufacturers' Association is concerned, you have practically got this situation in your own hands. I think it is up to you, gentlemen, to, in a measure, regulate the lumber prices from Kansas City to the Atlantic coast absolutely.²

That the members of the Yellow Pine Manufacturers' Association have practically got the situation in their own hands, and that it is "up to" them "to, in a measure, regulate the lumber prices," means the same as Mr. Bronson's suggestion; namely, that they can raise the price of lumber, and so increase their gains from their timber holdings, by restricting lumber production. The same idea is brought out in the following statement made at the annual meeting of the National Lumber Manufacturers' Association in April, 1910, by Mr. J. L. Thompson, president of the Yellow Pine Manufacturers' Association:

Recently we had a little meeting over at Memphis. We had 70 billion feet in a room about the size of this room here. We all realized that there was only one evil. We took a vote on what was the cause of our troubles—"overproduction." Every solitary man agreed on that, and everybody was willing to suggest a remedy; everybody knew what the remedy was.³

¹ Mississippi Valley Lumberman, Aug. 12, 1910, p. 33, column 3.

² Official Proceedings of the Fifth Semiannual Meeting of the Yellow Pine Manufacturers' Association, p. 9. Also, American Lumberman, July 23, 1910, p. 56, column 2.

³ Official Report Eighth Annual Meeting of the National Lumber Manufacturers' Association, held in New Orleans, La., Apr. 19 and 20, 1910, p. 126. Also, American Lumberman, Apr. 30, 1910, p. 44, column 3.

"Overproduction" evidently means that the current cut of lumber, and the resulting prices, were such that the owners were not getting so much as they desired for their standing timber, though the value of standing timber had doubled, trebled, or quadrupled, in 10 years or in less. The remedy which everybody was willing to suggest is obviously the policy advocated by Mr. Bronson and Mr. Hines—restriction of lumber production.

Mr. Thompson recognized that the power of a given set of men to restrict lumber production, and so to raise lumber prices, is not in proportion to the amount of lumber that they cut, but in proportion to the amount of standing timber that they control. He measured the weight of men in this connection, not by their importance as manufacturers, but by their importance as timber owners. "We had 70 billion feet;" that is, the owners of 70 billion feet of standing timber.

Therefore, in any consideration of what tendencies exist toward a unified control of the lumber business, the fundamental point is the extent of the tendency toward a unified control of the standing timber. Any combination elsewhere would be wholly under the dominion of a combination here, and if the timber were controlled it probably would be a matter of subordinate consequence how many separate interests might divide the manufacture and the distribution of the lumber.

Section 7. Necessity of a comprehensive investigation.

Previous to the present investigation the Government and the public had no data regarding the degree of concentration in the ownership of the standing timber of the country. The individual facts, particularly the relations of nominally distinct owners, individual and corporate, are of such a character that only an incisive investigation gets them; and nothing short of a very systematic and thorough handling of the detailed information gives a conclusive presentation of the general conditions. Absolutely no such inquiry had ever been attempted.

In determining the degree of concentration it was necessary to ascertain the amount owned by each large holder and also the total owned by all holders.

The total amount of standing timber in the country, even without regard to ownership, had never been made the subject of a serious and detailed inquiry. Prior to the present investigation, nothing like a census of timber had ever been taken for any considerable part of the timber area. Such detailed data as the Bureau of the Census had gathered had related only to timber reported by sawmills. Excepting a few areas, all inquiries made by the Government regarding the amount of privately owned timber had been fragmentary and admit-

tedly of little value, and the general estimates made by Government bureaus and by private individuals were based on the roughest calculations. Consequently, there was great uncertainty and difference of opinion regarding the available supply.

This question is very important, entirely apart from the need of the data in connection with the investigation of the industry by the Bureau of Corporations. The public needs the information in determining its policy toward the national forests and toward the private holdings. The lumbermen have urged the Government to make an investigation of the total amount of timber for the guidance it would give the private owners in the management of their properties.

In May, 1907, the National Lumber Manufacturers' Association passed a resolution stating that "in view of our rapidly decreasing forest resources, it is of the greatest importance that an accurate determination be made of the kind and quantity of standing timber in the United States in order to secure a sound basis for plans for forest management and utilization,"¹ and requesting that this work be undertaken by the Forest Service and the Bureau of the Census. Other lumber associations passed similar resolutions. In January, 1908, at the hearing on the subject before the House Committee on the Census, the Forester and the Director of the Census asked for \$250,000 for the work. At the same hearing Mr. George K. Smith, secretary of the National and also secretary of the Yellow Pine Manufacturers' Association, urged that the work be undertaken, and, in the course of his statement, said:

The manufacturers of lumber have had this matter on their mind for a great many years. Four years ago, when we came here to the large forestry congress that was being held, the question was started, and we have been agitating it ever since.²

In Forest Service circular 97, issued April 24, 1907, and entitled "The Timber Supply of the United States," the estimates of the total timber made since 1880 are discussed as follows:

It must be said at the outset that no authoritative estimate can be made at the present time, since the magnitude of the task and the many difficulties involved have hitherto prevented the gathering of the necessary data.

* * * * *

The principal estimates of the stumpage of the United States which have been made since 1880 are given in Table 4.³ The first is that presented by Sargent in Volume IX of the Tenth Census. This estimate, in addition to being too low for almost every species considered, with the possible exception of the hardwoods, is notable for its omission of the timber which exists to-day in greater quantity than any other—Douglas fir—and also for the

¹ Hearings before the Committee on the Census, House of Representatives, 1st session, 60th Congress, p. 4.

² *Ibid.*, p. 26.

³ Here printed on pp. 43 and 44.

omission of western yellow pine, another important species. The next estimate is that of Hotchkiss, published in his "Lumber and Forest History of the Northwest" in 1898. He does not go into details, but simply estimates that the total stumpage is 1,400 billion feet, of which the Northern States have 100 billion, the Southern States 300 billion, and the Pacific States 1,000 billion feet. Next are the estimates prepared by Gannett and published by the Twelfth Census in Bulletin 203. These are the most carefully prepared estimates yet made and have been widely quoted. In addition to bringing the figures for several species up more nearly to the probable stand, these estimates also cover Douglas fir, western yellow pine, and sugar pine, which were omitted in the census of 1880. The next estimate is the one made by Fernow in 1902 and published in his "Economics of Forestry." Like that of Hotchkiss, this is also a regional estimate, the stumpage of the Northern States being placed at 500 billion feet, that of the Southern States at 700 billion, and that of the Western States at 800 billion, a total of 2,000 billion feet and the highest of any given in the table. It may be noted in passing that in a previous estimate published in 1896, in Circular No. 11 of the Division of Forestry, Fernow placed the total stumpage of the country at 2,300 billion feet, which, upon further consideration, he evidently considered too high. At the thirteenth annual meeting of the Southern Lumber Manufacturers' Association, in New Orleans, January, 1903, R. A. Long read a paper upon "Stumpage," in which the figures given in the fifth column of Table 4 were presented. Long's estimate does not cover cypress, sugar pine, or hardwoods. Its principal point of interest is that it differs so radically—about 38 per cent—from that of the census of 1900 upon the stumpage of southern yellow pine. The last estimate given in the table is that published in the American Lumberman, September 23, 1905. It is based primarily upon census data, with the addition of some species and with increased figures for others.

ESTIMATES OF STUMPAGE OF THE UNITED STATES.

[NOTE BY BUREAU.—These estimates were made prior to the present investigation.]

Kind of timber.	Census, 1880.	Hotchkiss, 1898.	Census, 1900.	Fernow, 1902.	Long, 1903.	American Lumberman, 1905.
White pine.....	<i>M board ft.</i> 87,755,000	<i>M board ft.</i>	<i>M board ft.</i> 50,000,000	<i>M board ft.</i>	<i>M board ft.</i> 60,000,000	<i>M board ft.</i>
Eastern and northern pine.	.....	.....	.....	.....	.....	55,000,000
Southern yellow pine.....	237,141,500	.....	300,000,000	.....	187,250,000	300,000,000
Eastern spruce.....	12,265,000	.....	50,000,000	.....	18,221,000	75,000,000
Eastern hemlock.....	20,165,000	.....	100,000,000	.....	56,571,000	100,000,000
Douglas fir.....	.....	.....	300,000,000	.....	260,000,000	350,000,000
Western yellow pine.....	.....	.....	125,000,000	.....	138,000,000	250,000,000
Cypress.....	12,153,600	.....	65,000,000	.....	.....	65,000,000
Redwood.....	26,825,000	.....	75,000,000	.....	75,000,000	75,000,000

1 Florida and Alabama only.

ESTIMATES OF STUMPAGE OF THE UNITED STATES—Continued.

Kind of timber.	Census, 1880.	Hotchkiss, 1898.	Census, 1900.	Fernow, 1902.	Long, 1903.	American Lumberman, 1905.
	<i>M board ft.</i>	<i>M board ft.</i>	<i>M board ft.</i>	<i>M board ft.</i>	<i>M board ft.</i>	<i>M board ft.</i>
Cedar.....	21,800,000				27,640,000	50,000,000
Sugar pine.....			25,000,000			250,000,000
Other conifers.....	12,500,000					
Total conifers.....						
Pines.....	420,605,100		1,090,000,000			1,570,000,000
Fir.....	435,685,000		300,000,000		822,682,000	400,000,000
Total hardwoods.....						
Region:						
Northern States.....		100,000,000		500,000,000		
Southern States.....		300,000,000		700,000,000		
Western States.....				800,000,000		
Pacific States.....		1,000,000,000				
Total.....	856,260,100	1,400,000,000	1,390,000,000	2,000,000,000	822,682,000	1,970,000,000

* * * * *

It should be remembered in comparing the estimates of 1880 with recent ones that the total cut since 1880 has been over 700 billion feet, of which at least 500 billion feet have been conifers, or 80 billion feet more than the total coniferous stumpage covered by the census of 1880.

The Twelfth Census (1900) gathered no data regarding the amount of standing timber except that reported by sawmills as owned by them. No special effort was made to verify or correct the returns, and the experience of the Bureau of Corporations has shown that such effort is absolutely necessary for reasonably accurate results. Furthermore, the timber owned by a sawmill company may be only a fraction of the timber owned by the same interest. For instance, the Weyerhaeuser Lumber Company operates a sawmill, but owns very little timber; while all its capital stock is owned by the Weyerhaeuser Timber Company, the second largest holder of timber in the United States, which saws no lumber. The total amount of timber reported by the Twelfth Census as owned by sawmills was 215 billion (215,550,000,000) feet.¹ Such estimates as were made by the Twelfth Census on the total amount of standing timber were not based on statistical detail, but were simply the best opinions that could be drawn from the general information then available. The Census of Manufactures, 1905,² reports the

¹ Twelfth Census, Vol. IX, p. 828.² Part III, p. 639.

amount of timber owned by sawmills at 257 billion feet, and for some of the species gives about the same general estimate of the total in the country as appeared in the Twelfth Census. The uncertainty with which these estimates were made is shown by the following quotation from the Twelfth Census regarding cypress:

Little is known of the amount of this timber, though it is of great value. The total amount reported as owned by lumbermen [sawmills] was 6,562 million feet, and this is probably but a small fraction, probably not more than 10 per cent, of the total stand.¹

The Census of Manufactures, 1905, made exactly the same statement, except that the cypress owned by lumbermen was given at 8,847 million feet.² The estimates for cypress made by other writers through the use of these figures and the 10 per cent were far too high—the figure established by the present investigation is 40.4 billion (40,400,000,000) feet (see p. 113)—while the estimates made by the Census for other species were far too low.

In December, 1908, the Bureau of Corporations made a preliminary estimate of the total privately owned standing timber in the region investigated by it, and this figure, together with estimates by the Forest Service for the rest of the privately owned timber and that publicly owned, made a total of 2,500 billion board feet in continental United States; and this figure has since been used in Forest Service circulars and some other publications.

The estimate of the total standing timber in continental United States on January 1, 1911, made as a result of the investigation by the Bureau of Corporations, is 2,800 billion (2,800,000,000,000) board feet. Not allowing for the timber cut during the intervening years, this is more than twice the estimate shown for the Twelfth Census in the above quotation from Forest Service circular 97, and is 40 per cent above that credited to Fernow. These are the only estimates with sufficient basis to make comparison worth while.

Section 8. Nature of timber estimates.

The determination of the amount of standing timber on a given area is a matter of far greater difficulty than is likely to be assumed by persons who have not been concerned with the question. To show what the difficulties are, the methods of measuring and estimating timber must be set forth in some detail.

MEASUREMENTS OF LUMBER AND LOGS.—As already stated, measurements of lumber and timber in the United States are commonly made in terms of board feet. While 12 board feet make 1 cubic foot, a tree which contains 200 cubic feet of wood will make only a small fraction of 2,400 board feet of lumber. A large part of the wood—

¹ Vol. IX, p. 831.

² Part III, p. 643.

all the branches and the upper part of the trunk—is not suitable for lumber, and there is always some loss in the stump. But the lumber produced is far less than 12 board feet for every cubic foot of logs suitable for sawing. The slabs, removed in squaring the log, are wholly or largely wasted; the sawdust is wasted; there is a waste because of the difficulty of sawing true; and there may be further losses on account of internal defects in the log. Each of these losses varies widely. The slabs are a larger proportion of a small than of a large log, and a much larger proportion of a crooked log than of a straight one. The waste from defects depends upon the quality of the timber, and also on the size of the pieces sawed out; for a defect which is hidden in a heavy timber or even in a 3-inch plank may come to light in a board. The waste from the difficulty of accurate sawing varies with the wood, with the character of the mill, and with the skill of the sawyer. The waste from sawdust varies with the thickness of the saw and with the size of the lumber made. Some large circular saws take out a kerf three-eighths of an inch wide, or even more. Smaller ones may take one-fourth of an inch. Many band saws and gang saws work on one-eighth or little more. A few are said to cut as little as one-sixteenth.

With a saw that takes out a quarter-inch kerf, a thickness of an inch and a quarter is required for getting out a 1-inch board; one-fifth is lost in sawdust. If 2-inch plank are sawed, the waste is only one-ninth; if timbers, say 12 inches square, the kerf is unimportant.

The contents of logs are reckoned by lumbermen in board feet. For this purpose, however, the contents are not the full volume, but the quantity of lumber that a log may be expected to make. As has been shown in the preceding paragraphs, the product depends on many things besides the length and diameter of a log. At different mills, and under different circumstances, the product of exactly similar logs may vary materially; and at the same mill, and under the same circumstances, one log may produce considerably more than another whose gross cubic contents are the same. The measurement or "scaling" of logs, therefore, is not a mathematically accurate determination of their volume, but an approximate determination of the quantity of lumber they are likely to yield.

For this purpose, lumbermen commonly use a measure called a log scale or scale stick. This is a flat stick, a quarter of an inch or more in thickness and about an inch and a quarter broad. The edges are often graduated in inches. On the faces are usually six graduations, three on one and three on the other, for six lengths of logs. These graduations run lengthwise of the stick, and show the contents in board feet, at each diameter, for logs of each length. The length of a given log is first determined, usually by the eye; the stick is then laid across the small end, and the contents in board feet are read off.

The reading is supposed to give the contents of a straight, sound log; and if a log is crooked or unsound, the scaler makes a deduction according to his judgment. The measuring sticks are graduated according to tables, called log scales or log rules, which give the supposed product of logs of different diameters and lengths. Many such tables have been constructed; some from diagrams, some by mathematical formulæ, some by measurement of logs sawed and their product, and some by combinations of these methods. The Woodsman's Handbook, published as Bulletin 36 of the Forest Service, gives 44 different rules.¹ The differences among them are astonishingly wide. For a 16-foot log, 24 inches in diameter, the computed contents range from 268 board feet to 500; for a 12-foot log, 6 inches in diameter, from 3 board feet to 20.²

For a log 12 feet long and 6 inches in diameter, most rules give values ranging from 12 feet to 20. Yet the Doyle rule, which gives only 3 feet, is more widely used than any other. It is far more inaccurate for small logs than for large, yet in great areas of the country it is used for small logs only. There is another rule of long and wide acceptance, the Scribner, which gives smaller values than the Doyle for the larger diameters and much larger values for the smaller diameters. A combination of the two has been made, by taking the smaller value for each size of logs, with very few exceptions. This combination, called the Doyle-and-Scribner rule, is the scale chiefly used in many parts of the Eastern, Southern, and Middle-western States. Mills which use the Doyle or the Doyle-and-Scribner rule, and which cut small logs, often have an "overrun" of 20, 30, some-

¹ Issue of Nov. 22, 1910.

² The values of 268 feet and 500 feet for a log 16 feet long by 24 inches in diameter are given by the Cumberland River Rule and the Baughman Band Saw Rule, respectively; the values of 3 feet and 20 feet for a log 12 feet long and 6 inches in diameter by the Doyle Rule and the Square-of-three-fourths Rule, respectively. These figures, and the following statements regarding the rules named, are taken from the Woodsman's Handbook, Bulletin 36 of the Bureau of Forestry, Part I, revised edition, 1903.

The Cumberland River Rule is based upon the following formula: Deduct one-third from the diameter at the small end inside the bark to reduce the round log to square timber. Then from one side of the square thus obtained deduct one-fifth for saw kerf; multiply the remainder by the side of the square and the product will be the contents of a log 12 feet long. For logs of other lengths multiply by the length and divide by 12. (Woodsman's Handbook, pp. 49, 50.)

The Baughman Band Saw Rule was based upon diagrams drawn for logs of different sizes, and the table thus secured was corrected by the author of the rule from his experience in manufacturing lumber. (Woodsman's Handbook, p. 53.)

The Doyle Rule is used throughout the entire country and is more generally employed than any other rule. It is constructed by the following formula: Deduct 4 inches from the diameter of the log as an allowance for slab; square one-quarter of the remainder and multiply the result by the length of the log in feet. It was originally intended that in the use of this rule the average diameter of the log should be taken, but the usual custom is to measure the diameter inside the bark at the small end. (Woodsman's Handbook, p. 38.)

The Square-of-three-fourths Rule is based upon the following formula: Deduct one-fourth of the diameter at the small end of the log inside the bark for saw kerf and slab, square the remainder, multiply by the length of the log, and divide this last product by 12 for the contents in board feet. (Woodsman's Handbook, p. 51.)

times, with thin saws, of 40 or 50 per cent; that is, their actual product of lumber exceeds by so much the scale of the logs they saw.

Usually the timber owned by a sawmill will give quite uniform results when handled under the same conditions. Defects are characteristic not only of the species but also of the district where the trees grow, and by keeping records comparing the actual yield with the scale of the logs it is possible to determine the approximate relation between the two. The mill may thus compute the average overrun shown by its experience, and then reckon that its logs will in all likelihood yield approximately the same percentage above the scale.

ESTIMATING STANDING TIMBER.—It has perhaps been made clear enough that many uncertainties are involved in the scaling of logs. Even aside from the element of individual judgment, in allowing for defects, the mere application of the rules to straight and sound logs gives results which only approximate the product of the saw.

The estimating of standing timber introduces further difficulties. The ideal of accuracy, from the standpoint of the "cruiser" making the estimate, would be to reach the same result that would be reached, after the trees were felled, by the scaling of the logs. As just shown, this ideal falls far short of an accurate measure of the resultant lumber; but this very imperfect ideal is not approached in most estimates of standing timber. It can be approached by detailed calculation. Every merchantable tree can be counted, its diameter measured, and even its height. There may still be shrinkages between tree and log that can not be determined beforehand. There may be concealed hollows; in some species, as cypress, there will be many. There may be much breakage in felling; this is a heavy loss in redwood. But, waiving such points, counting and measuring are enormously expensive, and such a method is hardly ever used in practice. Even if the trees are counted, the average diameter is usually estimated by the eye, and the supposed normal content of the tree of this diameter is multiplied by the number of trees. This normal content is based on the estimator's experience or on volume tables. Even the counting of trees is not only slow and expensive, but difficult. It is hard to be sure of getting them all and counting none twice.

Often no attempt is made to count every tree, but sample plots, perhaps of an acre each, are laid off by pacing or with a surveyor's chain, and the trees on them are counted. The result is taken as the average stand on the larger area which the samples represent.

Far the commonest method of estimating, however, is simply to look the forest over, without any counting or measuring. The examination may be made with less or greater care. The cruiser may tramp back and forth on parallel paths only a few rods apart, or he may make only one trip through a strip a mile wide. He may

tramp all day without making a note, and set down at night his estimate of the area he has covered and of the whole amount of timber he has passed through.

By long experience, men learn to form judgments, by these rough methods, which, on an average, approximate fairly the scale of the logs. The general tendency is to estimate below the truth, because the estimator desires to be "safe;" that is, not to have his estimate subsequently proved too large by other cruisers or by the results at the mill. To overestimate reflects on the cruiser. The owner will not complain if the cut shows more timber than the estimate, but he will be displeased—especially if he bought on the estimate—if the cut shows less.

Moreover, an estimate which is accurate according to the customs of one time will be inaccurate according to those of another, because the standards of merchantable timber change. With higher prices for lumber, more logs are brought to the mill from the same tract and more board feet of lumber are made out of the same log, because the manufacturer is able to sell some low-grade lumber not previously marketable. Again, some species formerly regarded as worthless and not included in estimates become valuable with higher prices and increase the estimates of merchantable timber by their amount. This has been true of every timber region in the past, and as values rise and timber is cut closer in the future, estimates will rise far above those which are used to-day.

If two estimates of the same tract, made at the same time, do not differ more than 10 per cent, they agree quite as closely as can be expected. Good estimators often differ 25 per cent, and sometimes even 50 per cent. An important tract of pine in northern Minnesota was examined by three companies in 1909, with a view to purchase. One estimated it at 125,000,000 feet, and another at 135,000,000. The seller's estimate was 170,000,000, and on this basis the third company bought it. The purchase was made, however, against the opposition of a member of the buying company, who is reputed to be one of the best timbermen in Minnesota, and who estimated the tract at from 95,000,000 to 110,000,000. The accepted estimate exceeded his by more than 50 per cent, and if the mean of his figures be taken as representing his opinion the independent estimates of other prospective buyers exceeded his by 20 or 30 per cent.

The following table shows the average results, by years, of two series of estimates—first, those made by a company in the North Carolina pine region for purposes of purchase; second, those made by the State of Minnesota, on timber owned by the State, for purposes of sale. The quantities given as cut represent the scale of the logs; the quantity of lumber actually sawed was materially greater.

TABLE 2.—ESTIMATED AMOUNTS OF TIMBER ON CERTAIN TRACTS, CLASSIFIED BY YEAR OF PURCHASE, WITH THE AMOUNTS CUT THEREFROM.

Year.	Timber bought by a southern company.			Timber sold by the State of Minnesota.		
	Esti- mated.	Cut.	Cut, per cent of estimate.	Esti- mated.	Cut.	Cut, per cent of estimate.
1886.....	<i>M feet.</i>	<i>M feet.</i>		<i>M feet.</i>	<i>M feet.</i>	
1887.....	2,550	3,774	148.0	24,540	37,859	154.3
1888.....	460	1,249	271.5	40,472	34,021	84.1
1889.....	41,075	53,508	130.3	20,400	27,488	134.7
1890.....	25,648	31,718	123.7	33,040	49,952	151.2
1891.....	29,355	37,198	126.7	52,130	63,681	122.2
1892.....	4,575	5,997	131.1	78,710	176,784	224.6
1893.....	4,485	5,539	123.5	29,135	72,680	249.5
1894.....	4,550	5,497	120.6	23,795	36,791	154.6
1895.....	3,505	3,525	100.6	33,870	42,856	126.5
1896.....	24,936	23,534	94.4	27,403	41,010	149.7
1897.....	10,142	9,556	94.2	2,600	1,758	67.6
1898.....	10,085	9,917	98.3	51,322	68,598	133.7
1899.....	590	824	138.7	30,643	42,688	139.3
1900.....	1,200	1,353	112.8 (1)	4,035	3,464	86.3
1901.....	2,985	3,426	114.8	69,128	71,958	104.1
1902.....	166,141	196,605	118.3	25,400	29,565	116.4
1903.....				52,710	53,922	102.3
1904.....				70,875	82,045	115.8
1905.....				32,900	36,718	111.6
1906.....				68,078	105,970	155.7
1907.....				26,705	47,227	176.8
1908.....				22,795	27,105	118.9
1909.....						
Total.....				2,165	5,541	258.9
				822,851	1,156,701	140.9

(1) No sales.

The southern company usually paid a lump sum for a tract, and the prices it offered were fixed on the basis of its estimates. It would try to get a fair idea of the timber it was buying, but would wish to err rather on the conservative than on the liberal side. The State of Minnesota did not sell its timber at so much for a tract, but at so much a thousand, and the payments were determined by the quantity of logs scaled.

Some of the earlier purchases of the southern company stood several years between buying and cutting, and if the timber was immature the quantity may have increased somewhat by growth. This element is believed to have been of minor importance, however, and it does not enter in the case of the Minnesota timber. That was usually cut within two or three years after the estimate was made; and in any case the timber was mature, and the decay of the old trees probably balanced the growth of the young.

Under these circumstances, the scale of the logs from the Minnesota timber, taking all the sales of each year together, was usually

from 10 to 60 per cent above the estimate, with an average of 40 for the whole. The sales of 1896 cut only two-thirds of the estimate; those of 1892 and 1909 cut 2½ times the estimate.

In the case of the southern company, reckoning its purchases by annual aggregates, the purchases of most years, so far as they have been cut, have produced logs exceeding the estimates by from 10 to 40 per cent, with an average of 18 for the whole. Three years show a shortage of from 2 to 6 per cent, and one rather small lot went above 2½ times the estimate.

The variation is greater on particular tracts than on yearly aggregates. The following table shows the estimates and the scale of the logs, in detail, for the several tracts bought by the southern company in 1909:

TABLE 3.—ESTIMATED AMOUNTS OF TIMBER ON CERTAIN TRACTS, BOUGHT BY A SOUTHERN COMPANY IN 1909, AND THE AMOUNTS CUT THEREFROM.

Estimated.	Cut.	Cut, per cent of estimate.	Estimated.	Cut.	Cut, per cent of estimate.
<i>M/sect.</i> 75	<i>M/sect.</i> 80	106.7	<i>M/sect.</i> 675	<i>M/sect.</i> 443	65.6
40	35	87.5	200	161	80.5
20	15	75.0	425	500	117.6
550	1,059	192.5			
1,000	1,133	113.3	2,985	3,426	114.8

On the whole year's purchases the scale of the logs varied only 15 per cent from the estimates; but on particular tracts the result ranged from 34 per cent below the estimate to 92 per cent above.

The following table, except the percentages, is taken from the report of the Commissioner of the General Land Office for 1910, page 15. It gives the results of logging on ceded Chippewa lands in Minnesota, grouping the tracts according to date of sale. Payment is based on the amount actually cut.

TABLE 4.—ESTIMATED AMOUNTS OF TIMBER ON CERTAIN CEDED CHIPPEWA LANDS IN MINNESOTA, GROUPED BY DATE OF TIMBER SALE, WITH THE AMOUNTS CUT THEREFROM.

Date of sale.	Government estimate.	Cut.	Cut, per cent of estimate.
	<i>M/sect.</i>	<i>M/sect.</i>	
March 2, 1903.....	13,636	26,816	196.7
December 5, 1903.....	223,921	308,637	137.8
December 28, 1903.....	169,308	296,155	174.9
November 15, 1904.....	146,560	168,113	114.7
November 17, 1904.....	9,718	18,786	193.3
July 17, 1907.....	2,056	3,754	182.6
March 15, 1910.....	2,169	2,189	100.9
Total.....	557,368	824,450	145.3

On the whole quantity the log scale exceeded the estimate by 45 per cent. On the tracts sold November 17, 1904, and on those sold March 2, 1903, the log scale was nearly double the estimate.

Professional cruisers keep as well informed as possible on the relation between their estimates and the results shown in cutting the timber, and thus modify their judgment with experience. This is especially true in the first years of their work as cruisers, or when going from one timber region to another of very different character, or during periods of marked change in the standards of merchantable timber. On first going from the Lake States to the Pacific coast, cruisers made estimates far below the truth, because the stands per acre were so enormous that men accustomed to eastern stands could not grasp or accept them. It is only during recent years that estimates for western timber have been made close to the actual yield.

Section 9. Methods followed in the investigation.

In the preceding section, the effort has been made to show how far from exactness is the art of estimating timber. Even when the estimates are made with what is considered reasonable care, for the purpose of purchase or sale, they are uncertain. In naming offhand the probable contents of a tract which he has never carefully examined but has only a general knowledge of, a man will of course do worse, on an average, than in giving an estimate on a tract which he has just examined for the purpose. The most experienced lumberman can know but a comparatively small area by careful examination. When he undertakes to make a general estimate for a district, even for a few townships, he must usually depend partly on general observation and partly on the opinions of others.

Most individuals and corporations owning important tracts have had fairly good estimates of their timber made, either recently or in earlier years, and in the latter case they usually have a fairly definite opinion, based on the results of cutting or on general information, regarding the per cent by which the old estimate should be increased to make it approach present-day standards of merchantable timber. The owners of timber, cruisers, loggers, timber dealers, and the responsible employees of timber and lumber companies are often well acquainted with the approximate amount of timber in holdings other than those in which they are directly interested, and also well informed regarding the probable total amount of timber in certain survey townships or other subdivisions of a county, or in the county as a whole. Thus, there exists in the records of timber owners and in the minds of men a basis for arriving at the approximate amount of timber in a State and in the country. The accuracy of the results which may be obtained from these sources depends largely on the

willingness and truthfulness with which the informants give the information they possess, and on the perfection of the methods by which this information is gathered in detail by small areas and is studied.

The only better method would be a careful examination of the timbered area by public officers. The result would still be a collection of opinions, not of mathematical determinations; but the opinions would have more value, other things being equal, in proportion as they were based on more careful and detailed examination of the timber. By the expenditure of time and money, they might be raised to any degree of accuracy, up to the point where they should represent a count and measurement of every tree.

A count and measurement of all merchantable trees, however, or even a count without measurement, would, of course, not be thought of. Such work is so expensive that most timber is bought and sold without it; and a procedure which men can not afford to use for their guidance in buying and selling is far too expensive for any statistical inquiry. The only proposal which could be thought of would be an estimate by general observation, perhaps supplemented, where the forest was practically unbroken, with a count on sample tracts. The cost of such an estimate would vary with the minuteness of it, but the roughest canvass that would be worth making would be a matter of some millions of money and some years of time. Even if money were unlimited, it is not likely the work could be tolerably well done in ten years for lack of men. The estimating of timber is an art acquired by much practice. The men skilled in it are few, and they are employed in current business. They could hardly be diverted in the necessary numbers to an official investigation. Furthermore, such a plan would give information on the total amount of timber only and nothing regarding the ownership of it. To provide such data, it would be necessary to first obtain records of the ownership, and then to make the observations separately for each holding, which would greatly increase the expense and the time.

METHODS ADOPTED.—The problem before the Bureau of Corporations was to provide a plan which would give, within reasonable expense and time, as accurate information as the nature of the problem allowed regarding all large holdings separately, and regarding the scattered small holdings as a whole, in order to determine the proportion between the timber owned in holdings of certain specified sizes and the total timber in the country. Under the plan adopted, the investigation of the amount of timber in all small holdings proceeded side by side with the investigation of the essential facts regarding large holdings, in such a way that the latter checked and contributed to the former.

The work was guided by the following principles:

1. The available resources would not permit the employment of estimators with a view to the examination of timber. Any estimate must therefore be based on data already existing, in records or in the minds of men.
2. The estimate of the timber on each area should be derived from the records or the opinions of those most familiar with it, and as many records and opinions as possible should be obtained regarding it, in order to give a constant check on the work and to enable the Bureau to arrive at the best estimate from a thorough study of all the available evidence in detail.
3. A separate report should be made for each holding of 60 million board feet or more. Information regarding each such holding should be obtained from as many sources as possible.
4. For the total timber in holdings of less than 60 million board feet, the best local evidence must be relied on. Estimates should be obtained for the smallest possible units of area, and the opinions of each authority should have special weight for the neighborhood which he knows best.

There is no special significance in the limit of 60 million. It was necessary to waive the separate reports at about that point in order to save time.

The schedule used in reporting holdings of at least 60 million feet is shown on page 275.

The Bureau soon found that it had not money to cover the whole country. Congress made no special appropriation for the lumber investigation, and the work had to be done, along with all the other investigations of the Bureau, under the usual annual appropriation. The Bureau therefore narrowed the area to be investigated to the Pacific-Northwest, the Southern Pine Region, and the Lake States. (See sec. 10 for specific description of these regions and for the reason for their selection.)

A few reports were obtained by mail, but for nearly all owners the schedule was filled by special agents of the Bureau visiting the informants. With regard to the amount of timber, the essential items are these: The number of acres, the exact location of the land, and the detailed estimate called for under question 9 of the schedule; and all the facts, called for under question 8, which would enable the Bureau to judge the accuracy of the estimate. All States of the investigation area except Virginia, North Carolina, South Carolina, Georgia, and Texas are surveyed under the rectangular-survey system, and there it was possible to show the exact location of the timber holdings by the use of such township outlines as those printed on pages 5, 6, and 7 of the schedule. In Virginia, North Carolina,

South Carolina, Georgia, and Texas, maps or blueprints showing the exact location of the land were obtained wherever available, and other holdings were located descriptively as accurately as possible by political subdivisions of the county and by the relations of holdings to towns, railroads, streams, etc. The largest holders in these States usually have maps showing the exact location of their lands. In the rectangular-survey States, the agents did not secure the exact location in every case, and a relatively few holdings were located only by counties or as in certain survey townships; but in nearly all cases the exact location was obtained.

The first seven questions of the schedule called for general information regarding the owner and connected interests in the lumber or timber business. Question 7 covered the interrelations of timber owners through stock in corporations, and this question met persistent opposition on the part of informants. A few corporations furnished full information, but in general it must be said that this question has not been answered. For a further discussion of this point, see page 95.

Field work was begun by sending agents into the lumber centers, which are the headquarters of many of the largest owners of standing timber. The reports from them were tabulated by counties, showing for each holder in the county the number of acres, amount of timber, and stand per acre, and the land was platted on county maps with a different symbol for each holding. In the five States without the rectangular survey, the location of holdings could be shown exactly wherever blueprints or maps had been furnished, and in other cases only descriptively. With these records of information already obtained, an agent of the Bureau was sent into every one of about 900 counties in the investigation area. His instructions were to seek out every reliable local informant and secure all available information that would verify or correct the reports already obtained, to secure a separate report on each remaining holder in the county who had as much as 60 million feet in the United States, and to secure data in as much detail and from as many different sources as possible regarding the total timbered acreage and the amount of timber in all holdings not separately reported, including the small scattered tracts sometimes referred to as "farmers' woodlots." By adding the holders separately reported, as he obtained them, to the county map above mentioned, the agent was able to proceed systematically in obtaining data regarding all land within the timber line of the county. For many of the counties in the Southern Pine Region and in the Lake States it was not practicable to obtain these estimates on the timber in the county or subdivisions of it, such as survey or political townships, exclusive of the reported holdings of at least 60 million feet. In such counties it therefore became neces-

sary to secure the estimates on the total timber in the county or a subdivision of it, and then to obtain the amount in holdings of less than 60 million by subtracting the total timber reported in holdings of that amount or more. This was especially true in the five States not having the rectangular survey. But in the five States of the Pacific-Northwest, containing the great supply of timber, the estimates of the total in holdings not separately reported were obtained almost without exception by the use of maps showing the location of reported holdings. The informants, with these maps before them, made general estimates on the timberland not so platted.

All holdings of less than 60 million feet for which separate information was easily available, or which were made the subject of inquiry through belief that they might be above the limit, were separately reported, and were then tabulated and platted like the larger holdings. The proportion of the total timber in holdings of less than 60 million thus separately reported is very high in some States, and this increases the accuracy of the work.

For the timber in holdings of at least 60 million feet, the primary reliance was on the estimates of the owners or their representatives. But these estimates were not treated as necessarily conclusive. Many of them were made years ago, and omitted kinds or sizes of trees that were not then accounted merchantable, but are so accounted now. Many were admittedly only rough approximations. A very few owners, especially such as have borrowed money on their timber, were disposed to claim more than they possessed; very many holders did not wish the Bureau to know how large their holdings were. Some purposely gave erroneous information; others avoided the issue by giving access to old records which did not show the amount of timber under present standards, and withholding more recent records and facts within their personal knowledge. Agents were instructed to watch for errors from all these causes and to gather such evidence as might be available for correcting them. The owner's estimate was taken as *prima facie* evidence of the amount of his holding, but it was checked, wherever possible, with the estimates of other competent persons, such as former owners, timber estimators who had examined the tract, business associates, and others.

While the plating of the land owned by each holder and the replating of it on county maps required a great deal of time, the work was absolutely essential to the investigation. An informant who would have understated the acreage owned was deterred therefrom by having to show its location. Through the use of the plats, other men could be interviewed regarding the amount of timber on the holding or such subdivisions of it as they were familiar with.

Occasionally land not reported by the owner but otherwise indicated as owned by him could be added through further inquiry and the owner's supplemental statement. Again, the use of plats prevented duplication, and made it possible to say positively that a holding reported under one name was or was not the same, wholly or in part, as a holding reported by another agent under another name. Such duplication results from transfer of ownership during the inquiry and from occasional uncertainty on the part of local informants regarding the owner of record. An estimate on a given tract might be obtained from the corporation or individual who owned it at the time, and some months later, in another State, the estimate might be obtained from a corporation or individual who had bought the tract in the meantime.

As has been said, the field work was begun in the lumber centers, where men may be found who own timber from Florida to Washington. The agents were invariably instructed to report information from every authoritative source, on all timber wherever situated. On the holding of an Oregon corporation, for example, one estimate might be obtained from the manager at the mill, another from the treasurer at Portland, and another from the president in Wisconsin. Sometimes such estimates differed widely. There might be additional estimates from persons holding less responsible positions in the company, or wholly unconnected with it, such as cruisers who had examined the timber for the present owner or for others. In some States, notably Washington, estimates had been made by public officers for purposes of taxation, and these records were carefully considered. All the available estimates for each holding separately reported were transferred in the office from the original reports to a single tabulation sheet, so that they could be readily compared. Then the evidence was carefully weighed, with due regard to the position, means of knowledge, and apparent credibility of each informant. The estimate finally set down was a result of the consideration and balancing of testimony from many sources, often conflicting. In every case, an effort was made to arrive at the best possible judgment; but the care and time devoted to the effort were increased with the importance of the specific case.

Before determining the final estimates placed on these "company sheets" (each company sheet showing the estimates for that particular holding, by counties) preliminary tables had been prepared for each county, giving the number of acres, estimate of timber by species, and average stand per acre, for each separately reported holding in that county. These preliminary "county tables" threw much light on the estimates for particular holdings, for with the help of the county maps the average stands reported by neighboring owners could be compared with a view to detecting abnormal varia-

tions. Again, the county tables of particular holdings were a valuable aid as a check on the general estimates for the unenumerated holdings and on the total timber in the county. Over large areas, the average stand given for the holdings of less than 60 million feet was compared, township by township, with the stands reported by the separate holders above that limit.

When the data gathered by the field work had been collated in the office, agents were sent out a second time over practically all the timber area in the five States of the Pacific-Northwest, to verify and correct the results. The agents now had in their hands a digest of all reports previously made, and the conclusions reached in the office, together with a statement of the principal points on which there was uncertainty. The maps on which the separate holdings had been plotted showed how the holdings were locally related to each other; which lay side by side and which were intermingled. Sometimes the map and the tables showed that an owner's land was closely associated in location with that of others who had reported two or three times as much timber per acre. When this appeared, the agent sought for the explanation. In some cases he was satisfied that all the estimates were honestly made and reasonably accurate; in others he obtained admissions from the owners themselves, or good evidence from other sources, that some of the estimates first given were far from the truth. This second visit to the Pacific-Northwest was necessary in greater part because of the unwillingness with which many of the most important owners there had met the Bureau's request, some of them giving data which were admitted on the second visit to be incorrect; and in lesser part because of the very marked change in the standards of merchantable timber in that region. This has largely destroyed the value of the estimates made several years ago, and many of the estimates first given to the Bureau were of this kind. The aim was to get sufficient evidence to correct all estimates to an approximate agreement with present-day standards of merchantable timber.

This second period of field work in the five States of the Pacific-Northwest not only overcame these two difficulties, for the most part, but also increased the general accuracy of the work so that the data for that region are believed to be more reliable, according to current standards, than those for either the Southern Pine Region or the Lake States. In the course of the investigation, the Southern Pine Region was taken up first, then the Lake States, then the Pacific-Northwest, and after that the second visit to the last region. The methods used developed toward perfection as the work went on, and the agents became more and more experienced, and this played a very important part in overcoming the greater difficulties in the West.

ATTITUDE OF THREE LARGEST HOLDERS TOWARD BUREAU'S INQUIRY.—The three largest timber holders in the United States, in the order of size, are the Southern Pacific Company (through the Oregon and California Railroad Company and the Central Pacific Railway Company), the Weyerhaeuser Timber Company, and the Northern Pacific Railway Company. The land agent of the Northern Pacific willingly granted access to the records showing the location of the company's land and such records as he had regarding the amount of timber. He stated that the company did not have any reliable information regarding the amount of timber on its land, and this statement is believed to have been made in entire good faith. The officers of the Southern Pacific Company and of its subsidiary companies have claimed to have no information whatever regarding the amount of timber on its land, and to have only unsatisfactory records regarding the acreage and location of the land. It is believed that this company did not at any time meet the requests of the Bureau in good faith—that records and information within the personal knowledge of the officials were withheld. Delay and avoidance characterized the action of the company throughout. It furnished no information whatever regarding the amount of timber on its land. The Weyerhaeuser Timber Company furnished a satisfactory statement of the acreage and location of its land, but for its timber gave mostly old estimates made by the Northern Pacific from the eighties to 1900, before the purchase by the Weyerhaeuser Timber Company, with some more recent ones made by the company after its purchase. The Bureau did not use the estimates furnished. The old estimates were admittedly low even for the time when made, not to speak of the great change in the standards of saw timber since then, and the estimates made by the Weyerhaeuser Timber Company itself were in many cases out of date. No officer of the Weyerhaeuser Timber Company claimed that the estimates furnished were correct. The company simply furnished them as portions of its records. Urged to give access to records that would have thrown light on the error in these old estimates, on the basis of present standards, it gave the dates of such estimates as it furnished, for use in certain comparisons with county cruises, which would bear on the percentages of error in estimates made at different periods; but refused all further information on this subject. It specifically refused other more pertinent records it had, including up-to-date re-estimates on certain of its land, and refused to state the personal judgment of any of its officers or responsible employees as to the amount of its timber. As stated on page 101, the company also refused all information regarding the identity of its stockholders.

Regarding the amount of timber owned by these three companies—the Southern Pacific, the Weyerhaeuser Timber Company, and the

Northern Pacific—the Bureau sought detailed information from all available sources. The agents, with plats of the companies' land, interviewed competent informants wherever they could be found. On the Weyerhaeuser and Northern Pacific lands in the State of Washington all the available county cruises were tabulated, and the results tested and corrected by many office comparisons and field interviews. (In another Part will be given a discussion of the rather large degree of underestimating common in the official county cruises of Washington.)

In these ways reliable information regarding the timber owned by these three companies has been obtained from outside sources, and the figures are presented for each of the companies separately. The Bureau also shows for these companies separately the acreage of the land owned and the location of most of it. This information is not confidential, as it is a matter of public record either in the land-title books of the counties or in the records of the General Land Office.

Except for the three holders just mentioned, this report does not state separately the amount of timber in the large holdings, but presents them by size groups. (See p. 94.)

INCREASE MADE BY BUREAU IN ESTIMATES.—Most obtainable estimates had been made for the use of large buyers, whose first care was for a safe judgment on the value of the property. Such estimates run all the lower because in many instances the buyers have needed only rough and partial estimates to assure them that they were getting at least enough timber to make them safe at the price paid, with the probability that there was considerably more timber on the tract. This, together with the general tendency to underestimate, as stated on page 49, and the errors due to change in merchantable standards, make the available evidence show the amount of timber somewhat under the truth, and for many of the holders severally it is not possible to secure sufficient evidence to raise it to the proper basis. Furthermore, the estimates were not usually meant to give the most probable approximation to the quantity of lumber which would be produced at the mill, but only a conservative approximation to the scale of the logs. Even if the actual scale of the logs were known, the cut of the mill would almost invariably show an overrun. The question of overrun, or the excess of lumber output over log scale, has been studied in the light of the answers to question 8 on the schedule, of general interviews with the best-informed men, and of the actual records of selected sawmills scattered throughout the investigation area. When the figures had been established, on the basis of current methods of estimating standing timber, a correction was made to change them to the basis of the lumber that would

actually be sawed under present conditions in the industry. The correction was in the form of a percentage of increase, generally uniform in each State. It was determined after a careful study of all available evidence, and is probably below rather than above the truth, considering both the mill overrun and the normal conservatism of the estimates. The percentages used are, in California, 10 per cent, except redwood, for which 30 per cent was used; in Oregon, 10 per cent; in Washington, 20 per cent, except the Weyerhaeuser Timber Company and five other large holders, for which 15 per cent was used, and a seventh large holder, for which only 10 per cent was used; in Idaho and Montana, the Lake States, and the Southern Pine Region, 25 per cent. These percentages were applied to the totals for each size group, including that of the holders of less than 60 million, known in the tables as group 11; so that the correction affects only the amount of timber, and not the concentration of ownership. The relative size of the ownership groups remains the same, because the same percentage of increase was applied to all timber in each State, except in Washington, where lower rates were applied to seven large companies, because the estimates for them appeared to be on a somewhat higher basis. It is true that in each group of holders there were occasional indications that some were on a higher basis than others, and that for single holders some species were on a higher basis than others. But it did not appear that the general accuracy of the figures could be much better served than by applying the percentages uniformly to the group totals.

Only such timber as could be taken to the saw is included in the figures of this report. Such forest products as firewood, posts, and small poles are made either from trees or parts of trees not suitable for the saw, or as by-products in the manufacture of lumber. Occasionally the timber in a holding, or a part of it, would be estimated in terms of the number of ties or poles in trees which, of that species and in that region, were suitable for the saw, and in such cases these items were converted into board feet of lumber. It would be practically impossible to estimate the amount of such a product as firewood in the United States, although this might be done with reasonable accuracy in certain localities where it has a high price. For the great forest regions of the country, the amount of firewood that could be delivered in the market does not depend on the quantity in existence, but on the cost of getting it from the forest. There it is burned or rots in vast quantities; and all this wasted wood would be used if it could be transported and handled at a cost within the price which consumers could afford to pay for it.

Without question, as the price of lumber advances, a very considerable addition will be made to the supply of timber through the

lowering of standards of merchantable timber and the better use of such logs as are now saved, but there is now no basis upon which this additional amount can be approximated.

Section 10. The investigation area.

The territory covered by the present investigation is called in this report the "investigation area." The necessity of limiting the work to a selected area has already been explained (p. 54). The investigation area embraces three regions, called here "Pacific-Northwest" (California, Oregon, Washington, Idaho, and Montana), "Southern Pine Region" (specifically described below), and "Lake States" (Michigan, Wisconsin, and Minnesota).

The Pacific-Northwest and the Southern Pine Region are the two great sources of soft wood for building and construction. As a practical matter, it was relatively easy to extend the work to the Lake States and very difficult to extend it to the region from Maine to northern Georgia. This was owing to the fact that these last States do not have the rectangular survey, while the Lake States do. In the course of the work it was necessary to locate with exactness the timber covered by each report (see p. 56), and to do this on a large scale is extremely difficult where the rectangular survey does not exist. Moreover, the valuable white pine of Minnesota and the valuable hardwoods in Michigan and Wisconsin give great importance, in proportion to their supply of timber, to the Lake States.

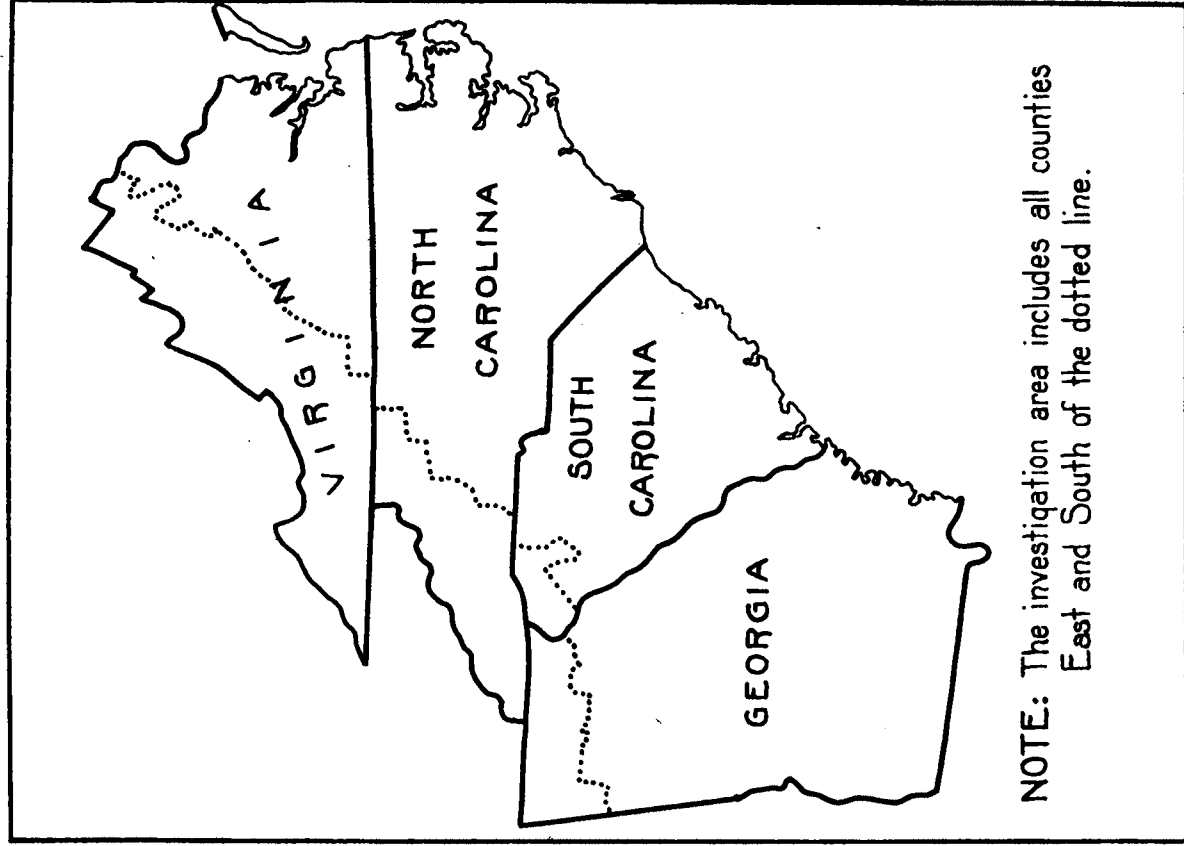
The principal soft-wood timber excluded from the investigation is the spruce, pine, and hemlock in New England, New York, and Pennsylvania; the spruce and hemlock in West Virginia; and the western pine of the southern Rocky Mountain States. An extensive hardwood region throughout the Appalachian system and west thereof to southern Illinois and the Mississippi River is also excluded.

In the Southern States, the intention was to cover primarily the pine area. Some western counties of Virginia, North Carolina, and South Carolina, and some northern counties of Georgia, all outside the pine belt, were omitted. In Texas, the inquiry was practically limited to the pine territory in the eastern part; but the rest of the State contains comparatively little valuable timber. The pine-bearing portion of Missouri is a small part of the State; and the remainder, though it contains considerable amounts of hardwoods, was not covered.

Without exception, the investigation covered all privately owned merchantable saw timber of all species in every county included in the investigation area.

The investigation area contains about four-fifths of the privately owned timber in the United States.

MAP SHOWING THE BOUNDARY OF THE INVESTIGATION AREA IN VIRGINIA, NORTH CAROLINA, SOUTH CAROLINA AND GEORGIA.



NOTE: The investigation area includes all counties East and South of the dotted line.

The Forest Service made a general estimate for all privately owned timber outside the investigation area, as stated on page 65.

EXACT AREA COVERED.—The investigation area includes all privately owned merchantable saw timber in the following States: California, Oregon, Washington, Idaho, Montana, Arkansas, Louisiana, Mississippi, Alabama, Florida, Michigan, Wisconsin, and Minnesota; and in parts of States as follows:

Missouri.—The following counties: Butler, Cape Girardeau, Carter, Douglas, Dunklin, Mississippi, New Madrid, Oregon, Ozark, Pemiscol, Reynolds, Ripley, Scott, Shannon, Stoddard, Wayne.

Texas.—The following counties: Anderson, Angelina, Bowie, Camp, Cass, Cherokee, Delta, Fannin, Franklin, Gregg, Grimes, Hardin, Harris, Harrison, Henderson, Hopkins, Houston, Hunt, Jasper, Jefferson, Kaufman, Lamar, Leon, Liberty, Marion, Montgomery, Morris, Nacogdoches, Newton, Orange, Panola, Polk, Rains, Red River, Rusk, Sabine, San Augustine, San Jacinto, Shelby, Smith, Titus, Trinity, Tyler, Upshur, Van Zandt, Walker, Waller, Wood.

Georgia.—All counties except the following: Catoosa, Chattooga, Dade, Dawson, Fannin, Floyd, Gilmer, Gordon, Habersham, Lumpkin, Murray, Pickens, Rabun, Towns, Union, Walker, White, Whitfield.

South Carolina.—All counties except the following: Greenville, Oconee, Pickens.

North Carolina.—All counties except the following: Alleghany, Ashe, Buncombe, Burke, Caldwell, Cherokee, Clay, Graham, Haywood, Henderson, Jackson, McDowell, Macon, Madison, Mitchell, Polk, Rutherford, Surry, Swain, Transylvania, Watauga, Wilkes, Yancey.

Virginia.—All counties except the following: Albemarle, Alexandria, Alleghany, Amherst, Augusta, Bath, Bedford, Bland, Botetourt, Buchanan, Carroll, Clarke, Craig, Dickenson, Fauquier, Floyd, Franklin, Frederick, Giles, Grayson, Greene, Highland, Lee, Loudoun, Madison, Montgomery, Nelson, Page, Patrick, Pulaski, Rappahannock, Roanoke, Rockbridge, Rockingham, Russell, Scott, Shenandoah, Smyth, Tazewell, Warren, Washington, Wise, Wythe.

In the stubs of the tables of the report the word "part," in parentheses, follows the name of each State not completely covered, except Texas, where the timber omitted is not of such amount and quality as to make it important.

The division line followed in Georgia, South Carolina, North Carolina, and Virginia was settled upon to include all yellow pine, and also to include all counties not then covered by the Forest Service in certain reconnaissance work in the Appalachian region.

The map opposite this page shows the exact territory covered in Georgia, South Carolina, North Carolina, and Virginia.

SPECIES.—The territories over which some of the most important species are distributed lie entirely within the investigation area, while for other species varying proportions lie outside. Practically the whole area of the following species was covered by the inquiry: Southern yellow pine, cypress, Douglas fir,¹ redwood, and sugar pine. For these species the estimates given in this report are presented as complete. They are the best estimates which the Bureau has been able to make of the whole existing stock of these species in the United States, as well as of the amounts in holdings of specified sizes. Douglas fir and southern yellow pine are now by far the most important items in the timber assets of the country. Far the greater part of the area of western pine, growing in and west of the Rocky Mountain region, was covered. There are, however, important stands of this timber in the Southern Rockies which were not reached. In white pine, spruce, and hemlock, nothing was done in West Virginia, Pennsylvania, New York, and New England, which contribute an important part of the supply. In hardwoods, the large region lying north and west of the southern pine belt was omitted.

¹ Except for relatively unimportant quantities of Douglas fir in the Rocky Mountain States south of Montana and Idaho.

CHAPTER II.

SUPPLY OF STANDING TIMBER IN THE UNITED STATES.

Section 1. Total timber in continental United States.

The amount of privately owned merchantable saw timber in the investigation area is 1,747 billion (1,747,000,000,000) board feet, distributed by regions as follows: Pacific-Northwest, 1,013 billion; Southern Pine Region, 634 billion; and the Lake States, 100 billion. The investigation area and its subdivisions are defined on pages 62 and 63. Outside this area no investigation was made, but the Forest Service, guided by information obtained through field work along other lines, and by opinions of State foresters in some of the States, has made a general estimate, without division by States or species, of 450 billion feet for all remaining privately owned saw timber. This gives a total of about 2,200 billion feet of privately owned timber in continental United States.

As shown in section 2, the Forest Service has made the following estimates for the timber not privately owned: National forests, 539 billion feet; national parks, military reservations, and unreserved public lands, 26 billion; Indian reservations, 29 billion; and State lands 35 billion; a total of 629 billion feet. These estimates added to the figures in the above paragraph give a total of about 2,800 billion board feet for all merchantable saw timber in continental United States (that is, exclusive of Alaska and the insular possessions), as follows:

TABLE 5.—TOTAL STANDING TIMBER IN CONTINENTAL UNITED STATES.

	Billion feet.
Grand total-----	2, 826
Privately owned timber-----	2, 197
In "Investigation area"-----	1, 747
Pacific-Northwest-----	1, 013
Southern Pine Region-----	634
Lake States-----	100
Outside of "Investigation area" ¹ -----	450
Total owned by Federal Government in national forests ¹ -----	539
Total otherwise owned by Federal Government, owned by States, or on Indian reservations ² -----	90

¹ Estimates furnished by Forest Service.

It should be noted that the estimate made by the Forest Service for the privately owned timber outside the investigation area is a general estimate only, and not the result of a detailed investigation.

It should also be noted that the estimate of 2,800 billion feet for continental United States is based, not on log scale, but on mill output; that is, on the amount of lumber that would be produced from this timber if cut under present standards.

As indicated on page 32, the total quantity of merchantable saw timber now standing in the country is equal to about 55 years' supply at the rate of the present annual consumption.

TOTAL TIMBER IN PACIFIC-NORTHWEST.—Of the total of 2,800 billion board feet in the country, 1,318.2 billion feet is in California, Oregon, and Washington, and 194.7 billion in Montana and Idaho, making a total of 1,512.9 billion, or 54 per cent, in the Pacific-Northwest.

The following table shows the total amount of standing timber in each of the five States of the Pacific-Northwest:

TABLE 6.—TOTAL STANDING TIMBER IN THE PACIFIC-NORTHWEST.
[In billions of board feet. Thus, 1,512.9=1,512,900,000 board feet.]

State.	Total.	Privately owned.	National forests.	All other. ¹
Pacific-Northwest.....	1,512.9	1,013.0	440.8	59.1
California.....	381.4	248.1	114.4	18.9
Oregon.....	645.8	396.1	135.8	11.9
Washington.....	391.0	294.6	81.6	14.8
Idaho.....	129.1	50.4	71.0	7.7
Montana.....	65.6	21.8	38.0	5.8

¹ Includes national parks, military reservations, unreserved public land, Indian reservations, and timber land owned by the States. (See p. 67.)

Section 2. Timber publicly owned.

While the Forest Service has estimated the timber in the national forests, this estimate is not the result of a detailed examination of the forest area. It is based on the reports of the experts in charge of the forests, who were directed to make a general examination of the forest area for the purpose in question. Also, the Forest Service has made general estimates from available information regarding the timber in national parks and military reservations and on unreserved public land.

TABLE 7.—STANDING TIMBER OWNED BY THE UNITED STATES GOVERNMENT
IN CONTINENTAL UNITED STATES, BY STATES.

[In billions of board feet. Thus, 539.0=539,000,000,000 board feet. Estimates furnished by the Forest Service.]

State.	National forests.	National parks.	Military reservations. ¹	Unreserved public lands.	Total.
Total.....	539.0	11.8	0.3	13.8	564.9
Arizona.....	24.7		.1		24.8
Arkansas.....	2.3			.6	2.9
California.....	114.4	8.0		3.2	125.6
Colorado.....	25.1			1.2	26.3
Florida.....	.1				.1
Idaho.....	71.0			2.0	73.0
Minnesota.....	1.6			.5	2.1
Montana.....	38.0	1.1		1.2	40.3
Nevada.....	1.6			.1	1.7
New Mexico.....	16.4			.8	17.2
Oregon.....	135.8	.5		2.5	138.8
South Dakota.....	4.9			.4	5.3
Utah.....	8.4			.3	8.7
Washington.....	81.6	1.5	.1	.7	83.9
Wyoming.....	13.0	.7			13.8
Other States.....	.1			.3	.4

¹ Estimates for military reservations are as follows: Arizona, 50,000,000 feet; Montana, 12,000,000 feet; New Mexico, 40,000,000 feet; Oregon, 600,000 feet; Washington, 75,000,000 feet; Wyoming, 75,900,000 feet; other States, 20,095,000 feet.

The Forest Service has made the following offhand estimates, in billions of board feet, for the timber on land owned by the States and on Indian reservations:

State.	State land. ¹	Indian reservations.	State.	State land. ¹	Indian reservations.
Total.....	35.5	29.0	Montana.....	1.2	2.3
Arizona.....	.7	2.0	New Mexico.....	.6	.9
California.....	5.4	2.3	New York.....	8.6	
Colorado.....	.7		North Carolina.....	.2	
Florida.....	.7		Oklahoma.....		4.0
Idaho.....	3.8	1.9	Oregon.....		3.9
Michigan.....	.5		South Dakota.....	.1	.1
Minnesota.....	2.5	1.9	Washington.....	5.0	7.5
Mississippi.....	.2		Wisconsin.....		2.0
			Wyoming.....	.3	.2

¹ Report of the National Conservation Commission, February, 1909 (60th Congress, 2d session, Senate Dec. 676), Vol. II, p. 191.

No reliable information is available regarding the amount of timber on State lands and Indian reservations, and the above estimates are only rough approximations. The Bureau of Corporations has learned incidentally, through its field work on the timber privately

owned, that the above estimate for land owned by the State of Oregon is much too high, and that for land owned by the State of Washington much too low.

The 539 billion feet in the national forests—less than one-fifth of the total amount of timber in the country—together with that on State lands, are all that can be considered subject to public management for the purposes of a future supply of timber. The national parks will be managed from a different point of view; the unreserved public lands are subject to private entry under the land laws; and the Indian reservations are held by the Government only for the benefit of the Indians. The timber in the national forests is on the average of considerably less value than that privately owned, because it is of lower quality and less accessible, often lying along high mountain watersheds, or in very rough country where logging is difficult, or in old burns.

It will be noted that 441 billion feet of the timber in the national forests is in the five States of the Pacific-Northwest, and only 9 billion feet of it lies east of the Rocky Mountain States. Most of this 9 billion is in South Dakota, Arkansas, and Minnesota.

Section 3. Privately owned timber in the investigation area, by species.

None of the estimates made by the Forest Service and presented in the two preceding sections included a division by species. The classification by species was carried in all work of the Bureau of Corporations on the privately owned timber in the investigation area.

The only practicable classification of standing timber by kinds, or species, was that according to the usage of the lumber trade. Some of the trade names, such as gum, include trees of different genera and even different botanical families. While there is general uniformity in the use of names in each locality, there is a wide variation the country over, some trees being called by several names and some names being used for several species. There is a tendency to call a comparatively new wood in the market by the name of some similar wood with an established reputation.

For the annual statistics of the lumber cut, the Forest Service and the Bureau of the Census have adopted the list of species shown in Table 18 (p. 88), which is accompanied by an explanatory note regarding some of them. The division between softwoods and hardwoods is made, according to the general custom of the lumber trade, between conifers and deciduous or broad-leaved trees, and has no necessary relation to the actual hardness of the wood. The same list of species is used in this report. Where the same species was reported to the Bureau under different local names, correction was made. Thus, the tree known as tamarack in the Lake States is not

found in the Northwest, but the name tamarack is there used by many to designate larch. The name larch is often applied in the same region to both noble fir and lovely fir, true firs of widely different value. Some errors could be corrected on the basis of the habitat of the species, and others only by comparison with the species on neighboring holdings. In the case of the true firs in the Pacific-Northwest, the confusion of names made it impossible to satisfactorily divide the total among the several species.

On a mixed stand of several species, an owner's estimate is likely to be much more accurate for the total than for each species separately. Hardwoods never grow in pure stands of one species, and it is in the attempt to separate hardwoods from each other that the greatest difficulty arises. Such separation is not attempted here, except in Table 12 and in the footnote on page 75.

But this difficulty over mixed stands has no important bearing on the accuracy of the divisions by species presented in this report. In the Southern Pine Region separate estimates are presented only for longleaf pine, shortleaf and loblolly pine, cypress, and for hardwoods collectively, and there is comparatively little intermixture of the forest stands of any two of these four. Likewise, in the Lake States there is little intermixture of the four species divisions. In the Pacific-Northwest small amounts of minor species have no doubt often been included with the main species instead of being separately reported.

When the division by species was not furnished by the holder, it was supplied as well as possible through interviews with other informants and through comparison of the distribution by species on neighboring holdings.

PACIFIC-NORTHWEST.—There is practically no stand of hardwoods in the Pacific-Northwest. An insignificant amount was reported in each State and included in the tables under "All other species."

For a number of localities in California, it was uncertain whether timber reported simply as "fir" was Douglas fir, which is botanically not a fir, or white fir or red fir, both of which are true firs; and in some localities informants would report "red fir" when Douglas fir and not the true red fir was meant. Correction of such errors was made largely on the basis of the botanical distribution of the species.

In Oregon and Washington Douglas fir is commonly reported by cruisers and lumbermen under the names "yellow fir" and "red fir," the terms "yellow" and "red" being used to indicate, apparently, the quality of the timber rather than any difference of species. In general, the term "yellow fir" is applied to the trees of greater age, which are more valuable because of the higher yield of clear lumber. Red fir and yellow fir were formerly the usual terms for this wood in the lumber market. In that use they are now nearly replaced by Douglas fir; but, except when the marketing of lumber is under discussion, the old terms yellow and red are likely to be used still.

There are a number of species of true fir. The most common in the Northwest are white fir, lowland fir, lovely fir, noble fir, silver fir, and alpine fir. Balsam fir is another name for white fir; but almost all the common true firs, except lovely fir and noble fir, go by the name of white fir. Noble fir and lovely fir are sometimes called red fir. A more common term among lumbermen, however, is larch. A considerable amount of larch was reported west of the Cascades, while the range of the true larch is altogether east of the summit of the Cascade Range, except very slight overlaps. The true larch is often called tamarack. In a few unimportant districts, there is some confusion between white pine and western pine, the latter of which is known by several names.

The confusion of names in Oregon and Washington did not result in any material error. It did make it impossible, however, to arrive at correct figures for the different true firs separately, which were, therefore, thrown together in the office tabulations under the term "true firs." In the published tables, true firs are included among "all other species."

There was some confusion of names in the reports from Idaho and Montana, especially between the true firs and Douglas fir. The division between these two in Montana could not always be made with certainty.

Table 8 shows the privately owned standing timber in the Pacific-Northwest, by species.

TABLE 8.—PRIVATELY OWNED STANDING TIMBER IN THE PACIFIC-NORTHWEST.
BY SPECIES.

[In billions of board feet. Thus, 1,013.0=1,013,000,000 board feet.]

State.	Total timber.	Douglas fir.	White pine.	Western pine.	Sugar pine.	Red wood.	Cedar.	Hemlock.	Spruce.	All other species.
Pacific-Northwest.....	1,013.0	521.9	19.6	153.4	34.7	101.9	56.7	57.4	21.9	45.5
California.....	248.1	45.2	.....	61.2	23.8	101.9	3.4	.....	1.2	11.4
Oregon.....	398.1	273.5	.2	58.5	10.9	.....	12.6	23.9	10.1	8.4
Washington.....	294.6	193.6	.7	12.5	.....	.....	37.0	33.0	8.9	8.9
Idaho.....	50.4	5.1	18.4	13.3	.....	.....	3.5	.5	.5	9.1
Montana.....	21.8	4.5	.3	7.9	.....	.....	.2	.....	1.2	7.7
<i>Per cent of the total in each species.</i>										
Pacific-Northwest.....	100.0	51.5	1.9	15.1	3.4	10.1	5.6	5.7	2.2	4.5
California.....	100.0	18.2	.....	24.6	9.6	41.1	1.4	.....	.5	4.6
Oregon.....	100.0	68.7	.1	14.7	2.7	.....	3.2	6.0	2.5	2.1
Washington.....	100.0	65.7	.2	4.3	.....	.....	12.6	11.2	3.0	3.0
Idaho.....	100.0	10.1	36.5	26.4	.....	.....	6.9	1.0	1.0	18.1
Montana.....	100.0	20.7	1.4	36.2	.....	.....	.9	.....	5.5	35.3

In the Pacific-Northwest as a whole Douglas fir makes 52 per cent of the total privately owned timber, western pine 15 per cent, and redwood 10 per cent, and the other species are each less than 6 per cent. The relation of each species to the total, for each State, is easily read from the tables.

Considerable interest attaches to the division of the timber in Oregon and Washington between the regions west and east of the summit of the Cascade Range, because of the difference in species, and because of the contrast between the dense compact forest areas on the Pacific slope and the relatively light and scattered stands east of the mountains. In California a very narrow belt of the great redwood stretches south from the Oregon State line for over 200 miles. From this belt to the Nevada line the forests contain Douglas fir, western pine, and sugar pine, and in the east-central part of the State the western pine, sugar pine, bigtree (giant sequoia), and true firs comprise almost all the timber.

In Table 9 California is divided into three parts, as follows: (1) Del Norte, Humboldt, Mendocino, and Sonoma Counties, comprising the northern coast region from the Oregon line nearly to San Francisco; (2) Siskiyou, Modoc, Trinity, Shasta, Lassen, Tehama, Glenn, Butte, and Plumas Counties, comprising that part of northern California east of division 1 from the Oregon line southward to within 50 or 75 miles of Sacramento; (3) the rest of the State. In the first division, the redwood belt enters Sonoma County for only a short distance. The redwood is almost a pure stand, its length north and south being broken here and there by open country or stands of other timbers; and most timber of other species in division 1 lies to the east. In divisions 2 and 3 the great bulk of the timber is east of the Sacramento and San Joaquin Rivers. There is very little privately owned timber south of Tulare County.

All figures in this report for California include 75,000 acres, with about 1 billion feet of timber, owned by the Central Pacific Railway Company in Washoe County, Nev., just across the State line.

In Table 9 Oregon and Washington also are divided, each into two regions—west and east of the Cascade Mountains. The division line follows the summit of the Cascade Range, where it is well marked; but in southern Oregon and across the valley of the Columbia an arbitrary extension is made along county boundaries, Jackson and Hood River Counties, Oreg., and Skamania County, Wash., being included as west of the Cascades. In general, this line separates two very distinct forest regions—Douglas fir to the west, and western pine (mixed with Douglas fir and other species) to the east; but in Washington and northern Oregon the western slope conditions overlap the summit and extend a little way down the eastern slope, while in southern Oregon the eastern slope conditions extend

west of the divide into southeastern Douglas, Jackson, and eastern Josephine Counties.

TABLE 9.—PRIVATELY OWNED STANDING TIMBER IN FOREST DIVISIONS OF CALIFORNIA, OREGON, AND WASHINGTON, BY SPECIES.

[In billions of board feet. Thus, 248.1=248,100,000,000 board feet.]

State and division.	Total.	Douglas fir.	White pine.	Western pine.	Sugar pine.	Redwood.	Cedar.	Itemlock.	Spruce.	All other species.
California.....	248.1	45.2	.....	61.2	23.8	101.9	3.4	.....	1.2	11.4
Division 1.....	116.9	16.1	.....	3.2	.4	96.1	.1	.....	.6	.4
Division 2.....	90.6	28.8	.....	43.8	15.1	.....	1.7	.....	.4	.8
Division 3.....	40.6	.3	.....	14.2	8.3	5.8	1.6	.....	.2	10.2
Oregon.....	398.1	273.5	0.2	58.5	10.9	.....	12.6	23.9	10.1	8.4
West of Cascades.....	348.5	269.7	.2	17.5	9.3	.....	12.2	23.8	10.1	5.7
East of Cascades.....	49.6	3.8	.....	41.0	1.6	.....	.4	.1	.....	2.7
Washington.....	294.6	193.6	.7	12.5	.....	.....	37.0	33.0	8.9	8.9
West of Cascades.....	270.5	180.1	.....	.2	.....	.....	30.4	32.8	8.6	6.4
East of Cascades.....	24.1	7.5	.7	12.3	.....	.....	.6	.2	.3	2.5

Per cent of the total in each species.

California.....	100.0	18.2	.....	24.6	9.6	41.1	1.4	.....	0.5	4.6
Division 1.....	100.0	13.8	.....	2.7	.3	82.2	.1	.....	.5	.4
Division 2.....	100.0	31.8	.....	48.3	16.7	.....	1.9	.....	.4	.9
Division 3.....	100.0	.7	.....	35.0	20.5	14.3	3.9	.....	.5	25.1
Oregon.....	100.0	68.7	0.1	14.7	2.7	.....	3.2	6.0	2.5	2.1
West of Cascades.....	100.0	77.4	.1	5.0	2.7	.....	3.5	6.8	2.9	1.6
East of Cascades.....	100.0	7.7	.....	82.7	3.2	.....	.8	.2	.....	5.4
Washington.....	100.0	65.7	.2	4.3	.....	.....	12.6	11.2	3.0	3.0
West of Cascades.....	100.0	68.8	.....	.1	.....	.....	13.4	12.1	3.2	2.4
East of Cascades.....	100.0	31.1	2.9	51.0	.....	.....	2.5	.8	1.3	10.4

Of the 1,013 billion board feet of privately owned timber in the Pacific-Northwest, 867 billion is on the "Pacific slope," that is, in California and west of the Cascades in Oregon and Washington; 74 billion east of the Cascades in Oregon and Washington; and 72 billion in Idaho and Montana. (See Table 8.)

The 867 billion feet on the Pacific slope is divided by species as follows: Douglas fir, 501 billion, of which 54 per cent (269.7 billion) is in western Oregon, 37 per cent (186.1 billion) in western Washington, and 9 per cent (45.2 billion) in California; western pine, 79 billion in California and southwestern Oregon; sugar pine, 33 billion in California and southwestern Oregon; redwood, 102 billion in Cali-

formia; cedar, 52 billion, 70 per cent in Washington, 23 per cent in Oregon, and 7 per cent in California; hemlock, 57 billion, 58 per cent in Washington and 42 per cent in Oregon; spruce, 20 billion, 51 per cent in Oregon, 43 per cent in Washington, and 6 per cent in California; and "All other species," mostly true firs, 23 billion, about half in California and the rest about equally divided between Oregon and Washington.

The per cent distribution by species for each forest division is also shown in the above table.

The 146 billion feet in Oregon and Washington east of the Cascades and in Idaho and Montana is divided by species as follows: Western pine, 75 billion, being 55, 16, 18, and 11 per cent in eastern Oregon, eastern Washington, Idaho, and Montana, respectively; white pine, 19 billion, nearly all in Idaho; Douglas fir, 21 billion, being 18, 36, 24, and 22 per cent in eastern Oregon, eastern Washington, Idaho, and Montana, respectively; cedar, 5 billion, three-fourths in Idaho; and the other species, 26 billion, 72 per cent in Idaho and Montana.

About two-thirds of the privately owned timber in Oregon east of the Cascades is in Klamath, the western part of Lake, and the western part of Crook Counties; and about one-third is scattered through the Blue Mountain region from eastern Crook County east and north-east to the State lines. About two-thirds of the timber in Washington east of the Cascades is along the east slope of the Cascades in the counties of Chelan, Kittitas, Yakima, and Klickitat, and about one-third is in Okanogan, Ferry, Stevens, and Spokane Counties. Nearly 90 per cent of the timber in Idaho is in Nez Perce, Latah, Shoshone, Kootenai, and Bonner Counties. Nearly all the timber in Montana is west of the continental divide; Lincoln, Flathead, and Missoula are by far the most important counties. Another Part of this Report will present an extended discussion of large forest areas in northern California and west of the Cascades in Oregon and Washington.

SOUTHERN PINE REGION.—In the Southern Pine Region comparatively little difficulty was experienced by the Bureau in obtaining the estimates for longleaf pine, shortleaf pine, cypress, and total hardwoods separately, but it was impossible to obtain any reliable information regarding the division of hardwoods among the various species. Prior to the field work it was the opinion of many of those familiar with the industry that it would not be practicable to divide the yellow pine between longleaf and shortleaf and loblolly. This opinion probably arose in most part from the fact that there is no complete separation in the lumber market. Although it proved to be impracticable to separate shortleaf and loblolly, the virgin forests of

these species are quite distinct from those of longleaf, and this separation could usually be made by careful inquiry. This was especially true in Texas, Louisiana, and Mississippi, and somewhat less so in Alabama. In Georgia, South Carolina, and North Carolina, where most of the original forest has been cut over, and a large part of the present stand is of recent growth and inferior quality, the division of yellow pine into the two classes is much less accurate. A small amount of longleaf was reported in Virginia, but it has been included under shortleaf. There is almost no shortleaf in Florida. Throughout this report shortleaf pine is used to include both shortleaf and loblolly. A great deal of inferior lumber is furnished by the old-field pine, or pine which has grown up on old fields that were cultivated till their fertility was exhausted and were then abandoned, according to the former custom in the South. This is chiefly loblolly. In the lumber market such names as North Carolina pine and Virginia pine are used to designate shortleaf and loblolly from the States of Virginia, North Carolina, South Carolina, and Georgia. The term loblolly is seldom used in the market. Georgia pine generally denotes longleaf or a good grade of shortleaf; not necessarily cut in Georgia.

There is a striking general agreement between the data gathered by the Bureau of Corporations on longleaf and shortleaf and the botanical distribution of the species as shown in Bulletin 13 of the Forest Service.¹ It is believed that the division made is sufficiently accurate for the purposes it may serve, and especially so in Texas, Louisiana, and Mississippi.

In the important cypress regions of Louisiana, Florida, and Georgia there was little difficulty in separating cypress, but in other places along the coast and bordering the Mississippi and other rivers, where there are comparatively unimportant scattered tracts of cypress, it has probably been often included in small amounts under hardwoods.

The hardwoods grow in mixed stands, and never in a pure stand of any large amount of one species. To estimate the total timber in a hardwood tract is, therefore, far easier than to estimate the amount of each species separately. It is only when the hardwoods have become of considerable value that the owners are interested in estimating the different kinds; and a large part of the hardwood in the Southern Pine Region is as yet of very low value. Till late years gum was worthless, and even mixed stands of other hardwoods were often considered only an incumbrance on the agricultural lands of the lower Mississippi. With the great rise in lumber prices, even gum has come to have a market value, but little effort has yet been made to determine the amount of it, and the quantity of the more

¹ Also H. Doc. 181, 55th Cong., 3d sess.

valuable hardwoods is much less known than that of pine. Because of these conditions, it was impossible to secure as reliable information regarding the total amount of hardwoods as was obtained for yellow pine and cypress, and it was altogether impossible to obtain a satisfactory division of the estimates of total hardwoods among the various species. The questions of the amount of all hardwoods and the approximate distribution by species were put so persistently, however, that nearly every report does give the informant's judgment on the amount of each one separately. Although the division by species is not regarded as sufficiently trustworthy for the publication of the exact amounts reported for each, the facts stated in the footnote below are given for the use of those to whom very general statements may be of help. This approximate division by species should not be used without the addition of statements indicating its probable inaccuracy.¹

It is probable that the lack of interest in hardwoods has resulted not only in defective information about the several species but in too low estimates of the total. The percentage of error in the hardwood estimates as a whole is thought likely to be considerably greater than in the estimates for pine, and the true amount is much more likely to be above the estimates than below.

¹ Oak, including all species, and gum, are without doubt the predominating hardwoods throughout the Southern Pine Region. The only other species for which it is worth while to give the approximations are hickory and ash. All other hardwoods are included under miscellaneous, and larger or smaller amounts of oak, gum, hickory, and ash have been included under miscellaneous in some of the reports. The approximate percentage distribution of the total hardwoods among oak, gum, hickory, ash, and miscellaneous, as compiled from the opinions of informants, is as follows:

State.	Oak.		Gum.		Hickory.		Ash.		Miscellaneous.	
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Missouri.....	42	28	2	4	2	2	2	2	24	34
Arkansas.....	53	23	6	2	2	2	2	16	4	16
Texas.....	33	19	3	4	3	4	4	4	4	41
Louisiana.....	30	25	3	5	3	5	3	3	37	37
Mississippi.....	33	25	4	3	4	3	3	3	3	35
Alabama.....	45	12	7	1	7	1	1	1	1	35
Florida.....	8	12	1	2	7	1	2	2	7	77
Georgia.....	25	11	4	5	4	5	2	5	5	55
South Carolina.....	20	34	2	3	2	3	3	3	3	41
North Carolina.....	28	30	1	1	1	1	1	1	1	40
Virginia.....	39	18	1	1	1	1	1	1	1	41
Southern Pine Region.....	37	22	4	3	4	3	3	3	3	34

The standing timber in the Southern Pine Region is shown by species below:

TABLE 10.—PRIVATELY OWNED STANDING TIMBER IN THE SOUTHERN PINE REGION, BY SPECIES.

[In billions of board feet. Thus, 634.0=634,000,000 board feet.]

State.	Total.	Yellow pine.			Cypress.	Hard-woods.
		Total.	Long-leaf.	Short-leaf.		
Southern Pine Region.....	634.0	384.4	232.3	152.1	40.4	209.2
Missouri (part).....	9.9	1.1	.....	1.1	.9	7.9
Arkansas.....	78.7	26.0	.....	26.0	2.2	50.5
Texas.....	66.0	44.9	22.4	22.5	.2	20.9
Louisiana.....	119.8	67.7	52.5	15.2	15.7	36.4
Mississippi.....	95.3	62.4	47.6	14.8	1.9	31.0
Alabama.....	56.3	38.0	25.6	12.4	-.2	18.1
Florida.....	73.9	59.1	58.2	.9	10.7	4.1
Georgia (part).....	46.0	31.7	18.5	13.2	2.8	11.5
North Carolina (part).....	30.7	19.2	4.6	14.6	2.6	8.9
South Carolina (part).....	42.9	25.6	2.9	22.7	3.0	14.3
Virginia (part).....	14.5	8.7	.....	8.7	.2	5.6

Per cent of the total in each species.

Southern Pine Region.....	60.6			36.6			24.0			6.4			
	100.0	11.1	33.0	68.0	43.8	12.7	13.1	30.4	32.5	32.1	14.5	6.1	25.0
Missouri (part).....	100.0	11.1	33.0	68.0	43.8	12.7	13.1	30.4	32.5	32.1	14.5	6.1	25.0
Arkansas.....	100.0	11.1	33.0	68.0	43.8	12.7	13.1	30.4	32.5	32.1	14.5	6.1	25.0
Texas.....	100.0	11.1	33.0	68.0	43.8	12.7	13.1	30.4	32.5	32.1	14.5	6.1	25.0
Louisiana.....	100.0	11.1	33.0	68.0	43.8	12.7	13.1	30.4	32.5	32.1	14.5	6.1	25.0
Mississippi.....	100.0	11.1	33.0	68.0	43.8	12.7	13.1	30.4	32.5	32.1	14.5	6.1	25.0
Alabama.....	100.0	11.1	33.0	68.0	43.8	12.7	13.1	30.4	32.5	32.1	14.5	6.1	25.0
Florida.....	100.0	11.1	33.0	68.0	43.8	12.7	13.1	30.4	32.5	32.1	14.5	6.1	25.0
Georgia (part).....	100.0	11.1	33.0	68.0	43.8	12.7	13.1	30.4	32.5	32.1	14.5	6.1	25.0
South Carolina (part).....	100.0	11.1	33.0	68.0	43.8	12.7	13.1	30.4	32.5	32.1	14.5	6.1	25.0
North Carolina (part).....	100.0	11.1	33.0	68.0	43.8	12.7	13.1	30.4	32.5	32.1	14.5	6.1	25.0
Virginia (part).....	100.0	11.1	33.0	68.0	43.8	12.7	13.1	30.4	32.5	32.1	14.5	6.1	25.0

Louisiana has 120 billion feet, nearly one-fifth of all the standing timber in the Southern Pine Region. Adjoining it on the west is the timbered part of Texas, on the north the shortleaf pine of southern Arkansas, and to the east the great stand of pine in Mississippi. These four States with Florida have 260 billion of the total of 384 billion feet of yellow pine, 31 billion of the 40 billion feet of cypress, and 143 billion of the 209 billion feet of hardwoods. Louisiana and Florida have the large cypress forests, totaling 26 billion. The virgin pine and cypress forests of these five States have offered the greatest opportunity in the Southern Pine Region for profit through holding timber, and in those forests has come about the greatest concentration of ownership, as is shown in Chapter III.

Speaking generally, from Virginia to Georgia and in some parts of Alabama lumbering has been carried on for a much longer period than in the rest of the region, and consequently the forests have been largely culled, so that much of the yellow pine there is of materially lower value than in the virgin pine forests of Florida, southern Alabama and Mississippi, Louisiana, Texas, and southern Arkansas. This makes the importance of the latter States much greater than is indicated by the above figures.

The hardwoods are far less important than their amount would indicate, as compared with the pine and cypress. Their average value is low because of the high proportion of inferior timber, especially the great quantity of gum. As is shown in Chapter III, the hardwood districts have not passed so largely to the great timber owners.

LAKE STATES.—Comparatively little difficulty was experienced in the Lake States in separating the species as presented in Tables 11 and 12. Here the hardwood stand, unlike most of that in the Southern Pine Region, is of such value that care is usually taken to separate the species in estimates, so that a fairly reliable division among the different species was obtained, as shown in Table 12. The amount shown under "Miscellaneous" includes some woods not specified in the table, and unknown amounts of those separately shown; many of the estimates giving the amounts of the chief hardwoods in the particular tracts, and lumping all others as miscellaneous. Of the white and Norway pine, 79, 83, and 64 per cent was reported as white pine in Michigan, Wisconsin, and Minnesota, respectively, but the accuracy of this division is subject to considerable doubt. There is now little accurate separation of white and Norway pine in the lumber market, and as much of the timber is in mixed stands the terms are often used loosely.

TABLE 11.—PRIVATELY OWNED STANDING TIMBER IN THE LAKE STATES, BY GROUPS OF SPECIES.

[In billions of board feet. Thus, 100.0 = 100,000,000,000 board feet.]

State.	Total.	White and Norway pine.	Hemlock.	Other conifers.	Hardwoods.
Lake States.	100.0	17.7	26.6	13.8	41.9
Michigan.....	47.6	2.0	15.0	5.2	25.4
Wisconsin.....	29.2	3.2	11.6	2.3	12.1
Minnesota.....	23.2	12.5	.....	6.3	4.4
<i>Per cent of the total in each group of species.</i>					
Lake States.....	100.0	17.7	26.6	13.8	41.9
Michigan.....	100.0	4.2	31.5	10.9	53.4
Wisconsin.....	100.0	11.0	39.7	7.9	41.4
Minnesota.....	100.0	53.9	.....	27.1	19.0

The 100 billion feet of privately owned timber in the Lake States is distributed as follows: White and Norway pine, 18 billion, 70 per cent of which is in Minnesota; hemlock, 26 billion, in Michigan and Wisconsin; other conifers, chiefly tamarack, spruce, and cedar, 14 billion; maple, 15 billion, mostly in Michigan; birch, 10 billion, basswood, 5 billion, and elm, 4 billion, in Michigan and Wisconsin with small amounts in Minnesota; and 8 billion of other and miscellaneous hardwoods.

TABLE 12.—PRIVATELY OWNED STANDING TIMBER IN THE LAKE STATES, BY SPECIES.

[In billions of board feet. Thus, 100.0=100,000,000 board feet.]

Species.	Total.	Michi- gan.	Wis- consin.	Minne- sota.	Species.	Total.	Michi- gan.	Wis- consin.	Minne- sota.
Total.....	100.0	47.6	29.2	23.2	Hardwoods.....	41.9	25.4	12.1	4.4
Conifers.....	58.1	22.2	17.1	18.8	Maple.....	14.5	12.2	2.3	.....
White and Norway pine.....	17.7	2.0	3.2	12.5	Birch.....	10.1	5.1	4.3	.7
Hemlock.....	26.6	15.0	11.6	.....	Basswood...	5.1	2.2	2.5	.4
Tamarack...	5.4	2.0	1.2	2.2	Elm.....	3.7	2.1	1.5	.1
Spruce.....	3.4	1.2	.2	2.0	Beech.....	1.6	1.6	.....	.....
Cedar.....	2.5	1.4	.6	.....	Ash.....	1.0	.6	.3	.1
Jack pine	1.4	.....	.3	1.1	Poplar.....	1.7	.....	.....	1.7
Balsam.....	1.1	.6	.....	.5	Oak.....	.7	.2	.3	.2
					Balm of Gil- ead.....	.3	.....	.....	.3
					Miscellane- ous.....	3.2	1.4	.9	.9

There is some reason to believe that for Wisconsin the total quantity of pine is understated here. The percentage of error in the estimates of some other species is probably considerable, tending to increase as the reported quantities diminish. It may be, for instance, that the supply of oak is considerably greater than is here indicated.

Section 4. Annual lumber cut compared with the stand of timber.

The broad relation between the annual cut of lumber and the stand of timber, by States and by species, may be shown by comparing the cut as reported by the Bureau of the Census and the Forest Service (see Table 18) with the stand of timber as shown in sections 1 and 3.

TABLE 13.—LUMBER CUT OF THE UNITED STATES, BY SPECIES, 1909.

Species.	Cut (M feet).	Per cent distribu- tion.	Species.		Per cent distribu- tion.
			Hardwoods.....	Cut (M feet).	
Total.....	44,599,761	100.0	Hardwoods.....	10,612,802	23.8
Soft woods.....	33,896,959	76.2	Oak.....	4,414,457	9.9
Yellow pine.....	16,277,185	36.6	Maple.....	1,106,604	2.5
Douglas fir.....	4,856,378	10.9	Yellow poplar.....	858,500	1.9
White pine.....	3,900,034	8.8	Red gum.....	706,945	1.6
Hemlock.....	3,051,399	6.9	Chestnut.....	663,891	1.5
Spruce.....	1,748,547	3.9	Beech.....	511,244	1.1
Western pine.....	1,499,985	3.4	Birch.....	452,370	1.0
Cypress.....	955,635	2.1	Basswood.....	399,151	.9
Redwood.....	521,630	1.2	Elm.....	347,456	.8
Cedar.....	346,008	.8	Cottonwood.....	265,900	.6
Larch.....	264,022	.6	Ash.....	291,209	.7
Tamarack.....	157,192	.3	Hickory.....	333,929	.7
White fir.....	89,318	.2	Tupelo.....	96,676	.2
Sugar pine.....	97,191	.2	Walnut.....	46,108	.1
Balsam fir.....	108,702	.2	Sycamore.....	56,511	.1
Lodgepole pine.....	23,723	.1	Cherry.....	24,594	.1
			All other.....	37,557	.1

Table 13 gives the lumber cut of the United States for 1909, by species. Southern yellow pine furnished 36 per cent of the total; Douglas fir, 11 per cent; oak, 10 per cent; white pine, 9 per cent; and hemlock, 7 per cent. These five species together furnished 73 per cent, or nearly three-fourths, of the whole.

Table 14 compares the amount of lumber cut during 1909 with the total stand of timber, both privately and publicly owned (see secs. 1 and 2), for each State entirely within the investigation area. Missouri, Georgia, South Carolina, North Carolina, and Virginia are included in "All other States," as part of each is outside the investigation area, and there is no estimate for the total stand in any one of them.

TABLE 14.—TOTAL STAND OF TIMBER, PRIVATELY AND PUBLICLY OWNED, AND LUMBER CUT (1909) BY STATES.

State.	Stand of timber.		Lumber cut, 1909.		Percent- age of total stand cut in 1909.
	Billions of feet.	Per cent distribu- tion.	Thousands of feet.	Per cent distribu- tion.	
United States.....	2,826.4	100.0	44,599,761	100.0	1.6
Pacific-Northwest.....	1,512.9	53.5	7,859,800	17.7	.5
California.....	381.4	13.5	1,143,507	2.6	.3
Oregon.....	545.8	19.3	1,898,995	4.3	.3
Washington.....	391.0	13.8	3,862,916	8.7	1.0
Idaho.....	129.1	4.6	645,800	1.4	.5
Montana.....	65.6	2.3	308,562	.7	.5

TABLE 14.—TOTAL STAND OF TIMBER, PRIVATELY AND PUBLICLY OWNED, AND LUMBER CUT (1909) BY STATES—Continued.

State.	Stand of timber.		Lumber cut, 1909.		Percent- age of total stand cut in 1909.
	Billions of feet.	Per cent distribu- tion.	Thousands of feet.	Per cent distribu- tion.	
Lake States.....	109.0	3.9	5,476,270	12.3	5.0
Michigan.....	48.1	1.7	1,889,724	4.2	3.9
Wisconsin.....	31.2	1.1	2,025,038	4.6	6.5
Minnesota.....	29.7	1.1	1,561,508	3.5	5.8
Six Southern States.....	463.9	17.5	13,227,752	29.7	2.7
Arkansas.....	81.6	2.9	2,111,300	4.7	2.6
Texas.....	66.0	2.3	2,089,130	4.7	3.2
Louisiana.....	119.8	4.2	3,551,918	8.0	3.0
Mississippi.....	95.5	3.4	2,572,669	5.8	2.7
Alabama.....	56.3	2.0	1,691,001	3.8	3.0
Florida.....	74.7	2.7	1,201,784	2.7	1.6
All other States.....	170.6	25.1	17,945,939	40.3	2.5

¹ Includes 144 billion privately owned within the investigation area in Missouri, Georgia, South Carolina, North Carolina, and Virginia; the 450 billion estimated by the Forest Service for all privately owned timber outside the investigation area (see p. 65); and 116.6 billion nonprivate timber in States lying outside the investigation area. (See secs. 1 and 2.)

The last column of Table 14 shows what fraction of the total stand in each State was cut in 1909. Thus, California contains 381.4 billion feet of standing timber, publicly and privately owned. During the year 1909 only 1,143,507 thousand feet, or but three-tenths of 1 per cent of it, was sawed into lumber. In the Lake States the cut was 5 per cent of the stand, and in the six Southern States it ranged from 2.6 to 3.2 per cent, except in Florida, where it was 1.6 per cent, the same as in the country as a whole.

The Pacific-Northwest has more than half the timber supply of the country and furnishes only a little more than one-sixth of the annual cut; in other words, just about one-third as much lumber is now being sawed there as would be sawed were the annual cut distributed among the States in proportion to the stand of timber. In the Lake States the cut is three times as great as it would be under such a distribution. In the six Southern States and in the "other States" the relation is one and seven-tenths and one and six-tenths, respectively.

The comparison of cut and stand is best made on the basis of the privately owned timber, by species, as is done in Tables 15, 16, and 17. The publicly owned timber is not an important part of the stand except in the Pacific-Northwest. The cut includes what comes from the national forests, but the amount of this is not enough to materially affect the comparison except in one or two States. For

other reasons, however, the percentages here given can be taken only broadly. The division by species is not wholly trustworthy, either for the stand or for the cut. The error is probably greatest for the minor species. There is a tendency to sell a comparatively unknown or inferior wood under the trade name of some kind well established in the market, and no doubt this has influenced the returns to the Bureau of the Census. The stands shown by the present report are less accurate for the minor than for the important species in each locality (see p. 69); the timber owners would in many cases either include the small amounts of the less important species under the more important or report them as miscellaneous.

In a few cases appreciable amounts of timber grown in one State are manufactured into lumber in another. Thus, many North Carolina logs are sawed at Norfolk and Suffolk, Va., and it is understood that some Minnesota pine is sawed in Wisconsin. In such cases the cut is credited to the State where the mill stands; for the Census reports of cut are mill reports, and do not relate to the origin of the logs.

For all these reasons the cut of the several species as shown by the Bureau of the Census can not be taken as exactly comparable with the stand as reported by the Bureau of Corporations. Wherever there is a considerable amount of a species in a State, however, the relation between stand and cut as thus shown is broadly correct.

The following table shows the percentages obtained by dividing the total cut of 1909 by the privately owned stand, in the Pacific-Northwest and each State thereof, by species:

TABLE 15.—APPROXIMATE PERCENTAGE OF THE PRIVATELY OWNED STANDING TIMBER OF EACH SPECIES CUT¹ DURING 1909, FOR THE PACIFIC-NORTHWEST AND FOR EACH STATE.

State.	All species.	Douglas fir.	White pine.	Western pine.	Sugar pine.	Redwood.	Cedar.	Hemlock.	All Spruce, other.
Pacific-Northwest.....	0.8	0.9	1.0	0.8	0.3	0.5	0.4	0.2	1.1
California.....	.5	.2	.....	.6	.4	.5	.4	.....	1.1
Oregon.....	.5	.6	.....	.3	.1	.....	.2	.1	.6
Washington.....	1.3	1.6	(²)	2.1	.....	.....	.5	.3	1.9
Idaho.....	1.3	1.3	.9	1.9	.....	.....	.8	.2	1.4
Montana.....	1.4	1.0	.6	1.9	.....	.....	(³)	.....	.6

¹The figures of cut include the small quantity cut from national forests. For this and other sources of possible error, see the paragraphs immediately preceding this table.

²Per cent omitted. Stand of this species is small, and part of it may have been reported under other names; also the reported cut of it may in fact have been partly other species.

³Less than one-tenth of 1 per cent.

The highest percentages in the above table are for western pine and Douglas fir in Montana, Idaho, and Washington, spruce in Washing-

ton and California, and miscellaneous woods in Montana and Idaho, ranging from 1 per cent for Douglas fir in Montana to 2.1 per cent for western pine in Washington.

Table 16 presents similar data for the States in the Southern Pine Region.

TABLE 16.—APPROXIMATE PERCENTAGE OF THE STAND OF PRIVATELY OWNED YELLOW PINE, CYPRESS, AND HARDWOODS CUT DURING 1909, FOR THE SOUTHERN PINE REGION AND FOR EACH STATE.

State.	All species.	Yellow pine.	Cypress.	Hardwoods.
Southern Pine Region.....	(¹)	4.1	2.3	(¹)
Missouri (part).....	(¹)	12.9	3.7	(¹)
Arkansas.....	2.7	5.1	2.5	1.5
Texas.....	3.2	4.5	1.0	.4
Louisiana.....	3.0	4.0	3.9	.6
Mississippi.....	2.7	3.4	2.2	1.3
Alabama.....	3.0	4.0	3.3	1.0
Florida.....	1.6	1.9	.8	.1
Georgia (part).....	(¹)	3.8	1.0	(¹)
South Carolina (part).....	(¹)	4.2	1.4	(¹)
North Carolina (part).....	(¹)	6.2	1.2	(¹)
Virginia (part).....	(¹)	14.0	2.7	(¹)

¹ The yellow pine and cypress territory is practically all within the investigation area, and the cut of those species may therefore be compared with the stand shown in Table 10; but as explained on page 62 only a part of the hardwood territory of Missouri, Georgia, South Carolina, North Carolina, and Virginia is within the investigation area, and it is thus impossible to compare stand and cut of hardwoods and "all species" in those States.

The most striking fact shown by Table 16 is the great difference in the relation of annual cut to stand between yellow pine and cypress on the one hand and hardwoods on the other. Large amounts of hardwoods in these States have not yet reached a price which would lead to extensive marketing. For instance, the cut of yellow pine in Texas during 1909 was 4.5 per cent of the stand, while the cut of hardwood was only 0.4 per cent. In other words, the present annual drain is proportionally 11 times as great upon the yellow-pine supply of Texas as upon the supply of hardwoods. As is shown in Table 10, Louisiana and Florida contain the large amounts of cypress, and Table 16 shows that the present rate of cut from the cypress forests is 5 times as great in Louisiana as in Florida.

The area covered by this table includes practically the entire supply of southern yellow pine and cypress. In southern yellow pine the annual cut is equal to 4.1 per cent of the stand, and in cypress the cut is 2.3 per cent. In the six States lying entirely within the investigation area the cut of hardwoods during 1909 was 1 per cent of the total stand, and the cut of "all species" was 2.7 per cent of the stand. Table 17 shows similar data for the Lake States.

TABLE 17.—APPROXIMATE PERCENTAGE OF THE PRIVATELY OWNED WHITE AND NORWAY PINE, HEMLOCK, OTHER CONIFERS, AND HARDWOODS CUT DURING 1909, FOR THE LAKE STATES.

State.	All species.	White and Norway pine.	Hemlock.	Other conifers.	Hardwoods.
Lake States.....	5.5	12.3	5.0	2.4	3.9
Michigan.....	4.0	12.9	4.1	1.8	3.6
Wisconsin.....	6.9	19.1	6.1	3.4	5.2
Minnesota.....	6.7	10.5	.....	2.5	1.9

In the Lake States the prices of almost all standing timber have now become so high that extraordinary profits are not expected from speculative holding, and the owners are disposed to realize. The table indicates that a substantial fraction of the timber of almost every species was cut in 1909. The high percentage of white pine is explained partly by its high value and partly by the approaching exhaustion of the virgin stand. The cut diminishes year by year. More sawing equipment has been provided than would have been provided if the supply had not formerly been much greater than now, and each mill, having been employed on white pine, tends to continue in the same line as long as possible. This influence is less important in Minnesota than in Wisconsin or Michigan, and accordingly the cut appears as 10.5 per cent of the stand in Minnesota, against 13 per cent in Michigan and 19 per cent in Wisconsin. The reported stand of white and Norway pine in Wisconsin (3.2 billion feet) is perhaps too low, giving an unduly high percentage in the above table.

The faster the value of standing timber is expected to increase the slower its owners are to cut it. As in all calculations of profit, the increase that counts is a proportional increase. An advance from 50 cents a thousand feet to \$1 gives the same rate of return on investment as an advance from \$5 a thousand to \$10; in either case the investor doubles his money. But the smaller increase may be expected to come faster, because it does not involve so great a relative increase of the price of lumber.

When the owner cuts his timber, he gets for it what is left of the price he gets for his lumber when the cost of converting the trees into lumber (plus his manufacturing profit and freight) is deducted. If the conversion cost and the manufacturing profit amount to \$10 a thousand feet and the average freight to the points of consumption is \$10 more, the lumber must bring an average price of \$20.50 at the point of consumption to give the owner 50 cents for his standing timber. From \$20.50 to \$21 would be a trifling change of price, but it would double the proceeds of his stumpage, raising them from 50 cents to \$1. Now, let the average price of lumber be \$25

while the cost of conversion, with profit, and the average freight, are still \$10 each. The return for the stumpage is \$5. To double this, the average price of lumber must be raised from \$25 to \$30. This is apt to take much longer than the rise from \$20.50 to \$21, which gave stumpage owners the same percentage of profit from holding.

To state the case more generally, the thing that interests the stumpage owner is the margin between the cost of converting trees into lumber and the price of the product. The conversion cost is comparatively constant; changes of lumber price, as far as they are believed to be permanent, are mostly reflected in the margin which represents the proceeds of the stumpage. As the margin increases, any given rise of lumber prices, increasing the return from the stumpage by the same absolute amount as before, increases it by a smaller percentage.

An increase is likeliest, for a given kind of timber, while the value is low. Other things being equal, therefore, the lower the price of timber the more profitable it will be to hold. As the price goes up the chance of a satisfactory rate of future profit becomes less, and owners are disposed to realize and look for investments elsewhere. Present stumpage values may be taken as ranging up to \$5 a thousand in the Pacific-Northwest and up to \$15 in the Lake States. This is the proximate reason why the lumber cut of the Lake States in 1909 was one-eighteenth, while that of the Pacific-Northwest was only one one-hundred-and-twenty-fifth, of the privately owned timber; why Oregon, with four times as much privately owned timber as the three Lake States, cut little more than one-third as much as they. In the Lake States, the annual percentage of rise in value promises to be so small that the timber is being rapidly turned into money. In the Pacific-Northwest the rise promises in most cases to equal a high rate of interest, and most owners prefer to hold.

Differences of stumpage value depend on many circumstances, but one of overwhelming importance is accessibility to market. This reduces itself practically to a matter of freight rates. Lumber is very heavy in proportion to its value, and differences of freight rate are of enormous importance.

The freight rate from Portland, Oreg., or Seattle, to Chicago is 55 cents a hundred pounds. From the southwestern yellow-pine territory it is only 26 cents. Douglas fir weighs from about 2,000 pounds a thousand feet in flooring to about 3,300 pounds in rough green timbers; shortleaf pine from about 2,000 pounds in flooring to 4,200 pounds in timbers; longleaf pine from about 2,200 pounds in flooring to about 4,500 pounds in timbers. The advantage of the southwestern pine territory in freight to Chicago ranges from \$5.25 to \$7.25 per thousand feet. As a result, only a relatively small amount of

Douglas fir is shipped as far east as Chicago, except timbers of such length and thickness as can be sawed only from the great trees of the Pacific slope. The freight rates to Omaha from Seattle or Portland and from Texarkana or Beaumont are 50 cents and 25 cents, respectively. Here the advantage of the southwestern pine is from \$4.50 to \$6. Passing westward from the neighborhood of Omaha, the advantage of the southern region diminishes, and an increasing quantity of lumber from the Pacific-Northwest is found.

Of any species, some grades and some special dimensions and dressed forms are shipped farther than others. Many prefer rift yellow-pine flooring to that of Douglas fir. On the other hand, Douglas fir takes paint better than yellow pine, and its grain is often preferred for interior finish where the grain is to be shown. So it comes about that in some places where one wood furnishes the greater part of the flooring, another may furnish a large part of the siding, finish, and ceiling. Again, some woods are desirable for interiors, but decay badly if exposed to the weather.

In general, too, the lowest grades are used near home, and the best grades travel farthest. This is because the freight is the same for the poor lumber as for the good, and so is far higher on the poor in proportion to its value.¹ Very inferior stuff at \$12 may be pre-

¹ The article below, in showing the effect of freight rates on the competition between different regions and between different grades, points out how the freight may even be more per thousand on the cheaper than on the higher-priced lumber. The article was written by Mr. A. F. Peterson, assistant manager of the National Lumber & Box Co., Hoquiam, Wash., and published in *The Timberman*, Portland, Oreg., January, 1910, p. 32W. The abbreviations "V. G." and "F. G.," descriptive of flooring, mean vertical grain and flat grain. The freights on yellow pine appear to be reckoned on the Kansas City rate, 24 cents, when not otherwise specified. The Omaha rate of 26½ cents, given in the table below, was changed to 25 cents on Oct. 12, 1910. The far lower estimated weight of flooring than of rough lumber is due partly to the removal of the shavings (dressed lumber, such as flooring, being counted according to its dimensions before dressing), and partly, it would seem, to the tacit assumption that the rough lumber is shipped green. "Relatively, fir and yellow pine conditions for January, 1910, comparing fir values on a Missouri River rate of 50 cents with yellow-pine values on southern rates of 24 and 26½ cents, are as follows:

Dimension (sized):	Fir, 50 cents.		Yellow pine.	
			24 cents.	26½ cents.
2 by 4-16.....	\$22.00-\$23.50	\$19.50	\$20.25	
2 by 4-18-20.....	24.00-25.50	22.50	23.25	
2 by 4-22-24.....	25.00-26.50	24.50	25.50	
2 by 12-16.....	23.50-25.00	20.75	21.50	
2 by 12-18 and 20.....	24.50-26.00	22.25	23.00	
2 by 12-22-24.....	25.50-27.00	24.50	25.50	
Small timbers (rough):				
6 by 6 and 6 by 8-16 feet.....	25.50-27.00	22.25	24.00	
6 by 6 and 6 by 8-32 feet.....	26.50-31.00	27.75	28.00	
Common boards:				
1 by 10-16.....	22.00-24.00	20.25	21.00	
1 by 12-16.....	22.50-24.50	23.25	24.00	
Flooring, V. G., 1 by 4, No. 2.....	35.00-37.00	{A 36.00	36.50	
Flooring, F. G., 1 by 4, No. 2 and better.....	26.00-29.00	{B 33.50	34.00	
		{A 25.00	25.50	
		{B 24.00	24.50	

ferred to somewhat better lumber at \$13, though the choice might be the other way if the prices were \$22 and \$23. This makes it possible to sell at a profit, where the freight charge is very little, lumber so poor that it could hardly be sold for the amount of the freight where that is high. Similarly, where lumber from different regions meets and competes, a difference of \$1 a thousand may determine the control of the market for common boards, say, at about \$20 a thousand, while on lumber worth \$40 a difference of \$1 would hardly

"The above comparisons are made on Omaha (Nebr.) and Kansas City basis.

"Relative fir and yellow-pine mill basis values, using the above figures, are as follows:

	Fir, mill basis.	Yellow pine, mill basis.
Dimension (sized):		
2 by 4-16.....	\$9.00-\$10.50	\$13.50
2 by 4-18 and 20.....	11.00-12.50	16.50
2 by 4-22-24.....	12.00-13.50	18.50
2 by 12-16.....	10.00-11.50	14.75
2 by 12-18 and 20.....	11.00-12.50	16.25
2 by 12-22 and 24.....	12.00-13.50	18.50
Small timbers (rough):		
6 by 6 and 6 by 8-16 feet.....	9.00-10.50	12.25
6 by 6 and 6 by 8-32 feet.....	13.00-14.50	17.25
Common boards:		
1 by 10-16.....	9.50-11.50	14.25
1 by 12-16.....	10.00-12.00	17.25
Flooring, V. G., 1 by 4, No. 2.....	25.00-27.00	31.25
Flooring, F. G., 1 by 4, No. 2 and better.....	16.00-19.00	20.25
		19.25

"Yellow pine, even at the lower selling basis in competitive territory, it is noted, commands a higher relative mill base than fir. This, of course, is explained by the difference in freight rate from the South as against freight rate from the Coast, which, per thousand feet, is as follows:

	Fir.	Yellow pine.
Dimension.....	\$13.00	\$6.00
Timbers.....	16.50	10.00
Common boards and fencing.....	12.50	6.00
Flooring.....	10.00	4.75

"The differences are particularly noticeable in dimension, timbers, and common boards and fencing, and give yellow pine absolute control of the selling basis of these stocks throughout the great Middle West.

"The marketing of low-grade fir into the Middle West will be handicapped as long as the present method of calculating transcontinental freight rates on a flat rate per hundred pounds for all classes of fir products remains in force.

"An ordinary 40-foot car of 80,000 pounds capacity loaded with 30,000 feet of No. 1 flooring and valued at \$1,200 f. o. b., a 50-cent rate, will require an outlay of approximately \$270 (54,000 pounds, at 50 cents) for freight. The same car, loaded with, say, 25,000 feet of common rough fir and valued at approximately \$637 to \$650 f. o. b., a 50-cent rate, will require an outlay of \$412.50 (82,500 pounds, at 50 cents), or practically a 53 per cent greater cost per car for freight of the rough common fir than the cost of freight of the car of flooring representing an 84 per cent higher destination valuation than the car of rough common.

"To overcome this condition, graduated rates of coast fir products, based to some extent on the character and not the weight of the commodity, is required.

"It will not require much of a change in freight rates to place low-grade fir on a parity with yellow pine. The bulk of our Eastern movement to-day is in high-grade stocks. What we want are freight rates that will permit of the movement of our common lumber instead of simply a small percentage of our output in the better grade."

be regarded, and the choice at such a difference would be determined almost wholly by other considerations.

LUMBER CUT, 1909, IN DETAIL, BY STATES.—The statistics of lumber production are so important in connection with the supply of standing timber that they are given in full in Table 18, by States and species, with the numbers of lath and of shingles made in each State. Lath are chiefly a by-product of sawmills. Shingles are often made at sawmills, but the greater part come from separate plants. The shingle-mill business is especially developed in the State of Washington, where the chief material used is cedar and where more than half the shingles of the country are made. The first column in Table 18 includes all mills reporting lumber, lath, or shingles, and the numbers therefore differ from the numbers of sawmills shown on pages 34 and 278. Thus the sawmills reported in the United States in 1909 were 46,584, while the mills reporting lumber, lath, or shingles were 48,112.

White pine in this table includes the timber originally called by that name growing in the Lake States, the Middle States, New England, and the southern Appalachian region; Norway pine and a certain proportion of jack pine, tamarack, and other species sold with white pine in the Lake States under the name of northern pine; and the white pine of Montana, Idaho, and Washington, which is very similar to the white pine of the East.

Yellow pine includes all pine lumber produced east of the Rocky Mountains except white, Norway, and jack pine. The term covers several botanical species, such as longleaf pine, shortleaf pine, loblolly pine, and Cuban pine. Most of the yellow pine cut in Virginia, North Carolina, and South Carolina is loblolly, or, as the bulk of it is known commercially, North Carolina pine or Virginia pine. The principal species cut in Georgia, Florida, Alabama, Mississippi, Louisiana, and Texas is longleaf, while practically all the yellow pine cut in Arkansas and Missouri is shortleaf.

By the term "western pine" is here meant the western yellow pine, known botanically as *Pinus ponderosa*, although small quantities of lumber cut from other western pines are probably included. It is properly classed with the pitch or yellow pines, but the wood is lighter and less resinous than that of the southern yellow pines, and many manufacturers insist, with considerable reason, that it is so nearly like white pine that the word "white" should appear in the name.

Sugar pine belongs to the white-pine family.

The terms "larch" and "tamarack" are used interchangeably both in the Lake States and in Montana, Idaho, eastern Washington, and eastern Oregon, but the species so designated in the two regions are wholly different. Tamarack in this table designates the Lake States species and larch the western.

TABLE 18.—CUT OF LUMBER BY SPECIES AND CUT OF LATH AND SHINGLES, FOR EACH STATE: 1909.

[From "Forest Products of the United States: 1909," compiled by Bureau of the Census in cooperation with Forest Service.]

State.	Active mills report- ing. ¹	Softwoods.					
		Total cut of lumber.	Total softwoods.	Yellow pine.	Douglas fir.	White pine.	Hem- lock.
		<i>M feet.</i>	<i>M feet.</i>	<i>M feet.</i>	<i>M feet.</i>	<i>M feet.</i>	<i>M feet.</i>
United States.....	48,112	44,509,761	33,896,959	16,277,185	4,856,378	3,900,034	3,051,999
Alabama.....	2,188	1,691,001	1,516,382	1,506,863	.....	.....	.....
Arizona.....	21	62,731	62,731	.....	5,527	.....	.....
Arkansas.....	2,060	2,111,300	1,969,187	1,313,668	.....	.....	.....
California.....	805	1,143,507	1,141,301	.....	88,852	.....	416
Colorado.....	250	141,710	141,549	.....	6,046	.....	.....
Connecticut.....	420	168,371	44,249	2,152	.....	30,579	11,177
Delaware.....	151	55,440	40,990	38,320	.....	960	.....
Florida.....	493	1,201,734	1,106,912	1,110,840	.....	.....	.....
Georgia.....	2,083	1,342,249	1,259,231	1,194,987	.....	31,324	966
Idaho.....	304	645,800	640,354	.....	63,869	169,403	1,165
Illinois.....	827	170,181	4,521	.....	.....	153	.....
Indiana.....	1,804	556,418	1,216	.....	.....	64	482
Iowa.....	350	132,021	80,378	.....	.....	80,158	215
Kansas.....	7	4,716	.....	.....	.....	.....	.....
Kentucky.....	2,372	860,712	78,869	38,419	.....	4,606	27,086
Louisiana.....	658	3,551,918	3,345,610	2,736,756	.....	.....	.....
Maine.....	1,243	1,111,565	983,954	13,474	.....	383,551	109,681
Maryland.....	729	287,939	130,884	97,588	.....	4,943	20,912
Massachusetts.....	643	361,200	291,429	6,110	.....	222,604	24,797
Michigan.....	1,823	1,889,724	966,747	.....	.....	258,080	614,622
Minnesota.....	745	1,561,508	1,479,553	.....	.....	1,308,861	15,552
Mississippi.....	1,795	2,572,669	2,186,427	2,114,706	.....	.....	.....
Missouri.....	2,076	660,159	178,146	142,271	.....	.....	.....
Montana.....	180	308,562	308,072	.....	43,270	1,671	.....
New Hampshire.....	708	649,606	592,663	17,526	.....	242,656	66,898
New Jersey.....	276	61,620	24,690	16,145	.....	323	212
New Mexico.....	80	91,987	91,987	.....	4,925	.....	.....
New York.....	2,308	661,440	404,564	.....	.....	104,668	162,784
North Carolina.....	3,307	2,177,715	1,776,401	1,575,186	.....	96,624	40,018
Ohio.....	1,632	642,904	10,389	1,629	.....	203	8,415
Oklahoma.....	380	225,730	141,677	141,664	.....	.....	.....
Oregon.....	696	1,898,995	1,895,900	.....	1,581,621	.....	.....
Pennsylvania.....	3,054	1,462,771	820,604	32,623	.....	92,431	24,794
Rhode Island.....	57	25,489	13,660	1,106	.....	11,403	687,005
South Carolina.....	1,048	897,660	855,515	797,094	.....	7,618	888
South Dakota.....	54	31,057	30,294	.....	.....	.....	.....
Tennessee.....	2,643	1,223,849	208,126	117,135	.....	35,553	35,563
Texas.....	719	2,099,130	2,021,617	2,019,423	.....	.....	.....
Utah.....	88	12,638	12,211	.....	674	.....	.....
Vermont.....	725	351,571	242,980	3,184	.....	43,274	62,345
Virginia.....	3,511	2,101,716	1,460,133	1,221,691	.....	96,061	42,359
Washington.....	1,143	3,862,916	3,861,137	.....	3,060,983	33,960	103,268
West Virginia.....	1,624	1,472,942	565,395	16,615	.....	25,986	279,832
Wisconsin.....	1,241	2,025,038	1,399,398	.....	.....	612,327	709,347
Wyoming.....	89	28,602	28,476	.....	611	.....	.....
All other States ²	4	11,230	10,500	.....	.....	.....	.....

¹ The numbers in this column include all mills reporting lumber, lath, or shingles, and therefore are greater than the numbers of sawmills shown on p. 34 and in Table I, p. 278.

² Includes Nebraska and Nevada.

TABLE 18.—CUT OF LUMBER BY SPECIES AND CUT OF LATH AND SHINGLES, FOR EACH STATE: 1909—Continued.

State.	Softwoods—Continued.							
	Spruce. M/ft.	Western plac. M/ft.	Cypress. M/ft.	Red- wood. M/ft.	Cedar. M/ft.	Larch. M/ft.	Tame- rack. M/ft.	White fir. M/ft.
United States.....	1,748,547	1,499,965	955,635	521,630	346,008	264,022	157,192	98,318
Alabama.....			6,650		2,869			111
Arizona.....	4	57,089						
Arkansas.....			55,012		507			
California.....	13,241	394,748		521,630	14,834			48,306
Colorado.....	32,471	95,254						585
Connecticut.....	262							
Delaware.....	1,610		32		78			
Florida.....			84,811		1,261			
Georgia.....	2,789		27,517		1,648			
Idaho.....	1,136	254,283			28,644	97,743		22,705
Illinois.....			4,186		595		152	
Indiana.....			125					
Iowa.....					3		2	
Kansas.....								
Kentucky.....	2,226		5,607		995			
Louisiana.....			608,854					
Maine.....	421,297				15,140		420	
Maryland.....	5,718		1,601		112			
Massachusetts.....	36,911				618		102	
Michigan.....	21,797				17,647		44,956	
Minnesota.....	78,500		41,666		1,945		63,555	
Mississippi.....			32,891		2,984			
Missouri.....								
Montana.....	6,837	146,890			60	104,130		2,647
New Hampshire.....	253,107				44		201	
New Jersey.....	125							
New Mexico.....	3,822	82,739			7,885			
New York.....	127,864							501
North Carolina.....	24,277		34,506		5,965			
Ohio.....	78				16		48	
Oklahoma.....			13					
Oregon.....	57,002	169,592			26,607	22,354		5,586
Pennsylvania.....	7,307				374		809	
Rhode Island.....	355				26			
South Carolina.....	13,803		36,040		72			
South Dakota.....		30,234						
Tennessee.....	720		8,709		8,927			
Texas.....			1,972		222			
Utah.....	2,381	7,495						796
Vermont.....	123,164				876		28	
Virginia.....	79,672		5,443		14,907			
Washington.....	165,331	286,357			183,952	39,795		7,491
West Virginia.....	242,897				65			
Wisconsin.....	21,168							
Wyoming.....	675	15,304			6,257		46,919	
All other States ¹		10,000						500

¹ Includes Nebraska and Nevada.

TABLE 18.—CUT OF LUMBER BY SPECIES AND CUT OF LATH AND SHINGLES, FOR EACH STATE: 1909—Continued.

State.	Softwoods—Continued.				Hardwoods.			
	Sugar pine.	Balsam fir.	Lodgepole pine.	Total hardwoods.	Oak.	Maple.	Yellow poplar.	Red gum.
United States.....	<i>M feet.</i> 97,191	<i>M feet.</i> 108,702	<i>M feet.</i> 23,733	<i>M feet.</i> 10,612,802	<i>M feet.</i> 4,414,457	<i>M feet.</i> 1,106,904	<i>M feet.</i> 858,500	<i>M feet.</i> 706,945
Alabama.....				174,619	86,557	1,041	38,324	17,092
Arizona.....								
Arkansas.....				742,113	358,556	18,500	4,484	200,953
California.....	86,822	463	452	2,206	2,190			
Colorado.....		1	6,730	161				
Connecticut.....				124,122	34,246	3,924		
Delaware.....				14,450	11,128	331	313	1,659
Florida.....				4,822	1,300		1,268	260
Georgia.....				83,018	46,329	535	21,472	4,828
Idaho.....	88	1,228		5,446				
Illinois.....				165,600	101,279	7,163	3,628	9,748
Indiana.....				555,202	228,343	43,644	29,174	23,649
Iowa.....				51,643	17,335	3,128		
Kansas.....				4,716	524	117		
Kentucky.....				781,823	405,677	9,069	149,808	42,072
Louisiana.....				206,308	74,490	445	586	34,499
Maine.....	50,491			117,611	18,554	16,714		
Maryland.....				137,055	71,792	6,391	5,328	4,482
Massachusetts.....	287			69,771	13,991	6,166		
Michigan.....	9,645			922,977	40,023	543,214		
Minnesota.....	11,140			81,955	15,801	1,519		
Mississippi.....				416,242	168,508	770	25,833	120,731
Missouri.....				482,013	271,623	10,376	1,791	83,905
Montana.....		2,567		510				
New Hampshire.....	12,231			56,943	15,919	7,892	657	429
New Jersey.....				36,930	17,700	476		
New Mexico.....								
New York.....	9,248			276,886	36,520	75,024	2,351	
North Carolina.....	125			401,314	209,405	5,510	74,285	30,883
Ohio.....				632,515	259,410	43,852	42,317	2,194
Oklahoma.....				84,053	60,964	342		2,557
Oregon.....	8,369		25	3,045	165	1,491		
Pennsylvania.....		55		642,167	297,154	91,654	14,727	1,178
Rhode Island.....				11,829	3,567	554		
South Carolina.....				42,145	11,217	329	7,644	14,651
South Dakota.....				823	1			
Tennessee.....	1,489			1,015,723	546,500	8,610	164,826	75,865
Texas.....				77,513	47,252	90		18,988
Utah.....			845	427				
Vermont.....	10,059			108,641	11,463	27,533		
Virginia.....				641,583	387,937	6,104	114,503	13,760
Washington.....				1,779	106	388		
West Virginia.....				907,547	466,424	53,782	154,581	2,952
Wisconsin.....	3,380			625,640	84,391	109,925		
Wyoming.....			11,886	126	126			
All other States ¹				730				

¹ Includes Nebraska and Nevada.

TABLE 18.—CUT OF LUMBER BY SPECIES AND CUT OF LATH AND SHINGLES, FOR EACH STATE: 1909—Continued.

State.	Hardwoods—Continued.							
	Chestnut.	Beech.	Birch.	Bass-wood.	Elm.	Cotton-wood.	Ash.	Hickory.
United States.....	<i>M feet.</i>	<i>M feet.</i>	<i>M feet.</i>	<i>M feet.</i>	<i>M feet.</i>	<i>M feet.</i>	<i>M feet.</i>	<i>M feet.</i>
Alabama.....	1,909	1,125		564	1,062	1,269	3,387	7,076
Arizona.....								
Arkansas.....		78	138	605	13,066	54,507	33,212	45,133
California.....								
Colorado.....						161		
Connecticut.....	77,604	804	1,361	745	367	476	1,684	2,442
Delaware.....	752	82	30		3		61	81
Florida.....							282	1,383
Georgia.....	2,429	67	20	88	274	2,260	3,106	1,171
Idaho.....						5,446		
Illinois.....		1,472	475	587	12,102	3,939	2,894	11,095
Indiana.....	2,789	98,729	1,216	13,917	40,364	4,143	23,488	23,513
Iowa.....			627	4,111	11,710	10,778	788	1,490
Kansas.....					720	586	116	1,034
Kentucky.....	35,648	36,953	1,040	10,056	10,130	1,537	14,958	41,656
Louisiana.....		581			1,341	47,509	11,200	7,704
Maine.....	171	9,638	62,812	4,123	910	2,012	2,572	93
Maryland.....	32,251	2,968	1,350	2,386	974		2,166	4,267
Massachusetts.....	28,831	4,035	8,908	1,296	366	799	2,879	656
Michigan.....		111,340	64,341	69,453	58,321	6,384	24,865	1,850
Minnesota.....			9,785	20,131	14,645	16,668	3,326	28
Mississippi.....	1,692	680	85	591	6,090	46,222	15,017	21,967
Missouri.....		325	1,115	1,090	27,913	17,987	12,685	33,259
Montana.....						510		
New Hampshire.....	4,338	8,397	13,723	2,328	242	896	2,554	64
New Jersey.....	14,722	106	57	356	102	3	183	1,566
New Mexico.....								
New York.....	18,829	42,334	31,990	36,058	16,280		12,747	1,426
North Carolina.....	49,738	880	658	6,387	404	309	4,476	3,132
Ohio.....	16,424	49,421	836	16,007	33,182	2,944	25,753	21,774
Oklahoma.....			48	2	2,140	9,585	2,879	2,572
Oregon.....						883	455	
Pennsylvania.....	107,838	57,285	21,650	13,008	4,954	87	9,814	15,267
Rhode Island.....	6,936	20	148		6	50	236	172
South Carolina.....	629	15			19	2,048	2,219	170
South Dakota.....						810	12	
Tennessee.....	71,962	18,341	1,274	11,463	10,688	12,380	18,709	58,477
Texas.....		62	99	97	703	3,354	5,346	922
Utah.....						427		
Vermont.....	641	16,452	33,450	10,478	1,766	1,881	4,531	100
Virginia.....	67,996	2,238	843	9,658	244	254	5,590	5,528
Washington.....						769	215	
West Virginia.....	119,762	36,722	14,579	29,679	881	352	9,171	16,552
Wisconsin.....		9,444	179,692	133,867	75,472	4,338	27,631	297
Wyoming.....								
All other States ¹						730		

¹ Includes Nebraska and Nevada.

TABLE 18.—CUT OF LUMBER BY SPECIES AND CUT OF LATH AND SHINGLES, FOR EACH STATE: 1900—Continued.

State.	Hardwoods—Continued.						Lath.	Shingles.
	Tupelo.	Walnut.	Sycamore.	Cherry.	All other.	Lath.		
	<i>M. feet.</i>	<i>M. feet.</i>	<i>M. feet.</i>	<i>M. feet.</i>	<i>M. feet.</i>	<i>M.</i>		
United States.....	96,676	46,108	56,511	24,594	37,557	3,708,195	<i>M.</i> 14,907,371	
Alabama.....	13,074	721	419	117	862	50,979	245,871	
Arizona.....						7,816	583	
Arkansas.....	6,084	644	5,406	332	525	78,362	208,080	
California.....					26	32,615	574,342	
Colorado.....						11,494	657	
Connecticut.....	54	186	10	159	60	203	2,801	
Delaware.....	7	6			4	1,086	570	
Florida.....						55,741	283,206	
Georgia.....	286	48	80	15	10	58,704	443,200	
Idaho.....						86,740	62,308	
Illinois.....	764	5,051	5,073	163	227	1,055	2,245	
Indiana.....	262	7,669	11,003	1,969	1,330	3,600	7,340	
Iowa.....			382	177	382	22,978	8,264	
Kansas.....		1,114	355		150			
Kentucky.....	307	4,907	6,760	792	10,453	19,776	55,010	
Louisiana.....	24,703		94		2,856	377,708	757,808	
Maine.....				7	5	337,086	598,131	
Maryland.....	225	362	904	872	337	17,583	12,352	
Massachusetts.....		228	6	782	176	11,885	13,347	
Michigan.....		184	749	1,587	660	218,308	891,649	
Minnesota.....		28		8	16	478,008	74,818	
Mississippi.....	6,146	33	379	5	1,493	90,926	151,303	
Missouri.....	4,351	4,314	10,526	376	377	19,931	51,932	
Montana.....						35,460	525	
New Hampshire.....		4		586		26,873	30,132	
New Jersey.....	10	78	15	16	154	19,143	35,727	
New Mexico.....						10,571	150	
New York.....				3,327		70,878	91,886	
North Carolina.....	12,219	267	221	325	2,215	70,724	280,942	
Ohio.....		8,580	5,243	2,105	2,453	17,508	3,227	
Oklahoma.....	111	302	2,353	8	190	1,233	4,635	
Oregon.....					51	161,512	293,644	
Pennsylvania.....	19	1,762	562	4,324	884	143,059	79,336	
Rhode Island.....		138		2			1,000	
South Dakota.....	3,165	11	10	18		28,303	122,709	
Tennessee.....	3,180	4,068	3,512	874	5,294	31,179	35,692	
Texas.....	25	79	59		525	59,627	137,719	
Utah.....						264	725	
Vermont.....		5		285	56	7,249	24,001	
Virginia.....	20,942	2,308	690	220	2,478	127,555	39,172	
Washington.....					300	451,384	8,879,467	
West Virginia.....	742	1,968	1,533	5,058	2,809	150,820	6,829	
Wisconsin.....		285		85	193	299,945	392,963	
Wyoming.....						1,224	960	
All other States *.....						500		

* A "thousand" (usually written M) shingles does not mean 1,000 pieces, as illustrated by the following extract from the grading rules of the Southern Cypress Manufacturers' Association: "The count of our manufacture of shingles, of all grades, is based on 4,000 linear inches in width, making 1,000 standard shingles. Consequently there would be only 667 6-inch shingles packed and counted as 1,000 standard shingles, 5-inch dimension being counted in like proportion."

* Includes Nebraska and Nevada.

The report by the Bureau of the Census and the Forest Service gives the following information regarding the species from which shingles and lath are produced.

OUTPUT OF SHINGLES BY SPECIES: 1909.

Species.	Output.	Species.	Output.
Total	<i>M.</i> ¹ 14,907,371		<i>M.</i> ¹ 147,132
Cedar.....	10,963,817	Spruce.....	91,766
Cypress.....	1,386,722	Hemlock.....	76,029
Yellow pine.....	1,283,565	Western pine.....	68,984
Redwood.....	506,651	Oak.....	32,818
White pine.....	283,213	All other.....	56,724

¹ See footnote 1, p. 92.

Of this total of 14,907,371 M shingles cut in 1909, cedar constituted the material of 73.5 per cent, yellow pine and cypress of approximately 9 per cent each, and redwood of 3.4 per cent. The bulk of the cedar shingles were cut from the western red cedar, and were manufactured in the State of Washington. The shingle output of that State in 1909 was about three-fifths of that of the country. Considerable quantities of shingles of the eastern white cedar, or arbor vitæ, are manufactured in Michigan, Wisconsin, and Maine. The cypress shingles are cut chiefly in Louisiana, and the redwood shingles entirely in California.

Lath are chiefly a by-product of lumber manufacture, and are cut from so many kinds of timber that it is very difficult to get satisfactory reports upon the total production of any one kind. Consequently, only the total production of lath by States in 1909 is shown.

In the Lake States lath are chiefly manufactured from white pine and hemlock, in Washington from Douglas fir, and in the Southern States from yellow pine.

CHAPTER III.

CONCENTRATION OF TIMBER OWNERSHIP.

The concentration of timber ownership is discussed in this report solely with reference to timber within the investigation area. The amount here shown as concentrated in holdings of over 60 million feet each includes only holdings of over 60 million in the investigation area and therefore should not be compared with the estimate of the total privately owned timber in the United States, but only with that in the investigation area. To make the comparison with the total privately owned in the country it would, of course, be necessary to ascertain the large holdings outside the investigation area and include them with those inside. Though the Bureau made no investigation outside this area, general information which has come to its attention indicates the strong probability that a systematic canvass would reveal a very high degree of concentration in the ownership of the timber outside the investigation area, especially in the Appalachian region from Maine to northern Georgia, and in the southern Rockies. A considerable number of reports on large holdings outside the investigation area were secured by the Bureau, incidental to its main work. Many of these are holdings owned by large companies that also have important amounts of timber in the investigation area. In the same way, some information was obtained showing large investments by prominent American timber holders in Canadian and Mexican timber.

Section 1. Size groups used.

Except for the Southern Pacific Company, the Weyerhaeuser Timber Company, and the Northern Pacific Railway Company, the holdings of standing timber are shown in this chapter by size groups. The holdings of these three companies are stated separately in section 3, and in the tables they always constitute group 1. All other holdings are grouped according to the following limits:

- Group 2: From 13,000,000,000 feet to 25,000,000,000 feet.
- Group 3: From 5,000,000,000 feet to 13,000,000,000 feet.
- Group 4: From 3,500,000,000 feet to 5,000,000,000 feet.
- Group 5: From 2,000,000,000 feet to 3,500,000,000 feet.
- Group 6: From 1,000,000,000 feet to 2,000,000,000 feet.
- Group 7: From 500,000,000 feet to 1,000,000,000 feet.
- Group 8: From 250,000,000 feet to 500,000,000 feet.
- Group 9: From 125,000,000 feet to 250,000,000 feet.
- Group 10: From 60,000,000 feet to 125,000,000 feet.
- Group 11: Less than 60,000,000 feet.

Some of the holders in groups 2, 3, and 4 are named in the discussion of the tables. If a holding falls just within a group, the statement that it does fall there might be nearly equivalent, in the eyes of men familiar with the timber situation in the region, to a statement of its size. To avoid conveying in this way any definite information about particular holdings, four or five holders in the first few groups whose holdings were a little above the line which divides one group from another have been placed in the group below. If a holder is named as belonging to a group, he has at least a moderate amount more than the group minimum; he may possibly have a little more than the group maximum.

To give the reader an idea what a billion (1,000,000,000) feet of lumber means, the following illustrations are given: A billion feet of lumber would load a freight train 417 miles long, or it would build about 65,000 ordinary 5 or 6 room houses.

Section 2. Incompleteness of statistical measurements of concentration.

The concentration of timber ownership shown in this report is to be taken as only a minimum. The full amount and significance of concentration has not been ascertained, for the following reasons:

1. That there is an extensive interownership of stock not shown by the report.
2. That large holders control great quantities of timberland which they do not actually own.
3. That the large holdings, generally speaking, are of better quality than the small.

INTEROWNERSHIP OF STOCK NOT SHOWN.—There is a remarkable interweaving of interests among owners of timber, individual and corporate. It often happens that only a fraction of the timber under one control is held in any one name. Most of the important owners refused to furnish the information necessary to reveal the great concentration of control through personal and corporate relations. Yet only answers on this point (see question 7 of schedule, p. 275) would reveal the true concentration of the ownership of timber. Persistent effort was made to secure the information on stock holdings from those concerned and from others who might know the facts, and, as is shown below, separate owners of record were consolidated wherever sufficient evidence of one controlling interest was obtained. But nothing short of access to the stock books of all important timber-owning corporations would show the true situation. Therefore the degree of concentration set forth in this report is certainly much below that which actually exists.

Some corporations gave the information regarding stockholders and stock interests in other corporations; some individuals stated, apparently in good faith, their stock holdings in corporations con-

nected with the lumber industry; and from independent sources some specific facts and much general information were gathered. This evidence was carefully considered, and where it was sufficient to show a common control through ownership the separate holdings so controlled were combined and treated as one in the tables of this chapter. Such combinations were not made because of mere common management or harmonious operation. The test was that of actual control through ownership of at least half the stock by the interest in question. If an individual owning timber had at least half the stock of a timber-owning corporation, the two holdings were combined as one. A corporation was combined with others in which it held a majority of the stock. In a number of important cases, the same few individuals appeared in several corporations as holding a majority of the stock in each, and the corporate holdings were therefore combined as one.

A vast amount of interrelation short of actual majority control was proved by the information obtained, but there is no way of presenting the precise measure of it. For instance, an important individual owner is known to be an officer or important stockholder of a corporation; two corporations have largely the same officers or stockholders; a corporation owns stock in other corporations; a few individuals are known to be interested in each of several corporations; or a few individuals are known to control a corporation, and these individuals appear separately as very important stockholders in a number of other corporations. In none of these cases were combinations made, and the various holdings are counted separately in the tables as though there were no connections. It is believed that actual majority control by the same interest would be proved in a great number of such cases if the full facts were known from the stock books.

At first thought, it might seem that some way could have been devised to show the approximate importance of such interrelations; that, for example, loose groups might have been made containing corporations connected by important stockholders. The chief difficulty here would have arisen from the production of an endless chain. One corporation is connected by important stockholders with others, these by other important stockholders with yet other corporations, and so on; the group becoming too loose to be serviceable.

BLOCKING IN OF SMALL HOLDINGS.—Small tracts of standing timber can usually be handled alone only at a great disadvantage, and often not at all. Therefore, the big interests have a very important control of the small holders "blocked in" by them. The small holder can not log his timber, because there is no available market in which to sell the logs. He can sell the tract only to the one large holder or to one of a few large holders surrounding him, and if more than one they frequently have an understanding on the situation,

often in the form of buying zones. It is very common for a large holder to speak of the amount of timber he "controls," meaning the amount he owns plus the small holdings wholly or practically surrounded by his holding. It is impossible to measure this control in any exact way. The subject will be mentioned in more detail in Part II.

GENERALLY BETTER QUALITY OF LARGE HOLDINGS.—Speaking generally, the large holdings are of better quality than the small, and can be logged at less cost per unit of product. It follows that they are of greater importance in the market than their size alone would indicate.

These considerations are especially important in the Southern Pine Region. They are applicable to most large holdings in the Pacific Northwest, but not to those of the Southern Pacific Company and the Northern Pacific Railway Company, as the holdings of those companies were originally grants composed largely of alternate sections, and, further, the Northern Pacific has sold most of its best timber.

CONCENTRATION OF OWNERSHIP IN ENTIRE INVESTIGATION AREA.

Section 3. Southern Pacific, Weyerhaeuser Timber, and Northern Pacific companies.

The largest holders of standing timber in the United States are the Southern Pacific Company, the Weyerhaeuser Timber Company, and the Northern Pacific Railway Company.

The holding called by the name of the Southern Pacific Company in this report includes the timberland owned by the Oregon and California Railroad Company in Oregon; that of the Central Pacific Railway Company in California, together with about 75,000 acres owned by that company in Washoe County, Nev., just across the State line; and about 22,000 acres in Mendocino County, Cal., with less than 1.5 billion feet of timber, owned by the Albion Lumber Company. The Southern Pacific Company owns the stock of the Oregon and California Railroad Company and of the Central Pacific Railway Company. It has been reported from outside sources that in the latter part of 1907 the stock of the Albion Lumber Company was sold to Southern Pacific interests, and at the present time the current belief in timber circles is that the stock of the company is owned by the Southern Pacific and the Atchison, Topeka and Santa Fe interests. There seems to be no reasonable doubt regarding this control, but its exact form and extent are not known. The two railroad companies jointly own the entire capital stock of the Northwestern Pacific Railroad Company, which extends from San Francisco north into Mendocino County and near the holding of the Albion.

The Southern Pacific timber holding in California, as defined in this report, does not extend south of Eldorado County. It consists almost wholly of land acquired under Federal land grants by the California and Oregon Railroad Company and the Central Pacific Railroad Company, and now owned by the Central Pacific Railway Company. Besides this, it includes only the comparatively small holding of the Albion Lumber Company. The Southern Pacific has other great land interests arising from land grants in southern California, Nevada, and Utah, but this land bears very little timber. The Union Pacific, which dominates the Southern Pacific through the Oregon Short Line Railroad Company,¹ also has large land interests, but without an important amount of timber. These land interests of the Southern Pacific and the Union Pacific will be discussed in a subsequent part. The Southern Pacific directly and through its subsidiary corporations has about 130,000 acres, with less than a billion feet of timber, in Texas and Louisiana. In order that the great Southern Pacific holding might be discussed as entirely in the Pacific-Northwest, the comparatively small amount owned in Texas and Louisiana has not been included in it, but is included instead in group 3. (See p. 131.) The addition may readily be made by those who wish the total.

The figures for the timber holding of the Southern Pacific in Oregon do not include 23,000 acres of unpatented land, and about 270,000 acres of unsurveyed land claimed by the company under the grant.

The Weyerhaeuser Timber Company owns all the stock except the officers' qualifying shares in the following corporations: Weyerhaeuser Land Company, Pokegama Sugar Pine Lumber Company, Pelton-Reid Sugar Pine Lumber Company, Weyerhaeuser Realty Company, and Weyerhaeuser Lumber Company. The Weyerhaeuser Timber Company owns timber in Washington and a little in Idaho, the Weyerhaeuser Land Company owns timber in Oregon, the Pokegama in Oregon, the Pelton-Reid in Oregon and a small acreage of nontimbered land in California, the Weyerhaeuser Realty a very small amount in California, and the Weyerhaeuser Lumber a very small amount in Washington. The Weyerhaeuser Timber Company holds one-half the stock of the Clarke County Timber Company, owning 26,928 acres and less than three-quarters of a billion feet in Washington, the remaining half of the stock being owned by the Davis Land Company. The Weyerhaeuser Land Company has an undivided three-quarters interest with the Western Pacific Land and Timber Company in about 5,000 acres in Oregon; the Weyerhaeuser Timber Company owns an undivided half interest with the Western Washington Logging Company in 1,800 acres in

¹ See footnote on p. 17.

Washington, and an undivided half interest with the Davis Land Company in 2,240 acres in Washington. The timberland owned by the Weyerhaeuser Timber, Weyerhaeuser Land, Clarke County, Pokema, Pelton-Reid, Weyerhaeuser Realty, and Weyerhaeuser Lumber companies, and the fractional parts of the three undivided interests are included in this report under the name of the Weyerhaeuser Timber Company.

For other timberland in which Mr. Frederick Weyerhaeuser and associates are interested, see page 101.

Nearly all the timber included in this report under the name of the Northern Pacific Railway Company is owned by that company direct, but about 160,000 acres are owned by the Northwestern Improvement Company. All the stock of the Northwestern Improvement Company is owned by the Northern Pacific.

The amount of timber owned by each of these great holders is shown below, by States.

TABLE 19.—TIMBER HOLDINGS OF THE SOUTHERN PACIFIC, WEYERHAEUSER TIMBER, AND NORTHERN PACIFIC COMPANIES.

[In billions of board feet. Thus, 105.6=105,600,000 board feet.]

State.	Southern Pacific. ¹	Weyerhaeuser Timber.	Northern Pacific. ²	Total.
Pacific-Northwest.....	105.6	95.7	36.2	237.5
California.....	\$ 35.1	.1	.....	35.2
Oregon.....	70.5	18.7	.....	89.2
Washington.....	.....	76.9	25.2	102.1
Idaho.....	.....	.....	4.5	4.5
Montana.....	.....	.....	6.5	6.5

¹ As given in this and other tables the figures for this holding exclude something less than a billion feet owned in Texas and Louisiana.

² Holds about 37,000 acres in Minnesota in the name of Northwestern Improvement Company, but the small amount of timber on this land is not included in the table.

³ Includes the timber in Washoe County, Nev., mentioned on p. 97.

The Southern Pacific, Weyerhaeuser Timber, and Northern Pacific companies own 106, .96, and 36 billion feet of standing timber, respectively, in the Pacific-Northwest. The Southern Pacific owns 14.1 per cent of the privately owned timber in California and 17.7 per cent of that in Oregon; the Weyerhaeuser Timber Company owns 4.7 per cent of the privately owned timber in Oregon and 26.1 per cent of that in Washington; the Northern Pacific owns 8.6 per cent of the privately owned timber in Washington, 8.9 per cent of that in Idaho, and 29.8 per cent of that in Montana. The Southern Pacific and the Weyerhaeuser Timber, together, have 22.4 per cent of the privately owned timber in Oregon; and the Weyerhaeuser Timber and Northern Pacific together have 34.7 per cent of that in Wash-

ington. The three companies together have 23.5 per cent of all privately owned timber in the five States of the Pacific-Northwest.

The entire holding of the Southern Pacific in Oregon lies west of the Cascades, except that in Klamath County. The entire holding of the Weyerhaeuser Timber Company in Washington lies west of the Cascades, while its holding in Oregon is about three-fourths west of the Cascades and the remainder in Klamath and Lake counties. About two-thirds of the holding of the Northern Pacific in Washington is west of the Cascades. The Southern Pacific and the Weyerhaeuser Timber, together, own 25.8 per cent of the privately owned timber in Oregon and Washington west of the Cascades; and they and the Northern Pacific have 28.4 per cent.

The two enormous timber holdings of the country are those of the Southern Pacific and the Weyerhaeuser Timber companies. The 201 billion feet of timber in them would supply all the sawmills in Washington, Oregon, and California for twenty-nine years at the rate of the present annual output, and it would supply all the 46,584 sawmills in the United States (in 1909) for four and one-half years. Adding the Northern Pacific to these two companies, the total of 238 billion feet would supply all the sawmills in the five States of the Pacific-Northwest for thirty years at the rate of the present annual output, and all the sawmills in the United States for five and one-third years. These three holdings have enough standing timber to build an ordinary 5- or 6-room frame house for each of the 16,000,000 families in the United States in 1900. If sawed into lumber and placed in cars, their timber would load a train about 100,000 miles long.

The Southern Pacific and the Northern Pacific are not cutting any timber, and the logging operations of the Weyerhaeuser Timber Company are small compared with its holding. All the companies have great financial strength and so are able to hold the timber for the higher prices of the future. As is shown on page 88, over four-fifths of the present cut of lumber is from the timber in the eastern part of the United States, and with this rapid depletion of the supply there the country must turn more and more to the Pacific-Northwest. This, together with the cutting of the smaller holdings in that region, will give these three great holdings an increasing importance in the future. Furthermore, as is shown later, the Weyerhaeuser Timber Company has very important connections with other great timber-owning corporations in the Pacific-Northwest, and the interests in them are also powerful in the Southern Pine Region and in the Lake States. Eighty per cent of the timberland owned by the Weyerhaeuser Timber Company has been purchased from the Northern Pacific Railway Company since January 1, 1900, and there is some indication that the two companies may have important identical

stockholders. Other companies connected with the Weyerhaeuser Timber Company have also purchased large amounts of timberland from the Northern Pacific. There is some indication of considerable interrelation between the individuals of the Southern Pacific interests and other large timber-owning corporations on the Pacific coast.

The weight of lumber is great compared with its value, and consequently the industry is especially subject to the influence of transportation conditions. The Southern Pacific and the Northern Pacific thus become still more powerful factors in the lumber industry. In this connection, it may be noted that the Chicago, Milwaukee and Puget Sound Railway Company (subsidiary to the Chicago, Milwaukee and St. Paul Railway Company) and the Great Northern Railway Company also have important timber interests in the Pacific-Northwest.

As is shown in Chapter VI, the great holdings of the Southern Pacific, Weyerhaeuser Timber, and Northern Pacific companies have all resulted from railroad land grants, and patents for some of the land have not yet been issued; and all that owned by the Southern Pacific in Oregon is involved in the case of the United States *v.* The Oregon and California Railroad Company et al.

INTERRELATIONS OF MR. FREDERICK WEYERHAEUSER AND OTHER LARGE TIMBER HOLDERS.—The Weyerhaeuser Timber Company gave information regarding the corporations in which it owned stock, but it refused to furnish a list of its stockholders and the amount of stock owned by each. From the list of officers and directors, and from outside sources, a number of men have been recognized as apparently important stockholders in the company. Mr. Frederick Weyerhaeuser furnished informally a list of companies in which he is interested, together with the amount of stock in each owned by him and members of his family. This list has not been verified by access to the stock books of the corporations or other records. A comparatively large number of men influential in the industry have been close associates of Mr. Weyerhaeuser for many years, and in lumber circles he is usually credited with being the most influential person in the timber and lumber companies in which he is interested.

The companies with which Mr. Weyerhaeuser or some of his associates are identified make an important list of connected interests, which can be discussed best by groups as follows: 1. The Weyerhaeuser Timber Company. 2. Group A, consisting of other companies in which Mr. Weyerhaeuser is interested. 3. Group B, consisting of companies, other than those in A, in which one or more stockholders of the Weyerhaeuser Timber Company are interested. 4. Group C, consisting of companies, other than those in A and B

and the Weyerhaeuser Timber Company, in which one or more associates of Mr. Weyerhaeuser in the companies of group A are interested. The amount of timber owned by these groups, so far as they are known, is shown below in billions of board feet:

	Total.	Pacific-North-west.	Southern Pine Region.	Lake States.
Weyerhaeuser Timber Co.....	95.7	95.7	.....	.....
Group A.....	49.5	35.3	7.3	6.9
Group B.....	65.1	48.3	14.7	2.1
Group C.....	81.6	49.2	26.7	5.7
Total.....	291.9	228.5	48.7	14.7

The above table does not include any of the great railroad holdings. The stockholders of the Weyerhaeuser Timber Company are known to be interested in the enormous total of 210 billion feet, including the company holding itself and those of groups A and B.

According to the informal statement mentioned above, Mr. Weyerhaeuser owns from 10 to 60 per cent of the stock in each company included in group A, and about three-fourths of the timber in that group is owned by companies in which he holds from 20 to 60 per cent of the capital stock. There is, of course, a marked interrelation among the companies in these four groups through other stockholdings than those on which each particular group is based. Some of the stockholders in the Weyerhaeuser Timber Company and other associates of Mr. Weyerhaeuser are also important stockholders in the companies of group A, and, likewise, some of the stockholders in each group are stockholders in each of the other groups. As a rule, each company in these groups is connected with others by more than one stockholder. If the ownership of stock in each company were fully known, much stronger connections might appear. Important companies which have not been included might be included if the Bureau's information were complete. Moreover, companies which have been included may own stock in timber-owning corporations not included. For instance, such stock may be held by the timber-owning and other companies in which Mr. Weyerhaeuser is a stockholder. A few cases of this kind are known.

From the very incomplete information at hand it appears, as the above table shows, that the companies in which Mr. Weyerhaeuser owns stock, other than the Weyerhaeuser Timber Company, own 49.5 billion feet; that the companies in which other known stockholders of the Weyerhaeuser Timber Company own stock and in which Mr. Weyerhaeuser is not known to own stock have 65.1 billion feet; and that the companies in which the associates of Mr. Weyer-

haeuser own stock and in which neither he nor the known stockholders of the Weyerhaeuser Timber Company are known to be interested own 81.6 billion feet; a total of 291.9 billion feet owned by companies which, broadly speaking, are under the influence of Mr. Weyerhaeuser and his important associates. This total of 291.9 billion feet is divided by regions as follows: Pacific-Northwest, 228.5 billion feet; Southern Pine Region, 48.7 billion feet; and Lake States, 14.7 billion feet. It is important to note that nearly all this timber in the Southern Pine Region is in valuable virgin forests of longleaf and shortleaf pine in Arkansas, Louisiana, Mississippi, and Florida. Very little of the low-priced hardwoods is included in the reports for these companies in the Southern Pine Region and in Minnesota. Generally speaking, the companies in these groups have timber of the most valuable class in their localities, and further, by reason of the conditions described on page 96, their holdings "block in" a large amount of timber owned by small holders.

While the control of one company in these groups may lie with certain individuals and the control of another company with certain other individuals, there is a remarkable interweaving of interests among the various companies. As a whole they are controlled by a comparatively small number of persons closely united in subgroups through long business connection and often through family relationship. There is a very marked general spirit of harmony and cooperation among them. An extensive consolidation among these interests may easily be brought about at any time when circumstances favor it.

It is important to state that the companies of groups B and C have stockholders, other than those upon whom the groups are based, who hold stock in important companies outside these groups; and beyond these companies again another circle of companies might be formed, and so on.

It is also very important to note that the significant connection between the holdings making up the above 291.9 billion feet finds no expression in the tables of this report. Each holding involved in groups A, B, and C is counted separately in the tables and placed in its proper ownership group according to its individual size. Thus, this significant but more or less intangible affiliation of the Weyerhaeuser Timber Company and the holders of groups A, B, and C is an illustration of the point made in section 2, that there is a vast but unknown amount of concentration of ownership beyond that which could be shown in the tables presented.

The 292 billion feet owned by the companies described above, with the 106 billion of the Southern Pacific, the 36 billion of the Northern Pacific, and the 102 billion of the five holders discussed in section 4, make a total of 536 billion feet, or 31 per cent of all the privately

owned timber in the investigation area, in the hands of a few interests. Beyond this is the fact that these companies as a rule own the most valuable timber in their localities; that they control, by "blocking in," a large amount of additional timber owned by small holders; that many important timber-owning companies not here included are connected with companies that are included, as the above paragraph indicates, through men who have stock in one and another; and that the more valuable timber outside this group of interests is owned in large part by a comparatively few companies, many of which are interrelated.

Section 4. The five holdings in group 2.

The five holdings in group 2, ranging from 13 to 25 billion, total 102 billion feet, 0.6 billion of which is in Minnesota and Michigan and the rest in the Pacific-Northwest, as follows: California, 49.0 billion; Oregon, 34.6; Washington, 14.8; and Idaho, 3.0. These five holdings, in order of size, are as follows:

1. A number of companies controlled by Charles A. Smith, of Minneapolis, Minn., and having largely the same minor stockholders. Nearly all the timber is owned by the following corporations: The C. A. Smith Fir Company, the C. A. Smith Timber Company, and the Linn and Lane Timber Company, in Oregon, and the C. A. Smith Redwood Company and the C. A. Smith Sugar Pine Company, in California.

2. The personal holding of Thomas B. Walker, of Minneapolis, Minn., in California, and a small company holding in Minnesota.

3. A number of companies in which N. P. Wheeler and W. E. Wheeler, brothers, of Endeavor, Pa., are the chief stockholders. N. P. Wheeler and W. E. Wheeler have more than a majority interest in about two-fifths of the total timber in the holding; they, together with J. E. Wheeler, son of W. E. Wheeler, and one other stockholder, have more than a majority interest in about two-fifths more; and they appear to be the chief stockholders in the remaining fifth, although their exact interest is not known. A small number of individuals own the rest of the stock in these companies, and while they are not each interested in every company the community of ownership is far greater than is indicated by the interest of the Wheelers alone. The Wheelers also have timber interests outside the investigation area, which have not been reported.

4. A. B. Hammond Company of New Jersey, Hammond Lumber Company of Delaware, Hammond Lumber Company of New Jersey, Vance Redwood Company, Curtis Lumber Company, Oregon Rafting Company, and Western Oregon Company. A. B. Hammond, of San Francisco, is apparently the largest stockholder in the A. B. Ham-

mond Company. That corporation owns, directly or indirectly, all or most of the stock of all the others named, and also that of the following companies which do not own timber: National Lumber Company, capital stock \$500,000, engaged in the distribution of lumber; Oakland Sash and Door Company, capital stock \$50,000, engaged in the sash and door trade; Humboldt Door and Sash Company, capital stock \$50,000, engaged in the manufacture of sash and doors; and the Oregon and Eureka Railroad Company, capital stock \$125,000, operating a railroad between Eureka and Trinidad, Cal. The A. B. Hammond Company, the Hammond Lumber Company of New Jersey, the Vance Redwood Company, and the Curtis Lumber Company own large amounts of timber; the Oregon Rafting and Western Oregon companies own small amounts; the Hammond Lumber Company of Delaware owns only stock. The timber credited to the A. B. Hammond Company is one-half of a joint holding with the Winton Timber Company. It is not known whether there is any stock connection between these companies. Part of the timber credited to the Hammond Lumber Company of New Jersey is its proportion of three joint holdings, the largest of which is held with the Hill-Davis Company. It is not known whether there are stock connections between this company and the Hammond companies. A. B. Hammond and members of the Hill-Davis Company are associated in a very important Oregon timber-owning company not in this group. H. E. Huntington is a director in one of the principal Hammond companies and also a director of the Southern Pacific Company and of its two timber-owning subsidiaries, the Central Pacific and Oregon and California railroad companies.

5. The timber interests of the Chicago, Milwaukee and Puget Sound Railway Company (subsidiary to the Chicago, Milwaukee and St. Paul Railway Company), nearly all in the name of the Milwaukee Land Company.

Section 5. Concentration of ownership, by size groups.

In Table 20 the holdings are grouped according to their size in the investigation area. The figures in italics opposite "Investigation area" show the number of holdings in each group, and the figures in italics opposite each of the three geographic divisions show the number of the holders in each group who own in that division. These figures show, for each geographic division, not the numbers of holdings of the indicated sizes therein, but the numbers of holdings, lying wholly or partly therein, which have the indicated sizes in the investigation area. The sums of the numbers for the three divisions are greater than the numbers for the investigation area because some holdings lie partly in one division and partly in another. In a small number of

cases, chiefly in the Southern Pine Region and the Lake States, where the portion of a holding in one division is less than about 15 per cent of the minimum limit of the group, the holding has been excluded from the count of the number of holdings for that division. This was done to keep the insignificant parts of some holdings from obscuring the number of important holders that practically constitute the group in a given region. A further explanation is given in a footnote to Table 20.

The size groups are described on page 94. Group 11, which embraces all holdings of less than 60 million feet, must not be supposed to consist of small and scattered holdings, such as "farmers' wood lots." A large part of the timber in this group is in holdings worth \$100,000 or more apiece; not a little in holdings worth \$200,000 and \$300,000; some of it in holdings worth \$500,000 or more. A holding of 25 million feet of southern yellow pine at \$4 a thousand is worth \$100,000; 40 million feet of cypress at \$8 a thousand is worth \$300,000; 50 million feet of white pine at \$10 is worth \$500,000. Such holdings are "small" only when compared with the enormous holdings discussed in this report.

One such holding will overbalance a great many farmers' wood lots, both in extent and in value. In the South or the Lake States a holding of 50 million feet may mean a tract of 10,000 or 15,000 acres. Suppose a farmer has 50 acres of timber, with a stand of 5,000 feet to the acre. That is 250,000 feet. In most cases it will consist of the cheaper sorts; it is shown below (p. 134) that timber is the more certainly gathered into large holdings in proportion as it is more desirable. If the farmer's 250,000 feet is worth \$1 a thousand, the whole value of it is \$250; at \$2 a thousand it would be worth \$500; at \$5 a thousand it would be worth only \$1,250.

Persons of small means are not so likely as the large capitalist to share in the gain of timber speculation, even in proportion to their means. Persons whose property is small are likely to want a current income from it; timber held for the rise gives no current income. The small absentee owner can do nothing to protect his property from theft—a danger to which timber is particularly liable; and the speculative owner is apt to be an absentee. Moreover, timber is ill fitted for speculation on a small scale, because, as is fully shown in Chapter V (p. 178), the small owner usually gets materially less than the large owner for precisely similar stumpage.

TABLE 20.—HOLDINGS OF STANDING TIMBER IN THE INVESTIGATION AREA, GROUPED BY SIZE.

In billions of board feet. Thus, 237.5=237,500,000 board feet. Each holding is grouped according to its total in the investigation area. See p. 94 for description of the groups, and p. 105 for explanation of the figures in italics.¹

	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	Group 11.		
Total.	3	5	14	86	42	105	190	873	489	655	1,802			
Investigation area.....	1,747.0	237.5	102.0	119.5	115.3	116.2	149.2	132.4	96.4	84.8	55.5	1,208.8	538.2	
Pacific-Northwest.....	3	5	12	18	20	67	80	90	176	222	711			
California.....	248.1	35.2	49.0	24.9	27.5	21.2	26.4	12.4	5.2	4.2	3.3	209.3	38.8	
Oregon.....	398.1	89.2	34.6	33.3	26.7	24.4	39.9	23.3	13.7	12.7	7.6	305.4	92.7	
Washington.....	294.6	102.1	14.8	11.8	14.1	16.8	22.9	21.8	12.3	13.8	6.8	237.2	57.4	
Idaho.....	50.4	4.5	3.0	19.1	1.0	2.0	2.7	1.6	2.3	1.1	.3	37.6	12.8	
Montana.....	21.8	6.5	8.3	1.7	.2			.1	.8		.3	17.9	3.9	
Southern Pine Region.....	634.0		8	18	38	92	148	251	367	945	336.3	297.7		
Missouri (part).....	9.9					.3	1.2	1.7	.4	.9	.7	5.2	4.7	
Arkansas.....	78.7			2.9	3.5	6.1	8.3	7.8	5.2	4.1	37.9	40.8		
Texas.....	66.0			11.2	3.6	6.0	.6	4.9	4.2	3.3	2.7	36.5	29.5	
Louisiana.....	119.8			3.7	15.2	14.8	15.8	11.4	9.4	7.5	5.0	82.8	37.0	
Mississippi.....	95.3			6.5	4.3	7.9	7.7	4.6	7.2	5.5	4.1	47.8	47.5	
Alabama.....	56.3			1.0	.9	2.6	7.4	3.6	3.8	2.4	21.7	24.6		
Florida.....	73.9			.6	.7	7.4	11.9	13.6	10.0	8.4	5.6	58.2	15.7	
Georgia (part).....	46.0					2.2	1.1	.2	3.2	1.9	2.3	10.9	35.1	
South Carolina (part).....	30.7			.1		3.3	.4	3.1	2.0	2.2	2.1	13.2	17.5	
North Carolina (part).....	42.9			4.9	.3	2.4	2.9	3.2	3.0	1.7	18.4	24.5		
Virginia (part).....	14.5			.1	1.3	.4		.6	.3	.7	3.7	10.8		
Lake States.....	100.0			4	6	7	27	34	69	68	215	34.9		
Michigan.....	47.6			.2		6.0	1.6	3.4	6.4	5.0	5.8	2.8	31.2	16.4
Wisconsin.....	26.2			.6		2.1	2.0	5.9	4.8	4.4	2.2	22.0	7.2	
Minnesota.....	23.2			.4		5.0		1.7	2.2	1.0	.8	8	11.9	11.3

¹ As noted in the text, in a few instances small fractions of holdings have been included in the above table without also counting the holder in the italicized entries. The number of such holders not included in the italicized entries, and the amount of timber in hundredths of a billion feet owned by them (the timber being included in the above table) are given below:

	Group number—						
	3	4	5	6	7		
Pacific-Northwest.....	1	1	1	1	1	1	1
Southern Pine Region.....	0.59	0.61	0.05	0.15	0.25	0.1	0.1
Lake States.....	.61	.61	.16	.12			

The above table shows the absolute amount of timber owned by each group of holders.

Concentration of ownership is brought out more clearly in Table 21. That table shows what percentage of the total timber falls within each group and also the number of holders in each group. These percentages are based on the figures in Table 20. Thus, 6.7 per cent of all the timber in the investigation area is owned by the 42 holders in group 5 (each having from 2,000,000,000 to 3,500,000,000 feet). Twenty-six of these holders have all or part of their holdings in the Pacific-Northwest, 18 in the Southern Pine Region, and 6 in the Lake States. This illustrates the point mentioned in the first paragraph of this section, that the sum of the numbers of holders in the three geographic divisions is greater than the number in the investigation area. Likewise, no opinion as to the number of holders in a particular State can be drawn from the number shown for the geographic division.

TABLE 21.—HOLDINGS OF STANDING TIMBER IN THE INVESTIGATION AREA: DISTRIBUTION BY SIZE GROUPS, IN PERCENTAGES.

[Percentages computed from Table 20. See note at head of Table 20.]

	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	Group 11.
Investigation area.....	100.0	3	5	14	26	42	105	160	273	459	655	1,802	30.8
Pacific-Northwest.....	100.0	3	5	12	18	29	67	86	96	176	222	711	79.7
		23.5	10.0	9.6	7.0	6.4	9.1	5.8	3.4	3.1	1.8		20.3
California.....	100.0	14.2	19.8	10.0	11.1	8.6	10.6	5.0	2.1	1.7	1.3	84.4	15.6
Oregon.....	100.0	22.4	8.7	8.4	6.7	6.1	10.0	5.9	3.4	3.2	1.9	76.7	23.3
Washington.....	100.0	34.6	5.0	4.0	4.8	5.7	7.8	7.4	4.2	4.7	2.3	80.5	19.5
Idaho.....	100.0	8.9	5.9	37.9	2.0	4.0	5.3	3.2	4.6	2.2	-6	74.6	25.4
Montana.....	100.0	29.8	.....	38.1	7.8	.9	.....	.4	3.7	.....	1.4	82.1	17.9
		3	8	18	38	92	148	261	307	325			
Southern Pine Region.....	100.0	.....	3.5	5.2	7.5	7.9	9.3	8.1	6.6	4.9	53.0	47.0	
Missouri (part).....	100.0	.....	3.0	12.1	17.2	4.0	9.1	7.1	.....	.....	.....	52.5	47.5
Arkansas.....	100.0	.....	3.7	4.5	7.8	10.5	9.9	6.6	5.2	.....	.....	48.2	51.8
Texas.....	100.0	.....	17.0	5.4	9.1	.9	7.4	6.4	5.0	4.1	.....	55.3	44.7
Louisiana.....	100.0	.....	3.1	12.7	12.3	13.2	9.5	7.8	6.3	4.2	.....	69.1	30.9
Mississippi.....	100.0	.....	6.8	4.5	8.3	8.1	4.8	7.6	5.8	4.3	.....	50.2	49.8
Alabama.....	100.0	.....	1.8	1.6	4.0	13.1	6.4	6.7	4.3	.....	.....	38.5	61.5
Florida.....	100.0	.....	.8	1.0	10.0	16.1	18.4	13.5	11.4	7.6	.....	78.8	21.2
Georgia (part).....	100.0	.....	.....	4.8	2.4	.4	7.0	4.1	5.0	.....	.....	23.7	76.3
South Carolina (part).....	100.0	.....	.3	.....	.....	.....	1.3	10.1	6.5	7.2	.....	43.0	57.0
North Carolina (part).....	100.0	.....	11.4	.7	5.6	6.7	7.5	7.0	4.0	.....	.....	42.9	57.1
Virginia (part).....	100.0	.....	.7	9.0	2.7	4.1	2.1	2.1	4.8	.....	.....	25.5	74.5
		4	6	7	27	34	69	68	215				
Lake States.....	100.0	.....	.6	11.6	3.7	7.1	14.5	10.8	11.0	5.8	.....	65.1	34.9
Michigan.....	100.0	.....	.4	12.6	3.4	7.1	13.4	10.5	12.2	5.9	.....	65.5	34.5
Wisconsin.....	100.0	.....	.....	2.1	7.2	6.8	20.2	16.4	15.1	7.5	.....	75.3	24.7
Minnesota.....	100.0	.....	1.7	21.6	.....	7.3	9.5	4.3	3.5	3.4	.....	51.3	48.7

The degree of concentration is brought out still more prominently by cumulative addition of the percentages shown in the above table. The result of such cumulative addition is given in Table 22.

TABLE 22.—HOLDINGS OF STANDING TIMBER IN THE INVESTIGATION AREA: DISTRIBUTION BY SIZE GROUPS, SHOWN CUMULATIVELY IN PERCENTAGES.

[Computed by adding the percentages in Table 21.]

	Group 1.	Groups 1-2	Groups 1-3	Groups 1-4	Groups 1-5	Groups 1-6	Groups 1-7	Groups 1-8	Groups 1-9	Groups 1-10	Groups 1-11.
Investigation area.....	3	8	22	48	90	105	355	638	1,147	1,802	
	13.6	19.4	26.2	32.8	39.5	48.0	55.6	61.1	66.0	69.2	100.0
Pacific-Northwest.....	3	8	39	58	64	131	217	313	489	711	
	23.5	33.5	43.1	50.1	56.5	65.6	71.4	74.8	77.9	79.7	100.0
California.....	14.2	34.0	44.0	55.1	63.7	74.3	79.3	81.4	83.1	84.4	100.0
Oregon.....	22.4	31.1	39.5	46.2	52.3	62.3	68.2	71.6	74.8	76.7	100.0
Washington.....	34.6	39.6	43.6	48.4	54.1	61.9	69.3	73.5	78.2	80.5	100.0
Idaho.....	8.9	14.8	52.7	54.7	58.7	64.0	67.2	71.8	74.0	74.6	100.0
Montana.....	29.8	29.8	67.9	75.7	76.6	76.6	77.0	80.7	80.7	82.1	100.0
Southern Pine Region.....	3	11	29	67	159	307	558	925			
	3.5	8.7	16.2	24.1	33.4	41.5	48.1	53.0	58.1	63.0	100.0
Missouri (part).....			3.0	15.1	32.3	36.3	36.3	45.4	52.5	100.0	
Arkansas.....			3.7	8.2	16.0	26.5	36.4	43.0	48.2	100.0	
Texas.....			17.0	22.4	31.5	32.4	39.8	46.2	51.2	55.3	100.0
Louisiana.....			3.1	15.8	28.1	41.3	50.8	58.9	64.9	69.1	100.0
Mississippi.....			6.8	11.3	19.6	27.7	32.5	40.1	45.9	50.2	100.0
Alabama.....			1.8	3.4	8.0	21.1	27.5	34.2	38.5	100.0	
Florida.....			.8	1.8	11.8	27.0	46.3	59.8	71.2	78.8	100.0
Georgia (part).....					4.8	7.2	7.6	14.6	18.7	23.7	100.0
South Carolina (part).....			.3	11.1	12.4	22.5	29.0	36.2	43.0	100.0	
North Carolina (part).....			11.4	12.1	17.7	24.4	31.9	38.9	42.9	100.0	
Virginia (part).....			.7	9.7	12.4	16.5	18.6	20.7	25.5	100.0	
Lake States.....	.6		4	10	17	44	78	147	215		
	6		12.2	15.9	23.0	37.5	48.3	59.3	65.1	100.0	
Michigan.....	.4		13.0	16.4	23.5	26.9	47.4	59.6	65.5	100.0	
Wisconsin.....			2.1	9.3	16.1	36.3	52.7	67.8	75.3	100.0	
Minnesota.....	1.7		23.3	23.3	30.6	40.1	44.4	47.9	51.3	100.0	

The great importance of group 1 has been discussed in section 3.

The above tables show a remarkable concentration of ownership in the Pacific-Northwest. Three companies own almost one-fourth of the privately owned timber in that region, 8 own one-third, 20 own 43 per cent, and 37 own one-half. (Table 22 indicates that it takes 38 holdings to make half the timber in the Pacific-Northwest, but 2 of these holdings are largely in the South, and if in the place of the 2 be put 1 western holding from group 5 the 37 holdings thus obtained include half the timber in the region.) A few of these 37 owners have additional timber in the Southern Pine Region and the Lake States, totaling about 9 billion feet.

The 313 holders in groups 1 to 8 own three-fourths of the privately owned timber in the Pacific-Northwest, while the 398 holders in groups 9 and 10 own only one-twentieth. Group 11, which contains all privately owned timber not reported in holdings of 60 million feet or more, comprises only 20 per cent.

The 20 holders in groups 1 to 3, each holder having more than 5 billion feet in the investigation area, own about 40 per cent of the privately owned timber in Oregon, about 45 per cent of that in California and Washington, more than half of that in Idaho, and more than two-thirds of that in Montana. Group 11 ranges from less than 16 per cent of the whole in California to 25 per cent in Idaho.

The degree of concentration is far less in the Southern Pine Region than in either the Pacific-Northwest or the Lake States. While more than one-third of all the timber in the Pacific-Northwest is owned by 8 holders it takes 159 holdings to represent the same proportion in the Southern Pine Region. In the Lake States 44 holdings have 37.5 per cent of all the timber.

HOLDINGS IN EACH GEOGRAPHIC DIVISION GROUPED BY SIZE IN THAT DIVISION.—The three geographic divisions are widely separated territorially, and for some purposes the grouping of the timber holdings in each by size therein, independently of the other divisions, is more serviceable than the grouping by size in the investigation area. The three tables below present this independent grouping for each of the geographic divisions. Thus, in the first of the three tables, the column headed "Group 3" shows that 11 holders have each between 5 and 13 billion feet of timber in the Pacific-Northwest, and that the total of these 11 holdings in that region is 93.5 billion feet, distributed by States as follows: California, 24.9; Oregon, 29.4; Washington, 11.8; Idaho, 19.1; Montana, 8.3.

TABLE 23.—HOLDINGS OF STANDING TIMBER IN THE PACIFIC-NORTHWEST, GROUPED BY SIZE.

[In billions of board feet. Thus, 1,013.0=1,013,000,000 board feet. Each holding is grouped according to its total in the Pacific-Northwest. See page 94 for description of the groups. The number of holdings in each group is shown in italics.]

	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	Group 11.
Pacific-Northwest, 1,013.0	3	6	11	16	25	65	86	101	174	227	713	206.5
California.....	35.2	49.0	24.9	24.0	24.1	26.2	13.0	5.2	4.4	3.3	200.3	35.8
Oregon.....	398.1	80.2	34.6	29.4	29.2	24.3	38.4	14.7	12.3	8.0	305.4	92.7
Washington.....	294.6	102.1	14.8	11.8	11.4	17.1	23.5	22.1	14.0	6.9	237.2	57.4
Idaho.....	50.4	4.5	3.0	19.1	1.0	.3	4.4	1.6	2.3	1.1	.3	37.6
Montana.....	21.8	6.5	.....	8.3	1.7	.....	.2	.1	.....	.3	17.9	3.9
Total.	1,013.0	237.5	101.4	93.5	67.3	65.8	93.7	61.1	36.5	31.8	807.4	206.5

TABLE 24.—HOLDINGS OF STANDING TIMBER IN THE SOUTHERN PINE REGION, GROUPED BY SIZE.

[In billions of board feet. Thus 634.0=634,000,000 board feet. Each holding is grouped according to its total in the Southern Pine Region. See page 94 for description of the groups. The number of holdings in each group is shown in italics.]

	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	Group 11.
Southern Pine Region.....	634.0												
Missouri (part).....	9.9			3	6	18	36	90	168	251	373	637	
Arkansas.....	78.7					3	1.2	1.7	.4	.9	.7	5.2	4.7
Texas.....	66.0			1.4		5.0	6.1	8.2	7.6	5.3	4.3	37.9	40.8
Louisiana.....	119.8			12.6		6.0	2.1	5.6	4.2	3.3	2.7	36.5	29.5
Mississippi.....	95.3			18.3		15.0	15.8	11.2	9.7	7.6	5.2	82.8	37.0
Alabama.....	56.3			10.8		6.8	7.3	4.9	8.2	5.6	4.2	47.8	47.5
Florida.....	73.9					1.2	1.9	7.0	4.4	3.9	2.4	21.7	34.6
Georgia (part).....	46.0					7.8	11.5	13.8	11.1	8.4	5.0	58.2	15.7
South Carolina (part).....	30.7			.1		2.2	1.1	.2	3.2	1.9	2.3	10.9	35.1
North Carolina (part).....	42.9			4.9		.3	2.4	2.9	3.2	3.0	1.7	18.4	24.5
Virginia (part).....	14.5			.1		1.3	.4	.6	.3	.3	.7	3.7	10.8

TABLE 25.—HOLDINGS OF STANDING TIMBER IN THE LAKE STATES, GROUPED BY SIZE.

[In billions of board feet. Thus, 100.0=100,000,000 board feet. Each holding is grouped according to its total in the Lake States. See page 94 for description of the groups. The number of holdings in each group is shown in italics.]

	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	Group 11.
Lake States.....	100.0												
Michigan.....	47.6				2	8.8		7	21	39	69	81	219
Wisconsin.....	29.2				4.9		3.2	6.9	6.2	6.7	3.3	7.0	65.1
Minnesota.....	23.2				3.9		3.0	5.8	6.0	4.6	2.6	22.0	16.4
							2.0	2.3	1.7	.9	1.1	11.9	7.2
													11.3

Section 6. Concentration by size groups and by species.

The distribution by groups as shown in Tables 20, 21, and 22 does not reveal the full extent of concentration. This is better developed by figures for species. Table 26 classifies the timber shown in Table 20 by species, the size grouping also being shown. In some of the Southern States scattered amounts of cypress have no doubt been included in the estimates for hardwoods instead of being separately reported, and similarly the estimates for the minor species in the Pacific-Northwest are somewhat less accurate than the estimates for total timber. This does not involve any error for the other species. In this and the following

tables entries showing a small amount, as a few tenths of a billion feet, for a particular species and a particular group in a State, may be considerably in error; but where the amount of timber shown by a given entry is relatively large, the element of error is not material.

TABLE 26.—HOLDINGS OF STANDING TIMBER IN THE INVESTIGATION AREA, CLASSIFIED BY SIZE AND BY SPECIES.

[In billions of board feet. Thus, 338.9=338,900,000 board feet. Each holding is grouped according to its total in the investigation area. See p. 94 for description of the groups, and p. 105 for explanation of the figures in italics.]

PACIFIC-NORTHWEST.

Total for 5 States.

	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	Group 11.
Total.....	1,013.0	8	13	18	26	67	89	99	176	222	711	807.4	205.6
Douglas fir.....	521.9	182.3	40.5	35.9	34.3	45.1	29.6	18.5	18.2	10.2	414.6	107.3	
White pine.....	19.6	2.8	9.2	.5	.9	1.2	.2	.8	.5	.1	10.2	3.4	
Western pine.....	153.4	55.1	14.8	6.1	3.8	13.3	8.4	3.9	3.0	1.9	110.3	43.1	
Sugar pine.....	34.7	15.5	1.0	1.5	1.1	3.5	2.7	1.0	.4	.6	27.3	7.4	
Redwood.....	101.9	20.6	17.8	16.6	14.0	14.6	4.3	2.7	2.9	1.5	95.0	6.9	
Cedar.....	56.7	18.1	3.8	3.5	3.6	4.4	4.6	2.8	3.0	1.5	46.3	11.4	
Hemlock.....	57.4	23.7	2.6	3.8	2.9	4.7	3.8	2.0	2.1	1.2	46.8	10.6	
Spruce.....	21.9	6.4	.4	1.7	1.8	1.9	2.3	1.1	.7	.5	16.8	5.1	
All other species.....	45.5	14.4	7.3	1.4	2.2	3.2	3.3	1.5	1.0	.8	35.1	10.4	

California.

Total.....	248.1	84.2	24.9	27.5	21.2	26.4	12.4	5.2	4.2	3.3	209.3	38.8
Douglas fir.....	45.2	18.4	2.6	5.9	3.1	2.4	1.0	.7	.4	.3	34.8	10.4
Western pine.....	61.2	30.7	2.7	3.3	1.7	4.3	2.9	.7	.6	.9	47.8	13.4
Sugar pine.....	23.8	9.3	.9	1.3	1.1	2.9	2.1	.6	.2	.4	18.8	5.0
Redwood.....	101.9	20.6	17.8	16.6	14.0	14.6	4.3	2.7	2.9	1.5	95.0	6.9
Cedar.....	3.4	.8	.3	.4	.4	.2	.3	.1	.....	.....	2.5	.9
Spruce.....	1.2	.1	.2	.....	.1	.3	.1	.1	.....	.....	1.0	.2
All other species.....	11.4	4.3	.4	.....	.8	1.7	1.7	.3	.1	.1	9.4	2.0

Oregon.

Total.....	398.1	89.2	34.6	33.3	26.7	24.4	36.9	23.3	13.7	12.7	7.6	305.4	92.7
Douglas fir.....	273.5	54.4	29.2	25.0	21.8	19.3	26.8	14.7	9.3	9.1	5.2	214.8	58.7
White pine.....	.2	.....	.....	.....	.....	.....	.....	.....	.1	.....	.....	.1	.....
Western pine.....	58.5	16.1	1.0	4.0	2.1	1.5	7.3	3.3	2.1	1.3	.9	39.6	18.9
Sugar pine.....	10.9	6.0	.2	.1	.2	.....	.6	.6	.4	.2	.2	8.5	2.4
Cedar.....	12.6	4.1	.8	.9	.6	.8	.5	.4	.8	.3	.....	10.0	2.6
Hemlock.....	23.9	6.3	1.9	1.9	1.0	1.1	2.9	1.9	.9	.8	.6	19.3	4.6
Spruce.....	10.1	1.3	.8	.....	.8	1.1	.7	1.5	.5	.2	.2	7.1	3.0
All other species.....	8.4	1.0	.7	1.4	.2	.6	.8	.8	.1	.2	.2	6.0	2.4

TABLE 2A.—HOLDINGS OF STANDING TIMBER IN THE INVESTIGATION AREA,
CLASSIFIED BY SIZE AND BY SPECIES—Continued.

PACIFIC-NORTHWEST—Continued.

Washington.

Total	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	Group 11.	
Total	294.6	102.1	14.8	11.8	14.1	16.8	22.9	21.8	12.3	13.8	6.8	237.2	57.4
Douglas fir	193.6	71.4	6.2	9.8	7.7	11.8	15.6	13.7	8.1	8.6	4.5	157.4	36.2
White pine	.7	.2	.....	.....	.....	.2	.....	.....	.....	.....	.....	.5	.2
Western pine	12.5	4.6	.....	.1	.3	.9	1.2	.3	.8	.1	.....	8.3	4.2
Cedar	37.0	9.9	1.7	1.4	2.5	2.1	3.2	3.8	2.1	2.1	1.2	30.0	7.0
Hemlock	33.0	10.2	5.1	.5	2.8	1.8	1.8	1.9	1.1	1.2	.6	27.0	6.0
Spruce	8.9	2.3	.9	.1	.5	.5	.9	.7	.5	.5	.2	7.4	1.5
All other species	8.9	3.5	.9	.....	.2	.3	.3	.5	.2	.5	.2	6.6	2.3

Idaho.

Total	50.4	4.5	3.0	19.1	1.0	2.0	2.7	1.6	2.3	1.1	.3	37.6	12.8
Douglas fir	5.1	.7	.4	1.5	.1	.1	.3	.2	.2	.1	.1	3.7	1.4
White pine	18.4	1.3	1.3	9.0	.5	.9	1.0	.2	.8	.3	.1	15.4	3.0
Western pine	13.3	.4	.2	4.8	.1	.2	.8	.9	.6	.3	.....	8.3	5.0
Cedar	3.5	.6	.2	1.0	.....	.3	.2	.....	.2	.1	.....	2.6	.9
Hemlock	.5	.....	.....	.2	.....	.....	.....	.....	.....	.....	.....	.5	.....
Spruce	.5	.1	.....	.1	.....	.1	.....	.....	.....	.....	.....	.3	.2
All other species	9.1	1.2	.9	2.5	.3	.4	.4	.3	.5	.2	.1	6.8	2.3

Montana.

Total	21.8	6.5	.....	8.3	1.7	.2	.....	.1	.8	.....	.3	17.9	3.9
Douglas fir	4.5	1.6	.....	1.6	.4	.....	.....	.....	.2	.....	.1	3.9	.6
White pine	.3	.....	.....	.2	.....	.....	.....	.....	.....	.....	.....	.2	.1
Western pine	7.9	2.1	.....	3.3	.5	.1	.....	.1	.2	.....	.....	6.3	1.6
Cedar	.2	.....	.....	.2	.....	.....	.....	.....	.....	.....	.....	.....	.....
Spruce	1.2	.9	.....	.1	.....	.....	.....	.....	.....	.....	.....	1.0	.2
All other species	7.7	1.9	.....	3.0	.7	.1	.....	.4	.....	.2	.....	6.3	1.4

SOUTHERN PINE REGION.

Total for 11 States.

Total	694.0	.....	.....	8	8	18	58	98	148	251	307	985	
Yellow pine	384.4	.....	.....	22.1	32.7	47.9	50.2	58.7	51.3	42.0	31.4	336.3	267.7
Longleaf	232.3	.....	.....	21.5	27.9	35.8	33.3	41.4	34.4	26.3	18.5	239.1	145.3
Shortleaf and loblolly	182.1	.....	.....	21.0	19.6	21.1	28.7	26.8	22.4	17.4	11.9	168.9	63.4
Cypress	40.4	.....	.....	.5	8.3	14.7	4.6	14.6	12.0	8.9	6.6	70.2	81.9
Hardwoods	209.2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	23.2	11.2
		.....	.....	.6	3.5	6.6	11.9	10.3	12.3	12.0	10.8	68.0	141.2

TABLE 26.—HOLDINGS OF STANDING TIMBER IN THE INVESTIGATION AREA, CLASSIFIED BY SIZE AND BY SPECIES—Continued.

SOUTHERN PINE REGION—Continued.

Missouri (part).

	Total	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	Group 11.	
Total.....	9.9						.3	1.2	1.7	.4	.9	.7	5.2	4.7
Yellow pine.....	1.1					.2	.4	.4		.1			.7	.4
Longleaf.....	1.1					.2	.4	.4		.1			.7	.4
Shortleaf and loblolly.....														
Cypress.....	.9						.2	.2	.2	.1	.1	.1	.6	.3
Hardwoods.....	7.9					.1	1.2	1.1	.2	.7	.6	3.9	4.0	

Arkansas.

Total.....	78.7					2.9	3.5	6.1	8.3	7.8	5.2	4.1	37.9	40.8
Yellow pine.....	26.0					2.5	1.6	1.2	5.6	3.1	1.3	.9	16.2	9.8
Longleaf.....														
Shortleaf and loblolly.....	26.0					2.5	1.6	1.2	5.6	3.1	1.3	.9	16.2	9.8
Cypress.....	2.2						.1	.1	.3	.1	.1	.1	.7	1.5
Hardwoods.....	50.5					.4	1.9	4.8	2.6	4.4	3.8	3.1	21.0	29.5

Texas.

Total.....	66.0					11.2	3.6	6.0	.6	4.9	4.2	3.3	2.7	36.5	29.5
Yellow pine.....	44.9					10.8	3.6	5.6	.6	4.3	3.4	2.5	1.6	32.4	12.5
Longleaf.....	22.4					10.3	2.4	1.9	.1	2.5	.9	.6	.7	19.4	3.0
Shortleaf and loblolly.....	22.5					.5	1.2	3.7	.5	1.8	2.5	1.9	.9	13.0	9.5
Cypress.....	.2													.3	
Hardwoods.....	20.9					.4			.6	.8	.8	1.1	4.1	16.8	

Louisiana.

Total.....	119.8					3.7	15.2	14.5	15.8	11.4	9.4	7.5	5.0	82.8	37.0
Yellow pine.....	67.7					3.6	13.8	10.7	12.1	5.3	4.2	3.4	2.1	55.2	12.5
Longleaf.....	52.5					3.6	11.2	7.4	10.9	4.6	3.1	2.3	1.2	44.3	8.2
Shortleaf and loblolly.....	15.2					2.6	3.3	1.2	.7	1.1	1.1	.9	.9	10.9	4.3
Cypress.....	15.7					.8	2.9	.6	3.6	2.1	1.2	.9	12.1	3.6	
Hardwoods.....	36.4					.1	.6	1.2	3.1	2.5	3.1	2.9	2.0	15.5	20.9

STANDING TIMBER.

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TABLE 26.—HOLDINGS OF STANDING TIMBER IN THE INVESTIGATION AREA,
CLASSIFIED BY SIZE AND BY SPECIES—Continued.

SOUTHERN PINE REGION—Continued.

Mississippi.

	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	Group 11.
Total.....			6.5	4.3	7.9	7.7	4.6	7.2	5.5	4.1	47.8	47.5
Yellow pine.....			6.5	4.3	5.3	6.9	4.0	5.9	4.0	2.3	39.2	23.2
Longleaf.....			6.5	4.3	3.3	6.8	3.7	4.8	3.4	1.9	34.7	12.9
Shortleaf and loblolly.....					2.0	.1	.3	1.1	.6	.4	4.5	10.3
Cypress.....	1.9				.5				.1	.3	.1	1.0
Hardwoods.....	31.0				2.1	.8	.6	1.2	1.2	1.7	7.6	23.4

Alabama.

Total.....	56.3				1.0	.9	2.6	7.4	3.6	3.8	2.4	21.7	34.6
Yellow pine.....	38.0				1.0	.9	2.2	6.5	3.1	2.8	1.8	18.3	19.7
Longleaf.....	25.6				1.0	.7	2.0	5.4	3.0	2.2	1.3	15.6	10.0
Shortleaf and loblolly.....	12.4					.2	.2	1.1	.1	.6	.5	2.7	9.7
Cypress.....	.2											.1	.1
Hardwoods.....	18.1					.4	.9	.5	.9	.6	3.3	14.8	

Florida.

Total.....	73.9				.6	.7	7.4	11.9	13.6	10.0	8.4	5.6	58.2	15.7
Yellow pine.....	59.1				.6	.7	6.2	8.8	10.4	8.2	7.3	5.1	47.3	11.8
Longleaf.....	58.2				.6	.7	6.2	8.8	10.3	8.1	7.3	5.1	47.1	11.1
Shortleaf and loblolly.....	.9								.1	.1			.2	.7
Cypress.....	10.7						1.2	2.6	2.7	1.4	1.0	.4	9.3	1.4
Hardwoods.....	4.1						.5	.5	.4	.1	.1	.1	1.6	2.5

Georgia (part).

Total.....	46.0						2.2	1.1	.2	3.2	1.9	2.3	10.9	35.1
Yellow pine.....	31.7						1.1	.1	.2	2.3	1.3	1.8	6.8	24.9
Longleaf.....	18.5						1.1	.1	.2	2.1	1.3	1.4	6.2	12.3
Shortleaf and loblolly.....	13.2								.2	.2		.4	.6	12.6
Cypress.....	2.8						.6	.9	.3	.3	.2	.2	2.3	.5
Hardwoods.....	11.5						.6	.1	.6	.3	.3	.3	1.8	9.7

TABLE 28.—HOLDINGS OF STANDING TIMBER IN THE INVESTIGATION AREA, CLASSIFIED BY SIZE AND BY SPECIES—Continued.

SOUTHERN PINE REGION—Continued.

South Carolina (part).

	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	Group 11.
Total.....	30.7			.1		3.3	.4	3.1	2.0	2.2	2.1	13.2	17.5
Yellow pine.....	19.2					2.7	.4	1.8	1.7	1.1	1.1	8.8	10.4
Longleaf.....	4.6					.5		.1	.3	.2	.2	1.3	3.3
Shortleaf and loblolly.....	14.6					2.2	.4	1.7	1.4	.9	.9	7.5	7.1
Cypress.....	2.6					.3		.3	.1	.5	.3	1.5	1.1
Hardwoods.....	8.9			.1		.3		1.0	.2	.6	.7	2.9	6.0

North Carolina (part).

Total.....	42.9				4.9	.3	2.4	2.9	3.2	3.0	1.7	18.4	24.5
Yellow pine.....	25.6				2.0	.3	.9	2.4	2.3	2.3	1.3	11.5	14.1
Longleaf.....	2.9								.1	1	.1	.3	2.6
Shortleaf and loblolly.....	22.7				2.0	.3	.9	2.4	2.2	2.2	1.2	11.2	11.5
Cypress.....	3.0				.5		.7	.1	.1	1		1.5	1.5
Hardwoods.....	14.3				2.4		.8	.4	.8	.6	.4	5.4	8.9

Virginia (part).

Total.....	14.5					1.3	.4	.6	.3	.3	.7	3.7	10.8
Yellow pine.....	8.7					1.2	.1	.5	.2	.2	.5	2.7	6.0
Longleaf.....													
Shortleaf and loblolly.....	8.7					1.2	.1	.5	.2	.2	.5	2.7	6.0
Cypress.....	.2						.1					.1	.1
Hardwoods.....	5.6					1.1	.2	.1	.1	.1	.2	.9	4.7

LAKE STATES.

Total for 8 States.

	Total.	4	6	7	27	34	69	68	#15		
Total.....	100.0	.6	11.6	3.7	7.1	14.5	10.8	11.0	5.8	65.1	34.9
White and Norway pine.....	17.7	.5	4.5	.4	1.8	3.4	1.2	1.3	1.0	14.1	3.6
Hemlock.....	26.6	.1	1.7	1.4	1.4	4.4	4.5	4.3	2.0	19.8	6.8
Other conifers.....	13.8		1.6	.2	.7	.9	.6	.8	.7	5.5	8.3
Hardwoods.....	41.9		3.8	1.7	3.2	5.8	4.5	4.6	2.1	25.7	16.2

TABLE 26.—HOLDINGS OF STANDING TIMBER IN THE INVESTIGATION AREA, CLASSIFIED BY SIZE AND BY SPECIES—Continued.

LAKE STATES—Continued.

Michigan.

	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	Group 11.
Total.....	47.6	.2		6.0	1.6	3.4	6.4	5.0	5.8	2.8	31.2	16.4
White and Norway pine.....	2.0	.1		.2		.3	.4	.1	.3	.2	1.6	.4
Hemlock.....	15.0	.1		1.4	.5	.8	2.0	2.1	2.3	1.1	10.3	4.7
Other conifers.....	5.2			.8	.1	.3	.3	.2	.5	.3	2.5	2.7
Hardwoods.....	25.4			3.6	1.0	2.0	3.7	2.6	2.7	1.2	16.8	8.6

Wisconsin.

Total.....	29.2			.6	2.1	2.0	5.9	4.8	4.4	2.2	22.0	7.2
White and Norway pine.....	3.2			.1	.4	.2	1.2	.2	.5	.2	2.8	.4
Hemlock.....	11.6			.3	.9	.6	2.4	2.4	2.0	.9	9.5	2.1
Other conifers.....	2.3			.1	.1	.4	.4	.3	.2	.2	1.3	1.0
Hardwoods.....	12.1			.2	.7	1.1	1.9	1.9	1.7	.9	8.4	3.7

Minnesota.

Total.....	23.2			.4	5.0	1.7	2.2	1.0	.8	.8	11.9	11.3
White and Norway pine.....	12.5			.4	4.2	1.3	1.8	.9	.5	.6	9.7	2.8
Hemlock.....	6.3			.8		.3	.2	.1	.1	.2	1.7	4.6
Other conifers.....	4.4					.1	.2		.2		.5	3.9

In Table 26 the 35.1 billion owned by the Southern Pacific in California (see Tables 19 and 20) is combined with the 49.0 billion in group 2, and this causes a similar consolidated column in the section of the table for the Pacific-Northwest. The division of the Southern Pacific timber in California by species was somewhat uncertain, and, therefore, it is not shown separately. The total of this holding and group 2 is so large that in its distribution by species, as shown above, no important error is caused by the somewhat uncertain data for the Southern Pacific.

The concentration in ownership by species is particularly important in the Southern Pine Region.

Nearly all the 232 billion feet of longleaf pine in the Southern Pine Region is in the States of Texas, Louisiana, Mississippi, Alabama, Florida, and Georgia, and in all but Georgia the concentration of ownership is remarkably high. A similar or even greater concentration of cypress ownership appears in Louisiana, Florida, and

Georgia, which have 29 billion feet out of 40 billion feet of cypress in the region. The remaining 11 billion feet of cypress is largely in scattered tracts, mixed with cheap hardwoods, and as a result much of it is owned in relatively small lots. There is very high concentration of ownership in the virgin stands of shortleaf and loblolly pine in Arkansas, Texas, and Louisiana. In Mississippi and Alabama the bulk of the shortleaf and loblolly pine is in lighter and more scattered stands than longleaf, and it is less valuable. As compared with the States to the west the yellow pine in Georgia, South Carolina, North Carolina, and Virginia has offered much less profit to large investors, partly because it has been culled over since before the civil war, so that the present stand is more scattered and largely of younger growth; and partly because the development of the lumber industry in these States had given the timber a relatively high value before large capitalists were attracted to timber investments. There are a few very large holders in these States, but the bulk of the timber is in much smaller holdings than in the Gulf States.

A very large proportion of the hardwoods of the Southern Pine Region was regarded until recent years as only an incumbrance on the land. Consequently the large investors passed them by for the species promising a rapid increase in value. Of the 209 billion feet of hardwoods in the Southern Pine Region 141 billion, or 67.5 per cent, is in group 11. The percentage in group 11 for the States separately ranges from 50 in Missouri to 84 in Georgia and Virginia. In figures on total timber in the Southern Pine Region the relatively low concentration in the hardwoods of all the States; in the yellow pine of Virginia, North Carolina, South Carolina, and Georgia, and in the shortleaf and loblolly pine of Alabama and Mississippi, conceals the exceedingly high concentration in those forest areas which have offered great profit to large investors through their very rapid increase in value.

Table 27, derived from Table 26, shows the percentage of each species, in each geographic division and in each State, that is owned by each group. Thus, 34.9 per cent of the Douglas fir and 44.6 per cent of the sugar pine in the Pacific-Northwest is owned by holders in groups 1 and 2. The same groups own 50.2 per cent of the western pine in California. Group 1 owns 19.9 per cent of the Douglas fir in Oregon and 36.9 per cent of the Douglas fir in Washington.

TABLE 27.—HOLDINGS OF STANDING TIMBER IN THE INVESTIGATION AREA: DISTRIBUTION OF EACH SPECIES BY SIZE GROUPS, IN PERCENTAGES.

[Percentages computed from Table 26. See note at head of Table 26.]

PACIFIC-NORTHWEST.

Total for 5 States.

	Group 1.		Group 2.		Group 3.		Group 4.		Group 5.		Group 6.		Group 7.		Group 8.		Group 9.		Group 10.		Groups 1-10.		Group 11.		
	Total.	8	18	18	26	26	67	86	86	176	711	711	711	711	711	711	711	711	711	711	711	711	711	711	711
Total.....	100.0	33.5	9.6	7.0	6.4	9.1	5.8	3.4	3.1	1.8	79.7	20.3													
Douglas fir.....	100.0	34.9	7.8	6.9	6.6	8.6	5.7	3.5	3.5	1.9	79.4	20.6													
White pine.....	100.0	14.3	48.9	2.6	4.6	6.1	1.0	4.1	2.6	.5	82.7	17.3													
Western pine.....	100.0	35.9	9.6	4.0	2.5	8.7	5.5	2.5	2.0	1.2	71.9	28.1													
Sugar pine.....	100.0	44.6	2.9	4.3	3.2	10.1	7.8	2.9	1.2	1.7	78.7	21.3													
Redwood.....	100.0	20.2	17.5	16.3	13.7	14.3	4.2	2.7	2.8	1.5	83.2	6.8													
Cedar.....	100.0	31.9	6.7	6.2	6.4	7.8	8.1	4.9	5.3	2.6	79.9	20.1													
Hemlock.....	100.0	41.3	4.5	6.6	5.0	8.2	6.6	3.5	3.7	2.1	81.5	18.5													
Spruce.....	100.0	29.2	1.8	7.8	8.2	8.7	10.5	5.0	3.2	2.3	76.7	23.3													
All other species.....	100.0	31.6	16.0	3.1	4.8	7.0	7.3	3.3	2.2	1.8	77.1	22.9													

California.

Total.....	100.0	34.0	10.0	11.1	8.6	10.6	5.0	2.1	1.7	1.3	84.4	15.6
Douglas fir.....	100.0	40.7	5.7	13.1	6.9	5.3	2.2	1.5	.9	.7	77.0	23.0
Western pine.....	100.0	50.2	4.4	5.4	2.8	7.0	4.7	1.1	1.0	1.5	78.1	21.9
Sugar pine.....	100.0	39.1	3.8	5.5	4.6	12.2	8.8	2.5	.8	1.7	79.0	21.0
Redwood.....	100.0	20.2	17.5	16.3	13.7	14.3	4.2	2.7	2.8	1.5	83.2	6.8
Cedar.....	100.0	23.5	8.8	11.8	11.8	5.9	8.8	2.9	.....	.....	73.5	26.5
Spruce.....	100.0	34.9	4.8	.....	7.1	15.9	14.3	3.2	.8	1.6	82.6	17.4
All other species.....	100.0	34.9	4.8	.....	7.1	15.9	14.3	3.2	.8	1.6	82.6	17.4

Oregon.

Total.....	100.0	22.4	8.7	8.4	6.7	6.1	10.0	5.9	3.4	3.2	1.9	76.7	23.3
Douglas fir.....	100.0	19.9	10.7	9.1	8.0	7.0	9.8	5.4	3.4	3.3	1.9	78.5	21.5
White pine.....	100.0	27.4	1.7	6.8	3.6	2.6	12.4	5.6	3.6	2.4	1.5	67.6	32.4
Western pine.....	100.0	55.1	1.8	.9	1.9	.....	5.5	5.5	3.7	1.8	1.8	78.0	22.0
Sugar pine.....	100.0	32.5	6.4	7.1	4.8	6.3	6.3	4.0	3.2	6.4	2.4	79.4	20.6
Cedar.....	100.0	26.4	8.0	4.2	4.6	12.1	7.9	3.8	3.3	2.5	80.8	19.2	
Hemlock.....	100.0	12.9	7.9	.....	7.9	10.9	6.9	14.9	4.9	2.0	2.0	70.3	29.7
Spruce.....	100.0	11.9	8.3	16.7	2.4	7.1	9.5	9.5	1.2	2.4	2.4	71.4	28.6
All other species.....	100.0	11.9	8.3	16.7	2.4	7.1	9.5	9.5	1.2	2.4	2.4	71.4	28.6

Washington.

Total.....	100.0	34.6	5.0	4.0	4.8	5.7	7.8	7.4	4.2	4.7	2.3	80.5	19.5
Douglas fir.....	100.0	36.9	3.2	5.1	4.0	6.1	8.0	7.1	4.2	4.4	2.3	81.3	18.7
White pine.....	100.0	36.4	.....	.....	.8	2.3	8.3	9.1	2.3	6.8	.7	66.7	33.3
Western pine.....	100.0	26.8	4.6	3.8	6.7	5.7	8.6	10.3	5.7	5.7	3.2	81.1	18.9
Cedar.....	100.0	30.9	15.5	1.5	8.5	5.4	5.5	5.8	3.3	3.6	1.8	81.8	18.2
Hemlock.....	100.0	25.8	10.1	1.1	9.0	5.6	10.1	7.9	5.6	5.6	2.3	83.1	16.9
Spruce.....	100.0	39.3	10.1	.....	2.3	3.4	3.4	5.6	2.3	5.6	2.2	74.2	25.8
All other species.....	100.0	39.3	10.1	.....	2.3	3.4	3.4	5.6	2.3	5.6	2.2	74.2	25.8

TABLE 27.—HOLDINGS OF STANDING TIMBER IN THE INVESTIGATION AREA: DISTRIBUTION OF EACH SPECIES BY SIZE GROUPS, IN PERCENTAGES—Continued.
PACIFIC-NORTHWEST—Continued.

Idaho.

	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	Group 11.
Total.....	100.0	8.9	5.9	37.9	2.0	4.0	5.3	3.2	4.6	2.2	.6	74.6	25.4
Douglas fir.....	100.0	13.7	7.8	29.4	2.0	2.0	5.9	3.9	3.9	2.0	2.0	72.6	27.4
White pine.....	100.0	7.1	7.1	48.9	2.7	4.9	5.4	1.1	4.4	1.6	.5	83.7	16.3
Western pine.....	100.0	3.0	1.5	36.1	.7	1.5	6.0	6.8	4.5	2.3	.....	62.4	37.6
Cedar.....	100.0	17.1	5.7	28.6	.....	8.6	5.7	.....	5.7	2.9	.....	74.3	25.7
Hemlock.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Spruce.....	100.0	14.8	8.9	27.7	3.0	4.9	4.0	3.0	4.9	3.0	1.0	75.2	24.8
All other species.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Montana.

	Total.	3	8	18	38	98	148	251	367	995			
Total.....	100.0	29.8	.....	38.1	7.8	.9	.....	.4	3.7	.....	1.4	82.1	17.9
Douglas fir.....	100.0	35.6	.....	35.6	8.9	.....	.....	.....	4.4	.....	2.2	86.7	13.3
White pine.....	100.0	25.6	.....	42.7	6.1	1.2	.....	1.2	2.5	.....	.....	79.3	20.7
Western pine.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cedar.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Spruce.....	100.0	30.8	.....	35.1	8.8	1.1	.....	.....	4.4	.....	2.2	82.4	17.6
All other species.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

SOUTHERN PINE REGION.

Total for 11 States.

	Total.	3	8	18	38	98	148	251	367	995		
Total.....	100.0	.....	3.5	5.2	7.5	7.9	9.3	8.1	6.6	4.9	53.0	47.0
Yellow pine.....	100.0	.....	6.6	7.3	9.3	8.7	10.8	8.9	6.8	4.8	62.2	37.8
Longleaf.....	100.0	.....	9.0	8.4	9.1	12.4	11.5	9.7	7.5	5.1	72.7	27.3
Shortleaf and loblolly.....	100.0	.....	.3	5.5	9.7	3.0	9.6	7.9	5.9	4.3	46.2	53.8
Cypress.....	100.0	.....	.....	3.2	13.6	12.4	17.3	11.4	9.2	5.2	72.3	27.7
Hardwoods.....	100.0	.....	.3	1.7	3.1	5.7	4.9	5.9	5.7	5.2	32.5	67.5

Missouri (part).

	Total.	3	8	18	38	98	148	251	367	995		
Total.....	100.0	.....	.....	.....	3.0	12.1	17.2	4.0	9.1	7.1	52.5	47.5
Yellow pine.....	100.0	.....	.....	.....	18.2	36.3	.....	9.1	.....	.....	63.6	36.4
Longleaf.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Shortleaf and loblolly.....	100.0	.....	.....	.....	18.2	36.3	.....	9.1	.....	.....	63.6	36.4
Cypress.....	100.0	.....	.....	.....	.....	22.2	22.2	11.1	11.1	11.1	66.6	33.4
Hardwoods.....	100.0	.....	.....	.....	1.3	15.2	13.9	2.5	8.9	7.6	49.4	50.6

TABLE 27.—HOLDINGS OF STANDING TIMBER IN THE INVESTIGATION AREA: DISTRIBUTION OF EACH SPECIES BY SIZE GROUPS, IN PERCENTAGES—Continued.

SOUTHERN PINE REGION—Continued.

Arkansas.

	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	Group 11.
Total.....	100.0												
Yellow pine.....	100.0			3.7	4.5	7.8	10.5	9.9	6.6	5.2	48.2	51.8	
Longleaf.....				9.6	6.2	4.6	21.5	11.9	5.0	3.5	62.3	37.7	
Shortleaf and loblolly.....	100.0			9.6	6.2	4.6	21.5	11.9	5.0	3.5	62.3	37.7	
Cypress.....	100.0					4.5	4.5	13.6	4.6	4.6	31.8	98.2	
Hardwoods.....	100.0			.8	3.8	9.5	5.2	8.7	7.5	6.1	41.6	58.4	

Texas.

Total.....	100.0	17.0	5.4	9.1	.9	7.4	6.4	5.0	4.1	55.8	44.7		
Yellow pine.....	100.0			24.0	8.0	12.5	1.3	9.6	7.6	5.6	3.6	72.2	27.8
Longleaf.....	100.0			46.0	10.7	8.5	.4	11.2	4.0	2.7	3.1	86.6	13.4
Shortleaf and loblolly.....	100.0			2.2	5.3	16.5	2.2	8.0	11.1	8.5	4.0	57.8	42.2
Cypress.....	100.0											100.0	
Hardwoods.....	100.0			1.9	.....	1.9	.....	2.9	3.8	3.8	5.3	19.6	80.4

Louisiana.

Total.....	100.0	3.1	12.7	12.3	13.2	9.5	7.8	6.3	4.2	69.1	30.9		
Yellow pine.....	100.0			5.3	20.4	15.8	17.9	7.8	6.2	5.0	3.1	81.5	18.5
Longleaf.....	100.0			6.8	21.3	14.1	20.8	8.8	5.9	4.4	2.3	84.4	15.6
Shortleaf and loblolly.....	100.0			17.1	21.7	7.9	4.6	7.2	7.3	5.9	71.7	28.3	
Cypress.....	100.0			5.1	18.5	3.8	22.9	13.4	7.7	5.7	77.1	22.9	
Hardwoods.....	100.0			.3	1.6	3.3	8.5	6.9	8.5	8.0	5.5	42.6	57.4

Mississippi.

Total.....	100.0	6.8	4.5	8.3	8.1	4.8	7.6	5.8	4.3	50.2	49.8		
Yellow pine.....	100.0			10.4	6.9	8.5	11.1	6.4	9.4	6.4	3.7	62.8	37.2
Longleaf.....	100.0			13.7	9.0	6.9	14.3	7.8	10.1	7.1	4.0	72.9	27.1
Shortleaf and loblolly.....	100.0			.....	.....	13.5	.7	2.0	7.4	4.1	2.7	30.4	69.6
Cypress.....	100.0			.....	.....	26.3	.....	.....	5.2	15.8	5.3	52.6	47.4
Hardwoods.....	100.0			.....	.....	6.8	2.6	1.9	3.9	3.8	5.5	24.5	75.5

TABLE 27.—HOLDINGS OF STANDING TIMBER IN THE INVESTIGATION AREA: DISTRIBUTION OF EACH SPECIES BY SIZE GROUPS, IN PERCENTAGES—Continued.

SOUTHERN PINE REGION—Continued.

Alabama.

	Total	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	Group 11.
Total.....	100.0												
Yellow pine.....	100.0				1.8	1.6	4.6	13.1	6.4	6.7	4.3	38.5	61.5
Longleaf.....	100.0				2.6	2.4	5.8	17.1	8.2	7.4	4.7	48.2	51.8
Shortleaf and loblolly.....	100.0				3.9	2.7	7.8	21.1	11.7	8.6	5.1	60.9	39.1
Cypress.....	100.0					1.6	1.6	8.9	.8	4.9	4.0	21.8	78.2
Hardwoods.....	100.0						2.2	5.0	2.7	5.0		50.0	50.0
	100.0											18.2	81.8

Florida.

Total.....	100.0												
Yellow pine.....	100.0				.8	1.0	10.0	16.1	18.4	13.5	11.4	7.6	78.8
Longleaf.....	100.0				1.0	1.2	10.5	14.9	17.6	13.9	12.3	8.6	80.0
Shortleaf and loblolly.....	100.0				1.0	1.2	10.7	16.1	17.7	13.9	12.5	8.8	80.9
Cypress.....	100.0								11.1	11.1		22.2	77.8
Hardwoods.....	100.0						11.2	24.3	25.2	13.1	9.4	3.7	86.9
	100.0							12.2	12.2	9.8	2.4	2.4	39.0
													61.0

Georgia (part).

Total.....	100.0												
Yellow pine.....	100.0					4.8	2.4	.4	7.0	4.1	5.0	23.7	76.3
Longleaf.....	100.0					3.5	.3	.6	7.3	4.1	5.7	21.5	78.5
Shortleaf and loblolly.....	100.0					5.9	.5	1.1	11.4	7.0	7.6	33.5	66.5
Cypress.....	100.0								1.5		3.0	4.5	95.5
Hardwoods.....	100.0					21.4	32.1		10.7	10.7	7.2	82.1	17.9
	100.0					4.4	.9		5.2	2.6	2.6	15.7	84.3

South Carolina (part).

Total.....	100.0												
Yellow pine.....	100.0				.3	10.8	1.3	10.1	6.5	7.2	6.8	43.0	57.0
Longleaf.....	100.0					14.1	2.1	9.4	8.8	5.7	5.7	45.8	54.2
Shortleaf and loblolly.....	100.0					10.9			2.2	6.5	4.4	28.3	71.7
Cypress.....	100.0					15.1	2.7	11.6	9.6	6.2	6.2	51.4	48.6
Hardwoods.....	100.0					11.6			11.5	3.9	19.2	57.7	42.3
	100.0				1.1	3.4			11.2	2.3	6.7	32.6	67.4

TABLE 27.—HOLDINGS OF STANDING TIMBER IN THE INVESTIGATION AREA: DISTRIBUTION OF EACH SPECIES BY SIZE GROUPS, IN PERCENTAGES—Continued.

SOUTHERN PINE REGION—Continued.

North Carolina (part).

Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	
100.0				11.4	.7	5.6	6.7	7.5	7.0	4.0	42.9	57.1
100.0				7.8	1.1	3.5	9.4	9.0	9.0	5.1	44.9	55.1
100.0								3.5	3.4	3.4	10.3	89.7
100.0				8.8	1.3	4.0	10.6	9.7	9.7	5.3	49.4	50.6
100.0				16.7		23.3	3.3	3.3	3.4		50.0	50.0
100.0				16.8		5.6	2.8	5.6	4.2	2.8	37.8	62.2

Virginia (part).

100.0				.7	9.0	2.7	4.1	2.1	2.1	4.8	25.5	74.5
100.0					13.8	1.2	5.7	2.3	2.3	5.7	31.0	69.0
100.0					13.8	1.2	5.7	2.3	2.3	5.7	31.0	69.0
100.0						50.0					50.0	50.0
100.0				1.8	1.8	3.6	1.8	1.8	1.8	3.5	16.1	83.9

LAKE STATES.

Total for 3 States.

Total	4	6	7	7	7	7	7	7	7	7	7	7	7
100.0	.6	11.6	3.7	7.1	14.5	10.8	11.0	5.8	65.1	34.9			
100.0	2.8	25.4	2.3	10.2	19.2	6.8	7.3	5.7	79.7	20.3			
100.0	.4	6.4	5.3	5.2	16.5	16.9	16.2	7.5	74.4	25.6			
100.0		11.6	1.5	5.1	6.5	4.3	5.8	5.1	39.9	60.1			
100.0		9.1	4.1	7.6	13.8	10.7	11.0	5.0	61.3	38.7			

Michigan.

100.0	.4	12.6	3.4	7.1	13.4	10.5	12.2	5.9	65.5	34.5			
100.0	5.0	10.0		15.0	20.0	5.0	15.0	10.0	80.0	20.0			
100.0	.7	9.4	3.4	5.3	13.3	14.0	15.3	7.3	68.7	31.3			
100.0		15.4	1.9	5.8	5.8	3.8	9.6	5.8	48.1	51.9			
100.0		14.2	3.9	7.9	14.6	10.2	10.6	4.7	66.1	33.9			

TABLE 27.—HOLDINGS OF STANDING TIMBER IN THE INVESTIGATION AREA: DISTRIBUTION OF EACH SPECIES BY SIZE GROUPS, IN PERCENTAGES.—Continued.

LAKE STATES—Continued.

Wisconsin.

	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	Group 11.
Total.....	100.0				2.1	7.2	6.8	20.2	16.4	15.1	7.5	75.3	24.7
White and Norway pine.....	100.0				3.1	12.5	6.2	37.5	6.3	16.6	6.3	87.5	12.5
Hemlock.....	100.0				2.6	7.8	5.2	20.7	20.7	17.2	7.7	81.9	18.1
Other conifers.....	100.0				4.3	4.4	17.4	13.0	8.7	8.7	8.7	56.5	43.5
Hardwoods.....	100.0				1.7	5.8	9.1	15.7	15.7	14.0	7.4	69.4	30.6

Minnesota.

	Total.	1.7	21.6	7.3	9.5	4.3	3.5	3.4	51.3	48.7
Total.....	100.0	1.7	21.6	7.3	9.5	4.3	3.5	3.4	51.3	48.7
White and Norway pine.....	100.0	3.2	33.6	10.4	14.4	7.2	4.0	4.8	77.6	22.4
Hemlock.....	100.0									
Other conifers.....	100.0									
Hardwoods.....	100.0	12.7		4.7	3.2	1.6	1.6	3.2	27.0	73.0
				2.3	4.6	4.5			11.4	88.6

On the Pacific coast there is comparatively little difference between one species and another in respect to their distribution among the groups of holders. This is due to the fact that most of the stand of the less desirable species grows intermixed with the more desirable so that the ownership of one goes with that of the other. Groups 1 and 2, composed of 8 holders, own 33.5 per cent of all the privately owned timber in the Pacific-Northwest, and they own about this proportion of each enumerated species, with two or three exceptions. Of white pine, they have only 14.3 per cent, while group 3 has 46.9 per cent. Of redwood, groups 1 and 2 own 20.2 per cent. Groups 3, 4, 5, and 6 have each a considerable share of this species, ranging from 13.7 per cent of the total for group 5 to 17.5 per cent for group 3. The holders of less than 60 million feet each have only 6.8 per cent of the redwood—far less than of any other species enumerated.

In Arkansas 54 per cent of the shortleaf and loblolly pine is owned in groups 4 to 8. In Texas 46 per cent of the longleaf is owned in group 3, 19 per cent in groups 4 and 5, 11 per cent in group 7, and only 13 per cent in group 11, while 24 per cent of the shortleaf and loblolly pine is owned in groups 3 to 5. Forty-two per cent of all the yellow pine in Louisiana is owned in groups 3 to 5, and those groups together with group 6 contain 60 per cent. Nearly two-thirds of the cypress in Louisiana is in groups 4 to 8. Thirty per cent of the longleaf pine in Mississippi is owned in groups 3 to 5, and 32 per cent in

groups 6 to 8. In Alabama 47 per cent of the longleaf is in groups 4 to 8. In Florida 45 per cent of the yellow pine is in groups 3 to 7, and 35 per cent more in groups 8 to 10. Sixty-one per cent of the cypress in Florida is in groups 5 to 7, and 23 per cent in groups 8 and 9.

In connection with this high concentration in the ownership of the longleaf pine in Florida, it may be noted that this tree is the source of turpentine and rosin; and that at present nearly half of the country's output of these commodities comes from Florida.

Section 7. Proportion of species in each size group.

Table 28 below shows the relative preponderance of each species in each group of holdings. This is a table of percentages based on the figures in Table 26 (p. 112). Thus 53.8 per cent of the holdings of groups 1 and 2 in the Pacific-Northwest is Douglas fir. In next to the last column in the table is shown the percentage which each species forms of all the timber owned in the first 10 groups; that is, the groups in which each of the holdings consists of 60 million feet or more. The last column in the table shows the percentage for group 11; that is, those holdings each of which has less than 60 million feet. Thus, these columns show that Douglas fir constitutes 51.3 per cent of the total timber of the first 10 groups and 52.2 per cent of that in group 11; western pine, 13.7 per cent of the total for the first 10 groups and 21 per cent for group 11; redwood, 11.8 per cent and 3.4 per cent, respectively.

TABLE 28.—HOLDINGS OF STANDING TIMBER IN THE INVESTIGATION AREA: DISTRIBUTION OF THE TIMBER IN EACH SIZE GROUP, BY SPECIES, IN PERCENTAGES.

[Percentages computed from Table 26. See note at head of Table 26.]

PACIFIC-NORTHWEST.

Total for 5 States.

	Total	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Group 11.
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Douglas fir.....	51.5	53.8	41.6	50.6	53.1	49.1	49.1	50.0	53.9	57.2	55.7	51.3
White pine.....	1.9	.8	9.4	.7	1.4	1.3	.3	.3	2.3	1.5	.5	2.0
Western pine.....	15.1	16.3	15.2	8.6	5.9	14.5	14.2	11.4	9.4	10.4	13.7	21.0
Sugar pine.....	3.4	4.5	1.0	2.1	1.7	3.8	4.5	2.9	1.3	3.3	3.4	3.5
Redwood.....	10.1	6.1	18.3	23.4	21.6	15.9	7.3	7.9	9.1	8.2	11.8	3.4
Cedar.....	5.6	5.3	3.9	4.9	5.6	4.8	7.8	8.2	9.4	8.2	5.6	5.5
Hemlock.....	5.7	7.0	2.7	5.3	4.5	5.1	6.4	5.8	6.6	6.6	5.8	5.1
Spruce.....	2.2	1.9	.4	2.4	2.8	2.0	3.9	3.2	2.2	2.7	2.1	2.5
All other species.....	4.5	4.3	7.5	2.0	3.4	3.5	5.6	4.4	3.2	4.4	4.3	5.1

TABLE 28.—HOLDINGS OF STANDING TIMBER IN THE INVESTIGATION AREA: DISTRIBUTION OF THE TIMBER IN EACH SIZE GROUP, BY SPECIES, IN PERCENT. AGES—Continued.

PACIFIC-NORTHWEST—Continued.

California.

	California.												
	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	Group 11.
Total.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Douglas fir.....	18.2	21.9	10.4	21.5	14.6	9.1	8.1	13.5	9.5	9.1	16.6	26.8	
Western pine.....	24.6	36.5	10.9	12.0	8.0	16.3	23.4	13.5	14.3	27.3	22.8	34.5	
Sugar pine.....	9.6	11.0	3.6	4.7	5.2	11.0	16.9	11.5	4.8	12.1	9.0	12.9	
Redwood.....	41.1	24.5	71.5	60.4	68.0	55.3	34.7	51.9	69.0	45.5	45.4	17.8	
Cedar.....	1.4	.9	1.2	1.4	1.9	.8	2.4	1.9	.....	.....	1.2	2.3	
Spruce.....	.5	.1	.8	.....	.5	1.1	.8	1.9	.....	.....	.5	.5	
All other species.....	4.6	5.1	1.6	.....	3.8	6.4	13.7	5.8	2.4	3.0	4.5	5.2	

Oregon.

	Oregon.											
	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Group 11.
Total.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Douglas fir.....	68.7	61.0	84.4	75.1	81.6	79.1	67.2	63.1	67.9	71.6	68.4	70.3
White pine.....	.1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	(1)
Western pine.....	14.7	18.0	2.9	12.0	7.9	6.1	18.3	14.2	15.3	10.2	11.9	13.0
Sugar pine.....	2.7	6.7	.6	.3	.8	.....	1.5	2.6	2.9	1.6	2.6	2.8
Cedar.....	3.2	4.6	2.3	2.7	2.2	3.3	2.0	2.1	2.9	6.3	4.0	3.3
Hemlock.....	6.0	7.1	5.5	6.7	3.7	4.5	7.3	8.2	6.6	6.3	7.9	6.3
Spruce.....	2.5	1.5	2.3	.....	3.0	4.5	1.7	6.4	3.7	1.6	2.6	2.3
All other species.....	2.1	1.1	2.0	4.2	.8	2.5	2.0	3.4	.7	1.6	2.6	2.0

Washington.

	Washington.											
	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Group 11.
Total.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Douglas fir.....	65.7	69.9	41.9	63.1	54.6	70.2	68.1	62.9	65.9	62.3	66.2	66.4
White pine.....	.2	.2	.....	.....	.....	.....	.9	.....	.....	.....	.....	.8
Western pine.....	4.3	4.5	.....	.....	.7	1.8	3.9	5.5	2.4	5.8	1.5	3.5
Cedar.....	12.6	9.7	11.5	11.9	17.7	12.5	14.0	17.4	17.1	15.2	17.7	12.6
Hemlock.....	11.2	10.0	34.4	4.2	19.9	10.7	7.9	8.7	8.9	8.7	8.8	11.4
Spruce.....	3.0	2.3	6.1	.8	5.7	3.0	3.9	3.2	4.1	3.6	2.9	3.1
All other species.....	3.0	3.4	6.1	.....	1.4	1.8	1.3	2.3	1.6	3.6	2.9	2.8

Idaho.

	Idaho.											
	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Group 11.
Total.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Douglas fir.....	10.1	15.6	13.3	7.9	10.0	5.0	11.1	12.5	8.7	9.1	33.3	9.8
White pine.....	36.5	28.9	43.3	47.1	50.0	45.0	37.1	12.5	34.8	27.3	33.4	41.0
Western pine.....	26.4	8.9	6.7	25.1	10.0	10.0	29.6	56.2	26.1	27.2	.....	22.1
Cedar.....	6.9	13.3	6.7	5.2	.....	15.0	7.4	.....	8.7	9.1	.....	6.9
Hemlock.....	1.0	4.4	.....	1.1	.....	.....	.....	.....	.....	.....	.....	1.3
Spruce.....	1.0	2.2	.....	.5	.....	5.0	.....	.....	.....	.....	.....	.8
All other species.....	18.1	26.7	30.0	13.1	30.0	20.0	14.8	18.8	21.7	18.2	33.3	18.1

¹ Less than one-tenth of 1 per cent.

TABLE 28.—HOLDINGS OF STANDING TIMBER IN THE INVESTIGATION AREA: DISTRIBUTION OF THE TIMBER IN EACH SIZE GROUP, BY SPECIES, IN PERCENT. AGES—Continued.

PACIFIC-NORTHWEST—Continued.

Montana.

	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	Group 11.
Total.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Douglas fir.....	20.7	24.6	19.3	23.5	.....	.....	.....	.....	25.0	.....	33.3	21.8	15.4
White pine.....	1.4	.....	2.4	.....	.....	.....	.....	.....	.....	.....	.....	1.1	2.6
Western pine.....	36.2	32.3	39.8	29.4	50.0	.....	.....	100.0	25.0	.....	.....	35.2	41.0
Cedar.....	.9	.....	2.4	.....	.....	.....	.....	.....	.....	.....	.....	1.1	.....
Spruce.....	5.5	13.9	.....	5.9	.....	.....	.....	.....	.....	.....	.....	5.6	5.1
All other species.....	35.3	29.2	36.1	41.2	50.0	.....	.....	.....	50.0	.....	66.7	35.2	35.9

SOUTHERN PINE REGION.

Total for 11 States.

Total.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Yellow pine.....	60.6	.....	97.3	85.3	74.7	66.3	70.5	67.0	62.6	58.9	71.1	48.8	.....
Longleaf.....	36.6	.....	95.0	59.9	44.0	57.2	45.6	43.6	41.4	37.9	50.2	21.3	.....
Shortleaf and loblolly.....	24.0	.....	2.3	25.4	30.7	9.1	24.9	23.4	21.2	21.0	20.9	27.5	.....
Cypress.....	6.4	.....	.....	4.0	11.5	10.0	11.9	9.0	8.8	6.7	8.7	3.8	.....
Hardwoods.....	33.0	.....	2.7	10.7	13.8	23.7	17.6	24.0	28.6	34.4	20.2	47.4	.....

Missouri (part).

Total.....	100.0	.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Yellow pine.....	11.1	.....	66.7	.....	.....	.....	23.5	.....	11.1	.....	.....	13.5	8.5
Longleaf.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Shortleaf and loblolly.....	11.1	.....	66.7	.....	.....	.....	23.5	.....	11.1	.....	.....	13.5	8.5
Cypress.....	9.1	.....	.....	.....	.....	.....	.....	11.8	50.0	11.1	14.3	11.5	6.4
Hardwoods.....	79.8	.....	33.3	100.0	64.7	50.0	77.8	85.7	75.0	85.1	.....	.....	.....

Arkansas.

Total.....	100.0	.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Yellow pine.....	33.0	.....	86.2	45.7	19.7	67.5	39.7	25.0	22.0	.....	.....	42.7	24.0
Longleaf.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Shortleaf and loblolly.....	33.0	.....	86.2	45.7	19.7	67.5	39.7	25.0	22.0	.....	.....	42.7	24.0
Cypress.....	2.8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hardwoods.....	64.2	.....	13.8	54.3	78.7	31.3	56.4	73.1	75.5	.....	.....	55.4	72.3

TABLE 28.—HOLDINGS OF STANDING TIMBER IN THE INVESTIGATION AREA: DISTRIBUTION OF THE TIMBER IN EACH SIZE GROUP, BY SPECIES, IN PERCENT-AGES—Continued.

SOUTHERN PINE REGION—Continued.

Texas.

	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	Group 11.
Total.....	100.0		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Yellow pine.....	68.0		96.4	100.0	93.3	100.0	87.8	81.0	76.8	69.3	88.8	42.4	
Longleaf.....	33.9		91.9	66.7	31.6	16.7	51.0	21.5	18.2	25.9	53.2	10.2	
Shortleaf and loblolly...	34.1		4.5	33.3	61.7	83.3	36.8	59.5	57.6	33.4	35.6	32.2	
Cypress.....	.3												.7
Hardwoods.....	31.7		3.6		6.7		12.2	19.0	24.2	40.7	11.2	56.9	

Louisiana.

	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Group 11.
Total.....	100.0		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Yellow pine.....	56.5		97.3	90.8	72.3	76.6	46.5	44.7	45.3	42.0	66.7	33.8
Longleaf.....	43.8		97.3	73.7	50.0	69.0	40.4	33.0	30.6	24.0	53.5	22.2
Shortleaf and loblolly...	12.7		17.1	22.3	7.6	6.1	11.7	14.7	18.0		13.2	11.6
Cypress.....	13.1		5.3	19.6	3.8	31.6	22.3	18.0	18.0		14.6	9.7
Hardwoods.....	30.4		2.7	3.9	8.1	19.6	21.9	33.0	38.7	40.0	18.7	56.5

Mississippi.

	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Group 11.
Total.....	100.0		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Yellow pine.....	65.5		100.0	100.0	87.1	89.6	87.0	81.9	72.7	66.1	82.0	46.8
Longleaf.....	50.0		100.0	100.0	41.8	88.3	80.5	66.6	61.8	46.3	72.6	27.1
Shortleaf and loblolly...	15.5		25.3	1.3	6.5	15.3	10.9	9.8			9.4	21.7
Cypress.....	2.0				6.3				1.4	5.5	2.4	2.1
Hardwoods.....	32.5		28.6	10.4	13.0	16.7	21.8	41.5			15.9	48.3

Alabama.

	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Group 11.
Total.....	100.0		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Yellow pine.....	67.5		100.0	100.0	84.6	87.8	86.1	73.7	75.0		84.3	56.9
Longleaf.....	45.5		100.0	77.8	76.9	73.0	83.3	57.9	54.2		71.9	28.9
Shortleaf and loblolly...	22.0		22.2	7.7	14.8	2.8	16.8	20.8			12.4	28.0
Cypress.....	.4									2.6		.5
Hardwoods.....	32.1		15.4	12.2	13.9	23.7	23.0				14.2	43.6

TABLE 28.—HOLDINGS OF STANDING TIMBER IN THE INVESTIGATION AREA: DISTRIBUTION OF THE TIMBER IN EACH SIZE GROUP, BY SPECIES, IN PERCENT. AGES—Continued.

SOUTHERN PINE REGION—Continued.

Florida.

	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	Group 11.
Total.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Yellow pine.....	80.0	100.0	100.0	100.0	83.8	74.0	76.5	82.0	86.9	91.1	81.3	75.2	
Longleaf.....	78.8	100.0	100.0	83.8	74.0	75.8	81.0	86.9	91.1			80.9	70.7
Shortleaf and loblolly.....	1.2						.7	1.0				.4	4.5
Cypress.....	14.5			16.2	21.8	10.8	14.0	11.9	7.1			16.0	8.9
Hardwoods.....	5.5						4.2	3.7	4.0	1.2	1.8	2.7	15.9

Georgia (part).

Total.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Yellow pine.....	68.9				50.0	9.1	100.0	71.9	68.4	78.3	62.4	71.0	
Longleaf.....	40.2				50.0	9.1	100.0	65.6	68.4	60.9	56.9	35.1	
Shortleaf and loblolly.....	28.7							6.3		17.4	5.5	35.9	
Cypress.....	6.1				27.3	81.8		9.4	15.8	8.7	21.1	1.4	
Hardwoods.....	28.0				22.7	9.1		18.7	15.8	13.0	16.5	27.6	

South Carolina (part).

Total.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Yellow pine.....	62.5				81.8	100.0	58.1	85.0	50.0	52.4	66.7	59.4	
Longleaf.....	15.0				18.1		3.2	15.0	9.1	9.5	9.9	18.8	
Shortleaf and loblolly.....	47.5				66.7	100.0	54.9	70.0	40.9	42.9	58.8	40.6	
Cypress.....	8.5				9.1		9.7	5.0	22.7	14.3	11.3	6.3	
Hardwoods.....	29.0				100.0		32.2	10.0	27.3	33.3	22.0	34.3	

North Carolina (part).

Total.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Yellow pine.....	68.7				40.8	100.0	37.5	82.8	71.9	76.7	76.5	62.5	57.6
Longleaf.....	6.8							3.1	3.3	5.9	1.6	10.6	
Shortleaf and loblolly.....	52.9				40.8	100.0	37.5	82.8	68.8	73.4	70.6	60.9	47.0
Cypress.....	7.0				10.2		29.2	3.4	3.1	3.3		8.2	6.1
Hardwoods.....	33.3				49.0		33.3	13.8	25.0	20.0	23.5	29.3	36.3

TABLE 53.—HOLDINGS OF STANDING TIMBER IN THE INVESTIGATION AREA: DISTRIBUTION OF THE TIMBER IN EACH SIZE GROUP, BY SPECIES, IN PERCENT. AGES—Continued.

SOUTHERN PINE REGION—Continued.

Virginia (part).

	Total	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	Group 11.
Total.....	100.0				100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Yellow pine.....	60.0					92.3	25.0	83.3	66.7	66.7	66.7	71.4	55.0
Longleaf.....													
Shortleaf and loblolly.....	60.0					92.3	25.0	83.3	66.7	66.7	66.7	71.4	55.0
Cypress.....	1.4					25.0							2.7
Hardwoods.....	38.6				100.0	7.7	50.0	16.7	33.3	33.3	28.6	24.3	43.4

LAKE STATES.

Total for 3 States.

	Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
White and Norway pine.....	17.7					38.8	10.8	26.3	23.5	11.1	11.8	17.2	21.7
Hemlock.....	26.6		16.7			14.6	37.8	19.7	30.3	41.7	39.1	34.5	30.4
Other conifers.....	13.8					13.8	5.4	9.9	6.2	5.5	7.3	12.1	8.4
Hardwoods.....	41.9					32.8	46.0	45.1	40.0	41.7	41.8	36.2	39.5

Michigan.

	Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
White and Norway pine.....	4.2		50.0			3.3		8.8	6.2	2.0	5.2	7.1	5.1
Hemlock.....	31.5		50.0			23.4	31.3	23.6	31.3	42.0	39.7	39.3	33.0
Other conifers.....	10.9					13.3	6.2	8.8	4.7	4.0	8.6	10.7	8.4
Hardwoods.....	53.4					60.0	62.5	58.8	57.8	52.0	46.5	42.9	53.9

Wisconsin.

	Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
White and Norway pine.....	11.0					16.7	19.0	10.0	20.3	4.2	11.4	9.1	12.7
Hemlock.....	39.7					50.0	42.9	30.0	40.7	50.0	45.5	40.9	45.2
Other conifers.....	7.9						4.8	5.0	6.8	6.2	4.5	9.1	5.9
Hardwoods.....	41.4					33.3	33.3	55.0	32.2	39.6	38.6	40.9	38.2

Minnesota.

	Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
White and Norway pine.....	53.9					84.0		76.5	81.8	90.0	62.5	75.0	81.5
Hemlock.....													24.8
Other conifers.....	27.1					16.0		17.6	9.1	10.0	12.5	26.0	14.3
Hardwoods.....	19.0							5.9	9.1	25.0			4.2

CONCENTRATION MOST MARKED IN MOST VALUABLE SPECIES.—In holdings of 60 million and over in the Southern Pine Region, and in smaller holdings, respectively, the percentages of each kind of timber are as follows: Longleaf pine, 50.2 and 21.3; shortleaf and loblolly pine, 20.9 and 27.5; cypress, 8.7 and 3.8; hardwoods, 20.2 and 47.4. The valuable longleaf pine and cypress form about three-fifths of the larger holdings and one-fourth of the small; the low-value hardwoods, one-fifth of the larger and one-half the small. The 22.1 billion in group 3, which consists of 3 holdings and the relatively small amount owned by the Southern Pacific (see p. 98), is 95 per cent longleaf pine and only 2.7 per cent hardwoods. The 32.7 billion feet owned by the 8 holders in group 4 is 85.3 per cent yellow pine and 10.7 per cent hardwoods. The percentage of longleaf pine decreases from group 3 to group 11 in every case except group 6, while the percentage of hardwood increases in every case except group 7.

In Texas the timber in groups 1 to 10 is 53.2 per cent longleaf pine and only 11.2 per cent hardwood, while that in group 11 is only 10.2 per cent longleaf pine and 56.9 per cent hardwood. Eighty per cent of the hardwood in groups 1 to 10 is in groups 7 to 10. In Louisiana the timber in groups 1 to 10 is 53.5 per cent longleaf pine and only 18.7 per cent hardwood, while that in group 11 is only 22.2 per cent longleaf pine and 56.5 per cent hardwood. Hardwoods furnish only insignificant parts of the holdings in groups 3, 4, and 5. In Mississippi groups 1 to 10 have 72.6 per cent longleaf pine, while group 11 has only 27.1 per cent. Generally speaking, the shortleaf and loblolly pine in Mississippi has been much less profitable as an investment than the longleaf, and as a result the holdings in groups 1 to 10 are only 9.4 per cent shortleaf and loblolly and 72.6 per cent longleaf, while the holdings in group 11 are 27.1 per cent longleaf and 21.7 per cent shortleaf and loblolly. Groups 1 to 10 have only 15.9 per cent hardwoods, while group 11 has 49.3 per cent. In Alabama 71.9 per cent of the timber in groups 1 to 10 is longleaf pine and only 12.4 per cent shortleaf and loblolly, while in group 11 the two species are almost equal. The hardwoods are only 15.2 per cent of the timber in groups 1 to 10 and 42.8 per cent in group 11. Nearly all the timber in Florida is valuable longleaf and cypress. In Georgia the holdings in groups 1 to 10 are 56.9 per cent longleaf and only 5.5 per cent shortleaf, while the two species are almost equal in group 11. In South Carolina and North Carolina the division of yellow pine between longleaf and shortleaf and loblolly is of doubtful accuracy, and is therefore not significant.

In all three of the Lake States there is very high concentration in white and Norway pine and hemlock. In Minnesota there is a relatively very low concentration of the ownership of hardwoods, and of conifers other than white and Norway pine.

In the Lake States as a whole 79.7 per cent of the white and Norway pine and 74.4 per cent of the hemlock is in groups 1 to 10. Fifty-nine and nine-tenths per cent of the white and Norway pine is owned in groups 2 to 7, and 66.5 per cent of the hemlock is owned in groups 4 to 9. In Minnesota 61.6 per cent of the white and Norway pine and only 6.9 per cent of the hardwoods is owned in groups 2, 4, 6, and 7. In this State the timber in groups 1 to 10 is 81.5 per cent white and Norway pine and only 18.5 per cent other conifers and hardwoods, while that of group 11 is only 24.8 per cent white and Norway pine and 75.2 per cent other conifers and hardwoods.

The hardwood stands in Michigan and Wisconsin, unlike those in Minnesota and in the Southern Pine Region, are of high average value, and as a consequence the ownership is concentrated.

CONDITIONS INFLUENCING BUYERS IN MAKING LARGE TIMBER INVESTMENTS.—Forest land is not gathered into large holdings unless the buyers expect its value to increase. Most of the virgin forests contain a very large proportion of mature trees, and neither the amount nor the quality of the timber is materially changed by growth. It follows that investors look for the forest land which promises the most rapid rise of price per thousand feet. This may depend on several factors. Some species are more valuable than others, and the same species is better in one region than in another because of differences in quality, stand per acre, continuity of the forest, or other circumstances which affect the cost of logging. Again, investors will avoid regions where settlement and the development of the lumber industry have given the timber considerable value, and look for places where the timber is good, but the demand for it has not yet arisen. When Government forest land could be bought for \$1.25 an acre, investors naturally bought such as had a good stand of the valuable species. For these reasons, the concentration of ownership is far greater in some sections than in others of every timber State. The same conditions explain the differences among the States.

It must not be forgotten that the importance of the large holdings is very inadequately indicated by the quantity of timber they contain. A further measure of their importance is their value; and that is wholly out of proportion to their quantity. For instance, compare a large holder of Louisiana cypress worth \$5 to \$8 per thousand feet with a small holder of gum, willing to almost give away his timber to rid the land of it; a large holder of Mississippi longleaf worth \$4 or \$5 a thousand with a small holder of scattered shortleaf worth less than \$1; or a large holder of the best Texas shortleaf worth almost as much as the longleaf with a small holder of scattered shortleaf of poor quality worth only a fraction as much. In Mississippi 49.8 per cent of the

timber is in holdings of less than 60 million feet each, while such holdings have only 21.2 per cent of the total in Florida. This has come about because the timber in Florida is more uniformly valuable than in Mississippi. Half the timber in these smaller Mississippi holdings is low-priced hardwoods, of which there is very little in Florida.

The longleaf pine grows in almost pure stands, and a great part of the cypress forests of Louisiana and Florida contain only small portions of hardwood. There is practically no intermingling of hardwoods with the various species of pine. Under such conditions it is practicable to buy one kind of timber to the nearly complete exclusion of others. Outside of the Louisiana and Florida cypress forests a considerable amount of cypress grows as a minor species with hardwoods. The various hardwoods always grow in mixed stands, so that there is no such thing as a holding of one kind alone. Some of the trees in a hardwood holding would bring a high price, but since they are mixed with great quantities of comparatively poor timber, especially gum, the value of the mixed stand is low.

Large investors in Minnesota white and Norway pine, like investors in the finest virgin southern pine and cypress, have been able to pass by the other conifers and the hardwoods.

In the Douglas fir region the lower-priced species grow here and there among the fir, so that the ownership of one goes with that of the other. In those parts of the Pacific-Northwest where the pine is of relatively low value or where the less valuable species predominate the property has been left to the small investor, save for the railroad grants.

Section 8. Relative holdings of more desirable and less desirable timber in certain States, by groups.

The greatest profits from timber investments have been made in certain well-defined forest areas which were of low market value at the time of purchase and have since risen rapidly on account of the fine quality of their timber and the comparatively cheap logging. By selecting such forest areas a very large proportion of the valuable standing timber in the investigation area could be segregated, of which the ownership is exceedingly concentrated. In every timber State the concentration of ownership is far higher in some parts than in others, and the districts in which the large investors have bought are those in which, because of higher quality and better location, there has been the highest rate of increase in value.

Such contrasts are most conveniently shown by comparing the ownership of the more desirable with that of the less desirable species in whole States. In the Pacific-Northwest the variety of species is far less than in the South. The forests are almost wholly coniferous, and there are no such wide differences of value as between yellow pine

and the least valuable hardwoods, like the gums. Redwood grows in a narrow strip along the coast almost wholly separate from other timber, and the ownership of it is highly concentrated, as is shown below on page 155; but for the most part the proportion of one species in the larger holdings of the Pacific-Northwest does not very greatly differ from that of another. (See Table 27.)

In Wisconsin and Michigan and in the South Atlantic States, except Florida, the virgin stand of the most desirable species is largely cut off. In the Gulf States and in Arkansas and Minnesota there are still large stands of virgin pine, and in Louisiana and Florida of cypress; and the other species, taken in the mass, are far below these in average value. Particular kinds of hardwood, as some varieties of oak and hickory, are valuable, but these grow intermingled with other species of small value. The only comparison that can be conveniently made on a large scale is that between pine and cypress on the one hand and all remaining species on the other.

The following tables show how much higher is the proportion of the more desirable than of the less desirable species in the larger holdings in the States where such a separation can be readily made—Arkansas, Texas, Louisiana, Mississippi, Alabama, Florida, and Minnesota. The "more desirable timber," as the phrase is here used, includes the white and Norway pine of Minnesota, the yellow pine of Arkansas, Texas, Louisiana, and Florida, the longleaf pine of Mississippi and Alabama, and the cypress of Florida and Louisiana. The "less desirable timber" includes all other timber reported from these States. Table 29 shows by groups the ownership of the "more desirable timber" and the "less desirable timber" separately.

TABLE 29.—HOLDINGS OF STANDING TIMBER IN CERTAIN STATES, CLASSIFIED AS MORE DESIRABLE AND LESS DESIRABLE, AND GROUPED BY SIZE OF HOLDING OF ALL SPECIES IN THE INVESTIGATION AREA.

[In billions of board feet. Thus, 309.8=309,800,000 board feet. Each holding included in this table is in the same group as in Table 20. "More desirable timber" includes white and Norway pine in Minnesota, yellow pine in Arkansas, Texas, Louisiana, and Florida, longleaf pine in Mississippi and Alabama, and cypress in Florida and Louisiana. "Less desirable timber" includes all other timber reported from these States.]

More desirable timber.

	Total											
	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	Group 11.
Total.....	309.8	0.4	21.5	30.9	32.2	35.0	42.8	31.1	22.8	14.8	232.5	77.3
Arkansas.....	26.0	.....	.....	2.5	1.6	1.2	5.6	3.1	1.3	.9	16.2	9.8
Texas.....	44.9	.....	10.8	3.6	5.6	.6	4.3	3.4	2.5	1.6	32.4	12.5
Louisiana.....	83.4	.....	3.6	14.6	13.6	12.7	8.9	6.3	4.6	3.0	67.3	16.1
Mississippi.....	25.6	.....	6.5	4.3	3.3	6.8	3.7	4.8	3.4	1.9	34.7	12.9
Alabama.....	69.8	.....	1.0	.7	2.0	5.4	3.0	2.2	1.3	1.3	15.6	10.0
Florida.....	12.5	.....	.6	.7	7.4	11.4	13.1	9.6	8.3	5.5	56.6	13.2
Minnesota.....	.....	.....	.....	4.2	.....	1.3	1.8	.9	.5	.6	9.7	2.8

TABLE 29.—HOLDINGS OF STANDING TIMBER IN CERTAIN STATES, CLASSIFIED AS MORE DESIRABLE AND LESS DESIRABLE, AND GROUPED BY SIZE OF HOLDING OF ALL SPECIES IN THE INVESTIGATION AREA—Continued.

Less desirable timber.

	Total	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	Group 11.
Total.....	203.4	0.5	1.8	8.3	10.4	9.6	12.1	11.7	9.9	64.3	139.1		
Arkansas.....	52.7		.4	1.9	4.9	2.7	4.7	3.9	3.2	21.7	31.0		
Texas.....	21.1		.4		.4		.6	.8	1.1	4.1	17.0		
Louisiana.....	36.4		.1	.6	1.2	3.1	2.5	3.1	2.9	2.0	15.5	20.9	
Mississippi.....	47.7			4.6	.9	.9	2.4	2.1	2.2	13.1	34.6		
Alabama.....	30.7			.2	.6	2.0	.6	1.6	1.1	6.1	24.6		
Florida.....	4.1				.5	.5	.4	.1	1.1	1.6	2.5		
Minnesota.....	10.7			.8		.4	.4	.1	.3	.2	2.2	8.5	

Table 30 gives the percentage of the more desirable timber and of the less desirable timber, separately, in holdings of each size group, for each of the States named and for the total in the seven States.

TABLE 30.—HOLDINGS OF STANDING TIMBER SHOWN IN TABLE 29: DISTRIBUTION BY SIZE GROUPS, IN PERCENTAGES.

[Percentages computed from Table 29. See note at head of Table 29.]

More desirable timber.

	Total	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	Group 11.
Total.....	100.0	0.1	6.9	10.0	10.4	11.6	13.8	10.0	7.4	4.8	75.0	25.0	
Arkansas.....	100.0			9.6	6.2	4.6	21.5	11.9	5.0	3.5	62.3	37.7	
Texas.....	100.0		24.0	8.0	12.5	1.3	9.6	7.6	5.6	3.6	72.2	27.8	
Louisiana.....	100.0		4.3	17.5	16.3	15.2	10.7	7.6	5.5	3.6	80.7	19.3	
Mississippi.....	100.0		13.7	9.0	6.9	14.3	7.8	10.1	7.1	4.0	72.9	27.1	
Alabama.....	100.0			3.9	2.7	7.8	21.1	11.7	8.5	5.1	60.9	39.1	
Florida.....	100.0		.9	1.0	10.6	16.3	18.8	13.7	11.9	7.9	81.1	18.9	
Minnesota.....	100.0		3.2		33.6		10.4	14.4	7.2	4.0	4.8	77.6	22.4

Less desirable timber.

	Total	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	Group 11.
Total.....	100.0	0.2	0.9	4.1	5.1	4.7	5.9	5.8	4.9	31.6	68.4		
Arkansas.....	100.0		.8	3.6	9.3	5.1	8.9	7.4	6.1	41.2	58.8		
Texas.....	100.0		1.9		1.9		2.8	3.8	3.8	5.2	19.4	80.6	
Louisiana.....	100.0		.3	1.6	3.3	8.5	6.9	8.0	5.5	42.6	57.4		
Mississippi.....	100.0			9.7	1.9	1.9	5.0	4.4	4.6	27.5	72.5		
Alabama.....	100.0				.6	2.0	6.5	2.0	5.2	3.6	16.9	80.1	
Florida.....	100.0					12.2	12.2	9.8	2.4	2.4	39.0	61.0	
Minnesota.....	100.0			7.5		3.7	3.8	.9	2.8	1.9	20.6	79.4	

In Table 31 the percentages of Table 30 are cumulated, so as to show what per cent of the more desirable and of the less desirable timber is in holdings of a given size and larger.

TABLE 31.—HOLDINGS OF STANDING TIMBER SHOWN IN TABLE 28: DISTRIBUTION BY SIZE GROUPS, IN PERCENTAGES, IN PERCENTAGES, SHOWN CUMULATIVELY.

[Computed by adding the percentages in Table 30.]

More desirable timber.

	Group 1.	Groups 1-2.	Groups 1-3.	Groups 1-4.	Groups 1-5.	Groups 1-6.	Groups 1-7.	Groups 1-8.	Groups 1-9.	Groups 1-10.	Groups 1-11.
Total.....	0.1	7.0	17.0	27.4	39.0	52.8	62.8	68.8	70.2	75.0	100.0
Arkansas.....				9.6	15.8	20.4	41.9	53.8	58.8	62.3	100.0
Texas.....		24.0	32.0	44.5	45.8	55.4	63.0	68.6	72.2	72.2	100.0
Louisiana.....		4.3	21.8	38.1	53.3	64.0	71.6	77.1	80.7	80.7	100.0
Mississippi.....		13.7	22.7	29.6	43.9	51.7	61.8	68.9	72.9	72.9	100.0
Alabama.....				3.9	6.6	14.4	35.5	47.2	55.8	60.9	100.0
Florida.....			.9	1.9	12.5	28.8	47.6	61.3	73.2	81.1	100.0
Minnesota.....		3.2	36.8	36.8	47.2	61.6	68.8	72.8	77.6	77.6	100.0

Less desirable timber.

Total.....	.2	1.1	5.2	10.3	15.0	20.9	28.7	31.6	100.0	
Arkansas.....		.8	4.4	13.7	18.8	27.7	35.1	41.2	100.0	
Texas.....		1.9	3.8	3.8	6.6	10.4	14.2	19.4	100.0	
Louisiana.....		.3	1.9	5.2	13.7	20.6	29.1	37.1	42.6	100.0
Mississippi.....				9.7	11.6	13.5	18.5	22.9	27.5	100.0
Alabama.....				.6	2.6	9.1	11.1	16.3	19.9	100.0
Florida.....					12.2	24.4	34.2	38.6	39.0	100.0
Minnesota.....		7.5	7.5	11.2	15.0	15.9	18.7	20.6	100.0	

Table 30 shows that groups 2 and 3, composed of holdings of 5 billion feet or more, have 7 per cent of the more desirable timber in the seven States, and two-tenths of 1 per cent of the less desirable. Group 4 (holdings of 3½ to 5 billion feet each) has 10 per cent of the more desirable and less than 1 per cent of the less desirable.

In Texas, 24 per cent of the more desirable timber is in the highest group, group 3, with less than 2 per cent of the less desirable; groups 4 and 5 together have 20 per cent of the more desirable and again but 2 per cent of the less desirable. In Louisiana, 17.5 per cent of the more desirable, and only 1.6 per cent of the less, is in group 4. In Mississippi, groups 3 and 4 show 22.7 per cent of the more desirable and no appreciable share of the less desirable.

From Table 31 it appears that the holdings in groups 1 to 5 (all over 2 billion feet each) contain 44.5 per cent of the more desirable timber in Texas and only 3.8 per cent of the less desirable; 38.1 per

cent of the more desirable timber in Louisiana and only 5.2 per cent of the less desirable; 36.8 per cent of the more desirable timber in Minnesota and only 7.5 per cent of the less desirable.

More than half the more desirable timber of the seven States is in holdings of groups 1 to 7, having more than half a billion feet each. Some idea of the importance of a holding as large as half a billion feet may be gained by noting that, if it consist of yellow pine worth \$4 a thousand, its value is \$2,000,000. While holdings of such size and larger have 52.8 per cent of the more desirable timber in the table, they have only 15 per cent of the less desirable. In Louisiana they have 64 per cent of the more desirable and 20.6 per cent of the less desirable; in Minnesota, 61.6 per cent of the more desirable and only 15 per cent of the less desirable.

Holdings of 60 million feet and more have 75 per cent of the more desirable timber in the seven States, and only 31.6 per cent of the less desirable. A holding of 60 million feet is a very important investment, worth \$240,000 at the moderate price of \$4 a thousand. Even below the 60-million line the great bulk of the timber is owned by large investors; the amount owned by small investors is relatively unimportant. Yet holdings above that line include three-fourths of the more desirable timber, while smaller holdings have two-thirds of the less desirable.

Moreover, the disproportion increases with the size of the holdings. This is clearly brought out by the following table, which compares the percentages of more desirable and of less desirable timber held by the several groups.

TABLE 22.—PERCENTAGES OF THE MORE DESIRABLE AND OF THE LESS DESIRABLE TIMBER OF TABLE 20, IN HOLDINGS OF THE SEVERAL SIZE GROUPS.

	More desirable timber.		Less desirable timber.	
	<i>Billions of feet.</i>	<i>Per cent.</i>	<i>Billions of feet.</i>	<i>Per cent.</i>
Total.....	369.8	100.0	203.4	100.0
Group 11.....	77.3	25.0	133.1	68.4
Group 10.....	14.8	4.8	9.9	4.9
Group 9.....	22.8	7.4	11.7	5.8
Group 8.....	31.1	10.0	12.1	5.9
Group 7.....	42.8	13.8	9.6	4.7
Group 6.....	36.0	11.6	10.4	5.1
Group 5.....	32.2	10.4	8.3	4.1
Group 4.....	30.9	10.0	1.8	.9
Group 3.....	21.5	6.9	.5	.2
Group 2.....	.4	.1	.....	.....
Group 1.....	.....	.....	.....	.....

The second and fourth columns of this table show that group 11, composed of holdings under 60 million feet each, has two-thirds of the less desirable timber and only one-fourth of the more desirable. Group 10, from 60 to 125 million feet, has about the same proportion of one class of timber as of the other. In groups 5, 6, and 7, ranging from one-half to 3½ billion feet, the proportion of the more desirable is two or three times that of the less desirable.

Comparing the entries in the first column with those in the third, it will be seen that the holdings in group 11 contain only about half as much of the more desirable timber as of the less desirable, while in group 10 the more desirable timber is 1½ times the less desirable, the ratio increasing up to group 7, where it is 4½. Group 4 contains 17 times as much of the more desirable as of the less desirable timber, and group 3 has practically none of the less desirable.

CONCENTRATION OF OWNERSHIP IN THE SEVERAL STATES OF THE INVESTIGATION AREA AND ON THE PACIFIC SLOPE.

Excepting in Tables 23 to 25, which occur on pages 110 and 111, holdings have thus far been grouped according to size in the investigation area and percentages based on the total timber involved. Considerable interest attaches to separate classifications for each State and for selected portions of the investigation area, particularly for the Pacific slope; i. e., California and those portions of Oregon and Washington west of the Cascades. The importance of each group on the Pacific slope and in the individual States is shown in the two sections following. The classifications and percentages in each case are based on the total timber in the particular area and not on that in the entire investigation area. That is to say, in the first case the holders are grouped according to the amounts of timber owned on the Pacific slope; for instance, to come in group 3 a holder must have over 5 billion feet in that particular area. A similar basis is used for individual States, so that the table shows the order of size of groups of holdings in that State. This manner of presentation brings out some points better than the preceding table; it will also be of much local interest. The relations of the groups are not the same in any separate State or selected area as they are in the entire investigation area. Thus, group 1 has 13.6 per cent (Table 21) of all the timber in the investigation area, 24.4 per cent (Table 40) on the Pacific slope, and 34.6 per cent (Table 34) in Washington.

The tables here given, it may be noted, are presented mainly for study by those whose interest may be largely local and therefore are not extensively discussed here.

Section 9. Concentration of ownership by size of holding in each State separately by species.

A separate classification for each State, according to size in the State, is shown in Table 33. However, it is to be noted that the

Southern Pacific, Weyerhaeuser Timber Company, and Northern Pacific always constitute group 1; but otherwise the figures for each State are entirely independent of those for other States. For instance, a holding of 100 million in Texas is placed in group 10, even though the owner may have several billion feet elsewhere in the investigation area. The number of holdings in each group is shown in italics just above the entry for the total timber. An addition of the number of holders shown for the States would give totals different from those in Table 20 for the geographic divisions and the investigation area. This is due to the different basis of classification. In a number of cases, two or more groups have been consolidated in order not to show one or two holders alone. Thus, in Washington, groups 3 and 4 are consolidated, giving a total of 26 billion feet in three holdings. Such consolidated columns are centered below the groups they contain. The 7 holders with 100.1 billion feet in groups 1 to 3 in California include the Southern Pacific with 35.1 billion, leaving 6 holders in groups 2 and 3 with 65 billion. The Southern Pacific is included merely to make the subdivision by species more representative (see p. 117); and for a similar reason, the Northern Pacific holding of 4.5 billion in Idaho, the total of which is shown separately on page 113, is included with group 3. In some of the consolidations of groups a middle group may contain no holdings, in which case a footnote states in which of the groups the timber is owned. When groups are consolidated the figures in italics show the total number of holdings in each of the groups consolidated. But the number of holdings in each one of the groups thus blocked together is given in Table 48, page 173, in connection with the acreage on which the timber of Table 33 stands.

TABLE 33.—HOLDINGS OF STANDING TIMBER IN EACH STATE, CLASSIFIED BY SIZE IN THE STATE AND BY SPECIES.

[In billions of board feet. Thus, 100.1=100,000,000 board feet. This table differs from Table 26 in that the holdings in each State are here grouped according to their size in that State instead of according to their size in the investigation area. See p. 94 for a description of the groups. The number of timber holdings in each group is shown in italics.]

PACIFIC-NORTHWEST.

California.

	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	Group 11.
Total.....	7	100.1	7	30.2	9	19	23	20	28	40	160	38.8
Douglas fir.....	18.5		7.3	4.0	1.9	1.3	.8	.6	.4		34.8	10.4
Western pine.....	31.4		5.2	1.2	3.5	3.9	.8	.6	1.2	47.8	13.4	
Sugar pine.....	23.8		9.4	2.2	.7	2.6	2.6	.5	.3	.5	18.8	5.0
Redwood.....	101.9		14.7	18.5	12.4	6.0	3.5	3.2	1.5		95.0	6.9
Cedar.....	3.4		.8	.6	.4	.2	.4	.1	.....	.....	2.5	.9
Spruce.....	1.2		.1	.2	.....	.3	.3	.1	.....	.....	1.0	.2
All other species.....	11.4		4.7	.....	.6	1.6	1.8	.4	.1	.2	9.4	2.0

TABLE 33.—HOLDINGS OF STANDING TIMBER IN EACH STATE, CLASSIFIED BY SIZE IN THE STATE AND BY SPECIES—Continued.

PACIFIC-NORTHWEST—Continued.

Oregon.

	Oregon.											
	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Group 11.
Total.....	398.1	89.2	54.8	26.3	23.7	42.8	31.4	15.1	13.2	8.9	305.4	92.7
Douglas fir.....	273.5	54.4	43.0	23.2	18.8	29.8	20.2	10.0	9.3	6.1	214.8	58.7
White pine.....	.2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.1	.1
Western pine.....	58.5	16.1	5.0	2.4	5.6	5.2	2.5	1.6	1.2	39.6	18.9	8.5
Sugar pine.....	10.9	6.0	.3	.2	.5	.6	.4	.3	.2	8.5	2.4	2.4
Cedar.....	12.6	4.1	1.2	.7	.6	1.1	.7	.4	.9	.3	10.0	2.6
Hemlock.....	23.9	6.3	2.8	1.4	.5	3.7	2.2	1.1	.7	.6	19.3	4.6
Spruce.....	10.1	1.3	.8	.7	.8	1.0	1.5	.6	.2	.2	7.1	3.0
All other species.....	8.4	1.0	1.7	.3	.4	1.1	1.0	.1	.2	.2	6.0	2.4

Washington.

	Washington.										
	Total.	5	8	19	34	46	84	99	265	237.2	57.4
Total.....	294.6	102.1	26.0	21.6	25.3	22.7	16.3	15.1	8.2	237.2	57.4
Douglas fir.....	193.6	71.4	14.8	14.2	17.9	13.8	10.5	9.5	5.3	187.4	36.2
White pine.....	.7	.2	.....	.....	.....	.....	.....	.....	.....	.1	.5
Western pine.....	12.5	4.6	.....	.3	.7	.7	.9	.9	.2	8.3	4.2
Cedar.....	37.0	9.9	3.4	2.9	3.5	4.0	2.5	2.4	1.4	30.0	7.0
Hemlock.....	33.0	10.2	5.5	3.5	1.7	2.6	1.6	1.2	.7	27.0	6.0
Spruce.....	8.9	2.3	1.4	.5	1.0	.9	.5	.5	.3	7.4	1.5
All other species.....	8.9	3.5	.9	.1	.4	.7	.3	.5	.2	6.6	2.3

Idaho.

	Idaho.											
	Total.	5	5	5	4	9	8	9	9	36	37.6	12.8
Total.....	50.4	123.3	.....	6.0	3.0	3.0	1.6	.7	.....	.....	.....	.....
Douglas fir.....	5.1	2.1	.....	.6	.5	.3	.1	.1	.....	.....	.....	.....
White pine.....	18.4	10.2	.....	2.6	.6	1.2	.6	.2	.....	.....	.....	.....
Western pine.....	13.3	5.3	.....	.5	1.3	.7	.3	.2	.....	.....	.....	.....
Cedar.....	3.5	1.6	.....	.6	.....	.2	.2	.....	.....	.....	.....	.....
Hemlock.....	.5	.4	.....	.....	.....	.1	.....	.....	.....	.....	.....	.....
Spruce.....	.5	.1	.....	.1	.....	.....	.1	.....	.....	.....	.....	.....
All other species.....	9.1	3.6	.....	1.6	.6	.5	.3	.2	.....	.....	.....	.....

Montana.

	Montana.										
	Total.	1	5	5	6	6	18	18	18	18	3.9
Total.....	21.8	6.5	.....	10.8	.....	.6	.....	.....	.....	.....	.....
Douglas fir.....	4.5	1.6	.....	2.2	.....	.1	.....	.....	.....	.....	.....
White pine.....	.3	.....	.....	.2	.....	.....	.....	.....	.....	.....	.....
Western pine.....	7.9	2.1	.....	4.0	.....	.2	.....	.....	.....	.....	.....
Cedar.....	.....	.....	.....	.2	.....	.....	.....	.....	.....	.....	.....
Spruce.....	1.2	.9	.....	.1	.....	.....	.....	.....	.....	.....	.....
All other species.....	7.7	1.9	.....	4.1	.....	.3	.....	.....	.....	.....	.....

1 Groups 1 and 3.

2 Groups 3, 6, and 8.

TABLE 33.—HOLDINGS OF STANDING TIMBER IN EACH STATE, CLASSIFIED BY SIZE IN THE STATE AND BY SPECIES—Continued.

SOUTHERN PINE REGION.

Missouri (part).

	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Group 11.
Total.....	9.9											
Yellow pine.....	1.1											
Longleaf.....												
Shortleaf and loblolly.....	1.1											
Cypress.....	.9											
Hardwoods.....	7.9											

Arkansas.

	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Group 11.
Total.....	78.7											
Yellow pine.....	26.0											
Longleaf.....												
Shortleaf and loblolly.....	26.0											
Cypress.....	2.2											
Hardwoods.....	50.5											

Texas.

	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Group 11.
Total.....	66.0											
Yellow pine.....	44.9											
Longleaf.....	22.4											
Shortleaf and loblolly.....	22.5											
Cypress.....	.2											
Hardwoods.....	20.9											

Louisiana.

	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Group 11.
Total.....	119.8											
Yellow pine.....	67.7											
Longleaf.....	52.5											
Shortleaf and loblolly.....	15.2											
Cypress.....	15.7											
Hardwoods.....	36.4											

1 Groups 3 and 5.

TABLE 33.—HOLDINGS OF STANDING TIMBER IN EACH STATE, CLASSIFIED BY SIZE IN THE STATE AND BY SPECIES—Continued.

SOUTHERN PINE REGION—Continued.

Mississippi.

	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	Group 11.
Total.....	95.3												
Yellow pine.....	62.4				2	4	4	7	24	36	59	136	47.8
Longleaf.....	47.6				8.4	9.1	6.1	4.5	8.3	6.2	5.2		
Shortleaf and loblolly.....	14.8				8.4	6.9	6.0	3.9	0.8	4.3	2.9	39.2	23.2
Cypress.....	1.9												
Hardwoods.....	31.0					.5			.1	.3	.1	1.0	.9
					1.7	.1	.6	1.4	1.6	2.2	7.6	23.4	

Alabama.

Total.....	56.3								15	16	23	57	89
Yellow pine.....	38.0							8.5	4.4	3.1	2.3	18.3	19.7
Longleaf.....	25.6							7.6	3.8	2.5	1.7	15.6	10.0
Shortleaf and loblolly.....	12.4							.9	.6	.6	.6	2.7	9.7
Cypress.....	.2									.1		.1	.1
Hardwoods.....	18.1							.7	1.0	.9	.7	3.3	14.8

Florida.

Total.....	73.9								2	9	19	33	53	67	132
Yellow pine.....	59.1								4.9	9.8	10.1	9.5	7.7	5.3	47.3
Longleaf.....	58.2								4.9	9.8	10.1	9.4	7.6	5.3	47.1
Shortleaf and loblolly.....	.9											.1	.1		.2
Cypress.....	10.7								1.1	2.6	2.5	1.5	1.1	.5	9.3
Hardwoods.....	4.1								.5	.4	.4	.2	.1	1.6	2.5

Georgia (part).

Total.....	46.0								2	9	12	31	54
Yellow pine.....	31.7								1.2	2.1	1.3	2.2	6.8
Longleaf.....	13.5								1.2	1.9	1.3	1.8	6.2
Shortleaf and loblolly.....	13.2								.2	.2	.4	.6	12.6
Cypress.....	2.8								1.4	.3	.4	.2	.5
Hardwoods.....	11.5								.6	.3	.3	.8	1.8

TABLE 33.—HOLDINGS OF STANDING TIMBER IN EACH STATE, CLASSIFIED BY SIZE IN THE STATE AND BY SPECIES—Continued.

SOUTHERN PINE REGION—Continued.
South Carolina (part).

	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	Group 11.
Total.....	30.7					5	14	32	69				
Yellow pine.....	19.2					15.4	2.7	2.4	2.7			13.2	17.5
Longleaf.....	4.6					4.0			2.1	1.2	1.5	8.8	10.4
Shortleaf and loblolly.....	14.6					.5	.2	.3	.3	.3		1.3	3.3
Cypress.....	2.6					3.5	1.9	.9	1.2			7.5	7.1
Hardwoods.....	8.9					.4	.2	.6	.3			1.5	1.1
						1.0	.4	.6	.9			2.9	6.0

North Carolina (part).

Total.....	42.9					8	9	21	25	63			
Yellow pine.....	25.6					19.6	3.2	3.5	2.1	18.4		24.5	
Longleaf.....	2.9					4.9	2.6	2.5	1.5	11.5		14.1	
Shortleaf and loblolly.....	22.7						.1	.1	.1	.3		2.6	
Cypress.....	3.0					4.9	2.5	2.4	1.4	11.2		11.5	
Hardwoods.....	14.3					1.2	.1	.1	.1	1.5		1.5	1.5
						3.5	.5	.9	.5	5.4		8.9	

Virginia (part).

Total.....	14.5					2	2	2	9	16			
Yellow pine.....	8.7						1.9	.7	.3	.8		3.7	10.8
Longleaf.....							1.7	.3	.2	.5		2.7	6.0
Shortleaf and loblolly.....	8.7												
Cypress.....	.2						1.7	.3	.2	.5		2.7	6.0
Hardwoods.....	5.6							.1	.....	.....		.1	1.1
							.2	.3	.1	.3		.9	4.7

LAKE STATES.
Michigan.

Total.....	47.6					12	21	36	41	110			
White and Norway pine.....	2.0					13.2	7.4	6.8	3.8	31.2		16.4	
Hardwood.....	15.0					.7	.2	.4	.3	1.6		.4	
Other conifers.....	5.2					3.4	2.7	2.8	1.4	10.3		4.7	
Hardwoods.....	25.4					1.1	.5	.5	.4	2.5		2.7	
						8.0	4.0	3.1	1.7	16.8		8.6	

1 Groups 5 and 7.

2 Groups 4, 6, and 7.

TABLE 33.—HOLDINGS OF STANDING TIMBER IN EACH STATE, CLASSIFIED BY SIZE IN THE STATE AND BY SPECIES—Continued.

LAKE STATES—Continued.
Wisconsin.

	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	Group 11.
Total.....	39.2						10	7.0	18	34	34	96	
White and Norway pine.....	3.2						.9		1.0	.6	.3	2.8	.4
Hemlock.....	11.6						3.0		2.7	2.7	1.1	9.5	2.1
Other conifers.....	2.3						.4		.3	.3	.8	1.3	1.0
Hardwoods.....	12.1						2.7		2.4	2.2	1.1	8.4	3.7

Minnesota.

	Total.	6	8	14	58
Total.....	23.2	17.9	1.5	1.2	11.9
White and Norway pine.....	12.6	6.8	1.2	.7	10.0
Hemlock.....	6.3	1.0	.1	.4	2
Other conifers.....	4.4	.1	.2	.1	1.1
Hardwoods.....					1.7
					4.6
					3.9

1 Groups 4, 6, and 7.

Tables 34 and 35 are computed from Table 33, one showing the per cent distribution of each species by ownership groups, and the other showing the per cent distribution of the timber in each ownership group by species.

TABLE 34.—HOLDINGS OF STANDING TIMBER IN EACH STATE: DISTRIBUTION OF EACH SPECIES, BY SIZE GROUPS, IN PERCENTAGES OF THE TOTAL IN EACH STATE.

[Percentages computed from Table 33. See note at head of Table 33.]

PACIFIC-NORTHWEST.
California.

	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	Group 11.
Total.....	100.0	7	40.4	7	16	23	23	20	28	40	150	84.4	15.6
Douglas fir.....	100.0	40.9	16.2	8.8	4.2	2.9	1.8	1.3	.9			77.0	23.0
Western pine.....	100.0	51.3	8.5	2.0	5.7	6.4	1.3	1.0	1.9	1.9		78.1	21.9
Sugar pine.....	100.0	39.5	9.3	2.9	10.9	10.9	2.1	1.3	2.1			79.0	21.0
Redwood.....	100.0	34.5	14.4	18.2	12.2	5.9	3.4	3.1	1.5			93.2	6.8
Cedar.....	100.0	23.5	17.6	11.8	5.9	11.8	2.9	.....	.....			73.5	26.5
Spruce.....	100.0	38.1	1.6	4.7	15.1	16.7	4.0	.8	1.6			82.6	17.4
All other species.....													

TABLE 34.—HOLDINGS OF STANDING TIMBER IN EACH STATE: DISTRIBUTION OF EACH SPECIES, BY SIZE GROUPS, IN PERCENTAGES OF THE TOTAL IN EACH STATE—Continued.

PACIFIC-NORTHWEST—Continued.

Oregon.

	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	Group 11.
Total.....	100.0	22.4	5	6	6	6	6	6	6	6	6	6	6
Douglas fir.....	100.0	19.9	15.7	8.5	5.9	10.9	7.4	3.6	3.4	2.2	78.5	21.5	
White pine.....	100.0	27.4	8.5	.....	4.1	9.5	8.9	4.3	2.7	2.2	67.0	32.4	
Western pine.....	100.0	55.1	2.8	.....	1.8	4.6	5.5	3.7	2.7	1.8	78.0	22.0	
Cedar.....	100.0	32.5	9.5	3.6	4.8	8.7	5.6	3.2	7.1	2.4	79.4	20.6	
Hemlock.....	100.0	26.4	11.7	5.9	2.1	15.5	9.2	4.6	2.9	2.5	80.8	19.2	
Spruce.....	100.0	12.9	7.9	6.9	7.9	9.9	14.9	5.9	2.0	2.0	70.3	29.7	
All other species.....	100.0	11.9	20.2	3.6	4.7	13.1	11.9	1.2	2.4	2.4	71.4	28.6	

Washington.

	Total.	2	3	5	8	19	34	48	64	89	285	19.5
Total.....	100.0	34.6	.....	8.8	7.3	8.6	7.7	5.6	5.1	2.8	80.5	19.5
Douglas fir.....	100.0	36.9	.....	7.7	7.3	9.3	7.1	5.4	4.9	2.7	81.3	18.7
White pine.....	100.0	36.4	.....	.....	2.3	6.0	5.3	6.8	7.6	2.3	66.7	33.3
Western pine.....	100.0	26.8	.....	9.2	7.8	9.5	10.8	6.7	6.5	3.8	81.1	18.9
Cedar.....	100.0	30.9	.....	16.7	10.6	5.2	7.9	4.8	3.6	2.1	81.8	18.2
Hemlock.....	100.0	25.8	.....	15.7	5.6	11.3	10.1	5.6	5.6	3.4	83.1	16.9
Spruce.....	100.0	39.3	.....	10.1	1.1	4.5	7.9	3.4	5.6	2.3	74.2	25.8

Idaho.

	Total.	3	5	4	9	8	9	36	25.4
Total.....	100.0	40.2	.....	11.9	6.0	5.9	3.2	1.4	74.6
Douglas fir.....	100.0	41.2	.....	11.8	9.8	5.9	2.0	1.9	72.6
White pine.....	100.0	55.4	.....	14.1	3.3	6.5	3.3	1.1	83.7
Western pine.....	100.0	39.8	.....	3.8	9.8	5.3	2.2	1.5	62.4
Cedar.....	100.0	45.7	.....	17.2	.....	5.7	5.7	.....	74.3
Hemlock.....	100.0	40.6	.....	16.8	5.9	5.9	4.0	2.0	75.2
Spruce.....	100.0	.....	.....	.....	.....	.....	.....	.....	.....
All other species.....	100.0	.....	.....	.....	.....	.....	.....	.....	.....

Montana.

	Total.	1	5	6	12	17.9
Total.....	100.0	29.8	.....	249.5	2.8	82.1
Douglas fir.....	100.0	35.6	.....	48.9	2.2	86.7
White pine.....	100.0	25.6	.....	51.2	2.5	79.3
Western pine.....	100.0	.....	.....	.....	.....	.....
Cedar.....	100.0	30.8	.....	48.3	3.3	82.4
Spruce.....	100.0	.....	.....	.....	.....	.....
All other species.....	100.0	.....	.....	.....	.....	.....

¹ Groups 1 and 3.² Groups 3, 6, and 8.

TABLE 34.—HOLDINGS OF STANDING TIMBER IN EACH STATE: DISTRIBUTION OF EACH SPECIES, BY SIZE GROUPS, IN PERCENTAGES OF THE TOTAL IN EACH STATE—Continued.

SOUTHERN PINE REGION.

Missouri (part).

Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	Group 11.
100.0												
100.0												
100.0												
100.0												
100.0												

Arkansas.

Total.	7	15	21	35	58	154
100.0	14.1	10.3	9.8	7.8	6.2	48.2
100.0	18.5	21.5	12.7	5.8	3.8	62.3
100.0	18.5	21.5	12.7	5.8	3.8	62.3
100.0						
100.0						
100.0						
100.0						

Texas.

Total.	8	9	12	21	33	81
100.0	122.1	7.6	8.9	6.8	5.5	4.4
100.0	31.4	10.9	11.4	8.2	6.5	3.8
100.0	54.5	10.7	11.6	4.0	2.7	3.1
100.0	8.5	11.1	11.1	12.4	10.2	4.5
100.0	2.4	.5	3.8	3.8	3.4	5.7
100.0						

Louisiana.

Total.	10	17	28	50	74	189
100.0	28.6	12.2	9.9	8.1	6.9	5.4
100.0	39.1	16.5	9.6	6.4	5.8	4.1
100.0	39.6	19.0	11.4	6.7	4.8	2.9
100.0	37.5	7.9	3.3	5.3	9.2	8.5
100.0	23.6	3.8	22.3	13.4	7.6	6.4
100.0	4.7	7.7	5.2	9.1	8.8	7.1

1 Groups 3 and 5.

TABLE 34.—HOLDINGS OF STANDING TIMBER IN EACH STATE: DISTRIBUTION OF EACH SPECIES, BY SIZE GROUPS, IN PERCENTAGES OF THE TOTAL IN EACH STATE—Continued.

SOUTHERN PINE REGION—Continued.

Mississippi.

	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Group 11.
Total.....	100.0											Groups 1-10. 186 50.2
Yellow pine.....	100.0											62.8 37.2
Longleaf.....	100.0											72.9 27.1
Shortleaf and loblolly.....	100.0											30.4 69.6
Cypress.....	100.0											52.6 47.4
Hardwoods.....	100.0											24.5 75.5

Alabama.

	Total.	15	16	25	37	89
Yellow pine.....	100.0	16.3	9.6	7.3	5.3	38.5
Longleaf.....	100.0					48.2
Shortleaf and loblolly.....	100.0					60.9
Cypress.....	100.0					21.8
Hardwoods.....	100.0					81.8

Florida.

	Total.	2	9	19	35	52	67	182
Yellow pine.....	100.0	8.1	17.5	17.6	15.4	12.2	8.0	78.8
Longleaf.....	100.0							80.0
Shortleaf and loblolly.....	100.0							80.9
Cypress.....	100.0							22.2
Hardwoods.....	100.0							86.9

Georgia (part).

	Total.	2	9	12	31	64
Yellow pine.....	100.0	7.0	6.3	4.1	6.3	23.7
Longleaf.....	100.0					21.5
Shortleaf and loblolly.....	100.0					33.5
Cypress.....	100.0					4.5
Hardwoods.....	100.0					82.1

TABLE 34.—HOLDINGS OF STANDING TIMBER IN EACH STATE: DISTRIBUTION OF EACH SPECIES, BY SIZE GROUPS, IN PERCENTAGES OF THE TOTAL IN EACH STATE—Continued.

SOUTHERN PINE REGION—Continued.

South Carolina (part).

	Total.	Groups 1-10.											Group 11.				
		Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Group 11.					
Total.....	100.0						5	14	39	69							
Yellow pine.....	100.0						117.6										
Longleaf.....	100.0						20.8										
Shortleaf and loblolly.....	100.0						10.9	4.4	6.5	6.5	28.3	71.7					
Cypress.....	100.0						24.0	13.0	6.2	8.2	51.4	48.6					
Hardwoods.....	100.0						15.4	7.7	23.1	11.5	57.7	42.3					
	100.0						11.2	4.5	6.8	10.1	32.6	67.4					

North Carolina (part).

	Total	6	9	21	25	65	Groups 1-10.										
							Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Group 11.
Total.....	100.0	22.4	7.5	8.1	4.9	42.9											
Yellow pine.....	100.0	19.1	10.1	9.8	5.9	44.9											
Longleaf.....	100.0																
Shortleaf and loblolly.....	100.0	21.6	3.5	3.4	3.4	10.3											
Cypress.....	100.0	40.0	11.0	10.6	6.2	49.4											
Hardwoods.....	100.0	24.5	3.3	3.3	3.4	50.0											
	100.0		3.5	6.3	3.5	37.8											

Virginia (part).

	Total	8	9	2	9	15	Groups 1-10.										
							Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	
Total.....	100.0	13.1	4.8	2.1	5.5	25.5											
Yellow pine.....	100.0	19.5	3.5	2.3	5.7	31.0											
Longleaf.....	100.0																
Shortleaf and loblolly.....	100.0	19.5	3.5	2.3	5.7	31.0											
Cypress.....	100.0		50.0			50.0											
Hardwoods.....	100.0	3.6	5.3	1.8	5.4	16.1											

LAKE STATES.

Michigan.

	Total	12	21	56	41	110	Groups 1-10.										
							Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	
Total.....	100.0	27.7	15.5	14.3	8.0	65.5											
White and Norway pine.....	100.0																
Hemlock.....	100.0	35.0	10.0	20.0	15.0	80.0											
Other conifers.....	100.0	22.7	18.0	18.7	9.3	68.7											
Hardwoods.....	100.0	21.2	9.6	9.6	7.7	48.1											
	100.0	31.5	15.7	12.2	6.7	66.1											

¹ Groups 5 and 7.

² Groups 4, 6, and 7.

TABLE 34.—HOLDINGS OF STANDING TIMBER IN EACH STATE: DISTRIBUTION OF EACH SPECIES, BY SIZE GROUPS, IN PERCENTAGES OF THE TOTAL IN EACH STATE.—Continued.

LAKE STATES—Continued.
Wisconsin.

	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Group 11.
Total.....	100.0						10	18	34	34	34	96
							24.0	21.9	19.8	9.6		75.3
White and Norway pine.....	100.0						28.1	31.2	18.8	9.4		87.5
Hemlock.....	100.0						25.8	23.3	23.3	9.5		81.9
Other conifers.....	100.0						17.4	13.1	13.0	13.0		56.5
Hardwoods.....	100.0						22.3	19.8	18.2	9.1		69.4
												30.6

Minnesota.

	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Group 11.
Total.....	100.0						6	4	8	14	38	48.7
							134.0	6.5	5.2	5.6		51.3
White and Norway pine.....	100.0						54.4	9.6	5.6	8.0		77.6
Hemlock.....	100.0						15.9	1.6	0.3	3.2		27.0
Other conifers.....	100.0						2.3	4.5	2.3	2.3		11.4
Hardwoods.....	100.0											88.6

TABLE 35.—HOLDINGS OF STANDING TIMBER IN EACH STATE: DISTRIBUTION OF THE TIMBER IN EACH SIZE GROUP, BY SPECIES, IN PERCENTAGES OF THE TOTAL IN EACH GROUP.

[Percentages computed from Table 33. See note at head of Table 33.]

PACIFIC-NORTHWEST.
California.

	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Group 11.
Total.....	100.0	100.0										
Douglas fir.....	18.2	18.5					24.2	15.7	8.4	8.0	12.9	12.5
Western pine.....	24.6	31.4					17.2	4.7	15.6	23.9	12.9	12.5
Sugar pine.....	9.6	9.4					7.3	2.8	11.6	16.0	8.1	6.2
Redwood.....	41.1	35.1					48.7	72.8	55.1	36.8	56.5	66.7
Cedar.....	1.4	.8					2.0	1.6	.9	2.5	1.6	.....
Spruce.....	.5	.1					.6	.....	1.3	1.8	1.6	.....
All other species.....	4.6	4.7					2.4	7.1	11.0	6.4	2.1	5.3
Total.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Douglas fir.....	18.2	18.5					24.2	15.7	8.4	8.0	12.9	12.5
Western pine.....	24.6	31.4					17.2	4.7	15.6	23.9	12.9	12.5
Sugar pine.....	9.6	9.4					7.3	2.8	11.6	16.0	8.1	6.2
Redwood.....	41.1	35.1					48.7	72.8	55.1	36.8	56.5	66.7
Cedar.....	1.4	.8					2.0	1.6	.9	2.5	1.6	.....
Spruce.....	.5	.1					.6	.....	1.3	1.8	1.6	.....
All other species.....	4.6	4.7					2.4	7.1	11.0	6.4	2.1	5.3
Total.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Douglas fir.....	68.7	61.0	78.5	88.2	79.3	69.6	64.3	66.2	70.5	68.5	70.3	63.3
White pine.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Western pine.....	14.7	18.0	9.1	.....	10.1	13.1	16.6	12.1	13.5	13.0	20.4	.....
Sugar pine.....	2.7	6.7	.5	.....	.9	1.2	1.9	2.6	2.3	2.3	2.8	2.6
Cedar.....	3.2	4.6	2.2	.....	2.7	2.5	2.6	2.2	2.6	6.8	3.4	3.3
Hemlock.....	6.0	7.1	5.1	.....	5.3	2.1	8.6	7.0	7.3	5.3	6.7	6.3
Spruce.....	2.5	1.5	1.5	.....	2.7	3.4	2.3	4.8	4.0	1.5	2.3	3.2
All other species.....	2.1	1.1	3.1	.....	1.1	1.7	2.6	3.2	.7	1.5	2.2	2.0

Oregon.

	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Group 11.
Total.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Douglas fir.....	68.7	61.0	78.5	88.2	79.3	69.6	64.3	66.2	70.5	68.5	70.3	63.3
White pine.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Western pine.....	14.7	18.0	9.1	.....	10.1	13.1	16.6	12.1	13.5	13.0	20.4	.....
Sugar pine.....	2.7	6.7	.5	.....	.9	1.2	1.9	2.6	2.3	2.3	2.8	2.6
Cedar.....	3.2	4.6	2.2	.....	2.7	2.5	2.6	2.2	2.6	6.8	3.4	3.3
Hemlock.....	6.0	7.1	5.1	.....	5.3	2.1	8.6	7.0	7.3	5.3	6.7	6.3
Spruce.....	2.5	1.5	1.5	.....	2.7	3.4	2.3	4.8	4.0	1.5	2.3	3.2
All other species.....	2.1	1.1	3.1	.....	1.1	1.7	2.6	3.2	.7	1.5	2.2	2.0

1 Groups 4, 6, and 7.

2 Less than one-tenth of 1 per cent.

TABLE 36.—HOLDINGS OF STANDING TIMBER IN EACH STATE: DISTRIBUTION OF THE TIMBER IN EACH SIZE GROUP, BY SPECIES, IN PERCENTAGES OF THE TOTAL IN EACH GROUP—Continued.

PACIFIC-NORTHWEST—Continued.

Washington.

	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Group 11.
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Douglas fir.....	65.7	69.9	.....	56.9	.....	66.1	70.7	60.8	64.4	62.9	64.6	63.1
White pine.....	2	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Western pine.....	4.3	4.5	.....	.....	.....	1.4	2.8	3.1	5.5	6.0	2.4	3.5
Cedar.....	12.6	9.7	.....	13.1	.....	13.5	13.8	17.6	15.3	15.9	17.1	12.6
Hemlock.....	11.2	10.0	.....	21.1	.....	16.3	6.7	11.4	9.8	7.9	8.5	11.4
Spruce.....	3.0	2.3	.....	5.4	.....	2.3	4.0	4.0	3.1	3.3	3.7	3.1
All other species.....	3.0	3.4	.....	3.5	.....	5.5	1.6	3.1	1.9	3.3	2.5	2.8

Idaho.

	Total.	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Douglas fir.....	10.1	9.0	.....	.....	.....	10.0	16.7	10.0	6.3	14.3	9.8	10.9
White pine.....	36.5	43.8	.....	.....	.....	43.3	20.0	40.0	37.5	28.6	41.0	23.4
Western pine.....	26.4	22.7	.....	.....	.....	8.3	43.3	23.3	18.7	28.6	22.1	39.1
Cedar.....	6.9	6.9	.....	.....	.....	10.0	.....	6.7	12.5	.....	6.9	7.0
Hemlock.....	1.0	1.7	.....	.....	.....	.....	.....	3.3	.....	.....	1.3	.....
Spruce.....	1.0	.4	.....	.....	.....	1.7	.....	.....	6.2	.....	.8	1.6
All other species.....	18.1	15.5	.....	.....	.....	26.7	20.0	16.7	18.8	28.5	18.1	18.0

Montana.

	Total.	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Douglas fir.....	20.7	24.6	.....	.....	.....	20.4	.....	.....	16.7	.....	21.8	15.4
White pine.....	1.4	.....	.....	.....	.....	1.9	.....	.....	.....	.....	1.1	2.6
Western pine.....	36.2	32.3	.....	.....	.....	37.0	.....	.....	33.3	.....	35.2	41.0
Cedar.....	.9	.....	.....	.....	.....	1.8	.....	.....	.....	.....	1.1	.....
Spruce.....	5.5	13.9	.....	.....	.....	.9	.....	.....	.....	.....	5.6	5.1
All other species.....	35.3	29.2	.....	.....	.....	38.0	.....	.....	50.0	.....	35.2	35.9

SOUTHERN PINE REGION.

Missouri (part).

	Total.	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Yellow pine.....	11.1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Longleaf.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Shortleaf and loblolly.....	11.1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cypress.....	9.1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hardwoods.....	79.8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

1 Groups 1 and 3.

3 Groups 3, 6, and 8.

TABLE 35.—HOLDINGS OF STANDING TIMBER IN EACH STATE: DISTRIBUTION OF THE TIMBER IN EACH SIZE GROUP, BY SPECIES, IN PERCENTAGES OF THE TOTAL IN EACH GROUP—Continued.

SOUTHERN PINE REGION—Continued.

Arkansas.

	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	Group 11.
Total.....	100.0					100.0						100.0	100.0
Yellow pine.....	33.0					43.2		60.2	42.9	24.6	20.4	42.7	24.0
Longleaf.....													
Shortleaf and loblolly.....	33.0					43.2		60.2	42.9	24.6	20.4	42.7	24.0
Cypress.....	2.8							1.2	3.9	1.6	4.1	1.9	3.7
Hardwoods.....	64.2					56.8		29.6	53.2	73.8	75.5	55.4	72.3

Texas.

	Total.	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total.....	100.0		100.0										100.0
Yellow pine.....	68.0		96.6				98.0	86.4	82.2	80.6	58.6	88.8	42.4
Longleaf.....	33.9		83.6				48.0	44.0	20.0	16.7	24.1	53.2	10.2
Shortleaf and loblolly.....	34.1		13.0				50.0	42.4	62.2	63.9	34.5	35.6	32.2
Cypress.....	.3												.7
Hardwoods.....	31.7		3.4				2.0	13.6	17.8	19.4	41.4	11.2	56.9

Louisiana.

	Total.	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total.....	100.0		100.0										100.0
Yellow pine.....	56.5		83.1				76.7	54.6	44.3	47.0	43.8	66.7	33.8
Longleaf.....	43.8		65.2				68.5	50.4	36.1	30.1	23.5	53.5	22.2
Shortleaf and loblolly.....	12.7		17.9				8.2	4.2	8.2	16.9	20.3	13.2	11.6
Cypress.....	13.1		11.6				4.1	29.4	21.7	14.5	15.6	14.6	9.7
Hardwoods.....	30.4		5.3				19.2	16.0	34.0	38.5	40.6	18.7	56.5

Mississippi.

	Total.	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total.....	100.0		100.0										100.0
Yellow pine.....	65.5		100.0				75.8	98.4	86.7	81.9	69.4	55.8	48.8
Longleaf.....	50.0		100.0				57.1	98.4	86.7	62.6	59.7	44.2	27.1
Shortleaf and loblolly.....	15.5		18.7							19.3	9.7	11.6	21.7
Cypress.....	2.0		5.5							1.2	4.8	1.9	1.9
Hardwoods.....	32.5		18.7				1.6	13.3	16.9	25.8	42.3	15.9	49.3

Alabama.

	Total.	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total.....	100.0												100.0
Yellow pine.....	67.5												84.3
Longleaf.....	45.5												56.9
Shortleaf and loblolly.....	22.0												28.9
Cypress.....	.4												.3
Hardwoods.....	32.1												42.8

1 Groups 3 and 6.

TABLE 35.—HOLDINGS OF STANDING TIMBER IN EACH STATE: DISTRIBUTION OF THE TIMBER IN EACH SIZE GROUP, BY SPECIES, IN PERCENTAGES OF THE TOTAL IN EACH GROUP—Continued.

SOUTHERN PINE REGION—Continued.

Florida.

	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	Group 11.
Total.....	100.0					100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Yellow pine.....	80.0					81.7	76.0	77.7	83.3	85.6	89.8	81.3	75.2
Longleaf.....	78.8					81.7	76.0	77.7	82.4	84.5	89.8	80.9	70.7
Shortleaf and loblolly.....	1.2								9	1.1	.....	4	4.5
Cypress.....	14.5					18.3	20.1	19.2	13.2	12.2	8.5	16.0	8.9
Hardwoods.....	5.5					3.0	3.1	3.5	2.2	1.7	.....	2.7	15.9

Georgia (part).

	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Group 11.	
Total.....	100.0					100.0	100.0	100.0	100.0	100.0	100.0	100.0	
Yellow pine.....	68.9					37.5	.....	.....	72.4	68.4	75.9	62.4	71.0
Longleaf.....	40.2					37.5	.....	.....	65.5	68.4	62.1	56.9	35.1
Shortleaf and loblolly.....	28.7					.....	.....	.....	6.9	.....	13.8	5.5	35.9
Cypress.....	6.1					43.8	.....	.....	6.9	15.8	13.8	21.1	1.4
Hardwoods.....	25.0					18.7	.....	.....	20.7	15.8	10.3	16.5	27.6

South Carolina (part).

	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Group 11.	
Total.....	100.0					1100.0	100.0	100.0	100.0	100.0	100.0	100.0	
Yellow pine.....	62.5					74.1	.....	.....	77.8	50.0	55.6	66.7	59.4
Longleaf.....	15.0					9.3	.....	.....	7.4	12.5	11.1	9.9	18.8
Short leaf and loblolly.....	47.5					64.8	.....	.....	70.4	37.5	44.5	56.8	40.5
Cypress.....	8.5					7.4	.....	.....	7.4	25.0	11.1	11.3	6.3
Hardwoods.....	29.0					18.5	.....	.....	14.8	25.0	33.3	22.0	34.3

North Carolina (part).

	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Group 11.	
Total.....	100.0					100.0	100.0	100.0	100.0	100.0	100.0	100.0	
Yellow pine.....	59.7					51.0	.....	.....	81.3	71.4	71.4	62.5	57.6
Longleaf.....	6.8					.....	.....	.....	3.1	2.8	4.7	1.6	10.6
Shortleaf and loblolly.....	52.9					51.0	.....	.....	78.2	68.6	66.7	60.9	47.0
Cypress.....	7.0					12.5	.....	.....	3.1	2.9	4.8	8.2	6.1
Hardwoods.....	33.3					36.5	.....	.....	15.6	25.7	23.8	29.3	36.3

Virginia (part).

	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Group 11.	
Total.....	100.0					100.0	100.0	100.0	100.0	100.0	100.0	100.0	
Yellow pine.....	60.0					89.5	.....	.....	42.9	66.7	62.5	73.0	55.6
Longleaf.....	60.0					.....	.....	.....	42.9	66.7	62.5	73.0	55.6
Shortleaf and loblolly.....	1.4					.....	.....	.....	14.3	.....	.....	2.7	9
Cypress.....	38.6					10.5	.....	.....	42.8	33.3	37.5	24.3	42.5

¹ Groups 5 and 7.

² Groups 4, 6, and 7.

TABLE 35.—HOLDINGS OF STANDING TIMBER IN EACH STATE: DISTRIBUTION OF THE TIMBER IN EACH SIZE GROUP, BY SPECIES, IN PERCENTAGES OF THE TOTAL IN EACH GROUP—Continued.

LAKE STATES.

Michigan.

	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	Group 11.
Total.....	100.0				100.0				100.0	100.0	100.0	100.0	100.0
White and Norway pine.....	4.2				5.3				2.7	5.9	7.9	5.1	2.4
Hemlock.....	31.5				25.8				30.5	41.2	36.9	33.0	28.7
Other conifers.....	10.9				8.3				6.8	7.3	10.5	8.0	16.5
Hardwoods.....	53.4				60.6				54.0	45.6	44.7	53.9	52.4

Wisconsin.

	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	Group 11.
Total.....	100.0						100.0	100.0	100.0	100.0	100.0	100.0	100.0
White and Norway pine.....	11.0						12.8	15.6	10.3	10.7	10.7	12.7	5.5
Hemlock.....	39.7						42.9	42.2	46.6	39.3	43.2	29.2	29.2
Other conifers.....	7.9						5.7	4.7	5.2	10.7	10.7	5.9	13.9
Hardwoods.....	41.4						38.6	37.5	37.9	39.3	38.2	38.2	51.4

Minnesota.

	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	Group 11.
Total.....	100.0						100.0	100.0	100.0	100.0	100.0	100.0	100.0
White and Norway pine.....	53.9						86.1	80.0	58.3	76.9	76.9	81.5	24.8
Hemlock.....	27.1						12.6	6.7	33.3	15.4	14.3	40.7	40.7
Other conifers.....	19.0						1.3	13.3	8.4	7.7	4.2	4.2	34.5

¹ Groups 4, 6, and 7.

The Southern Pacific owns 14.1 per cent of the privately owned timber in California, and it, together with the 6 holders in groups 2 and 3, owns 40.4 per cent. The 14 largest holdings in California contain 52.6 per cent of the privately owned timber in that State, 23 holdings contain 62.8 per cent, 39 contain 71.9 per cent, and 62 holdings contain 78.5 per cent. The holdings of the Southern Pacific, the Weyerhaeuser Timber Company, and the 5 owners in groups 2 and 3, contain 36.2 per cent of the privately owned timber in Oregon. The holdings of the Weyerhaeuser Timber Company, the Northern Pacific, and the 3 owners in groups 3 and 4 contain 43.4 per cent of the privately owned timber in Washington. The Northern Pacific and 2 holders in group 3 own 46.2 per cent of the privately owned timber in Idaho. The Northern Pacific and the Amalgamated Copper Company, together with 4 relatively small holders in groups 3, 6, and 8, own 79.3 per cent of the privately owned timber in Montana.

In Arkansas 7 holders own 18.5 per cent of the shortleaf and loblolly pine and 12.5 per cent of the hardwoods.

In Texas, 3 holders have 22.1 per cent of all the timber and 54.5 per cent of the longleaf pine. The 15 holders in groups 3, 5, 6, and 7 own 76.8 per cent of the longleaf, 30.7 per cent of the shortleaf and loblolly, and 6.7 per cent of the hardwoods.

In Louisiana 37 holders in groups 4 to 7 own 48.7 per cent of the total timber, 70 per cent of the longleaf pine, 48.7 per cent of the shortleaf and loblolly, 49.7 per cent of the cypress, and 17.6 per cent of the hardwoods.

In Mississippi, 2 holders have 17.7 per cent of the longleaf. The 10 holders in groups 4 to 6 have 24.8 per cent of the total timber, 41.2 per cent of the longleaf pine, 11.5 per cent of the shortleaf and loblolly, and 5.8 per cent of the hardwoods.

In Alabama, 13 holders in groups 6 and 7 have 29.7 per cent of the longleaf pine, 7.3 per cent of the shortleaf and loblolly, and 3.9 per cent of the hardwoods.

In Florida, 30 holders have 43.2 per cent of the total timber, 42.6 per cent of the longleaf pine, 57.9 per cent of the cypress, and 21.9 per cent of the hardwoods.

In Georgia, 2 holders have 7 per cent of all the timber; in South Carolina, 5 holders have 17.6 per cent of all the timber; in North Carolina, 8 holders have 22.4 per cent of all the timber; and in Virginia, 2 holders have 13.1 per cent.

The 12 holdings in groups 4, 6, and 7 contain 27.7 per cent of all the timber in Michigan. The 10 holdings in groups 6 and 7 contain 24 per cent of all the privately owned timber in Wisconsin, and these, together with the 18 holdings in group 8, contain 45.9 per cent. The 6 holdings in groups 4, 6, and 7 contain 34.0 per cent of the privately owned timber in Minnesota, 54.4 per cent of the white and Norway pine, 15.9 per cent of the other conifers, and 2.3 per cent of the hardwoods. The 32 holdings in groups 4 to 10 contain 77.6 per cent of the white and Norway pine, 27.0 per cent of the other conifers, and 11.4 per cent of the hardwoods.

REDWOOD.—Nearly all of this species is in a long narrow belt with an enormous stand per acre. The ownership of it is very highly concentrated, as shown by the following table, in which only redwood is considered and the holdings of that timber are grouped without regard to the amounts of other species owned by the same holders—that is, to come within group 3 a holder must have over 5 billion feet of redwood and not merely 5 billion feet of all timber. This explains why there are no figures in the columns for groups 1 and 2 here, although in some other tables figures for redwood were given for these groups. To come within group 2 a holding must exceed 13 billion feet. No single holding contains that amount of redwood, though there are redwood owners whose total holdings of all timber surpass that size, and therefore fall in group 2 or group 1 when total timber is the basis of classification.

TABLE 36.—HOLDINGS OF REDWOOD IN CALIFORNIA, GROUPED BY SIZE.

[In billions of board feet. Thus, 101.9=101,900,000,000 board feet. This table differs from the rounded line shown under California in Table 33, in that each holding which contains redwood is here grouped according to the amount of redwood therein, while in Table 33 each holding is grouped according to the total amount of timber of all species therein.]

	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	Group 11.
Amount of redwood.....	101.9			4	2	9	9	11	12	24	19	80	
Percentage in each group.....	100.0			31.0	8.5	24.0	14.0	7.3	4.1	4.2	1.7	94.8	7.1
				30.4	8.3	23.6	13.7	7.2	4.0	4.1	1.7	93.0	7.0

Four holders having each more than 5 billion feet of redwood own 30 per cent of the total supply of that species, 15 holders own 62 per cent, and 24 holders own over three-fourths.

The ownership of timber and land in the great redwood belt will be more fully discussed in another Part of this Report.

CYPRESS.—A similar condition exists in the ownership of cypress. Fourteen holders having each more than 250 million feet of cypress in Louisiana own about three-fifths of the cypress in that State, 7 having each more than 500 million own two-fifths, and one owns more than 15 per cent.

Eleven holders having each more than 250 million feet of cypress in Florida own half the cypress in that State, and 5 having each more than 500 million own three-tenths.

OREGON AND WASHINGTON, WEST OF THE CASCADES.—Tables 37 and 38, based on a classification of holdings according to the amount of timber belonging to each in western Oregon and in western Washington, respectively (see p. 156), will be especially valuable to persons interested in the local timber situation in those regions. In Table 37 the timber west of the Cascades in Oregon is classified by size of holding in that area. Thus, the column headed "Group 4" shows that 6 holders have each between $3\frac{1}{2}$ and 5 billion feet in Oregon west of the Cascades, and that the total of these 6 holdings in that area is 26.3 billion feet.

TABLE 37.—HOLDINGS OF STANDING TIMBER IN WESTERN OREGON, CLASSIFIED BY SIZE AND BY SPECIES.

[In billions of board feet. Thus, 348.5=348,500,000 board feet. This table differs from the Oregon section in Table 33 in that the holdings are here grouped according to their size in western Oregon instead of according to their size in the State. See p. 94 for a description of the groups. The number of holdings in each group is shown in italics.]

	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	Group 11.
Total.....	348.5	82.9	49.4	26.3	21.0	34.7	26.8	13.6	11.3	7.8	281	273.8	74.7
Douglas fir.....	269.7	53.9	42.9	23.2	18.7	28.0	20.7	10.4	8.7	6.0	212.5	57.2	1.1
White pine.....	.2										.1	.1	
Western pine.....	17.5	11.1	.4			.1	.5	.6	.4	.2	13.3	4.2	4.2
Sugar pine.....	9.3	5.5	.2		.1	.1	.5	.3	.3	.2	7.2	2.1	2.1
Cedar.....	12.2	4.1	1.1	.7	.5	1.0	.6	.5	.9	.3	9.7	2.5	2.5
Hemlock.....	23.8	9.3	2.8	1.4	.5	3.6	2.2	1.1	.6	.7	19.2	4.6	4.6
Spruce.....	10.1	1.3	.8	.7	.8	.9	1.7	.6	.2	.2	7.2	2.9	2.9
All other species.....	5.7	.7	1.2	.3	.4	1.0	.6	.1	.2	.1	4.6	1.1	1.1

In Table 38 the holdings in Washington west of the Cascades are classified without regard to timber owned by the same holders elsewhere, just as those of western Oregon are in Table 37.

TABLE 38.—HOLDINGS OF STANDING TIMBER IN WESTERN WASHINGTON, CLASSIFIED BY SIZE AND BY SPECIES.

[In billions of board feet. Thus, 270.5=270,500,000 board feet. This table differs from the Washington section in Table 33 in that the holdings are here grouped according to their size in western Washington instead of according to their size in the State. See p. 94 for a description of the groups. The number of holdings in each group is shown in italics.]

	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	Group 11.
Total.....	270.5	93.1		25.0	19.4	7	19	32	44	76	95	278	47.9
Douglas fir.....	186.1	68.6		14.8	12.8	19.2	13.5	10.5	8.9	5.4	153.7	32.4	
Western pine.....	.2	.1										.2	
Cedar.....	36.4	9.5		3.4	2.8	3.5	4.0	2.6	2.3	1.4	28.5	6.9	6.9
Hemlock.....	32.8	10.0		5.5	3.2	1.0	2.7	1.7	1.2	.7	26.9	5.9	5.9
Spruce.....	8.6	2.1		1.4	.5	1.0	.8	.5	.5	.3	7.1	1.5	1.5
All other species.....	6.4	2.8		.9	.1	.3	.5	.2	.3	.1	5.2	1.2	1.2

Section 10. Concentration of ownership on the Pacific slope.

California and the parts of Oregon and Washington lying west of the Cascades contain 867 billion feet of privately owned timber (see Table 9), or about half the privately owned timber in the investigation area. Broadly speaking, this is a region of enormous stands per acre

and exceedingly high concentration of ownership. The separate treatment of this region—called here the Pacific slope—is of special interest. Table 39 classifies the holdings according to size in this region, as Table 26 does for the investigation area. The table includes all privately owned timber in California and the parts of Oregon and Washington lying west of the Cascades. The portions of Oregon and Washington east and west of the Cascades are defined on page 71, and the amount of timber lying east of the Cascades is given in Table 9.

TABLE 39.—HOLDINGS OF STANDING TIMBER ON THE PACIFIC SLOPE, CLASSIFIED BY SIZE AND BY SPECIES.

[In billions of board feet. Thus, 211.2=211,200,000 board feet. Each holding is grouped according to its total on the Pacific slope. See p. 94 for description of the groups. The number of timber holdings in each group is shown in italics. The Pacific slope covers all of California and the portions of Oregon and Washington lying west of the Cascades.]

PACIFIC SLOPE.

Total.

	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	Group 11.
Total.....	867.1	211.2	97.8	58.4	55.9	68.2	83.8	54.4	31.7	27.1	17.2	706.7	161.4
Douglas fir.....	501.0	176.2	31.2	30.3	38.9	47.5	29.6	19.5	17.3	10.3		401.0	100.0
White pine.....	.2											.1	.1
Western pine.....	78.9	42.4	2.7	3.3	1.6	4.2	3.8	1.4	.6	1.3		61.3	17.6
Sugar pine.....	33.1	15.0	.9	1.3	1.2	3.2	2.5	1.0	.3	.6		28.0	7.1
Redwood.....	101.9	20.6	17.8	13.9	16.7	13.7	4.9	3.0	2.9	1.5		96.0	6.9
Cedar.....	52.0	16.9	2.5	2.0	3.7	4.8	4.5	2.9	2.9	1.5		41.7	10.3
Hemlock.....	56.6	23.3	1.8	3.4	3.0	5.4	4.0	2.2	1.9	1.1		46.1	10.5
Spruce.....	19.9	5.2	.3	1.4	1.7	2.1	2.3	1.2	.6	.5		16.3	4.6
All other species.....	23.5	9.4	1.2	.3	1.4	2.9	2.6	.5	.6	.3		19.2	4.3

California.

	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.
Total.....	248.1	35.2	49.0	24.9	24.0	24.4	25.0	13.7	5.6	4.0	3.5	206.3
Douglas fir.....	45.2	18.4	2.6	5.1	3.9	2.0	1.2	.8	.5	.3		34.8
Western pine.....	61.2	30.7	2.7	3.3	1.6	3.9	3.4	.7	.4	1.1		47.8
Sugar pine.....	23.8	9.3	.9	1.3	1.0	3.1	2.1	.6	.1	.4		18.8
Redwood.....	101.9	20.6	17.8	13.9	16.7	13.7	4.9	3.0	2.9	1.5		96.0
Cedar.....	3.4	.8	.3	.4	.4	.2	.3	.1				2.5
Spruce.....	1.2	.1	.2	.1	.1	.3	.1	.1				1.0
All other species.....	11.4	4.3	.4	.4	.7	1.8	1.7	.3	.1	.1		9.4

TABLE 39.—HOLDINGS OF STANDING TIMBER ON THE PACIFIC SLOPE, CLASSIFIED BY SIZE AND BY SPECIES—Continued.

PACIFIC SLOPE—Continued.

Western Oregon.

	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	Group 11.	
Total.....	348.5	82.9	34.0	21.7	23.8	26.4	33.3	20.7	13.3	10.7	7.0	273.8	74.7
Douglas fir.....	260.7	53.9	29.1	18.8	21.0	22.7	27.4	15.8	10.0	8.4	5.4	212.5	57.2
White pine.....	.2											.1	.1
Western pine.....	17.5	11.1	.5					.2	.4	.7	.2	13.3	4.2
Sugar pine.....	9.3	5.5	.2					.2	.1	.4	.2	7.2	2.1
Cedar.....	12.2	4.1	.8	.8	.4	.8	.8	.5	.4	.8	.3	9.7	2.5
Hemlock.....	23.8	6.3	1.9	1.3	1.4	1.1	3.2	1.7	1.1	.7	.5	19.2	4.6
Spruce.....	10.1	1.3	.8			.8	1.0	.9	1.4	.6	.2	7.2	2.9
All other species.....	5.7	.7	.7	.8	.2	.6	.7	.5	.1	.2	.1	4.6	1.1

Western Washington.

	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Group 11.	
Total.....	270.5	93.1	14.8	11.8	8.1	17.4	25.5	20.0	12.8	12.4	6.7	222.6	47.9
Douglas fir.....	186.1	68.6	6.2	9.8	4.2	12.3	18.1	12.8	8.7	8.4	4.6	153.7	32.4
Western pine.....	.2	.1										.2	.2
Cedar.....	36.4	9.5	1.7	1.4	1.2	2.5	3.8	3.7	2.4	2.1	1.2	29.5	6.9
Hemlock.....	32.8	10.0	5.1	.5	2.0	1.9	2.2	2.3	1.1	1.2	.6	26.9	5.9
Spruce.....	8.6	2.1	.9	.1	.6	.6	.9	.8	.5	.4	.2	7.1	1.5
All other species.....	6.4	2.8	.9		.1	.1	.4	.4	.1	.3	.1	5.2	1.2

In Table 40 the above holdings are expressed in percentages, by groups and by species.

TABLE 40.—HOLDINGS OF STANDING TIMBER ON THE PACIFIC SLOPE: DISTRIBUTION OF EACH SPECIES BY SIZE GROUPS, IN PERCENTAGES.

[Percentages computed from Table 39. See note at head of Table 39.]

PACIFIC SLOPE.

Total.

	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	Group 11.
Total.....	5	5	8	13	26	59	77	90	157	209	648	18.6
Douglas fir.....	100.0	24.4	11.3	6.7	6.4	7.9	9.7	6.3	3.6	3.1	2.0	81.4
White pine.....	35.2	6.2	6.0	7.8	9.5	5.9	3.9	3.4	2.1	1.8	80.0	20.0
Western pine.....	53.6	3.4	4.2	2.0	5.3	4.8	1.8	.7	1.8	77.6	22.4	
Sugar pine.....	100.0	45.3	2.7	3.9	3.6	9.7	7.6	3.0	.9	1.8	78.5	21.5
Redwood.....	100.0	20.2	17.5	13.6	16.4	13.4	4.8	2.9	2.9	1.5	83.2	6.8
Cedar.....	100.0	32.5	4.8	3.8	7.1	9.2	8.7	5.6	5.6	2.9	80.2	19.8
Hemlock.....	100.0	41.2	3.2	6.0	5.3	9.5	7.1	3.9	3.4	1.9	81.5	18.5
Spruce.....	100.0	26.2	1.5	7.0	8.5	10.6	11.6	6.0	3.0	2.5	76.9	23.1
All other species.....	100.0	40.0	5.1	1.3	6.0	12.3	11.1	2.1	2.5	1.3	81.7	18.3

TABLE 40.—HOLDINGS OF STANDING TIMBER ON THE PACIFIC SLOPE: DISTRIBUTION OF EACH SPECIES BY SIZE GROUPS, IN PERCENTAGES—Continued.

PACIFIC SLOPE—Continued.

California.

	Total.	Groups											
		Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	Group 11.
Total	100.0	14.2	19.8	10.0	9.7	9.8	10.1	5.5	2.3	1.6	1.4	84.4	15.6
Douglas fir	100.0	40.7	5.7	11.3	8.6	4.4	2.7	1.8	1.1	.7		77.0	23.0
Western pine	100.0	50.2	4.4	5.4	2.6	6.4	5.6	1.1	.6	1.8		73.1	21.9
Sugar pine	100.0	39.1	3.8	5.5	4.2	13.0	8.8	2.5	.4	1.7		79.0	21.0
Redwood	100.0	20.2	17.5	13.6	16.4	13.4	4.8	2.9	2.9	1.5		93.2	6.8
Cedar	100.0	23.5	8.8	11.8	11.8	5.9	8.8	2.9	.....	.....		73.5	26.5
Spruce	100.0	34.9	4.8	.....	6.3	16.7	14.3	3.2	.8	1.6		82.6	17.4
All other species	100.0	.....	.....	.....	.....	.....	.....	.....	.....	.....		.....	.....

Western Oregon.

	Total	Groups											
		Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	
Total	100.0	23.8	9.8	6.2	6.8	7.6	9.6	5.9	3.8	3.1	2.0	78.6	21.4
Douglas fir	100.0	20.0	10.8	7.0	7.8	8.4	10.2	5.8	3.7	3.1	2.0	78.8	21.2
White pine	100.0	62.7	2.8	.....	.....	.....	1.1	2.3	4.0	1.1	1.7	75.7	24.3
Western pine	100.0	59.1	2.1	.....	.....	.....	2.2	1.1	4.3	4.3	2.1	77.4	22.6
Sugar pine	100.0	33.6	6.5	6.5	3.3	6.5	6.6	4.1	3.3	6.6	2.5	79.5	20.5
Cedar	100.0	28.5	8.0	5.5	5.9	4.6	13.5	7.1	4.6	2.9	2.1	80.7	19.3
Hemlock	100.0	12.9	7.9	.....	.....	.....	7.9	9.9	8.9	13.9	5.9	71.3	28.7
Spruce	100.0	12.3	12.3	14.0	3.5	10.5	12.3	8.8	1.7	3.5	1.8	80.7	19.3
All other species	100.0	.....	.....	.....	.....	.....	.....	.....	.....	.....		.....	.....

Western Washington.

	Total	Groups											
		Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	
Total	100.0	34.4	5.5	4.4	3.0	6.4	9.4	7.4	4.7	4.6	2.5	82.3	17.7
Douglas fir	100.0	36.9	3.3	5.3	2.2	6.6	9.7	6.9	4.7	4.5	2.5	82.6	17.4
Western pine	100.0	50.0	.....	.....	.....	.....	50.0	.....	.....	.....	.....	100.0	.....
Cedar	100.0	26.1	4.7	3.8	3.3	6.9	10.4	10.2	6.6	5.8	3.3	81.1	18.9
Hemlock	100.0	30.5	15.5	1.5	6.1	5.8	6.7	7.0	3.4	3.7	1.8	82.0	18.0
Spruce	100.0	24.4	10.5	1.2	7.0	7.0	10.5	9.3	5.8	4.6	2.3	82.6	17.4
All other species	100.0	43.7	14.1	.....	1.6	1.6	6.2	6.2	1.6	4.7	1.6	81.3	18.7

Table 40 shows that on the Pacific slope the first 10 groups have, roughly, 80 per cent of every species, except redwood, of which they have 93.2 per cent.

Table 41, below, shows what percentage each species constitutes of the total holdings in each group on the Pacific slope. It will be seen that with the exception of redwood and perhaps western pine there is, broadly speaking, a general similarity in the distribution of species among the various groups. This is especially marked if comparison be made between the first 10 groups collectively and group 11. Thus 56.8 per cent of the total timber in these 10 groups is Douglas fir, as compared with 61.9 per cent for group 11. The percentages for hemlock and unenumerated species are identical in the two cases.

This general similarity is due to the fact already noted that the various species generally are intermingled by nature throughout this area. In the case of redwood, however, the stand is compact and fairly homogeneous. This valuable species, it will be seen, represents 13.5 per cent of all the timber in the first 10 groups and only 4.3 per cent of that in group 11.

TABLE 41.—HOLDINGS OF STANDING TIMBER ON THE PACIFIC SLOPE: DISTRIBUTION OF THE TIMBER IN EACH SIZE GROUP, BY SPECIES, IN PERCENTAGES.

[Percentages computed from Table 39. See note at head of Table 39.]

PACIFIC SLOPE.

Total.

	Group										Group 11.	
	Total.	1.	2.	3.	4.	5.	6.	7.	8.	9.		10.
Total.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Douglas fir.....	57.8	57.0	53.4	54.2	57.0	56.7	54.8	61.5	63.9	59.9	56.8	61.9
White pine.....	(1)		13.7	4.6	5.9	2.3	5.0	7.0	4.4	2.2	7.6	8.7
Western pine.....			3.8	1.5	2.3	1.8	3.8	4.6	3.2	1.1	3.5	3.7
Sugar pine.....			11.8	6.7	30.5	24.9	24.5	16.4	9.0	9.5	10.7	13.5
Redwood.....			6.0	4.3	3.6	5.4	5.7	8.3	9.1	10.7	8.7	5.9
Cedar.....			6.5	7.5	3.1	6.1	4.4	6.4	7.3	6.9	7.0	6.4
Hemlock.....			2.3	.5	2.5	2.5	2.5	4.2	3.8	2.2	2.9	2.2
Spruce.....			2.7	3.0	2.1	.6	2.1	3.5	4.8	1.6	2.2	1.7
All other species.....												

California.

	Group										Group 11.	
	Total.	1.	2.	3.	4.	5.	6.	7.	8.	9.		10.
Total.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Douglas fir.....	18.2	21.9	10.4	21.3	16.0	8.0	8.8	14.3	12.5	8.6	16.6	26.8
Western pine.....	24.6	36.5	10.9	13.7	6.6	15.6	24.8	12.5	10.0	31.4	22.8	34.5
Sugar pine.....	9.6	11.0	3.6	5.4	4.1	12.4	15.3	10.7	2.5	11.4	9.0	12.9
Redwood.....	41.1	24.5	71.5	57.9	68.4	54.8	35.8	53.6	72.5	42.9	45.4	17.8
Cedar.....	1.4	.9	1.2	1.7	1.6	.8	2.2	1.8	.....	.....	1.2	2.3
Spruce.....	.5	.1	.8	.....	.4	1.2	.7	1.8	.....	2.8	.5	.5
All other species.....	4.6	5.1	1.6	.....	2.9	7.2	12.4	5.3	2.5	2.9	4.5	5.2

Western Oregon.

	Group										Group 11.	
	Total.	1.	2.	3.	4.	5.	6.	7.	8.	9.		10.
Total.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Douglas fir.....	77.4	65.0	85.6	86.5	88.2	86.0	82.3	76.3	75.2	78.5	77.1	76.6
White pine.....	.1										(1)	.1
Western pine.....	5.0	13.4	1.5	.....	.....	.6	1.9	5.3	1.9	2.9	4.9	5.6
Sugar pine.....	2.7	6.6	.6	.....	.....	.7	3.2	3.0	1.9	2.9	2.6	2.8
Cedar.....	3.5	5.0	2.3	3.7	1.7	3.0	2.4	3.0	7.5	4.3	3.6	3.3
Hemlock.....	6.8	7.6	5.6	6.0	5.9	4.2	9.6	8.2	8.3	6.5	7.1	7.0
Spruce.....	2.9	1.6	2.3	.....	3.4	3.8	2.7	6.8	4.5	1.8	2.9	2.6
All other species.....	1.6	.8	2.1	3.7	.8	2.3	2.1	2.4	.7	1.9	1.4	1.5

¹ Less than one-tenth of 1 per cent.

TABLE 41.—HOLDINGS OF STANDING TIMBER ON THE PACIFIC SLOPE: DISTRIBUTION OF THE TIMBER IN EACH SIZE GROUP, BY SPECIES, IN PERCENTAGES—Contd.

PACIFIC SLOPE—Continued.

Western Washington.

	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	Group 11.
Total.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Douglas fir.....	68.8	73.7	41.9	83.1	51.9	70.7	71.0	64.0	68.0	67.8	68.7	69.0	67.7
Western pine.....	.1	.1	.....	.....	.....	.....	.4	.....	.....	.....	.....	.1	.....
Cedar.....	13.4	10.2	11.5	11.9	14.8	14.4	14.9	18.5	18.7	16.9	17.9	13.3	14.4
Hemlock.....	12.1	10.7	34.4	4.2	24.7	10.9	8.6	11.5	8.6	9.7	8.9	12.1	12.3
Spruce.....	3.2	2.3	6.1	.8	7.4	3.4	3.5	4.0	3.9	3.2	3.0	3.2	3.1
All other species.....	2.4	3.0	6.1	1.2	.6	1.6	2.0	.8	2.4	1.5	2.3	2.5

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CHAPTER IV.

ACREAGE OF TIMBER HOLDINGS.

Section 1. Acreage of holdings, classified by size in investigation area. This chapter presents data on the acreage of land involved in the timber holdings classified in the preceding chapter.

As will be noted from question 9 of the timber schedule (see p. 276), the information obtained regarding acreage relates primarily to the timber holdings. Special emphasis was laid upon the acreage of land now bearing merchantable saw timber. The owners were asked to make a separate statement of other land, but a great many did not report it at all. Again, vast areas of nontimbered land are owned by corporations controlled by the same interests that control timber corporations; but no reports were obtained from such land-owning corporations. Furthermore, in other cases the timber owners are known to own land outside the timbered parts of the States in the investigation area (for instance, the great Southern Pacific land holding in southern California); but in the few cases where such land was reported it is not included in the tables. For these three reasons, large amounts of land owned by the timber holders of the investigation area are not shown in the tables of this section.

Table 42 shows the acreage reported in the investigation area as bearing merchantable saw timber, classified according to the groups used in Table 20; that is to say, in this and similar tables in this chapter holdings of timberland are not grouped in the order of their acreage, but in accordance with the size of the holding of timber. In other words, the grouping of the acreage of a given holder is determined by the amount of his timber and not by his acreage. The acreages here given by groups correspond, therefore, to the groups of timber in the companion timber tables preceding. The order of land holdings as such would be considerably different. A discussion of concentration of land holdings will be taken up in Part II.

In many cases, especially in lumbering sections, it was impossible to separate timbered acreage from that of open, cut-over, and young timber land. The nontimbered and young timber land was distinguished from the timbered land wherever the information could be obtained (see Table 43), but in the records of many holders the separation is not made. In the lumbering sections there are, therefore,

considerable acreages of cut-over and young timber land included in Table 42, and in some other cases considerable acreages of open land. This is especially the case in the Upper Peninsula of Michigan, where some enormous land holdings were reported without division between timbered and cut-over land, although the amount of timber owned was comparatively small.

TABLE 42.—ACREAGE OF TIMBER HOLDINGS AS GROUPED IN TABLE 20, FOR THE INVESTIGATION AREA.

[In thousands of acres. Thus, 154,130=154,130,000 acres. This table shows the acreage bearing the timber as classified in Tables 20 and 26—i. e., according to the size of timber holdings in the investigation area. The figures here given include both timber acreage owned in fee and timber rights. See page 162 for further qualification as to the use of these figures. The entries in italics show the number of holders in each group for the investigation area.]

	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	Group 11.
Total.	3	5	14	29	42	105	199	273	489	655	1,892	
Investigation area.	154,130	8,763,213	5,101,632	1,140,111,440	11,270,948	6,87679,062	75,038					
Pacific-Northwest.....	31,620	8,725,260	2,911,153	1,006,184	1,422	925	829	552	21,895	9,735		
California.....	7,386	1,439,112	329	656	268	463	314	114	92	120	5,449	1,937
Oregon.....	10,066	2,288	516	648	445	394	821	507	320	284	198	6,421
Washington.....	8,501	3,018	288	223	242	303	439	402	307	395	165	5,902
Idaho.....	2,571	327	130	688	42	87	91	103	105	88	14	1,645
Montana.....	3,006	1,153	21,023	146	14	.....	6	79	.....	25	2,448	558
Southern Pine Region.....	104,725	.....	2,190,294	6,730,642	7,666	8,510,691	5,207	46,615	38,110			
Missouri (part).....	2,447	.....	.....	166	298	.....	102	414	118	1,244	1,203	
Arkansas.....	13,905	.....	337	573	550	999	1,021	774	596	4,950	8,955	
Texas.....	9,336	.....	1,207	315	432	117	598	569	385	327	4,150	5,186
Louisiana.....	12,476	.....	260	1,269	1,112	1,296	817	1,049	871	633	7,307	5,169
Mississippi.....	12,063	.....	579	259	619	797	501	908	573	483	4,719	7,344
Alabama.....	10,879	.....	1	92	122	480	1,165	618	675	484	3,637	7,242
Florida.....	17,659	.....	134	792,346	2,219	2,394	2,448	2,029	1,384	13,030	4,629	
Georgia (part).....	11,130	.....	.....	415	298	30	954	432	546	2,695	8,435	
South Carolina (part).....	4,847	.....	9	432	38	461	309	247	258	1,754	3,063	
North Carolina (part).....	7,466	.....	565	34	389	449	493	463	281	2,674	4,792	
Virginia (part).....	2,517	.....	25	179	60	16	39	97	455	2,062		
Lake States.....	17,785	38	79	1,849	448	1,444	2,052	1,835	1,750	1,117	10,612	7,173
Michigan.....	8,315	.....	20	1,194	182	692	1,171	1,081	856	675	5,871	2,444
Wisconsin.....	4,686	.....	77	264	262	593	665	750	334	2,345	1,741	
Minnesota.....	4,784	38	59	578	2	490	288	89	144	108	1,706	2,988

Table 42 includes both the acreage owned in fee and the acreage on which only the timber rights—i. e., the right to remove the timber within a certain number of years—are owned. In the Pacific-Northwest the amount of timber rights is negligible, and the figures given may be taken as showing ownership in fee. Only comparatively small acreages are owned as timber rights in the Lake States. In the Southern Pine Region, however, large areas are owned as timber rights, a few of the principal holdings being largely of this character. Some of the reports obtained do not distinguish the land so controlled, and it is therefore impossible to make a complete and accurate separation. In a great many cases the fee to this land is owned by other large landowning corporations.

Table 42 shows the acreage bearing the timber as grouped in Tables 20 and 26. Thus, Table 20 shows that 12 holders, each having from 5 to 13 billion feet in the investigation area, own 97.4 billion feet in the Pacific-Northwest, distributed as follows: California, 24.9; Oregon, 33.3; Washington, 11.8; Idaho, 19.1; and Montana, 8.3 billion feet. Table 42 shows that this timber stands on 2,911,000 acres, distributed as follows: California, 329,000; Oregon, 648,000; Washington, 223,000; Idaho, 688,000; and Montana, 1,023,000 acres.

Table 43 shows additional land owned in fee by some of the holders whose timberland is given in Table 42. This additional land is excluded from Table 42 because definitely reported as cut-over or as bearing young timber or as nontimbered. In both tables the holdings are grouped by number of feet of merchantable saw timber; that is, in each of Tables 20, 26, 42, and 43 a holder appears in the same group (determined by the amount of timber he owns).

A large part of the additional land in Table 43 bears young timber not yet merchantable, and most of the rest is of the same character as the timber-bearing land in the same holdings. The table is therefore of value in a consideration of the future supply of timber. As already pointed out, this table is not a full statement of the additional land of this kind owned by timber holders in the timbered parts of the investigation area, and of course it excludes great tracts owned elsewhere. (See p. 162.)

TABLE 43.—ACREAGE OF LAND BEARING YOUNG TIMBER AND OF NONTIMBERED LAND OWNED IN CONNECTION WITH THE TIMBER HOLDINGS AS GROUPED IN TABLE 20.

[In thousands of acres. Thus, 10,652=10,652,000 acres. This table includes only the additional lands owned in fee. As explained on p. 162, it does not include all additional land of this character thus owned.]

Investigation area.....	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.
Pacific-Northwest.....	772	61	353	622	1,871	1,959	1,136	1,615	1,228	1,035	10,652
California.....	772	31	352	35	68	117	121	87	52	52	1,087
Oregon.....	882	10	58	4	15	46	92	35	5	28	675
Washington.....	184	8	77	13	12	37	12	20	12	8	383
Idaho.....	137	13	61	16	41	34	17	31	34	14	398
Montana.....	69		52					1	1	2	124
			104	2				1			107
Southern Pine Region.....			1	158	1,438	1,251	654	1,269	719	751	6,441
Missouri (part).....						1	10		8	24	43
Arkansas.....				14	53	27	89	128	41	81	433
Texas.....			29	85			74	69	30	21	308
Louisiana.....			67	311	102		90	86	147	73	726
Mississippi.....			17	15	12		24	28	43	37	159
Alabama.....					22		52	230	48	43	435
Florida.....			31	1,232	1,079		177	665	372	354	3,960
Georgia (part).....								47	15	98	160
South Carolina (part).....			1			7	61	31	15	17	132
North Carolina (part).....							77	5			82
Virginia (part).....										3	3
Lake States.....		30		429	165	591	361	259	457	232	2,324
Michigan.....		30		390	66	131	204	109	201	65	1,556
Wisconsin.....					99	180	105	30	144	165	732
Minnesota.....				39		271	52	60	112	2	536

The three greatest timber owners—the Southern Pacific, the Weyerhaeuser Timber Company, and the Northern Pacific (group 1)—own 8,725,000 acres of timberland and 772,000 acres of additional land in the timbered parts of the Pacific-Northwest. This acreage of these three holders is shown below by States. (See p. 167 for the total land holdings of the Southern Pacific and Northern Pacific.)

TABLE 44.—NUMBER OF ACRES OF LAND OWNED BY THE SOUTHERN PACIFIC, WEYERHAESUSER TIMBER, AND NORTHERN PACIFIC COMPANIES, IN THE TIMBERED PARTS OF THE PACIFIC-NORTHWEST.

[In thousands of acres. Thus, 9,497 = 9,497,000 acres.]

	Total.	Southern Pacific.	Weyerhaeuser Timber.	Northern Pacific.
Pacific-Northwest.....	9,497	4,393	1,945	3,159
California.....	2,321	2,314	7	.....
Oregon.....	2,472	2,079	393	.....
Washington.....	3,155	.....	1,542	1,613
Idaho.....	396	.....	3	393
Montana.....	1,153	.....	.....	1,153

Maps of southwestern Washington, western Oregon, and northern California, to be presented in another Part, will show how completely these three great companies dominate the land in great areas of the country from Seattle to Sacramento. The importance of these holdings results only in part from the enormous value of their timber. Portions of them are very fertile, and will be valuable as agricultural land when the timber is cut and the stumps removed. Some of this land is similar to the present farming and orchard regions west of the Cascades. The ownership of this land, together with that of the railroad facilities, gives the interests in question a powerful influence on economic conditions in that part of the country.

The Amalgamated Copper Company owns over 1 million acres of timberland and more than 100,000 acres of nontimbered land, all in Montana, and Thomas B. Walker owns about 760,000 acres in California. Excluding Mr. Walker's holding in California, the four other holders in group 2 own 1,310,000 acres of timbered land in the Pacific-Northwest. Excluding the Amalgamated Copper Company, the 11 other holders in group 3 own 1,885,000 acres of timbered land in the Pacific-Northwest. The 20 holders in groups 1, 2, and 3 own 13,696,000 acres of timbered land in the Pacific-Northwest, and in addition to this they own 1,155,000 acres of nontimbered land.

The timberland owned or controlled by the 1,802 timber owners of groups 1 to 10, each of whom has at least 60 million feet of timber, together with the additional land which they own in the timbered parts of the investigation area, amounts to 89,744,000 acres.

Certain counties in the States of the Pacific-Northwest were not covered by the detailed inquiries of the Bureau, because they were

known to have no merchantable timber. No land in such counties is included in Tables 42 and 43; and the amount of land held there by timber owners, particularly by the Southern Pacific in southern California and by the Northern Pacific in eastern Montana and eastern Washington, is very large. The tables include no Southern Pacific land in California south of Eldorado County; that is, south of about the latitude of Sacramento. In Montana they include only so much Northern Pacific land as lies in the extreme west of the State, and they omit the Northern Pacific land in several nontimbered counties of eastern Washington. The Northern Pacific still has nearly 10 million acres in all, and the Southern Pacific nearly 14 million, or, with the Union Pacific (which controls the Southern Pacific), nearly 15 million. (See Table 44 for the acreage of these two holders included in the tables of this chapter.)

After the enormous sales to such companies as the Weyerhaeuser Timber Company and the Amalgamated Copper Company, and after sales of other vast quantities to smaller purchasers, the land still held by the Northern Pacific, together with that of the Southern Pacific and the 9,700,000 acres of the Atchison, Topeka & Santa Fe, makes the present timbered and nontimbered holdings of these three railroads over 33,500,000 acres, an area as large as England.

ACREAGE OF TIMBER HOLDINGS, BY STATES.—Florida is by no means the largest State in the investigation area, being surpassed by Georgia, Minnesota, and Michigan, as well as by Texas and all the States of the Pacific-Northwest; but the timbered acreage in Florida is the largest—17,659,000 acres. Then follow Arkansas, with 13,905,000; Louisiana, 12,476,000; Mississippi, 12,063,000; Georgia (part), 11,130,000; Alabama, 10,879,000; and Oregon, 10,066,000. If the whole of Georgia had been covered by the Bureau's investigations, it would probably have shown between 12,000,000 and 13,000,000 acres; the total area, timbered and nontimbered, of the counties not covered, is 5,602 square miles, or 3,585,280 acres.

In respect to the acreage of timber controlled by the larger timber owners the order of the States is different; most of the southern States standing relatively lower and those of the Pacific-Northwest higher. Florida is again first, however, with 13,030,000 acres of timber in the hands of owners above 60,000,000 feet. Louisiana is second, with 7,307,000 acres, and no other State shows half so much as Florida. Next in order are Oregon, Washington, Michigan, and California, though none of these is among the first six States in total timbered areas.

The preponderance of Florida lies in groups 5 to 10, ranging from 3½ billion feet down to 60 million per holder. No other State contains even half so much timberland in any one of these groups, except Louisiana in group 6, and here the proportion is little more than half. In Florida there are no holdings in groups 1 and 2, and in groups 3 and 4 the acreage is comparatively small.

Section 2. Approximate average stand per acre.

Table 45 shows the approximate average stand per acre of the timber owned in each group, as computed from Tables 20 and 42.

TABLE 45.—APPROXIMATE AVERAGE STAND PER ACRE OF TIMBER HOLDINGS AS GROUPED IN TABLE 20, FOR THE INVESTIGATION AREA.

[In thousands of board feet per acre. Thus, 11.3=11,300 feet per acre. This table is to be read in connection with Table 20, the entries here given being obtained by dividing a given entry in Table 20 by a corresponding entry in Table 42. Owing to the fact that in the acreage there is some land bearing young timber and some nontimbered land, these averages must be read broadly. See p. 162 for further qualification as to the use of these figures.]

	Total.	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	Group 11.
Investigation area.....	11.3	27.2	47.7	23.4	18.2	14.0	15.4	11.9	8.6	8.9	8.1	15.3	7.2
Pacific-Northwest..	32.0	27.2	49.2	33.5	46.4	58.9	50.7	41.6	37.1	35.4	33.2	36.9	21.1
California.....	33.6	18.2	43.6	75.7	41.9	71.1	57.0	39.5	45.6	45.7	27.6	38.4	20.0
Oregon.....	39.5	39.0	67.1	51.4	60.0	61.9	48.6	46.0	42.8	44.7	38.4	47.6	25.4
Washington.....	34.3	33.8	51.4	52.9	58.3	55.4	52.2	44.3	40.1	34.9	34.9	40.2	21.3
Idaho.....	19.6	13.8	23.1	27.8	23.8	23.0	29.7	15.5	21.9	19.0	21.4	22.9	13.8
Montana.....	7.3	5.6	8.1	11.6	14.3	.....	.....	16.7	10.1	.....	12.0	7.3	7.0
Southern Pine Region.....	6.1	.....	.....	10.1	11.1	7.1	7.8	7.7	6.0	6.1	6.0	7.2	5.1
Missouri (part).....	4.0	.....	.....	.....	.....	1.8	5.8	7.2	3.9	2.2	5.9	4.2	3.9
Arkansas.....	5.7	.....	.....	8.6	5.2	11.1	8.3	7.6	6.7	6.7	6.9	7.7	4.6
Texas.....	7.1	.....	.....	9.3	11.4	9.5	5.1	8.2	7.4	8.6	8.3	8.8	5.7
Louisiana.....	9.6	.....	.....	14.2	12.0	13.3	12.2	14.0	9.0	8.6	7.9	11.3	7.2
Mississippi.....	7.9	.....	.....	11.2	16.6	12.8	9.7	9.2	7.9	9.6	8.5	10.1	6.5
Alabama.....	5.2	.....	.....	10.9	10.9	7.4	5.4	6.4	5.8	5.6	5.0	6.0	4.8
Florida.....	4.2	.....	.....	4.5	8.9	3.2	5.4	5.7	4.1	4.1	4.0	4.5	3.4
Georgia (part).....	4.1	.....	.....	.....	.....	5.3	3.7	6.7	3.4	4.2	4.2	4.0	4.2
South Carolina (part).....	0.3	.....	.....	11.1	.....	7.6	10.5	6.7	6.5	8.9	8.1	7.5	5.7
North Carolina (part).....	5.7	.....	.....	8.7	8.8	6.2	6.5	6.5	6.5	6.5	6.0	6.9	5.1
Virginia (part).....	5.8	.....	.....	4.0	7.3	6.7	137.5	7.7	7.7	7.7	7.2	8.1	5.2
Lake States.....	5.6	.....	7.6	.....	6.3	8.3	4.9	7.1	5.9	6.3	5.2	6.1	4.9
Michigan.....	5.7	10.0	.....	5.0	8.8	4.9	5.5	4.6	6.8	4.1	5.3	6.7	6.7
Wisconsin.....	6.2	.....	.....	7.8	8.0	7.6	9.9	7.2	5.9	6.6	7.5	4.1	4.1
Minnesota.....	4.8	.....	6.8	.....	8.7	.....	3.5	7.6	11.2	5.6	7.4	6.6	3.8

1 See note on p. 170.

The average stands in the above table must be read very broadly, and must not be regarded as in any way precise. As stated on page 163, the acreages in Table 42 include some cut-over and some nontimbered land, which could not be excluded on the basis of the information reported to the Bureau. The averages here given, therefore, are not exact averages for the timbered acreage. The effect of the error is, of course, to understate the average. Again, on the Pacific coast there is a very wide range from tract to tract, varying from enormous stands per acre to the light stands along forest borders.

For this reason, therefore, the averages here given, aside from being only approximate, do not represent the average stands in the forest areas containing the bulk of the timber supply. It may be noted in particular that the great stands of Douglas fir in Washington and Oregon and of redwood in California are averaged with comparatively low stands east of the Cascades and of the Coast Range. Averages for selected forest areas would be very much greater than the averages here given. Thus, in the Douglas fir region of the Pacific-Northwest average stands of over 75,000 feet per acre over large areas are frequent, and in California stands of redwood of over 100,000 feet per acre are usual.

The average for all timbered land in the investigation area is 11,300 feet per acre. In the Pacific-Northwest the average is 32,000 feet per acre; Southern Pine Region, 6,100; and Lake States, 5,600. No State in the Lake States or the South averages so much as 10,000. Louisiana ranks considerably above any other State in these regions, with 9,600 feet per acre. This average is largely due to heavy stands of cypress and longleaf pine. Mississippi and Texas, which also have large areas of fine virgin longleaf pine, come next, with averages of 7,900 and 7,100. The only others so high as 6,000 are South Carolina, with 6,300, and Wisconsin, with 6,200. Missouri stands lowest, with 4,000. The next lowest is Georgia, whose great forests of longleaf, depleted by many years of lumbering, have been only scantily replaced and whose average stand appears as 4,100 feet per acre.

The only State of the Pacific-Northwest whose average stand is not very much above these is Montana; and even Montana shows 7,300 feet per acre, which surpasses all the Lake States and all States of the Southern Pine Region except Louisiana and Mississippi. In Idaho the average is 19,600; California, 33,600; Washington, 34,300; and Oregon, 39,500.

It is the large holdings that have the high stands. In the Lake States the average stand reported for holdings of 60 million feet and over is about one-fourth greater than for holdings below that size; Southern Pine Region, two-fifths greater; and Pacific-Northwest, three-fourths greater. In California, Oregon, and Washington the average for such large holdings is nearly twice as great as for those under 60 million feet.

Even among the holdings above 60 million feet the smallest holdings have the least timber per acre. The average in the Lake States is 5,200 feet for group 10, embracing holdings of from 60 million to 125 million feet, while for all the higher groups together it is 6,200, this last average being an understatement, owing to the inclusion of cut-over land. (See p. 163.) In the Southern Pine Region the average for groups 8, 9, and 10, ranging from 500 million down to 60 million feet per holder, is 6,000, while it is 8,100 for the higher groups together,

and in the holdings of more than 3½ billion feet each it rises above 10,000. In the Pacific-Northwest the average for group 10 is 33,200 feet; for all the higher groups together, excluding the two great railroad holdings, it is 47,000.

Table 45 shows only one conspicuous exception to the rule that the high stands per acre are in possession of the big holders.¹ This exception is group 1 in the Pacific-Northwest, where the average is below those of all the lower groups in the same region down to the 60-million line. This is due to the two great railroad holdings. The other large holdings have been selected for timber and include in great part the best timber in their respective territories. The railroad land, acquired by Federal grant, consisted chiefly of alternate sections, and thus ran about like the average of the localities traversed. In the case of the Northern Pacific, the present holding is a residuum from which the best timber has been selected by the Weyerhaeuser Timber Company and others. The average stand of the Weyerhaeuser Timber Company is nearly 50,000 feet per acre; that of the remaining Northern Pacific timberland is 11,500.

Section 3. Acreage of holdings, classified by size in each State.

Tables 46 and 47 present data on land holdings of timber owners according to the size of the timber holding in each State. In other words, they occupy the same relation toward Table 33 that Tables 42 and 43 do toward Table 20. The number of holdings in Table 46 is shown in Table 48.

¹ One other exception appears in group 7 in Virginia. It happens that no Virginia timber falls in this group except certain tracts of second-growth pine which have attained an extraordinary density. The average shown in this instance must not be taken as in any way representing normal conditions.

TABLE 46.—ACREAGE OF TIMBER HOLDINGS AS GROUPED IN TABLE 33, FOR EACH STATE SEPARATELY.

[In thousands of acres. Thus, 7,386=7,386,000 acres. This table shows the acreage bearing the timber as classified in Table 33, i. e., according to the size of the timber holdings in the particular State. The figures here given include both timber acreage owned in fee and timber rights. See p. 162 for further qualification as to the use of these figures.]

	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.	Group 11.
Total.												
Pacific-Northwest:												
California.....	7,386	1,939	567	784	300	374	467	134	103	139	5,449	1,937
Oregon.....	10,066	2,288	248	356	401	746	757	346	308	230	6,421	3,645
Washington.....	8,591	3,018	414	69	403	439	470	414	431	244	5,922	2,689
Idaho.....	2,571	327	676	.....	128	114	164	127	75	34	1,645	926
Montana.....	3,006	1,153	1,023	.....	113	.....	.....	113	14	32	2,448	538
Southern Pine Region:												
Missouri (part).....	2,447	.....	.....	.....	.....	.....	321	381	413	129	1,244	1,203
Arkansas.....	13,905	.....	.....	.....	571	791	976	1,012	843	757	4,950	8,955
Texas.....	9,336	.....	1,060	.....	414	470	768	502	470	376	4,150	5,186
Louisiana.....	12,476	.....	.....	726	1,768	1,209	738	1,048	934	823	7,307	5,169
Mississippi.....	12,063	.....	.....	624	719	583	536	960	655	636	4,719	7,344
Alabama.....	10,879	.....	.....	.....	.....	96	1,207	1,021	706	607	3,637	7,242
Florida.....	17,659	.....	.....	.....	1,911	2,612	2,352	2,476	2,118	1,561	13,030	4,659
Georgia (part).....	11,130	.....	.....	.....	384	297	.....	837	440	737	2,685	8,435
South Carolina (part).....	4,847	.....	.....	.....	391	.....	346	379	271	367	1,754	3,083
North Carolina (part).....	7,466	.....	.....	565	.....	170	584	448	580	327	2,674	4,792
Virginia (part).....	2,517	.....	.....	.....	.....	179	16	98	29	133	455	2,062
Lake States:												
Michigan.....	8,315	.....	.....	1,134	.....	60	1,350	1,440	973	908	5,871	2,444
Wisconsin.....	4,686	.....	.....	.....	.....	90	641	808	882	464	2,945	1,741
Minnesota.....	4,784	38	.....	387	.....	191	697	108	180	195	1,796	2,988

TABLE 47.—ACREAGE OF LAND BEARING YOUNG TIMBER AND OF NONTIMBERED LAND OWNED IN CONNECTION WITH THE TIMBER HOLDINGS AS GROUPED IN TABLE 33.

[In thousands of acres. Thus, 382 = 382,000 acres. This table includes only the additional land owned in fee. As explained on p. 162, it does not include all additional land of this character thus owned.]

	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.
Pacific-Northwest:											
California.....	382		68	4	15	30	103	35	6	32	675
Oregon.....	184	1	72	13	6	43	20	11	22	11	383
Washington.....	137		40	15	66	29	19	42	35	15	398
Idaho.....	69		50						1	4	124
Montana.....	104							2		1	107
Southern Pine Region:											
Missouri (part).....							12		8	23	43
Arkansas.....						26	81	161	58	107	433
Texas.....					40	45	74	98	30	21	308
Louisiana.....			25	208	102	134	34	132	91	726	
Mississippi.....				16	5	5	28	24	42	44	159
Alabama.....					24	33	99	201	78	435	
Florida.....				1,183	1,147	132	772	371	355	3,960	
Georgia (part).....								11	15	134	160
South Carolina (part)							60	26	20	26	132
North Carolina (part)							74	3	5		82
Virginia (part).....										3	3
Lake States:											
Michigan.....		381				9	203	277	272	114	1,256
Wisconsin.....							103	152	259	218	732
Minnesota.....						39	270	112		115	536

TABLE 46.—NUMBER OF HOLDINGS IN EACH GROUP SHOWN IN TABLE 46.

	Group 1.	Group 2.	Group 3.	Group 4.	Group 5.	Group 6.	Group 7.	Group 8.	Group 9.	Group 10.	Groups 1-10.
Pacific-Northwest:											
California.....	1	1	5	7	9	16	23	20	28	40	150
Oregon.....	2	1	4	6	9	29	43	40	69	111	314
Washington.....	2	2	1	8	19	34	46	84	99	295	
Idaho.....	1	2	2	1	2	4	9	8	9	36	
Montana.....	1	1	1	1	1	1	3	1	5	12	
Southern Pine Region:											
Missouri (part).....							3	4	5	9	21
Arkansas.....				1	6	13	21	35	58	134	
Texas.....		1	2	3	9	12	21	33	81		
Louisiana.....			2	5	10	17	28	50	74	189	
Mississippi.....			2	4	4	7	24	36	59	136	
Alabama.....					1	12	16	23	37	89	
Florida.....				2	9	19	33	52	67	182	
Georgia (part).....				1	1	1	9	12	31	54	
South Carolina (part).....				1	1	4	8	14	32	59	
North Carolina (part).....		1	1	1	6	9	21	25	63		
Virginia (part).....				1	1	1	2	2	9	15	
Lake States:											
Michigan.....			1	1	10	21	36	41	110		
Wisconsin.....			1	1	9	18	34	34	96		
Minnesota.....			1	1	4	4	8	14	32		

Tables 46 and 47 above have the same general meaning as Tables 42 and 43. They are presented chiefly for use in connection with Table 33 by those interested in a particular State. Thus, Table 33 shows that the 16 holders in group 6 own 22.5 billion feet of timber in California. Table 46 shows that this timber stands on 374,000 acres, and Table 47 shows that some of these 16 holders own 30,000 acres of additional land in the timbered parts of the State.

The land-grant railroads and the Weyerhaeuser Timber Company are, of course, the greatest landowners in the investigation area; but if these be disregarded Florida appears again in Tables 46 and 47 as preeminently the State of great land holdings. The two largest timber owners hold the timber on 1,911,000 acres, and they own 1,183,000 acres of cut-over or of nontimbered land besides.

CHAPTER V.

VALUE OF STANDING TIMBER.

Section 1. Purpose and limitations of this discussion.

The existing widespread speculative holding of timber lands has been referred to. The fact has been pointed out that such holders add little or no improvement to such timber and that their public services rendered therein are practically negligible in comparison with the great profits received from the rise in timber prices.

It is desirable, therefore, to indicate concretely and in some detail this rise in price that has taken place during the period of concentration, and thus to give some suggestion of the profits which have thereby accrued to the private holders of timber.

The value of timber varies so extremely, according to location, species, quality, and stand, that it is impossible to measure accurately the average amount of the advance. For the purpose of this report it is not necessary so to measure it. The comparative figures hereafter given are not intended to represent the absolute values of any kind of timber or to establish in any sense a timber price. The danger of using any of the following figures to establish an absolute price can be best illustrated by a single example. In Washington a lumber company paid about \$3.25 per thousand in 1906 for a certain piece of timber. But this same company refused in the spring of 1909 to pay more than 22 cents a thousand for another piece in the same township, of similar timber but less favorably situated for logging. This shows the danger of using these figures for any other purpose than that for which they are here given. That purpose is simply to demonstrate a movement of price, rather than the absolute price of any class of timber, and for that purpose they are conclusive.

The present chapter discusses the causes which determine the value of standing timber, the rate at which timber values have risen, the probable future increase, and the degree in which private owners have profited by the advance.

As population increases, demand increases for a natural resource like timber, and at the same time the supply of such a limited resource diminishes. This increase of demand, with decrease of supply, results wholly to the advantage of those who have secured control of the natural resource. The power of the great timber owners increases,

not only as the timber passes more and more into their hands, but also as its value rises.

No attempt has been made by the Bureau to estimate closely the total value of the standing timber in the investigation area, or the value of any holding or group of holdings. Such an estimate, if it could be accurately made, would indicate the present pecuniary importance of this natural resource, and of such parts of it as have been placed in particular hands. Its present pecuniary importance is a poor measure, however, of its actual significance to the commonwealth. By the pecuniary measure, the forests of Washington and Oregon had little importance 25 years ago, and even now the part they are to play can be judged better from their contents than from their price. Their price is low as yet, partly because the freight rates to the great markets are so high; but they will sooner or later play an overwhelmingly important rôle in the lumber markets, and their importance will in all reasonable probability be attested by an enormously increased price.

This is the evident opinion of men who are accumulating great estates in timber. Such estates are acquired or held only for the profit of holding them, and it is certain that their owners expect the future advance to cover the interest on their present value, as well as taxes and other carrying charges.

Section 2. Causes which determine the value of standing timber.

The value of standing timber depends ultimately upon—

1. The market value of the lumber which can be manufactured from it.
 2. The cost of logging, manufacturing, and getting to market.
- This does not mean that the value of standing timber can be estimated by subtracting these costs from the market value of lumber. Interest and other factors keep the price of stumpage normally below the margin obtained by such a reckoning. But this margin is the basis of all stumpage value. Speaking broadly, stumpage value does not arise till lumber can be sold for more than the cost of converting trees into lumber; and the margin between that cost and the price of lumber determines a limit beyond which stumpage value can not permanently go.

It is true that during a temporary depression in the lumber market the current value of standing timber may possibly be greater than the current margin between lumber values and costs of production; that is, timber owners in general may hold their timber at a higher price than can at the moment be realized by manufacturing it. For a short time the market may possibly be supplied by timber-owning mills which are forced to sell in order to pay debts, or which prefer to keep running to maintain their organization and their place in the

market, even though they get less thereby for their standing timber than they consider it worth, and less than they could probably realize by postponing cutting.

Omitting the purely personal matter of bargaining, the factors which determine the relative value of any lot of standing timber may be classified as follows: Species; quality; logging conditions; accessibility to mills; accessibility to market; size of holding; size, ownership, and topographic relation of neighboring holdings.

Species and quality are the most obvious factors in making one lot of timber worth more than another. Other things being equal, a white-pine tree may be worth ten times as much as a tupelo tree which would make the same amount of lumber. Tupelo lumber is worth little more than the cost of logging and manufacturing, while white-pine lumber, if the timber is of fair quality, is worth much more. But a particular white-pine tree may, of course, be so poor that it is not worth cutting.

Species and quality affect chiefly the value of the product, but they have an effect also on costs. The softer woods are easier to manufacture than the harder, and large and perfect timber is manufactured at less cost per unit of product than small and defective timber.

Other factors which affect the value of standing timber only on the side of cost, are logging conditions, accessibility to mill and market, size of holding, and relation to neighboring holdings.

Logging conditions include the density of the stand, the character of the ground, and the natural facilities for transportation. Other things being equal, a tract which bears 10,000 feet to the acre can be logged for less per thousand than one which bears 2,500. The timber in a cypress swamp, where no road can be built unless on piles, is worth less than if it stood on solid ground. Timber which must be hauled out over mountain roads is worth less, as it stands, than it would be if it stood upon a plain. Timber which can be rolled into a stream and floated to a mill is worth more than it would be if it had to be hauled the same distance by wagon or by rail.

Accessibility to mills and accessibility to markets depend partly on conditions of transportation and partly on growth and location of the markets themselves in accordance with the growth of population and industrial progress.

It is not obvious, till one has considered the special conditions of the industry, how the size of a holding can greatly affect its value per unit, nor how its value can be greatly affected by the ownership of neighboring timber.

It is physically possible to manufacture lumber wherever a portable sawmill can be erected. It is economically possible, in many places, to set up a portable mill and cut an isolated tract of a few acres.

But such manufacture is relatively expensive. A larger mill, with better equipment, would saw the same logs more cheaply, and with less waste and consequently with a greater product; its cost per unit of product would be lower. But a large mill will be built only when the owners are sure of timber enough to keep it occupied for some years. In a few places, as on Puget Sound, there is a large trade in logs, and a mill can rely for its supply upon the open market. In most parts of the country, however, there is no considerable offering of logs, and a mill can not depend on a supply except by securing the timber on the stump.

If a man has a timber holding of such size and such situation that the erection of a large mill to cut it is economically justified, and if he is not under financial pressure, his position is one of independence. He can build a mill himself, or he can deal on equal terms with buyers. The result is that, if he chooses to sell, he can get a price pretty definitely related to the anticipated margin between price of lumber and cost of converting trees into lumber.

The small owner is not, in the same sense, independent. His holding does not justify the building of a mill. If he gets anything for his timber, he must sell it. It is likely that not more than one large mill will be in a position to cut and haul his timber economically. If this is so, he either has no choice of purchasers, or his choice depends on mills of the smaller sort, whose own margin over the actual costs of production and marketing is less than that of larger mills.

To give the most favorable conditions for cutting, a holding must not only be large, but it must also be compact. The more compact it is the less often will the logging railroad have to pass through or around land from which it can derive no tonnage. The more compact the holding is, the greater the amount of timber which the owner can cut within a given radius, and the shorter the average haul. It is undesirable, therefore, on grounds of physical economy, for one large buyer to acquire timber interspersed with that of another owner. It is also undesirable for business reasons of another sort. The result is, as the investigation of the Bureau shows, that in a large proportion of cases each such buyer consults his own interest by keeping out of the territory of others. The small timber owner is often practically limited, therefore, to the choice between keeping his timber or selling it at such price as the one buyer in his neighborhood may think it wise to pay. This is so well recognized that large owners commonly reckon, not only the timber which they own, but also that which they "control;" that is, timber which is so interspersed with their holdings that no one else can well handle it.¹ Under these circumstances, the small holders naturally receive less than they would receive if there

¹ For further discussion of control of timber, see pp. 96, 97.

were active competition among several buyers, each of whom was in a position to make the most economical use of the timber. An agent of the Bureau, reporting in 1908 on the value of longleaf pine in southwestern Alabama, said:

Large tracts in this and adjoining counties are bought at \$3 per thousand feet; small tracts are picked up by forties at \$1 to \$1.50 per thousand feet.

A company in southern Arkansas, in 1907, named \$2 a thousand as the prevailing price for pine stumpage; "that is, in buying small lots from individuals. Where a company has a block of timber that will make a good manufacturing proposition the price would range from \$3 to \$5 a thousand, depending on the cost of getting logs to the sawmill." A company in Texas estimated its own timber at 55,000,000 feet of pine and 10,000,000 feet of hardwood, but said that, with the addition of lands controlled by these holdings, it expected ultimately to have 100,000,000 feet of pine and 60,000,000 feet of hardwood. This company had paid about \$2.50 a thousand for much of its stumpage, but for some small tracts it had paid as little as \$1. A company in eastern North Carolina reported that it bought several million feet of pine stumpage in 1906 at an average cost of 90 cents a thousand. Prices in that region ranged generally from \$1.50 to \$3, and even \$5, with an average probably not below \$2.50. The company that bought at an average of 90 cents explained that the timber was in territory which would have to be logged over its railroad, and it was thus able to force down the price.

Even a considerable owner may be unable to get much more than the current price of small lots, unless his holding is large enough and compact enough to justify the erection of a mill. A lot of 15,000 acres of timber rights in southern Arkansas was sold in 1906 at \$2.50 a thousand. This was probably a little more than small owners were generally getting in the region, but was considerably less than the value which large owners were putting on their own holdings. The seller explained:

The price was much lower than the present value, but the tract was too small to be a commercial proposition, and the holding was scattered.

The present difficulty of logging small tracts and the present business need that a large mill own a supply of timber for 20 years or more do not arise from conditions inherent in logging as such, but from those inherent in the system of large holdings and of logging railroads that are not common carriers. It is these conditions which give large timber holders the power, on the one hand, to block in and control small holders, and on the other to cut off a sawmill from its natural supply of timber.

Had the laws under which the Government passed title to forest land made it impossible for anyone to own more than a comparatively small holding at a time there can be no doubt that logging railroads would have been built as branches of the commercial railroads, and would have transported logs as common carriers. This would have given the small holders facilities for transportation to a number of buyers; a sawmill likewise would not have been dependent on a few sellers. A sawmill, whether it bought timber in the log or on the stump, would have bought it currently, as a cotton mill buys cotton. The mill would have been an independent manufacturing enterprise, like a cotton mill, instead of being, as an important sawmill now is apt to be, an incident of timber holding. Each small tract of timber would normally have been almost equally accessible to several mills, and prices of timber might have been expected to be fixed by competition.

Such conditions existed formerly along the rivers of Maine, on the Susquehanna and the Delaware, and along the Mississippi. The rivers were the highways, open to small and great alike, and there were mills which owned no standing timber, but supplied themselves by current purchases of logs. Such conditions still exist to some extent on Puget Sound. But a small owner can not profit much by this situation unless he is within easy reach of the water or of a common carrier that will take his logs at a reasonable rate to the water.

CAUSES OF THE PROGRESSIVE RISE OF STUMPAGE VALUES.—The great determining causes of the general rise of stumpage values are two: The depletion of the forests and the increase of population. Improved facilities for transportation increase the value of the particular timber which they make more accessible to market, but they keep down the value of the timber which was already accessible, and whose advantage is thereby diminished.

A small fraction of the increased price of timber, but only a small fraction, may be attributed to the causes which have in recent years raised prices generally. Lumber agrees with other commodities in reflecting the depreciation of gold. So far as the increased price of lumber depends upon such general causes, however, only part of it is reflected in the price of stumpage; for part is taken up by the increased cost of production which the general rise of prices involves. Since the return from the standing timber when it is cut depends upon the difference between the value of the resultant lumber and the cost of cutting and marketing, any increase of these costs diminishes the return by so much. It is impossible to say definitely what the net effect of these general causes on stumpage prices may have been, but it has certainly been only a small part of the total increase.

Take, for instance, a quarter section in Oregon, which might have sold for \$600 or \$1,000 in 1895, and for \$5,000, or \$10,000, or \$15,000, or \$20,000, according to the stand and the local conditions, in 1910. Suppose that the peculiar circumstances which have raised the value of standing timber had not existed, and the price of stumpage had been affected only by the causes which have raised the prices of commodities generally. These general causes probably did not raise the price of 1895 by 50 per cent.¹ Fifty per cent would have given an increase of \$300 or \$500 on the Oregon quarter section. The actual increase has probably been 10 times as great, and may easily have been 20 or 40 times as great. Even where stumpage prices have only doubled or trebled in 15 years, the special have overwhelmingly outweighed the general causes.

In those parts of the country where large bodies of virgin timber still exist the whole value of stumpage may be said, in one sense, to have a speculative origin; that is, it depends upon the opinion which owners and buyers have of the probable value in the future. For instance, if owners and buyers generally believed that young trees were coming on in such numbers and would produce timber of such quality that good longleaf-pine stumpage could be bought 25 years hence for a dollar a thousand, no one would pay a dollar a thousand for it now for purposes of long time investment. It might, indeed, have no more than a nominal value, and in many places would be given, as it would have been given 50 years ago, to anyone who would remove it.

The small owner has usually little knowledge of conditions, of the history of timber values, or of their probable future movement. Moreover, as has been shown above (pp. 178, 179), the small owner is at a serious disadvantage in comparison with the large. So the timber whose rise of value is likely to be swiftest passes early into strong hands. The strong owner, who has bought to profit by the rise in value, is in no haste to sell. His practical withdrawal of large bodies of timber from the market creates an artificial scarcity, and accelerates the rise of prices. The rise again reacts upon the minds of the owners and encourages them to refuse to sell unless at prices higher yet. Though the number of important owners may be considerable, and though there may be no deliberate concert of action among them, their situation leads inevitably to a mode of dealing which has much of the effect of a monopolistic control.

¹ By general causes are here meant such as affect the prices of all commodities in the same way. Notable among them in recent years has been the increase of the supply of gold. The changes of price due to general causes are approximately shown by average index numbers, based, as nearly as possible, on the prices of all commodities. The index number established by the Bureau of Labor was 93.6 for 1895 and 131.6 for 1910, an increase of 40.6 per cent. (Bulletin, Bureau of Labor, No. 93, p. 318.) With a liberal allowance for any failure of these index numbers to show the effect of general causes exactly, it may safely be said that such causes did not increase prices of timber between 1895 and 1910 by more than 50 per cent.

Section 3. Prices received for stumpage by the United States.

In the "public-land States," which include all continental United States, except the 13 original States and the "legislative" States of Maine, Vermont, West Virginia, Kentucky, Tennessee, and Texas, practically all the timber in the country was once owned by the people of the United States. Three-fourths of what now remains has passed out of their common ownership; much of it without payment, and most of the rest at \$1.25 or \$2.50 an acre. The era of land grants, beginning about 1850, passed millions of acres of valuable timber into the hands of railroad and other corporations, and the largest timber holdings now existing in the country are of this origin. Moreover, of the millions of acres of timberland granted by the Federal Government to the States (swamp grants, school grants, agricultural college grants, etc.), much was acquired by timber speculators in large tracts at low prices.

The land law passed in 1820 and not repealed until 1889 (repealed by 25 Stat., 854) provided for the disposal of public lands by private cash sale at \$1.25 per acre. There was no limit to the amount one person might buy. The law simply required that before the land was disposed of at private sale it should be "offered" at public auction. Little of the land offered was sold at the public auctions. Most buyers waited and bought at private sale at the flat price of \$1.25. Many large timber holdings were thus acquired directly from the Government. For the period from 1866 to 1876, as shown below, the private-sale law was suspended in five Southern States.

The private-sale law was supplemented by three other important laws under which individuals could secure public lands, though ostensibly in very limited amounts: (1) The preemption law, developed by various acts culminating in the act of 1841, which was in force till 1891, and under which settlers had a preference right to buy claims at \$1.25 per acre (\$2.50 per acre within primary limits of railroad grants); (2) the homestead law, in force from 1862, giving 160 acres free to any settler who should improve the land and reside on it five years; and (3) the timber and stone law, in force from 1878, giving anyone a right to enter one 160-acre claim at \$2.50 per acre.

The preemption law was intended to encourage the establishment of homes on the public domain by preventing the dispossession of any settler who should establish a domicile and make improvements there, provided he would pay the minimum price of \$1.25 an acre. The homestead act went still further by absolving such settlers from all indebtedness to the Government for their land. In timbered regions, however, these laws, as well as the timber and stone act, were largely used by lumber men to acquire timber land; and the claims, whether entered by dummies or entered by others without collusion,

were commonly transferred to large timber holders soon after title was secured.

At the close of the Civil War there were still large amounts of public land in Alabama, Arkansas, Florida, Louisiana, and Mississippi, much of it covered with the finest virgin timber. In 1866 Congress directed that all public lands in these States should be reserved for settlement under the homestead act. As a matter of fact, many of the resulting homestead entries were fraudulent, being made by dummies at the instance of persons who desired to secure the timber, either for its value as timber or for turpentine. In 1876 Congress again made the public lands in these Southern States subject to sale at \$1.25 an acre. More than 800,000 acres were sold in 1882 and more than 1,100,000 acres in 1883.

In the Pacific-Northwest the homestead law and the timber and stone law have been the principal means of acquiring timberland from the Government, aside from railroad land grants. By the terms of the timber and stone law the price of \$2.50 an acre was a minimum, and it was within the discretion of the administrative officers to fix any higher price. In practice, however, the law was administered till recent years as if the price of \$2.50 were unchangeable. Mr. H. H. Schwartz, former Chief of Field Service of the General Land Office, stated in 1909 that this law alone had resulted in the sale of over 12,000,000 acres of valuable timberlands, of which fully 10,000,000 acres had been transferred by the entrymen to corporate or individual timberland investors; and that these lands, which were sold by the Government for a gross sum of \$30,000,000, were reasonably worth at the time of sale \$240,000,000. (See p. 265.)

The evil effects of these railroad and State grants and of other land legislation are further discussed in Chapter VI.

Section 4. General increase in stumpage values.

To men settling as farmers in a new forest country, the timber was a burden. The settlers were anxious only to convert the timber land to fields, and they killed¹ and burnt the timber, or killed it and waited for it to rot. There are still corners of the United States where this condition is not wholly past. Within the last half dozen years, land has been leased for terms of years in the Yazoo-Mississippi delta, under contracts which required no payment from the lessees, but only that they should clear the land of timber. Since the year 1900 many thousand acres of virgin hardwood have been deadened and burnt in Alabama, Mississippi, Louisiana, and Arkansas. The time was long past when timber of the better sorts was counted

¹The trees are killed by the process called "girdling" or "deadening"—chopping a ring around the trunk deep enough to stop the flow of sap. The ground may be cultivated among the dead but standing trunks, while the branches gradually decay and fall, and at last the trunks themselves, one by one, fall or are pushed over or cut down. The fallen wood is gathered from time to time and burnt.

worthless in those regions. That which has been destroyed there in recent years has been chiefly gum and other species which the lumbermen had not learned how to treat and which consumers had hardly been compelled as yet to buy. As the more desirable species grow dearer, the less desirable are forced into use wherever they can be used, and so acquire a value as standing timber.

In the Northeastern States, every sort of sound timber had become valuable before the civil war; and during the last 50 years the timber of the Lake States and of most parts of the South has changed from an incumbrance or an object of indifference to a highly valued asset.

Mr. James D. Lacey, one of the best-known timber experts in the United States, sketched the general advance of stumpage values in the following terms at the annual meeting of the National Lumber Manufacturers' Association in April, 1910:

In my own experience, hemlock stumpage in Pennsylvania 50 years ago was really a waste material, the bark being the real product. However, as the dense forests of Pennsylvania were penetrated and lumbering came to be carried on on a large scale, the value of stumpage advanced in keeping with the demand and the disappearance of the timber supply, until what is left there to-day is worth from \$5 to \$8 per thousand.

Government timberlands were to be had in Michigan as late as the year 1866 at \$1.25 to \$2.50 per acre. White-pine stumpage in Michigan passed the dollar mark in the early seventies and advanced to \$5 a thousand and upwards in the year 1880. In the year 1880 pine stumpage in northern Minnesota ranged in price from 50 cents to \$1 a thousand, and in the same year I bought shortleaf pine in what was then known as the "Irish Wilderness" in southern Missouri at 5 cents per thousand. Anywhere in the Southern Coast States pine stumpage could be had from the United States Government at \$1.25 per acre (about 10 cents per thousand) and from the State governments at from 25 cents to 75 cents per acre. As you all know, Michigan, Wisconsin, and Minnesota stumpage advanced very rapidly after 1880 until reduced transportation and the change of base of the Michigan and Wisconsin lumbermen to the South aided in the development of that territory, and brought southern lumber into competition with northern white pine. The same condition existed on the Pacific coast until within the last six or seven years, with practically the same low range of prices.¹

Mr. Lacey made the following statement in November, 1908, before the Committee on Ways and Means of the House of Representatives:

In 1880, when I first went South, in Louisiana and Mississippi and those coast States, we estimated what the value of Government land was. It was nearly all vacant then, and it was timber land. In 1889 it was offered at \$1.25 an acre. We located

¹ The Forest and the Saw Mill (National Lumber Manufacturers' Association, official report eighth annual convention), pp. 200, 201.

several million acres for northern lumber companies. We estimated those lands would cut about 6,000 feet per acre, as they were then cutting timber. They were not going above the first limbs; the balance was left in the woods or burned up.¹

Mr. J. B. White, of Kansas City, one of the best-known lumber manufacturers in the United States, spoke as follows at a meeting of the Yellow Pine Manufacturers' Association, held at New Orleans, in January, 1909:

As I have shown, stumpage increased in 20 years from 12½ cents to \$4 per thousand in some places, and this explains. This money was made by the capitalists—by the speculator in these large investments. The Government had for many long years been offering these millions of acres of fine yellow-pine timber for \$1.25 per acre, and finally capitalists began to buy. No settlement or cultivation or anything was required; only to pay this \$1.25 per acre to the Land Department and get a United States patent of title.²

Mr. George K. Smith, secretary of the National Lumber Manufacturers' Association and also of the Yellow Pine Manufacturers' Association, made the following statement in April, 1907, regarding a tract of southwestern yellow pine:

The increase in the value of standing timber is well illustrated by a tract of 85,000 acres bought within the last few months.
* * * Eight or ten years ago there was an option on this tract at \$4.75 per acre. This option was not exercised, and the price placed on the land rose to \$12.50, \$17.50, \$22.50, \$27.50, \$35, and the tract was recently sold at \$50 per acre. It will cut about 17,000 feet per acre.

Mr. George H. Emerson, vice-president of the North Western Lumber Company, of Hoquiam, Wash., in an article in "The Coast" magazine, speaking of the increase of timber values in western Washington, said:

In 1882 * * * all lands west of the Northern Pacific grant were offered for sale [by the Government] at \$1.25 per acre, without restriction as to the number of acres; to-day those lands are worth from \$1.50 to \$3 per thousand feet of their standing timber, often from \$60 to \$150 per acre, or from \$15 to \$30 per tree.³

Mr. W. I. Ewart, in an address before the Pacific Coast Lumber Manufacturers' Association, at Tacoma, August 25, 1905, said:

Stumpage values have at intervals come to a standstill temporarily, but the tendency has been steadily upward and no advance has ever been lost. There has been no retrogression

¹ Before the Committee on Ways and Means of the House of Representatives, Nov. 20, 1908: *Tariff Hearings*, p. 1004.

² Paper on Forest Conservation in Yellow Pine, presented by J. B. White, at annual meeting of Yellow Pine Manufacturers' Association, Jan. 19-20, 1909.

³ Oregon & Washington Lumber Manufacturers' Association et al. v. Union Pacific Railroad Co. et al. Before the Interstate Commerce Commission, No. 1327. Brief for railroads, p. 32.

except on the manufactured product. This has been uniformly and invariably true; depressions in the lumber market have at times lessened transactions in timber lands, but no decline from fixed valuations has ever been recorded. Mr. Frederick Weyerhaeuser once remarked to me that the only times he ever lost money on timberlands were the times when he didn't buy.

Section 5. Average values of stumpage.

The Bureau has made no effort to determine the average values of standing timber. Such an average could not be determined except by the expenditure of an enormous amount of time and money, and even then could be only approximate.

In Forest Service Bulletin 77, "Forest Products of the United States, 1906," page 40, the following table is presented, giving values for several species of standing timber for the years 1899, 1904, and 1907:

TABLE 46.—COMPARISON OF STUMPAGE VALUES, 1899, 1904, AND 1907.

[Figures for 1899 and 1904 are by the Bureau of the Census; those for 1907 are based on reports to the Forest Service.]

Kind.	Average value per M feet.			Kind.	Average value per M feet.		
	1899	1904	1907		1899	1904	1907
White pine.....	\$3.66	\$4.62	\$8.09	Birch.....	.....	.....	\$4.40
Ash.....	3.03	3.95	7.58	Cypress.....	\$1.58	\$3.42	4.37
Basswood.....	1.50	3.89	6.79	Cottonwood.....	1.45	2.61	3.97
Hickory.....	.....	.....	6.69	Beech.....	.....	.....	3.56
Oak.....	1 3.18	3.83	6.52	Yellow pine.....	1.12	1.68	3.16
Spruce.....	2.26	3.70	5.49	Maple.....	2.06	3.82	2.50
Chestnut.....	2.71	3.39	4.97	Red gum.....	1.68	1.67	2.46
Elm.....	3.30	5.58	4.94	Redwood.....	1.06	1.55	2.35
Poplar.....	2.81	3.89	4.64	Western pine.....	.....	.....	1.66
Cedar.....	1.32	1.49	4.63	Douglas fir.....	.77	1.05	1.44
Hemlock.....	2.56	3.51	4.51	Tupelo.....	.....	.....	1.27

¹ White oak only.

² Eastern spruce only.

³ Eastern hemlock only.

The values given in this table do not profess to be true average values for all timber of the species named. Those for 1899 and 1904 are Census figures, based on the reported values, not of all timber, but of timber owned by sawmills. Those for 1907 are based on reports made to the Forest Service by about 1,500 manufacturers for timber in their vicinity. In each case most of the timber covered would be comparatively accessible, and its value would, in general, be above the average value of all timber of the given species.

This could not but happen in the newer regions, especially, and because of it the apparent rise would be less than the true rise of the average value of all timber. The timber frontier was much advanced between 1899 and 1907. A very large part of the supply was beyond

the scope of milling operations or mill ownership in 1899, and did not enter into the mill reports of price, on which the Census averages were based. Much of this timber had only a trifling value. If account had been taken of it, the apparent average value for 1899 would have been greatly reduced; that is, the reported average for 1899 was far above the true average value of all timber. By 1907, the purview of lumbering activities had been greatly extended. The quantity, and still more the proportion, of timber which could then be regarded as remote had greatly shrunken. Moreover, even for that which was still remote, the difference between its value and the value of timber on the verge of cutting was much diminished. This resulted partly from the extension of logging railroads and the improvement of other logging facilities; partly from increased general confidence in the continued rise of timber values; partly from the concentration of ownership. The large owner, able to hold for the distant future, and to provide such transportation facilities as his property may need, allows a comparatively small difference, so far as his own timber is concerned, between the near and the remote. For these various reasons the real advance in timber values from 1899 to 1907 was much greater than a mere comparison of the mill returns would suggest.

The actual increase of value is further disguised, for many species, by the progressive exhaustion of the best supplies. The white pine, for instance, of 1907 was a different article from the white pine of 1899. It was, on an average, of poorer quality. The average value for white pine in the Forest Service table is \$3.66 in 1899 and \$8.09 in 1907; but the increase of value for identical material was greater.

The departures from any average or representative timber price are very great. In some places, under some circumstances, lots of any given species are selling at two or three or four times the average price; elsewhere, under other circumstances, other lots of the same species are selling for a few cents a thousand. Even in the same locality the variations are astonishingly wide. Within one small county of North Carolina, an agent of the Bureau, reported in 1907 that pine stumpage was bringing on an average from \$2.50 to \$3 per thousand, and also that it had sold within two years as high as \$10 and as low as 50 cents.

The following comments, offered by the Forest Service in connection with the values for 1907 in the above table, show how far stumpage prices depart from uniformity.

White pine.—The average stumpage value of \$8.09 given for white pine is based upon 400 reports from 19 States. The average State values run from \$1.56 in Alabama to \$11.51 in Wisconsin. The quotations from New England and the Middle Atlantic States are considerably higher than those from farther

south in the Appalachian region. The maximum value of white-pine stumpage, \$20 per thousand, is reported from the farming counties of New York, northwest and central Pennsylvania, and northern Wisconsin. In Michigan, the quotations extend from \$5 to \$18, with an average of \$10.73 for the lower peninsula and \$11 for the upper. In Minnesota the range reported is from \$5 to \$12, with an average of \$7.58.

Yellow pine.—Nearly 600 reports upon the value of yellow pine stumpage gave an average of \$3.16 per thousand, nearly three times that given by the census for 1899. The reports upon longleaf yellow pine, the most important of the yellow-pine group, ranged from \$1.50 to \$5 in Florida and Georgia, and from \$2.50 to \$5.40 in southern Alabama. In southern Mississippi the range was from \$2 to \$5 per thousand. Practically the same ranges were quoted for southern Louisiana; the average for Sabine and Calcasieu Parishes was \$3.79. In the eastern counties of Texas longleaf-pine stumpage values were from \$1.25 to \$5 per thousand. In Arkansas, the leading shortleaf-pine producing State, stumpage values were quoted at from \$1 to \$5 per thousand, with an average of approximately \$2.50 per thousand.

In eastern Virginia loblolly or North Carolina pine was quoted at from \$1.50 to \$7 per thousand, with an average of slightly more than \$3. The range in eastern North Carolina was from \$1.50 to \$4, with an average of \$2.56. The average stumpage price quoted for this species in northern Mississippi was \$1.60 per thousand, with a range of from \$1 to \$3; and in Texas the reports upon the value of loblolly ran up to \$2.50.

Cypress.—The average value of cypress stumpage, based upon 200 reports, was \$4.37 per thousand. In Louisiana the extreme quotations were \$2 and \$10 per thousand, with an average of \$4.65 for the southeastern portion of the State, which may be considered fairly representative. In Florida stumpage prices ranged from \$1.50 to \$12, with an average of \$4.14; and in the Mississippi Valley section of Mississippi, from \$2 to \$5, with an average of \$3.69.

Douglas fir.—Two hundred and sixty-six reports upon the stumpage value of Douglas fir gave an average value of \$1.44 per thousand. State averages ranged from \$1.11 in Oregon to \$3 in New Mexico. There is but little Douglas fir in New Mexico, however. In the coast and Puget Sound sections of Washington, the great centers of Douglas-fir lumber production, the extreme stumpage prices quoted were 50 cents and \$5 per thousand, with an average of about \$1.75. In western Oregon the prices quoted were considerably lower, with an average of \$1.09 per thousand. Nearly the same values were given for northern California.

However wide the variations, it is always possible to state, roughly, the prices usually paid for a given species in a given locality. Everywhere, and for every kind of timber, these prevailing prices have greatly increased during recent years. Some indication of the movement, though not a full measure of it, is given by the above Forest Service table. According to this table, the average value of Douglas fir and hemlock stumpage nearly doubled during the eight years from

1899 to 1907, that of white pine, white oak, and spruce more than doubled, and that of yellow pine nearly trebled. These six species furnish about three-fourths of the lumber cut in the United States, and yellow pine alone furnishes one-third. It would appear that the people of this country paid to the owners of standing timber, merely as owners, fully twice as much per thousand feet on the lumber cut in 1907 as on that cut eight years earlier.

The ratio of aggregate increase is certainly greater than the ratio of increase per thousand feet. As prices for clear lumber rise, consumers have to take poorer qualities at the prices they formerly paid for good. This poorer timber is such as no one is compelled to use so long as lumber is cheap; and the whole amount of it is an addition to the previous product per acre when rising prices force consumers to content themselves with it. As one of the oldest and largest lumber operators in southern Georgia said to an agent of the Bureau, a sawmill in that region "in the early years, say 30 years ago, cut only the choicest trees, and used only the choicest parts of those trees. A large yield of timber in those days was 2,500 feet to the acre, while the same land, under present methods of cutting, would yield from 6,000 to 10,000 feet to the acre."

Whether prices are quoted by the acre or by the thousand, it is the returns per acre which are important to the owner of timberland. A doubling of the amount cut per acre, with maintenance of the average price on the stump, is as good for him as a doubling of price without increase of product. If both price and product double, the returns increase fourfold.

A similar gain arises from the bringing into use of species for which there has been no market. Up to 1900, and even later, hemlock stumpage had no value on the Pacific coast. It is not many years since old-field pine—pine which has grown on fields which were once cultivated and afterwards abandoned—was valueless in most parts of the South. Now it is an important factor in the market. Gum has become marketable only within very recent years. Reference has been made above (p. 183) to the clearing of hardwood land by deadening the timber. Capt. J. B. White, one of the oldest lumber manufacturers in the South, said in an address at the Southern Conservation Congress, October 8, 1910:

Even now, in places where the trees have no market, old-fashioned deadenings are still to be seen. * * * I have seen it very recently in some of the Southern States where gum trees can not be marketed.¹

In the second county northwest of Birmingham, Ala., timbered land could still be bought in 1908, excluding mineral rights, for from

¹ Pamphlet issued by J. B. White: "Conservation in Relation to Lumbering," p. 8. Reprinted from St. Louis Lumberman.

\$1 to \$5 an acre, while cleared land, without mineral rights, brought from \$5 to \$10; that is, the timber was still regarded as an income-brance. In Bolivar County, Mississippi, in the same year, it was said that the average owner considered the timber of little or no value, and looked upon it as a hindrance to the development of his property. These are the last relics in this country of a condition which has at some time existed everywhere in the eastern and southern forest region.

Every tract and every tree which contains good lumber contains also poor. The price per thousand at a given time is the average price of all the timber, good and bad, which the current conditions of the market make salable. When only the best, amounting on an average acre to less than 2,500 feet, was salable in southern Georgia, the current price per thousand applied only to this 2,500 feet of substantially clear stock. When the price of this clear stock went too high for common uses, poorer stuff, largely from the same trees, became salable, to the extent, according to the veteran Georgia operator quoted above, of from 3,500 to 7,500 feet per acre. Then the price of timber was the average price of the whole 6,000 or 10,000 feet per acre, including the 2,500 good and the 3,500 or 7,500 poorer. For this reason, to say that stumpage sold at 50 cents a thousand at one time and \$2 at another gives a false impression. The timber which now sells at \$2 is poorer timber than that which formerly sold at 50 cents. Such timber as then sold at 50 cents might now be worth, taken by itself, \$3 or \$4.

The owner profits by the rise of the best 2,500 feet from 50 cents to \$3 or \$4. He profits further by whatever he gets for the poorer timber, which formerly he could not sell at all. This second factor, changing the basis on which average prices are reckoned, puts insuperable difficulties in the way of an accurate measurement of changes of stumpage values. The present chapter throws little direct light on this factor, and touches it only so far as the chapter deals with increases of timber values per acre.

At this point it is well to mention the fact that the depression of 1907 did not cause any considerable fall in the price of timberland, however much it may have depressed the price of lumber and the price of logs. Some owners who had to sell got less than they could have got a few months earlier; but owners in general were confident that, by holding on a little, they could get at least as much as ever before, and they had no desire to sell lower. The number of sales was diminished, but few of the stronger timber owners suffered anything more than a postponement of their profits, unless they were manufacturing, and so felt the decline of lumber prices.

This is confirmed by the following passage, from the address of the president of the Yellow Pine Manufacturers' Association, opening the annual meeting of the association in January, 1911:

During the year I addressed letters to the representative timber holders of the South with whom I had a personal acquaintance and asked that they give me in confidence the value of yellow-pine stumpage. In no instance was there a price less than \$3 a thousand feet for shortleaf suggested, or \$4 for longleaf, but the average of all of the letters that I had could be summed up in a statement that the holders of yellow pine in the South consider that stumpage values have not declined in the last three years, and that \$4 a thousand feet for shortleaf timber and \$5 for longleaf are the market values. I am led to believe that none of those from whom this information was secured would have disposed of his holdings at lower figures than the letters would indicate.¹

Section 6. Stumpage values in the South.

The lumber industry of the Southern Pine Region, on a large scale, belongs almost wholly to the period since the Civil War. It was first developed in the part nearest to the great northern markets—Virginia and North Carolina. Thence it has gradually extended down through the Atlantic States and west through those along the Gulf. It was in full blast in Georgia in the eighties, and it was at about that time that the name "Georgia pine" became well known in the northeastern markets. That name now designates hard or pitch pine, without much regard to origin. Many of the most important southern mills to-day are in Mississippi, Louisiana, and Texas, and much of what is sold as Georgia pine does not come from Georgia.

In a similar way the names "Virginia pine" and "North Carolina pine" are used interchangeably to designate the loblolly of Virginia, North Carolina, and South Carolina.

The longleaf or pitch pine, the source of turpentine and of a great part of the best southern lumber, covered much of eastern North Carolina and South Carolina; much of Georgia and northern Florida; much of Alabama, Louisiana, and Mississippi; and a large area in eastern Texas. Shortleaf pine extended from Maryland through the Atlantic and Gulf States, partly mixed with the longleaf and partly farther from the coast. It covered most of Arkansas and extended into Missouri.

The term "yellow pine" includes the several species of pine in the Southern Pine Region.

A large part of the original stand in most of the Atlantic States has been cut, and the most important areas of virgin yellow pine are now in Florida, Mississippi, Louisiana, and Texas.

¹ American Lumberman, Jan. 21, 1911, p. 57. See also the statement of W. I. Ewart, quoted above, p. 185.

VIRGINIA AND NORTH CAROLINA.—The following table shows the purchases of timber rights, chiefly in yellow pine, which were made by one company in the North Carolina pine region, from 1895 to 1909, with the company's estimates thereon:

TABLE 50.—ESTIMATED COST OF STUMPAGE IN PURCHASES OF TIMBER RIGHTS, 1895 TO 1909.

Year.	Quantity (estimated) in M feet.	Cost.	Cost per M feet (estimated).	Year.	Quantity (estimated) in M feet.	Cost.	Cost per M feet (estimated).
1895.....	16,080	\$0,704	\$0.60	1903.....	26,301	\$29,857	\$1.14
1896.....	4,235	1,740	.41	1904.....	64,136	95,771	1.49
1897.....	87,455	35,135	.40	1905.....	53,839	111,933	2.08
1898.....	80,103	56,019	.70	1906.....	29,922	55,110	1.84
1899.....	107,910	82,740	.77	1907.....	4,982	12,150	2.44
1900.....	28,645	25,047	.87	1908.....	3,375	9,975	2.96
1901.....	9,316	8,701	.93	1909.....	2,985	7,828	2.62
1902.....	39,583	45,148	1.14				

In 1895-1897 this company made large purchases at an average cost of 43 cents a thousand. During the next four years the average price was approximately 80 cents; during the three years following, \$1.31; in 1905 and 1906, about \$2; and thereafter, roughly, \$2.50 and \$3.

The real increase was greater than this, because the timber obtained by the earlier purchases was much more than the estimates. So far as the tracts included have been cut, and so far as the product is reported to the Bureau in such a way that it can be compared with the estimates, the following table shows the results:

TABLE 51.—ESTIMATED AMOUNTS OF TIMBER ON CERTAIN TRACTS, WITH THE AMOUNTS CUT THEREFROM, CLASSIFIED BY YEARS OF PURCHASE.

Year of purchase.	Estimate.	Cut.		Year of purchase.	Estimate.	Cut.	
		M feet.	Per cent of estimate.			M feet.	Per cent of estimate.
1895.....	M feet. 2,550	3,774	148.0	1904.....	M feet. 24,936	23,534	94.4
1896.....	460	1,249	271.5	1905.....	10,142	9,556	94.2
1897.....	41,075	53,508	130.3	1906.....	10,085	9,917	98.3
1898.....	25,648	31,718	123.7	1907.....	590	824	139.7
1899.....	29,355	37,198	126.7	1908.....	1,200	1,353	112.8
1900.....	4,575	5,997	131.1	1909.....	2,985	3,426	114.8
1901.....	4,485	5,539	123.5	Total.....	166,141	196,605	118.3
1902.....	4,550	5,487	120.6				
1903.....	3,505	3,525	100.6				

On the timber bought up to and including 1900, the logs as scaled when cut have exceeded the estimates by nearly 30 per cent, on an

average, while on later purchases the scale of the logs has, on an average, nearly agreed with the estimates.

The amounts cut, shown in the table, are the contents of the logs as scaled in the woods. The actual product of sawed lumber has exceeded these results of the log scale by 25, 40, and even 50 per cent, and has considerably exceeded the estimates on the purchases of every year, and doubtless on almost every tract. This, however, does not affect the relation between the earlier and the later estimates.

The earlier purchases stood longer than the later, on an average, between purchase and cutting; and where the timber was immature the actual quantity increased somewhat by growth. It is impossible to measure accurately the degree in which this increased the apparent inaccuracy of the earlier estimates.

Out of the purchases of 1897, tracts estimated to contain 41,075 M feet produced logs to the amount of 53,508 M feet, as scaled in the woods; or 30.3 per cent more than the estimate. If all the timber bought in 1897 gave similar results, the actual cost of the logs would be, not 40 cents a thousand feet, as indicated in the table on page 192, but about 31 cents. Even if, after allowing for the gain by growth, the product exceeded the estimate by only 20 per cent, the actual price per thousand was 33½ cents.

The Bureau has no other record of southern stumpage values which is so specific, but it has abundance of testimony to the same general effect. One informant in southern Virginia, in 1908, who gave the current price as \$3 to \$4 a thousand, according to location with regard to railroad facilities, said that the same timber could have been bought 10 years earlier at 50 cents to \$1 an acre, or about 10 cents to 20 cents a thousand. Another told of a tract which was offered to him about 1895 for \$3,500, and refused. The hardwood was afterwards sold from it for \$8,000, and the pine for \$40,000, making a total of almost 14 times the price named in 1895.

It should be borne in mind, as already pointed out, that specific transactions even though numerous do not afford a basis for accurately measuring the general rise in values. Such specific instances are here presented as a matter of interest for what they may be worth.

In eastern North Carolina, one buyer said in 1907 that he had recently been paying about \$2 a thousand, while the price five or six years earlier had been about \$1. One who had recently paid \$20 an acre remembered when similar timber could be bought, say, 12 years earlier, at from \$3 to \$5 per acre. In a county in western North Carolina, where the prevailing prices in 1908 appeared to be about \$5 a thousand for forest pine and \$2.50 for old-field pine, it was said that forest pine had been worth about \$1.50 in 1898, and that old-field pine had had no value.

SOUTH CAROLINA.—In eastern South Carolina, one informant stated in 1908 that the value of timber had increased 300 per cent in 10 years. Another said that longleaf-pine lands, which were then selling all the way from \$5 to \$20 an acre, could have been bought 15 years earlier at from \$1 to \$1.50. A particular tract was mentioned which sold at \$2 an acre in 1905 and at \$4.75 an acre in 1906. North of the city of Columbia, longleaf pine was quoted at about \$3 a thousand in 1908, while it could have been bought 10 years earlier for 75 cents; shortleaf was said to be worth about \$1.25 a thousand, while in 1893 it could not have been given away for the cutting and hauling. Still farther northwest, near the edge of the pine belt, pine stumpage was reported to have risen sixfold in 13 years, from about 25 cents a thousand in 1895 to about \$1.50 in 1908.

GEORGIA.—In Georgia \$3 a thousand was the commonest value for pine stumpage in 1908. Informants near the Savannah River, naming this price, compared it with \$1 ten years before. Near the middle of the State, one lumber company named 50 cents per thousand and \$3 per thousand as the prevailing prices for longleaf pine in 1898 and in 1908, respectively. It estimated that oak and hickory had advanced in the same period from \$2 per thousand to \$3 per thousand. A little farther south it was said that timber rights had been bought at \$1.25 an acre in 1898, and were worth about \$10 to \$15 in 1908. Another informant, near the southern border of the State, said:

Ten years ago timber could be bought for \$1 to \$2 per acre, which was 25 cents to 50 cents per thousand feet; now it is worth about \$3 per thousand feet.

Because of the closer cutting which accompanies higher stumpage values, this indicates a greater gain to the timber owner than appears on the surface. Three dollars per thousand feet in 1908 was probably equal to from \$15 to \$25 per acre.

In Clinch County, in southeastern Georgia, one informant said that timberland in fee simple was not worth more than \$1.50 an acre in 1898, and was worth \$10 in 1908. Another said that timber tracts had increased in value 400 per cent in 10 years. In the neighboring county of Coffee, one informant stated that a tract of 15,000 acres, which he bought in 1906 for \$153,000, had changed hands about 1902 at \$1.60 per acre, or about \$24,000.

One of the lumber pioneers of southern Georgia told the Bureau that when he went there, in 1872, he bought thousands of acres of longleaf yellow pine, land and timber, at 40 cents an acre, and that choice timberland could be bought on the basis of \$1 a thousand feet as late as 1899. But few tracts as good are now left, he said, and they are easily worth \$4 a thousand.

FLORIDA.—Prevailing prices for pine stumpage seem to be rather lower in eastern Florida than in southern Georgia. Two dollars a thousand was the price oftenest named to the Bureau in 1908. In 1898 the prevailing price seems to have been about 50 cents, and in 1903 not more than \$1; one informant said from 25 cents to \$1.

In the region north of Tampa, the following prices per thousand feet were named as current in 1890 and in 1908: Pine, 1890, 30 cents; 1908, \$2 to \$3. Cypress, 1890, \$1; 1908, \$5.

Near the angle between the Florida Peninsula and the mainland, one company gave the price of pine in 1898 as 25 to 30 cents a thousand, and another as 50 cents to \$1 an acre. The latter price would be equivalent to from 15 to 25 cents a thousand. In Taylor County, in this part of the State, one informant declined to pay \$9,000, in 1901, for 11,000 acres of longleaf pine; five years later he paid \$50,000 for the same tract with 3,000 acres added, and he afterwards sold the 14,000 acres for \$120,000. Somewhat farther west, a company valuing its pine in 1908 at \$2 to \$3 a thousand and its cypress at \$3 to \$4 a thousand, said:

Ten years ago this timber was considered inaccessible and had no value in the market.

In central and northeastern Florida, \$5 a thousand was considered a normal price for cypress stumpage in 1908 and 1909. One large company, not far from St. Augustine, had offered this price for some cypress tributary to its mill, and had been refused. Most of this company's timber was bought about 20 years ago at prices ranging from \$1.25 to \$2.50 per acre. These lands cut from 10,000 to 25,000 feet per acre; so the owners, who are now willing to pay \$5 a thousand, paid originally 10 or 15 cents on the yield now actually utilized.

ALABAMA.—In Mobile County, Ala., the timber on about 100,000 acres of railroad land was contracted for about 1893, under 15 and 20 year removal clauses, at 50 cents per thousand feet. By 1908, agents of the railroad reported that what was left of it was worth \$4 to \$5 per thousand. In Monroe County, in the southwestern part of the State, one company stated in 1908 that stumpage had increased in eight years from an average of \$1 per thousand to \$4 or more for well-located tracts.

All these prices in Alabama are for longleaf yellow pine.

MISSISSIPPI.—In southeastern Mississippi, the value of longleaf-pine stumpage seems frequently to have increased from five to twenty-five fold in 10 years. One informant stated that in his vicinity it was bringing \$3 to \$4 a thousand in 1908, and that it could have been bought six years earlier for 50 cents. Another, living in a region where most of the holdings are reported at about 6,000 or 7,000 feet per acre, said, in 1907:

Ten years ago land and timber around here could be bought for \$1 an acre. Now stumpage is worth \$3 and \$4 a thousand.

I know of 1,260 acres that parties sold six years ago at 60 cents per acre. I have lately tried to buy it at \$4 per thousand, stumpage basis, but can't.

A tract of 7,000 acres was offered to a lumber company about 1900 for \$5 an acre and was refused. It was sold at \$22 in 1906, and in 1907 it was bought at \$30 by the company that had refused to pay \$5 seven or eight years earlier.

The hardwood in some parts of Mississippi has been transferred within 10 years from the position of an encumbrance to that of a considerable asset. In Yazoo County, northeast of Vicksburg, the statement was made in 1908 that gum had risen within five years from 50 cents a thousand to \$2.50. A tract of 6,240 acres, estimated to contain 83,000,000 feet of mixed hardwoods, was bought in 1897 at an average price of \$1.50 an acre, or less than \$10,000. In 1907, \$100,000 was offered for it, and refused. It was contracted for at \$124,000 in October, 1907, but the deal fell through on account of the panic.

LOUISIANA.—In various parts of Louisiana pine stumpage sold at less than \$1 a thousand down to 1900, and even later. One owner in Vernon Parish bought 3,500 acres of timber rights in 1898 at 75 cents a thousand. He referred to a tract which was offered in 1898 or 1899 at \$7 an acre, and was sold in 1904 at \$40. Similar tracts, he said, were worth \$60 in 1909. Another informant, in Sabine Parish, stated that the current value was about \$1 a thousand from 1899 to 1901, while in 1909 it was from \$4 to \$5.

A tract of about 85,000 acres of longleaf yellow pine, in western Louisiana, was sold early in 1907 for substantially \$50 an acre. The secretary of the Yellow Pine Manufacturers' Association stated that an option had been given on this tract 8 or 10 years before at \$4.75 an acre, but had not been exercised; and that the timber would cut about 17,000 feet per acre.

A tract of 18,889 acres of yellow-pine timber, in Calcasieu Parish, was sold early in 1909 for \$1,125,000, or about \$59.50 an acre. About 15,400 acres of this tract was bought from the Government, chiefly in 1881 and 1882, at \$1.25 an acre; nearly all the rest had been granted by the Government to the State of Louisiana as school or swamp land. The purchasers estimated the timber at about 16,000 feet to the acre. On this estimate they paid nearly \$3.75 a thousand. The price received by the Government in 1881 and 1882 for the part for which the Government received anything was about 7½ cents a thousand.

The president of a cypress company in Louisiana stated that most of his company's timber was bought more than 20 years ago at about \$2.50 an acre. In 1908, however, he bought 175,000,000 feet of cypress to supply a new mill. This tract had been offered to him in 1894 at \$4 an acre. The terms on which he bought it in 1908 were

\$6 a thousand feet guaranteed to the seller, and one-fourth of the profits of the manufacturing business. The lands were estimated to cut 17,000 to 18,000 feet per acre.

ARKANSAS.—Shortleaf pine in some parts of southern Arkansas, in small lots, could be bought up to 1907 as low as \$2 a thousand, but prices running up to \$5 were paid where the seller was in a position to insist on full value. Some large owners valued their holdings as high as \$7, but no sales at this price are reported. In the late nineties the current price was from 25 to 50 cents a thousand.

A company which bought a tract about 1880, mostly from the Government, at a cost of \$152,000, and has held it since, stated in 1907 that the annual increase in the value of the timber had averaged as much as \$152,000.

In the hardwood region of Arkansas, a large holding was bought up for taxes in the early eighties, at an average cost of about 12½ cents an acre, which was increased by litigation, clearing of titles, etc., to 18 cents an acre. Most of this land has since been sold at prices ranging up to \$25 an acre. A tract of 20,000 acres was reported to have sold in 1900 for \$1 an acre, in 1901 for \$3.50, and in 1904 for \$13.50.

Section 7. Stumpage values in the Lake States.

The Southern Pine Region may not yet have reached its maximum lumber production; but the lumber product of the Lake States—Michigan, Wisconsin, and Minnesota—entered many years ago on its decline. The reported output of Michigan was 3,012 million feet in the census year 1900, and 1,890 million in 1909; that of Wisconsin, 3,362 million in 1900 and 2,025 million in 1909; that of Minnesota, 2,342 million in 1900 and 1,562 million in 1909.¹ The falling off of the Lake States in white pine, on which their fame as lumber producers has been based, is more striking than the decrease of their total lumber product. The cut of white pine diminished, between 1900 and 1909, in Minnesota, from 2,158 million feet to 1,309 million; in Wisconsin from 2,336 million to 612 million; in Michigan from 1,232 million to 258 million.

MICHIGAN.—For many years Michigan produced far more white pine than any other State, but her great pine forests have nearly disappeared. In 1909 her mills sawed less pine than those of Maine, and only a little more than those of Massachusetts or New Hampshire. The State still produces a large quantity of lumber, but most of it is hemlock and hardwood. In 1909 less than one-seventh of the cut was reported as pine; genuine white pine doubtless furnished far less than one-tenth.

One holder in the northern part of the lower peninsula, whose timber is about one-half maple, one-fourth hemlock, and one-sixth

¹ Twelfth Census of the United States, 1900, Vol. IX, p. 876. Bureau of the Census, "Forest Products of the United States," 1909, p. 56.

beechn, counted the whole worth \$6 a thousand in 1908, against \$2 ten years earlier. Others indicated lower present values; \$3.50 to \$4 for hemlock, \$3 to \$4 for maple, about \$2 for beech, with a doubling in 10 years. Twenty years ago, said one holder in the central part of the lower peninsula, tamarack was considered worthless; now it is worth from \$2 to \$4 a thousand on the stump.

The increase of values has been more rapid in the upper peninsula, and present prices seem to be higher; perhaps because the lower peninsula is nearer exhaustion, and the quality of what is left there is lower. "Fifteen years ago," says one upper-peninsula informant, "hemlock and most all hardwoods had no market value. Now the price ranges all the way from \$4 to \$10 per thousand." Another says: "Elm and basswood were not salable 15 years ago. They are now worth as high as \$10 on the stump."

WISCONSIN.—In northern Wisconsin the prevailing prices of white pine, about 1893 to 1898, ranged from \$2.50 to \$6 a thousand. The Bureau has the record of an important purchase as late as July, 1900, at an average cost of less than \$4 a thousand. This purchase covered 31,600 acres, and the price was \$800,000. The pine was estimated at 204,418,000 feet; no other timber was estimated at all. If nothing is allowed for the land or for any timber but pine, the average price of the pine is \$3.91 a thousand. If the land, with the other timber, be valued at only \$2.50 an acre, the average price of the pine is \$3.53 a thousand. The prevailing prices for white pine in this region in 1907 are stated at \$12 to \$14 per thousand feet. In Washburn County, in northwestern Wisconsin, jack pine is said to have been worth nothing in 1898, and \$4 to \$5 a thousand in 1908; Norway pine \$1 to \$4 in 1898, and \$6 to \$7 in 1908.

In Wisconsin, as in Michigan, hemlock is now the principal element of the lumber product. Up to about 1895, hemlock stumpage hardly had a market value. In 1898 it had to be well situated to command \$1 a thousand. By 1907 it was worth \$4 to \$5 a thousand.

Basswood, which sold at about \$1 a thousand in the middle nineties, now costs \$8 and \$10. Soft elm, which was then worth about 50 cents, is now \$4. Rock elm, which was \$1, is \$10.

The president of a Wausau company gave the following as the average values of pine and hemlock stumpage, per thousand, from 1902 to 1908:

Year.	Hemlock.		Year.	Hemlock.	
	Pine.	Hemlock.		Pine.	Hemlock.
1902.....			1906.....	\$9.00	\$2.00
1903.....	\$4.00	\$0.75	1907.....	10.00	3.50
1904.....	5.00	1.00	1908.....	10.00	3.50
1905.....	6.00	1.50			
	8.00	1.50			

In June, 1910, this informant estimated the value of pine stumpage during the preceding winter at \$9, and that of hemlock at \$2. He reached these figures, as he says, by deducting the cost of logging from the price paid for logs, in "a territory where competition was strong." He adds:

Stumpage is being held at a higher price, but there is none being sold, which is a very good evidence that it is being held for more than it is worth at the present time. * * * Although as a matter of fact, people do not like to sell their stumpage at a less price than what they considered it worth three years ago, in spite of the fact that lumber is selling at a considerably less price; so the price I gave you is about right for the actual value, compared with the price of lumber at this time.

This informant's observation would seem to be, therefore, that in some cases, where the owners were led to sell by some special consideration, timber could be bought at about \$9 for pine and \$2 for hemlock, which the informant considered the "actual value compared with the price of lumber at this time;" but that owners in general held their timber at about the prices of 1907, which he reports as \$10 for pine and \$3.50 for hemlock.

One company bought 2,000 acres of hemlock and mixed hardwoods at from \$1.25 to \$3 an acre, according to location, in 1894, and sold it in January, 1908, at \$30. Another bought 160 acres at \$5, for land and timber, in 1891, and sold the timber rights only, in 1904, at \$22. The same company "bought hemlock lands in 1891 for 50 cents per acre, simply to get the hardwoods. The same class of lands are worth \$20 per acre to-day."

MINNESOTA.—In 1909 over four-fifths of the lumber cut in Minnesota was white pine, and Minnesota produced about one-third of the white pine cut in the United States.

The State contains hardly any hemlock; and the other less important conifers, such as jack pine, spruce, and tamarack, were regarded as worthless in the early days of the lumber industry, and are now put in with the white pine, under the trade name of "northern pine." Out of these conditions has grown a custom, in the northern part of the State, of counting only the white pine, when stumpage is sold at so much a thousand, and throwing in the others. So far as this custom is followed, it tends somewhat to exaggerate the current price of pine, since the amount paid nominally for 10,000,000 feet of pine may tacitly include 1,000,000 or 2,000,000 feet of other timber. On the other hand, if the minor woods are included in the statement of quantity, and one price is fixed for all, the increase of stumpage values is partly hidden. Spruce and tamarack are less valuable than white pine, and a price per thousand based on the full quantity of all would be lower than a price made for pine alone. These influences have been felt chiefly in recent years, because the minor woods were valueless before,

and did not in any way come into the reckoning. The masking of higher prices, however, by the inclusion of inferior woods in the count, is a phase of a process which goes on wherever the forests are depleted. Everywhere, as timber grows scarcer and values rise, smaller trees and poorer trees are counted in the estimates. The thousand feet which sells at \$5 now is often not so good as the thousand feet which sold at \$2 ten years ago.

The State of Minnesota has for many years sold timber from its State lands at public auction, and the records of its sales are of considerable importance in a study of the course of stumpage values. The table below covers all sales, except small lots below 100,000 feet, from 1880 to 1909. The table shows the total number of feet actually cut from the tracts sold each year, as scaled by the surveyor general, the aggregate sum paid therefor, and the average payment per thousand feet. For a part of the sales, the estimates made on behalf of the State before the sale, as well as the quantity of logs afterwards cut and scaled, are known. For these sales the official estimate of standing timber and the official scale of the logs, with the ratio between them, have already been given in Table 2, on page 50.

TABLE 52.—TIMBER SOLD BY THE STATE OF MINNESOTA, 1880-1909.

Year.	Scale in M feet.	Total price.	Average price per M feet.	Year.	Scale in M feet.	Total price.	Average price per M feet.
1880.....	19,508	\$28,625.02	\$1.47	1896.....	1,758	\$3,625.00	\$2.05
1881.....	14,808	24,026.00	1.62	1897.....	72,400	182,626.20	2.52
1882.....	21,808	34,249.70	1.57	1898.....	42,688	121,961.05	2.86
1883.....	28,012	40,700.17	1.77	1899.....	3,484	9,208.00	2.64
1884.....	6,602	14,045.92	2.11	1900.....	72,027	372,480.00	5.17
1885.....	5,213	9,013.25	1.73	1901.....	29,565	175,354.25	5.93
1886.....	48,095	100,834.42	2.19	1902.....	53,922	451,957.10	8.38
1887.....	44,701	104,868.57	2.35	1903.....	82,045	403,959.80	6.02
1888.....	31,002	80,280.25	2.54	1904.....	36,718	283,207.95	7.71
1889.....	56,407	122,650.75	2.18	1905.....	106,713	706,063.45	7.18
1890.....	65,653	148,019.60	2.25	1906.....	47,227	425,099.09	9.00
1891.....	102,809	412,251.75	2.14	1907.....	127,021	1,216,408.00	7.83
1892.....	73,351	138,894.80	1.89	1908 ¹.....	.....	.....	.....
1893.....	46,426	85,190.20	1.83	1909.....	37,026	278,744.50	7.53
1894.....	50,944	91,781.40	1.80	Total.....	1,361,118	5,321,884.44	3.91
1895.....	41,025	89,439.25	2.18				

¹ Including 490 M feet, estimated stand on one tract not cut, and the value of the same at the sale price, \$6 per thousand feet.

² No sales.

³ Including 31,485 M feet, estimated stand on tracts not cut, and the value of the same at the sale price.

The prices indicated by this table are subject to the same criticism as almost all other series of stumpage prices—that the thing valued is not continuously the same. Successive sales have covered timber farther and farther toward the remote north end of the State. At the

beginning of the period covered by the table, most of the timber sold was within 75 or 100 miles of St. Paul. In recent years much of it has been more than 200 miles from St. Paul. Till recently, nothing but white pine was counted. Now, Norway pine, jack pine, spruce, tamarack, and balsam are all counted, and all sold at the same price. This is nominally the price of white pine, but it must necessarily be affected by any considerable admixture of less valuable woods.

When the quantity sold in a year is small, the price is especially likely to be erratic. It may represent the special advantages or disadvantages of a particular tract. When the total quantity is large, the special circumstances of any single tract disappear in the general average.

The prices rose almost steadily from 1880 to 1888, receded till 1894, and made only a moderate gain up to 1899. The returns that year were \$2.64. The sales were very small, but the average price for the preceding year, with larger sales, was only \$2.86. In 1900, however, prices practically doubled, rising to an average of \$5.17, and from that time there has been a general upward movement. In 1906 timber which scaled 47,227 M feet was sold at an average of \$9. There was a slight recession to \$7.83 in 1907 and \$7.53 in 1909.

The prices recently obtained by the State have perhaps run higher than the prices obtained by small owners. The agents of the Bureau were repeatedly told by lumbermen that the prices of State timber were above those prevailing in the market. The State is a large owner, able to deal with large buyers on equal terms. Its timber is sold at public auction, after wide advertising. The prices it has received approximate what strong sellers have obtained from strong buyers, in the localities where the State has made its sales. They do not show the changes in the value of any one piece of timber.

Section 8. Stumpage values in western Montana, northern Idaho, and eastern Washington.

The important forest region in western Montana, northern Idaho, and eastern Washington produces timber wholly different from that of the Pacific coast. In Washington west of the Cascades the prevailing tree is Douglas fir. Along the east slope of the Cascades there is considerable Douglas fir mixed with western pine, but in northeastern Washington, in Idaho, and in Montana Douglas fir is of minor importance, the bulk of the lumber cut being western pine, white pine, and larch.

MONTANA.—The Big Blackfoot Milling Company bought the bulk of its timber from the Northern Pacific Railway, in 1899, under a contract which required it to take every forty on which the agreed estimate showed as much as 25,000 feet. The price was 50 cents a thousand. The estimates were so low that this meant probably not more than 30 cents a thousand for the actual product.

The Helena National Forest in Montana has been receiving \$5 to \$6 a thousand for piling, on the stump. This is for straight, perfect trees, 12 to 22 inches in diameter at the butt, and 35 to 40 feet long. The Big Blackfoot Milling Company was paying the Government \$3 and \$4 a thousand in 1909 for timber from the national forests, but complained that it could make no profit on it, because the price was too high, the scale was too close, and the requirements as to logging and piling the brush were too onerous; "piling the brush alone costs nearly \$1 a thousand."

These prices are doubtless somewhat exceptional. Yet the Forest Service obtained for Montana timber, during the fiscal year 1907-1908, an average of \$5.68 a thousand for 3,000,000 feet from the Yellowstone National Forest, an average of \$2.95 a thousand for 51,000,000 feet from Lewis and Clark, and an average of \$2.28 for 105,000,000 feet from all the national forests in the State.

The prevailing price secured in 1907 and 1908 by the State of Montana was about \$2.50 to \$2.75 a thousand, though as much as \$4.50 was obtained for some exceptionally well-located tracts. By a law of 1909 a minimum price of \$3 a thousand was fixed for timber owned by the State.

Both the Government and the State do much better than the small owners. The Big Blackfoot Milling Company, while it was paying \$3 and \$4 to the Government, paid from 50 cents to \$1.50 for small lots. With one other less important interest, this company dominated the lumber business of Montana, except in the far northwest corner. Occasionally a speculator would get together a tract of such size and such situation that the company wanted it; then a better price would be paid. For one round lot of 100,000,000 feet, exceptionally well situated for logging, the company did pay, in 1907, \$2.50 a thousand; but the president said in 1909 that this was the highest price it had paid except to the Forest Service.

One informant states to the Bureau that in 1897 he could have bought Northern Pacific timber on Thompson River, in Sanders County, now estimated at 870,000,000 feet, for \$151,000; and that on the Lolo, in Missoula County, estimated at 152,000,000 feet, for \$25,000. These prices are about 17 cents a thousand on the estimates. The 100,000,000 feet just referred to as sold by a speculator to the Big Blackfoot in 1907 at \$2.50 a thousand was on the Lolo, in Missoula County, in even numbered sections interspersed between the odd numbered sections of the Northern Pacific timber here spoken of. That tract, as noted, was exceptionally well located.

IDAHO.—The same informant stated that in 1897 he could have bought Northern Pacific timber in Idaho, now estimated at 700,000,000 feet, for \$70,000, which would be 10 cents a thousand on the present estimate.

In the middle part of Idaho, about the latitude of Lewiston, the situation is much the same as in the middle and southern part of western Montana. Two companies control the timber, each within a well-defined territory of its own. They do not compete with each other, and they have so far absorbed the timber that no one else can compete with them. Under these conditions, they were in 1909 maintaining a nominal price of about \$1 a thousand. The stumpage cost per thousand of actual product was likely to be much less, because the quoted estimates of amounts of stumpage were likely to be far below the truth. An agent of the Bureau saw the sale of one claim, estimated by the owner to contain 2,600,000 feet. The buying company's estimate of this claim was 3,100,000 feet, but it represented to the owner that its estimate was 2,250,000 feet. The claim was bought for \$2,350; a little more than \$1 a thousand, according to the buyer's statement to the owner, but about 75 cents, on the basis of the buyer's actual estimate. The seller afterwards told the agent of the Bureau that he had been offered \$3,150 for the claim four years before, but that only the one company would bid on it now, and he had to take \$2,350 or not sell.

In the extreme north of Idaho and the extreme northwest of Montana, somewhat higher prices are quoted than in other parts of the Inland Empire; in 1908, 75 cents to \$1.50 for larch and fir, \$1.25 to \$2.50 for western pine, and still more for white pine. A small company in the northernmost county of Idaho made purchases as follows:

Year.	M feet, esti- mated.	Average cost per M feet of estimate.	Year.	M feet, esti- mated.	Average cost per M feet of estimate.
1905.....	5,225	\$1.71	1907.....	20,975	\$2.20
1906.....	32,915	2.10	1908.....	5,465	2.00

Not quite half of these purchases included the land, and the rest covered timber only; but the prices were not apparently affected by the exclusion or inclusion of the land. The estimates were probably so low that the average payment per thousand feet of logs actually cut from the tracts purchased would hardly equal more than \$1.25 in 1905, and \$1.50 to \$1.70 in the later years. In 1909 this company paid the Government \$4 a thousand for white pine and \$2 for larch and cedar, and doubtless paid on a full scale. In that year one informant reported private timber selling as high as \$2.50 for tamarack, cedar, and fir; \$3 for western pine and spruce; and \$4 for white pine. These were nearly the prices the Government was getting, and were undoubtedly above the usual payments to small holders. One man sold an exceptionally fine and well-situated lot of 60,000,000 feet of western pine in the spring of 1909 at \$3.65. He considered

that the timber of the Inland Empire generally was not worth \$2 a thousand, on an average.

A tract of about 30,000 acres in northern Idaho was picked up in 1901 and 1902 at a total cost of \$240,000; sold in 1902 for \$900,000; and in 1909 sold for \$2,500,000, or more than ten times what it cost in 1901 and 1902.

EASTERN WASHINGTON.—One informant did not value the timber of Stevens County, which occupies the northeastern corner of Washington, at more than 75 cents a thousand. Others said that Stevens County timber could have been bought 10 years before for 25 cents a thousand, but would now cost from 50 cents to \$3, according to accessibility. Speculators have been picking up timber in that region at about \$1 a thousand. One exceptionally fine tract of white pine in Stevens County, 2,560 acres, estimated at 30,000,000 feet, was sold in 1908 for \$75,000, or \$2.50 per thousand on the estimate. The comparatively high price was due partly to the quality and the situation of the timber, and partly to the size of the holding, which gave it some importance. In Ferry County, next west of Stevens, one small company bought 20,367,000 feet of pine in 1906, at a total cost of \$20,272, or practically \$1 a thousand. The land went with the timber, and so did a considerable quantity of larch and fir, which was not considered in reckoning the price. All was in 160-acre claims, except one purchase of 320 acres. Nearly all was bought at \$1 a thousand on the estimate; probably equivalent to 60 or 70 cents a thousand, for the pine only, on the scale of the logs. In Stevens County the same company made purchases of small lots, from 1905 to 1908, amounting in the aggregate to about 100,000,000 feet, at prices ranging from about \$1 to about \$2 a thousand on the estimates.

The greater part of this timber is western pine. There are smaller quantities of larch and fir, a little white pine, and a little miscellaneous timber.

A tract of 60,000 acres in Stevens County was bought from the Northern Pacific Railway Company, in 1901, for \$127,500, and was sold in October, 1906, for \$500,000. The original purchasers estimated the timber at 310,000,000 feet. This was said to be double the Northern Pacific cruise, but was far below the estimate of the later owners. On this estimate the price of 1901 was 41 cents a thousand, and that of 1906 was \$1.61—nearly four times as much.

On the whole, the market value of any given tract of timber in western Montana, Idaho, or eastern Washington, taken at random, is perhaps likely to be 4 or 6 times as great in 1911 as it was in 1900; but those who gathered considerable holdings about 1900, by picking up small tracts at the prices then current for small tracts, might now, in some cases, sell for 10 or 15 times what they paid.

Section 9. Stumpage values on the Pacific coast.

WESTERN WASHINGTON.—So recently as the years 1902-1904, timber operators were still absorbing large quantities of timber in Washington which till then was owned by the United States. Under the timber and stone act alone, nearly 600,000 acres in the State were taken during those three years. Men used to take up 160-acre claims, and pay the Government \$2.50 an acre, or \$400 per claim. Some purchasers got 10,000,000 feet or more; and in such cases the cost was 4 cents per thousand feet or less. Most of the claimants sold their lands to speculators at from \$600 to \$1,500 per claim. For instance, in 1891 a speculator bought 160 acres in King County for \$800. He estimated that it contained between 7 and 9 million feet, of which half was cedar. He held it till 1909, and sold it for \$18,500. So late as the years from 1903 to 1907, a tract of 8,000 acres, in Clallam County, west of Puget Sound, was picked up from claimants at an average cost of about \$1,220 per 160-acre claim, or a total cost not far from \$61,000. The timber was estimated in 1907 at 472,000,000 feet. The cost to the speculator, on this estimate, was a fraction under 13 cents a thousand. The tract was sold, in June, 1907, for \$200,000, and soon after the speculator had closed this bargain he received an offer of \$280,000. The price he sold at was 42 cents a thousand on the estimate; the price afterwards offered was 59 cents.

In general, the less accessible timber has sold in recent years at from 50 cents to \$1 a thousand, but most of the tracts which go at such prices are small. What gets into the hands of the larger owners is likely to stay there till it commands more. One company bought a holding of 100 million feet, 25 or 30 miles southeast of Tacoma, in 1907, at \$1 a thousand, and about the same time picked up 18 million feet in small lots at an average cost of 81 cents. The Milwaukee Land Company, which made very extensive purchases of inaccessible timber about the same time, buying almost exclusively from small owners, is understood to have paid an average price of about 80 cents. Mr. George S. Long, manager of the Weyerhaeuser Timber Company, stated in a public hearing before the Pierce County board of equalization, in August, 1908, that the Milwaukee company had "purchased in 1906 and up to September, 1907, six billion feet at less than 80 cents."

Small lots, in accessible situations and for immediate cutting, have sold in the general market during the last three or four years for about \$2 a thousand. Probably not many small holders have received more. The larger owners, however, have got \$2.50 or more for fairly accessible tracts.

In April, 1910, Mr. George S. Long, manager of the Weyerhaeuser Timber Company at Tacoma, published some comments on the rise

of timber values. The occasion was the report of a legislative committee on the disposition of timber lands belonging to the State of Washington. Mr. Long said:

The case is cited of three quarter-sections of land purchased by the Weyerhaeuser interests in section 16, township 16 north, range 5 east, being a total of 480 acres, sold [by the State] in June, 1901, at public auction for \$7,087.50. * * * During the years 1900 and 1901 the Weyerhaeuser interests were offered and purchased from the different homesteaders and claimants in that township an aggregate of 4,751 acres, which cost on an average \$11.17 an acre. At the same time the State lands referred to above were advertised for sale, and the Weyerhaeuser interests purchased them at an average price of \$14.76 an acre. It is apparent from this that the State got at least \$3.50 an acre more for the lands which it sold than did the various 35 or 40 people who sold other lands immediately surrounding the State lands in the same township and at the same time.

In the year 1900 township 16 north, range 5 east, which is near Eatonville, was a remote and inaccessible region so far as transportation was concerned, and since then the Tacoma Eastern Railway has been built within a few miles of this township, which makes it available for an early operation.

Not only were homesteaders and timber claimants selling timberland at low figures 10 years ago, but everybody else who was selling timberlands and anything else in Washington. As an illustration, the London and San Francisco Bank, one of the richest corporations engaged in the banking business at that time on the Pacific coast, sold to the Weyerhaeuser Timber Company, in the year 1900, 10,000 acres of choice timberlands near Centra, Wash., at an average price of \$9 an acre, and were exceedingly glad to have the opportunity to make the sale.

Ten years ago the so-called Tower-estate lands, consisting of about 40,000 acres, situated largely in Lewis and Cowlitz Counties, were offered for sale at \$8 an acre and found no takers. These prices seem ridiculously low in the light of recent events.¹

The timber in township 16 north, range 5 east (the first piece mentioned), probably runs about 70,000 feet to the acre, and the second piece, purchased from the London and San Francisco Bank, probably runs about 50,000. On these estimates, the State land referred to cost the Weyerhaeuser interests about 21 cents a thousand; the homesteads and claims, an average of about 16 cents; and the London and San Francisco Bank purchase, about 18 cents.

As far back as 1882, \$20 an acre was paid for a tract of about 2,250 acres in Wahkiakum County, near the Columbia River. The tract was held till the spring of 1909, and then was sold at \$3 per thousand, on an estimate of about 50,000 feet to the acre, making the price per acre about \$150. On the estimate of 1909, the price paid in 1882 was about 40 cents a thousand.

¹ Mississippi Valley Lumberman, Apr. 22, 1910, p. 24.

All these reports relate to the region west of the Cascade Range, where far the greater part of the timber of Washington lies. Some timber, however, stands on the eastern slopes of the Cascades. This runs largely to pine; the Douglas fir is much less important east of the mountains. In Klickitat County, on the southern border, a tract of 46,000 acres, containing 500 million feet or more of western pine, was offered in the fall of 1909 for \$675,000; about \$14.65 per acre, or \$1.35 per thousand feet. Farther north, in Kititas County, a lumber company began operations in 1902, and its stumpage up to 1906 cost less than \$1 a thousand. It has since paid much higher prices; as much as \$3.25 a thousand for a quarter section on the headwaters of the Yakima River. But—as illustrating the differences of value which result from small differences of location—it refused in the spring of 1909 to pay more than \$600 for a quarter section, estimated to contain 2,700,000 feet of timber, and lying in the same township with the quarter for which \$3.25 a thousand was paid, and only 3½ miles from the stream. Six hundred dollars for 2,700,000 feet is 22 cents a thousand. The owner refused the offer, but he would have sold for \$900, or 33 cents a thousand. In explanation of the great difference of price between two tracts a few miles apart, the company says that the first quarter was logged at a cost of \$2 a thousand feet, while it estimates the cost of logging the second quarter at \$7 a thousand.

It is a common statement of timbermen on the coast that the value of stumpage trebled in 10 years from the later nineties, and about 15 cents a thousand is given as the prevailing value in the eighties. The weight of evidence indicates that the increase in 10 years ending about 1907 averaged more than threefold. Many specific instances could be cited where the advance was tenfold or more. One company paid \$110,000 in 1909 for a section which was sold about 10 years earlier for \$10,000. Another sold six claims in 1900 at \$1,000 each, bought them back in 1907 at \$15,000 each, and sold them again in 1907 at \$16,000 each. In 1900 the Northern Pacific sold a section, estimated to contain 32,000,000 feet, for 37 cents a thousand, or \$11,840. In 1907 this section sold for \$115,000.

In many instances the later prices are based on much larger estimates than the earlier. The earlier estimates disregarded a large part of the stand. Hemlock was not counted at all till within six or eight years. In the eighties no tree of any sort was counted that did not measure 18 or 20 inches in diameter at 20 feet from the ground. Nothing smaller was scaled at the mills. No log above the first limb was considered, and trees even slightly defective were thrown out. In some places the timber was nearly all mature; here the difference between former and present estimates may be comparatively small. In other localities there is much "sapling" tim-

ber; and here the old estimates may be doubled or trebled. One informant states that he sold a tract of 250 million feet in Whatcom County, in 1896, at 10 cents a thousand, and that a present-day cruise would be more than double that which he sold on. An old cruiser for the Northern Pacific states that, in the Puyallup region in Pierce County, the maximum cruise to the forty in 1888 was 400,000 feet; now it is 1,000,000 to 1,200,000 feet. He cites, as an exceptional instance of this increase, a section in Pierce County, which he cruised for the Northern Pacific in October, 1888, at 1,480,000 feet, and for the county in 1908 at 17,041,000.

The great Weyerhaeuser purchase.—The course of timber prices in Washington shows well the effect of "strong hands." One of the most spectacular events in the timber history of the country was the purchase of Northern Pacific timber lands by the Weyerhaeuser Timber Company. The Weyerhaeuser company was organized for the very purpose of holding timber for the speculative profit to be gotten out of it. Not that it refuses to sell; but it holds a stiff price, and its usual policy is to sell only to mills for present cutting. It is strong enough to reserve all speculative profit for itself.

The big purchase was made in 1900, and the price understood to have been paid was equivalent to about 10 cents a thousand for the lumber which the holding will actually produce. Mr. F. B. Lynch, a well known timberman of St. Paul, made the following statement at the tariff hearings before the Ways and Means Committee, November 20, 1908:¹

We were offered the timber that the Northern Pacific Railroad sold to the Weyerhaeuser people—I do not say we were offered it, but we put in a bid for it and the Weyerhaeuser people got it—and the price of that timber, on the Northern Pacific estimates, was less than 20 cents per thousand.

The Northern Pacific estimates do not, upon the whole, exceed half the output, and a price of 20 cents on those estimates would not exceed 10 cents on the actual product of lumber.

It is universally agreed that the Weyerhaeuser purchase was followed by a marked increase of timber prices, and that this great holding exerts a continuous stiffening effect upon the market. A large holder in Chehalis County says that only the most accessible timber there would have brought \$1 a thousand, and a great deal would have brought nothing, up to 1900, when Mr. Weyerhaeuser made this great purchase. "This caused the stumpage in the county to have a value." Another prominent man in the Gray's Harbor country says:

Prior to the time the Weyerhaeusers came in here about 10 years ago, when they purchased the Northern Pacific Railway

¹ Tariff Hearings, 60th Cong., p. 862.

lands, a large amount of the stumpage had no value at all. Only the most accessible timber would bring \$1 per thousand. Weyerhaeuser purchased from the Northern Pacific Railway at 10 cents per thousand. This caused the stumpage in the county to have a value, and in five years the average value of stumpage was \$1 per thousand feet. During the last five years it has steadily increased until the average value is now \$2.50 per thousand feet.

OREGON.—A large holder of Oregon timber, who has bought about 150,000 acres in the State and who says that he has paid out over \$40,000 for the mere cruising of his land, makes the following statement:

There was a general depression in the price of timberlands from 1896 to 1900. During this period values remained constant and were very low. About 1900 values began to rise and have constantly advanced since that time. The price of stumpage land in Oregon depends greatly upon its location; for example, that part of Oregon known as the Columbia River district and that part in the interior of Oregon known as the Willamette Valley. There is also a large district around Coos Bay. The most rapid advance has been in the Columbia River district, where a number of mills are located and the supply of timber has been rapidly exhausted. Ten years ago timber could be obtained at 75 cents per thousand feet, and on the same cruise at the present time this timber could be sold at \$2.50 per thousand feet. I believe that these figures are quite conservative. In the Willamette Valley 10 years ago timber could be purchased at from 30 to 35 cents per thousand feet, and to-day on the same cruise it would be worth \$1 per thousand feet. When I speak of the timber in the Willamette Valley I mean that timber which is distant from a railroad and for which at the present time there is no outlet. Around the Coos Bay country 10 years ago timber could be purchased at \$1.65 per thousand feet, and on the same cruise it could to-day be sold at \$3 per thousand feet.

The change of values during the last 5 or 10 years has probably not been exceptionally great in the immediate vicinity of the Columbia River. There logging began earliest, and there stumpage first attained a substantial value. Back from the river, even in the river counties, timberland had little value till after 1900. In the southwestern part of Columbia County, the second river county from the ocean, the best timberland is said to have sold about 1902 at an average of \$10 an acre, or about 20 or 25 cents per thousand of estimated stand. By 1908 this timber was selling at \$1 a thousand.

In the southern part of Clatsop County, which borders the river at its mouth, one informant thinks that values have multiplied by 20 since 1897. In those days, it is said, plenty of 160-acre claims, with more than 11,000,000 feet of timber apiece, could be bought at \$500, and many sold for less. Up to about 1903, 160-acre claims usually sold for

\$800 to \$1,200. In 1907 a company bought 36 claims, mostly of 160 acres each, in the southwestern part of Clatsop County, at from \$2,000 to \$4,000 per claim, or \$12.50 to \$25 an acre. The prices per thousand feet of timber, as estimated, ranged from 30 cents to 50 cents, with an average of 40 cents. This tract, though near the sea, is not accessible to the river nor to any good means of transportation. Another tract in this county, 6,040 acres, was sold about May 1, 1910, for \$500,000. The seller estimated the timber at approximately 350,000,000 feet, and considered that he received about \$1.40 a thousand. He bought the tract in 1907, at 65 cents a thousand, of a somewhat lower estimate.

A holder in the next county south of Portland names the following ranges of value:

1898.....	Per M feet.
1904.....	\$0.10-\$0.50
1908.....	1.00- 1.50
	2.00- 2.50

These prices, he adds, apply to good large bodies of timber, well located. Small bodies could have been bought for much less, at any time during the 10-year period.

Comparisons of prices per thousand give an inadequate idea of the actual rise in value of timberlands, because of the "safe" or "conservative" character of the estimates, and especially of the earlier ones. A tract in Clatsop County, estimated at 300,000,000 feet, was bought about 1899 for \$500,000. The buyers have now been cutting from it for several years. By 1909 they had cleared more than \$500,000 from it, over and above all expenses, and they then estimated that they had at least 300,000,000 feet of timber left. A tract of 5,425 acres, assembled from claim holders at about \$700 per 160-acre claim, or for about \$24,000 in all, was estimated in 1892 at 60,000 feet to the acre. In 1907 it was estimated at 90,000 feet to the acre, and was sold for \$460,000.

A tract of about 3,500 acres, in Washington County, the next county west of the city of Portland, was assembled from the claim holders in 1896 at about \$800, or in a few cases as much as \$1,000, per 160-acre claim. In 1906 it was sold at \$65 an acre, \$10,400 a claim, on an estimate of 60,000 feet per acre. In 1908 it was sold on an estimate of 87,000 feet per acre, at \$1.25 a thousand. The last sale was at the rate of \$108.75 an acre, \$17,400 a claim.

A tract of a little more than 9,000 acres, in Tillamook County, west of Washington County, was assembled from the claim holders prior to 1892. In 1892 it was sold for \$23,000. In 1906 it was sold for \$255,000. In 1908 an offer of \$500,000 for it was refused.

In Marion County, the second county south of Portland, a tract of 19,600 acres was bought in 1900 at \$8 an acre, and sold about 1903 at

\$24 an acre. The estimated stand was 1,500,000,000 feet, or about 76,500 feet per acre. On this estimate, the price per thousand was about 10 cents in 1900 and about 31 cents in 1903. A tract of 9,000 acres, in Clackamas and Marion Counties, was bought in December, 1906, at \$27 an acre, and sold in 1907 for \$750,000, or about \$83 an acre. The timber was estimated at 1,000,000,000 feet. On this estimate, the first price was 24 cents a thousand, and the second was 75 cents.

In Lane and Douglas Counties, in the southerly half of western Oregon, fir and cedar are said to have been worth 10 cents a thousand, or less, in 1898, and 50 cents to \$1, according to location, in 1908. The Bureau's record of sales in 1909 and 1910 covers prices from 50 cents to \$1, on the basis of estimated stand. One informant says that the general price was \$1.25 an acre for school lands and \$2.50 an acre for other land in 1898, and that in 1908 the price ranged from \$12 to \$30 an acre, according to location and natural advantages. A tract of 36,000 acres, bought in small lots from 1901 to 1903 at prices ranging from \$6 to \$10 an acre, was sold about the beginning of 1907 at \$20 an acre.

East of the Cascade Range, most of the timber will be inaccessible till railroads are built to it. Its value is therefore speculative, and ranges from \$1 a thousand down. In the Blue Mountain region, particularly in Grant County, the average price of timber 50 miles from a railroad was given in 1908 as 75 cents a thousand.

CALIFORNIA.—In California the bulk of the lumber cut is furnished by the several species of pine in the interior, and by redwood on the coast. The pines rank considerably higher than fir in the lumber market, and redwood ranks somewhat higher than fir; but only part of the difference appears to be reflected as yet in the prevailing prices of stumpage.

In the extreme northeast, where transportation facilities are lacking, prices have continued very low. One of the highest prices reported from that region is \$6.75 an acre, paid in 1904 or 1905 for a tract of 47,000 acres, estimated at 14,000 feet per acre. One company, whose holdings are estimated to average 16,000 or 17,000 feet to the acre, bought them between 1905 and 1908 at an average cost of \$5 an acre, or about 30 cents a thousand. This land is said to have been worth practically nothing before 1900. Five dollars an acre is said to have been the price most commonly paid in assembling one of the largest individual holdings in the country, which lies in northeastern California.

Somewhat similar conditions are reported from the more southerly parts of eastern California, in or near the Sierra Nevada. A tract near the Yosemite, 160 acres, estimated to contain 4,000,000 feet, three-fourths pine, was bought in 1908 for \$700, or 17½ cents a thousand. Other recent purchases are reported at 25 and 30 cents

a thousand. One tract of about 20,000 acres, however, estimated at about 50,000 feet per acre, in Tuolumne and Mariposa Counties, was assembled in 1900 at an average cost of \$18 an acre, and sold in 1905 at \$35. A railroad has now been built near this land, and an offer of \$100 an acre has been refused for it. These prices are about 35 cents, 70 cents, and \$2, respectively, per thousand of estimated stand.

The prices of 25 and 50 cents a thousand are for timber which is at present inaccessible, and which is not likely to be reached by railroads, so far as the public knows, for many years. One company reports paying \$1 a thousand for timber in Calaveras County, south-east of Sacramento, easily accessible to their mill but hard to log. This company paid \$6 an acre in 1902, or 30 cents a thousand, for land estimated at 20,000 feet to the acre. Some of this company's land was bought in 1882 at \$2 and \$2.50 an acre. A holding of 25,000 acres in Calaveras County was sold during 1909 at \$25 an acre. The average stand per acre is put at 20,000 to 22,000 feet; and about 30 per cent of the timber is sugar pine—one of the most valuable species on the Pacific coast—about 45 per cent yellow pine, and only about 25 per cent the less valuable fir. Other owners in the same part of the State bought land which they estimate at 30,000 feet per acre, in 1893, at \$6 an acre, equivalent to 20 cents a thousand. They doubt whether the land could have been sold during the following 10 years for what they paid. So late as 1903 they bought additional tracts as grazing land; the timber was hardly valued. From 1903 to 1908, they say, the value trebled.

In the northern part of the valley east of the Coast Range, near the railroad which comes down from Oregon, somewhat higher prices prevail. One company reckons its timber at \$2 a thousand, on an average. Another, whose timber is fairly accessible, values it as follows:

	Per M feet.
Red fir.....	\$1.00
California white pine.....	1.50
Sugar pine.....	2.00
Average, all species.....	1.40

Timber must apparently be near a railroad to bring \$2 a thousand. In some parts of Trinity County, a region without railroads, mountainous, and bounded on the east by the crest of the Coast Range, purchases were reported in 1909 as low as \$6.50 per acre.

Some informants near national forests say that the local price of timber is largely determined by the price the Government charges. One, in Placer County, says that before the establishment of the national forests in that region the value of timber was \$1 or \$1.50 a thousand; but the Forest Service has fixed its prices at from \$1.25 to \$4, and private owners will not take less than the Government is

charging. Others, in Placer County and in Nevada County, next north, make similar statements. In the general upward movement, however, it is not possible to determine how much effect the Government's example may have had on the ideas of other holders or of buyers. A company which owns 8,000 acres in Placer County within the national forest, valued its property at \$17.50 an acre in 1908, and said that it began buying in 1901 at \$5. This is not a greater increase than appears in many places where no special governmental influence is alleged.

In the redwood belt, on the coast above San Francisco, values perhaps trebled or quadrupled in 10 years. Nominal prices ranged in 1908 from \$1.50 to \$3 a thousand, according to character and accessibility. The usual figures 10 years earlier seem to have ranged from 50 cents to \$1.

A redwood tract of about 30,000 acres, in Del Norte County, was sold in 1898, on an estimate of at least 100,000 feet per acre, at an acre price of \$55. The actual stand is probably about 150,000 feet per acre. The price paid in 1898 was about 50 cents a thousand on the 1898 estimate, but materially less on the actual stand.

A holding of 30,000 acres in Humboldt County was assembled about 1902 to 1904, at from \$8 to \$20 an acre, and is now held at \$150 an acre. It must be remembered that in the redwood belt the average stand per acre is enormous. The holding in question will probably average 100,000 feet of redwood to the acre.

Another 30,000-acre tract, in the northern part of Humboldt County, is said to have been sold about 1900 for \$77.50 an acre, or approximately \$2,325,000. In 1907 it sold for \$4,000,000. At that time the sellers considered that they were getting \$2 a thousand for the redwood. The buyer's cruise, however, showed that there was at least 3,500,000 feet of redwood on the tract, and the true quantity is undoubtedly much greater. The price made in 1907 did not amount to \$1 a thousand for the true quantity of redwood; and there is some fir besides, of which no account has been taken. The present owners value the tract at \$350 an acre, or about \$10,500,000; more than two and one-half times the price of 1907, and more than four times the price of 1900.

A holder of about 18,000 acres in Humboldt County, which he estimates, roughly, at 35,000 feet per acre, valued it at \$40 to \$50 an acre in 1909, and said that its value 10 years earlier was about \$12 or \$15.

Another holder, in Mendocino County, having now a much larger acreage but a much lower average stand, bought so early as 1884 at from \$7.50 to \$12.50 an acre, and so late as 1905 at from \$10 to \$30.

Section 10. Summary view of the rise of stumpage values.

Taking the rise of stumpage values as a rate per cent per annum, it is likely to be greatest when a new region or a new species is just beginning to attract attention. When timber is selling by the acre at rates equivalent to 10 cents a thousand, it may rise almost at once to 50 cents a thousand. The increase on each thousand feet in such a case is unimportant; yet it is an advance of 400 per cent. When the price has reached \$2 a thousand an advance of 400 per cent would carry it to \$10.

As has been shown above (pp. 175-176), it is not possible to say definitely that the value of stumpage in general is so and so, or that it has advanced at such and such a rate. Different regions differ wholly from each other in both respects. So do different species in the same region. Moreover, even comparatively small differences of location, affecting the cost of logging, may cause wide differences of value between tracts otherwise similar. Finally, prices are affected in a surprising degree by the mere circumstances of buyer and seller. If the owner is dependent on a single buyer, the price may be very low; if he is independent, either through competition among buyers or through ability to cut his timber for himself, the price is likely to be relatively high.

Only in a very rough way, therefore, is it possible to state what the rise of stumpage values has been. The following paragraphs indicate, on the basis of the information gathered by the Bureau, the commonest rates of advance in the several regions of the investigation area during about 10 years ending with 1907 or 1908. From the depression of 1907 up to a very recent time the changes of stumpage value are believed to have been in general comparatively small.

SOUTHERN PINE REGION.—The investigation of the Bureau indicates that the value of a given piece of southern pine, taken at random, is likely to have increased in any ratio from threefold to tenfold during the 10 years from 1898 to 1908. Some instances of greater increase are quoted above (pp. 195-196), and some informants named a greater increase than tenfold as normal in their vicinity. The greatest relative advance is likely to be found in timber whose value at the beginning of the period of comparison was very small. This includes both the less desirable species, like gum, which hardly had a market value till after 1900, and the less accessible tracts of pine. Some tracts which sold by the acre in the nineties, at prices equivalent to 10 or 15 cents a thousand feet, have advanced twenty-fold or thirtyfold in 10 years.

LAKE REGION.—The general ratio of advance of timber values during the last 10 or 20 years has probably been rather less in the Lake States than in the South, because the Lake States had in the nineties a smaller proportion of timber which was not immediately

available for the market. Perhaps the advance of any given tract, taken at random, in 10 years from 1898 was most likely to be between twofold and fivefold. In some localities much greater changes are reported.

PACIFIC-NORTHWEST.—In the Pacific-Northwest, where much timber could be bought even in the late nineties at a few cents a thousand, there are many instances of enormous relative advance; advances which seem impossible when stated in percentages. It may be said here, as in the Southern Pine Region, that a tract taken at random is likely to have increased in any ratio from threefold to tenfold during the 10 years ending in 1907 or 1908. The proportion of advances at extraordinary rates per cent is probably greater on the Pacific slope than in the South.

While, therefore, it is impossible to express in absolute figures, or even approximately, the extent of the advance in stumpage values in recent years, the evidence presented in this chapter shows that this advance has almost invariably been marked and has frequently been enormous.

Section 11. Agitation for higher prices of standing timber.

In addition to the great increase in stumpage values which has already taken place, as shown in the preceding sections, there can be little doubt that for a large part of the timber supply, particularly in the great Pacific-Northwest, a further great increase will be realized as the amount of timber is diminished and as demand increases with increasing population. It would, of course, be wholly speculative to attempt to forecast the probable future of timber prices, even approximately. As an illustration of what is being advocated among timber owners, and some foresters as well, it is important to point out that there appears at the present time to be something approaching a propaganda to the effect that the price of stumpage should equal the cost of growing trees. When it is considered that much of the virgin timber available for market to-day has required scores, and in some cases hundreds, of years for its growth, and, furthermore, that such virgin stands are at the present time the free gift of nature, the idea of seriously advocating a price for such timber in the near future equal to the cost of raising it seems almost incredible. Nevertheless, it is advanced by responsible men, who must, from their position, be regarded as in some measure representing the lumber industry, especially as such arguments have been published and distributed by trade associations. It is therefore necessary to treat this idea seriously.

Such a price for timber was not conceived of, apparently, until a few years ago. The notion seems to have been first conceived by certain enthusiastic "conservationists," who, very likely, had no

selfish interest in advocating higher prices. The idea was a new one to the timbermen, and at first it apparently surprised them. One of them, while admitting the desire of timbermen for all they could get, said that they "would not ask for so much as that." But the idea spread, and by November, 1909, a prominent lumberman had reached the point of saying in a public address delivered before the Lumbermen's Club of St. Louis:¹

Below the cost of production there can not be any trust that is injurious to a community or that is morally or economically wrong. * * * It is a positive sin against posterity for a lumberman to sell his lumber at less than the cost of growing the trees or less than some good competitive substitute can be produced for. Any law and any trust that will prevent a man cutting and selling timber below the cost of reproducing it and a reasonable added profit, is a good law and a good trust for the people.

This speaker actually proposed a law to keep timber owners from selling below the limit indicated, one of the provisions of which was to be as follows:

If the timber cut and removed is being sold at less than cost of reproduction, it shall be *prima facie* evidence of intentional violation of this act, and the difference between the price obtained and the cost of reproduction, to be estimated and ascertained according to the best available methods, shall be the measure of damage to be assessed and collected, as all fines and penalties are adjudged and collected for other misdemeanors.

It is difficult to believe that timbermen generally would support any such extraordinary suggestion as this for an actual law of this character, and it is not here presented as fairly reflecting the drift of sentiment among lumbermen but as a matter of sufficient interest to warrant mention.

Again, Mr. R. S. Kellogg, secretary of the Northern Hemlock and Hardwood Manufacturers' Association, said in 1910:

For the benefit of my good friends among the lumbermen of the United States, I should like to paint a rosy new year of strong demand and satisfactory prices for that product—a year in which yellow pine, Douglas fir, and hemlock would cease to compete, and each be marketed on the basis of its own intrinsic value; * * * a year in which forest conservation would become a reality, because timber brought a price at which it could be grown.²

The idea of a price for stumpage equal to the cost of production apparently rests on the proposition that the natural supply of virgin timber is diminishing, and that when it is gone there will be no sufficient new supply unless measures are taken to raise timber; but

¹ J. B. White, address before the Lumbermen's Club of St. Louis, Nov. 9, 1909.

² "Some Christmas Reflections," by R. S. Kellogg, in *The Southern Lumberman*, Dec. 24, 1910, p. 73.

that such measures are not likely to be taken unless the price of timber is immediately made high enough to cover the cost of raising it.

One simple answer is this: The planting of trees to-day for sale fifty or seventy-five years hence is not determined by the price of timber to-day, but by what men think the price likely to be when the time comes to cut. To induce men to plant, it is not necessary to pay to the owners of the present natural supply what it would have cost to grow that supply by human labor. It is only necessary that men believe that by the time trees now planted mature the natural supply will be so far exhausted that there will then be a demand for the planted timber at rather more than the cost of raising it.

A more complete answer should, however, be given; and for this purpose, since the high price of timber is advocated as a conservation measure, it should first be considered what public end the conservation or cultivation of timber ought to serve. The end is often formulated in such terms as these: To prevent the exhaustion of our timber supply. This is not quite accurate. A literal and complete exhaustion of the timber supply is impossible. There will always be some timber, and it will always be possible to buy lumber. The thing to fear is not total absence of lumber, but high prices for it. The rational purpose of measures of planting or preservation, from a public point of view, is to keep the price from rising unnecessarily high.

But the proposal now brought forward in the name of conservation is a proposal deliberately to hasten the evil which conservation ought to moderate—the evil of excessive prices.

If, in connection with the marked and increasing concentration of timber ownership set forth in this report, the idea is to be inculcated by and among timbermen that prices should as rapidly as possible be carried to the cost of reproduction, it is obvious that this is a matter of grave concern to the consumer of lumber. Even without any effort to inculcate such a theory of timber prices, it is apparent, as already stated, that a further great advance in stumpage values is to be expected. Owing to the fact that not only the largest holders, but even the smaller holders, are aware that they possess a natural resource which is diminishing in quantity, there is a strong tendency for the owner of timber to await higher prices. If this natural tendency toward higher prices is to be accelerated by the spread of such a propaganda as that above described, and further fortified by increasing concentration of ownership, it is obvious that unreasonable prices for timber are exceedingly probable.

The situation clearly calls for serious consideration by those responsible for legislation or administration affecting this important

natural resource. It would appear that the Government is in a position to modify very substantially what might otherwise be the logical result of present conditions of timber ownership. In this connection, the proper policy to be adopted in respect to the cutting of the Government's present stand of timber (about one-fifth of the country's total supply) becomes a matter for careful consideration; and much may be accomplished in this direction. In the matter of timber culture, the Government's advantage is greatly increased because of its ability to borrow capital on more advantageous terms than even the most favorably situated private owner, while its ownership of large areas of land adaptable to timber culture, and which may be regarded as involving practically no investment, gives it further and marked advantages.

CHAPTER VI.

PUBLIC-LAND POLICY A PRIMARY CAUSE OF CONCENTRATION OF TIMBER OWNERSHIP.

Section 1. Introductory.

The marked concentration of ownership of timber in this country discussed in preceding chapters has resulted primarily from the public-land policy of the Federal Government. That policy has either directly facilitated, or failed to prevent, the tendency of this limited natural resource to become more and more concentrated in ownership as its future value was understood. It is not intended here to trace the development of the land policy fully nor in its historical sequence. But it is important to set forth its principal features in their bearing on the concentration of timber ownership. This is necessary to an understanding of how the significant conditions revealed in foregoing chapters have come about. More important still, a clear insight into the results of the land policy thus far pursued is necessary to a wise settlement of questions of the first magnitude now before the country, involving its natural resources.

The land legislation which has been especially responsible for the present concentration of timber ownership may be divided into two classes: (1) Land grants: Special grants for railroads, wagon roads, canals, and river improvements; and general grants to States for educational purposes, drainage, internal improvements, etc. (2) General land laws: The cash-sale law, the scrip and warrant acts, the preemption and homestead laws, and the timber and stone law. These grants and general laws, loosely drawn and loosely administered, were direct causes of the concentration of timber ownership now existing. In considering them to-day, account should be taken of the different conditions or peculiar exigencies existing at the time of their enactment. But a study of the practical result of these statutes is of importance in administration and in new constructive legislation affecting the public domain.

LAND GRANTS.

Section 2. Extent of land grants for railroads, wagon roads, canals, and river improvements.

By far the most important feature of the land policy in its effect on concentration of timber ownership was the Federal legislation making

grants for railroads and other means of transportation. The three largest timber holdings in the country, as will be fully shown below, are wholly or largely based on railroad grants.

The total amount of public lands granted by the Government for railroads, according to a recent estimate of the General Land Office, was 190,000,000 acres, or more than one-eighth the area of the "public-land States"; i. e., the States in which the public lands were at the disposal of Congress.¹ Of this, some 35,000,000 acres were subsequently forfeited because of failure to construct the railroads, leaving, however, no less than 155,000,000 acres as the estimated area of the unforfeited grants.

Up to June 30, 1910, the immense total of 113,660,000 acres had been actually patented to railroads under their grants. This is practically the equivalent of the entire land area of Pennsylvania, Ohio, Indiana, and Illinois. In addition, many million acres will be available for patent under some of the grants that are still in the process of adjustment, notably the Northern Pacific, Southern Pacific, and Santa Fe; but the exact amount can not be determined in advance.

The figures above cover only the Federal land grants. They do not include grants made by the State of Texas, which controlled its own public lands, and which has patented to railroads 32,400,000 acres.² Thus, for the whole country, the total of land subsidies actually received by railroads up to 1910 from the Federal Government and from Texas is 146,060,000 acres; and the estimated area of Federal railroad grants pending adjustment is 41,340,000 acres, the greater part of which will probably ultimately be secured by the railroads. Besides, the Federal Government has patented approximately 8,990,000 acres for wagon-road, canal, and river-improvement companies—2,987,000 for wagon roads, 4,598,000 for canals, and 1,405,000 for river improvements.

These enormous totals do not include large railroad, wagon-road, and canal grants made by individual States out of land which they had received from the Government, not only under the internal-improvement act, but also under the swamp-land act. Some account of these grants is given on pages 253-254.

USUAL FORM OF RAILROAD GRANTS.—In most of the Federal railroad grants Congress gave, within a "primary limit" extending a certain number of miles on either side of the road when it should be definitely

¹ The public-land States are Wisconsin, Michigan, Illinois, Indiana, Ohio, Mississippi, Alabama, Florida, and all the States west of the Mississippi River except Texas. The area of these States is 1,442,200,320 acres. Alaska, though a public-land Territory, is excluded from the calculation given above.

² This does not include 1,431,000 acres recovered by the State for failure of the railroads to comply with the conditions imposed. An interesting feature of the Texas law is the requirement that the railroads alienate half of the granted lands within six years and all of them within twelve years of the date of patent. Among the more important railroads to which Texas granted lands were those now forming the Southern Pacific; the Texas and Pacific; Gulf, Colorado and Santa Fe; Houston and Texas Central; Missouri, Kansas and Texas; International and Great Northern; and St. Louis Southwestern.

located, alternate sections (640-acre tracts) of such lands as had not already been disposed of, reserved, or otherwise appropriated or excluded from the grant. Furthermore, in order to indemnify it for "loss," within such "primary limits," of lands disposed of, or reserved, or mineral lands excepted from the grant, the railroad was usually allowed by Congress to select an equal acreage in the alternate sections of an "indemnity strip"—commonly 5 or 10 miles in width—on each side of the primary limits, provided such equal amount of available acreage could there be found. In the case of certain canal grants an absolute number of acres was conferred, but this was not true of railroad grants. In practically all railroad grants the possible maximum that could be secured was the amount in *alternate* sections within the *primary* limits. In many cases it has proved that the acreage not available within the primary limits (commonly spoken of as "lost") was greater than the grantee could find available in the indemnity strips under the terms of the grant, owing to the fact that much land had been taken up by settlers or other owners, or reserved. But it should be clearly understood that there is really no such thing as loss by the railroad, since the acreage actually granted was only that part of the possible maximum which could be found available within the fixed limits and terms. That is, just as soon as a railroad has received its patent to the last piece of land available to it within the limits and restrictions set, it has received the total amount of its actual grant, even though that total may fall far short of the possible maximum had all the alternate sections within the primary limits been available for railroad selection. It can not be said that any lands are still due such a railroad.

It may be added that lands retained by the Government within the primary limits, i. e., the sections intervening between the railroad lands, were not subject to sale for less than \$2.50 per acre, which was double the minimum price of Government lands outside those limits.¹ The purpose of this was that the Government, after giving the railroad half the sections, should get as much for the remaining half as it would otherwise have got for the whole. By the act of June 15, 1880 (21 Stat., 237), the price of such of these lands as had been on the market since 1861 was reduced to \$1.25 per acre.

MAP OF FEDERAL GRANTS FOR RAILROADS AND WAGON ROADS.— Opposite page 222 is a map showing the limits within which land grants were made by the Federal Government to aid in the construction of railroads and wagon roads. The purpose of this map is to illustrate forcibly how far Congress went in its policy of land subsidies for the construction of means of transportation. It must be

¹ Such increase of price of remaining Government lands in primary limits was made by many of the granting acts themselves. Preemption entries in limits of all grants were raised to \$2.50 by act of Mar. 3, 1853 (10 Stat., 244); and by practice of Interior Department, crystallized into law by Rev. Stat., sec. 257 (see annotated edition), private-sale entries were also raised to this price.

remembered that these are only the Federal grants. The Texas grants of 32,400,000 acres are not included, nor the numerous but less important grants made by the States themselves.

In this connection the caution is repeated against assuming that the entire area within the limits shown on the map was granted to the railroads. The first set of heavy lines on each side of a road indicates the "primary limits" of the grant — a term already explained — within which limits it was to receive each alternate section (or part thereof) not already disposed of or reserved. The possible maximum of a grant, therefore, was half of the land within the primary limits. The second set of heavy lines, seen farther out on each side of the road in many grants, indicates the "indemnity limits" referred to above within which the railroad could select vacant alternate sections (or parts thereof) to make up for lands within the primary limits that had been previously disposed of or reserved. Often so much land had been disposed of or reserved both in the primary and the indemnity limits that a road received considerably less than its possible maximum. In Iowa so much land had already been disposed of at private sale, under warrants and to settlers, that although the State appears practically covered by grants only a little more than one-eighth its area was received by the railroads. But in regions where there was less of prior purchase and settlement the railroads secured a higher proportion; in some cases the whole of the possible maximum.

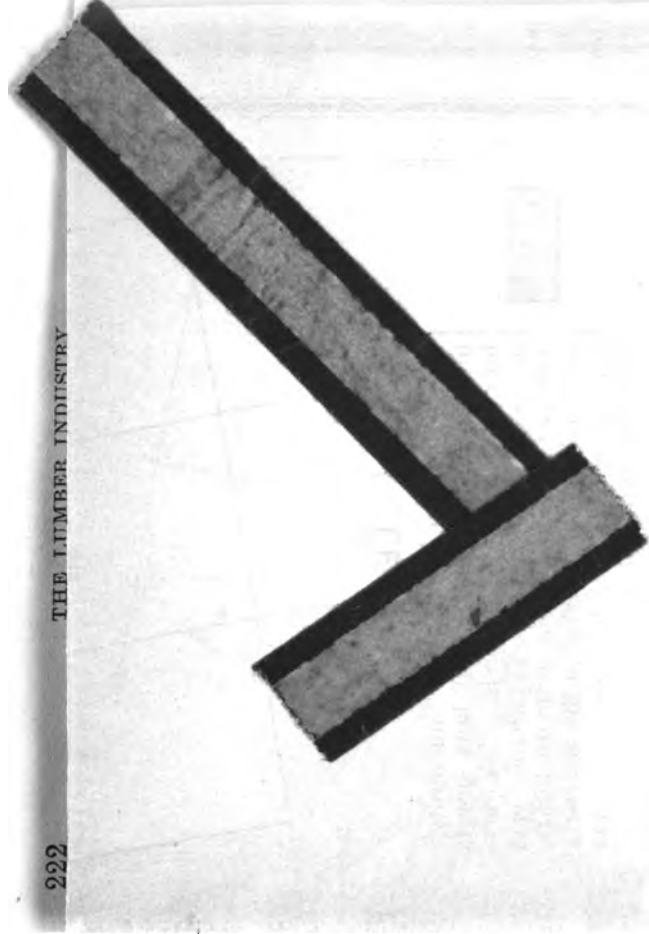
The third set of heavy lines in the Northern Pacific grant represents the "second indemnity" limits, established, for the most part in comparatively recent years, in those States where it has been determined that the maximum is not available within the primary and first indemnity limits.¹ In some of the eastern grants the extra sets of lines are due to the fact that the original primary limits, or both primary and indemnity limits, were subsequently extended.

As a guide to the eye in judging the distance between the outer limits of the various grants, it may be stated that in the case of the Union Pacific and Central Pacific grants from Nebraska to California the distance from outer limit to outer limit is 40 miles, 20 miles on each side of the road; and that in the case of the partly forfeited Atlantic and Pacific grant in northern New Mexico and Arizona the distance is 100 miles, 50 miles on each side of the road.

This map is reproduced here, with some revision, from *The Public Domain*, in which it was published as of June 30, 1883.² The title

¹ This in accordance with the resolution of May 31, 1870 (16 Stat., 378), which provided for the future establishment of these additional indemnity limits under certain circumstances.

² The note by the Bureau in the lower left-hand corner of the map states it was published in 1883 in *The Public Domain* (H. R. Misc. Doc. No. 45, Pt. 4, 47th Cong., 2d sess.). It should be added that it had previously been published in 1878 in an historical article by Willis Drummond on the Federal land grants, in connection with Maj. J. W. Powell's report on the Arid Lands of the United States (H. Ex. Doc. No. 78, 45th Cong., 2d sess.).



and legend have been made more exact; and a table showing the latest estimate of the General Land Office of the total area of the grants (forfeited and unforfeited), and also the amount patented to June 30, 1910, has been substituted for the tabular statement on the old map. The former map did not show all the grants, nor does the present one. Two early wagon-road grants in Ohio and Indiana were omitted, because their location was not available. Several relatively unimportant railroad grants in the South and in California, some of which were forfeited prior to 1883 and some subsequently, were also omitted, no map of definite location or general route having been filed in the General Land Office. For the same reasons, the grants referred to are omitted in the revision.⁷

The most important change in the new map is the indication by a separate symbol of those grants that were shown as valid on the former map, but which have since been forfeited. Where a forfeited grant overlaps one unforfeited (as the forfeited Atlantic and Pacific in upper southeastern California overlaps the Southern Pacific), the forfeiture symbol is not placed on the overlapping part. Practically all the forfeitures were on account of failure to construct the line. The more important of those indicated on the map were forfeited by special acts from 1884 to 1889, and the remainder by a blanket forfeiture act of September 29, 1890 (26 Stat., 496), which, with certain exceptions, forfeited grants opposite all railroads or portions of railroads not then constructed. The chief examples of forfeiture are the Texas Pacific grant in southern New Mexico, Arizona, and California; and part of the Atlantic and Pacific in northeastern New Mexico and in California.

As to that part of the Atlantic and Pacific grant extending from the point where it reached the ocean at Ventura, near Santa Barbara, Cal., northward hugging the coast to San Francisco—a stretch of about 400 miles—it should be stated that the company's claim to a grant for this 400 miles was approved by the Interior Department in 1872 and recognized as valid till 1886. But in the early part of that year Secretary Lamar, reviewing the decision of his predecessor, held that the company had no grant north of Ventura because, according to the granting act, the road was to extend "to the Pacific Ocean." In the same year Congress forfeited the Atlantic and Pacific grant opposite any part of the road not constructed. The company had

⁷ The former map omitted also a 50-mile stretch in the grants extending from Portland, Oregon, to Sacramento, Cal.—the part on either side of the boundary between the two States. At that time the roads had not been definitely located through this 50-mile stretch of mountainous country, and, indeed, it was then thought they would never be constructed. The lines have since been built through, however, and the lands received; hence, the map has been revised to agree. The Outonagon and Brule River grant in the extreme western part of the Upper Peninsula of Michigan was omitted from the former map, but 20 miles of the road was subsequently built, from Outonagon on Lake Superior southward. On the present revision this grant has, therefore, been added—not only the 20 miles obtained by construction but the remaining forfeited part of the grant southward to the Wisconsin-Michigan boundary.

not constructed its road in eastern New Mexico and had built none at all in California. Hence, as a practical matter, the act of Congress disposed of any further question as to whether the company did or did not originally have a grant north of Ventura. The 1883 map showed the grant as continuing northward to San Francisco, and on the present map it has been simply marked as forfeited.

The only other change of consequence in the revision was in the Northern Pacific grant. At the date of the former map the line of the Northern Pacific from the Columbia River over the Cascade Mountains to Tacoma had not been located and only the general route could be shown for that part of the road. Since then the road has been constructed, and the present map shows the revised limits of the grant based on the line as actually constructed, which differs considerably from the proposed general route. The second indemnity limits of the Northern Pacific referred to above were shown on the former map only in Minnesota. In Montana, Idaho, western Washington, and northwestern Oregon they have only recently been established.

The grant for the Grand Rapids and Indiana Railroad, as shown on the map, extended from Fort Wayne, Ind., to the northern end of the Lower Peninsula of Michigan; but all the lands secured by the company lay in Michigan, none being available in Indiana. In Iowa, the State was released from the construction of that part of the original Iowa Central Air Line Railroad east of Cedar Rapids. (Act of June 2, 1864, 13 Stat., 95, interpreted in 110 U. S., 27, 33.) Sufficient lands not being available to satisfy the grant for the portion actually constructed west of Cedar Rapids, the grantee was allowed to select lands within the indemnity limits opposite the unconstructed part east of that city. In Alabama, part of the Mobile and Girard grant, running easterly from Mobile to the Georgia boundary, was forfeited, but indemnity selections were allowed within the indemnity limits opposite the forfeited portion.

The railroad lines shown on the old map in many cases represented merely the proposed location of lines then unbuilt. However, it did not seem worth while to make any revision of the lines themselves (as distinguished from the grant limits), except in the western part of the Northern Pacific. In general, no special effort has been made by the Bureau to obtain minute accuracy in revising the former edition; it was not essential to the purpose in view, nor could it well be achieved in a map so small in scale.

IMPORTANT TIMBER REGIONS TRAVERSED BY GRANTS.—Many of the railroad and wagon-road grants traversed important timbered regions. The Northern Pacific traversed the timber belt of western Montana, northern Idaho, and northeastern Washington, and also the great Pacific coast fir belt in western Washington. The grants now con-

trolled by the Southern Pacific swept through the Pacific coast fir and pine belts from Portland southward to Sacramento. The Atlantic and Pacific grant in northern Arizona and New Mexico included considerable areas in western pine; and the Union Pacific had smaller timbered areas in Wyoming, Colorado, and Utah. The grants in Michigan from about the forty-third parallel northward were in the white-pine belt. So also were the grants in Wisconsin, except part of that running from Madison northwestward toward St. Paul; and those in the northern and northeastern part of Minnesota, covering perhaps a third of the granted area in that State. In the southern yellow-pine belt were all the grants in Louisiana, Mississippi, and Florida, and most of those in Arkansas and Alabama. A few of the grants were in hardwood regions.

Part of these railroad grants, on the other hand, of course, were in nontimbered regions. Thus, the Union Pacific grant in the main traversed prairie or semiarid regions; and that portion of the Central Pacific grant which lies in Utah and Nevada had little timber. Again, those parts of the Northern Pacific grant lying in North Dakota, eastern Montana, and central Washington, and the Southern Pacific grants in California south of San Francisco, were in nontimbered regions. Much of the land included in the grants in Illinois, Iowa, and southern Minnesota was prairie.

Partial investigation indicates, as shown in a later section, that a very high proportion of the granted timberlands have passed into the hands of powerful timber companies.

Section 3. History of Federal land grants for railroads, wagon roads, canals, and river improvements.¹

The era of Federal land grants for railroads was practically from 1850 to 1871. By the latter date the unwisdom of these great land subsidies was realized and the policy was abandoned.

The grants for railroads were far more important than those for other means of transportation, but they were not first in time. In 1824 Congress had begun the policy of making grants of land to develop systems of transportation by making a canal grant to the State of Indiana; but the grant was not made use of. In 1827 canal grants made to the States of Indiana and Illinois were accepted and used. Up to 1866 grants were made to Ohio, Wisconsin, and Michigan for eight other canal-construction projects. In these projects the State in turn granted the land to private companies.

¹ For history and statistics of these grants up to 1883, see *The Public Domain, 1884*. For statistics, see also *Annual Reports of Commissioner of General Land Office*; *Report of Public Lands Commission, Washington, 1905* (S. Doc. No. 189, 56th Cong., 3d sess.); and *Statement Showing Land Grants Made by Congress, issued by General Land Office, 1907*.

There were three river-improvement grants made by Congress; the first in 1828, in northern Alabama; the second in 1846, along the Fox River, in eastern Wisconsin; the third in 1846, along the Des Moines River, in Iowa.

For wagon roads, Congress in 1802 made grants of money to Ohio, but afterwards the policy of grants of land to States for wagon roads was adopted. From 1863 to 1869 grants were made to Wisconsin, Michigan, and Oregon for military wagon roads. There were eight of the military wagon-road grants, and these were transferred by the States to private companies.

RAILROAD GRANTS THROUGH THE AGENCY OF THE STATES.—Railroad land grants may be said to have begun in 1850 with an act granting lands to the States of Illinois, Alabama, and Mississippi to aid in construction of railroads between specified points. From 1850 to 1862 the railroad grants were made to the States, which in turn granted them to private corporations. Illinois transferred its grant to the Illinois Central Railroad, but with a provision that from 5 to 7 per cent of the annual gross receipts of the original lines of the company should be paid to the State. In 1870 this provision was safeguarded by an amendment to the State constitution forbidding that the rights of the State under this contract be ever released, suspended, modified, or impaired. The road was to be a public highway, to be used by the Government free of toll or other charges, and the mails were to be carried at prices to be fixed by Congress. The States of Alabama and Mississippi transferred their grants to the Mobile and Ohio Railroad, which was to connect with the Illinois Central and branches.

Grants similar, in general, to those for Illinois, Alabama, and Mississippi were made to other States—to Missouri in 1852, to Arkansas in 1853, to Iowa, Wisconsin, and other States in 1856, to Minnesota in 1857, etc.—several grants often being made to the same State.

RAILROAD GRANTS DIRECT TO CORPORATIONS.—The making of Federal grants direct to corporations to aid the construction of these internal improvements was at first opposed as an unconstitutional invasion of State rights, and it was for that reason that the early grants were made to the States, which in turn granted them to corporations designated by the State legislatures. But for a railroad through the almost unsettled region from the Missouri River to the Pacific it seemed desirable that the Federal Government should make a direct grant. The agitation for a Government-aided railroad to the Pacific was strong as early as 1842. Asa Whitney asked Congress to grant him 100,000,000 acres to build such a road, and the plan was vigorously urged. Stephen A. Douglas, in 1845, proposed a railroad from Lake Erie to the Pacific coast, urging the organization

of Territories which should take and transfer the grants. Other proposals were made, including a plan for aiding the road by the loan of Government 5 per cent bonds to the extent of \$12,500 per mile; and the War Department made a series of surveys and explorations to find the most practicable railroad route.¹

In 1856, and again in 1860, some kind of land subsidy for a transcontinental road was indorsed by both the Republican and the Democratic parties in their platforms. President Lincoln in his messages to Congress made recommendations and suggestions on the subject.

Finally, on July 1, 1862, the Union Pacific Railroad Company was incorporated by direct act of Congress. This company and other corporations named in the act were to build a railroad from the Missouri River to the Pacific. The main line ran from Omaha westward to San Francisco; but one branch ran from Kansas City through central Kansas to Denver, joining the main line at Cheyenne, Wyo.; another ran from Atchison, Kans., 100 miles westward; and another from Sioux City to a junction with the main line at Fremont, Nebr. The main line as far west as Ogden was built by the Union Pacific, and from there to San Francisco by the Central Pacific and Western Pacific, both of which roads are now owned by the Southern Pacific. The branch from Kansas City to Cheyenne (that part from Kansas City to Denver at one time known as the Kansas Pacific, and that from Denver to Cheyenne as the Denver Pacific) was subsequently acquired by the Union Pacific, as was the line from Atchison westward. The branch from Sioux City was projected by the Union Pacific, but was subsequently acquired by the Sioux City Pacific and is now part of the Chicago and Northwestern line.

Following the Union Pacific grant in 1862 other Federal land grants were made direct to corporations. The more important were as follows: (1) The Northern Pacific, from Lake Superior to Puget Sound. (2) Certain grants now controlled by the Southern Pacific, viz, the two Oregon and California Railroad grants in Oregon, from Portland westward and from Portland southward to the State boundary; the California and Oregon from the junction with the preceding road at the State line southward to Sacramento; the Southern Pacific itself from San Francisco southeastward to the Colorado River at Needles, Cal.;² with a branch from Mohave via Los Angeles to the Colorado River at Yuma, Ariz. (3) The Atlantic and Pacific, from Springfield, Mo., via Albuquerque, N.

¹ Five transcontinental routes were covered in these surveys. They are, in general, the routes followed by the present Northern Pacific, Union Pacific, Denver and Rio Grande, Santa Fe, and Southern Pacific railroads.

² That part of this line between Needles and Mohave, Cal., has been recently leased to the Atchison, Topeka and Santa Fe. The control of the grant, however, remains with the Southern Pacific.

Mex., and Needles, to the Pacific Ocean near Santa Barbara;¹ subsequently forfeited except through Missouri, western New Mexico, and Arizona. The unforfeited part of this grant is now owned by the Atchison, Topeka and Santa Fe. (4) The Texas Pacific, from Marshall, Tex., across Texas to El Paso, and thence via Yuma to the Pacific Ocean at San Diego. Texas gave a grant for the part of the road constructed through its domain, but the Federal grant for the road through New Mexico, Arizona, and California was forfeited. The Southern Pacific subsequently built the road from Yuma to El Paso, but did not succeed in having the grant transferred to it. There were other less important grants direct to corporations, and during the whole period grants were also made through the agency of the States as had been done before 1862. The last of the grants was made in 1871.

"FOREST-LIEU" LEGISLATION.—Closely associated with the railroad grant legislation was the later "forest-lieu" legislation, the effect of which, in the case of certain western railroads, has been to increase, not the extent of the grants, but their value.

The first forest-lieu legislation was passed in a sundry civil appropriation act of June 4, 1897 (30 Stat., 36), which allowed a settler or owner whose lands fell within the exterior boundaries of a forest reserve to exchange such lands, if he so desired, for an equal area to be selected from unoccupied, unreserved, and nonmineral lands anywhere in the public domain. By act of June 6, 1900 (31 Stat., 614), and act of March 3, 1901 (31 Stat., 1037), selections under the previous act were restricted to surveyed lands. The word "owner" in the statute was sufficient to include the land-grant railroads, and the practical effect of the act, so far as such railroads were in a position to take advantage of it, was to enhance the value of their grants without affecting the absolute area. For, since the national forests were created in part to cover mountain watersheds, as well as timber areas still left to the Government, it followed that within the limits of some of these forests there were tracts of bare and worthless mountain lands, as well as good timber lands. It was therefore possible for a railroad, any of whose lands fell within the boundaries of the national forests, to retain such as were valuable, and at the same time to relinquish to the Government such as were worthless or of low value, and select in lieu an equal area of well-timbered land outside of the national forest boundaries.

The Northern Pacific was the only land-grant railroad in the investigation area conspicuously affected by this legislation. Relinquishments of land within the national forests were made by this railroad

¹ See p. 223 regarding the company's former claim for the extension of its grant from Ventura, Cal., near Santa Barbara, 400 miles northward along the coast to San Francisco.

on a very extensive scale. The Southern Pacific Company made few, if any, relinquishments or lieu selections. Relinquishments and selections were made by many individual settlers and owners.

In Arizona, outside the investigation area (defined on p. 62), extensive relinquishments were made by the Santa Fe Pacific Railroad Company (controlled by the Atchison, Topeka and Santa Fe), successor to the old Atlantic and Pacific Railroad Company's grant; and by certain companies and individuals who had purchased lands from the Atlantic and Pacific. The lieu selections taken in place of these relinquishments will be referred to on a later page (p. 242). Some of the selections under this Atlantic and Pacific grant, by agreement with the Secretary of the Interior, were restricted to nontimbered lands.

The first lieu selections of the Northern Pacific in Montana, Idaho, Washington, and Oregon were made by the company itself. In Washington and Oregon many of these early lieu selections were shortly afterwards sold or contracted to the Weyerhaeuser Timber Company. (See p. 237.) The later practice of the Northern Pacific and of certain other large owners of lieu-selection rights has been to sell these rights in the form of "scrip" at so many dollars per acre. The land to which this scrip applies is actually selected by the purchaser, but the seller of the scrip files the lists of relinquishments and lieu selections in the Land Office, and contracts to transfer title to the purchaser as soon as patent issues from the Government, the law providing that the Land Office should issue patent in the name of the party making the original relinquishment.

The lieu-selection acts above referred to (those of June 4, 1897, June 6, 1900, and Mar. 3, 1901), were repealed on March 3, 1905 (33 Stat., 1264), though provision was made for the perfecting of pending lieu selections made prior to the passage of the repeal. The act also provided that the validity of contracts previously entered into by the Secretary of the Interior should not be impaired.¹

There were other acts in 1898 and 1899 under which the Northern Pacific was allowed special lieu-selection rights. These will be noticed later (p. 237).

¹ A Land Office circular of May 16, 1905, framing regulations under this act of March 3, 1905, states that under the provision as to contracts entered into by the Secretary of the Interior, selections are still authorized to be made in satisfaction of tracts relinquished or to be relinquished, as follows: First, lands in the San Francisco Mountains Forest Reserve, Ariz., relinquished or to be relinquished by the Santa Fe Pacific Railroad Company, the Aztec Land and Cattle Company, the Saginaw and Maristee Lumber Company, William F. Baker, or Edward B. Perrin; second, lands in the Grand Canyon Forest Reserve, Ariz., relinquished or to be relinquished by the Santa Fe Pacific Railroad Company; and, third, lands in a certain part of the Santa Barbara Forest Reserve, Cal., relinquished or to be relinquished by the Santa Barbara Water Company, or Jed. L. Washburn.

Senate Document No. 612, Sixty-first Congress, second session, in response to a Senate resolution requesting the Secretary of the Interior to furnish information relative to the above contracts, gives information connected therewith and also lists in detail all the lieu lands selected both prior to and since the repeal of March 3, 1905, showing the restricted and unrestricted selections made in lieu of the relinquished tracts.

Enough has been said to make clear the general results of "forest-lieu" legislation. The purpose apparently was to enable the Government to regain as much land as possible for reservation in compact blocks, and to enable settlers within forest-reserve limits, if they so desired, to relocate elsewhere in regions where the settling up of the country had not been arrested by large withdrawals. By the actual working of the law, however, the Government reacquired a great deal of worthless or comparatively worthless land, much of it from railroad grants, and gave in exchange an equal area of excellent timberland.

Section 4. Land grants controlled by the Southern Pacific Company and the Union Pacific Railroad Company and amounts of land still held.

Certain of the railroad grants which have had the greatest effect in concentrating timber ownership will now be discussed, the first being those now controlled by the Southern Pacific and the Union Pacific. Practically all the present holdings of the Southern Pacific Company, the largest timber holder in the United States, were derived from land grants. The most important of these grants, so far as timber is concerned, were in Oregon and northern California. The present section will show the total amount of land patented by the Government up to June 30, 1910, to the railroads now forming the Southern Pacific system, and that patented to the railroads now forming the Union Pacific Railroad, which controls the Southern Pacific.¹ It will also show the total acreage still owned or claimed by the Southern Pacific and the Union Pacific on June 30, 1910, under these grants.

THE SOUTHERN PACIFIC'S LAND GRANTS IN OREGON.—In Oregon the Southern Pacific's lands, with the exception of some 5,000 acres, are in the name of the Oregon and California Railroad Company, a subsidiary corporation. The latter company holds, or is successor to, two grants in Oregon. These were made by Congress under acts of 1866, 1868, 1869, and 1870. The total amount of land patented under the two grants to June 30, 1910, was 2,892,585 acres, of which 2,074,454 acres remained unsold. The great bulk of the land was heavily timbered.

The Government is at present engaged in a suit in equity, which seeks, among other remedies, to regain title to this 2,074,454 acres, and also to the still unpatented part of the grants, which in the bill of complaint is estimated to amount to about 293,000 acres. The grounds of the suit and its present status are summarized on page 250.

THE SOUTHERN PACIFIC'S LAND GRANTS IN CALIFORNIA.—In California the Southern Pacific Company controls five grants, none of which is involved in the suit just mentioned. One of them, how-

¹ See footnote, p. 17.

ever (the Central Pacific), was made on the condition, also imposed in the case of the Union Pacific, that all lands not sold or disposed of three years after the completion of the railroad should be subject to settlement and preemption like other lands at a price not exceeding \$1.25 per acre, to be paid to the company. In construing this condition in the Union Pacific grant, the Supreme Court, in 1878, held that a mortgage of the entire grant constituted a "disposal" within the meaning of the act,¹ thereby rendering the condition practically ineffective. In two of the grants (Southern Pacific main line and California and Oregon) the condition that the roads should be completed by a certain date was not fulfilled. These grants have not been attacked by the Government for noncompliance with the conditions.

The total acreage patented in California up to June 30, 1910, under the grants now held by the Southern Pacific Company, was 9,285,802 acres; much of it, however, in nontimbered parts of the State.

In Oregon and California, taken together, there had been patented up to June 30, 1910, under these grants, 12,180,097 acres.

THE SOUTHERN PACIFIC'S LAND GRANTS IN OTHER STATES.—In addition to these lands in Oregon and California, the Federal Government up to June 30, 1910, had patented to the Central Pacific (now controlled by the Southern Pacific) the following amounts of land in other States: In Idaho, 9,546 acres; in Nevada, 3,584,722 acres; in Utah, 1,284,542 acres; a total of 4,878,810 acres. All this land except that in Idaho is outside the Bureau's investigation area and carries little timber.

Texas not being part of the public domain, the Federal Government had no land to grant in that State. The State of Texas itself granted many millions of acres² to railroads afterwards absorbed by the Southern Pacific Company. A Texas law, as noted above, requires that all lands patented by the State to a railroad shall be disposed of by the grantee, one-half in six years and the remaining one-half in twelve years from the issuance of the patents. According to the terms of this law much of the patented land should have been disposed of before the Southern Pacific took over the roads which received the grants. The Bureau has made no investigation of the exact amount patented to these roads, nor of the amount held by them when the Southern Pacific came into control, or secured by them since that time. Much of the land is in the nontimbered part of the State.

¹ *Platt v. Union Pacific* (99 U. S., 46, 64).

² See the Reports of the Texas Land Commissioner, 1871 to 1908; also Abstract of Titled and Patented Lands (1867 to 1871).

SUMMARY OF LANDS PATENTED BY THE FEDERAL GOVERNMENT UNDER THE SOUTHERN PACIFIC GRANTS.—The amount patented by the Federal Government to the roads now belonging to the Southern Pacific may be summed up as follows, by States and by grants:

TABLE 53.—ACREAGE PATENTED, UP TO JUNE 30, 1910, BY FEDERAL GOVERNMENT UNDER LAND GRANTS NOW CONTROLLED BY SOUTHERN PACIFIC COMPANY.

[Compiled from Report of Commissioner of General Land Office for 1910.]	
Oregon:	Acres.
Oregon and California Railroad Co. ("East Side" grant).....	2,765,477.10
Oregon Central Railroad Co. ("West Side" grant), Oregon and California Railroad Co. successor.....	128,618.13
Total.....	2,894,095.23
California:	
Central Pacific Railway Co.....	878,896.82
Central Pacific Railway Co. (successor to Western Pacific Railroad Co.).....	458,147.97
Central Pacific Railway Co. (successor to California and Oregon Railroad Co.).....	3,154,913.49
Southern Pacific Railroad Co. (main line).....	3,478,136.44
Southern Pacific Railroad Co. (branch line).....	1,315,707.13
Total.....	9,285,801.85
Idaho:	
Central Pacific Railway Co.....	9,545.59
Nevada:	
Central Pacific Railway Co.....	3,584,722.58
Utah:	
Central Pacific Railway Co.....	1,284,541.90
Grand total.....	17,058,907.15

UNION PACIFIC LAND GRANTS.—In addition to this aggregate of 17,058,907 acres patented by the Federal Government to roads controlled by the Southern Pacific, the Government has patented to the Union Pacific (which now controls the Southern Pacific), and to railroads to which the Union Pacific is successor, the enormous total of 19,136,992 acres¹ in various States. This makes a grand total of 36,195,899 acres transferred by Federal grant from the public domain to the railroads controlled by the Union Pacific and the Southern Pacific, which now form a single system.² This is the equivalent of the entire area of Iowa or that of Wisconsin.

All of the 19,136,992 acres patented to the Union Pacific and practically all of the 4,878,810 acres patented to the Central Pacific in Idaho, Nevada, and Utah are outside the Bureau's investigation area. Moreover, by far the greater part of the old Western Pacific grant and of the Southern Pacific main-line and branch-line grants in central and southern California is in nontimbered regions.

TOTAL ACREAGE AT PRESENT OWNED OR CLAIMED BY THE SOUTHERN PACIFIC.—By no means all of the immense area just referred to as patented to the railroads of the great Southern Pacific Company is still owned by them. Part has been sold, and not all the granted lands have yet been patented. The company includes in its present

¹ Compiled from Report of Commissioner of General Land Office for 1910.

² See footnote, p. 17.

acreage the patented lands unsold, and also the unpatented granted lands claimed by it. It may be that not all the unpatented lands are still claimed by the company, since it is possible for it to contract to sell before actually receiving patent from the Government. The figures here given for the present acreage of the Southern Pacific owned or claimed on June 30, 1910, are taken from the company's annual report to stockholders. Certain other lands of the company acquired in other ways than through the land grants are not included in this total. The term "granted lands" as used in this connection, of course, includes indemnity lands taken under the grants, as well as lands within the primary limits. The company's report shows 13,879,932 acres unsold, and is as follows, by grants:

TABLE 54.—GRANTED LANDS OF SOUTHERN PACIFIC COMPANY SUBJECT TO MORTGAGE AND REMAINING UNSOLD JUNE 30, 1910, WITH ACRES SOLD DURING PRECEDING YEAR.¹

Acres pledged for account of the following bonds.	Acres sold during fiscal year 1910.	Acres remaining unsold June 30, 1910.
Central Pacific Railway Co. 3½ per cent mortgage bonds.....	58,802	7,486,478
Oregon and California Railroad Co. first mortgage 5 per cent bonds	80	* 2,342,250
Southern Pacific Railroad Co. (of California) 6 per cent bonds of 1875.....	54,716	4,049,588
Trustees Houston and Texas Central Railway Co. lands.....	264,232	1,636
Total acres sold and total remaining unsold.....	377,830	13,879,932

¹ At the time of the publication of the Summary of this Report on February 13, 1911, the latest information available was that showing the acreage on June 30, 1909. The total unsold was then given as 14,408,217 acres. During the fiscal year 1909-9 the company sold 77,101 acres in Texas, and in 1909-10 sold 264,232 acres in Texas. In this connection, see the reference to the Texas law on p. 220.

* Company owns in addition 15,544 acres of granted lands not mortgaged.

Probably half, or more, of the 7,486,478 acres of the Central Pacific Railway Company's land lies in the State of Nevada, and a much smaller part in Utah; but the company still owns a very large area in California.

The fact that to-day, out of the 17,000,000 acres of land granted nearly 50 years ago¹ to several then distinct corporations, as much as 13,880,000 (or about 80 per cent) is still retained in a single ownership, is of great significance to the public, and especially with reference to the particular issue here involved—the concentration of timber ownership; for this one holder, by virtue of its retention of timber grants, is to-day the largest owner of timber in the United States.

Of its total acreage, no less than 3,840,000 acres is merchantable-timber land, carrying the immense amount of 105.6 billion feet of timber.

¹ Dates of grants were from 1862 to 1871.

PRESENT ACREAGE OF UNION PACIFIC RAILROAD COMPANY.—Part of the original land grant of the Union Pacific Railroad Company is now held by its subsidiary, the Union Pacific Land Company. The following statement from the annual report of the Union Pacific Railroad Company to stockholders shows the status of its land grants on June 30, 1910:

TABLE 55.—GRANTED LANDS OF UNION PACIFIC RAILROAD COMPANY (INCLUDING UNION PACIFIC LAND COMPANY) REMAINING UNSOLD JUNE 30, 1910, WITH ACRES SOLD, AND ACRES SURRENDERED DURING PRECEDING YEAR.

	Union Pacific Railroad Co.	Union Pacific Land Co.	Total.
Number of acres sold during year.....	206,542.96	4,474.67	210,017.63
Number of acres surrendered during year.....	8,296.04	5,141.00	13,437.04
Acres remaining unsold at end of year.....	996,174.62	8,952.88	975,127.50

The total acreage owned or claimed by the Union Pacific and its subsidiary, the Southern Pacific, on June 30, 1910, therefore, was 14,855,060 acres. This is equivalent to the land area of the five States of Massachusetts, Rhode Island, Connecticut, New Jersey, and Delaware. As observed above, much of this great acreage is nontimbered.

Section 5. The Northern Pacific grant.

The enormous grant to the Northern Pacific is the largest in area ever granted by the Government to any railroad. The company has already received over one-fourth of the entire amount patented by the Government to all railroads. The influence of this great grant in bringing about concentration of timber ownership is chiefly to be found in a study of the holdings of the Weyerhaeuser Timber Company, which is taken up in the next section. Yet notwithstanding the very large portion of its timber holdings sold to the Weyerhaeuser Timber Company, and over one million acres of less heavily timbered land sold to the Amalgamated Copper Company Interests in Montana, and other large sales, the Northern Pacific is still the third largest holder of timber in the United States.

The original grant (act of July 2, 1864, 13 Stat., 365) was of odd sections within a limit of 20 miles on either side of the road in States, and of 40 miles in Territories, with an indemnity limit 10 miles wide on each side of this primary grant, making a strip varying from 60 to 100 miles in width (according as it was located in a State or a Territory) within which the company was granted as much of its possible maximum as was available. By joint resolution of May 31, 1870 (16 Stat., 378), a second indemnity strip of 10 additional miles on each side was granted in any State or Territory of the grant in which such

additional indemnity should prove necessary to enable the railroad to fill the possible maximum of the original grant. Selections within this second indemnity belt could be made only on account of lands disposed of subsequent to the grant of 1864, and were required to be in the State or Territory within which the loss occurred. Within the indemnity limits described, the railroad could select available lands in odd sections to make up, so far as possible, for lands found to be unavailable within the primary grant. No subsequent legislation increased the amount of land contemplated under the original grant.

Under these grants, up to June 30, 1910, a total of 32,664,651 acres had been patented.¹ If it were possible to find available locations within the indemnity limits, under the terms of the original grant, the railroad might still secure no less than 10,494,777 acres more. But owing to the fact that locations for such an acreage may not be available, the actual amount of additional land which the company can still obtain may prove to be considerably less.

The Northern Pacific grant, like all other railroad grants, was made on condition that the road should be completed by a certain time. The time limit in this case was 1877, possibly to be construed as 1879, but the road was not finished till 1888. Of the 2,138 miles of subsidized road built by the company, no less than 1,607 miles was built after the time set by law had expired.

There was also in an amendment to the Northern Pacific grant (resolution of May 31, 1870, 16 Stat., 378) a condition regarding the disposition of the granted lands to settlers in 160-acre tracts; but the conditional clause was far less strictly drawn than that in the Oregon and California Railroad Company's grant, on which the Government is now suing for forfeiture. The Northern Pacific amendment "provided, that all lands hereby granted * * * which shall not be sold or disposed of or remain subject to the mortgage by this act authorized, at the expiration of five years after the completion of the entire road, shall be subject to settlement and preemption like other lands, at a price to be paid to said company not exceeding two dollars and fifty cents per acre." It also provided that on foreclosure of the mortgage, the lands be auctioned in small tracts. At the 1875 foreclosure, by the court order, the lands, being mostly unpatented, were not so sold. At the 1896 foreclosure of later mortgages, all patented lands were so sold, but the new railway company was reported in every instance the highest bidder. As a result, no doubt, of the Government's entering suit in the Oregon and California case, a large number of persons have settled on the Northern Pacific lands in southwestern Washington, including lands sold to the Weyerhaeuser Timber Company, evidently with the idea that the resolution of May

¹ This total acreage was distributed by States, as follows: Wisconsin, 10,354.99; Minnesota, 1,877,225.46; North Dakota, 10,643,228.87; Montana, 9,894,493.23; Wyoming, 51,914.17; Idaho, 831,591.11; Washington, 8,778,025.40; Oregon, 577,818.14; total, 32,664,651.37.

31, 1870, gave them the privilege of buying them at \$2.50 per acre. The case of one of these settlers recently brought before the Land Office was decided against the individual claimant. (*Heath v. Northern Pacific*, 38 L. D., 77.) The decision intimated that the real issue as to the present effect of the condition was a question for the courts. In any event, however, it is established by many court decisions that Congress alone, rather than individual settlers, would have the right to challenge the railroad company for nonperformance of the condition.

ACREAGE STILL OWNED BY NORTHERN PACIFIC RAILWAY COMPANY.—The land holdings of the Northern Pacific on June 30, 1910, are stated in the company's annual report for that year to its stockholders as follows:

TABLE 56.—ACREAGE OF NORTHERN PACIFIC LAND GRANT REMAINING UNSOLD JUNE 30, 1910, WITH AMOUNT SOLD DURING PRECEDING YEAR.

State.	Sold during fiscal year 1910.	Balance undischarged June 30, 1910.	
		Acres.	Acres.
Wisconsin.....	520.00	681.86	
Minnesota.....	2,854.03	28,331.97	
North Dakota.....	8,733.30	2,110.05	
Montana.....	377,433.48	6,876,966.62	
Wyoming.....	19,746.33	39,506.16	
Idaho.....	41,263.27	417,274.53	
Washington.....	80,870.29	2,227,354.06	
Oregon.....	20,193.45	1,318,515.33	
Subtotal.....	551,614.15	9,910,746.58	
Acquired from St. P. & N. P. R. y. Co. (in Minnesota).....	320.00	38,321.77	
Acquired from Little Falls and Dakota R. R. Co. (in Minnesota).....	.....	916.87	
Total.....	551,934.15	9,949,985.22	

¹ Most of this is non timbered land. All the company's timbered land in Oregon is under contract of sale, and in the Bureau's timber tables is therefore credited to the purchasers and not to the Northern Pacific.

Of the 9,950,000 acres shown in this table, something over 3,000,000 acres are timbered, lying practically all in Washington, Montana, and Idaho. This timbered acreage, as shown in Chapter III, carries more than 36 billion feet of timber. The company is exceeded in amount of timber only by the Weyerhaeuser Timber Company and the Southern Pacific.

Section 6. Weyerhaeuser Timber Company holding based on Northern Pacific land grant.

No less than 1,525,000 acres, or 80 per cent, of the Weyerhaeuser Timber Company's great holding was originally part of the Northern Pacific land grant. The Weyerhaeuser Timber Company pur-

chased the best part of the heavily timbered lands of the Northern Pacific in Washington west of the Cascade Mountains. Nine hundred thousand acres were purchased in one block in 1900 at \$6 per acre, and contracts were entered into, chiefly in 1902 and 1903, for the acquisition of other Northern Pacific lands in Washington and Oregon, the average price paid for these being about \$6.25 per acre. The greater part of these other lands consisted of such then unpatented lands in certain townships as the railway should subsequently get title to under its grant or by lieu selection. Including the original purchase of 900,000 acres, the Weyerhaeuser Timber Company and its Oregon subsidiary, the Weyerhaeuser Land Company, have acquired or contracted for from the Northern Pacific up to the present time, roughly, 1,350,000 acres in Washington and 175,000 acres in Oregon, making the total acquired from the Northern Pacific about 1,525,000 acres, as above stated.

Part of the lands contracted for in 1902 and 1903 are still unpatented, part even unsurveyed. The unpatented contract lands are approximately 200,000 acres, of which 190,000 acres are timbered. Title will pass to the Weyerhaeuser Timber Company if patents are issued by the Government to the Northern Pacific. On account of contests with settlers and for other reasons it is possible that the railway company, and consequently the Weyerhaeuser Timber Company, will lose a part of these lands. It will be seen, however, that the entire contract acreage which could be thus involved is relatively insignificant.

The important fact is that the holdings of the Weyerhaeuser Timber Company, the second largest timber owner in the United States, are substantially based upon the old railroad grant.

Section 7. Special lieu-selection acts affecting the Northern Pacific grant.

The Northern Pacific grant lies in Wisconsin, Minnesota, North Dakota, Montana, Wyoming, Idaho, Oregon, and Washington. The original grant covers only a little of Oregon. There had, however, been patented to the company up to June 30, 1910, 577,818 acres in that State. This is explained largely by lieu selections, which were provided for by special legislation, in addition to the general lieu-selection law of June 4, 1897, and amendatory acts.

The first of these special acts was that of July 1, 1898 (30 Stat., 597, 620), extended by the act of May 17, 1906 (34 Stat., 197). These acts grew out of the numerous cases of litigation between settlers and the Northern Pacific Railroad where both claimed the land. They provided that in pending cases of an adverse claim against the railroad, the settler or his heirs or assigns should be

given the option of remaining on his land or of relinquishing it and selecting in lieu an equal area of nonmineral land, surveyed or unsurveyed, in any State in which the railroad grant extended. If he elected to retain his land, the railroad was required to relinquish its claim thereto and to take lieu selection. Lands in contest which had been sold or contracted by the railroad company, or which it used or needed for railroad purposes, or which were valuable for stone, iron, or coal, were exempted from the operation of the act. The Supreme Court has held that this exemption of sold lands applied only to lands sold or contracted prior to the passage of the act. (See *Humbird v. Avery*, 195 U. S., 480). Though the act resulted especially from cases of contest in that part of the grant between Duluth, Minn., and Ashland, Wis., it applied to contested lands anywhere in the grant.

A second special lieu-selection law affecting the Northern Pacific was passed in connection with the creation of Mount Rainier National Park by act of March 2, 1899 (30 Stat., 993). This provided for the relinquishment of the Northern Pacific lands, surveyed or unsurveyed, within the national park and within the Pacific Forest Reserve, and authorized lieu selection of surveyed or unsurveyed nonmineral lands in any State into which the railroad extended. The Pacific Forest Reserve was a large area in the rough mountain region adjacent to Mount Rainier, now included in Mount Rainier National Park and in the Rainier National Forest. Under this law the Northern Pacific relinquished its lands in the national park; it also relinquished a much larger acreage consisting mostly of comparatively worthless mountain lands in the Pacific Forest Reserve. The total relinquished was about 450,000 acres, for which valuable timbered lands in the northwestern States were obtained in lieu.

A large part of the lieu lands obtained by this exchange (or of the scrip used in selecting them) was sold by the Northern Pacific to the Weyerhaeuser Timber Company or to various western timber companies in which the Weyerhaeusers are interested. The following table shows by States the amounts of the lieu selections under this act now owned by various large timber holders. It will be noted that the ownership of about 38,000 acres is not accounted for. Part of this may also be owned by large timber holders.

TABLE 57.—PRESENT OWNERSHIP OF NORTHERN PACIFIC SELECTIONS OF LAND OBTAINED IN LIEU OF LAND RELINQUISHED TO UNITED STATES IN MOUNT RAINIER NATIONAL PARK AND THE FORMER PACIFIC FOREST RESERVE.

Present owner.	Oregon.	Wash- ington.	Idaho.	Mont- ana.	Minne- sota.	Total.
	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Northern Pacific Railway Co.	119,708	49,723	9,800	40,851		169,481
Fee lands.	40,335	10,097				50,432
Contract lands.	160,043	59,820				219,863
Clearwater Timber Co.			67,000			67,000
Edward Rutledge Timber Co.			22,132			22,132
C. A. Smith Fir Co.	6,611					6,611
Hammond Lumber Co.	5,140					5,140
T. H. Shevlin Interests.			4,840		95	4,935
Cameron Lumber Co.			4,120			4,120
Storey-Brascher Lumber Co.	3,679					3,679
Cascade Timber Co.		2,440				2,440
Alger-Smith Lumber Co.					1,950	1,950
Panhandle Lumber Co.						1,713
United States Steel Corporation Interests		1,713				1,713
Pine Tree and Mississippi River lumber companies.					1,296	1,296
Western Timber Co.		924			1,215	1,215
Humbird Lumber Co.			840			840
Other lumber companies.	3,320	2,351	1,440	40	1,050	8,201
Total accounted for.	178,793	70,105	110,832	40,891	5,006	406,227
Selections not accounted for.	± 10,924	10,094	9,527	± 5,768	1,498	± 37,812
Total.	189,717	80,199	120,359	46,659	7,104	444,159

¹ C. A. Smith Interests at one time held 11,450 acres of these particular lieu selections in Oregon, but have since sold 4,839 acres, which are included in other entries of this table.

² Of this amount 9,382 acres consist of Northern Pacific selections under contract of sale to holders not known to the Bureau.

³ About half of this unaccounted-for acreage in Montana lies in counties where there is little timber.

⁴ Including 121 acres in North Dakota.

It must be remembered that this tabulation refers only to lieu selections made under the special law covering relinquishments in the Mount Rainier National Park and the Pacific Forest Reserve. It does not include those made under the general forest-lieu law of June 4, 1897, nor those made under the special lieu law of July, 1898, covering contests.

This table shows that the Weyerhaeuser Timber Company has secured about 220,000 acres of Northern Pacific selections taken in lieu of the lands relinquished in the area of Mount Rainier National Park and the former Pacific Forest Reserve. All these selections lie in western Oregon and western Washington, and are included in the 1,525,000 acres referred to in the preceding section as the total

acquired from the Northern Pacific by the Weyerhaeuser Timber Company. Of the 220,000 acres about 50,000 is land under contract of sale, title having not yet passed to the Weyerhaeuser Timber Company, because the railroad has not yet received patent from the Government. Much of this land under contract is still unsurveyed. Of the other companies listed in the above table as now owning a considerable area of these particular selections, it is important to point out those which are closely associated with the Weyerhaeuser Timber Company, or other Weyerhaeuser companies, through common stockholders. Some of these companies in which the Weyerhaeusers and their close business associates have control are the Clearwater Timber Company, Edward Rutledge Timber Company, Pine Tree Lumber Company, and Humbird Lumber Company, while their close associates are prominent in the Cameron Lumber Company and Western Timber Company.

These lieu selections lie for the most part in well-timbered regions. A very high proportion in Washington and practically all in Oregon lie west of the Cascades. In Idaho the selections lie almost altogether in Shoshone and Nez Perce Counties, in the region of the valuable white pine. The 40,000 acres of these selections retained by the Northern Pacific in Montana lie in the better-timbered regions of the State.

It should be noted that this particular law of March 2, 1899, allowed the lieu selection of either surveyed or unsurveyed lands. This fact made the exchange right especially valuable, since lands could be selected before they were thrown open to entry on survey.

Section 8. Summary of effect of railroad, wagon-road, and canal grants on timber ownership.

From the foregoing it is seen that the retention or purchase of railroad land grants forms the foundation of the three greatest timber holdings in the country—retention in the case of the Southern Pacific and the Northern Pacific; purchase in the case of the Weyerhaeuser Timber Company.

These three holders, as stated in Chapter III, have 238 billion feet of timber. They have 14 per cent of the privately owned timber in the investigation area and approximately 11 per cent of all the country's privately owned timber. They own 238 billion feet, while the United States which originally owned the whole of the timber in the public-land States has preserved in public ownership but 539 billion feet—only a little more than twice the amount owned by these three corporations.

The owners of these great timber tracts will, after the timber has been removed, still have possession of vast tracts of land, the value of which is in many cases very great, and almost certain to increase

enormously in the future. A considerable part of this land, which is now timbered, will, when denuded, be valuable for agriculture, and the remainder is natural forest land, which, if properly handled, will reproduce timber for generations to come. Part may contain great undeveloped wealth of oil, gas, and other minerals (though mineral lands, except iron and coal, were excluded under the terms of the grants). This local land monopoly, as it may fairly be termed, attains additional importance in the case of the two railroads mentioned because of their substantial control over transportation rates in large sections of their respective territories, and because of the power this gives them to retard or to direct to their own advantage the development of the country they traverse. The policy to be adopted by these railroads toward this land after the timber is removed becomes, therefore, a matter of deep public interest.

OTHER IMPORTANT HOLDINGS BASED ON GRANTS TO RAILROADS.—Many important timber holdings of less magnitude than the three just mentioned also consist wholly or in large part of lands originally comprised in railroad land grants. Without making a full investigation of this matter, the Bureau has traced, in certain large areas, the present ownership of lands originally included in various grants. The exact location of these areas and the detailed discussion of ownership of granted lands therein will be found in Part II (cf. also p. 255). Only the main facts are here summarized.

In an area comprising most of southwestern Washington the Northern Pacific's grant, including timbered and nontimbered land, amounted to about 2,415,000 acres. Of this, the Weyerhaeuser Timber Company now holds 1,230,000 acres, for this is in the region of its great purchase; and the Northern Pacific itself retains about 355,000 acres. But other large timber holders reported to the Bureau have no less than 340,000 acres of this granted land, in amounts ranging from 50,000 acres down. Thus, 80 per cent of the grant in this great region is now held by large timber owners, leaving only 20 per cent in small timber holdings and nontimbered land. In eastern Washington and in northern Idaho several important holdings are made up largely of granted land purchased from the Northern Pacific, but the Bureau has made no tabulation of the amount. In north central Idaho, out of at least 350,000 acres known by the Bureau to have been granted to the Northern Pacific in a certain area, the railroad retains about 175,000 acres, and six other large timber holders now own about 150,000 acres. In Montana the Northern Pacific's only sale of granted timber lands of any importance was the sale of over one million acres to the Amalgamated Copper Company Interests. In Oregon the Bureau traced the ownership of only 265,000 acres of the Northern Pacific grant, all being lieu

selections. Of this, the Weyerhaeuser Timber Company now holds about 175,000 acres, and other large holders own about 70,000 acres, in amounts ranging from 12,000 acres down.

The Southern Pacific itself retains (subject to the outcome of the Government's pending suit for forfeiture) 72 per cent of its grants in Oregon. It has sold 370,000 acres, or 13 per cent, to large timber holders reported to the Bureau, the largest amount to any one holder being about 65,000 acres. The remaining 15 per cent unaccounted for is perhaps partly held by small timber holders, but is mainly nontimbered agricultural land. In an immense area of northeastern California also, the Southern Pacific has largely retained the railroad-grant lands. About 220,000 acres, however, is now owned by six other large timber holders.

The Great Northern Railway Company, through its subsidiary, the St. Paul, Minneapolis and Manitoba, is holding a timber reserve of about 50,000 acres of heavily timbered land in Washington, which it obtained as indemnity for lands not secured under its Minnesota grant.

The lieu selections for original Atlantic and Pacific granted lands relinquished in Arizona have been referred to on page 229. They were made by the Santa Fe Pacific, the present owner of the grant, and by four purchasers from the Atlantic and Pacific, viz, Aztec Land and Cattle Company, R. and E. B. Perrin, Wm. F. Baker, and Saginaw and Manistee Lumber Company. Some of these selections were restricted to nontimbered land. The unrestricted selections made in the name of the five holders amounted to some 735,000 acres, of which about 570,000 acres lay in the counties covered by the Bureau's timber investigation. Of this 570,000 acres 350,000 are owned by large timber owners reported to the Bureau, who purchased the "lieu scrip," and made their own selections of land. The amounts owned by separate holders range from 75,000 acres down. Most of these selections were located in the Pacific-Northwest, but 47,000 acres were in the South and 18,000 acres in the Lake States.

In west central Louisiana, in a large region covering part of the grant to the New Orleans Pacific, it was found that large timber holders reported to the Bureau now hold, in fee or as timber rights, 595,000 acres (90 per cent) out of the total of not quite 660,000 acres there patented under the grant. Ten holders have 440,000 acres of the railroad lands. A single holder has nearly 135,000 acres.

In Arkansas the St. Louis, Iron Mountain and Southern, nearly 60 years after the date of its grant, is still retaining over 570,000 acres, carrying a large amount of valuable yellow-pine and hardwood timber. This is over 40 per cent of its total grant. In the Upper Peninsula of Michigan the Michigan Iron and Land Company now owns 320,000 acres of granted land, constituting three-fourths of the total

area of the Federal grants to the Marquette and Ontonagon, and Bay de Noquet and Marquette Railroads. In Wisconsin and Michigan the Chicago and Northwestern had Federal grants aggregating 1,065,000 acres. It still owns 370,000 acres, part of which may have been derived from State grants. The Bureau has not investigated the present ownership of the entire original area of the grants referred to in this paragraph, nor the ownership of the many other Federal railroad grants in these and other timbered States. There are indications, however, that a similar situation would be found wherever the grants traversed timbered regions.

IMPORTANT HOLDINGS BASED ON WAGON-ROAD AND CANAL GRANTS.—Wagon-road and canal grants also contributed to the concentration of timber ownership, though on a smaller scale. In western Oregon the grant to the Coos Bay Wagon Road Company, aggregating some 100,000 acres, is practically all now held in the ownership of a single company. The greater part of the land is very heavily timbered. The grant to the Corvallis and Yaquina Bay Wagon Road Company runs mainly through burned-over territory. Only 14,000 acres out of the 80,000 acres patented to this grant was reported to the Bureau by timber holders. The Oregon Central Military Road grant had received to June 30, 1910, a total of somewhat over 600,000 acres, much of it in the timberless region of eastern Oregon. The company now holding the western portion of the grant reports the ownership of 175,000 acres of granted timberlands. The Willamette Valley and Cascade Mountain Wagon Road grant of over 800,000 acres is now practically all in a single ownership, and about 180,000 acres of the western part is heavily timbered. The Dalles Military Road grant (embracing over 550,000 acres) traversed comparatively little of the timbered region of Oregon. The company now controlling the grant reported the ownership of 36,000 acres of granted timberlands.

In the Upper Peninsula of Michigan the Fort Wilkins, Copper Harbor, and State Line Wagon Road grant amounted to 220,000 acres. One estate now owns 174,000 acres of this, and three great copper owning and mining concerns own practically all of the remainder. The road traversed a large part of the rich Copper Range.

Three canal-construction projects received Federal grants in the Upper Peninsula of Michigan, aggregating about 760,000 acres.¹ Of this no less than 670,000 acres (or 88 per cent) is now reported to the Bureau as owned by large timber holders. The largest single holding of canal lands in the Upper Peninsula is over 300,000 acres.

¹ The total acreage granted for these three canals was 1,250,000 acres; but about 480,000 acres of this, the present ownership of which has not been obtained by the Bureau, was selected in the Lower Peninsula of Michigan.

Section 9. Course of public sentiment regarding the Federal grants for means of transportation.

In the first fifteen years of the period during which the land grants for railroads, etc., were being made there was a strong popular demand for Federal aid to transportation projects. But the corporations that proposed to carry out the projects in fulfillment of public demand were interested to secure as great private advantage as possible. This could be attained by influencing the choice of routes for the roads, especially so as to traverse the most valuable lands; and by securing grants with as few restrictions as possible, and those restrictions loosely drawn. The public demand was largely directed by the interested parties, and Congress, liberal in its grants of what then seemed an inexhaustible public domain, neglected those safeguards that now appear essential to good policy.

Some of the grants, it is to be presumed, went through, as Douglas said of the Illinois railroad grant of 1850, "without a dollar, pure, uncorrupt."¹ In other cases, however, the evidence leaves little doubt that there was corrupt use of money, or of stock or land bonds of the prospective railroad, to secure grants, extensions of time, or other privileges.²

POPULAR CONCEPTION OF LAND-GRANT POLICY.³—In the popular mind the grants in aid of internal improvements were conceived as a means of opening undeveloped parts of the public domain to settlement by providing transportation facilities. It is clear, therefore, that grants on terms that would fail to promote rapid settlement

¹ The Public Domain, p. 262.

² See H. Rept. No. 352, 33d Cong., 1st sess., 1854, for an investigation resulting in a repeal (10 Stat., 575) of a grant to the Territory of Minnesota.

Also for bribery of the State legislature and State officers by a certain company to secure its designation as beneficiary of one of the Federal railroad grants to Wisconsin, see Report of Joint Select Committee Appointed to Investigate into Alleged Frauds and Corruption in the Disposition of the Land Grant by the Legislature, 1856, and for Other Purposes, Madison, Wis., 1858, 48 pp., with 322 pp. of testimony.

For investigation of alleged corrupt combinations of Members of Congress to secure or prevent the passage of measures in the Congress of 1857, especially land grants and bills conferring special privileges, see H. Rept. No. 243, 34th Cong., 3d sess., pp. 15-19, 28-38, and testimony, pp. 54-219. The expulsion of three Members was recommended by the report, but it was stated that there was no evidence of any general combination of Members of Congress for the purposes alleged. The three Members resigned.

For an agreement between certain promoters of the Northern Pacific in 1857, see H. Rept. No. 1498, 50th Cong., 1st sess., Apr. 3, 1888.

For specific charges of bribery in securing the Texas and Pacific grant in 1871, see S. Doc. No. 27, 46th Cong., 1st sess., vol. 1, Dec. 20, 1883. The grant was forfeited in 1885.

For an account of the Crédit-Mobilier scandal over the construction of the Union Pacific Railroad, involving several Members of Congress, see H. Repts. Nos. 77 and 78, 42d Cong., 3d sess., vol. 2, Feb. 18 and 20, 1873. Also H. Repts. Nos. 81 and 82 in the volume just referred to, and S. Rept. No. 519, 42d Cong., 3d sess., Feb. 27, 1873. As a result of these reports an act directing, among other things, the bringing of a suit was enacted (17 Stat., 509). Suit was brought, but the bill was dismissed by the lower court, and the dismissal was sustained by the Supreme Court (98 U. S., 569).

³ Most of this and the following subsection from p. 244 to p. 247 is summarized, and in places taken verbatim (with or without quotation marks), from a review of the land-grant policy by Government counsel in the brief on the Oregon and California Railroad case (U. S. v. Oregon and California R. R. Co. et al.), in Circuit Court for the District of Oregon; in equity, No. 3340; argument on behalf of United States on demurrer of defendants (pp. 430-491). This brief contains a valuable historical sketch of the entire land legislation of the United States as well as of the land grants.

could scarcely have been contemplated, much less grants on terms that would hinder it. The public idea was that the lands would be sold to the producing agricultural class that would settle the areas tributary to the railroads, and thus the cost of constructing the road would be largely met, and at the same time substantial and permanent benefits would result to the public.

When the grants through the agency of the States were being made, the public did not realize that the State legislatures in their disposition of the lands would fail to protect the general public.¹ In these grants, as well as in those direct to corporations, it was natural to assume that the railroads would distribute their lands to settlers whose industry would build up a profitable traffic. In the first place, only lands classed as agricultural were granted, timberlands being regarded as susceptible of clearing and settlement. Indeed, till 1878, the date of the timber and stone act, the only land classifications recognized in the law were agricultural and mineral; and except in a few early cases mineral lands were excluded from the grants.² Moreover, it was conceived that the checkerboard style of grant, the Government retaining the alternate sections, would result in the railroad lands being disposed of much as the Government lands were; that both sharing equally in the benefits resulting from construction of the roads, they would be equally desirable, so that the Government "double minimum" price of \$2.50 per acre would establish a maximum for railroad lands. Probably few persons considered the likelihood that great numbers of the alternate railroad sections might be sold to single speculative purchasers who would hold them at a higher price, or that great tracts might be retained for any extended period of time by the railroads themselves; and that, even with the checkerboard style of grant, there was danger of land concentration and retardation of development.

That the policy of settlement and wide distribution of public lands was rapidly becoming paramount in the public mind is attested by the change from early grants altogether prohibiting preemption of lands in the intervening sections to grants allowing settlers to take 80-acre free homesteads in those sections; from provisions forbidding

¹ The acts of Congress granting the lands to the States usually followed the language of the act granting lands to Missouri (10 Stat., 8), which provided: "That the lands hereby granted to said State shall be disposed of by said State only in manner following, that is to say: that a quantity of land not exceeding one hundred and twenty sections on each road, and included within a continuous length of twenty miles of said road, may be sold; and when the Governor of said State shall certify to the Secretary of the Interior, that said twenty miles of said road is completed, then another like quantity of land hereby granted may be sold; and so from time to time, until said road is completed; and if said road be not completed within ten years, no further sales shall be made, and the land unsold shall revert to the United States." In nearly all cases the State legislatures simply conferred the grants as entitlements, with the privileges and conditions attached by Congress, to the companies designated to build the roads. The grants through States, therefore, in general came into the hands of the beneficiaries without any restriction as to their disposition other than that imposed by Congress, that they should not be sold before they were earned.

² The Pacific railroad grants excluded mineral lands other than coal and iron lands.

settlement on granted lands to provisions extending relief to settlers on lands found to be part of a grant, and provisions expressly permitting settlement on granted lands down to the time of their withdrawal on filing a map of "definite location" of the road. All these changes were in accord with the land policy of the Nation that found expression in the free-homestead law of 1862.

Experience, however, showed the necessity for specific conditions requiring the disposition of the railroad lands in such manner as to promote settlement. The enactment in the grant for the Union Pacific route was the first condition looking in this direction. This grant being in a sense a war measure, speedy completion of the road was perhaps regarded as paramount to other considerations. However, it was required (ineffectively, as noted on p. 231, above) that lands not sold or disposed of within three years after the completion of the road should be subject to settlement and preemption, like other lands, at not more than \$1.25 per acre, to be paid to the company. With provisions for a popular subscription to the stock, limitations on the amount one person should acquire,¹ a Federal representative on the board of directors, and direct responsibility of the corporation to the United States, the Union Pacific Railroad was generally regarded as largely in the nature of a public enterprise.

PUBLIC CONFIDENCE ABUSED.—In the years immediately following the war, however, the actual workings of the railroad grants began to shatter confidence in the system. The great revival of industry quickly following the war was accompanied by an unparalleled movement of settlers westward, particularly along the line of the Union Pacific Railroad, to develop the resources of the opening country.

The capacity of the Union Pacific was overtaxed with traffic. The enterprise was so profitable that the promoters and officers of the company could have fulfilled every moral and legal obligation to the public. Instead, "the subsidy of bonds and lands, intended to promote the success of the enterprise and at the same time conserve the general interests of the Nation, was perverted into means of enriching a few financial adventurers. * * * By fictitious stock issues, fraudulent and collusive construction contracts, and other equally dishonest practices the work of looting the enterprise * * * was carried out."²

The opportunity to manipulate the land grant was not overlooked. Lands were disposed of in large blocks to speculators; in many instances, it was charged, they were sold, at small prices, to development companies collusively organized for that purpose by some of the promoters and officers of the railroad. Thus the corporation

¹ By the original act of 1862 no person could acquire more than 200 shares of stock, but by amendment of 1864 this provision was repealed.

² Government brief above cited, p. 450.

received only partial benefit of the grant and the settler was compelled to make terms with the speculator.

This manner of handling the land grants was not confined to the Union Pacific and other Pacific railroads. Other grants were exploited in the same general manner, and with the same injurious effects upon the development and settlement of the country.

These abuses resulted in vigorous protests addressed to Congress complaining of the manner in which these land grants were being handled. These protests "came from all parts of the country and from the substantial and representative elements of the Nation. Public sentiment upon the subject was expressed through the public press, legislative memorials and petitions signed by thousands of individual citizens, all directing the attention of Congress to the demoralizing effects of the methods practiced by the railroad companies. The very conscience of the Nation was aroused."¹

This aroused public sentiment was given effect in the policy adopted by Congress in 1869 of attaching to new or revived grants of public lands a strict condition requiring the sale of the granted lands to actual settlers only, in 160-acre tracts, at not more than \$2.50 per acre. This condition was attached to two expired grants that were revived and to one new one. One of the revived grants was that of the Oregon and California Railroad Company (now a subsidiary of the Southern Pacific Company), and the new grant was that of the Oregon Central, which was subsequently acquired by the Oregon and California. The other revived grant was that now owned by the Alabama and Chattanooga Railroad Company in Alabama. The same condition was attached in 1869 to the grant of 100,000 acres for the Coos Bay Wagon Road Company in Oregon.

However, in two important grants made after 1869 conditions were substituted which have so far proved ineffective. Reference has already been made (p. 235) to one of these cases—the amendment to the Northern Pacific grant, in the resolution of May 31, 1870 (16 Stat., 378), imposing certain conditions concerning alienation. In the Texas Pacific grant of 1871 (16 Stat., 573), and one other grant made by the same act—that of the New Orleans Pacific in Louisiana—a condition on alienation was inserted even weaker than the one held to be ineffective in the case of the Union Pacific grant. The terms of the act itself allowed the condition requiring sale in small tracts to be avoided by mortgaging the lands. The Texas Pacific was forfeited before the road was constructed, but in the case of the New Orleans Pacific grant the lands acquired were not sold in small tracts.

With the act of 1871, which was subsequently attacked as obtained by bribery, the making of grants came to an end. The early public demand for them had changed to a determined opposition.

¹ Government brief above cited, p. 461.

FAILURE OF RAILROADS TO BUILD THEIR LINES WITHIN TIME SPECIFIED.—In practically every land-grant act a time limit was set for the completion of the road. The importance of this was obvious. If it had been desired to wait till the gradual development of the various regions would assure a profitable operation of railroads, railroads could have been had without subsidy. The only object of subsidy was to secure railroads early enough to aid the pioneer development, instead of having them follow after such development had occurred. In the grants through the agency of the States it was provided that if the entire road was not finished in a given time (usually 10 years) all the unsold railroad lands should revert to the United States. The grants direct to corporations were conditioned on the completion of the road within the time limit. Some of the grants even required the building of a specified number of miles each year, a requirement which would open up the regions along the line in orderly progress. In both kinds of grants many extensions of time were made by Congress.

While time was a vital condition of the grants, yet 40 out of the 80 or more subsidized roads were not completed within the time set by law nor within the extensions granted. This fact, therefore, constituted an important failure of the consideration demanded in return for the lands. Since the lands in alternate sections along the route of the roads were withdrawn from settlement,¹ and remained so till the railroads earned them by construction, it followed that where the roads were not built till long after the time limits had expired millions of acres of unearned railroad lands were for years tied up from use and settlement. Meantime, the value of the railroad lands and of railroad traffic was being enhanced by the fact that settlers were coming in on the alternate sections, thus tending to give the railroads a large business from the start.

The panic of 1857, the war, and afterwards the panic of 1873 contributed to the long series of failures to build the roads within time, but very largely the failures were due to the reckless and fraudulent management of railroad companies during this period.

EFFORTS TO ENFORCE FORFEITURE FOR VIOLATION OF THE CONDITIONS OF THE GRANTS.—In the early years, when breaches of the time conditions occurred, it was the practice of the General Land Office, in the absence of any reviving act by Congress, to restore to entry the lands or the part remaining unsold, considering that they had *by the breach* reverted to the United States. But in 1874, in a case involving a Federal railroad grant to Wisconsin (Schulenberg *v.* Hariman, 88 U. S., 44), the Supreme Court decided that the grant was

¹ A few early granting acts directed immediate withdrawal of lands which would "probably" fall within the grant; up to 1862 the withdrawals were usually made by the Interior Department before the final passage and approval of the acts; after that date the acts provided for withdrawals on filing of a map of general route, or, in some cases, not till filing of map of definite location.

not forfeited *ipso facto* by failure of the company to build in time; that such failure was merely a ground for declaration of forfeiture by Congress and in absence of such declaration the grant remained in force. In other words, action by Congress itself was necessary to recover the lands. The delinquent railroads, therefore, in many instances continued building after the time limit had expired. The decision in *Schulenberg v. Harriman* was followed by a long line of affirmative decisions, some of which extended the principle to the grants direct to corporations. Prior to the decision of the Supreme Court it had apparently been the general opinion among administrative officers and legislators that forfeitures in such cases required no positive action. The decision, however, clearly required initiative by Congress. It therefore gave every reason for an early consideration of forfeiture acts.

During the eighties and early nineties the question of forfeitures for breach of the time condition was prominently before Congress.¹ Three different positions found adherents. One group contended that failure to build any part of the road in the time or at the rate required should work a forfeiture of the entire grant. Another group contended that failure to build part of the road within the final time limit (irrespective of rate) should work a forfeiture of the grant as to that part. In case a company had continued to build after the expiration of the time limit, this group did not wish to allow it any lands for the part built out of time. The third group contended that lands should be forfeited only opposite road not constructed at the date of the forfeiting act. It would give lands for as much road as was built up to the date of actual forfeiture. These opposing views and legal arguments for and against each were set forth at length in debates and in committee reports.

The first forfeitures were of particular grants. In 1885 the grant opposite the then uncompleted portion of the Oregon and California Railroad from Forest Grove, Oreg., to the coast at Astoria was forfeited; and also the entire Texas Pacific grant, none of the road having been built. In 1886 the part of the Atlantic and Pacific grant opposite then uncompleted road was forfeited; and also several smaller grants in Alabama, Mississippi, and Louisiana where the roads had not been built. Unsuccessful attempts were made to enact legislation forfeiting the Northern Pacific, Southern Pacific, and other important grants where the companies were still building, although the time limit had expired.

General forfeiture bills covering all roads where there had been default in construction were also introduced. The House of Representatives by substantial majorities took the second position men-

¹ From 1870 to 1877 a few relatively unimportant railroad grants in Louisiana, California, and Kansas had been forfeited for failure to construct the road.

tioned above, favoring forfeiture of land opposite road not built in time, even though subsequently built. The Senate, however, repeatedly refused to agree to bills embodying this principle as passed by the House. Meantime, while Congress debated, many of the roads in default continued their building. Finally, on September 29, 1890, the Senate measure, forfeiting only grants opposite roads then unconstructed, was accepted by the House and became law (26 Stat., 496). The act, it was estimated, forfeited not much more than 5 million acres; while the House bills would have forfeited 54 million. If the Senate measure itself had been passed in the early eighties, millions of additional acres would then have been forfeited that by 1890 were secured by the railroads through construction in the meantime. In 1892, and again in 1894, the House passed general forfeiture bills along the lines of its original position, but the Senate refused to indorse them.

Whether Congress has the legal right to forfeit the lands that the House bills would have forfeited has never been determined; Congress has at no time declared a forfeiture of the grant opposite any constructed piece of road, on the ground of breach of time condition, and its right to do so has therefore never come before the courts. Neither the general act of September 29, 1890, nor the earlier special forfeiture acts, made any provision validating those parts of grants where the road was not constructed until after the time set.

The forfeitures hitherto referred to were for failure to build the road. But in 1908 the land-grant question came up from a new angle—the failure to comply with the conditions regarding the sale of the granted lands. In that year a memorial of the legislature of Oregon, in the matter of the alleged violation of such a condition by the Oregon and California Railroad Company (a subsidiary of the Southern Pacific Company) was brought before Congress. As a result, suits for forfeiture of the Oregon and California Railroad Company's grants and also the Coos Bay Wagon Road grant, made on a similar condition, were authorized. These suits challenge, not the right to receive the granted lands, but the failure, after acquisition, to dispose of them in the manner provided by law. This is the first time that the Government has declared or sought forfeitures of internal improvement grants for breach of such conditions prescribing the manner of disposal.

The specific ground of the suit against the Oregon and California Railroad Company is the alleged violation of the condition attached to its grants in 1869 and 1870, requiring that the lands should be sold to actual settlers only, in tracts not exceeding 160 acres each, at a price of not more than \$2.50 per acre. It is charged in the Government's bill of complaint that, out of 820,000 acres sold by the company, a very large amount (alleged to be over 500,000 acres) was

sold in violation of the condition. Of this 500,000 acres, about 370,000 acres are alleged to have been sold to only 38 purchasers, chiefly large timber owners. Another violation of the grant charged against the railroad is its retention of 2,074,454 acres of its grant (see p. 230), and its refusal to sell the same to settlers. For, since January 1, 1903, the company has for all practical purposes entirely withdrawn its Oregon lands from the market.

The lower Federal court (Judge Wolverton) in April, 1911, overruled the company's demurrer to this suit, and sustained the Government in its crucial contention that the grant was "on condition subsequent," and consequently forfeitable if the condition were broken (186 Fed., 861, 923). The case will presumably be appealed ultimately to the Supreme Court.

The Coos Bay Wagon Road grant is now practically all held by the Southern Oregon Company, and the points of law involved in the pending suit against this company are similar to those in the railroad case.

In the case of the lands involved in the breach of the conditions of the Oregon and California Railroad Company grants, the Attorney General confined the entering of suits to that against the railroad itself for the unsold lands and to those against the 45 purchasers who had bought more than 1,000 acres each from the railroad. This administrative action, coupled with the enactment by Congress at the last session that no suits for recovery of other lands purchased from this railroad company in violation of the condition should be brought after one year from the date of the act, will effectually secure the title of those who own small acreages, and thus prevent a general unsettling of titles.

If the Government should be successful in the case against the Oregon and California Railroad Company, this recovery would restore to public ownership 70 billion feet of timber, or over one-sixth the privately owned timber in Oregon. Congress, in the recent act referred to above, provided that if the Oregon and California Railroad Company's unsold lands should be adjudged forfeited, they should not be open to entry. By this action these lands, if recovered, will be kept in public control.

The fact that Congress, on information presented to it, has authorized the Oregon and California and Coos Bay suits for alleged violation of conditions imposed over 40 years ago, suggests the propriety of a searching inquiry whether nonfulfillment of the various conditions attached to the Northern Pacific and other grants, including time conditions, would possibly give Congress just and legal cause to seek further forfeitures.

Obviously, any recovery of large holdings of granted timberlands held to be legally forfeitable would in so far lessen the present concentration of timber ownership.

Section 10. Extent and character of general land grants to States.

Besides the 190,000,000 acres of special land grants for railroads and the 8,990,000 for wagon roads, canals, and river improvements, the Federal Government made general grants to the States amounting, roughly, to 170,000,000 acres. Most of the grants were to the public-land States, which include Wisconsin, Michigan, Illinois, Indiana, Ohio, Mississippi, Alabama, and Florida, and all States west of the Mississippi River except Texas. They comprised grants for common-school purposes, the sixteenth section out of each township in States admitted before 1848, and the sixteenth and thirtieth sections in States admitted after that date; grants for general internal improvements, in most cases 500,000 acres to each State; grants for drainage purposes, giving to the States all swamp lands within their borders; grants for colleges of agriculture and mechanic arts,¹ and others less important in amount.

The Bureau has not given special attention to the manner of alienation by the States of timberlands acquired under these various grants. In certain States, however, the matter has been somewhat looked into, and there it has been found that many large blocks of land now in the hands of large timber holders were originally part of the State grants.

Some of the States sold direct to lumbermen without limitation of amount. Others allowed entries only in limited amounts by persons alleging intent to settle and taking oath that they had made no agreement to transfer the land to others. Yet even in such States, either by the looseness of the laws or by violation of them, large holdings were built up from State lands. The price received by the States was commonly only \$1.25 per acre, though in recent years prices have been sharply raised. In these ways many of the States have disposed of their lands rather freely and in such manner that valuable tracts of timber were eventually acquired by large holders at a low price. In Oregon two large timber holdings consist almost entirely of State school lands in sections 16 and 36. The State has already disposed of by far the greater part of its grants, much at low prices. In certain large areas in northeastern California it was found that, out of 360,000 acres selected by the State under its various grants, almost two-thirds is now owned by large timber holders. One holder, Thomas B. Walker, has more than 125,000 acres of this land; three others together have 65,000 acres of it. In Idaho the State has sold the timber on large tracts to lumber companies but has retained the fee.

¹ Grants for colleges of agriculture and mechanic arts were made to all States. Those which were not public-land States received scrip instead of land. This was sold, the buyer being then allowed to select land in the public-land States to the amount of the scrip he had bought.

The agricultural college scrip was often sold outright in large blocks. As early as 1867 a company advertised that during the two preceding years it had bought all the scrip issued to the States of Kentucky, Indiana, Maryland, North Carolina, and New Hampshire, and the greater part of that issued to Massachusetts, Ohio, and Pennsylvania; enough, with smaller lots, to make a total of over 3,000,000 acres. The amount of this scrip granted to all the States was only 7,800,000¹ acres; by 1867, according to this statement, two-fifths of it had passed to a single company. This company, no doubt, resold the scrip instead of itself locating the land.

Some States granted large amounts of their swamp lands and internal-improvement lands directly to railroads. Florida, whose entire area is less than 35,000,000 acres, received a swamp grant of over 20,000,000 acres. Up to 1910 its grants to railroad, canal, and drainage companies, and compensation to State agents for selecting swamp lands, together with a single sale of 4,000,000 acres, had absorbed about 16,000,000 acres out of not quite 19,000,000 acres disposed of.² Much of the swamp grant outside of the Everglades was covered with pine and cypress; and a great part of the present high concentration of timber ownership in the State is due to the policy adopted in disposing of the grant. Michigan also granted large amounts of its swamp lands to railroads. The Cleveland Cliffs Iron Company Interests now own 890,000 acres of swamp land in the Upper Peninsula, purchased from the railroad to which the State had granted it.

The original swamp-land grant (act of Sept. 28, 1850, 9 Stat., 519) granted the lands with a provision for their drainage and reclamation. The great bulk of the land, however, still remains undrained. What effect the failure to drain may have on the present title seems to be an undetermined question.

In Minnesota, according to Samuel G. Iverson,³ State Auditor, whose office is charged with the administration of the State lands, the Federal land grants to the State (excluding the Federal railroad grants) amounted to 8,150,000 acres, of which about 2,955,000 acres were common-school lands and 4,460,000 acres swamp lands. The State has sold or granted nearly 5,670,000 acres. Of this over 2,850,000 acres was swamp land granted by the State to various railroads, as shown in Table 58.⁴

¹ See *The Public Domain*, pp. 229-231, for the acreage of scrip received by each State and the amount realized from its sale—usually less than \$1 per acre.

² See the Eleventh Biennial Report of the Commissioner of Agriculture of the State of Florida, 1909-10, p. 645.

³ Address on the Public Lands and School Fund of Minnesota, by Hon. Samuel G. Iverson, State Auditor, p. 14 ff. Delivered at the monthly council meeting of the Minnesota Historical Society, Feb. 13, 1911, and published by the society.

⁴ *Ibid.*, p. 24.

TABLE 58.—SWAMP LANDS GRANTED TO RAILROADS BY MINNESOTA LEGISLATURE.

Date of act.	Grantee.	Acres granted.
Mar. 8, 1861	Lake Superior & Mississippi (now St. Paul & Duluth) R. R. Co. ¹	694, 399
Do	Taylor Falls & Lake Superior (now St. Paul & Duluth) R. R. Co.	91, 830
Mar. 5, 1863	St. Paul & Chicago (now Chicago, Milwaukee & St. Paul) R. R. Co.	462, 336
Feb. 11, 1865	Minneapolis & St. Cloud (now Great Northern) R. R. Co.	425, 664
Feb. 16, 1865	Southern Minnesota Railroad Co. ¹	36, 778
Mar. 2, 1865	Minnesota Central (now Wisconsin, Minnesota & Pacific) R. R. Co. ¹	275, 000
Mar. 9, 1875	Duluth & Iron Range R. R. Co.	600, 214
Mar. 3, 1881	Little Falls & Dakota R. R. Co.	265, 856
		2, 852, 077

¹ Company also received a Federal land grant.

In spite of these great gifts of 2,852,000 acres to railroads, the State, by its policy as to the rest of its lands, has already received from sale of lands and from timber and ore leases the sum of \$27,000,000, of which nearly \$22,500,000 is invested as a permanent educational fund. The sales of timber alone have already brought \$7,000,000, a fair price per thousand feet being received for the actual scale of logs cut and the State retaining the land. (For a table of the price received, by years, see p. 200 above.) It is estimated that the State has enough timber left to realize \$7,000,000 more. Besides, it still has 2,485,000 acres of patented lands, mostly swamp and school lands. Approximately 600,000 acres more, now in the course of selection and approval, are claimed by the State.

The discovery of iron ore on cut-over lands of the State emphasized the wisdom of its policy of retaining the fee of its timberlands. Following the ore discoveries a similar policy of retaining the fee of all its lands in the ore region and leasing mineral rights at a royalty of 25 cents a ton was adopted. This policy will, according to calculations based upon the present royalty, ultimately bring the State the immense sum of \$187,500,000¹ for ore. This calculation does not include very large areas of State lands scattered over northern Minnesota which may in the future prove to contain ore.

The State of Minnesota, according to Mr. Iverson, will receive more revenue from a certain 120 acres of swamp lands containing ore deposits, leased by the State for a royalty, than the States of Wisconsin and Michigan together received from the sale of all their lands. This 120 acres lies near Hibbing, Minn., in section 12, township 57 north, 21 west, and is called the "Scranton mine." According to the ore estimates, the State's royalties from this mine will ultimately reach \$10,000,000.² Concerning another section (640 acres) of school land, Mr. Iverson says:

¹ Address above cited, p. 25.

² *Ibid.*, p. 22.

The Minnesota school fund will * * * receive more money from one section of school land, the Hill iron mine, than the States of Michigan, Wisconsin, and Iowa combined have received or will ever receive from all the lands granted to them by Congress.¹

The State of Washington also, it should be said, still retains from its grants a very large body of valuable timberlands, and Montana and Idaho hold smaller amounts. In general, however, the instances that have come to the Bureau's knowledge suggest that throughout the timbered area the land policy of the States has done much to further the present concentration of timber ownership.

In Part II of this report details will be given for many of the condensed statements in this chapter regarding the present ownership of lands originally forming part of the Federal and State grants. This will be done in connection with the discussion of timber and land maps showing ownership in certain large selected areas in Washington, Oregon, California, Idaho, Louisiana, Michigan, and Florida. It was principally in these areas selected for mapping that the comparisons were made to determine how far the lands originally forming part of the great grants are now owned by large timber holders.

GENERAL LAND LAWS.

Section 11. Principal statutes.

The most important general land laws of the United States were the private-sale law; the act making military-bounty land-warrants assignable; the preemption law; the homestead law, with its commutation feature; and the timber and stone law. Historically, the underlying theory of the early land policy was that the public lands should be sold for revenue. To this end settlement without legal title was at first prohibited. Sales of land in unlimited tracts were made, credit being allowed at first; but after the breakdown of this system through overspeculation in land, the sales were strictly for cash.

In the later development of the land policy emphasis began to be laid on the rights of the settler as against the mere land speculator, and various acts were passed, culminating in 1841 in the act known as the preemption law, which gave the settler a preference right to buy at \$1.25 per acre one 160-acre tract in consideration of his residing thereon and improving it. This tendency toward favoring the settler seems at odds with the making of the immense land grants in the 20 years succeeding 1850. But, as pointed out above, the expectation was that the railroads would dispose of the lands to settlers much as the Government was doing; and when it was found that this was not being done public sentiment demanded that whenever new

¹ Address above cited, p. 2.

grants were made or old ones revived conditions should be imposed requiring sale of granted land in small tracts to actual settlers.

The homestead law of 1862 carried the preemption law a step further, by giving one 160-acre tract free in consideration of residence and cultivation. This law made the preemption law unnecessary, yet the latter was not repealed till 1891. The abuse of these laws in the timber regions will be pointed out below, but on the whole they were of substantial benefit in the agricultural development of the country.

The timber and stone law of 1878, which has conspicuously failed to accomplish its apparent purpose, was originally urged on the ground that the settler, limited to his 160 acres of cultivated land, needed a "wood lot" to supply timber for his domestic use; and that for local commercial use, in districts where the public lands had not been offered for sale, there was no legitimate way of getting timber from the public domain. Within five years the practical effect of this law in transferring public timberlands almost directly to large corporations and timber speculators was recognized in official reports, and its repeal was strongly urged. It nevertheless still remains in effect.

After this brief survey of the principal land laws to show their relation to one another, the discussion of their effect on the concentration of timber ownership may be taken up in some detail.

Section 12. Private cash sale of Government land.

The private-cash-sale law, which was in force with various modifications from 1820 to 1889, provided that the land should first be put up at auction for sale to the highest bidder at not less than \$1.25 per acre. But land thus "offered" at public auction without takers could then be sold at private sale for \$1.25 per acre flat (later raised to \$2.50 per acre within primary limits of railroad land grants). There were few bidders at public auction, and the great bulk of the land sold was sold under the private-sale plan rather than at public sale. The amount of land thus sold by the Government for cash at private or public sale was probably over 150,000,000 acres,¹ though no official statement of the actual quantity has been made.

There was no limit to the amount of land that one individual or corporation could thus acquire at private entry direct from the Government. Though only one section, 640 acres, could be acquired in one purchase, a buyer could make as many purchases as he pleased. By the operation of this law the ownership of timberlands in the Lake States, and especially in the South, passed directly into private hands, and in tracts of considerable size. Such tracts bought direct from the Government at \$1.25 per acre formed the nucleus of some

¹ Including the 25,696,000 acres sold in small tracts to settlers under the graduation act of 1854 for less than \$1.25 per acre. See Report of the Public Lands Commission, 1905 (S. Doc. No. 169, 58th Cong., 3d sess.), pp. 190-232, for sales at private entry for cash from July 1, 1880, to June 30, 1904, by States.

of the present large timber holdings. Since timber speculators did not go extensively into the far western field so early as into the South and the Lake States, it is probable that this law, repealed in 1889,¹ had less effect in the Pacific-Northwest than in the other regions named. But in the timbered regions of the Lake States and the South millions of acres of the public lands passed by this law into the hands of speculators and capitalists at a flat rate of \$1.25 per acre.

In 1866 it was estimated that the United States owned more than 40,000,000 acres in the five public-land States in the South—Florida, Alabama, Mississippi, Louisiana, and Arkansas.² In that year Congress enacted that all public lands in those States should be reserved for settlement under the homestead act, the maximum amount to be entered by one person in those States being 80 acres. This was in line with the policy of encouraging negroes to take up land and cultivate it for themselves. It excluded the land in these States from the operation of the cash-sale act, leaving the land strictly for the settler rather than for the speculator. From 1866 to 1883 there were 121,964 homestead entries under this act, covering 12,187,812 acres.³ Many of these entries, however, were fraudulent.

It was no uncommon thing for one person or one firm engaged in the timber or turpentine trade to procure to be made large numbers of homestead entries with apparently no intention of complying with the law.⁴

While the act of 1866, on the whole, encouraged settlement, it was repealed by Congress on June 22, 1876, and thus the public lands in these five States once more came under the operation of the cash-sale law.

With reference to this repeal the following statement was made in The Public Domain (1884):

It was claimed that the passage of the act of June 22, 1876, would enable persons to at once acquire titles to homes without waiting the long period required under the homestead act. Besides, it was urged that, as much of this land was covered with valuable timber, the Nation would secure a greater price than \$1.25 per acre, it being worth a great deal more at public sale. This was and always is mere subterfuge. It is a cunning device to pass a cash or private sales law. * * * The sales are advertised; a few persons come to the land office where offered; scarcely anyone bids. The lands thus become offered, are so marked on the plats, and are thereafter sold for cash in unlimited quantities at \$1.25 per acre. This is going on at this date in the Southern States, and especially in Alabama, under the act of March 3, 1883. * * * Any person, citizen or alien, can at this hour buy a million acres of the public lands, not occu-

¹ Act of Mar. 2, 1889 (25 Stat., 854).

² The Public Domain, p. 546.

³ *Ibid.*, p. 544.

⁴ *Ibid.*, p. 542.

ped by settlers, in any of the five Southern States, at \$1.25 per acre—timber, mineral, and agricultural.¹

The sales in five Southern States during the fiscal year 1882 were, at public offering, 2,033 acres, and at private sale, 830,406 acres. In the fiscal year 1883 they were, at public offering, 5,229 acres, and at private sale, 1,103,406 acres.²

The Bureau has made no extended study to determine how far the cash-sale law has aided the concentration of timber ownership. A study was made, however, of a large area in west central Louisiana where it was found that 65 purchasers originally secured from the Government under this law 1,000,000 acres, in amounts ranging from 1,000 acres to over 100,000 acres to a single purchaser. Of this, about 950,000 acres (95 per cent) is now held by timber owners reported to the Bureau. The 13 largest original purchasers of cash-sale lands in this area bought 670,000 acres. The 13 largest present owners of cash-sale lands hold 835,000 acres of such land in fee or as timber rights. Several of the original purchasers of large tracts still retain an interest in them to-day as stockholders in the corporations that now hold title.

Similarly, in the Upper Peninsula of Michigan it was found that the Cleveland Cliffs Iron Company Interests alone are the present owners of 200,000 acres of land originally sold by the Government under the private-sale law.

It is reasonable to assume that a study of this matter throughout the timbered regions of the public-land States would reveal a large number of cases where lands were alienated in great blocks under this law and are now owned in great blocks by large timber holders.

ASSIGNABILITY OF MILITARY-BOUNTY LAND-WARRANTS.—Another opportunity for the land speculator was offered by the provision of the act of March 22, 1852, making military-bounty land-warrants assignable. Under various acts granting individual land bounties for military service there were issued warrants embracing over 61,000,000 acres³ of land. Under the earlier acts the warrants were not assignable, but warrants for nearly 35,000,000 acres were issued after the act of 1852 providing for their assignability.

The military warrants were locatable on any public land which was subject to private cash entry. They were bought up by land speculators in large quantities and used instead of cash to purchase public land at private entry. In such cases land was patented to the assignee who presented the warrant. The fact that land could be bought at private sale for \$1.25 per acre cash indicates that the speculators who bought up warrants to use in place of cash obtained them for less than that price.

¹ The Public Domain, pp. 544-545.

² *Ibid.*, p. 545.

³ See Public Domain, pp. 233-237.

Section 13. Abuse of preemption, homestead, and timber and stone laws.

The general land laws already discussed, the cash-sale law, and the law making military warrants assignable, placed no limit on the amount of land any one person could acquire from the Government. The Federal preemption, homestead, and timber and stone laws, on the other hand, limited each individual to a 160-acre tract;¹ yet under cover of these laws great areas of timberland have passed from the possession of the Government in tracts of 160 acres each, only to fall almost directly into the hands of large timber owners.

It has been noted above that some of the State land laws limited the amount of State land that could be taken by any individual, without thereby securing any effective check against the speedy transfer of the individual's right in the land to some great timber holder, who practically used many such individuals to build up a great holding. The same has been true on a far larger scale of the Federal preemption, homestead, and timber and stone laws.

PREEMPTION AND HOMESTEAD LAWS.—The Public Land Commission (of 1879) in its preliminary report, February 24, 1880, said:

Until the passage of the act of June 3, 1878, entitled "An Act for the sale of timberlands in the States of California, Oregon, Nevada, and in Washington Territory," there was no manner by which timber or timberlands in either of the States or the Territory mentioned could be obtained excepting by settlement under the homestead and preemption laws, and by the location of certain kinds of scrip and additional homestead rights, which cost several dollars per acre.

Settlements upon timber-bearing lands in the States and Territory mentioned in the act, under the homestead and preemption laws, are usually a mere pretense for getting the timber. Compliance with those laws in good faith where settlements are made on lands bearing timber of commercial value is well-nigh impossible, as the lands in most cases possess no agricultural value, and hence a compliance with the law requiring cultivation is impracticable.

The commission visited the redwood-producing portion of the State of California, and saw little huts or kennels built of "shakes" that were totally unfit for human habitation, and always had been, which were the sole improvements made under the homestead and preemption laws, and by means of which large areas of redwood forests, possessing great value, had been taken under pretenses of settlement and cultivation which were the purest fictions, never having any real existence in fact, but of which "due proof" had been made under the laws.²

Many official recommendations were made for the repeal of the preemption law, and in 1891 it was repealed. All its purposes were better fulfilled by the homestead law, and for years before its repeal

¹ Preemption law, act of Sept. 4, 1841, and amendments (see *The Public Domain*, pp. 214-216); homestead law, act of May 20, 1862, and amendments (*ibid.*, pp. 332-356); timber and stone law, act of June 3, 1878, and amendments (*ibid.*, pp. 357-359). For later data, see Annual Reports of Commissioner of General Land Office.

² *The Public Domain*, p. 543.

it had been used as an easy means of transferring public lands to large speculators in agricultural and timberlands.

THE COMMUTATION CLAUSE OF THE HOMESTEAD LAW.—Congress, in recognition of the fact that misfortune or change of circumstances might befall a settler, provided by a clause in the homestead act of 1862 that any claimant after 14 months' residence and cultivation might "commute" his entry; that is, purchase the land at \$1.25 or \$2.50 per acre at the end of the 14 months, instead of getting it free at the end of 5 years of residence and cultivation. There is no such thing as a separate and distinct law allowing the entry of agricultural land with *intent* to commute. The applicant for homestead land must swear, among other things, that he takes the land in "good faith for the purpose of making a home for himself" and not for speculation or sale. The commutation clause, however, allows him to buy the land after 14 months, if his original plans should change.

While the wording of the commutation clause required 14 months' residence and cultivation, the Interior Department until recently held that since homesteaders are given 6 months from the date of entry to establish themselves on the land, therefore 8 months' actual residence immediately following this 6 months was a sufficient compliance with that part of the law requiring 14 months' residence before commutation. This construction of the clause was given the force of actual law, as to former entries, by a recent Congress, but now the full 14 months is required in actual residence.

During the four years from July 1, 1899, to June 30, 1903, 1,485 homestead commutations were made in the timber belt of Minnesota alone, covering 192,189 acres, on which the timber was then estimated at 297,000,000 feet. The Government received \$251,306.55, or 85 cents per thousand on the estimated amount of timber. A committee appointed by the Commissioner of the General Land Office estimated the value of the timber at that time at \$3 a thousand, or \$891,000, giving an immediate loss to the Government of \$639,693.45, besides the value of the land itself.¹

The following passage is from the report of this committee:

The effect of the commutation clause of the homestead act within the State of Minnesota has been to place millions of feet of merchantable timber and hundreds of acres of prospective mineral lands in the hands of lumbering and mining corporations, with prospective profits of thousands of dollars to their present owners.

* * * * *
The head of a large lumber company at Duluth, Minn., is authority for the statement, made in the presence of a member of your committee, that between the years 1885 and 1890 a certain lumber company of Minnesota and himself, together with others, obtained thousands of acres of pine lands from the

¹ Report of Public Lands Commission, 1905, p. 67.

Government under the old preemption law by simply filing names of persons found in the St. Paul (Minn.) and Chicago (Ill.) directories. When time for proof came, one set of men would appear at the local office and make proof on all claims set for that date. This gentleman also stated that he and the said lumber company had a standing agreement with the local land officers whereby they were to permit this kind of proofs for a consideration of \$25 per claim. He denied that it was continued after the repeal of the old preemption law, but there is to be found strong evidence that this same system was continued as late as 1894 under the commutation clause of the homestead act.

It is common knowledge in the city of Duluth, Minn., that in 1892, 1893, and 1894 persons desiring to commute would take an ordinary dry-goods box, make it resemble a small house with doors, windows, and a shingled roof. This box would be 14 by 16 inches, or larger, and would be taken by the entryman to his claim. On date of commutation proof he would appear at the local office, swear that he had upon his claim a good board house, 14 by 16, with shingled roof, doors, windows, etc. The proof on its face would appear excellent, and was readily passed by the local officers.¹

In 1909, H. H. Schwartz, at that time chief of field service of the General Land Office, commented as follows on the commutation clause of the homestead law:²

It has been my experience and observation in 10 years of field service that the commuted homestead is almost universally an entry initiated with a full intent never to make the land a home. Before the timber and stone law was extended to all public-land States the commutation clause in the homestead law was the vehicle through which timber was fraudulently acquired from the Government.

It has been my personal experience to examine solid townships in northern Wisconsin, in which practically all the even-numbered sections had been acquired under the homestead law, quite generally commutation. The timber had been cut off after patent, and yet not a single voter or inhabitant could be found in the township. The Government got \$400 a quarter section for lands frequently worth from \$10,000 to \$20,000. More recently actual farmers have purchased these stump lands from the mill companies.

"Commutation" is the clause in the homestead law under which citizens who are not farmers or ranchers, and who have no intention of ever becoming such, enter agricultural or valuable timberlands.

* * * * *

Actual inspection of hundreds of commuted homesteads shows that not one in a hundred is ever occupied as a home after commutation. They become part of some large timber holding, or parcel of a cattle or sheep ranch.

* * * * *

¹ Report of Public Lands Commission, 1905, pp. 72 and 73.

² Report of the National Conservation Commission (S. Doc. No. 676, 60th Cong., 2d sess.), Vol. III, p. 390.

Since the passage of the first commutation clause in the homestead law in 1862 there have been practically 35,000,000 acres of land acquired thereunder. The Government received probably \$70,000,000 for lands worth over \$350,000,000 at the time title left the United States.

The average yearly acreage commuted has been approximately 600,000. It is noted, however, that in the past few years the acreage of land annually commuted has largely increased. In 1905 there was a slight excess above 1,400,000 acres sold; in 1908 the acreage had increased to 3,124,277.

This increase coincides with the closer inspection and enforcement of the public-land law. Because of the inspection, those who are "dummies" for investors in timber, or cattle, or sheep concerns, and those who have no actual intent to make homes upon the land, are now unable to give such physical presence and cultivation to the land as will permit them to make a 5-year proof. As a consequence, they put in 8 months' time on the land, and thereupon commute. At present 14 months' actual residence is required.

On page 267, below, is shown the manner in which the United States parted with its title to some 34 of the most valuable sections of timberland in Pierce County, Wash. Twenty-three quarter sections were obtained by homestead entries. Each of these entries, if made in good faith, involved the establishment of a home; and a home could not be established without a clearing. The following table shows how many acres on each of these "homesteads" were reported by the assessor in 1910 as free from timber:

TABLE 59.—ACRES REPORTED BY THE ASSESSOR AS FREE FROM TIMBER, ON CERTAIN "HOMESTEADS" IN PIERCE COUNTY, WASH.

Part of section.	Section.	Township.	Range.	Acres free from timber.	Part of section.	Section.	Township.	Range.	Acres free from timber.
NE. $\frac{1}{4}$	12	15	4	(¹)	NE. $\frac{1}{4}$	32	16	5	0
SE. $\frac{1}{4}$	12	15	4	(¹)	SE. $\frac{1}{4}$	32	16	5	0
W. $\frac{1}{2}$ NW. $\frac{1}{4}$ and W. $\frac{1}{2}$ SW. $\frac{1}{4}$	12	15	4	(¹)	SW. $\frac{1}{4}$	32	16	5	0
SE. $\frac{1}{4}$ NW. $\frac{1}{4}$ and E. $\frac{1}{2}$ SW. $\frac{1}{4}$	12	15	4	(¹)	NW. $\frac{1}{4}$	32	16	5	0
NE. $\frac{1}{4}$ NW. $\frac{1}{4}$	12	15	4	(¹)	NE. $\frac{1}{4}$	16	17	5	0
Lots 3 and 4 and S. $\frac{1}{2}$ NW. $\frac{1}{4}$	4	15	5	0	NW. $\frac{1}{4}$	26	17	5	0
SW. $\frac{1}{4}$	4	15	5	0	SE. $\frac{1}{4}$	28	17	5	0
NE. $\frac{1}{4}$	22	16	5	0	SE. $\frac{1}{4}$	28	17	5	0
NW. $\frac{1}{4}$	22	16	5	0	SE. $\frac{1}{4}$	30	17	5	0
SE. $\frac{1}{4}$	22	16	5	0	NW. $\frac{1}{4}$	32	17	5	0
SW. $\frac{1}{4}$	22	16	5	0	SE. $\frac{1}{4}$	32	17	5	0

¹ These four tracts, being three "homesteads" and three-fourths of another, are owned by one lumber company and are assessed together. The assessment shows 15 acres untimbered on the four tracts, but does not show on what tract the clear land is.

² These two tracts, of 120 acres and 40 acres, respectively, were obtained from the Government as one homestead. The 40-acre piece is assessed to an individual, and 18 acres of it are reported free from timber. The other 120 acres are owned by the same great timber company that owns the rest of the section.

On the 23 "homesteads," 3,676 acres, the whole amount of unfor-ested land, whether naturally barren or cleared by man, is 33 acres. This clearing may be all on one claim, and, if not on one, is probably on two. Of the 23 "homesteads," at least 19, probably 21, and possibly 22, have no cleared land whatever.

THE TIMBER AND STONE ACT.—The act of June 3, 1878, entitled "An Act for the sale of timber lands in the States of California, Oregon, Nevada, and in Washington Territory," is commonly called the "timber and stone act." Later the act was extended to all the public-land States. It provided for the sale, at not less than \$2.50 an acre, to citizens of the United States or persons who had declared their intention to become citizens, of all such land as was chiefly valuable for timber or stone. Not more than 160 acres was to be sold to one person, but this interposed no serious obstacle to the acquisition of unlimited quantities through dummy entrymen.

The practical effect of the timber and stone act in aiding timber companies to assemble large holdings was early discovered, but it is still unrepealed. In 1883, five years after its passage, the Commissioner of the General Land Office vigorously denounced the law, and its repeal has been frequently urged in official reports of the Land Office, in the report of the Public Lands Commission in 1905, and in the report of the National Conservation Commission in 1909.

The law specifies that lands taken under it "may be sold * * * at the minimum price of \$2.50 per acre." In administrative practice, until November 30, 1908, the *maximum* price asked was \$2.50, as if the law had read "*shall* be sold." Since that date, by order of the Commissioner of the General Land Office, tracts taken have been appraised and the price fixed with reference to the amount and value of the timber and land, but at not less than \$2.50 per acre. This is an improvement of administration, but it does not remedy the vital defects of the statute.

The criminal prosecution of timber frauds under this law, and of other public-land frauds as well, has been greatly hindered and in many cases prevented by the statute of limitations (U. S. Comp. Stat., ch. 19), which provides that a prosecution for criminal offenses against the United States (other than certain excepted crimes) is barred after a lapse of three years. As to recovery of the lands themselves, fraudulent entries may be canceled by the Interior Department at any time prior to patent. After patent has issued, any suit by the United States to annul or cancel it and recover the lands must be brought within six years of the date of the patent. (Act of Mar. 3, 1891, 26 Stat., 1099.)

On the evil effects of the timber and stone law in general it is sufficient to refer to five official reports: The first that of the Public Land Commission in 1880; the second that of the Commissioner of the

General Land Office in 1883; the third that of the same officer for 1886; the fourth that of the Public Land Commission in 1905; and the fifth that of the National Conservation Commission in 1909.

The first Public Land Commission as early as 1880 recommended a law for timberlands, which provided for retaining the fee ownership of natural forest land, selling the product on lease, and maintaining a perpetual supply. These recommendations of the commission were not enacted into law.

A report of the Commissioner of the General Land Office in 1883 clearly pointed out the abuses under the timber and stone act, in part as follows:

The present and increasing value of timber is an inducement to individuals and companies to make large investments with a view to the control of the timber product, and the further enhancement of prices resulting from such control. The facility with which the restrictions of the public-land laws are evaded is a temptation to the illegal acquirement of title for the purpose of such investments.

It would perhaps be of little moment how soon the public title to lands should pass to private holders, since that is the ultimate purpose of the laws, if the further purpose of the laws that public lands should in the original instance be widely distributed among the people could also be secured. But if this can not be done, and the systems of public disposal are to result, as they now do, in permitting capitalists to indirectly obtain great bodies of public land, it is certainly but provident for the United States to require a price to be paid for its timberlands somewhat commensurate to their value.

Several propositions have been presented in Congress looking to a change in the methods of disposing of lands valuable chiefly for timber. The subject is one of difficulty, and it is important that the wisest action be taken. I am of opinion that such lands should be reserved by law from ordinary disposal, and sold only after appraisal and upon sealed bids, at not less than the appraised price. It would be proper that an act to such effect should not deprive settlers on the public lands of the right to take timber for domestic purposes or the support of their improvements.¹

Again in his annual report for 1886 the Commissioner of the General Land Office gave numerous specific instances of violations of the timber and stone law.²

The Public Lands Commission of 1903 in its second partial report of February 13, 1905, in speaking of the frauds under this law pointed out that in many cases transfers of the land were made to lumber companies immediately, often on the same day as the title was received; that the original entrymen rarely realized more than ordinary wages for the time spent in making the entry and completing

¹ Quoted in *The Public Domain*, pp. 1165-1166.

² *H. Ex. Doc.*, No. 1, Pt. 5, pp. 93-95, 49th Cong., 2d sess., vol. 9.

the transfer; that the corporations which ultimately secured the land usually absorbed by far the greater part of the profit; and that the timber was withdrawn from use till the corporations that owned it saw fit to cut.¹

The commission urged the repeal of the timber and stone act, and in its place recommended the sale of timber (without the land) on the remaining unreserved public domain, as follows:

We recommend the enactment of a law under which it shall be lawful for the Secretary of the Interior to sell to the highest bidder, at public outcry or otherwise, under such rules and regulations and subject to such conditions and restrictions and in such quantities as he may prescribe, the right to cut and remove, within such period of time as he may fix, any timber from any unappropriated, nonmineral, surveyed public lands, after first having had such timber duly appraised, and after giving public notice of the time, terms, manner, and place of such sale; that he shall have power and authority to reject any and all bids offered at any such sale, and that it shall be unlawful for any purchaser at such sale to sell, transfer, assign, or in any manner alienate the rights secured by him under this act, except as authorized by said Secretary; * * * and that no lands valuable chiefly for timber shall hereafter be patented under the commutation provisions of these provisions, or laws; that any person who violates any of these provisions, or any regulation or requirement prescribed pursuant thereto, shall forfeit to the United States all benefits conferred, and all moneys paid by him, and that any right to cut and remove timber which he may then hold shall be canceled and revoked.²

The commission also urged the classification of lands: Its recommendations quoted above have not been enacted into law.

A further statement as to the results of the timber and stone act was made in 1909 in connection with the report of the National Conservation Commission, by Mr. H. H. Schwartz, whose statement on the commutation clause of the homestead act has already been given. Mr. Schwartz said in part:³

In practice * * * this law has resulted in the sale of over 12,000,000 acres of valuable timberlands, of which fully 10,000,000 acres were transferred to corporate or individual timberland investors by the entrymen. These lands brought to the people or General Government a gross sum of \$30,000,000. At the date of sale they were reasonably worth \$240,000,000. The profit of over \$200,000,000 went not to the needy settler engaged in subduing the wilderness, but to the wealthy investors. Not over a fractional part of 1 per cent of the timber purchased from the United States under this act is held, consumed, or even cut by the men and women who made the entries.

¹ Report of the Public Lands Commission of 1903, p. xvi.

² *Ibid.*, pp. vii, viii.

³ Report of the National Conservation Commission, Vol. III, pp. 387-389.

The law requires, and each applicant makes, an oath containing among other things the following:

"That he does not apply to purchase the same on speculation, but, in good faith to appropriate it to his own use and benefit; and that he has not directly or indirectly made any agreement or contract in any way or manner, with any person or persons whatever, by which the title he might acquire from the Government of the United States should inure, in whole or part, to the benefit of any person except himself."

The Supreme Court, in *United States v. Budd* (144 U. S., 154), holds that an entry and purchase made with intent to sell at an advance if the market improves, and with no intent to use the timber itself, is not a "purchase for speculation."¹

With enough entrymen possessed of \$500 each, or credit to borrow that amount, and a prospective buyer at a small advance, the machinery is complete for transferring title from the Government, or general public, to the single corporate or individual investor. The process has been automatic, and in most cases neither fraud, perjury, or false swearing is needed.

Since January 6, 1908, the person entering timberlands, where some investor has given his notice of a willingness to buy all lands entered, need not even have the \$500 with which to buy, nor need he have credit upon which he may borrow that amount. The Supreme Court of the United States, in the case of *United States v. Williamson* (207 U. S., 425), decided upon the above date, holds that an entryman who has filed his sworn statement designating the particular tract he desires to purchase may, between the date of so filing and the date of actual payment—the 60 or 90 days during which he advertises his application to purchase—lawfully contract to sell or convey the land after patent issues. In other words, he may enter the lands with an intent to sell at once if he can make a profit; the corporate or individual investor may inform him that he will buy at a profit; after the entry is made, and before the applicant advances a dollar of the purchase price, entryman and prospective purchaser may contract to convey and the investor bind the bargain by depositing with entryman's attorney enough of the sale price to pay the Government for the land, and the identical money advanced on the lawful contract to sell is paid over the counter of the land office by entryman's attorney at final proof.

There is no fraud in the entryman; no risk to the investor; and a single concern may secure a wood lot of 100,000 acres in less than a year, at a profit of \$1,000,000 to the corporation and at a loss of the same sum to the general public, which is the Government.

I recall a specific instance in the Susanville and Redding districts, California, where a single investor, in the course of probably three years, acquired approximately 700,000 acres of heavily timbered lands, a large amount of which was secured under the timber and stone act.

¹ *Note by Bureau: Cf. also Olson v. United States* (133 Fed., 849, 852, 853), where the Circuit Court of Appeals interprets the holding in the Budd case, and the meaning of the statute.

In another large operation in central Oregon trainloads of women school-teachers were shipped out from Minnesota and entered lands under the timber and stone act. A hundred citizens of Oregon made like entries. These lands were then transferred to a timber investor from Minneapolis, Minn.; transfers going to him by deeds to a corporation. The articles of this incorporation were peculiar. They provided that only the president need own stock therein. Its officers were composed of the president (who was the investor) and his wife and son, who were, respectively, secretary and treasurer.

During the past 10 years there have been like individual operations in Montana, Idaho, Washington, and Colorado.

An excellent illustration, not only of the actual working of the homestead and the timber and stone laws, but also of the danger involved in making eliminations from the national forests, is found in the Olympic Peninsula of Washington. Over 400,000 acres (net area) was eliminated from the Olympic National Forest in 1900 and 1901 on the ground that the land was chiefly valuable for agriculture, and that the settlement of the country was being retarded. The land thus eliminated for *agricultural* use was largely taken up under the timber and stone law, which requires oath that the land is "*valuable chiefly for timber, but not fit for cultivation.*" It is now (10 years later) held mostly by great timber holders in private instead of public reserves. Only 100 settlers are living in the area eliminated, and the total amount of land they have in cultivation is only 570 acres, an average of less than 6 acres to the settler. Thus, the alleged purpose of the elimination was defeated and bona fide settlement was not advanced. The brief mention here made is to be supplemented by a full discussion, with maps, in a later part of this report.

Section 14. Prodigality of the public-land policy.

The fact that the land policy of the past 60 years has resulted in transferring great tracts of timberland from the public to a limited number of individuals becomes more significant when the values involved are considered. Two concrete examples of the prodigality of the policy are here given, in addition to those cited in Chapter V above.

The Bureau selected some 34 sections of the best timberland in Pierce County, Wash., and then traced the manner in which these sections were originally alienated by the United States and the amount received by it for them. The sections were chosen for their relatively high assessed valuation, ranging from \$25,000 to \$52,000 per section of 640 acres. They are not intended to be regarded as average or as typical, though it is believed that there are many other equally striking instances. The exact area of the timberland selected for this study was 21,602 acres. The total assessed valuation of the

timber (exclusive of the land) in 1910 was \$1,132,389. It is probable that the cash value of the timber on the individual sections would range from about \$50,000 to about \$125,000, and that the cash value of the whole is from \$2,250,000 to \$2,750,000.¹

Except for the land in the Northern Pacific grant and the school sections the earliest date of initiation of any right to these lands was 1889, only 22 years ago, and (with the exception of school sections which passed to the State without patent) all of it, including the railroad land, has been patented within the last 18 years. Nearly all was alienated without cash recompense, and in no case for a greater consideration than \$2.50 an acre. For the 5,082 acres not included in the Northern Pacific grant and the State grants the Government received less than \$5,000.

Nearly all the tracts shown in the table have passed into the hands of great corporations. Thus, 12,023 acres, with an assessed valuation of \$653,289 and a probable cash value of about \$1,200,000 or \$1,500,000, is assessed to the Weyerhaeuser Timber Company, and 6,080 acres, with an assessed value of \$308,260 and a probable cash value of from \$600,000 to \$750,000, is assessed to the St. Paul and Tacoma Lumber Company. A table showing detail of the facts here summarized will be found on page 281.

In 1909 an estimate of the present value of certain lands included in court cases, or before the Interior Department, on charges of illegality or fraudulent acquisition from the public domain, was officially submitted to Congress in connection with the request of the General Land Office for the special appropriation of \$1,000,000 which was made to investigate and prosecute the cases. This estimate showed a total valuation of \$114,733,273, for the lands involved in the cases listed. The statement does not in all cases show the acreage involved, but, taking this where it is shown, it is found that the estimated value of 556,861 acres of land claimed or secured under the settlement or timber and stone laws, as placer locations, or under the land grants, is no less than \$32,581,400. This is an average of over \$58 per acre, whereas for some of this land the Government received

¹ The Pierce County authorities have made a "cruise," or estimate of quantity, of the timber on each tract in the county. They reached the assessed value of the timber on each tract by multiplying the estimated number of thousands of feet by the assessed value per thousand.

A careful study of the Pierce County cruise, in the light of reports made to the Bureau by many large owners of timber in the county, indicates that, in general, the amounts fixed on by the county do not exceed two-thirds of the actual amounts of timber. The assessment is professedly intended to be about 60 per cent of the actual cash value of the quantity of timber which the cruise shows. If this quantity is two-thirds of the true amount, and if the assessed value is 60 per cent of the actual cash value of such a quantity, the assessed value is 40 per cent of the true value of the timber actually present. On this basis it would appear that the assessed valuations of timber should be multiplied by 2½ to give approximately the true value.

The Washington State Board of Tax Commissioners placed the actual value of all the timberlands in Pierce County in 1908 at \$18,868,004. The assessed value of such lands for 1910 was \$7,802,600, or 41.4 per cent of the actual value as estimated two years before. (See Second Biennial Report of State Board of Tax Commissioners, Appendix B, p. 96; Third Biennial Report of State Board of Tax Commissioners, Appendix B, p. 90.)

no cash payment and for none of it more than \$2.50 an acre. The 556,861 acres includes, however, 300 acres of mineral lands alleged to have been erroneously acquired under the Union Pacific grant (which excluded minerals). The estimated value of the 300 acres is \$15,000,000, or \$50,000 an acre. It also includes 161,600 acres of coal lands taken under timber, or under nonmineral forms, of entry, valued at \$9,360,000, an average of \$58 an acre, or over 23 times the highest price received by the Government for any of it. Of timberlands proper, it includes 288,201 acres, with a valuation of \$7,135,800, equivalent to \$25 per acre, or 10 times the highest price received by the Government. In point of size, the main item of this 288,201 acres is a holding of 200,000 acres of timberland within the boundaries of the forest reserve taken up as placer locations, the Government price of which is \$2.50 per acre. This is valued at \$5,000,000, or \$25 per acre.

Besides the 556,861 acres referred to, the statement shows 84,262 acres of mineral and coal land entries, other than placer locations, alleged to be fraudulent, with an estimated present value of \$15,355,840. Of this, 78,000 acres is coal land, valued at over \$15,000,000, an average of \$193 per acre, as against the regular Government price of \$10 or \$20. A single case involved 40,000 acres of coal land, valued at \$200 an acre, or \$8,000,000. One item of the statement which specifies no acreage covers four suits involving mineral lands acquired under railroad grants which excluded minerals. The value of the lands comprised in the four suits is placed at over \$25,000,000.

This estimate of the values involved in land cases pending in 1909 (irrespective of whether in the final outcome the Government or the private claimant obtains the land) strikingly illustrates how the Government's land policy with reference to timberlands—as distinct from agricultural lands—as it has actually worked out in practice, has disposed of immense public wealth in timber, and other resources, without securing any adequate return therefor in money or social advantage. Furthermore, this wealth, instead of having been distributed among a vast number of independent owners, as contemplated by the original spirit of this policy, has actually been concentrated to a very marked degree in a comparatively few hands.

Section 15. Summary and conclusions.

In this chapter there has been an attempt to set forth some of the principal features of the public-land policy which have contributed to the present concentration of timber ownership. There have been traced partially here and there the effects of Federal laws disposing of the public domain, such as the great land grants, cash sales, and the homestead and the timber and stone laws. Much of the legislation in question, including the land grants, was expected

to bring about ultimately a distribution of public lands in comparatively small tracts. As a matter of fact, so far at least as the timber regions are concerned, most of it has signally failed in this respect. Instead, the facts presented in this report show that timberlands alienated in immense grants have largely been retained by the original grantees or transferred in great blocks; and even where alienated in small tracts under the general land laws, such lands have largely been gathered into great holdings by timber speculators.

Altogether, it is clear that there has been a lavish dissipation of standing timber and other natural resources of the national domain, and that the beneficiaries of this policy have too frequently been not actual settlers, but capitalists who have been able to take advantage of this legislation or its faulty administration, and thus to accumulate vast holdings of timberland at a comparatively small cost and reap therefrom an enormous profit.

A striking fact is that the operation of much of this legislation was early understood and condemned by careful observers. That such warnings as those of public-land commissions and other public officers were so long disregarded is partly explained, no doubt, by the counter-pressure of local self-interest and the persistent efforts of beneficiaries of such legislation. However, it was also due in some part to the easy-going attitude of the public itself, which at that time looked upon these resources as practically inexhaustible. This attitude of the public was also to some extent attributable to the specious character of some of this legislation, especially the apparent limitation of the amount of land available to a single individual, which seemed to assure a wide distribution of ownership.

The development of public opinion affecting the country's natural resources has been very slow, and it must be remembered that in judging the public-land policy of a generation ago allowance must be made for conditions then existing. It would seem, however, that the public mind has at last been awakened to a realization of the fact that the present supply of standing timber is not inexhaustible. The creation of national forests, which reserved from private acquisition a large part of the timbered areas still remaining in public ownership, definitely marked a fundamental change in policy, and this is also indicated by the progress in recent years toward scientific and accurate classification of the remaining resources of the public domain. However, there is now a disposition to secure the alienation of timberland from national forests under the subterfuge of settlement. The experience of the past, as set forth in this report, may therefore be pertinently emphasized at this time.

It is also desirable to call attention to the fundamental difference between the sale of agricultural lands to actual settlers, who by their

industry improve this land and thereby contribute to the development of the community, and the alienation of timberlands, which do not require improvement and the value of which tends almost certainly to rise because of reduction in the supply and increase in population. The mere acquisition of timberlands from the public domain and their speculative holding involve only a negligible service to the public, while the concentration of the ownership of such lands, as set forth in this report, constitutes a serious public danger.

While much of the public domain has been dissipated in the manner indicated, it may be repeated, as already shown, that the Government is still the largest single owner of standing timber. While much of its timber is of relatively low value, nevertheless, in view of the fact that the Government is in an especially advantageous position for the practice of reforestation on an extensive scale, it seems that it should be able at a later date to materially strengthen its relative position as a timber owner. A further addition to its holdings may, moreover, be brought about as a result of forfeiture suits, some of which are now in progress. The facts set forth in this report clearly point to the desirability of maintaining the integrity of the national forests and, furthermore, suggest the desirability of the extension of the essential principles of the national-forest policy to such publicly owned timber as now stands on lands outside of these reserves, including forests of Alaska, possibly by bringing such lands within national-forest limits. It would seem that the same principles should also be extended to lands recovered by the Government in suits for forfeiture of title. This, however, affords only a partial solution of the grave problems involved in the concentration of the privately owned timber of the country.

SCHEDULE ON STANDING TIMBER
AND
ADDITIONAL TABLES.

100200°—13—18

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SCHEDULE ON STANDING TIMBER.

Department of Commerce and Labor, Bureau of Corporations.

SCHEDULE ON STANDING TIMBER.

[Return to Commissioner of Corporations, Department of Commerce and Labor, Washington, D. C. If more space is required, other sheets may be attached. Additional copies of pages 4 and 5 will be furnished on request.]

-----, -----, 19-----
(Place) (Date)
1. Name and address of person furnishing information given in this schedule: -----

If an officer or employee of the owner, give position: -----

2. Name of owner of standing timber: -----

Principal office at -----

Other offices at -----

3. If owner is a corporation, State of incorporation: -----

date of incorporation, -----; issued, \$ -----; capital stock authorized, \$ -----; address, -----

President, -----

Vice president, -----

Secretary, -----

Treasurer, -----

4. If owner is a partnership, full name and address and amount of interest of each partner: -----

5. Names of lumber associations or other trade organizations connected with the lumber industry of which this owner or any of its officers or employees is a member: -----

6. Business of owner: -----

(a) Are timber lands held for supply to sawmill or as an investment? -----

(b) Sawmills at -----

(c) Wholesale or distributing yards at -----

(d) Retail yards at -----

(e) If any properties of this owner (connected with the lumber industry) are operated under a name other than that shown for question 2, give name, location, and business of such establishments: -----

7. Connection between this owner and other lumber interests. (If the owner is an individual or a partnership, give the other timber or lumber interests of such individual or the several partners under the second part of "a"): -----

(a) Names and addresses of the individuals who hold the controlling stock interest in this company, and amount of stock held by each: -----

What other timber or lumber interests have these individuals (personal holdings or interests in other concerns owning timber, or manufacturing or marketing lumber)?

(b) If other companies or partnerships have a stock interest in this company, give name, principal office, and business of each such company or partnership and amount of said interest: -----

(c) If this company has a stock interest in other companies, give name, principal office, and business of each such company, the amount of its stock or bonds, and amount held by this company: -----

(d) Is this owner a part owner of any timberland or timber rights not shown in this schedule? ----- If so, fill out another schedule for the land or timber rights so owned, or name the person from whom the information may be obtained: -----

8. *Estimates of timber:* (When the estimates on separate tracts have been made at different times, or by different methods, the following blanks will not be sufficient. In such cases please write out a full statement covering the several points for each estimate and attach it to the schedule.)

(a) How was the estimate made (give such brief description of the method used as will indicate the accuracy of the work, for example, whether by mensuration over typical areas, or on the judgment of estimator after detailed examination of tract, or after general observation only)? -----

(b) When was estimate made? ----- (c) How much should this estimate be increased to cover changes in standards of merchantable timber since it was made? ----- per cent.

(This per cent is included in the per cent of overrun called for in "g.")

(d) Diameter at stump of smallest trees considered in making estimate? ----- inches. Height of stump? ----- inches. Diameter at stump of smallest trees that would now be taken? ----- inches. Height of stump? ----- inches.

(e) Was the estimate intended to be the best possible approximation to the actual mill output, or was it based on a log rule? -----

(f) Log rule used: -----

(g) The mill output will probably be ----- per cent more than this estimate.

(h) If timber of any kind was neglected in making the estimates, state the kinds, and the nearest approximation to the amount of each that can be made: -----

9. *Location of land and estimate of timber:* On the following page give the totals for all lands and timber rights owned and also estimates for each part thereof that has been separately estimated. If the estimates were made in greater detail than can be shown on page 4—as by survey sections or forties—a copy of the full record should be attached to the schedule. The exact location of the lands should be shown by a copy or blue print of the owner's plat, or if the land is in the States covered by the rectangular survey the location may be shown on pages 5, 6, and 7,¹ on which the forties may be marked as follows: Timberland . Timber rights . Young timber . Denuded land .

¹ The diagram plats referred to are not reproduced here.

Statement for all land and timber rights owned on....., 19.....

STATEMENT FOR EACH SUBDIVISION WHICH HAS BEEN SEPARATELY ESTIMATED.		TOTAL HOLDINGS.
Location.	State..... County..... Range..... Township.....	
Number of Acres.	ACREAGE. Timber land ¹ Timber rights. Young timber ² Denuded land ³	
	Total acres.....	
Kind in M board feet.	KIND OF TIMBER.	
Estimate of timber of each kind in M board feet.		
	Total timber.....	

¹ Include all land owned which has merchantable timber.

² Include all land owned now having no merchantable timber, but which will probably yield such timber in the future.

³ Include all land owned from which all merchantable timber has been cut and which will not yield any merchantable timber in the future.

Remarks.

State whether timber is virgin or second growth, and give a general statement regarding the present condition and prospects of the young timberland and also the possible future disposition of the denuded land (whether suitable for agriculture, reforestation, or waste). State the extent and nature of the changes in merchantable timber during recent years (that is, better utilization of the trees cut and the inclusion of kinds of timber not previously considered). Give the present value of each kind of standing timber and changes therein during the past ten years, and include price, date, and location of any typical sales for which exact information is had. Also, include any additional facts or general comments regarding the supply of timber or other points mentioned in this schedule.....

ADDITIONAL TABLES.

TABLE I.—NUMBER OF SAWMILLS, GROUPED ACCORDING TO OUTPUT: 1909.

[From Forest Products No. 2, 1909, compiled by Bureau of the Census in cooperation with Forest Service.]

State.	Total.	Number of mills cutting—									
		Less than 50 M.	50 to 500 M.	500 to 1,000 M.	1,000 to 2,500 M.	2,500 to 5,000 M.	5,000 to 10,000 M.	10,000 to 15,000 M.	15,000 to 25,000 M.	25,000 to 50,000 M.	50,000 M and over.
United States...	46,584	4,543	28,459	6,468	4,198	1,245	783	338	329	185	36
Alabama.....	2,125	179	1,313	317	211	45	27	15	13	4	1
Arizona.....	5	5	1	1	1	2	1	2	2	4	1
Arkansas.....	1,958	162	1,092	327	237	2	64	16	16	12	8
California.....	273	19	1,011	43	35	19	23	11	12	8	2
Colorado.....	250	32	146	42	22	4	2	1	1	1	1
Connecticut.....	422	77	228	65	46	5	1	1	1	1	1
Delaware.....	151	10	169	21	9	2	1	1	1	1	1
Florida.....	471	11	183	81	82	39	40	21	10	4	4
Georgia.....	1,991	130	2,141	312	215	43	32	12	5	1	1
Idaho.....	1,290	25	1,433	50	35	11	13	4	2	6	1
Illinois.....	827	158	610	39	15	4	1	1	1	1	1
Indiana.....	1,569	195	1,121	173	80	26	3	1	1	1	1
Iowa.....	350	55	277	12	1	2	1	1	1	1	1
Kentucky.....	2,351	274	1,681	258	92	30	13	2	1	1	1
Louisiana.....	641	10	1,163	103	131	67	58	37	38	30	4
Maine.....	1,181	63	625	206	187	63	27	6	3	1	1
Maryland.....	721	71	516	99	28	2	2	1	1	1	1
Massachusetts.....	628	89	702	158	108	11	6	1	1	1	1
Michigan.....	1,293	67	528	62	18	6	6	8	6	20	5
Minnesota.....	1,791	134	914	234	271	97	54	26	20	8	3
Mississippi.....	2,045	369	1,402	157	90	13	10	1	2	1	1
Missouri.....	2,179	21	92	20	22	11	5	3	2	3	3
Montana.....	682	31	296	150	153	41	8	1	1	2	2
New Hampshire.....	290	55	175	35	3	1	1	1	1	1	1
New Jersey.....	80	5	40	17	10	3	4	1	1	1	1
New Mexico.....	2,226	460	1,481	195	73	17	4	3	3	1	1
New York.....	3,249	210	1,937	571	350	101	54	16	10	10	10
North Carolina.....	1,628	153	1,193	190	80	8	1	3	1	1	1
Ohio.....	1,370	34	226	51	40	12	5	1	1	1	1
Oregon.....	645	31	299	119	101	48	30	11	23	4	3
Rhode Island.....	2,974	433	2,065	321	112	9	12	8	7	4	8
South Carolina.....	57	8	28	11	10	4	2	1	1	1	1
South Dakota.....	998	60	608	142	111	45	20	4	2	6	6
Tennessee.....	54	6	33	11	1	1	2	1	1	1	1
Texas.....	2,431	224	1,803	388	150	34	23	6	3	1	1
Utah.....	603	17	222	120	155	62	26	17	27	15	2
Vermont.....	88	19	65	148	77	9	3	1	1	1	1
Virginia.....	711	42	432	148	77	9	3	1	1	1	1
Washington.....	3,485	305	2,059	600	415	57	21	12	16	16	16
West Virginia.....	714	13	186	100	110	102	90	35	41	29	8
West Virginia.....	1,524	150	830	232	115	34	33	13	13	3	1
Wisconsin.....	1,205	69	713	190	97	43	32	19	29	13	1
Wyoming.....	88	11	68	3	3	3	3	1	1	1	1
All other States.....	11	2	5	2	1	1	1	1	1	1	1

1 Includes Kansas, Nebraska, and Nevada.

TABLE II.—LUMBER CUT DIVIDED ACCORDING TO THE OUTPUT OF INDIVIDUAL MILLS: 1909.
[From Forest Products No. 2, 1909, compiled by Bureau of the Census in cooperation with Forest Service.]

State.	Total.	Output of mills cutting—									
		Less than 50 M.	50 to 500 M.	500 to 1,000 M.	1,000 to 2,500 M.	2,500 to 5,000 M.	5,000 to 10,000 M.	10,000 to 15,000 M.	15,000 to 25,000 M.	25,000 to 50,000 M.	50,000 M and over.
	M feet.	M feet.	M feet.	M feet.	M feet.	M feet.	M feet.	M feet.	M feet.	M feet.	M feet.
United States.....	44,509,761	124,966	5,362,738	4,315,636	5,996,043	4,072,549	5,291,606	4,078,988	6,308,819	6,286,229	2,500,187
Alabama.....	1,691,001	4,957	245,392	207,761	309,862	147,409	179,839	177,983	245,216	1172,862	
Arizona.....	62,170	1,405	1,405			58,513			52,643		
Arkansas.....	2,111,300	4,875	221,068	225,428	341,949	208,999	228,523	200,763	303,202	377,093	
California.....	1,143,507	467	20,174	27,862	56,890	67,889	159,637	146,283	281,811	4412,484	
Colorado.....	141,710	911	27,494	28,225	27,777	11,467	545,906				
Connecticut.....	168,371	1,378	41,730	43,489	62,812	18,992					
Delaware.....	55,440	251	23,432	13,710	618,047						
Florida.....	1,201,734	202	43,568	54,809	124,702	142,333	283,603	245,216	177,579	128,722	
Georgia.....	1,342,249	3,286	238,906	203,043	297,384	104,935	201,482	144,497	7112,716	1323,010	
I Idaho.....	645,800	625	30,424	33,198	47,628	34,116	86,244	90,555			
Illinois.....	170,181	4,423	97,339	24,997	23,661	19,761					
Indiana.....	556,418	5,540	207,319	118,890	113,355	84,590	926,724				
I Iowa.....	132,021	1,428	40,356	8,577		108,984					
Kentucky.....	860,712	8,093	326,150	170,330	125,225	104,483	87,764	1138,667	766,609	1,048,753	
Louisiana.....	3,551,918	281	39,925	72,634	212,328	233,075	407,997	445,897	183,860		
Maine.....	1,111,565	1,845	141,220	140,961	274,386	205,134	194,174	69,985			
Maryland.....	267,939	2,150	102,436	65,680	32,483		622,197				
Massachusetts.....	361,200	1,412	77,755	61,595	156,462	63,976					
Michigan.....	1,889,724	2,683	166,971	108,511	144,952	177,083	476,893	271,123	318,116	1223,385	
Minnesota.....	1,561,508	1,993	96,902	39,695	23,312	21,256	39,914	98,432	118,551	797,704	
Mississippi.....	2,572,669	4,024	185,040	160,233	403,314	329,200	377,563	303,754	362,660	256,555	
Missouri.....	660,159	9,995	227,992	104,037	130,088	38,399	91,431				
Montana.....	308,582	822	16,832	12,943	31,460	37,891	31,667	82,336		94,631	
New Hampshire.....	649,606	823	67,231	105,377	227,939	107,631	51,615			1188,990	
New Jersey.....	61,620	1,462	31,025	22,033	17,100						
New Mexico.....	91,987	1,70	8,267	11,291	12,620	57,994	29,875	36,708	51,694		
New York.....	681,440	11,840	256,067	130,100	107,162	80,924	303,476	175,726	196,378		
North Carolina.....	2,177,715	5,807	395,992	369,527	462,780	298,929					
Ohio.....	542,904	4,152	242,863	121,714	99,634	334,927					

1 Includes the cut of 1 mill in group 10.
 2 Includes the cut of 1 mill in group 3.
 3 Includes the cut of 1 mill in group 8.
 4 Includes the cut of 1 mill in group 7.
 5 Includes the cut of 2 mills in group 10.
 6 Includes the cut of 1 mill in group 7 and of 1 mill in group 8.
 7 Includes the cut of 1 mill in group 5.
 8 Includes the cut of 2 mills in group 5.
 9 Includes the cut of 1 mill in group 9.
 10 Includes the cut of 2 mills in group 8.
 11 Includes the cut of 1 mill in group 7.
 12 Includes the cut of 1 mill in group 4.
 13 Includes the cut of 1 mill in group 8.
 14 Includes the cut of 1 mill in group 5.

TABLE II.—LUMBER CUT DIVIDED ACCORDING TO THE OUTPUT OF INDIVIDUAL MILLS: 1909—Continued.

State.	Output of mills cutting—										
	Total.	Less than 50 M.	50 to 500 M.	500 to 1,000 M.	1,000 to 2,500 M.	2,500 to 5,000 M.	5,000 to 10,000 M.	10,000 to 15,000 M.	15,000 to 25,000 M.	25,000 to 50,000 M.	50,000 M. and over.
	M feet.	M feet.	M feet.	M feet.	M feet.	M feet.	M feet.	M feet.	M feet.	M feet.	M feet.
Oklahoma.....	225,730	1,002	42,048	31,305	15,951	42,334	1,63,090	132,133	430,270	233,117	406,498
Oregon.....	1,895,695	757	56,893	77,212	141,445	162,650	208,312	100,034	136,866	140,739	194,055
Pennsylvania.....	1,462,771	10,937	403,866	221,453	145,460	27,622	78,729				
Rhode Island.....	25,489	188	5,137	7,824	12,340						
South Carolina.....	897,660	1,801	108,309	89,872	165,051	136,535	131,510	* 92,409		171,973	
South Dakota.....	31,057	103	7,846	7,846			111,068				
Tennessee.....	1,223,849	6,579	357,448	256,396	203,029	120,885	144,816	77,539	57,157		
Texas.....	2,099,130	472	47,698	80,250	231,347	213,549	180,184	211,276	511,017	623,297	
Utah.....	12,658	522	9,675	2,441							
Vermont.....	351,571	1,147	102,156	98,212	106,175	26,198	17,683				
Virginia.....	2,101,716	8,802	415,583	399,803	560,722	156,916	124,831	145,735	289,324		
Washington.....	3,862,916	357	43,382	67,935	165,167	357,715	600,963	411,424	771,685	972,370	471,918
West Virginia.....	1,472,942	3,965	199,337	153,485	166,133	122,618	243,777	160,745	260,883	161,969	
Wisconsin.....	2,025,038	2,060	154,276	130,764	169,282	152,113	227,408	227,601	549,051	412,473	
Wyoming.....	28,602	237	9,935	2,052	5,400	10,978					
All other States *.....	15,946		7,630	* 15,316							

1 Includes the cut of 1 mill in group 7 and of 1 mill in group 8.

2 Includes the cut of 2 mills in group 8.

3 Includes the cut of 1 mill in group 4 and of 1 mill in group 5.

4 Includes the cut of 2 mills in group 10.

* Includes the cut of 1 mill in group 10.

5 Includes Kansas, Nebraska, and Nevada.

6 Includes the cut of 2 mills in group 1.

7 Includes the cut of 1 mill in group 5 and of 1 mill in group 7.

TABLE III.—ASSESSED VALUE OF THE TIMBER ON CERTAIN SELECTED SECTIONS IN PIERCE COUNTY, WASH., FOR THE YEAR 1910, WITH THE MANNER AND DATES OF ALIENATION BY THE UNITED STATES.

Part of section.	Sec- tion.	Town- ship (north).	Range (east).	Num- ber of acres.	Manner of alienation.	Patented.	Settled.	Assessment for 1910.		Assessed to—
								Timbered acreage.	Value of timber, exclusive of land.	
All	1	15	4	638	Northern Pacific Railroad grant...	Apr., 1901	Nov., 1890	616	\$34,334	Weyerhaeuser Timber Co.
NE $\frac{1}{4}$	12	15	4	160	Homestead	Nov., 1899	Sept., 1891			
SE $\frac{1}{4}$	12	15	4	160	do.	Oct., 1899	July, 1891	585	29,490	Do.
SE $\frac{1}{4}$ NW $\frac{1}{4}$ and W $\frac{1}{2}$ SW $\frac{1}{4}$	12	15	4	160	do.	Dec., 1900	Apr., 1893			
SE $\frac{1}{4}$ NW $\frac{1}{4}$ and E $\frac{1}{2}$ SW $\frac{1}{4}$	12	15	4	120	do.	do.	do.	22	1,510	R. Vincent.
NE $\frac{1}{4}$ NW $\frac{1}{4}$	12	15	4	4	do.	do.	do.	1 677	29,920	Wheeler-Reese Lumber Co.
All	1	16	4	676	Northern Pacific Railroad grant...	Mar., 1896	Sept., 1889	474	19,345	Weyerhaeuser Timber Co.
NE $\frac{1}{4}$	4	15	5	156	Homestead	Oct., 1895				
SE $\frac{1}{4}$	4	15	5	159	State selection ²	Mar., 1899				
SE $\frac{1}{4}$ and 4 and S $\frac{1}{2}$ NW $\frac{1}{4}$	4	15	5	160	Timber and stone	May, 1900				
SE $\frac{1}{4}$	4	15	5	160	Timber and stone	Oct., 1898	July, 1891	160	6,745	Washington Fir and Timber Co.
SW $\frac{1}{4}$	4	15	5	160	Homestead					
NE $\frac{1}{4}$	8	15	5	160	Timber and stone	July, 1893		400	24,215	Weyerhaeuser Timber Co.
E $\frac{1}{2}$ NW $\frac{1}{4}$ and E $\frac{1}{2}$ SW $\frac{1}{4}$	8	15	5	80	do.	do.	do.			
W $\frac{1}{2}$ NW $\frac{1}{4}$	8	15	5	80	do.	do.	do.	80	5,100	A. Elsner.
W $\frac{1}{2}$ SW $\frac{1}{4}$	8	15	5	80	do.	do.	do.	640	29,640	Weyerhaeuser Timber Co.
All	9	15	5	640	Northern Pacific Railroad grant...	Dec., 1894		640	52,200	Do.
All	16	15	5	640	School land			640	46,950	Do.
All	17	15	5	640	Northern Pacific Railroad grant...	Dec., 1894		589	40,675	Do.
All	21	15	5	640	do.	do.		320	19,415	Do.
S $\frac{1}{2}$	24	15	5	320	State selection	Nov., 1896		640	40,475	Do.
All	23	15	5	640	Northern Pacific Railroad grant...	Dec., 1894		686	39,350	Do.
All	3	16	5	686	do.	do.	do.	686	29,645	Do.
All	5	16	5	686	do.	do.	do.	633	33,700	Do.
All	7	16	5	633	do.	do.	do.	640	26,455	Do.
All	15	16	5	640	School land			480	28,000	Do.
N $\frac{1}{2}$ and SW $\frac{1}{4}$	16	16	5	480	Northern Pacific Railroad grant...	Oct., 1895	Oct., 1891	636	30,515	Do.
All	19	16	5	636	Homestead	May, 1898				
NE $\frac{1}{4}$	22	16	5	160	do.	Aug., 1901	Oct., 1895	640	25,635	Do.
NW $\frac{1}{4}$	22	16	5	160	do.	do.	do.			
SE $\frac{1}{4}$	22	16	5	160	do.	Oct., 1898 ³	Sept., 1895			
SW $\frac{1}{4}$	22	16	5	160	do.	Aug., 1898	Mar., 1891			
All	29	16	5	640	Northern Pacific Railroad grant...	Oct., 1895		640	34,475	Do.
All	31	16	5	638	do.	do.	do.	638	31,225	Do.

¹ Land-office records show 676 acres in section.

² For charitable, educational, penal, and reformatory institutions.

³ Credited with military service two years.

TABLE III.—ASSESSED VALUE OF THE TIMBER ON CERTAIN SELECTED SECTIONS IN PIERCE COUNTY, WASH., FOR THE YEAR 1910, WITH THE MANNER AND DATES OF ALIENATION BY THE UNITED STATES—Continued.

Part of section.	Sec-tion.	Town-ship (north).	Range (east).	Num-ber of acres.	Manner of alienation.	Patented.	Settled.	Assessment for 1910.		Assessed to—
								Timbered acreage.	Value of timber, exclusive of land.	
NE. 1/4	32	16	5	160	Homestead	May, 1896	Oct., 1890	480	\$28,700	Salling and Wheeler.
SE. 1/4	32	16	5	160	do	do	do			
SW. 1/4	32	16	5	160	do	May, 1898	June, 1891	160	8,590	Weyerhaeuser Timber Co.
NW. 1/4	32	16	5	160	do	Oct., 1896	Apr., 1891	640	30,230	St. Paul and Tacoma Lum-ber Co.
All.	9	17	5	640	Northern Pacific Railroad grant	Apr., 1895				
All.	15	17	5	640	do	do	Jan., 1889	640	28,415	Do.
NE. 1/4	16	17	5	160	Homestead	Oct., 1895		320	13,635	Do.
SW. 1/4	16	17	5	160	School land					
All.	17	17	5	640	Northern Pacific Railroad grant	Apr., 1895		640	26,430	Do.
All.	21	17	5	640	do	Dec., 1894		640	27,265	Do.
All.	23	17	5	640	do	do		640	37,310	Do.
NE. 1/4	26	17	5	160	Preemption	Apr., 1893				
NW. 1/4	26	17	5	160	Homestead	July, 1893	Apr., 1889	640	32,300	Dempsey Lumber Co.
SE. 1/4	26	17	5	160	do	do	July, 1889			
SW. 1/4	26	17	5	160	Preemption	Apr., 1893		640	37,625	St. Paul and Tacoma Lum-ber Co.
All.	27	17	5	640	Northern Pacific Railroad grant	Dec., 1894				
NE. 1/4	28	17	5	160	Homestead	Dec., 1896	Jan., 1890	160	12,220	Do.
E. 1/2 NW. 1/4	28	17	5	80	Preemption	June, 1895				
W. 1/2 NW. 1/4	28	17	5	80	Surveyor's scrip.					
SE. 1/4	28	17	5	160	Homestead	July, 1896	July, 1889	480	28,150	Do.
SW. 1/4	28	17	5	160	do	Mar., 1896	do			
All.	29	17	5	640	Northern Pacific Railroad grant	Dec., 1894		640	36,345	Do.
NE. 1/4	30	17	5	160	Preemption	June, 1893		320	13,795	Dempsey Lumber Co.
SE. 1/4	30	17	5	160	Homestead	Nov., 1898	July, 1889			
NE. 1/4	32	17	5	160	Preemption	Apr., 1893		480	19,500	Do.
NW. 1/4	32	17	5	160	Homestead	Mar., 1895	Fall, 1889			
SE. 1/4	32	17	5	160	do	Mar., 1897	Nov., 1891	640	30,635	St. Paul and Tacoma Lum-ber Co.
All.	33	17	5	640	Northern Pacific Railroad grant	Dec., 1894		640	33,270	Northwestern Improvement Co.
All.	21	15	6	640	do	do				
All.	9	19	8	640	do	Apr., 1901		640	28,960	Weyerhaeuser Timber Co.

¹ Credited with military service, two years.

NOTE.—The following tables (IV to IX) were compiled for the Forest Service at its request:

TABLE IV.—STANDING TIMBER, BY SPECIES, IN LOUISIANA, BY DIVISIONS BASED ON THE AREAS OF YELLOW PINE.

[In billions of board feet. Thus, 119.8=119,800,000,000 board feet.]

Species.	Louisiana.		East of the Mississippi River. ¹	North of the Red River. ²	Other parishes.
	Total	Yellow pine.			
Yellow pine.....	119.8		15.9	36.4	67.5
Longleaf Shortleaf and loblolly.....	67.7		11.5	17.0	38.6
Cypress.....	52.5		10.9	7.5	34.1
Hardwoods.....	15.2		.6	10.1	4.5
	15.7		1.3	1.0	13.4
	36.4		3.1	17.8	15.5

¹ Except the parishes south of the north boundary of Ascension, which contain no yellow pine.

² Includes all of Red River Parish and excludes all of Natchitoches, Rapides, and Avoyelles Parishes.

The parishes in each division are as follows: *East of the Mississippi River*—East Baton Rouge, East Feliciana, Livingston, St. Helena, St. Tammany, Tangipahoa, Washington, West Feliciana. *North of the Red River*—Bienville, Bossier, Caldwell, Claiborne, Concordia, Catahoula, East Carroll, Franklin, Grant, Jackson, La Salle, Lincoln, Madison, Morehouse, Ouachita, Red River, Richland, Tensas, Union, Webster, West Carroll, Winn. *Other parishes*—Acadia, Ascension, Assumption, Avoyelles, Caddo, Calcasieu, Cameron, De Soto, Iberia, Iberville, Jefferson, Lafayette, Lafourche, Natchitoches, Orleans, Plaquemines, Pointe Coupee, Rapides, Sabine, St. Bernard, St. Charles, St. James, St. John the Baptist, St. Landry, St. Martin, St. Mary, Terrebonne, Vernon, Vermilion, West Baton Rouge.

TABLE V.—CYPRESS AND HARDWOODS IN LOUISIANA, BY DIVISIONS, BASED ON THE ALLUVIAL REGIONS.

[In billions of board feet. Thus, 15.7=15,700,000,000 board feet.]

Species.	Louisiana.	North Mississippi River parishes.		South Mississippi River parishes.		Red, Sabine, and Pearl River parishes.		Other parishes.
		Yellow pine.	Hardwoods.	Yellow pine.	Hardwoods.	Yellow pine.	Hardwoods.	
Cypress.....	15.7	0.6	14.3	0.7	0.1			0.1
Hardwoods.....	36.4	13.8	9.5	10.9	2.2			2.2

The parishes in each division are as follows: *North Mississippi River parishes*—Caldwell, Catahoula, Concordia, East Carroll, Franklin, La Salle, Madison, Morehouse, Ouachita, Richland, Tensas, Union, West Carroll. *South Mississippi River parishes*—Ascension, Assumption, Avoyelles, East Baton Rouge, Iberia, Iberville, Jefferson, Lafourche, Livingston, Orleans, Plaquemines, Pointe Coupee, St. Bernard, St. Charles, St. James, St. John the Baptist, St. Landry, St. Martin, St. Mary, Tangipahoa, Terrebonne, West Baton Rouge, West Feliciana. *Red, Sabine, and Pearl River parishes*—Bossier, Caddo, Calcasieu, Cameron, De Soto, Grant, Natchitoches, Rapides, Red River, Sabine, St. Tammany, Vernon, Washington, Winn. *Other parishes*—Acadia, Bienville, Claiborne, East Feliciana, Jackson, Lafayette, Lincoln, St. Helena, Vermilion, Webster.

TABLE VI.—STANDING TIMBER IN MISSISSIPPI, BY SPECIES AND BY GROUPS OF COUNTIES.

[In billions of board feet. Thus, 95.3=95,300,000 board feet.]

Group of counties.	Total timber.	Yellow pine.		Hard-woods and cypress.
		Longleaf.	Shortleaf and loblolly.	
Mississippi.....	95.3	47.6	14.8	32.9
Group 1.....	3.4	.4	.8	2.2
Group 2.....	8.6	6.9	.3	1.4
Group 3.....	15.6	14.4	.....	1.2
Group 4.....	21.0	19.3	.....	1.7
Group 5.....	14.3	6.6	5.0	2.7
Group 6.....	6.9	.....	4.1	2.8
Group 7.....	4.2	.....	2.3	1.9
Group 8.....	4.8	.....	1.7	3.1
Group 9.....	1.2	.....	.....	1.0
Group 10.....	2.2	.....	.3	1.9
Group 11.....	13.1	.....	.1	13.0

The stand of cypress in the State is 1.9 billion feet. Of this, 1 billion is in Sharkey, Washington, and Issaquena counties; outside these counties the most important stand is in Wilkinson, and the next in Greene.

The counties in each group are as follows:

Group 1. Warren, Claiborne, Jefferson, Adams, and Wilkinson.

Group 2. Copiah, Lawrence, Lincoln, Franklin, Amite, and Pike.

Group 3. Simpson, Smith, Covington, Jefferson Davis, Marion, Jones, and Lamar.

Group 4. Forrest, Perry, Greene, George, Jackson, Harrison, Pearl River, and Hancock.

Group 5. Kemper, Lauderdale, Newton, Scott, Rankin, Hinds, Jasper, Clarke, and Wayne.

Group 6. Noxubee, Winston, Attala, Madison, Leake, and Neshoba.

Group 7. Lowndes, Monroe, Itawamba, Tishomingo, Prentiss, and Alcorn.

Group 8. Pontotoc, Lafayette, Calhoun, Chickasaw, Clay, Webster, Choctaw, and Oktibbeha.

Group 9. Lee, Union, Tippah, Benton, and Marshall.

Group 10. De Soto, Tate, Panola, Yalobusha, Tallahatchie (hill section), Grenada, Montgomery, Carroll, Holmes (hill section), and Yazoo (hill section).

Group 11. Tunica, Coahoma, Quitman, Bolivar, Sunflower, Tallahatchie (delta section), Leflore, Holmes (delta section), Yazoo (delta section), Washington, Sharkey, Issaquena.

TABLE VII.—STANDING TIMBER IN ALABAMA, BY SPECIES AND BY GROUPS OF COUNTIES.

[In billions of board feet. Thus, 56.3—56,300,000,000 board feet.]

Group of counties.	Total timber.	Yellow pine.		Hard-woods and cypress. ¹
		Longleaf.	Short-leaf and loblolly.	
Alabama.....	56.3	25.5	12.4	18.3
Group 1.....	10.0	8.2	.3	1.5
Group 2.....	9.3	6.7	.6	2.0
Group 3.....	9.5	.4	4.8	4.3
Group 4.....	1.8	.3	.9	.6
Group 5.....	2.5	.9	.6	1.0
Group 6.....	7.3	3.1	2.0	2.2
Group 7.....	5.4	4.2	.6	.6
Group 8.....	2.1	.8	.6	.7
Group 9.....	7.4	1.0	2.0	4.4
Group 10.....	1.0	.....	.....	1.0

¹ The stand of cypress in the State is 200 million feet.

The counties in each group are as follows:

- Group 1. Washington, Mobile, Baldwin, Escambia, Covington, Geneva, and Houston.
 Group 2. Choctaw, Clarke, Monroe, Conecuh, Butler, and Crenshaw.
 Group 3. Marengo, Sumter, Greene, Pickens, Lamar, Marion, Franklin, and Colbert.
 Group 4. Wilcox, Dallas, Lowndes, Montgomery, Macon, and Bullock.
 Group 5. Pike, Coffee, Dale, Henry, Barbour, Russell, Lee, and Chambers.
 Group 6. Tuscaloosa, Hale, Perry, Bibb, Chilton, and Autauga.
 Group 7. Elmore, Coosa, Tallapoosa, Randolph, Clay, Talladega, and Cleburne.
 Group 8. Shelby, St. Clair, Calhoun, Etowah, and Cherokee.
 Group 9. Fayette, Walker, Jefferson, Blount, Cullman, Winston, Lawrence, Morgan, Marshall, Dekalb, and Jackson.
 Group 10. Madison, Limestone, and Lauderdale.

TABLE VIII.—STANDING TIMBER IN MINNESOTA, BY SPECIES AND BY GROUPS OF COUNTIES.

[In billions of board feet. Thus, 23.2—23,200,000,000 board feet.]

Group of counties.	Total timber.	White and Norway pine.		Other conifers.	Hard-woods.
		White pine.	Norway pine.		
Minnesota.....	23.2	12.5	6.3	4.4	4.4
Group 1.....	13.3	7.7	4.2	1.4	1.4
Group 2.....	6.8	3.5	1.7	1.6	1.6
Group 3.....	2.2	.8	.3	1.1	1.1
Group 4.....	.9	.5	.1	.3	.3

The counties in each group are as follows:

- Group 1. Cook, Lake, and St. Louis.
 Group 2. Koochiching, Itasca, and Beltrami.
 Group 3. Aitkin, Cass, Hubbard, and Clearwater.
 Group 4. The rest of the State.

TABLE IX.—STANDING TIMBER IN WISCONSIN, BY SPECIES AND BY GROUPS OF COUNTIES.

[In billions of board feet. Thus, 29.2=29,200,000,000 board feet.]

Group of counties.	Total timber.	White and Norway pine.	Hemlock.	Other conifers.	Hardwoods.
	Wisconsin.....	29.2	3.2	11.6	2.3	12.1
Group 1.....	6.5	.5	2.1	.7	3.2
Group 2.....	2.8	.1	1.1	.1	1.5
Group 3.....	7.2	.9	3.1	.7	2.5
Group 4.....	5.7	.3	2.7	.2	2.5
Group 5.....	6.0	1.3	2.4	.5	1.8
Group 6.....	1.0	.1	.2	.1	.6

The counties in each group are as follows:

- Group 1. Florence, Forest, Marinette, and Oconto.
 Group 2. Langlade and Shawano.
 Group 3. Vilas, Oneida, Lincoln, and Marathon.
 Group 4. Price, Sawyer, Rusk, and Taylor.
 Group 5. Iron, Ashland, Bayfield, and Douglas.
 Group 6. The rest of the State.

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DEPARTMENT OF COMMERCE
BUREAU OF CORPORATIONS

JOSEPH E. DAVIES, Commissioner

THE
LUMBER INDUSTRY

PART II. CONCENTRATION OF TIMBER
OWNERSHIP IN IMPORTANT
SELECTED REGIONS

PART III. LAND HOLDINGS OF LARGE
TIMBER OWNERS
(WITH OWNERSHIP MAPS)

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LETTERS OF TRANSMITTAL.

DEPARTMENT OF COMMERCE,
OFFICE OF THE SECRETARY,
Washington, July 13, 1914.

SIR: I have the honor to transmit herewith Parts II and III of the Report of the Commissioner of Corporations on the Lumber Industry. Part II deals with concentration of timber ownership in important selected regions, and Part III deals with land holdings of large timber owners.

Very respectfully,

WILLIAM C. REDFIELD,
Secretary.

The PRESIDENT.

DEPARTMENT OF COMMERCE,
BUREAU OF CORPORATIONS,
Washington, July 13, 1914.

Sir: I have the honor to transmit herewith the full text of Parts II and III of the Report on the Lumber Industry, made to the President under your direction and in accordance with the law creating the Bureau of Corporations. Part II deals with concentration of timber ownership in important selected regions, and Part III deals with land holdings of large timber owners.

I desire to mention as especially contributing to the preparation of these parts Mr. Walter Y. Durand of this Bureau.

Very respectfully,

JOSEPH E. DAVIES,
Commissioner.

To Hon. WILLIAM C. REDFIELD,
Secretary of Commerce.

LETTER OF SUBMITTAL.

DEPARTMENT OF COMMERCE,
BUREAU OF CORPORATIONS,

Washington, July 13, 1914.

SIR: I have the honor to submit Parts II and III of the Report on the Lumber Industry. The preparation of these Parts was begun by my predecessors in office. Except where otherwise stated, the data are for the period 1907 to 1910.

OWNERSHIP MAPS SHOWING VAST TIMBER HOLDINGS.

Part II continues the subject of standing timber discussed in Part I. It treats of the concentration of timber ownership in selected portions of the timber area, in detail. The concentration is illustrated by elaborate ownership maps of large regions in Washington, Oregon, California, Idaho, and Louisiana, covering 68,000 square miles. This is an area about the size of Missouri. Ownership maps of extensive timber regions have never before been published.

The mapped areas contain 755 billion feet of timber, or one-third of all the privately owned timber in continental United States, exclusive of Alaska.

Ownership in the important timbered regions covered by the maps is highly concentrated. Thus, in the southwestern Washington map area 2 holders have 49 per cent of the timber; in the western Oregon area, 5 have 36 per cent; in the northeastern California area, 6 have 70 per cent; in the redwood area, 10 have over half; and in the north central Idaho area, 4 have 59 per cent.

The control of our standing timber in a comparatively few enormous holdings, speculatively held far in advance of any use thereof, and the great increase in the value of timber, resulting in part from such speculative holding, are underlying facts that will become more and more important elements in determining the price of lumber as the supply of timber diminishes.

EXTENSIVE LAND HOLDINGS OF LARGE TIMBER OWNERS.

Incidental to its study of the concentration of timber ownership, the Bureau has found a corresponding concentration of land ownership, which is suggestive enough to merit presentation. Part III deals with this phase of the subject.

XVII

The main fact shown is that 1,694 timber owners hold in fee over one-twentieth of the land area of the entire United States from the Canadian to the Mexican border. In many States these 1,694 own no lands at all. In the 900 timbered counties investigated they own one-seventh of the area.

These 1,694 holders own 105,600,000 acres. This is an area four-fifths the size of France; or greater than the entire State of California; or more than two and one-half times the land area of the six New England States. Sixteen holders own 47,800,000 acres, or nearly ten times the land area of New Jersey. Three land-grant railroads own enough to give 15 acres to every male of voting age in the 9 western States where almost all their holdings lie.

Not all this land is suitable for agriculture. In the South and in the Lake States and in part of the West a large portion of it can be used for agriculture after the timber is removed; but in many parts of the West the land is mountainous and adapted chiefly to reforestation. Much of the railroad-owned land outside the timber regions is arid or semiarid.

In the Upper Peninsula of Michigan 45 per cent of the land is held, mostly in fee, by 32 timber owners. An ownership map of the Peninsula is given. In Florida 52 holders (mostly timber owners) hold one-third of the land in the entire State.

PUBLIC-LAND POLICY A CAUSE OF PRESENT CONCENTRATION.

Lavish land grants and loose, ill-enforced land laws are the historical background of the concentration of land and timber ownership shown in this Report. A study of the present ownership of 7,370,000 acres of railroad, wagon-road, and canal grant lands, covering most of the granted lands in the map areas, and a little elsewhere, shows that of these particular lands, granted long ago to single corporations, apparently with the idea that they would be quickly sold to settlers, only 15 per cent are now distributed in small holdings. Eighty-five per cent are owned by the grantees or their successors, or by large timber holders. Of 82,500,000 acres granted to three western railroads in the sixties, the roads still retained 40 per cent in 1910.

Moreover, the States appear to have disposed of the various Federal grants made to them in such a way as to contribute to the concentration of land and timber ownership. Florida is a striking example of this. Again, the public-land laws, the cash-sale law (now repealed), the scrip laws, and the homestead and timber and stone laws operated, at least in timber regions, to transfer Government lands directly or almost directly to great holders.

Ninety-eight per cent of the 1,500,000 acres comprised in the largest timber holding in the Lake States was acquired in a wholesale

manner, chiefly from tracts disposed of by the Government through grants to the State or under the scrip and the cash-sale laws.

ECONOMIC EFFECTS OF CONCENTRATION OF OWNERSHIP.

This marked concentration in the ownership of land has two important aspects. The first is the concentration of control of the natural resources, other than agricultural, in the area comprised in these great holdings. Besides its timber now standing, part of the land must be depended on, together with the national forests, to supply future crops of timber. Furthermore, some of it has valuable resources of ores, oil, gas, water power, etc.

The second is the possibility that these holdings, which will form a considerable proportion of the future area used for agriculture in this country, may be retained under concentrated control. Formerly lumbermen often got rid of their cut-over land at nominal prices or let it go for taxes. But as the agricultural possibilities of such land have become apparent this policy is being abandoned. A large part of the present cut-over land is now of considerable value for tillage. That part of the present timberland which when denuded will be arable, will have a higher and higher value as land the longer the timber is kept uncut; because if the timber is held for many years the land when finally denuded will be in greater demand for agriculture. Such a condition suggests the following potential effects upon the public: High prices for land sold to settlers, increase of the tenantry system, or direct farming by large corporations.

The data obtained by the Bureau, so far as land is concerned, are not sufficient for a study of the land problem as a whole. They cover only one class of owners, the timbermen, and only part of the country. They show conditions only at the time of the investigation, and do not show whether the concentration is increasing or decreasing. They are not typical of present conditions in agricultural communities, where the average size of holding is, of course, much smaller. Though incomplete, these data are nevertheless suggestive and worthy of serious consideration.

SUITS TO RECOVER GRANTS OF DISPUTED TITLE.

Most of the land grants were made on conditions, and it appears that in many cases not all of the conditions were complied with. The Government is now attacking some of these grants for alleged violation of the conditions imposed. On July 1, 1913, the Department of Justice obtained a decree in the United States District Court for the District of Oregon adjudging all the Southern Pacific Co.'s lands in Oregon (about 2,400,000 acres with 70 billion feet of timber) to be forfeited to the United States. The case is pending on appeal.

Another very important suit has been started against the Southern Pacific Co. to establish the Government's title to extensive and immensely valuable oil lands in California, claimed by that company though mineral lands were specifically excluded from its grant. If the contention of this suit is established, the same principle will be applicable to large areas of other grants as well. The Government is also suing for the forfeiture of about 100,000 acres (mostly timberland) owned by the Southern Oregon Co. and others.

The abuse of the general land laws in the past suggests that any lands restored to the public domain by these, or other, forfeiture suits should not be disposed of under the present land laws. This principle has been recognized in the act of August 20, 1912, which declares that the Southern Pacific lands in Oregon, if eventually recovered, shall not be subject to entry under any law of the United States. To allow such lands to be taken up by private parties before the revision of the public-land laws has been completed would be to lose much of the public benefit from their recovery.

Very respectfully,

JOSEPH E. DAVIES,

Commissioner of Corporations.

The President.

REPORT OF THE COMMISSIONER OF CORPORATIONS ON THE LUMBER INDUSTRY—PARTS II AND III.

Part II.—CONCENTRATION OF TIMBER OWNERSHIP IN IMPORTANT SELECTED REGIONS.

CHAPTER I.

INTRODUCTION.

Section 1. Purpose of discussion in Part II.

The amount of standing timber in the United States, the concentration of its ownership, and the effect of the public-land policy in furthering that concentration have already been set forth in a broad way in Part I of this Report. That Part showed that four-fifths of the timber supply has passed into private ownership. It indicated what proportion of the supply, within the whole area covered by the Bureau's investigation, has been gathered into a few large holdings. But broad statements like these are inadequate. The statement that the Government owns one-fifth of the timber in the country gives an inaccurate idea of the Government's relation to the timber supply and to the lumber market. Vast as the importance of this public holding is, it does not have the influence in the market which might at first thought be expected from it. It is, in general, less accessible, lighter in stand, and poorer in quality than the privately owned timber. Conversely, the power of the larger private owners is greater than is indicated by the ratio between their holdings and the total supply.

Location, quite as much as quantity and quality, determines the significance of a holding, public or private. Part I, dealing seldom with an area smaller than a State, could not show how holdings public and private are concentrated in particular parts of States, and how greatly this local concentration affects their importance. It is the purpose of Part II to make a more intensive study of the facts as they are found in several of the more important timber regions. The significance of the private control of standing timber thus revealed points to the need of careful consideration to determine the most practical and effective solutions of the public problems involved.

This part rests upon the same basic data as Part I—data obtained by field work from 1907 to early 1910. All the facts are of the

years 1907 to 1910 unless otherwise stated. Throughout the report such terms as "recent" and "present" relate, in general, to those years.

Ownership maps of these regions have been prepared by the Bureau, showing the lands owned by the larger holders in each region. The maps cover the greater part of southwestern Washington, western Oregon, northeastern California, northwestern California (the redwood belt), north central Idaho, and west central Louisiana. The Washington and Oregon maps cover chiefly Douglas fir; the California maps, sugar pine, western pine, and redwood; Idaho, white pine; and Louisiana, longleaf yellow pine. The Louisiana map not only shows the degree of concentration, but it also illustrates the thoroughness with which the Bureau made its investigation. On that map are shown all holdings the exact location of which is known to the Bureau. On the other maps only the more important holdings are shown.

Three great holdings are platted separately: (1) the Southern Pacific Co.; (2) the Weyerhaeuser Timber Co.; (3) the Northern Pacific Railway Co. The holdings of these three companies are shown separately on the maps and in the map tables because their great size makes the amount of their timber and the location of their lands of special importance. The estimate of the amount of their timber was obtained from other sources than the companies themselves,¹ and the location of their lands is matter of public record. With these three exceptions, however, the location of the lands and the amount of timber owned by holders are not given separately, but in appropriate groups, the individual tracts not being distinguished on the maps nor the individual estimates in the tables.

These maps give an impression of the degree of concentration now existing in these particular sections of the country. The tables in the text show the actual degree of concentration, and the discussion points out its significance and certain of its causes. Other tables give a view of the importance of the holdings of the same platted holders in other timber regions.

KEY MAPS.—In order to show the location in the respective States of the areas selected for the various ownership maps, rough key maps have been prepared. The locations of all the areas covered by the ownership maps in southwestern Washington, western Oregon, and northern California are shown on the key map of the Pacific coast, facing page 4. This map also indicates the location of national forests. The key maps for the selected areas in Idaho and Louisiana are drawn in small scale directly on the ownership maps.

OWNERSHIP MAPS IN WASHINGTON, OREGON, AND CALIFORNIA.—It will be seen from the first key map that the ownership maps in Wash-

¹ See Part I, pp. 59-60.

ington, Oregon, and California embrace a large part of the Pacific coast territory from Seattle to San Francisco. Between those points they cover most of the important regions of privately owned timber from the Cascades and the Sierras to the ocean. In the forests of the territory covered by these four Pacific coast ownership maps (printed for convenience in nine parts)¹ there stand 685 billion feet of privately owned timber, which is over two-thirds of the privately owned timber in the "Pacific-Northwest" and nearly 40 per cent of that in the entire "investigation area." The "investigation area" comprises three regions: (1) The Pacific-Northwest, a term used for the States of California, Oregon, Washington, Idaho, and Montana; (2) the Southern Pine Region, made up of a small part of Missouri, all of Arkansas, Texas, Louisiana, Mississippi, Alabama, and Florida, and the greater part of Georgia, the Carolinas, and Virginia; (3) the Lake States, embracing all of Michigan, Wisconsin, and Minnesota.²

On these four maps the lands of 123 timber holders are platted. These 123 own on the area of these four maps 498 billion feet of timber. This is nearly three-fourths of all the privately owned timber on the area of these maps; nearly one-half of all that in the Pacific-Northwest; and over one-fourth of that in the entire investigation area. But not all of the timber owned by these 123 holders is on the selected map areas. Their total holdings in the investigation area reach the enormous figure of 635 billion feet.

OWNERSHIP MAPS IN IDAHO AND LOUISIANA.—On the area of the north central Idaho map, which covers an important region of white pine and western pine, there are 29.8 billion feet of private timber. Only seven holdings are platted on the map, but these seven comprise 21.1 billion feet of the total.

The west central Louisiana map area contains about 41 billion feet of timber, largely longleaf yellow pine. Here the lands of 74 holders (all for which plats were obtained) were mapped. These 74 own 33 billion feet of the 41 billion in the map area, and 27 of the larger ones own 28 billion of it.

SUMMARY.—The grand total of all the private timber within the areas of the four Pacific coast maps, the Idaho map, and the Louisiana map is roundly 755 billion feet. The total number of platted holders, omitting duplications, is 198. These 198 own on these map areas 552 billion feet out of the total of 755 billion. That is, 552 billion feet is the amount of timber standing on the lands platted to corporate and individual holders on the maps in Part II.

¹The four Pacific coast maps referred to are as follows: (1) Southwestern Washington; (2) Western Oregon, in four parts; (3) Northeastern California, in two parts; (4) The Redwood Belt of Northwestern California, in two parts.

²For exact definition, see Part I, p. 62.

Taking all the platted holders on the western maps, and only the 27 larger ones on the Louisiana map, and omitting duplications, there are 151 platted holders who own 547 billion feet on these great map areas.

Outside the map regions, in the various other parts of the investigation area, these same 151 holders own 158 billion feet, so that their total in the entire investigation area is 705 billion feet. This is practically two-fifths of the 1,747 billion feet of privately owned timber in the area investigated by the Bureau; and one-third of the 2,200 billion feet of privately owned timber, or one-fourth of the 2,800 billion feet of public and private timber, in continental United States exclusive of Alaska.

Section 2. General conditions resulting in concentration of timber ownership.

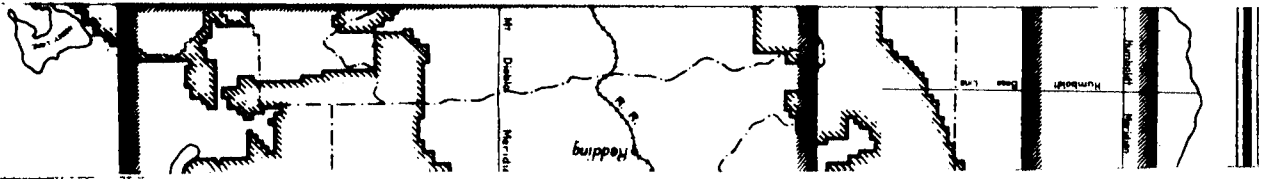
CONCENTRATION RESULTING FROM RAILROAD LAND GRANTS.—Concentration of private ownership of standing timber is the most important fact illustrated by the maps. Next in importance is the fact that such concentration has largely resulted from the railroad land grants. This has already been shown in its general aspects in the final chapter of Part I, where it was stated that no less than 190,000,000 acres had been granted by Congress to aid the construction of railroads, and that of the 155,000,000 acres of this unforfeited, patents had actually been received by the railroads, up to June 30, 1910, for 113,660,000 acres. The Northern Pacific alone, up to that date, had received 32,600,000 acres, and the railroads of the Union Pacific-Southern Pacific system,¹ 36,300,000 acres; a total for these two great systems of nearly 69,000,000 acres. The estimated area of the original grants for these roads reaches the immense figure of 90,000,000 acres, and the greater part of the 21,000,000 acres remaining unpatented will probably be available for them in the ultimate adjustment of the grants.

The Union Pacific grants had relatively little timber but the Southern Pacific and Northern Pacific grants traversed heavily timbered regions and have had marked effect in the concentration of timber ownership.

The three largest holdings of timber in the entire United States, those of the Southern Pacific Co., the Weyerhaeuser Timber Co., and the Northern Pacific Railway Co., were obtained altogether, or in very large degree, through railroad land grants. The Southern Pacific and Northern Pacific still retain great areas of the timberland granted them, and the Weyerhaeuser Timber Co. purchased 80 per cent of its holding from the Northern Pacific. Since a very large part of the timberland of these three holders lies on the various maps

¹ On Dec. 2, 1912, the Supreme Court of the United States declared the Union Pacific Southern Pacific merger illegal.

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that are presented later, a brief résumé of their entire holdings will be given here.

TIMBER HOLDING OF SOUTHERN PACIFIC CO.—The Southern Pacific's holding is the largest single holding of timber in the United States. Leaving out of account its great nontimbered acreage still retained in southern and central California, and about 551,000 acres of its nontimbered lands in the timber counties covered by the Bureau, the Southern Pacific Co. now holds in Oregon and California timberlands and timber as follows:

TABLE 1.—TIMBER HOLDING OF SOUTHERN PACIFIC CO., BY STATES.

(Timber in billions of board feet. Thus, 70.5=70,500,000 board feet.)

	States.		Timber-land.	Timber.
	Acrea.	Billions feet.		
Oregon.....	1,907,236	70.5		
California.....	1,193,450	35.1		
Total.....	3,841,816	105.6		

¹ Including 2,000 acres not acquired under the grants and 75,320 timbered acres, with somewhat less than a billion feet, in Washoe County, Nev., just across the State line, which are reckoned with the California total.

The Southern Pacific also has an interest in a timber holding of about 130,000 acres in Texas and Louisiana.

The extent of this vast timber estate may perhaps be better realized by the following illustration: The Southern Pacific mileage from Sacramento to Portland, on the route which determined the location of the grants, is 682 miles. The schedule time of the fastest train over this line is 31 hours. Yet during all that time the traveler is passing through lands a large proportion of which for 30 miles on either side of him belongs to the corporation over whose track he is riding; and in almost the entire strip, 60 miles wide and 682 miles long, this corporation is the dominating owner of both timber and land. How large a proportion is actually owned by it may roughly be judged by a study of the four parts of the Oregon map and of the two parts of the Northeastern California map.

The significance of this substantial monopoly of land and timber is enhanced by the fact that the Southern Pacific also has a practical monopoly of transportation through this entire region. This has enabled the company, among other things, practically to control the commercial and industrial development of the territory tributary to its lines in Oregon and California. It is important to state that on April 29, 1913, the United States district court decided in favor of the Government in its case against the company for the forfeiture of its entire present holding in Oregon on the ground of alleged violation of the

conditions of its grants¹; and on July 1, 1913, the decree was entered adjudging the lands to be forfeited to, and the title to them to be revested in, the United States of America. The case is now pending on appeal.

HOLDING OF WEYERHAEUSER TIMBER CO.—The second largest timber holding in the United States is that of the Weyerhaeuser Timber Co. The total timbered acreage of this company in the States of Washington, Oregon, and California is 1,900,000 acres, carrying over 95 billion feet of merchantable timber as follows:

TABLE 2.—TIMBER HOLDING OF WEYERHAEUSER TIMBER CO., BY STATES.

[Timber in billions of board feet. Thus, 76.9=76,900,000,000 board feet.]

	States.	
	Timber-land.	Timber.
Washington.....	<i>Acres.</i> 1, 515, 332	<i>Billion feet.</i> 76. 9
Oregon.....	390, 599	18. 7
California.....	4, 905	. 1
Total.....	1, 901, 436	95. 7

This does not include 2,559 acres of timberland in Bonner County, Idaho, with a negligible amount of timber; 26,070 acres elsewhere, on which it has sold the timber rights; and 40,904 acres not counted as timbered. It should be particularly noted that this is the total of the Weyerhaeuser Timber Co. and the companies controlled by it. It does not include the further very extensive interests of members of the Weyerhaeuser family nor of their close associates.²

¹ See Part I, pp. 230 and 250.

² The Weyerhaeuser Timber Co. and the concerns in which Frederick Weyerhaeuser and his close associates are interested have in the investigation area no less than 291.9 billion feet of timber. This aggregation of holdings, interrelated but counted as separate, was defined and tabulated as follows in Part I (pp. 101-102):

The companies with which Mr. Weyerhaeuser or some of his associates are identified make an important list of connected interests, which can be discussed best by groups as follows: (1) The Weyerhaeuser Timber Co.; (2) Group A, consisting of other companies in which Mr. Weyerhaeuser is interested; (3) Group B, consisting of companies, other than those in A, in which one or more stockholders of the Weyerhaeuser Timber Co. are interested; (4) Group C, consisting of companies other than those in A and B and the Weyerhaeuser Timber Co., in which one or more associates of Mr. Weyerhaeuser in the companies of Group A are interested. The amount of timber owned by these groups, so far as they are known, is shown below in billions of board feet:

	Total.	Pacific North-west.	Southern Pine Region.	Lake States.
Weyerhaeuser Timber Co.....	95. 7	95. 7		
Group A.....	49. 5	35. 3	7. 3	6. 9
Group B.....	65. 1	48. 3	14. 7	2. 1
Group C.....	81. 6	49. 2	26. 7	5. 7
Total.....	291. 9	228. 5	48. 7	14. 7

This table does not include any of the great railroad holdings.

Eighty per cent of the Weyerhaeuser Timber Co.'s holding was originally part of the Northern Pacific grant. In 1900 it purchased 900,000 acres from the Northern Pacific Railway Co., and subsequent purchases brought the amount acquired from the Northern Pacific up to 1,525,000 acres. Several of the other companies closely associated with the Weyerhaeusers also acquired considerable areas of timberland from the Northern Pacific grant.

TIMBER HOLDING OF NORTHERN PACIFIC RAILWAY CO.—The Northern Pacific's total timbered holding, practically all of which is in the Pacific-Northwest, now amounts to 3,017,000 acres, on which it has 36 billion feet of merchantable timber.

The Northern Pacific's present timber holding is composed of lands *patented* to it and lands *claimed* by it. For instance, much of the company's land, especially within the national forest, is unpatented, even unsurveyed. But this land, if within the primary limits, is nevertheless claimed by the company under its grant, the claim having attached at the date of the definite location of its road through the particular region. In the indemnity limits, however, its right to select lands as indemnity can not attach prior to survey, and can not attach at all if there is any valid adverse claim existing at the time the company makes the selection. The reserving of lands for a national forest prior to their being surveyed constitutes such an adverse claim. Consequently, the railway company can not claim unsurveyed lands within its indemnity strip if they have been withdrawn for a national forest. The amount of unsurveyed land which the Northern Pacific might have found available for indemnity selections, but which has been put beyond its reach by the creation of national forests, is, at a rough estimate, 340,000 acres, carrying in the neighborhood of 11.5 billion feet of timber.

It is important to point out that if the lands in question should for any cause be eliminated from the forest reserves the railroad's right then to select them, on survey, would seem to be unimpaired.

The Bureau's estimate on the Northern Pacific's holding, as carried in the tables, does not include the unsurveyed indemnity lands within the national forests which have just been discussed; nor does it include any lands which the company has sold or contracted to sell. The total holding of the Northern Pacific Railway Co., as carried in the Bureau's tables throughout this report, includes, for the timber area covered: (1) Lands actually owned by this company or its subsidiary, the Northwestern Improvement Co.; (2) surveyed but unpatented lands claimed by the company; (3) unsurveyed lands claimed by the company, to wit, (a) within the primary limits all the unsurveyed odd numbered sections, and (b) within the indemnity limits such unsurveyed odd numbered sections as do not fall within a national forest; and finally, (4) lands selected by the company for

its own use and benefit. Mineral lands were excluded from the grant and the Bureau's figures do not include lands classified as mineral.

For part of the Montana holdings of the company, the Bureau did not obtain data for distinguishing between the patented and the unpatented lands. The following tabular statement shows the timber of the Northern Pacific on patented and unpatented lands in Washington, Idaho, and in that part of Montana where the Bureau could make classification. To the total thus classified is added the amount in that part of Montana where classification could not be made.

TABLE 3.—TIMBER HOLDING OF NORTHERN PACIFIC RAILWAY CO. IN PACIFIC NORTHWEST, BY STATES, SHOWING AMOUNT PATENTED AND AMOUNT UNPATENTED.

[These figures are based on information of the latter part of 1908, supplemented in certain respects by information obtained in 1909.]

States.	Patented timberland and amount of timber thereon.		Unpatented timberland and amount of timber thereon.		Total.	
	Timberland.	Timber.	Timberland.	Timber.	Timberland.	Timber.
	<i>Acres.</i>	<i>Billion feet.</i>	<i>Acres.</i>	<i>Billion feet.</i>	<i>Acres.</i>	<i>Billion feet.</i>
Washington.....	486,877	10.4	1,015,427	14.8	1,502,304	25.2
Idaho.....	182,505	2.7	141,625	1.8	324,130	4.5
Montana (the portion classified).....	480,486	2.6	394,543	2.2	875,029	4.8
Total classified.....	1,149,868	15.7	1,551,595	18.8	2,701,463	34.5
Montana (the portion unclassified).....					277,560	1.7
Total.....					2,979,023	36.2

This table indicates that out of 2,979,023 acres of timberland held by the Northern Pacific in the Pacific-Northwest, classification can be made by the Bureau of about 2,700,000 acres, on which stand 34.5 billion feet of timber out of the company's total of 36.2 billion. So far as classification can be made, about 45 per cent of the company's timber stands on patented land, and about 55 per cent on unpatented.

Status of Northern Pacific holding constantly changing.—The status of the Northern Pacific Railway Co.'s holding is constantly changing. Lands previously unsurveyed are being surveyed; lands previously unpatented are being patented; contested cases are being settled by the Land Office for and against the company; and the area available under the grant is being defined by decisions of the courts. For these reasons any tabulation of the Northern Pacific's holding or any division of its lands between patented and unpatented is bound to become very soon out of date.

Thus, Moody's Manual¹ for 1910 indicates that during the year ended June 30, 1909, a total of nearly 1,350,000 acres accrued to the

¹ Manual of Railroads and Corporation Securities, 1910, p. 777.

company from portions of the original grant not theretofore available to it, as follows: "Resulting from the decision in the Wallula overlap case, 688,711.21 acres; the creation of a first indemnity belt in Wyoming, 51,912.48 acres; the selection of lands in the second indemnity belts in Wisconsin, Montana, Idaho, Washington, and Oregon, 607,959.62 acres; total accruing, 1,348,583.31." On the other hand, Moody's Manual indicates that in 1909 the company deducted from its statement of lands claimed some 340,000 acres of unsurveyed land within the indemnity limits reserved for national forests, which it had previously carried in its land accounts.

Character of Northern Pacific's timber holding.—The timberland of the Northern Pacific of which it still retains possession is different from that of the Southern Pacific. Until recently the Northern Pacific's policy has been to sell or contract to sell most of its best timber in great tracts, while the Southern Pacific has sold comparatively little. The Northern Pacific's sale to the Weyerhaeuser Timber Co. left it relatively little first-class timber in western Washington, while its sales to various companies in eastern Washington and in Idaho and to the Amalgamated Copper Co. Interests in western Montana have left it only a fraction of the timber which it originally had in those regions. As a result of these sales throughout the timbered expanse of the grant, taking the best timber except in portions of the unsurveyed townships, the average stand per acre on the Northern Pacific's remaining holding is materially lower than that on most of the lands of large holders. Its present policy, it is understood, is to make no further sales of timber.

OTHER IMPORTANT HOLDINGS BASED ON LAND GRANTS.—Many important holdings of less magnitude than the three which have been named above also consist wholly or in large part of lands originally comprised in railroad land grants. The more important of such holdings, so far as they lie within the map areas, will be taken up in the map discussions.

In some cases the foundation of a large timber holding was not in a railroad grant, but in a wagon-road grant. Some of these wagon-road grants were extensive, although much smaller than the two great railroad grants just discussed.

OTHER ASPECTS OF GOVERNMENT LAND POLICY.—The 170,000,000 acres of Federal grants to States for educational and other purposes, the cash-sale law under which probably 150,000,000 acres were disposed of, and the settlement and timber and stone laws have already been described and their general effect on timber concentration have been explained in the closing chapter of Part I. Forcible illustrations of the injurious operation of the State grants and cash-sale law that have come to the Bureau's attention in some of the regions mapped will be discussed in connection with those particular maps.

Section 3. Concentration of ownership and control greater than indicated by tables.

In considering the timber tables that are given in the discussion of each of the areas selected for mapping, two important facts should be borne in mind. The degree of concentration of timber ownership shown in the tables is notable, but the real concentration is materially greater than the tables indicate: (1) In many cases two or more companies that are considered as separate holders by the Bureau are known to have interrelations with each other through minority stock holdings—interrelations probably often strong enough to result in a common policy; and there are many cases where two or more companies probably comprise a single interest through ownership of a majority of their stock by the same persons, but are counted as separate holders because, though the fact that these persons were important stockholders in the different companies was reported to the Bureau, the information was not specific enough to determine that they had a majority interest. (2) The ownership of a large amount of timber often, by its strategic location, gives "control" of a further tributary amount not owned. Both these considerations, though important, are of an indefinite nature, so that the degree to which they actually enhance the concentration shown in the Bureau's figures can not be determined.

As for interrelation between holders counted as separate, a fuller discussion has already been given in Part 1, pages 95 and 96.¹ The number of cases of minority stock interests is very great. The cases vary from a simple interest in a single company that seems to have no other timber-owning connections, to the most complex interweaving of minority interests. Very many holders counted as separate are related, to a degree of complexity that would defy presentation by any other means than the patient statement of each case with all its ramifications.

"CONTROLLED" TIMBERLAND.—"Control" of timberland is a term used to express the idea of domination without ownership. A timber company, by owning the land which gives the only practicable outlet for other timberland lying back of it, may be said to "control" that other land, particularly if it is in relatively small tracts. No other company can successfully enter the field; and the owners of the "bottled-up" land can sell their timber only to the company which has acquired this strategic position. Again, a company may buy around a considerable tract of small holdings so as to completely encircle them with its own lands. Or, in a moderately small "logging chance," by acquiring half or even less of the timber, it may prevent any other company from buying up the rest. In all these cases of control, the company is

¹ Quoted on p. 27 of the present volume.

practically sure of purchasing the controlled lands at its own convenience and almost at its own price.

This control arises from the fact that a small tract can not be economically cut. The great trees of the Pacific coast can hardly be handled at all without such an investment in machinery as implies a regular logging business. In the East or South a small tract can be managed; a small mill can be set up on the ground and the lumber can be hauled out with wagons. But, unless the timber is near a railroad, the expense of hauling will be heavy. A logging railroad through the tract would get the timber out at a much lower operating cost. By so much as the wagon method costs more, by so much the net return for the standing timber will be lessened. But the comparatively small return obtainable in this way is the utmost that the small timber owner, even if he himself is a lumberman, can hope to get by doing his own lumbering. The owner of a large tract can build a logging railroad and a large mill, and increase the return for the standing timber by the whole difference between the cost of getting out the lumber by these means and the cost of getting it out with a small mill and with wagons.

The securing of this advantage is recognized among lumbermen as coming from the ownership of standing timber, and not from the ownership of any lumbering equipment. This is readily seen by supposing the case of two men, one of whom owns a large body of timber and the other a mill and a logging railroad by which the timber can easily be brought out. The mill owner will not be able to buy the timber without paying substantially the "full value" of it; that is, the net amount that can be realized from it by using the most economical means of transportation and manufacture. If the mill owner will not pay substantially this rate, the timber owner will build his own mill and his own railroad.

The small timber owner has no such choice. Unless he is so fortunate as to be within the range of two large competing buyers, the advantage in bargaining is all against him. He must sell for what his large neighbor will pay, or hold his timber, or depend on getting it out with uneconomical equipment. If he refuses to sell till the neighboring company has cut all around him, and his tract is left isolated, the logging railroad will be torn up and the company will no longer care to buy at any price. His timber is likely to be burnt when fire runs through the slashing of the company's logging; or, no longer protected by surrounding forest, it may be destroyed by wind. If he is wise, he will sell before the company finishes its cutting near him. He is not in a position, therefore, to haggle for much more than he could get out of his timber by independent cutting. The company has no reason for paying much more. If it does not get a particular tract it loses nothing but the possible profit on that tract. If it bids up the price on one tract, it not only loses part of

the possible profit on that, but furnishes an example which will make it hard to keep down the price on other near-by holdings.

Ordinary business prudence leads each company to avoid isolated tracts in territory which another company dominates. In a borderland fairly accessible to two companies there may be active competition, and then a small owner may get approximately the "full value" of his timber, as that phrase is defined above; but even in such regions competition is often suppressed by tacit or explicit understandings between the buyers.

In great part, however, this advantage comes to the large timber owner from the circumstances of the case, without any need of agreements. Moreover, it does not come to him because of any social service, such as the felling of trees or the manufacture of lumber. It comes to him purely and solely in his capacity of timber owner. It is in the strictest sense an "unearned increment."

Besides the direct advantage in price, the relation of control gives the larger owner a distinct advantage in enabling him to choose his own time for buying. The controlled timber can not get away from him. If he prefers to extend his investment in other directions he can let that wait till he is ready to cut it, secure in the knowledge that, whenever he is ready, he can add it to his holding at a price that will justify him in crediting up a substantial profit at the moment of the transfer.

EXAMPLES OF CONTROL OF TIMBERLAND.—Instances of such control are as follows: One holder owning one and a half billion feet in a certain region so controlled the situation that it considered its total supply of timber to be double the amount it owned, and made a practice of buying each year an amount of this controlled timber equal to the amount of its annual cut, thus maintaining the size of its holding unchanged. Two large purchasers of timberland in a certain county are reported to have divided the territory, one purchasing the alternate sections in the northern townships of the county, and the other those in the townships farther south. In this way they succeeded in heading off, in this instance, certain small operators, and each, without interference from the other, acquired control of an area equal to that which he owned. Another company owning over 8 billion feet of timber estimated that it controlled besides about a billion and a quarter feet belonging to the small holders in its territory. The company considered that it would be certain to pick up this timber in the course of its lumbering operations, since it could not be handled advantageously by any other operator.

Another company owning nearly 600 million feet of yellow pine stated in its bond prospectus that the estimates showed that 400 million feet additional yellow pine would be acquired by the company, "since it can be handled advantageously." This statement no doubt

indicates that the 400 million feet is in controlled territory. Still another company is reported in a bond prospectus as owning upwards of 2 billion feet in Louisiana and as controlling from 500 million feet to a billion feet more.

It has been stated that when a company is ready to operate it can purchase its controlled timber at much less than the "full value" of the stumpage. Instances of this follow: A company reported that through the control of timberland adjacent to its logging railroad it could buy stumpage at \$1 per thousand feet, though worth much more than that to the company. Another company could buy stumpage in the controlled region tributary to its mill at \$2 per thousand feet, though uncontrolled stumpage in the same region had been sold as high as \$5. Still another company was able to buy stumpage in controlled territory at 90 cents per thousand feet, though the price of surrounding stumpage was as high as \$2.50 per thousand feet.

In the case of railroad land-grant holdings, the grantee had no choice but to take alternate sections. Yet the mere ownership of alternate sections throughout a great area was bound to give the railroad a very large degree of control over the other lands in its territory. The fact that the other lands are in many hands while the railroad lands are in one strong grasp is sufficient to give the railroad an immense advantage. Besides, by the right of forest-lieu selection,¹ such a road as the Northern Pacific could materially strengthen its control in the most heavily timbered regions by judicious placing of its selections. The Weyerhaeuser Timber Co. in western Washington and in Oregon, and the various companies in Idaho in which the Weyerhaeusers and their associates are interested, bought large areas of Northern Pacific lands in odd-numbered sections, made further selections in even-numbered sections with Northern Pacific "lieu scrip,"² and bought up other lands—all in such a way as to secure not only actual ownership of a very large proportion of the timberland in the regions where their holdings lie, but a very considerable measure of additional power by control.

In western Washington the Weyerhaeuser Timber Co. (alone or in conjunction with other companies powerful in particular districts) is said to practically control the timber situation throughout large stretches of country—for example in the southern part of Pacific County, or in Lewis County.

The following extracts are from statements of well-informed men, as reported by the agents of the Bureau:

"The Weyerhaeuser Timber Co. and the Milwaukee Land Co. control practically all of the timber in the county." [Lewis County.]

"I have nothing against them [the Weyerhaeuser Timber Co.], * * * but it was a bad thing when they bought the Northern

¹ Defined in Part I, p. 228.

² Cf. also Part I, p. 237.

Pacific holdings. * * * It is due to them, of course, that timber has raised in price, but the poor man can not get hold of it. If a man buys the timber on an even section, it is up to him to sell it to the Weyerhaeuser Timber Co., and he can't get as much as the Weyerhaeuser Timber Co. gets for theirs."

"Weyerhaeuser [i. e., the Weyerhaeuser Timber Co.] absolutely controls all the timberland in this county [Pacific County]. They are a hard company to deal with. You can not cross their land without paying them about what the land itself is worth. In the southern part of the county they will not sell any of the timber."

"Weyerhaeuser [i. e., the Weyerhaeuser Timber Co.] absolutely controls the price of stumpage in this county [Pacific County], in fact he owns most of it."

How far this control of timberland not owned enhances the degree of concentration of ownership could not have been determined by any investigation practicable for the Bureau. Nevertheless, the general fact of additional power through control should be held in mind in considering all tables of ownership in this Report.

TENDENCIES TOWARD GREATER CONCENTRATION.—The interrelation of owners counted by the Bureau as separate and the control of timber not owned affect the present situation. The future will be further affected by the fact that the proportion of the timber supply in the hands of small holders is diminishing and must continue to diminish. Two tendencies in this direction deserve particular mention here.

1. Some large holders, who are large lumber manufacturers as well, hold their own timber in great part intact and supply their mills from other sources. One manufacturing company which owns over 5 billion feet has felled no timber for nearly 20 years, but has bought its logs in the open market. Both in the West and in the South many companies make a practice of buying timber rights on small tracts available for their manufacturing needs, and, so far as possible, defer cutting their own large tracts. Much of their current supply of lumber, therefore, is cut from holdings of smaller companies, from little individual tracts, or from controlled timberland of small holders which the operating companies are now ready to buy. On many of the largest holdings no cutting at all is done. Even if such holdings did not absolutely increase, they would, merely by being held uncut, form a larger and larger proportion of the diminishing timber supply.

2. Some large holders are constantly increasing their ownership by three distinct processes: (a) Buying up claims and little tracts owned by small individual holders; (b) buying more important holdings already assembled by individuals or by smaller companies; (c) buying stock of existing companies and so increasing the actual concentration of ownership without any formal transfer of title to land or timber.

Section 4. Extent of private holdings and nontimbered lands within national forests.

Maps of the United States showing the national forests in a solid color often give the erroneous impression that all the land within the reserve boundaries belongs to the Government. A glance at any of the Bureau's detailed ownership maps of regions in the Pacific-Northwest will show that in many parts of the national forests the platted holders alone own a large proportion of the land; and unplatted holders not shown in the timber maps also own lands within the national forest boundaries.

The Forest Service has published a table (June 30, 1909) which serves to correct the erroneous impression referred to above. It showed, for each national forest, the gross area, the privately owned area (that is, the area which the Government had already patented or which had been filed on before the creation of the forest), and the net area of Government land free from any private claim. In the States of California, Idaho, Montana, Oregon, and Washington the gross and net areas and average percentages of privately owned lands within the forest boundaries were as follows:

TABLE 4.—GROSS AREA, PRIVATELY OWNED AREA, NET PUBLICLY OWNED AREA, AND PERCENTAGE OF PRIVATELY OWNED LANDS IN NATIONAL FORESTS OF THE PACIFIC-NORTHWEST, BY STATES.

[June 30, 1909.]

States.	Gross area.	Privately owned area included in gross area.	Net publicly owned area.	Per cent of gross area privately owned.
	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	
California.....	27,908,510	6,410,656	21,557,852	22.9
Oregon.....	16,221,368	2,559,481	13,661,887	15.8
Washington.....	12,065,500	2,312,418	9,753,082	19.2
Idaho.....	20,099,029	1,029,460	19,069,569	5.1
Montana.....	21,389,696	2,352,468	18,037,228	11.5
For the five States.....	96,744,103	14,664,485	82,079,618	15.2

The detail in the Forest Service table of which the above figures are a summary showed that out of the 80 national forests listed in these States 60 had within their boundaries more than 5 per cent each of private land. Some of the forests containing the highest percentage of privately owned land were as follows: In California, the Shasta, with 62 per cent of the gross area privately owned, the Tahoe, with 48 per cent, the Stanislaus, with 38 per cent, and the Cleveland, with 30 per cent; in Oregon, the Siuslaw, with 51 per cent; in Washington, the Wenatchee, with 45 per cent, and the Rainier, with 43 per cent; in Montana, the Gallatin, with 34 per cent, and the Missoula, with 30 per cent.

Thus it will be seen that the Government is far from owning solidly the area within the reserve boundaries. The earlier any area was reserved, the fewer were the private lands already patented or entered in that area. In the case of later reservations, it was usually a matter of saving a remnant of a forest tract, or of reserving for future supply a young growth of timber not yet merchantable, where, on account of some former burn, timber locators had passed the land by in search of larger growth.

It should be noted not only that much of the land within the boundaries is privately owned, but also that much of the Government land has little or no merchantable timber on it. A considerable proportion of the area of many reserves is in very high mountainous regions and consists of bare rocks, glaciers, and land above the timber line. Again, the reserves include a considerable area of elevations where the timber is of the subalpine type, much lighter than on the lower slopes, and a considerable area of burned over land. Besides, in those more accessible parts of the national forests where prior to their creation some of the lands were taken up by private individuals, the private holders naturally selected the better and left to the Government the poorer timber. In certain timberless regions, the reserves were created to protect the grass and brush cover by proper grazing restrictions, and thus regulate stream flow.

Of course, there are large areas of excellent timber in the reserves, but taking the good timber, the poor timber, and the timberless lands together, the Government does not have nearly as much timber in the reserves as their area, or even their net area, would at first thought suggest. Thus, while the private owners of timber in the five States of the Pacific-Northwest have 1,013 billion feet of timber on about 31,620,000 acres, the Government has on the 82,080,000 acres constituting the net area of the forest reserves of the same States only in the neighborhood of 440 billion feet. That is to say, the national forests in these States have only about three-sevenths as much timber as the private holdings have, though they contain over two and one-half times as much land. If the *timbered* area of the national forests were known, the average stand on the part covered with timber would, of course, be much closer to the average stand on the timbered area held by private owners, though by no means equal to it.

Since June 30, 1909, the date of the tabular statement on page 15, there have been many changes in the national forest area, both by additions and by eliminations. In the areas selected for mapping in this Part, however, there were no changes between June 30, 1909, and May 1, 1910 (the date to which the boundaries were corrected on the maps), except for trifling eliminations in the Idaho area.

Section 5. General explanations.

The six ownership maps will be separately discussed in the following chapters. A few explanations of general application may conveniently be given here.

“PLATTED” AND “UNPLATTED” HOLDINGS.—In each map discussion, the holdings in that map area are grouped as “platted” holdings and “unplatted” holdings. By “platted holdings” is meant those whose location is shown on the map. Except in the Louisiana map, only the very large holdings have been shown; for the purpose is to show how high a proportion of the area is in the hands of a few. The rest of the holders, including some that own very considerable tracts, are termed “unplatted.” The terms “platted” and “unplatted” refer only to the ownership map in question. Thus, a holder platted on the Washington map may be an unplatted holder on the Oregon map, or vice versa. On each map the Bureau has the location of a great many “unplatted” holdings that could have been platted if the purpose had been, as in Louisiana, to show all the holdings for which the Bureau had plats.

“ADDITIONAL” LAND AND TOTAL ACREAGE.—The term “additional” as used throughout this Report covers all the fee land reported other than that bearing merchantable timber. Thus it includes young-growth timber, denuded land, open prairie or swamp land, etc. The maps in showing the platted holdings do not distinguish the fee merchantable timber land from the timber rights, nor do they distinguish the “additional” land, all these classes of land being given the same symbol. In each map discussion, however, one of the tables distributes the land of the platted holders on the map into these various classes. It also classifies the lands of the unplatted holders of over 60 million feet. Another table in each discussion shows, for the platted holders alone, the total acreage they hold in the entire investigation area, distributing it into the same classes.

These total-acreage tables need a word of explanation. On the one hand it must be kept in mind that the total acreage figures include the timber rights, which must be deducted if one wishes to get the total fee holdings. On the other hand, the figures for “additional” land (and consequently for total acreage) are believed to be, in general, incomplete; and in a few important instances are known to be so. The reasons for believing that the Bureau's data on additional lands are incomplete have been referred to in Part I (p. 162). The information obtained was limited to such additional lands as are held in connection with the timber holdings or in the immediate vicinity thereof; and did not extend to any lands that timber holders or their subsidiaries might have outside the investigation area nor to

lands they might have in large timberless regions within the investigation area.

In a very few important cases the Bureau learned, mainly from published sources, the total amount of land owned by certain timber holders who also have large acreages in the nontimbered regions. The general acreage tables of the Report, however, omit their lands in these regions because similar information was not specially sought for all holders. These known omissions amount to over 27,000,000 acres held by 5 owners, chiefly the Southern Pacific, the Northern Pacific, and the Atchison, Topeka & Santa Fe.

GOVERNMENT SURVEY METHOD OF DESIGNATING TOWNSHIPS AND SECTIONS.—For the aid of readers not familiar with the system of Government land survey, which obtains in all States covered by maps in this part, a brief explanation of the numbering of ranges and townships, the method of identifying land, and the scale of the maps is given on page 22 in the discussion of the first map—that of southwestern Washington.

METHOD OF DESIGNATING SURVEYED AND UNSURVEYED AREAS ON THE MAPS.—It was not the intention that these maps should show with absolute precision the location of survey lines. The township lines, so far as surveyed, have been indicated by a continuous light line. These lines have been made as accurate as was possible in the time that could be given to this work, and are as near correct as necessary for the purpose in view. Section lines have not been entered except that on each map, as already stated, a sample diagram township showing sections has been drawn.

It was important that so far as possible unsurveyed areas should be distinguished, since private ownership (other than the holding of land without patent under railroad grants and by means of certain kinds of *lieu scrip* selections) is not recognized in unsurveyed lands. In cases where there are several adjacent townships which have not been surveyed, the absence of survey is indicated on these maps by the fact that no township lines are shown. Extensive unsurveyed areas of this sort, shown by absence of all township lines, indicate Government land. They are chiefly found within the national forests.

In addition to these larger areas, embracing the greater portion of the unsurveyed lands in the map territories, there were smaller scattered areas unsurveyed—portions of townships, or rarely a whole township the interior of which was entirely unsurveyed, though the outer boundaries were surveyed. In certain cases it was impossible to indicate these minor unsurveyed areas.

As stated above, a continuous line of light weight has been used for the boundaries of the township square where those boundaries have been entirely surveyed. The same style of line has been used

to inclose surveyed parts of townships where only a portion of a township boundary has been surveyed, the remainder of the township square being completed by a broken line, which thus indicates absence of survey. If a county boundary or a national forest boundary coincides with an unsurveyed township line (that is, a broken line), no attempt is made to indicate the absence of survey.

It was not possible upon the scale adopted for the maps—which is as large as could well be used—to give with precision the small fraction of the platted holdings comprised in lots and bits of irregular survey. The Bureau's original reports of locations were in many cases made on diagram township plats, and some lots and irregular survey fractions may have been omitted or inaccurately located on the original reports. Where the Bureau had locations of lands in the form of legal descriptions, the position of lots was determined if survey prints of the townships were readily available, otherwise the lots were omitted from the map. It did not seem worth while to give the additional time that would have been required to obtain accuracy in these minor respects, since, for the purposes in view in this report, such extreme precision was not at all necessary. Apart from these minor points mentioned, however, great care was taken in the location of boundaries and in platting.

CHAPTER II.

CONCENTRATION OF TIMBER OWNERSHIP IN SOUTHWESTERN WASHINGTON.

Section 1. Amount and general distribution of timber in State of Washington.

The privately owned timber in the State of Washington is 294.6 billion feet. In this respect the State ranks second in the Union.

This timber lies in two distinct timber regions separated by the Cascade Mountains. This range, crossing the State from north to south, causes a marked difference in climate and rainfall, and consequently in species of timber and heaviness of stand between the eastern and western portions.

EAST OF CASCADES.—In Washington east of the Cascades the characteristic species of timber is western pine, everywhere mixed with some larch, Douglas fir, and other minor woods. The stand is relatively light as compared with that of the western part of the State. In extreme southeastern Washington there is a very small amount of timber, mostly included in the Wenaha National Forest. In the northeastern corner of the State, northern Spokane County and Stevens County have a considerable timbered area. This is mainly western pine, but the white-pine belt of Idaho crosses the State line and covers part of eastern Stevens County. The western pine stretches westward from Stevens County through the northern part of Ferry County, and continues somewhat scatteringly through Okanogan County to the Cascade divide, and southward along the eastern slope of the Cascades, from Okanogan County on the north to Klickitat County on the south. The timber on the mountain slopes at first is quite heavy, including a considerable proportion of Douglas fir; but eastward toward the Columbia River it becomes lighter and runs more to pine. South of Chelan County on both sides of the Columbia, there is a widening area of open nontimbered land. On the west this open region comprises a large part of Kittitas, Yakima, Klickitat, and Benton Counties, and on the east it comprises the great prairie region known as the Big Bend Country.

Roughly, the location of the timber of eastern Washington may be described as a rather narrow crescent bending to the north above a vast nontimbered section. Though the eastern part of the State is

far larger in land area than the western, it has only 24.1 billion feet of privately owned timber, or 8 per cent of the total privately owned in the State.

WEST OF CASCADES.—That part of Washington which lies west of the Cascades contains 270.5 billion feet of privately owned timber, or 92 per cent of the total privately owned in the entire State. The characteristic species of timber in most of western Washington is the Douglas fir, with cedar, hemlock, true firs, etc., in minor proportions. Considerable amounts of spruce are found in regions bordering the ocean. The ownership map of southwestern Washington (facing p. 44) covers most of the southern part of western Washington.

The northern part of western Washington has less compact stretches of timberland than are found in the map area. There is, however, heavy timber, privately owned, in western Jefferson County and western and northern Clallam County, in the belt along the ocean and the Straits of Juan de Fuca. There is another important belt of privately owned timber in Snohomish and Skagit Counties eastward from Puget Sound to the forest reserves, and to a certain extent within the reserves; and a smaller body of good timber in Whatcom County. There is some heavy timber on privately owned lands within the forest reserves in King County, east of the map area. In the same region the Northern Pacific has a large area, mostly of unsurveyed lands, some carrying heavy timber and some light. To the southeast of the map area there is a belt of privately owned timber in southern Skamania County and eastern Clarke County.

There is a large burned region in Whatcom County; and considerable land in Skagit, Snohomish, Kitsap, and eastern Jefferson and Clallam Counties has been logged. In general the timber along the shores of Puget Sound has been cut over.

Section 2. General explanation of ownership map of southwestern Washington.

AREA COVERED.—This map covers most of the southwestern part of the State of Washington, from the latitude of Tacoma south to the Columbia River, and from range 9 E. to range 10 W.—a territory about 100 miles from north to south by 115 miles from east to west. The inset in the left-hand corner shows besides an area of 12 townships east of Seattle and adjoining, directly the northeastern part of the main body of the map. The total map area embraces all of Thurston County, all of Wahkiakum County, the greater part of Pacific, Chehalis, Mason, King, Pierce, Lewis, and Cowlitz Counties, and portions of Skamania and Kitsap Counties. It covers the largest stretches of virgin timberlands privately owned in the State of Washington. On its area stand 166 billion feet of privately owned

timber, which is 56 per cent of the total of such timber in the State; and 61 per cent of that in western Washington. The platted holdings on the map amount to 2,599,111 acres, of which 2,410,628 acres, or over 92 per cent, are timbered.

The range and township numbers are entered in the margin of the map. In Government survey, townships are numbered and identified according to their position in relation to certain established meridians and base lines. The Willamette meridian—with reference to position east and west of which all ranges in the States of Washington and Oregon are numbered—is shown running north and south near the center of the map. The townships in each range are numbered consecutively north and south from the Portland base line, thus: 1 north, 2 north, etc., and 1 south, 2, south, etc. (abbreviated 1 N., 1 S., etc.). All townships on the southwestern Washington map are north of the base line. The southernmost tier of townships is 7 N., and so northward to 23 N. (and on the inset to 26 N.). The city of Tacoma, for example, is located in township 20 north, range 3 east (20 N., 3 E.); Olympia, the capital of the State, in 18 N., 2 W.; the peak of Mount Rainier, in 16 N., 8 E.

Each range and each township tier is usually 6 miles in width, since a regular township is 6 miles square. Such a township has an area of 23,040 acres. A sample diagram, indicating how each township is divided into 36 sections, is also shown on the map, being located in 19 N., 2 E., near Tacoma. This system of numbering the sections from 1 to 36 is uniform throughout the Government survey. A section contains normally 640 acres. The Northern Pacific grant has been spoken of as being a grant of odd-numbered sections, that is, of sections 1, 3, 5, 7, etc., to 35. Sections 16 and 36 in each township in public land States were granted to the respective States to provide funds for the public school system and are known as "school lands." (Only section 16 was granted to States admitted before 1848.)

Though county boundaries have been indicated on the map, they have not been named; and to identify them the key map facing page 4 may be consulted. National forest boundaries are indicated by a heavy black line with dots on the inner side. These dots are omitted when they would interfere with the platting of private holdings which adjoin the boundary.

RAILROAD GRANT LIMITS.—The legend shows the line used to indicate the limits of the Northern Pacific Railroad grant. These limits are named wherever convenient. The original line of the Northern Pacific Railroad, by the location of which the primary (or 40-mile) and indemnity (or 50-mile) limits of the grant were determined, is shown by name on the map, running from the eastern boundary of the selected area to Tacoma and thence southerly to the Columbia River.

The way in which the grant limits are determined by the course of the railroad is best understood by noticing how the two limits in the southeastern part of the map describe a rough curve governed at first by the distance reckoned at right angles from the road running westward toward Tacoma and then by the distance reckoned at right angles from the road running southward from Tacoma. To the north and west of Tacoma, however, it will be noticed that this results in a western "terminal limit" (running northeasterly from Tacoma) and a northern "terminal limit" (running westerly from Tacoma). The first marks the end of the grant received for the west-bound road to Tacoma; and the second marks the end of the grant for the road between Portland and Tacoma. A southern limit for this latter road will be seen on the map skirting the Columbia River.¹

In the western part of the map the locations of the 40-mile and 50-mile limits are, of course, governed by the location of the railroad between Tacoma and Portland. The map shows the location of a number of branch lines of the Northern Pacific system and some lines operated by other railroads, but only the main line of the Northern Pacific is named.

PLATTED AND UNPLATTED HOLDINGS.—The lands of only 35 selected private holders, with the lands of the State of Washington itself, are platted on the map. Many other private holders own timber in the region covered. Since, in the tables which are to follow, these unplatted holders are divided into groups and the amount owned by each group is tabulated, it is necessary here to explain the basis on which the Bureau determined which holdings were to be platted and in what groups the other holdings were to be arranged in the map tables.

1. *Platted holders.*—The lands of the Weyerhaeuser Timber Co. are platted in solid black; those of the Northern Pacific Railway Co. in a light single diagonal. These two holdings are shown separately on the map and the amount of timber for each is shown separately in the tables for the reasons stated on page 2. The lands of the group of 33 separate holders are also platted; one symbol, the heavy crosshatch, being used for the lands of all 33, so that no one holding is distinguished from any other. In the tables, similarly, the acreage and estimates for the 33 are shown, not for each holder separately, but for the group as a whole.

¹Though called a terminal limit this irregular line is really the boundary of the Oregon Central R. R. grant, which overlapped the Northern Pacific grant from this line southward to Portland. The Oregon Central grant was in part subsequently forfeited, but its line had been definitely located so that its right to the lands in the overlap had attached prior to the Northern Pacific's right. Lands within its limits, therefore, though forfeited by it, were not available to the Northern Pacific. The true terminal of the Northern Pacific line is at Portland, but the line shown on the map is its limit for the practical purpose of showing the area within which it received land.

As a rule the holders whose lands are platted on the map are the largest holders in this region, yet it must not be inferred that every platted holder has a larger amount of timber than any unplatted holder. A very few holdings have been platted whose timber on the map area amounts to less than that owned on the map area by certain unplatted holders. This was done purposely, and in the table the upper limit of the first group of 27 unplatted holders was purposely omitted, in order that no fixed amount of timber could be taken as the limit between platted and unplatted holdings. If such a limit were determinable it might furnish to interested persons a clue to the amount of timber owned by some of the smaller platted holders whose estimate might be only slightly above that limit. Again, the group of 33 must not be regarded as including all the very large holders in the State. There are other holdings in the State far larger than some of those platted on this map—holdings which lie altogether or mostly outside the selected area. This follows from the fact that the selection of holders for platting was made with sole reference to the amount of timber they own on the map area, not to that they own in the State.

Lands held by the State of Washington are platted with a letter "S," indicating State. (The "S" is placed horizontally for the lands on which the timber rights have been sold and upright for lands on which timber rights have not been sold.) This large publicly owned acreage was platted because it was desirable to show the area and location of the State lands, and also because these areas, if left blank, might be thought to represent privately owned timberlands belonging to the unplatted holders.

2. *Unplatted holders.*—The unplatted holders are divided into two classes: First, those owning over 60 million feet each on the map area (114 in number), who in turn are divided into several groups; and, second, those owning less than 60 million feet each on the map area.

As already explained,¹ the term "unplatted" does not necessarily mean that the Bureau has no plats of the location of such holdings. They are not platted simply because it is not the purpose of the map to show them. For practically all the holdings of over 60 million feet the Bureau has plats. The great majority of the holders of less than 60 million feet each, however—mostly individuals, each with his homestead or timber claim of 160 acres more or less—were covered in the Bureau's investigation by tabulations compiled from the official county cruises or by general estimates of well-informed cruisers, and no separate record or plats of ownership were kept.

"LITTLE OR NO TIMBER" AREAS.—Whatever timberlands are owned on the map area by the unplatted holders of the classes and groups

¹ Page 17.

mentioned in the last paragraph must obviously lie somewhere in the spaces not occupied by the symbols of platted holders. In order to guard against a false impression of the extent of unplatted timber holdings, the more important areas which can properly be described (according to the standards commonly accepted by lumbermen in western Washington) as having little or no timber have been so noted on the map. These notations of "Little or no timber" must not, however, be construed too broadly. The general size of each of these areas has been suggested by the size of the lettering. The "Little or no timber," when in smaller characters and stretched across a township, indicates a somewhat narrow strip in that portion of the township. If the description is appropriate to the whole township the size and position of the lettering suggests that fact.

The determination of the areas thus designated was arrived at from the cruises made by the county officials and from the best available local information. Though in the areas so marked there are, of course, parts of sections (and perhaps here and there in the larger areas a whole section) which have a much heavier stand per acre, it is believed that for the whole area covered by any particular notation the statement is approximately correct. The purpose of these notations is not to define with precision the areas involved, but only to mark off in a general way certain portions of the map that are of no importance for timber.

It is characteristic of this western Washington region that most of the logging, until recent years, has been along the ramifications of Puget Sound, along the Columbia River and other important streams, and along railroad lines. That is, only timber easily accessible was logged. In the past few years, however, there has been a greater development of the logging railroads necessary to open up large and remote bodies of timber otherwise inaccessible. In distinction from the logged lands, there are, of course, from place to place, especially from Tacoma southward to the Columbia River, considerable areas of open prairie land and meadows, which bear no timber.

UNPLATTED PRIVATELY OWNED LANDS WITHIN NATIONAL FORESTS.— Though there are large blank unplatted spaces within the national forests on the eastern side of the map, and in the northwestern part, there are relatively few timberlands—only about 25,000 acres—privately owned by unplatted holders in those areas. A large amount of land within the national forests is held by the Northern Pacific and some by other platted holders, but most of that not platted to these holders belongs to the Government. This is due to the fact that the national forests in this part of the State were created comparatively early, and, except for the grant to the railroad, the Government had alienated very little land within the reserve limits. The

fact that many townships had not been surveyed at the time of the creation of the reserves contributed to prevent acquisition of land by settlers. The detached part of the Rainier National Forest in the east central part of the map, covering townships 13 and 14 N., in ranges 3 and 4 E., was recently added to the reserve, but timber locators had not been attracted thither because the stand of timber is relatively light on account of an old burn. Consequently there are few private holders there except the Northern Pacific, which claims the odd sections under its grant.

As shown in the table on page 15, the privately owned land in the national forests of the State of Washington is 19.2 per cent of the gross area within the national forest boundaries. In the Olympic, Snoqualmie, Rainier, and Columbia National Forest—parts of each of which appear on the map area—the percentages of privately owned land (June 30, 1909) were as follows, in each case for the entire forest:

	Per cent of gross area pri- vately owned.
Olympic.....	11.2
Snoqualmie.....	28.8
Rainier.....	43.1
Columbia.....	20.5
For the four forests.....	26.4

In the last three forests named the railroad grant lands constitute the bulk of what is privately owned.

DIFFERENCES BETWEEN DATA ON MAP AND IN TABLES.—The map shows nothing as to the stand of timber; a piece of land platted with one symbol may have many times as much timber as an equal area platted with another symbol; and the tables alone can show the true concentration of timber ownership. In connection with the use of Table 5 in the following section, the reader should be cautioned that while the map shows *all* the lands of the platted holders, Table 5 shows only their *timberland*; that is, land bearing merchantable timber. Table 6, page 34, shows the *total* acreage held, and so corresponds to the map.

Lands aggregating close to 100,000 acres, which are really part of the holding of the Weyerhaeuser Timber Co., have not been platted on the map with the solid black symbol of that company, but instead, for reasons explained on page 29, have been platted with other symbols.

Finally, it should be remembered that there is a small percentage of timbered acreage on the map area which is held by lease of the timber rights while the land itself is not owned by the timber holders. This ownership of timber rights without land is distinguished in footnotes to the tables, but is not distinguished on the map.

Section 3. Concentration of timber ownership in area of Washington map.

As already noted, 56 per cent of the privately owned timber in the entire State and 61 per cent of that in western Washington stands within the boundaries of this map.

That the 35 platted holders have a large proportion of the land surface of this great selected area, the first glance at the map will tell. With a rough allowance made for the areas held by the State and the Government and for "little or no timber" areas, the graphic argument of the map is still stronger. But the true degree of concentration of ownership of timberland and timber can only be stated in tabular form. Table 5 shows the timberland and timber held on the map by all private holders—by the 35 platted holders and by the four groups of unplatted holders. It excludes the acreage owned on the map by the State (approximately 412,000 acres; see p. 44), and also excludes Government land. It shows what percentage of the total privately owned timber on the area is owned by the separately stated holders and groups. The concentration here shown means that a few holders control the most important source of lumber supply in this State.

To guard against possible misunderstanding as to what constitutes a "holder" in the sense in which the word is used throughout this report, it is well to repeat here two paragraphs given in Part I, pages 95 and 96, on this point:

There is a remarkable interweaving of interests among owners of timber, individual and corporate. It often happens that only a fraction of the timber under one control is held in any one name. Most of the important owners refused to furnish the information necessary to reveal the great concentration of control through personal and corporate relations. Yet only answers on this point (see question 7 of schedule, p. 275) would reveal the true concentration of the ownership of timber. Persistent effort was made to secure the information on stock holdings from those concerned and from others who might know the facts, and, as is shown below, separate owners of record were consolidated wherever sufficient evidence of one controlling interest was obtained. But nothing short of access to the stock books of all important timber-owning corporations would show the true situation. Therefore the degree of concentration set forth in this report is certainly much below that which actually exists.

Some corporations gave the information regarding stockholders and stock interests in other corporations; some individuals stated, apparently in good faith, their stock holdings in corporations connected with the lumber industry; and from independent sources some specific facts and much general information were gathered. This evidence was carefully considered, and where it was sufficient to show a common control through ownership the separate holdings so controlled were combined and treated as one in the tables of this chapter. Such combinations were not

made because of mere common management or harmonious operation. The test was that of actual control through ownership of at least half the stock by the interest in question. If an individual owning timber had at least half the stock of a timber-owning corporation, the two holdings were combined as one. A corporation was combined with others in which it held a majority of the stock. In a number of important cases, the same few individuals appeared in several corporations as holding a majority of the stock in each, and the corporate holdings were therefore combined as one.

TABLE 5.—TIMBER ACREAGE AND TIMBER OF PLATTED AND UNPLATTED HOLDINGS ON WASHINGTON MAP, BY GROUPS.

[Timber in billions of board feet. Thus, 70.4=70,400,000,000 board feet.]

Holders.	Number of holders.	Timber acreage ¹ owned on map area.	Timber owned on map area.	
			Area.	Per cent of total.
Platted holders:				
Weyerhaeuser Timber Co.....	1	1,372,474	70.4	42.3
Northern Pacific Ry. Co.....	1	300,261	11.1	6.7
Group of 33 holders.....	33	731,893	39.9	24.0
Total, platted holders.....	35	2,410,628	121.4	73.0
Unplatted holders (grouped by size of holding on map area):				
27 holders of over 250 million feet each.....	27	185,272	9.8	5.9
41 holders of 125 million feet to 250 million feet each ²	41	127,853	7.1	4.3
46 holders of 60 million feet to 125 million feet each.....	46	99,463	3.9	2.3
Total, unplatted holders of over 60 million feet each.....	114	412,588	20.8	12.5
Holders of less than 60 million feet each.....	.....	738,537	24.1	14.5
Total, unplatted holders.....	.....	1,151,125	44.9	27.0
SUMMARY.				
Platted holders.....	35	2,410,628	121.4	73.0
Unplatted holders of over 60 million feet each.....	114	412,588	20.8	12.5
Unplatted holders of over 60 million feet each.....	140	2,823,196	142.2	85.5
Unplatted holders of less than 60 million feet each.....	.....	738,537	24.1	14.5
Total, all holders ³.....	.....	3,561,753	166.3	100.0

¹ The figures in this column include 56,878 acres reported as timber rights, as follows: Weyerhaeuser Timber Co., 8,560 acres; group of 33 holders, 26,048 acres; group of 27 holders, 3,560 acres; group of 41 holders, 8,780 acres; group of 46 holders, 6,530 acres; holders of less than 60 million feet each, 3,400 acres.

² Includes 28,747 acres and 600 million feet of Northern Pacific "iteu scrip" lands contracted to unidentified holders. Not counted as an addition to the number of holders.

³ Excludes 9 holders in certain counties of the map area for whom the Bureau had no plats to indicate whether the holdings are in that part of the county which lies in the map area. The total for these 9 holders is 9,919 acres and 500 million feet of timber.

From the above table it will be seen that one holder, the Weyerhaeuser Timber Co., with its 70 billion feet on the area of the Washington map, owns over 42 per cent of all the privately owned timber on that area. Two holders, the Weyerhaeuser Timber Co. and the Northern Pacific Railway Co., with their 81.5 billion feet, own 49

per cent, and the 35 platted holders, with their 121 billion feet, own 73 per cent. If the holdings of 3 important members of the group of 33 holders were segregated and added to the holdings of the Weyerhaeuser Timber Co. and the Northern Pacific Railway Co., the 5 would be found to own 57 per cent of the total timber on the map area, leaving 16 per cent for the other 30 platted holders. Finally, 149 holders own over 142 billion feet, or 85.5 per cent.

Section 4. Holding of Weyerhaeuser Timber Co. on map area. (Map symbol, solid black.)

As stated on page 26, the solid black symbol of the Weyerhaeuser Timber Co. does not cover all the lands which it has on the map area. Over 85,000 acres of Weyerhaeuser timberland are platted with the symbol of the Northern Pacific, and about 15,000 acres are platted with the symbol of the group of 33 holders.

The 85,000 acres which are platted with the Northern Pacific symbol consist of contract lands sold by the Northern Pacific to the Weyerhaeuser Timber Co. before the railroad had itself received patent for them. The location of these particular contract lands (unlike that of the deeded lands) is not available from public sources. It was furnished to the Bureau by the Northern Pacific with the consent of the Weyerhaeuser Timber Co. It was, therefore, not thought proper to plat the contract lands with the solid black symbol, or to show their exact location separately. They have, instead, been platted with the symbol of the Northern Pacific, whose claim to them is matter of public record. On the map these contracted lands are not distinguished from the Northern Pacific lands proper. In the table, however, the contract acreage and the estimated amount of timber thereon are included in the figures for the Weyerhaeuser Timber Co., where they properly belong, rather than in the Northern Pacific figures. In Washington as a whole, the total acreage of the Weyerhaeuser Timber Co.'s contract lands is about 150,000 acres (of which 140,000 acres are timbered). It should be noted that contests often arise between the railway and settlers, and may arise in the case of some of the contract lands here referred to. If the Land Office decision on any given tract goes against the railway, the Weyerhaeuser company will, of course, lose whatever contract rights it now has in that particular piece of land.

That part of the Weyerhaeuser Timber Co.'s acreage which is platted to the group of 33 holders instead of with the solid black symbol of the company itself, represents a recent fairly large purchase. About 15,000 acres of this purchase lie on the map area, and four to five thousand acres of it outside. This land was platted with the group of 33 because the transfer had not been made a matter of public record at the time the data for the map were secured. In the tables

the acreage and timber are included in the figures for the Weyerhaeuser Timber Co.¹

With this purchase and the contract lands, the total of the Weyerhaeuser Timber Co. on the area of the map is 1,372,474 acres of timberland, and 70.4 billion board feet of timber, or over 42 per cent of the total privately owned timber in this area.

This holding illustrates the effect of railroad grants in concentrating the ownership of standing timber. It has already been stated that 80 per cent of the entire holding of the Weyerhaeuser Timber Co. was acquired from the Northern Pacific.² On this map area, nearly 90 per cent was so acquired.³ The predominance of the odd-numbered sections owned by the Weyerhaeuser company is noticeable in the checker-board effect of the solid black. The company's filling in with even-numbered sections forms in some parts a solid black area of considerable size and is usually coincident with a heavy stand of timber. The filling in, here, was in most cases by purchases from others than the Northern Pacific—purchases either of individual timber claims, or of considerable tracts previously assembled in the even-numbered sections by other companies. It will be observed that scarcely anywhere on this map area does the Weyerhaeuser Timber Co.'s holding extend beyond the outer limits of the Northern Pacific grant. The same is true for the relatively small remainder of its holding in Washington, i. e., the part not on the map. This remainder lies in Snohomish County immediately north of the area shown on the inset, except for a few forest-lieu selections farther north in Skagit and Whatcom Counties, quite without the grant limits.

From 1900 on, by reason of its purchase of Northern Pacific lands, the Weyerhaeuser Timber Co. has had a dominant position in southwestern Washington. It has apparently followed a policy of buying such additional heavily timbered tracts already assembled as it could secure advantageously, especially if they would enhance its strategic control. It sells some small and very accessible tracts to operating companies, at the highest market price, but it has refused to sell timber for speculative holding. In other words, its policy has been to make itself the great speculative holder, absorbing the profit from the steady rise of timber values. From these tracts sold at an extremely high profit it has received large sums. In Oregon, where the company is not a dominant holder, its policy has been not to sell at all. (See p. 56.)

¹ Again, about 4,000 acres in which the Weyerhaeuser Timber Co. has only a half interest are platted on the map with the company's symbol. The remaining half interest is owned by unplatted holders in lower groups. In the tables only one-half of this acreage and timber is counted to the Weyerhaeuser Timber Co., the other half being counted to the joint owners in their proper groups.

² Page 7.

³ Page 37.

Section 5. Holding of Northern Pacific Railway Co. on map area. (Map symbol, light single diagonal.)

The Northern Pacific Railway Co.'s holding on the Washington map area (including that of its subsidiary, the Northwestern Improvement Co., all of whose stock it owns) amounts to 306,261 acres of timberland and 11.1 billion feet of timber. The 85,000 acres of Weyerhaeuser contract lands¹ platted with the railway company's symbol, together with about 50,000 acres of Northern Pacific non-timbered lands, increase the amount actually platted with the light single diagonal to nearly 450,000 acres.

The Northern Pacific's lands lie, of course, largely in the odd-numbered sections of the grant, though some "lieu selections" lie in the even-numbered sections. The blank areas in Mount Rainier National Park, and in the tier of townships immediately north and the tier immediately south of the Park, are explained by the fact that the Northern Pacific relinquished to the Government its odd-numbered sections in these townships under the act of March 2, 1899, and took lieu lands elsewhere, as explained on pages 238 to 240 in Part I. These townships formed part of the former "Pacific Forest Reserve," created under the act of March 3, 1891.

NORTHERN PACIFIC HOLDING INCLUDES UNPATENTED AND UNSURVEYED LANDS.—The Northern Pacific's holding is composed of lands *owned* by it and lands *claimed* by it. For example, much of the company's land within the national forest along the eastern side of the map is unpatedented and even unsurveyed, but it is claimed by the company under its grant. This land is platted to the Northern Pacific and credited to it in the tables. The amount of this unpatedented land claimed by the company has not been distinguished for the map area. On page 8, however, it has been shown that, roughly, somewhat more than half of the company's acreage and timber in the investigation area is unpatedented.²

CHARACTER OF NORTHERN PACIFIC HOLDING ON MAP AREA.—Since the Weyerhaeuser Timber Co. and other purchasers of granted lands selected the best timberland of the Northern Pacific grant throughout southwestern Washington, the present holding of the Northern Pacific in this area is on the whole of less value for timber than the average of the other large timber holdings. Part of its land on the map area is well timbered and part is poorly timbered. Some of the well timbered land is held in the name of its subsidiary, the Northwestern Improvement Co.

In the high mountainous region south of Mount Rainier National Park, eastward from range 7 E., the Northern Pacific lands have a

¹ See p. 29. The 85,000 acres are merchantable timber. Besides there are about 9,000 acres of contract land not counted as bearing merchantable timber.

² See p. 7 regarding the fact that the Northern Pacific can not take unsurveyed lands in the indemnity limits, if within the national forests.

relatively low stand. In township 21 N., 7 E., where the Northern Pacific, through the Northwestern Improvement Co., owns most of the odd-numbered sections, the land was swept by fire many years ago and carries so little timber that it was not classed as timberland in the official cruise by the authorities of King County; in the neighborhood of South Bend on the coast, also, the railway company owns lands that have little timber.

Section 6. Holdings of group of 33 platted holders on map area. (Map symbol, crosshatch.)

The group of 33 platted holders owns on the Washington map area 731,893 acres of merchantable-timber land and 39.9 billion feet of timber. This is 24 per cent of the total timber privately owned on that area. The lands of these 33 separate holders are platted on the map with one symbol—a crosshatch.¹

Among the important holders in this group are the following: Chicago, Milwaukee & St. Paul Railway Co. interests (holding mainly in the name of the Milwaukee Land Co.); St. Paul & Tacoma Lumber Co. (including its subsidiary, the Connellsville Coal & Coke Co.); Puget Mill Co.; the Simpson, Phoenix, and Mason County logging companies and allied concerns; Merrill-Ring & Co. interests (including Polson Logging Co.); Western Timber Co.;² T. D. and E. S. Collins and companies controlled by them; Port Blakely Mill Co.;³ Great Northern Railway Co. interests;⁴ Carlisle-Pennell Lumber Co.; and Grandin Coast Lumber Co. (controlled by the Missouri Lumber and Land Exchange interests, which have large holdings in the Southern Pine Region).

A considerable proportion of the holdings of these 33 companies is scattered in various parts of the map, in the even-numbered sections, among the Weyerhaeuser Timber Co.'s holdings. There are, however, various areas on the map where the grouped holders have timberlands in solid blocks, to the exclusion of the Weyerhaeuser Timber Co.

¹ As explained above, a certain holding which has recently been purchased by the Weyerhaeuser Timber Co. is platted with this symbol, but in the table the acreage and the amount of timber in this purchase are not counted with the group of 33 holders, but to the Weyerhaeuser Timber Co. (See p. 29.)

² This company is also an important holder on the western Oregon map area; and the interests controlling the company control the Fir Tree Lumber and Chapman Timber companies owning timber on that area, and control other companies owning in the Southern Pine Region.

³ Important stockholders of this company are prominently identified with Hobbs, Wall & Co. and Hotchkiss Timber Co., large owners of redwood timber in California.

⁴ In accordance with St. Paul, Minneapolis & Manitoba R. R. Co. v. Phelps (137 U. S., 528) and the act of Aug. 5, 1892 (27 Stat., 390) the St. Paul, Minneapolis & Manitoba acquired a right to select 65,000 acres in any State through which its lines ran in lieu of lands lost to its grant in North Dakota, west of Red River. Upon the absorbing of this company by the Great Northern, this right of selection was assigned to the latter company and lands were selected in heavily timbered regions of the State of Washington. The Great Northern also controls the Skagit Coal & Coke Co. and the Somers Lumber Co., which own timber off the map area in western Washington and in Montana, respectively.

The important timber areas where the Weyerhaeuser Timber Co. did not acquire from the Northern Pacific Railway Co. the alternate sections, but where they are owned by members of the group of 33, are as follows: First, southeast of Tacoma; second, in the central part of the map, to the southeast of the city of Chehalis; third, about Silver Lake in the south central part of the map; fourth, along the Columbia River to the north of the terminal limit of the Northern Pacific grant; fifth, in the two townships south of South Bend, near the coast; sixth, a large region within the grant west of Olympia. In many of these regions the grouped holders now owning granted lands had acquired them from the railroad company long before the Weyerhaeuser entered the field. Scattered over the area of the map, the group of 33 now owns other granted lands, lying in smaller bodies than those in the six regions just mentioned.

A table showing the present ownership of the railroad-grant lands on the map area, including those owned by unplatted as well as platted holders, is given on page 35.

Section 7. Unplatted holdings on map area.

On the Washington map area there are holdings to the amount of 1,151,105 acres of timberland and 44.9 billion feet of timber which have not been platted. Though the group of 33 platted holders includes, of course, the more important companies, there are some important holders whose lands are not platted. The unplatted holders are presented in the table in four groups in the order of their holdings on the actual area of the map. All the unplatted holdings taken together comprise only 27 per cent of the total timber on the map area, as against 73 per cent comprised in the 35 platted holdings. The first three groups of unplatted holders own over 60 million feet each on the map area. There are 114 of them, and they own on this area one-eighth of the total timber.

The last group of unplatted holders shown in the table is composed of owners of less than 60 million feet each *on the map area*. Some holders in this group, though having less than 60 million feet on the map area, are really important holders in other regions of the State. The whole group together holds on the map 738,537 acres, with 24.1 billion board feet of timber, or 14.5 per cent of the total timber on the map area.

Section 8. Additional land owned on map area by timber owners of over 60 million feet each.

The discussion up to this point is confined, so far as land is concerned, to *timbered* land. The map itself, however, shows the location of *all* lands owned by the 35 platted holders, whether timbered or not. Some of the holders whose merchantable-timber acreage has

been shown in Table 5 have additional acreage which has been reported to the Bureau while others do not. The Bureau's information on the amount of additional land thus held is, in general, not complete, and a statement of the causes of this is given in Chapter I, page 17. The following table shows the merchantable-timber acreage as in Table 5; and the additional acreage, so far as reported to the Bureau, for each holder or group of holders of over 60 million feet each.

All land of each platted holder, whether timbered or not, is platted on the map. Therefore, with the exceptions previously noted, the figures in the total column below correspond to the amount of land platted to the holders of the group as closely as survey acreage can be shown on a map of the scale here used.

TABLE 6.—ACREAGE OF TIMBER (INCLUDING TIMBER RIGHTS) AND ADDITIONAL LAND OWNED ON WASHINGTON MAP BY HOLDERS HAVING OVER 60 MILLION FEET EACH ON MAP AREA, BY GROUPS.

[Not all members of a group own additional land. The number of those owning such land is shown for each group, parenthetically in italics, in the additional land column.]

Platted holders:	Number of holders.	Merchantable-timber acreage. ¹	Additional land reported.	Total on map area.
Holders.		<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Weyerhaeuser Timber Co.....	1	1,372,474	(1) 12,788	* 1,385,262
Northern Pacific Ry. Co.....	1	306,261	(1) 49,520	355,781
Group of 33 holders.....	33	731,893	(18) 126,175	858,068
Total, platted holders.....	35	2,410,628	(20) 188,483	* 2,599,111
Unplatted holders (grouped by size of holding on map area):				
27 holders of over 250 million feet each.....	27	185,272	(7) 22,980	208,252
41 holders of 125 million feet to 250 million feet each ²	41	127,833	(15) 16,315	144,148
46 holders of 60 million feet to 125 million feet each.....	46	99,463	(7) 10,610	110,073
Total, unplatted holders of over 60 million feet each.....	114	412,568	(29) 49,905	462,473
SUMMARY.				
Platted holders.....	35	2,410,628	(20) 188,483	2,599,111
Unplatted holders of over 60 million feet each.....	114	412,568	(29) 49,905	462,473
Total, holders of over 60 million feet each.....	149	2,823,196	(49) 238,388	3,061,584

¹ Pages 29 and 30.

² The figures in this column include 59,478 acres reported as timber rights, as follows: Weyerhaeuser Timber Co., 8,560 acres; group of 33 holders, 26,048 acres; group of 27 holders, 3,560 acres; group of 41 holders, 8,780 acres; group of 46 holders, 6,530 acres.

As stated on p. 6, the Weyerhaeuser Timber Co. retains the fee of 26,070 acres on which it has sold the timber. This tract of 26,070 acres is not included in its total in the above table, though practically all of it lies on the map area; part of it is reported by other holders as timber rights.

Conflicts appear in the Bureau's reports as to the ownership of various tracts. The land affected by such conflicts within the map area amounts in all to 4,410 acres. Of this amount, 1,900 acres are platted to the Weyerhaeuser Timber Co., but are also reported as owned by members of the group of platted holders. The remaining 2,510 acres comprise conflicts between different members of the platted group.

³ Including 28,747 acres of Northern Pacific lands contracted to unidentified holders. Not counted as an addition to the number of holders.

The significance of this table lies in the fact that 150 timber holders own over 3 million acres of land in southwestern Washington. After the timber is cut, therefore, the land will remain to them—suitable either for reforestation or for agriculture, and part probably of mineral value. Of this, the 35 platted holders own the fee of about 2,565,000 acres, or more than 4,000 square miles. Such a degree of concentration of land ownership is a matter of serious concern.

Section 9. Present ownership of Northern Pacific grant in map area.

The effect of railroad land grants upon the present concentration of timber ownership is clearly indicated by the following table, showing the present ownership of lands originally granted to the Northern Pacific in the area of the map. Of the 2,415,000 acres granted to the Northern Pacific here, about two-thirds is owned by two holders and no less than 75 per cent is now owned by 33 holders. The Northern Pacific itself retains 355,000 acres or 15 per cent, and the Weyerhaeuser Timber Co. owns 1,230,000 acres of the granted lands here, or 51 per cent of the amount granted in the map area.

TABLE 7.—PRESENT OWNERSHIP OF NORTHERN PACIFIC GRANT IN AREA OF WASHINGTON MAP.

Present holders.	Granted land owned on map area. ¹	Per cent of total granted land in map area.	Platted holders.	Granted land owned on map area. ¹	Per cent of total granted land in map area.
Platted holders:					
Northern Pacific Ry. Co.	355,781	14.7	Members of group of 33—		
Weyerhaeuser Timber Co.	1,231,857	51.0	Continued.		
Members of group of 33—			Cascade Timber Co. interests	9,158	
St. Paul & Tacoma Lumber Co.	51,717		Northwest Lumber Co.	7,565	
Puget Mill Co.	23,769		Eastern & Western Lumber Co.	6,807	
Simpson, Phoenix, and Mason County logging companies and allied concerns.			O'Connell Lumber Co.	6,664	
Carlisle-Pennell Lumber Co.	23,175		O'Neal Timber Co. (Ltd.) and Thos. Irvine Lumber Co.	4,197	
Port Blakely Mill Co.	20,958		N. P. Wheeler et al.	3,690	
Chicago, Milwaukee & St. Paul R. R. Co. interests	16,047		Henry Hewitt, Jr., interests	3,106	
T. D. and E. S. Collins interests	13,254		Pacific & Eastern Ry. Co. and Siler Mill Co.	2,901	
Vilas, Barden & Gregory	9,513		S. E. Shade Lumber Co.	2,576	
			A. B. Hammond Co. interests	2,411	
			Grays' Harbor Commercial Co.	2,083	

¹ Includes 21,445 acres reported as timber rights as follows: (a) Platted holders, 19,925 acres, the largest items of which are the Weyerhaeuser Timber Co., 8,920 acres; Northwest Timber Co., 7,565 acres; and O'Connell Lumber Co., 1,600 acres; (b) unplatted holders, 1,520 acres, of which the Monarch Timber Co. owns 1,120 acres. The table also includes 3,680 acres not distinguished between fee and timber rights, of which 1,240 acres are owned by platted holders and 2,440 acres by unplatted holders.

TABLE 7.—PRESENT OWNERSHIP OF NORTHERN PACIFIC GRANT, ETC.—Continued.

Present holders.	Granted land owned on map area.	Per cent of total granted land in map area.	Present holders.	Granted land owned on map area.	Per cent of total granted land in map area.
Platted holders—Contd.			Unplatted holders—Contd.		
Members of group of 33—Continued.	<i>Acres.</i>		McCormick Lumber Co....	1,480	
W. E. and Marie Boeig	2,012		Puget Sound Power Co....	1,468	
Portland Lumber Co....	1,320		Deep River Logging Co....	1,360	
6 other members of group.....	2,512		Defiance Lumber Co.....	1,348	
Total, group of 33.....	224,969	9.3	Axe Logging Co.....	1,344	
Total, platted holders.	1,812,627	75.0	Bismark Mill Co.....	1,338	
Unplatted holders:			Kleeb Lumber Co.....	1,300	
Tacoma Mill Co.....	8,222		Doty Lumber & Shingle Co.....	1,295	
Eastern Ry. & Lumber Co.....	7,851		Saginaw Timber Co.....	1,280	
Oregon Iron & Steel Co....	6,819		Lebovitz, Kronfeld & Cassey.....	1,233	
Cowfitz Lumber Co.....	4,686		Talbot-Walker Co.....	1,196	
Lytle Logging & Mercantile Co.....	3,730		Allen & Nelson Mill Co....	1,170	
Western Washington Logging Co.....	3,538		Monarch Timber Co.....	1,120	
W. K. Kneeland.....	3,049		Atlas Lumber & Shingle Co.....	1,060	
Walworth-Neville Manufacturing Co.....	2,864		White Star Lumber Co.....	1,033	
Salling-Hanson Co.....	2,642		Chehalis River Lumber Co.....	1,000	
Page Lumber Co.....	2,600				
South Bend Mills & Lumber Co.....	2,438		Subtotal, 39 unplatted holders of over 1,000 acres.....	90,696	3.8
F. A. Coates Logging Co....	2,240		57 unplatted holders of less than 1,000 acres.....	25,795	1.1
Scott & Howe.....	1,985		Total unplatted holders reported to the Bureau.....	116,491	4.9
Union Timber Co.....	1,920				
Keystone Timber Co.....	1,920		<i>SUMMARY.</i>		
Carbon Hill Coal Co.....	1,905		Platted holders.....	1,812,627	75.0
Kent Lumber Co.....	1,901		Unplatted holders reported to Bureau.....	116,491	4.9
W. W. Seymour.....	1,804		Total accounted for.....	1,929,118	79.9
Charles H. Clemmons.....	1,800		Unaccounted for.....	486,660	20.1
Campbell Lumber Co.....	1,796		Grand total.....	2,415,778	100.0
North End Lumber Co....	1,733				
Astoria Timber & Lumber Co.....	1,640				
E. J. Sande.....	1,588				

This table shows that approximately 15 per cent of the land granted to the Northern Pacific in the southwestern Washington map area is still held by that company, 51 per cent is held by the Weyerhaeuser Timber Co., and 9 per cent by the members of the group of 33; making, as already stated, 75 per cent now in the hands of the platted holders. About 5 per cent is in the hands of the unplatted timber holders separately reported to the Bureau. The amount not

accounted for is only 20 per cent, part of which no doubt belongs to smaller timber holders not separately reported, part of which is denuded land, and part prairie land.

It is worthy of note that while the Weyerhaeuser Timber Co. now holds 1,231,857 acres of the granted lands in this area, it originally acquired from the Northern Pacific about 102,000 acres in addition thereto, which it has subsequently sold. Of this amount formerly owned by the Weyerhaeuser Timber Co., about 44,000 acres are now held by 49 of the holders named in the table and included in the amounts set down for them. The remaining 58,000 acres are included in the acreage unaccounted for.

Since the total acreage of the Weyerhaeuser Timber Co. on the map area is 1,385,262 acres (Table 6), the 1,231,857 acres it acquired here from the railroad grant constitute practically 90 per cent of its land holding on the southwestern Washington map.

Section 10. Total holdings in investigation area of holders platted on Washington map.

The significance of a timber holding is not to be measured by the amount of timber or by the total acreage owned in a selected area, like the area of this map. The power of a timber company in a given region is enhanced if it has large interests in other timber regions as well. The total strength of the holders under discussion is shown below (1) as regards timberland and timber and (2) as regards total land holdings. The latter point is of great importance as bearing on the control of industry and political life which may be exercised through the ownership of a large proportion of the land in a community or region.

TIMBER HOLDINGS IN PACIFIC-NORTHWEST.—Table 8 (timbered acreage) and Table 9 (merchantable timber) have been prepared to show the total holdings in the Pacific-Northwest of the 35 holders platted on the southwestern Washington map; and a later paragraph will show whatever holdings they have in the Lake States and in the Southern Pine Region. The regions of the Pacific-Northwest chosen for separate presentation in these two tables are western Washington, western Oregon, and California. The extent of their total timber holdings in western Washington is shown both for "On the map area" and "Outside the map area." Whatever timber holdings any of these 35 holders have in eastern Washington, eastern Oregon, Idaho, or Montana is shown as a lump sum in the column headed "Other regions of Pacific-Northwest." The phrase "Pacific-Northwest" throughout the Report means the States of California, Oregon, Washington, Idaho, and Montana.

It will be noticed from the tables that the Northern Pacific Railway Co. has no timber holdings in western Oregon or California.

Most of the group of 33 holders, likewise, have no holdings in these States, and indeed 13 have no holdings at all beyond what they own on the Washington map area. The tables and text, therefore, state the actual number of holders who own the amount shown for the group in each of the regions.

The two tables, 8 (timbered acreage) and 9 (merchantable timber), show the timbered acreage and merchantable timber of the same holders. The timber of any entry in Table 9 stands on the acreage shown for the corresponding entry in Table 8. The two tables will be discussed together.

TABLE 8.—ACREAGE¹ OF TIMBER OWNED IN PACIFIC-NORTHWEST BY THE 35 PLATTED HOLDERS OF WASHINGTON MAP, BY REGIONS.

[Only part of the 33 grouped holders owns any land outside the Washington map area. The number of those who do own in each region is given in the table, parenthetically in italics.]

Holders platted on Washington map.	In western Washington.			In western Oregon. ²	In California.	In other regions of Pacific-Northwest.	Total in Pacific-Northwest.
	Total.	On map area.	Outside map area.				
	<i>A cres.</i>	<i>A cres.</i>	<i>A cres.</i>	<i>A cres.</i>	<i>A cres.</i>	<i>A cres.</i>	<i>A cres.</i>
Weyerhaeuser Timber Co.	1,515,932	1,372,474	143,458	250,430	4,905	132,728	1,903,995
Northern Pacific Ry. Co.	547,752	306,261	241,491	(7)	(5)	2,431,271	2,979,023
	(58)	(58)	(14)	(7)	(5)	(6)	(58)
Group of 33 holders.....	1,131,767	731,893	399,874	341,356	455,320	254,972	2,133,421
	(56)	(56)	(16)	(8)	(6)	(8)	(56)
Total, 35 holders.....	3,195,451	2,410,628	784,823	591,786	490,231	2,813,971	7,096,439

¹ The figures in this table include 53,752 acres reported as timber rights as follows: Total in western Washington, Weyerhaeuser Timber Co., 8,920 acres; group of 33 holders, 29,488 acres. In western Oregon, group of 33 holders, 465 acres. In California, group of 33 holders, 1,860 acres. In other regions of the Pacific Northwest, group of 33 holders, 13,079 acres.

² Including the part of Klamath County, in eastern Oregon, on Part IV of the Oregon map. (See p. 65.)

TABLE 9.—TIMBER OWNED IN PACIFIC-NORTHWEST BY THE 35 PLATTED HOLDERS OF WASHINGTON MAP, BY REGIONS.

[In billions of board feet. Thus, 76.9=76,900,000 board feet. Only part of the 33 grouped holders owns any timber outside the Washington map area. The number of those who do own in each region is given in the table, parenthetically in italics.]

Holders platted on Washington map.	In western Washington.			In western Oregon. ¹	In California.	In other regions of Pacific-Northwest.	Total in Pacific-Northwest.
	Total.	On map area.	Outside map area.				
Weyerhaeuser Timber Co.	76.9	70.4	6.5	15.9	0.1	2.8	95.7
Northern Pacific Ry. Co.	16.2	11.1	5.1	(7)	(5)	20.0	36.2
Group of 33 holders.....	(58) 63.1	(55) 39.9	(14) 23.2	(7) 20.7	(5) 31.2	(6) 4.9	(53) 119.9
	(56) 156.2	(55) 121.4	(16) 34.8	(8) 36.6	(6) 31.3	(8) 27.7	(56) 251.8

¹ Including the part of Klamath County, in eastern Oregon, on Part IV of the Oregon map. (See p. 65.)

Weyerhaeuser Timber Co..—Tables 8 and 9 show that the Weyerhaeuser Timber Co. has in western Washington a total of 1,515,932 acres of merchantable timberland and 76.9 billion feet of timber. Of this timbered acreage all but 143,458 acres and of the timber all but 6.5 billion feet is on the area of the southwestern Washington map. The 143,458 acres outside the map area are for the most part located in eastern Clarke County, in eastern King County, and in southern Snohomish County. The company also owns a small acreage outside the Northern Pacific grant limits in Skagit and Whatcom Counties—lands obtained by means of Northern Pacific scrip. It has no holdings in eastern Washington.

In western Oregon, including that part of Klamath County in eastern Oregon which lies on Part IV of the Oregon ownership map, the Weyerhaeuser Timber Co. has 250,430 acres of land and 15.9 billion feet of timber. The greater part of this timber is in the heavy Douglas fir region west of the mountains, and the remainder of it lies in eastern Jackson and western Klamath Counties, in the belt of sugar pine and western pine. In California the Weyerhaeuser Timber Co., in the name of its subsidiary, the Weyerhaeuser Realty Co., owns 4,905 acres of merchantable timberland, with less than 100 million feet. The holding shown in the tables for the Weyerhaeuser Timber Co. in other regions of the Pacific-Northwest is 132,728 acres and 2.8 billion feet of timber. With the exception of a negligible amount in northern Idaho this acreage and timber lie in eastern Klamath County and in Lake County, Oreg.

The Weyerhaeuser Timber Co.'s total in the Pacific-Northwest as shown by these tables is 1,903,995 acres of timberland and 95.7 billion feet of timber. The importance of this holding, the second in size in the United States, has already been discussed in a previous chapter. It is sufficient here to repeat that the holding amounts to 9.4 per cent of the privately owned timber in the Pacific-Northwest.

Northern Pacific Railway Co..—The tables under discussion show that the Northern Pacific Railway Co. has a total in western Washington of 547,752 acres of merchantable timberland and 16.2 billion feet of timber. The greater part of this, namely, 306,261 acres and 11.1 billion feet of timber, is on the area of the southwestern Washington map. The Northern Pacific's timberland in western Washington which lies outside the map area has a lighter stand than its land on the map area. Hence, though the company has 241,491 acres of timberland in western Washington outside the map area, it has on this acreage only 5.1 billion feet of timber.

In western Oregon and in California the Northern Pacific has no timber holding whatever. It is true that over 500,000 acres have been patented to the Northern Pacific in the State of Oregon, but practically all of these lands that are timbered have been sold or are under contract of sale. All such contract timberlands not only in

Oregon but in the other northwestern States, have been credited in the Bureau's tables to the holders of the contracts, if the contract holders were known. In cases where the Bureau did not know the contract holders, the lands were thrown into the group of holders of 125 to 250 million feet each. They were not credited to the Northern Pacific because that company has no further interest in them than to transfer title as soon as it receives patent from the Government.

The tables show that it is in "other regions" of the Pacific-Northwest that the Northern Pacific Railway has the greater part of its holding, viz, 2,431,271 acres of merchantable timberland and 20 billion feet of timber. These figures represent the holding of the Northern Pacific in eastern Washington, in Idaho, and in Montana. It may be noted that the average stand on its holding here is relatively low.

The company's total holding in the Pacific-Northwest—2,979,023 acres of timbered land and 36.2 billion feet of timber—makes it the third largest holder of timber in the investigation area.

The Northern Pacific and the Weyerhaeuser Timber Co. together have 4,883,000 acres of timber, with no less than 132 billion feet, or 13 per cent. of all privately owned timber in the five great States of the Pacific-Northwest.

Group of 33 holders.—Tables 8 and 9 show whatever holdings the group of 33 holders who are platted on the Washington map area has in the various regions of the Pacific-Northwest. Some of these 33 holders have no timber outside the map area. In western Washington outside the map area, their 399,874 timbered acres and 23.2 billion feet of timber are actually owned by only 14 holders out of the group. Of this timber, part lies in Chehalis County along the Pacific coast. A far larger part lies in western Jefferson and in western and northern Clallam Counties in the Olympic Peninsula; and in Snohomish and Skagit Counties in the northern part of western Washington. None of it lies south of the map area. In western Oregon 7 members of the group of 33 holders own 341,356 acres and 20.7 billion feet of timber, and no other members of the group have any holdings there. Similarly, in California the 455,326 acres of timberland and 31.2 billion feet of timber owned by the members of the group of 33 are actually in the hands of only 5 holders. Only 6 members of the group have timber in "other regions" of the Pacific-Northwest. These holdings, amounting to 254,972 acres of timberland and 4.9 billion feet of timber, are scattered in eastern Oregon, eastern Washington, Idaho, and Montana.

The entire holdings in the Pacific-Northwest of the whole group of 33 are 2,183,421 acres of timberland and 119.9 billion feet of timber.

The total for the 35 holders (Weyerhaeuser Timber Co., Northern Pacific Railway Co., and group of 33) reaches the enormous amount of 7,066,439 acres of timberland and 251.8 billion board feet of tim-

ber, which is almost one-fourth of all the privately owned timber in the Pacific-Northwest.

Timber owned in regions of Pacific-Northwest by holders selected from those platted on Washington map.—In the separate regions comprising the Pacific-Northwest a selection of certain ones from the members of the group of 33 who own in those regions would reveal a much higher degree of concentration than is shown in Tables 8 and 9; for those tables include all holders platted on the Washington map who own any timber at all in another region, no matter how small the amount.

Thus, though 14 of these holders own 23.2 billion feet of timber in western Washington outside the map area, 9 holders selected from that number own 22 billion feet out of the 23.2. These 9 own in western Washington as a whole 38.3 billion feet, and, taken with the Weyerhaeuser Timber Co. and the Northern Pacific, make 11 of the map holders owning in western Washington 131.4 billion feet of timber.

In western Oregon and California 5 selected holders from the Washington map group of 33 own no less than 51.4 billion feet of timber. This with the Weyerhaeuser Timber Co.'s holding in those regions makes a total of 67.4 billion feet owned there by 6 of the Washington map holders.

Still more striking is the fact that out of the 251 billion feet owned in the Pacific-Northwest by the Weyerhaeuser Timber Co., the Northern Pacific, and the group of 33, over 206 billion feet are in the hands of only 8 holders. This amounts to 20 per cent of all the privately owned timber in the States of California, Oregon, Washington, Idaho, and Montana—that part of the country where lies the chief remaining source of timber supply for the United States.

This 20 per cent, it will be observed, is composed of about 9.5 per cent owned by the Weyerhaeuser Timber Co., about 3.5 per cent owned by the Northern Pacific, and about 7 per cent by 6 holders selected from the group of 33. It should be remembered that these are not the 8 largest holders in the Pacific-Northwest. Only 5 out of the 8 holders referred to would appear in a list of the 8 largest holders in the Pacific-Northwest. The Southern Pacific, the largest single holder in the Pacific-Northwest, is not included here at all.

TIMBER OWNED IN LAKE STATES AND IN SOUTHERN PINE REGION BY HOLDERS PLATTED ON WASHINGTON MAP.—The tables which have just been discussed cover only the Pacific-Northwest, but there are 5 holders platted on the Washington map who also own timber outside the Pacific-Northwest—2 in the Lake States and 3 in the Southern Pine Region. The total amount of timber owned on the Washington map area by these 5 holders is 14.4 billion feet standing on 372,555 acres and the total owned by them in the Lake States and the Southern Pine Region is 5 billion feet of timber standing on 793,749 acres.

By adding these holdings to the total shown in Tables 8 and 9 for the 35 holders in the Pacific-Northwest (namely, 7,066,439 timbered acres and 251.8 billion feet) it will be found that the total timber strength of the 35 in the entire investigation area is 7,860,188 acres of merchantable timberland, carrying 236.8 billion feet of timber.

TOTAL LAND HOLDINGS.—The limitations of the Bureau's information as to the total land holdings of timber owners have been set forth on page 17. The reports to the Bureau, as summarized in the following table, show, however, that in the timbered portions of the Pacific-Northwest the holders platted on the Washington map own 397,813 acres of land not bearing merchantable timber. Adding this to the 7,066,439 acres of their merchantable timberland in the Pacific-Northwest (Table 8) would indicate that the total reported acreage of these holders (including their relatively small amount of timber rights) is 7,464,252 acres, of which the Northern Pacific owns 3,158,480 acres. These figures apply only to land in the timbered portions of the Pacific-Northwest, and particularly exclude a very large amount of land owned by the Northern Pacific in the timberless regions. The Northern Pacific's total acreage as shown in its annual report to stockholders for 1910 was 9,949,985 acres, of which all but 110,000 acres lay in Oregon, Washington, Idaho, and Montana. This indicates that the present table excludes about 6,680,000 acres of Northern Pacific land.

The table repeats for each holder or group the merchantable-timber acreage from Table 8, and then gives the "additional" land and the total acreage owned. Only 23 of the members of the group of 33 were reported as owning additional land.

TABLE 10.—ACREAGE OF TIMBER (INCLUDING TIMBER RIGHTS) AND ADDITIONAL LAND OWNED IN TIMBERED PORTIONS OF PACIFIC-NORTHWEST BY THE 35 PLATTED HOLDERS OF WASHINGTON MAP.

Holders platted on Washington map.	Merchantable-timber acreage.		Additional land reported.		Total in timbered portions of Pacific-Northwest.	
	Number of holders.	Acres.	Number of holders.	Acres.	Number of holders.	Acres.
Weyerhaeuser Timber Co.	1	1,903,995	1	40,904	1	1,944,899
Northern Pacific Ry. Co.	1	2,979,023	1	179,457	1	3,158,480
Group of 33 holders.....	33	2,183,421	23	177,452	33	2,360,873
Total.....	35	7,066,439	25	397,813	35	7,464,252

¹ Including 8,920 acres timber rights.

² The figure of 179,457 is incomplete for the Northern Pacific's additional lands in the Pacific Northwest. It covers probably the greater part of the company's additional land in the timbered counties investigated by the Bureau, but covers none of its very large holdings in the nontimbered regions of the States of Oregon, Washington, Idaho, and Montana. All totals which include this tract of 179,457 acres are, consequently, incomplete. The total land holding of this company in the whole country is 9,949,985, of which all but 110,000 acres are in the Pacific Northwest. The total is shown separately, by States, in Part I, p. 236.

³ Including 44,832 acres timber rights.

The distribution of the 7,066,439 acres of merchantable-timber acreage owned by the 35 holders in the various parts of the Pacific-Northwest has been given in Table 8. The distribution of the 397,000 acres of additional land is approximately as follows: Of the 41,000 acres of the Weyerhaeuser Timber Co., 26,000 acres are in western Washington, 13,000 acres in western Oregon, and 2,000 in California; of the 179,000 acres of the Northern Pacific Railway Co., 63,000 acres are in western Washington and 116,000 in eastern Washington, Idaho, and Montana; of the 177,000 acres reported for the 23 members of the group of 33, about 147,000 acres lie in western Washington, 18,000 in western Oregon, 10,000 in California, and 2,000 in other regions of the Pacific-Northwest.

The total acreage reported as owned by these 35 holders in the timbered portions of the Pacific-Northwest is 7,464,252 acres. This is equivalent to 46,651 tracts of 160 acres each—the “quarter section” which the individual can ordinarily take up under the Federal laws. It would be sufficient (at five persons to each settler's family) to give a landed interest to over 230,000 persons. The 6,680,000 acres of excluded Northern Pacific land in timberless parts of the same region would supply a landed interest to nearly as many more. Put in another way, the 14,145,000 acres owned in the Pacific-Northwest by these 35 holders amount to seven-tenths of an acre to each one of the 20 million families in the United States in 1910. These illustrations, and similar ones elsewhere in the Report, are meant merely to give an idea of the size of the areas involved; they do not imply anything as to the character of the land. A large part of it is not suited to agriculture at present, and much of it probably never will be.

Taking also the 790,000 acres of timberland, and 125,000 acres of additional land, which some of these same holders have in the Lake States and the Southern Pine Region, gives for the 35 a total reported acreage in the investigation area of over 15,000,000 acres.

Ten members of the group of 33 own well over 1,800,000 acres out of a group total of 2,360,000. Six holders of the group have well over 1,450,000. These 6, taken with the Weyerhaeuser Timber Co. and the Northern Pacific (including here only that part of its holdings covered in the table), give 8 holders owning more than 6,550,000 acres of land in the timbered portions of the Pacific-Northwest. Thus 8 holders have the equivalent of nearly a third of an acre for every family in the United States. The 5,103,379 acres shown in the table for the Northern Pacific and the Weyerhaeuser Timber Co. alone would, on this basis, provide for one-quarter of an acre, and with the excluded Northern Pacific land would be enough for over half an acre, to each of the 20 million families.

NOTE.

State lands on map area.—The lands of the State of Washington on the area of the map are platted with the symbol "S," standing for "State." Lands which are still owned by the State but on which the timber rights have been sold are platted with an "S" placed horizontally ("σ"). The greater part of the State lands which are platted with the upright "S" are timbered; and timber rights thereon have not been sold, but the Bureau has no complete data as to the actual acreage timbered nor as to the amount of timber. In the map area the total acreage of these lands on which timber rights have not been sold (symbol "S") is 363,045 acres; and the acreage on which timber rights have been sold is 62,612 acres. Of this 62,612 acres, however, 12,960 acres have been reported to the Bureau by timber-owning companies. The remaining 49,652 acres, therefore, are the State lands on which timber has been sold; and which have not been reported to the Bureau by owners of 60 million feet or over. The Bureau does not know whether the timber on these particular 49,000 acres has been logged as yet.

The 363,000 acres of timberland, with the 49,000 acres of land on which the timber has been sold, make a total of about 412,000 acres of land owned by the State on this map area. Of the 12,960 acres of State lands on which the timber was reported by private holders, about 7,000 acres were reported by unplatted holders. By oversight these 7,000 acres, which should have been left blank on the map, were platted to the State with the other "σ" lands. The amount of "σ" land actually platted on the map is therefore about 56,000 acres instead of 49,000.

It will be observed that the most important region of the State lands is in the southern half of the map, in Pacific, Lewis, Cowitz, and Wankiakum Counties; other smaller bodies of well-timbered State lands are found in Chehalis County southeast of Grays Harbor and in southern Pierce County below Tacoma. In the regions mentioned the State has not only the sections numbered 16 and 36, granted to the State for school purposes, but also a large area of land in other even-numbered sections. These lands in other sections than 16 and 36 were selected by the State as indemnity for school lands, or under various grants from the Federal Government allowing the State to select a fixed acreage in whatever part of the State it could find unappropriated public lands. The large acreage of State selections located on the map lies for the most part in heavy timber. Beyond the map to the northwest the State has made large selections of timberland in northern Chehalis, Jefferson, and Clallam Counties; and it has very considerable bodies of timberland in other more lightly timbered counties.

The law of Washington (Session Laws, 1909, ch. 223) forbids the State to sell the fee in timberlands which carry more than one million feet to the quarter section, i e., 6,250 board feet per acre. This means that on all the State lands which have sufficient timber to be really merchantable the timber must be sold separately from the land. Such sales are by public auction to the highest bidder, and no sale can be made at less than the appraised value. To indicate the prices at which the State is holding its timber it may be said the appraised values of certain parcels offered at public auction August 7, 1909, averaged as follows:

Counties.	Acres offered.	Average appraised value of timber per acre.
Chehalis.....	200	\$60.02
Chelan.....	960	17.94
Cowlitz.....	280	52.30
King.....	40	45.00
Pierce.....	640	155.73
Total.....	2,120	68.54

The law further provides that timber so sold must be removed within five years, or the purchaser loses his rights and the timber reverts to the State; though in cases of good faith the time may be extended five years upon payment of not less than \$1 and not more than \$2 per acre for each year of extension. The purpose of the law was to prevent large timber-owning corporations from securing fee to the State lands and holding the timber for a rise in price.

CHAPTER III.

CONCENTRATION OF TIMBER OWNERSHIP IN IMPORTANT AREAS IN WESTERN OREGON.

Section 1. Amount and general distribution of timber in State of Oregon.

There is more privately owned timber in Oregon than in any other State of the Union—over 398 billion board feet. Of this, 315.9 billion feet, or practically four-fifths, stand on the heavily timbered areas in western Oregon selected for this discussion.

A monograph on the forests of Oregon,¹ by Henry Gannett of the United States Geological Survey (published in 1902), gives an excellent general description of the forest areas of Oregon; following is an excerpt:

The Coast Range presents an almost unbroken wooded region extending from the Columbia to the south boundary of the State. Toward the south boundary, however, the forests become more open, the southern slopes of the mountains being largely without timber, while, as a rule, the northern slopes are well forested. The great burned areas in the Coast Range are, in the main, well advanced toward restocking with timber. Succeeding this region on the east is a depression extending from Columbia River south to the Siskiyou Mountains, which consists in large part of open country. The northern portion of it consists of the Willamette Valley, beyond which to the southward succeed the valleys of Umpqua and Rogue Rivers. The valley of the Willamette is a broad, open expanse. How much of this valley was originally forested and has been cleared by man it is impossible at this time to say, but probably strips of considerable width on either side were formerly forested and have thus been cleared. The valleys of Umpqua and Rogue Rivers contain much open land, in which are scattered bodies of timber.

The Cascade Range is heavily timbered from the west base to its crest, and to a varying distance upon the eastern side. As in the Coast Range, the forest is less dense in the southern part of the State, and to a large extent is confined to the northern slopes. From the crest the forest extends eastward to varying distances, the distance being greatest in the southern part of the State, in Klamath and Lake Counties, nearly all of the former county being covered by forests of yellow pine.

In the northeastern part of the State is a large, irregular, isolated body of timber covering the Blue and Wallowa Moun-

¹The Forests of Oregon, by Henry Gannett, Professional Paper No. 4, Series H, Forestry 1, Geological Survey, Washington, D. C., 1902, p. 10.

tains. These forests are open and light as compared with those in the western part of the State.

The crest of the Cascade Range is a natural dividing line between two very different portions of Oregon. West of this line the rainfall is heavy, and consequently the forests are, as a whole, dense, and in parts extremely luxuriant. East of that boundary the rainfall is light, the forests are comparatively scanty and open, and the stand of timber is small.¹

Section 2. Description of selected areas in western Oregon, and of ownership map.

The areas selected for this discussion lie in western Oregon and are covered by an ownership map in four parts (facing p. 80). The four parts are considered as a unit in the tables and in the text discussion of acreage and timber.² The mapped areas include 88 per cent of the privately owned timber in the State west of the Cascades.³ The portions of western Oregon omitted in this selection, in the main, comprise nontimbered lands, privately owned timberlands having a relatively light stand or scattered in location, and national forests where there is little private timber.

The exact location of the four parts of the map is shown in the key map of the Pacific coast, facing page 4. They may be briefly described as follows:

Part I covers an area west of Portland from range 2 W. (Willamette meridian) to the Pacific Ocean, and from the Columbia River southward to the south boundary of Polk County. In its greatest extent it is about 55 miles from west to east and about 100 miles from north to south. It embraces one of the heaviest Douglas-fir regions in the country, as well as much open land in the Willamette Valley and around Tillamook Bay. It includes all of Clatsop, Tillamook, Yamhill, and Polk Counties, the greater part of Columbia and Washington Counties, and portions of Lincoln, Marion, and Multnomah Counties.

Part II covers the area from the north line of township 4 S. to the south boundary of Lane County, and from ranges 6 E. to 2 W., inclusive. This is a strip about 50 miles in width, beginning a little south of Portland and stretching some 125 miles southward. It takes in a heavily timbered Douglas-fir region lying against the Cascade Mountains, whence it slopes westward to the open Willamette Valley. The best timber of Clackamas, Marion, and Linn Counties, as well as a large part of the timber in Lane County, stands on the area of Part II.

¹ For a digest from this same monograph relating to important burned forest areas in Oregon, see pp. 48 to 49.

² For statements showing for each of the four parts separately the amount of acreage and timber, see pp. 53 and 64.

³ Since the map covers part of Klamath County in eastern Oregon, the timber on this mapped part of Klamath County is added to that in Western Oregon proper in computing the 88 per cent.

Part III adjoins the southwestern boundary of the second map and stretches westward to the coast. It embraces that part of Douglas County that lies west of Willamette meridian, and all of Coos County except the southern tip. It also includes a few townships in the northern end of Curry County. Large portions of the area of this map, especially in Coos County, are heavily timbered. There are large open areas, however, in the Umpqua River Valley, especially in south central Douglas County.

Part IV extends from the south boundary of eastern Douglas County to the California line. It embraces the eastern half of Josephine County, practically all of Jackson County, and the Klamath Lake region in the western part of Klamath County. From Ashland to Grant's Pass a wide stretch on both sides of the Southern Pacific railroad has little merchantable timber. Here, as in the Umpqua Valley, some of the platted lands of the Southern Pacific are non-timbered. Except in eastern Jackson and in Klamath Counties, the chief species are Douglas fir and western pine, but in general the stand is light compared with that on Part I, Part II, and Part III. In eastern Jackson County and in Klamath County is an area forested principally with sugar pine and western pine. Although these kinds of timber do not produce stands so dense as redwood or Douglas fir, this region has an excellent and valuable stand of its characteristic species.

Taken together, the four parts include by far the greater portion of the important timbered areas of western Oregon. This is obvious from the fact that 80 per cent of the private timber in the entire State stands on the areas mapped, and of the private timber in Oregon west of the Cascade Mountains 88 per cent is on this map. Only 68 holders are platted on the four parts, and these 68 own 70 per cent of the privately owned timber on the map area. Their holdings on the map amount to about 56 per cent of the privately owned timber in the whole State.

The lands platted on the map to these 68 holders amount to about 4,195,000 acres, of which about 3,945,000 acres carry merchantable timber.

OPEN AND BURNED AREAS OF WESTERN OREGON.—The Bureau's information as to open and burned areas of western Oregon is not so detailed as in southwestern Washington, so that it was impracticable to map the "little or no timber areas," as was done on the Washington map. The general location of the most extensive of the open timberless areas on the various parts of the western Oregon map has been indicated in the paragraphs above; and this, with a brief statement of the general location of the great burns in this territory, will

be sufficient to give an idea of the important areas where there is practically no merchantable timber.

The historic burns of Oregon, and the stages which reforestation has reached on them, are described in the monograph above cited.¹ The Nestucca burn, which occurred between 1850 and 1860, is located in the southern portion of Part I of the map in townships 3, 4, and 5 S. from the coast eastward to the Willamette Valley. There are practically no platted holdings in these townships except that of the Southern Pacific. A considerable part of the area has been thrown into a national forest, in accordance with the policy of the Forest Service to reserve large burned areas and promote the restocking of the timber.

In 1868 great fires devastated the timber from Coos Bay southward along the coast to the Rogue River Mountains, and also that between the forks of the Coquille River, the latter area having been previously burned in 1843. These burns are located in the western portion of Part III of the map. In the region of the Coquille burn, the reforestation has been especially rapid and some of the young timber, very dense in stand, is in the ownership of platted holders.

The monograph also describes other important burns in parts of western Oregon not on the map, especially the Yaquina burn in Lincoln and Benton Counties and the burn from Cape Perpetua southward to the Siuslaw River in western Lane County. Both these burns lie in the territory between Part I and Part III of the map.

RAILROAD GRANT LIMITS.—The limits of the Oregon & California Railroad Co.'s land grants are shown. The primary limit runs at a distance of 20 miles from the original main line of the railroad on either side, and the indemnity limit runs 5 miles or 10 miles farther out, making it 25 miles or 30 miles from the road. Only the railroad line from which the grant limits are calculated is named on the map. Of the unnamed railroad lines and branches all (except two very short roads) are parts of the Southern Pacific system, but have no relation to the grant limits.

There were originally two grants, one to the Oregon & California Railroad Co., called the "East Side grant," and running from Portland to the California line, with a 30-mile indemnity limit; the other, called the "West Side grant," to the Oregon Central Railroad Co., running from Portland west to Forest Grove and from Forest Grove south to McMinnville, with a 25-mile indemnity limit. The latter grant originally contemplated the construction of a railroad from Portland to the ocean, but the line was never completed, and the remainder of the grant was forfeited. The Oregon & California

¹ Cited on p. 46.

Railroad Co. in 1880 became successor to the Oregon Central Railroad Co., and absorbed its grant. Both grants are now controlled by the Southern Pacific Co. Both roads started from Portland, one going south and the other west; consequently the limits of the two grants overlapped somewhat at the outset. The length of the road from Portland to the California line is about 370 miles; of that from Portland to McMinnville, 47 miles.

LAND-GRANT WAGON ROADS.—The location of the wagon road between Coos Bay and Roseburg, which carried a Federal land grant of over 100,000 acres, is mapped on Part III. The western portions of the Willamette Valley and Cascade Mountain Wagon Road and of the Oregon Central Military Road are mapped on Part II. These last roads, reaching across the mountains to the eastern boundary of the State, were also subsidized by land grants of alternate sections to aid in their construction. The primary and indemnity limits are not indicated on the map. The Willamette Valley & Cascade Mountain Wagon Road had a primary limit of 6 miles on each side of the road, within which three sections per mile were to be selected. The others had a primary limit of 3 miles on each side, with indemnity limits 3 miles farther out, likewise making 6 miles within which lands could be selected.

NATIONAL FORESTS.—National forest boundaries are shown in heavy black lines with a parallel row of dots on the inner side. Detached portions of some of the national forests will be seen separate from the main bodies. In some cases these detached parts are only a few sections or even a single section in extent, and if there happen to be lands platted in solid black within or about these bits of the forest, it is hard to make out their black boundaries. Reference to the key map of the Pacific coast (facing p. 4), which shows national forests, will help make clear these reserved areas.

A glance at Parts II, III, and IV, of the western Oregon map will illustrate the point already made in Chapter I, that the Government is far from owning solidly the area within the reserve boundaries. In many parts of the national forests in this area a large portion of the land is privately owned by the platted holders, and some of the remainder is in the hands of unplatted timber companies or of individuals. The amount of privately owned land within the national forest boundaries of the Pacific-Northwest States has been shown on page 15, in a table based on the published figures of the Forest Service (June 30, 1909). In Oregon the acreage within the national forest boundaries held by private persons is 15.8 per cent of the total area of these reserves. The national forests which are entirely or partly included in the areas selected for the western Oregon map, and the percentage of privately owned land in each, are

as follows, the figure being for the entire forest, not for the part on the map:

	Per cent of gross area pri- vately owned.
Cascade-----	1.5
Oregon-----	13.7
Siustlaw-----	51.3
Umpqua-----	26.3
Crater ¹ -----	22.0
Siskiyou ¹ -----	11.8
For the six forests-----	19.3

The great stretches of Government land along the main divide of the Cascades are, on account of their altitude, less heavily timbered than the lower slopes, where the private holdings are in evidence, and in general the heaviest timber has passed into private ownership.

In Parts I and III may be seen examples of the national forest areas reserving for future supply a young growth of timber not yet merchantable, where, on account of some old burn, timber locators had passed the land by to take larger timber.

Section 3. Concentration of timber ownership in area of Oregon map.

The following table for western Oregon, similar to that for the Washington map, shows the timbered acreage and timber owned on the four parts of the Oregon map area by the platted holders and groups of holders, and also by the groups of unplatted holders. The unplatted holders are grouped according to the size of their holding in the State, not according to their holding on the actual map area, as in the Washington table. Thus, an unplatted holder who owns 500 million feet or more in the State is included in the first group of unplatted "holders of 500 million feet and over," even though his actual holdings on the map area may be less than that. The figure for acreage and for timber in each group, however, is, strictly, that owned *on the map area* by members of the group. This method of grouping by size of holding in the State was convenient, and by it the results are not far different from what would have been by grouping according to size of holding in map area, since so large a proportion of the timber in the State is on the map area. The situation is very different from that obtaining in western Washington and justifies the different method used in compiling the tables.

The acreage in the first table is merchantable-timber acreage. A later table of total acreage will show the amount of land actually platted on the map. The amount of land held on the map area in the form of timber rights without ownership of the land itself is

¹ Forest situated in two States. Privately owned areas apportioned.

only 20,746 acres, the distribution of which among the different groups of holders is indicated in the tables by footnotes.

The tables include only privately owned timber, and exclude any timber on Government lands, whether in the national forests or on unappropriated public lands outside the national forests. They also exclude State lands. (See p. 80.)

TABLE 11.—TIMBER ACREAGE AND TIMBER OF PLATTED AND UNPLATTED HOLDINGS ON OREGON MAP, BY GROUPS.

[Timber in billions of board feet. Thus, 67.5 = 60,500,000 board feet.]

Holders.	Number of holders.	Timber acreage ¹ owned on map area.	Timber owned on map area.	
			Billions feet.	Per cent of total.
Platted holders:				
Southern Pacific Co.....	1	1,643,945	60.5	10.2
Weyerhaeuser Timber Co.....	1	247,950	15.8	5.0
First group, 3 holders.....	3	507,034	38.1	12.1
Second group, 8 holders.....	8	532,116	36.6	11.6
Third group, 17 holders.....	17	521,800	37.1	11.7
Fourth group, 38 holders.....	38	491,456	35.1	11.1
Total, platted holders.....	68	3,944,391	223.2	70.7
Unplatted holders (grouped by size of holding in State):				
16 holders of over 500 million feet each.....	16	119,477	7.7	2.4
32 holders of 250 million feet to 500 million feet each.....	32	206,255	11.4	3.6
58 holders of 125 million feet to 250 million feet each.....	58	192,564	10.5	3.3
89 holders of 60 million feet to 125 million feet each.....	89	139,193	7.2	2.3
Total, unplatted holders of over 60 million feet each.....	195	657,489	36.8	11.6
Holders of less than 60 million feet each.....		1,510,728	55.9	17.7
Total, unplatted holders.....		2,168,217	92.7	29.3
SUMMARY.				
Platted holders.....	68	3,944,391	223.2	70.7
Unplatted holders of over 60 million feet each.....	195	657,489	36.8	11.6
Total, holders of over 60 million feet each.....	263	4,601,880	260.0	82.3
Unplatted holders of less than 60 million feet each.....		1,510,728	55.9	17.7
Total, all holders.....		6,112,608	315.9	100.0

¹ The figures in this column include 20,746 acres reported as timber rights distributed by groups as follows—Platted holders: Second group, 725 acres; third group, 5,928 acres; fourth group, 4,920 acres. Unplatted holders: Group of 16 holders, 1,000 acres; group of 32 holders, 1,320 acres; group of 58 holders, 3,200 acres; group of 89 holders, 3,453 acres; holders of less than 60 million feet, 200 acres.

² Includes Northern Pacific "lieu-crier" land under contract to unidentified holders, amounting to 15,784 acres and 800 million feet of timber, not counted as an addition to the number of holders in this group.

³ This includes 26 holders of less than 60 million feet each whose holdings were separately reported to the Bureau. The total of these 26 separately reported holders is 18,630 acres (of which 200 acres are in timber rights) and 900 million feet. The remainder of the timber in this group was covered by general estimates.

NOTE.

Amount of timber acreage and timber on each part of Oregon map.—The tables and discussion in this chapter treat the four parts of the western Oregon map as a unit; but it may be desirable to state the amount of timberland and

timber on each part separately. The following tabular statement subdivides certain totals of timberland and timber in Table II among the four parts of the map:

TABLE 11G.—TIMBER ACREAGE AND TIMBER ON EACH OF FOUR PARTS OF OREGON MAP.

Parts of map.	Owned by holders of over 60 million feet each.						Owned by holders of less than 60 million feet each. Unplatted.						Total.
	Platted.			Unplatted.			Total.			Total.			
	Timber acreage. ¹	Timber.	Bil- lion feet.	Timber acreage. ¹	Timber.	Bil- lion feet.	Timber acreage. ¹	Timber.	Bil- lion feet.	Timber acreage. ¹	Timber.	Bil- lion feet.	
Part I.....	984, 805	71.4	238, 862	16.2	4, 224, 757	87.6	324, 075	15.9	1, 517, 832	103.5			
Part II.....	825, 838	58.0	111, 820	7.6	937, 667	65.6	324, 600	13.3	1, 262, 267	78.9			
Part III.....	1, 251, 222	69.5	158, 700	9.0	4, 409, 022	78.5	315, 288	18.8	1, 925, 210	97.3			
Part IV.....	882, 656	23.7	148, 008	4.6	1, 030, 534	28.3	346, 765	7.9	1, 377, 299	56.2			
Total map area	3, 944, 391	223.2	657, 480	36.8	4, 601, 880	260.0	1, 510, 728	65.9	6, 112, 608	315.9			

¹Including timber rights. See footnote 1 of Table 11 for distribution by groups, but not by parts of the map.

The total owned on the map area by the platted holders, 68 in number, amounts to 3,944,391 timbered acres, including timber rights, and 223.2 billion feet of timber. This is 70.7 per cent of the total timber on the map area. Some of these same holders have other timber outside of this selected area. But these 223.2 billion feet on the lands platted on this map to the 68 holders are 56 per cent of the total in the State and 64 per cent of the total in western Oregon.

Section 4. Holding of Southern Pacific Co. on map area. (Map symbol, solid black.)

The predominant feature of the Oregon map is the holding of the Southern Pacific Co. This is the largest single holding in western Oregon, totaling on the map area, 1,643,945 acres with 60.5 billion board feet of timber. It is 19.2 per cent of the total timber on the map area. The entire acreage with the exception of about 5,000 acres, is held in the name of the Oregon & California Railroad Co., practically all the stock of which is held by the Southern Pacific Co. The lands platted to the company on the four parts of the map contain about 85 per cent of the total timber owned by it in Oregon. These lands lie altogether in odd sections as originally granted.

This holding has been frequently referred to in Part I, and in Chapter I of Part II. Attention has been called to the Government's suit to forfeit the Oregon lands of the Southern Pacific Co. Since the publication of Part I, the lower court has declared the lands forfeited. The case, however, will no doubt be taken to the Supreme Court on appeal.

The unpatented Oregon lands of the company (lands still due under the East Side grant) are estimated in the Government's bill of complaint at about 293,000 acres. Of this, 23,774 acres in townships 27 S. 1 W., 28 S. 1 W., and 32 S. 11 W. (Part III of the map) have been publicly surveyed, and have been selected by the Oregon & California Railroad Co., but have not been patented, having been suspended by order of the Commissioner of the General Land Office to await the outcome of the Government suit. The remaining 270,000 acres estimated as due lie in as yet unsurveyed regions within the primary or indemnity limits.¹

The Bureau ascertained the exact location of the 23,774 acres of pending surveyed selections too late to make a field investigation of the amount of timber thereon, though it is informed, in general, that they lie in heavily timbered townships. Neither the said 23,774 acres nor the 270,000 acres of unsurveyed lands are included in the merchantable-timber acreage and timber shown for the company in the various tables of this report. The 23,774 acres, however, are platted to the company.² The 270,000 acres are not platted.

SUITS AGAINST PURCHASERS OF LAND FROM OREGON & CALIFORNIA RAILROAD Co.—Not only did the Government institute a forfeiture suit against the Oregon & California Railroad Co. for the lands still retained by the company, but 45 suits were also instituted against purchasers of lands sold by the company in alleged violation of the terms of its grants. These suits covered each purchase of over 1,000 acres of the railroad land. By act of August 20, 1912, however, Congress authorized the Attorney General to compromise the suits against the purchasers, provided in each case that, if with the defendant's consent, a decree of the court were entered adjudging the land forfeited to the United States, the defendant should then be allowed to purchase from the United States, at \$2.50 per acre, all his forfeited land originally purchased from the railroad. The grounds for this compromise are stated in the record of the hearings on the bill before the House and the Senate Committees on Public Lands. (H. R. 22,002; S. 5,885.) Briefly, the compromises were offered on the ground that there was strong indication that the purchases were made in good faith; that the lumber industry in western Oregon would be seriously crippled by the forfeitures; and that the Government's chance of winning the main suit against the railroad company

¹The records of the General Land Office show the possible maximum of the East Side grant to be 3,821,902 acres, and the acreage patented to be 2,765,677 acres. (Statement showing land grants made by Congress to aid in the construction of railroads, wagon roads, canals, and internal improvements, issued by the General Land Office, Department of the Interior, Washington, 1907.) The difference, 1,056,225 acres, would be the amount subject to selection under the grant, provided it were possible to find available locations within the indemnity limits for all "losses" within the primary limits. But according to the estimate only the 293,000 acres remain available for the company's selection.

²With the exception of 1,360 acres found to be in conflict with holdings platted on map to the first group.

would be stronger if the cases against the purchasers were compromised on these terms. The price of \$2.50 per acre was admittedly nominal. A list stating the parties against whom suits were entered, the amount of land involved in each suit, and the purchase price, if known, is given in the "Report of the Attorney General concerning institution of certain suits," (S. Doc. No. 426, 61st Cong., 2d sess.). Practically all the purchasers have already accepted the compromise.

Section 5. Holding of Weyerhaeuser Timber Co. on Oregon map area.
(Map symbol, W.)

The Weyerhaeuser Timber Co. owns in Oregon as a whole 380,599 acres of timberland and 18.7 billion feet of timber. Of this holding, 247,950 acres and 15.8 billion feet of timber are on the map area. Its holding comprises 5 per cent of the total timber on the Oregon map area.¹ About 50,000 acres which the Weyerhaeuser Timber Co. has under contract from the Northern Pacific (being lands which the railway company has sold to the timber company, but has not yet deeded because it has not itself received patent for them from the Government) are properly credited to the Weyerhaeuser Timber Co. in the table, but are platted on the map with the symbol of the first map group (the heavy diagonal bar). The reason for not plating these contract lands with the Weyerhaeuser symbol is the same as already explained in connection with the company's contract lands in Washington. (See p. 29.) Conversely, in another tract of something over 5,000 acres of land, the Weyerhaeuser Timber Co. owns a three-fourths interest, the remaining one-fourth interest being owned by a member of the third group of 17 platted holders; and this tract of 5,000 acres is platted with the symbol of the Weyerhaeuser Timber Co., though in the table the proper division of acreage and timber is made between the joint owners.

Approximately 46 per cent of the Weyerhaeuser Timber Co.'s timbered acreage in the State was acquired from the Northern Pacific Railway Co. by the purchase of lieu selections which the railway company had made under the land grant. (See Part I, p. 237.) Practically all of its lands on Parts I, II, and III of the Oregon map were thus acquired. On the other hand, on Part IV of the map, in Jackson and Klamath Counties, all its lands were acquired from individuals, by purchase of some larger tracts already assembled by other companies, or by purchase of the stock of companies owning timber, and none was here acquired from the Northern Pacific. Included in the acreage of the Weyerhaeuser Timber Co. on this part

¹ The record owners of this holding are the Weyerhaeuser Land Co., the Fokegama Sugar Pine Lumber Co., and the Peiton-Reid Sugar Pine Lumber Co., all subsidiaries of the Weyerhaeuser Timber Co.

of the map is a tract of 13,223 acres purchased by its subsidiary, the Pogeama Sugar Pine Lumber Co., from the Oregon & California Railroad Co., as shown by the list of suits just referred to.

The Weyerhaeuser Timber Co.'s policy in western Oregon, where it is not a dominant holder, has been to retain all its timberland, instead of selling small accessible tracts as it has done in Washington. In western Oregon the company has made practically no addition to its holding since its early purchases from the Northern Pacific. But in Klamath and Lake Counties its policy has been rapidly to increase its holdings by buying up lands from small holders. This fact may indicate a purpose on the part of the Weyerhaeusers and their associates to become dominant in the pine region of south central Oregon; for the Booth-Kelly Lumber Co. (in which associates of Mr. Weyerhaeuser are stockholders) also has great timber holdings in this territory. The likelihood of such a purpose is enhanced by the fact that the new Oregon Trunk Railway (controlled jointly by the Northern Pacific and the Great Northern, in both of which the Hill interests are important stockholders) is pushing from the Columbia River up the Deschutes Valley to tap the country lying immediately east of the Cascades. It is apparently in this connection that the holding previously owned by Charles Altschul, trustee for Lazard Frères, was purchased in 1910 by the Oregon & Western Colonization Co., the president of which is Watson P. Davidson, a director in one of the Hill banks. This holding, comprising over 700,000 acres of the grant for the Willamette Valley & Cascade Mountain Wagon Road, stretches from Albany, on the Willamette River, to the eastern boundary of the State. West of the Cascades this wagon-road grant consists mainly of heavily timbered fir lands, and the eastern part, though mostly nontimbered, has very considerable areas of pine lands.

These facts, together with the apparent harmony between the Hill interests and the Weyerhaeuser interests, possibly indicate a plan to secure a dominating position in this timber region. This part of Oregon is one of the last valuable timber regions of the country yet to be exploited in any extended way, and one where, on account of lack of railroads, the large timber speculators had scarcely been investing till the last seven or eight years.

Section 6. Holdings of first group—three platted holders—on map area.

(Map symbol, heavy diagonal bar.)

This group consists of the holdings of the C. A. Smith interests, of the Booth-Kelly Lumber Co. interests, and of the A. B. Hammond companies. These three holders, platted with a heavy diagonal bar, have on the map area 38 billion feet standing on 507,034 acres. Their timber is not quite one-eighth of that on the entire area of the map.

For reasons referred to above, approximately 50,000 acres of Weyerhaeuser lands contracted for from the Northern Pacific are platted with the symbol of this group, but in the table the acreage and timber are credited to the Weyerhaeuser Timber Co. and not to the group of three. One of the members of this group owns a half interest in approximately 55,000 acres, all of which, except 1,600 acres, carries merchantable timber, the other half interest being owned by a member of the third platted group. All this land is platted on the map to the first group, with the heavy diagonal bar. In the tables, however, half of the acreage and of the timber is counted to each group.

C. A. SMITH INTERESTS.—The great holdings of C. A. Smith in the map area are in the name of the C. A. Smith Timber Co., the C. A. Smith Fir Co., and the Linn and Lane Timber Co. Part of this holding was acquired by purchase from the Oregon & California Railroad Co. (19,772 acres), and part by purchase of Santa Fe Pacific scrip (14,160 acres) and Northern Pacific scrip (12,170 acres).¹ A larger proportion, however, was acquired by purchase of "timber claims" taken up by individual entrymen under the timber and stone act. It was with reference, apparently, to this holding that Mr. H. H. Schwartz of the General Land Office made the statement quoted in Part I, (p. 267), to the effect that trainloads of women school-teachers from Minnesota were sent to Oregon to take up lands under the timber and stone act, which lands were afterwards duly transferred to a single ownership. The chief agent of C. A. Smith in assembling his Oregon holdings was F. A. Kribs, who is himself associated with C. S. and C. J. Pillsbury and others in a large timber holding included in the following group of eight platted holdings. The Government has won cases against C. A. Smith, recently affirmed in the Federal circuit court of appeals, canceling the patents to 38 timber claims aggregating about 6,000 acres, on the ground of fraud (196 Fed., 593). The cases have been appealed to the Supreme Court.

BOOTH-KELLY LUMBER CO. INTERESTS.—The Booth-Kelly Lumber Co. has two allied companies, the California & Oregon Land Co. and the Oregon Land & Live Stock Co. The timber holdings of these interests are based primarily on the Federal grant for the Oregon Central Military Road from Eugene, Oreg., to the eastern boundary of the State (13 Stat., 355). The western portion of this wagon road is seen on Part II of the ownership map. The grant was made to the State of Oregon, which in turn designated as its grantee the Oregon Central Military Road Co., now succeeded by the California & Oregon Land Co. It covered the odd sections for 3 miles in width on each side of the road, and by act of December 26, 1866 (14 Stat.,

¹ See pp. 75, 77, and 78.

374), right of indemnity was given to the unappropriated odd sections within 6 miles on each side of the road.¹

The heavily timbered fir lands of the grant west of the Cascade Mountains were purchased and are now held by the Booth-Kelly Lumber Co. itself; and the pine lands east of the Cascades in Klamath County and part of Lake County by the Oregon Land & Live Stock Co. Still farther to the east the open lands in Lake, Harney, and Malheur Counties were disposed of to the Hunter Land Co., which in turn sold them to the Oregon Valley Land Co. The California & Oregon Land Co. now is, in effect, simply an intermediary for the Booth-Kelly Lumber Co. and the Oregon Land & Live Stock Co. to receive patents from the Government under this grant.

By act of June 21, 1906 (34 Stat., 368), the California & Oregon Land Co. was allowed to exchange the 111,000 acres belonging to it in the Klamath Indian Reservation in alternate sections along the line of the military road for a smaller area of other lands in a compact body also within the reservation. This consolidated acreage, now in the name of the Oregon Land & Live Stock Co., amounts to over 85,000 acres, solidly blocked in townships 31 and 32 S. in ranges 11, 12, and 13 E., off the map area to the eastward of Part IV. This is exceptionally well timbered with western pine. Besides the consolidated acreage within the Indian reservation the same company owns about 1,0,000 acres of timber outside the reservation in Klamath and Lake Counties, along the line of the road, making 135,000 acres of the granted lands now held by this subsidiary. On the map area of Part II about 40,000 acres held by the Booth-Kelly Lumber Co. itself were originally patented under the military-road grant. The two companies together have 175,000 acres of wagon-road lands.

The Booth-Kelly Lumber Co.'s holding in western Oregon does not consist solely of lands granted for the military road. It has been augmented by purchase of between 65,000 and 70,000 acres from the Oregon & California Railroad Co., part of the Federal grant to the railroad. Some 17,000 or 18,000 acres of this land are still under contract, deeds not having passed. Besides military-road land and railroad land, the Booth-Kelly and Oregon Land & Live Stock companies have some 90,000 acres, part of which, presumably, was originally secured from the Government by individual entrymen under the timber and stone laws and the homestead laws.

It should be noted that a large proportion of the stock of the Booth-Kelly Lumber Co. is now owned by individuals closely affiliated (in other companies) with the Weyerhaeusers.

¹ For a decision affirming the title of the California & Oregon Land Co. (as innocent purchaser) to the lands of this grant, see *U. S. v. California & Oregon Land Co.* (148 U. S., 31). The suit was intended by Congress to raise the question whether the road was constructed at all or not, but on account of a technicality of procedure evidence on this point was not admitted. (See also 192 U. S., 355.)

A. B. HAMMOND COMPANIES.—The lands of the A. B. Hammond companies were in part acquired from the Oregon & California Railroad Co. It appears that 19,427 acres were purchased in this way; and a half interest in 45,972 acres of the railroad lands was purchased by A. B. Hammond, the other half interest being purchased by Charles J. Winton of the Winton Timber Co. There are various subsidiaries of the A. B. Hammond Co. combined in this holding. (See Part I, p. 104.)

H. E. Huntington, a director in the Southern Pacific Co., is a director in one of the Hammond companies (Hammond Lumber Co.). Also the Hammond interests are connected with the Booth-Kelly Lumber Co. interests through an important common stockholder.

Section 7. Holdings of second group—eight platted holders—on map area.
(Map symbol, heavy crosshatch.)

The second group of holders contains eight separate holdings. These eight holders own on the area of the map 532,116 acres and 36.6 billion feet of timber, which is 11.6 per cent of the total timber on the map area. The holders in this group are the Oregon & Western Colonization Co., associated with the Hill interests; the Wheeler interests (see Part I, p. 104); the Southern Oregon Co.; the Western Timber, Fir Tree Lumber, and Chapman Timber companies;¹ the John E. DuBois interests; Kribs and Pillsbury interests, in which F. A. Kribs and C. S. and C. J. Pillsbury are the chief individuals; Whitney Co. (Ltd.); and Blodgett Co. (Ltd.) (connected with the Booth-Kelly Lumber Co. through some of the individual stockholders, but not closely enough to identify the two concerns as a single interest).

Of these holdings, that owned by the Oregon & Western Colonization Co. and that owned by the Southern Oregon Co. were originally Federal land grants to the State to aid in the construction of wagon roads.

The recent purchase of the Willamette Valley & Cascade Mountain Wagon Road grant by the Oregon & Western Colonization Co. has already been referred to.² The location of the western portion of this road is shown on Part II of the map in central Linn County. The grant covered three sections per mile to be selected within 6 miles on each side of the road. There were no indemnity limits. Under this grant 861,512 acres have been patented, and the grant is adjusted and closed. The colonization company now owns about 700,000 acres of it. Through a great part of its extent this wagon road passes through nontimbered territory. The timbered acreage

¹ The interests controlling the Western Timber Co., Fir Tree Lumber Co., and Chapman Timber Co. also control the Duluth Timber Co. and the McLeod Timber Co., which own timber in the Southern Pine Region.

² Page 56.

of the holding, as reported to the Bureau, is 178,720 acres. Of this, 74,380 acres of timbered land lie on the area of the map.¹

The Southern Oregon Co.'s holding is that originally patented to the Coos Bay Wagon Road Co., grantee of the State, to aid in the construction of a wagon road from Coos Bay to Roseburg, Ore. The location of this road is shown on Part III of the map. The grant covered the odd sections for 3 miles in width on each side of the road, with indemnity in odd sections for 6 miles on each side of the road. Under this grant 105,240 acres were patented. Of this total, 100,678 acres are now held by the Southern Oregon Co., about 88,000 acres being heavily timbered.

The Government has attacked the title of the Southern Oregon Co. to this holding on the ground of failure to comply with a condition of the original grant requiring that the land be sold to settlers in 160-acre tracts, at not more than \$2.50 per acre.² The defendants' demurrer was overruled in May, 1913. Both sides are now making final preparations to put in testimony.

The control of a majority of the stock of the Southern Oregon Co. has been recently secured by the Menasha Woodware Co. or individuals connected therewith.³ The president of the company is Charles R. Smith, who is also president of the Menasha Woodware Co. The Menasha Woodware Co. is a member of the group of 17 holders. The Southern Oregon Co.'s holding could not be combined with it, because the information was received after the maps and tables had been completed. Charles R. Smith is also interested in the Blackwell Lumber Co., one of platted holders of the Idaho map. (See p. 123.)

John E. DuBois, the Whitney Co. (Ltd.), and the Blodgett Co. (Ltd.), were among the early timber holders of western Oregon, their holdings having been assembled in the nineties when the Pacific coast timber region was just beginning to attract investors in timber. Stumpage values were very low at the time of their acquisitions. Of the lands of the Kribs and Pillsbury interests, 3,480 acres were purchased from the Oregon & California Railroad Co.

Section 8. Holdings of third and fourth groups of platted holders on map area.

HOLDINGS OF THIRD GROUP—17 PLATTED HOLDERS—ON MAP AREA. (MAP SYMBOL, SINGLE LIGHT DIAGONAL.)—The group of 17 holders owns 521,890 acres of timberland and 37.1 billion feet of timber. This is 11.7 per cent of the total timber on the map area. Among impor-

¹ In 1889 the Government attempted to secure the forfeiture of this grant for alleged nonconstruction of the road. (U. S. v. Willamette Valley & Cascade Mountain Wagon Road Co. et al., 42 Fed., 351; 140 U. S., 599, 622; 54 Fed., 807.)

² See bill of complaint of U. S. v. Southern Oregon Co., in the circuit court of the United States for the district of Oregon, ninth judicial circuit.

³ American Lumberman, July 1, 1911, p. 75.

tant holders in this group are the West Coast Timber Co. interests; the Wilson River Lumber Co.;¹ the Roach Timber Co.;² the Drew Timber Co. (which has some common stockholders with the Wilson River Lumber Co. and also with the Roach Timber Co., and which is closely connected with the Potlatch Lumber Co. and the Payette Lumber & Manufacturing Co., large holders in Idaho); the Simpson Lumber Co. of Coos County; and the J. and G. K. Wentworth interests. Nine members of this group of holders purchased an aggregate of more than 129,000 acres of the lands granted to the Oregon & California Railroad Co. In other words, about one-fourth of the entire timber acreage of this group is made up of railroad lands sold by the Oregon & California Railroad Co. in alleged violation of the terms of its grants.

For 60,000 acres in which members of this group have a part interest, but which are platted, 5,000 acres to the Weyerhaeuser Timber Co. and 55,000 to the first group, see pages 55 and 57 above.

HOLDINGS OF FOURTH GROUP—38 PLATTED HOLDERS—ON MAP AREA. (MAP SYMBOL, DOUBLE LIGHT DIAGONAL.)—The last group of platted holders consists of 38 separate holders owning 491,456 acres of timberland and 35.1 billion feet of timber, which is 11.1 per cent of the total timber on the map area. Among the holders in this group are the Bradley interests (owning in this area principally in the name of the Merrill Lumber Co.); the Crossett Timber Co.;³ the T. D. and E. S. Collins interests; and J. J. Rupp et al. These 38 holders have slightly over 35 billion feet on the map area, and they have in the State of Oregon over 38 billion feet; that is, the average size of this group of smaller platted holdings is 1 billion feet in the State. The T. D. and E. S. Collins holding includes 29,247 acres purchased from the Oregon & California Railroad Co. Three other members of this group, not named in this paragraph, hold about 11,000 acres of railroad lands, making the total of these lands for this group about 40,000 acres.

Section 9. Unplatted holdings on map area.

Table 11 shows that the unplatted holders on the Oregon map own 92.7 billion feet, or 29.3 per cent of the total timber on the map area. Of this amount 55.9 billion feet or 17.7 per cent of the total on the map is owned by holders who have less than 60 million feet. This leaves 36.8 billion, or 11.6 per cent, owned by the 195 unplatted

¹ The interests controlling the Wilson River Lumber Co. also control the Olean Land Co., which owns timber in eastern Oregon.

² The Roach Timber Co. is controlled by interests that also control the William Musser Lumber Co. with holdings in eastern Washington. With the holdings of these two companies are included the holdings in northern Idaho owned in the name of the Cameron Lumber Co.

³ The interests controlling this company also control the Crossett Lumber Co., the Fordyce Lumber Co., and the Jackson Lumber Co., which own timber in the Southern Pine Region.

holders of over 60 million feet each, an average for these of not quite 190 million feet against an average of over $3\frac{1}{4}$ billion feet for the 68 platted holders. That is, the size of the average platted holding is about 17 times that of the average unplatted holding of more than 60 million feet.

A few unplatted holders, included in the group of 16 unplatted holders, have somewhat more timber on the map area than some holders whose lands have been platted. The reason for plating a few holdings that are somewhat smaller than some of the holdings not platted, has been explained in connection with the Washington map (p. 24, above).

Section 10. Additional land owned on Oregon map area by timber owners of over 60 million feet each.

The acreage shown in Table 11 is merchantable-timber acreage. Some of the holders, however, have additional acreage which has been reported to the Bureau. A statement of the reasons for believing that the Bureau's information on the amount of additional land is not complete is given above.¹ The following table repeats from Table 11 the merchantable-timber acreage for all holders owning over 60 million feet of timber each, and shows the additional acreage and total acreage held on the map area by these holders, so far as reported to the Bureau. The total acreage of each platted holder is platted on the map, including additional lands as well as timbered lands. Therefore, with the exceptions noted in the footnote, the figures for the platted holders in the total column below correspond to the amounts of land platted to the holders or groups as closely as survey acreage can be shown on a map of the present scale. The column for merchantable-timber land includes a negligible amount of timber rights, the distribution of which among the groups is not here indicated.

TABLE 12.—ACREAGE OF TIMBER (INCLUDING TIMBER RIGHTS) AND ADDITIONAL LAND OWNED ON OREGON MAP BY HOLDERS OF OVER 60 MILLION FEET EACH, BY GROUPS.

[Not all members of a group own additional land. The number of those owning such land is shown for each group, parenthetically in italics, in the additional land column.]

Platted holders:	Number of holders.	Merchantable-timber acreage. ²	Additional land reported.	Total on map area.
		<i>A. cres.</i>	<i>A. cres.</i>	<i>A. cres.</i>
Southern Pacific Co.	1	1,643,945	(1) 133,055	1,777,000
Weyerhaeuser Timber Co.	1	247,950	(1) 12,496	260,446
First group, 3 holders.	3	507,034	(5) 36,160	543,194
Second group, 8 holders.	8	532,116	(4) 32,137	564,253
Third group, 17 holders.	17	521,890	(6) 10,421	532,311
Fourth group, 38 holders.	38	491,456	(11) 25,885	517,341
Total, platted holders.	68	3,944,391	(26) 250,154	4,194,545

¹ Page 17.

² Including 20,746 acres timber rights. For distribution of this by groups, see note 1 to Table 11.

TABLE 12.—ACREAGE OF TIMBER, ETC.—Continued.

Holders.	Number of holders.	Merchant-able-timber acreage.	Additional land reported.	Total on map area.
		<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Unplatted holders (grouped according to size of holding in State):				
16 holders of over 500 million feet each.....	16	119,477	(6) 1,500	120,977
32 holders of 250 million feet to 500 million feet each.....	32	206,255	(8) 6,700	212,955
58 holders of 125 million feet to 250 million feet each.....	58	192,564	(10) 4,384	196,948
89 holders of 60 million feet to 125 million feet each.....	89	139,193	(17) 11,306	150,499
Total, unplatted holders of over 60 million feet each.....	195	657,489	(51) 23,890	681,379
SUMMARY.				
Platted holders.....	68	3,944,391	(46) 250,154	4,194,545
Unplatted holders of over 60 million feet each.....	195	657,489	(51) 23,890	681,379
Total, holders of over 60 million feet each.....	263	4,601,880	(57) 274,044	4,875,924

¹ Including 15,784 acres of Northern Pacific "lien-script" land under contract to unidentified holders. This is not counted as an addition to the number of holders.

NOTES.

The amount of land platted on the four parts of the Oregon map to the various holders and groups is at variance with the total acreages shown in the above table in the following cases, some of which have been already explained:

- Southern Pacific Co.*—See page 54 regarding 23,774 acres of pending unpatented selections, probably well timbered, which are not included in the merchantable-timber acreage, additional, or total acreage of this holding in the above table. Of this tract, 22,414 acres are platted to the Southern Pacific Co., and 1,360 acres are claimed by and platted to one of the holders in the group whose symbol is the heavy diagonal bar.
- Weyerhaeuser Timber Co.*—See page 55 for discrepancies between the table and the acreage platted on the map.
- First group, three platted holders.*—See page 57 for discrepancies between the table and the acreage on the map.
- Second group, eight platted holders.*—One of the holders in the group of eight has, on the map area, roughly, 3,000 acres of land of which the Bureau does not have the exact location. Hence, the acreage platted on the map is about 3,000 acres less than the total acreage shown for the group in the above table. This difference is in the additional and total acreage, not in the merchantable-timber acreage.

- Third group, 17 platted holders.*—In the case of three members of this group no plats of exact location of part of the lands were furnished the Bureau, the acreage concerned amounting to over 11,000 acres. See pages 55 and 57 for further discrepancies between the table and the acreage platted on the map.
- Fourth group, 38 platted holders.*—Some of the companies in this group did not furnish the exact location of all their lands. On this account about 10,000 acres counted in the table could not be platted on the map.

- A conflict of 1,360 acres between the Southern Pacific and the first group—three platted holders—has been noted in point 1 above. In addition to this conflict, the Bureau's reports show an unimportant acreage of scattered con-

licts between the platted holders—cases where two companies are reported as owning the same land. These conflicts involve for the most part scattered forty or quarter sections, and are practically negligible. The total of all such conflicts is 9,840 acres.

Total acreage of timber holders of over 60 million feet on area of each part of Oregon map.—The following statement shows the total acreage owned by timber holders of over 60 million feet on each of the four parts of the western Oregon map separately. The corresponding total acreage figures for the four parts of the Oregon map taken together have been given above in Table 12. For convenience the present statement does not show "merchantable" and "additional" acreage, but only their sum, the total acreage, which includes a small proportion of timber rights. The "additional" acreage can be obtained by subtracting from the total acreage here given the acreage of merchantable-timber land for holders of over 60 million feet given in Table 11a (p. 53).

TABLE 12a.—TOTAL ACREAGE¹ OWNED ON EACH OF FOUR PARTS OF OREGON MAP BY TIMBER HOLDERS OF OVER 60 MILLION FEET.

	Parts of map.		Total.
	Platted.	Unplatted.	
Part I.....	<i>Acrea.</i> 1,029,874	<i>Acrea.</i> 248,742	<i>Acrea.</i> 1,278,616
Part II.....	936,243	113,055	1,049,298
Part III.....	1,318,483	165,310	1,483,793
Part IV.....	910,175	194,272	1,104,447
Total, map area.....	4,194,545	681,379	4,875,924

¹ Including 20,746 acres timber rights. See note 1 of Table 11 for distribution by groups, but not by parts of the map.

Section 11. Total holdings in investigation area of holders platted on Oregon map.

Since the western Oregon map area covers only a selected region, it is desirable to show the timber holdings of the important holders of the map area in the Pacific-Northwest as a whole. For the power of a timber owner in a given region, as that of the western Oregon map, is enhanced if he has large interests in other timber regions as well. This total strength of the platted holders of the Oregon map will be shown (1) as regards timberland and timber, and (2) as regards total land holdings. The former point is of more immediate importance, but the total land holdings have a significant bearing upon the broader question of concentration of land ownership.

TOTAL TIMBER HOLDINGS IN PACIFIC-NORTHWEST.—The figures presented in Table 11 on page 52 show the timber strength of the 68 platted holders for the particular area of the western Oregon map. The following tables, Table 13 (timbered acreage), and Table 14 (merchantable timber), have been prepared to show the total timber strength of these 68 holders in the entire Pacific-Northwest. The regions of the Pacific-Northwest chosen for separate

presentation in these two tables are western Oregon, western Washington, and California. In western Oregon the total strength of the 68 is shown both for "on map area," and "outside map area." Following the columns for the regions shown separately is a column headed "In other regions of Pacific-Northwest." In this column is tabulated whatever timber any of the 68 may have in eastern Oregon, eastern Washington, Idaho, or Montana. The table presents for each region, by groups, the total amount owned in that region by all members of each group who have any holdings there but many of them have no holdings outside of the map area itself. The tables, therefore, state the actual number of holders who own the amount shown for each group in each of the regions. Where the table would show only one or two holdings in a group in a region, the groups are combined to avoid revealing the estimates of individual holders.

The term "western Oregon" in these tables does not correspond to the division of the State called western Oregon in Part I of the Report. In Part I, western Oregon covers the counties west of the divide of the Cascade Mountains, and also Hood River County and Jackson County. On the other hand, in the present tables and in Part II of the Report generally, "western Oregon" includes not only all of western Oregon as defined in Part I, but also that part of Klamath County in eastern Oregon which is mapped on Part IV of the Oregon map; that is, the region to the west of Upper Klamath Lake. The difference is that in Part I of the Report all of Klamath County is included in the term "eastern Oregon," while in Part II and in the tables now to be presented a portion of the western side of Klamath County is taken as part of "western Oregon."

The two tables, 13 (timbered acreage), and 14 (merchantable timber), show the timbered acreage and merchantable timber of the same holders. The timber of any entry in Table 14 stands on the acreage shown for the corresponding entry in Table 13. The two tables will be discussed together.

TABLE 13.—ACREAGE¹ OF TIMBER OWNED IN PACIFIC-NORTHWEST BY THE 68 PLATTED HOLDERS OF OREGON MAP, BY GROUPS AND BY REGIONS.

[Only part of the 66 grouped holders own any land outside the Oregon map area. The number of those who do own in each region is given in the table, parenthetically in italics.]

Holders platted on Oregon map.	In western Oregon. ²				In other regions of Pacific-North-west.	Total in Pacific-North-west.	
	Total.	On map area.		In western Washington.			In California.
		A ctes.	A ctes.					Outside map area.
Southern Pacific Co.....	1,907,236	1,643,945	263,291	A ctes.	A ctes.	A ctes.	
Weyerhaeuser Timber Co.....	250,430	247,950	2,480		4,905	1,903,995	
First group, 3 holders.....	(11)	507,084	(4)	(6)	(4)	(8)	
Second group, 8 holders.....	1,091,041	523,116	21,891	45,287	363,676	919,454	
Third group, 17 holders.....	(65)	(17)	(15)	(18)	(4)	(17)	
Fourth group, 38 holders.....	1,053,624	521,890	46,278	114,115	17,999	1,007,388	
		(28)	(28)		(4)	(28)	
		491,456			167,497	912,096	
Total, 68 holders.....	(68) 4,272,331	(68) 3,944,391	(19) 327,940	(64) 1,675,334	(14) 2,488,657	(68) 9,432,959	

¹ The figures in this table include 151,733 acres timber rights reported as follows: In western Oregon on the map area, 20,746 acres, distributed by groups in note 1 of Table 11; outside the map area, 290 acres reported by the fourth group. In western Washington, Weyerhaeuser Timber Co., 8,920 acres; first group and second group, 754 acres; third group and fourth group, 700 acres. In California, first group and second group, 14,340 acres. In Pacific-Northwest as a whole, Weyerhaeuser Timber Co., 8,920 acres; first group, 13,234 acres; second group, 2,585 acres; third group, 121,084 acres; fourth group, 5,910 acres.

² Including the part of Klamath County in eastern Oregon on Part IV of the Oregon map.

TABLE 14.—TIMBER OWNED IN PACIFIC-NORTHWEST BY THE 68 PLATTED HOLDERS OF OREGON MAP, BY GROUPS AND BY REGIONS.

[In billions of board feet. Thus, 70.5=70,500,000 feet. Only part of the 66 grouped holders own any timber outside the western Oregon map area. The number of those who do own in each region is given in the table, parenthetically, in italics.]

Holders platted on Oregon map.	In western Oregon. ¹				In other regions of Pacific-North-west.	Total in Pacific-North-west.	
	Total.	On map area.		In western Washington.			In California.
		On map area.	Outside map area.				
Southern Pacific Co.....	70.5	60.5	10.0		35.1	105.6	
Weyerhaeuser Timber Co.....	15.9	15.8	.1	76.9	.1	95.7	
First group, 3 holders.....	(11) 75.7	(8) 38.1	(4) 1.0	(6) 3.0	(4) 28.2	(5) 88.0	
Second group, 8 holders.....	(65) 74.1	(8) 36.6	(15) 1.9	(18) 6.5	(4) .8	(8) 54.6	
Third group, 17 holders.....		(17) 37.1	(15) 1.9		(4) .8	(17) 49.7	
Fourth group, 38 holders.....		(38) 35.1			(4) 7.4	(38) 52.5	
Total, 68 holders.....	(68) 238.2	(68) 223.2	(19) 13.0	(64) 86.4	(14) 71.6	(68) 416.1	

¹ Including the part of Klamath County in eastern Oregon on Part IV of the Oregon map.

The Southern Pacific's holding in western Oregon (including under this term its holding on the map area in Klamath County) is 1,907,236 acres of timberland (Table 13) and 70.5 billion feet of timber (Table

14). Of this, 1,643,945 acres of timberland and 60.5 billion feet of timber lie on the four parts of the western Oregon map, leaving 263,291 acres of timberland and 10 billion feet of timber outside the map area. Its land off the map area lies mostly in western Lane County, with relatively small amounts in southern Lincoln County, Benton County, central Curry County, northern Clackamas County, and Multnomah County. In western Washington it has no timber. Its timber holding in California (including 75,320 acres just over the line in Nevada) amounts to 1,934,580 acres, with a stand of 35.1 billion feet of timber. This, with what it holds in Oregon, constitutes its total in the Pacific-Northwest, 3,841,816 acres of timberland and 105.6 billion feet of timber, the greatest single timber holding in the United States.

The Weyerhaeuser Timber Co.'s lands in western Oregon are practically all on the map area. Its timber holding here totals 250,430 acres (of which only 2,480 acres are off the area of the ownership map) and 15.9 billion feet of timber. In western Washington lies the bulk of this company's immense holding. Its total there—1,515,932 acres of timberland carrying 76.9 billion feet of timber—has already been discussed in previous sections of this volume and in Part I. In California the company has an insignificant amount. In "Other regions of Pacific-Northwest" it has 132,728 acres of land and 2.8 billion feet of timber. Of this acreage, 2,559 acres are in Idaho, and the remainder is all in eastern Oregon in Klamath and Lake Counties to the east of Part IV of the Oregon map. The Weyerhaeuser Timber Co.'s total in the Pacific-Northwest, as already stated, is 1,903,995 acres of timberland, on which stand 95.7 billion feet of timber, the second largest timber holding in the country.

For reasons noted above, the figures for the first and second groups of holders have not been shown separately in certain entries of the table, and the same is true in certain entries for the third and fourth groups. Thus, out of the three holders of the first group and the eight of the second group, there are only four holders who have timber in western Oregon outside the map area and only one of the four belongs to the second group of eight, the other three constituting the first group. Therefore, in order not to show separately what this one member of the second group owns outside the map area, the first two groups are combined and a single figure shown in the table for the two. The total for these two groups (comprising 11 holders) in Western Oregon, both on and off the map area, amounts to 1,061,041 acres of timberland and 75.7 billion feet of timber, of which the map area contains all but 21,891 acres and 1 billion feet. In the western Washington column of the table it has also been necessary to combine the first and second groups. Only 5 out of the 11 holders in the two groups have timber holdings in western Washington. In California 4 holders out

of the 11 own 363,676 acres of timberland and 28.2 billion feet of timber. The total in the Pacific-Northwest is stated separately for each of the two groups. The first group—3 platted holders—has in the Pacific-Northwest as a whole 848,210 acres with 58 billion feet of timber, an average of almost 20 billion feet apiece. The second group—8 platted holders—has slightly more timber acreage in the Pacific-Northwest with slightly less timber, namely, 919,454 acres of timberland and 54.6 billion feet of timber. This is an average of nearly 7 billion feet to each member of the group.

It will also be seen that the third group, 17 holders and the fourth group, 38 holders, making 55 holders in the two groups, have been combined in certain columns of the table. The 55 own in western Oregon, including the mapped part of Klamath County, 1,053,624 timbered acres with 74.1 billion feet of timber. This, with 6.5 billion feet in western Washington, 8.2 billion in California, and 13.4 billion in other regions, makes up their total of 102.2 billion feet in the Pacific-Northwest.

The total in the Pacific-Northwest for all the 68 holders platted on the western Oregon map reaches the immense amount of 9,432,959 acres of merchantable-timber land, and 416.1 billion feet. Their timber in the Pacific-Northwest is one and seven-eighths times as much as their timber on the Oregon map area. The immensity of this total of 416.1 billion feet (=416,100,000,000 board feet of timber) is difficult to realize. All the sawmills of the Pacific-Northwest cutting at their present annual rate would not exhaust the timber of these 68 holders in a period of 52 years.

Timber owned in regions of Pacific-Northwest by holders selected from those platted on Oregon map.—The discussion just above shows the amount of timber owned in the different regions of the Pacific-Northwest by the 68 platted holders of the Oregon map, or by as many of them in each region as own timber there at all.

By a selection of certain of these holders the real degree of concentration may be more clearly seen. Since the total tables for the Pacific-Northwest (Tables 13 and 14) were presented to show what timber the platted holders own in addition to their holdings on the map, those holders are selected who own most timber *outside* the Oregon map area.

In western Oregon so little is owned off the map area by the platted holders (except the Southern Pacific) that a selection among them would not be significant. In western Washington 24 of the 68 holders of the Oregon map have timberlands, and in California 14. Of these, however, 9 have holdings both in western Washington and in California, so that the net number is 29. The 29 own in western Washington and in California 158 billion feet of timber.¹ No less

¹ In western Washington 86.4 and in California 71.6 billion feet. See Table 14.

than 112.1 billion of this are owned by 2 holders, the Southern Pacific and the Weyerhaeuser Timber Co. Three others (selected from the first and second groups of holders platted on the Oregon map) have in western Washington and California 29.1 billion feet. Three others (selected from the fourth group of platted holders) have 10.8 billion feet in those regions. Taking these 6 selected holdings, together with those of the Southern Pacific Co. and the Weyerhaeuser Timber Co., it is found that the 8, who own on the Oregon map area 2,404,901 acres of merchantable-timber land and 112.8 billion feet of timber, have an additional amount of 4,062,028 timbered acres and 152 billion feet in western Washington and in California. That is, 8 own, in these two regions, over 95 per cent of what all the 29 own.

In the Pacific-Northwest as a whole these same 8 own 279.6 billion feet of timber standing on 6,923,068 acres of timberland. Of this, the greater part (5,745,811 acres and 201.3 billion feet) is held by the Southern Pacific and the Weyerhaeuser Timber Co., and 1,117,257 acres and 78.3 billion feet by the 6 other selected holders. All the 68 platted holders of the Oregon map own 416.1 billion feet in the Pacific-Northwest; the 8 selected holders own two-thirds of this.

Selecting on the same basis 4 other holders, and adding their timber to that of the 8 selected above, would give 12 holders owning in the Pacific-Northwest 314.8 billion feet of timber, which is three-fourths of that owned by all 68. These 12 holders own 31 per cent of all the privately owned timber in the five States of the Pacific-Northwest; and the 8 selected above have 27.6 per cent.

The following table shows the holding in the Pacific-Northwest owned by the 12 selected holders, dividing their holdings to show the amount on the Oregon map area, and the amount outside that area:

TABLE 15.—TIMBER ACREAGE¹ AND TIMBER OWNED ON OREGON MAP AND IN PACIFIC-NORTHWEST BY 12 HOLDERS SELECTED FROM THOSE PLATTED ON OREGON MAP.

Holders selected.	On Oregon map area.		In Pacific-Northwest outside Oregon map area.		Total in Pacific-Northwest.	
	Acrea.	Billion feet.	Acrea.	Billion feet.	Acrea.	Billion feet.
Southern Pacific Co.	1,643,945	60.5	2,197,871	45.1	3,841,816	105.6
Weyerhaeuser Timber Co.	247,950	15.8	1,656,045	79.9	1,903,995	95.7
5 holders selected from the first and second groups of platted holders...	685,333	47.9	606,654	35.7	1,292,087	83.6
5 holders selected from the third and fourth groups of platted holders...	91,097	7.0	679,713	22.9	770,810	29.9
Total, 12 holders	2,668,375	131.2	5,140,283	183.6	7,808,658	314.8

¹The figures in this table include 141,024 acres reported as timber rights as follows: The Weyerhaeuser Timber Co., 8,920 acres in Pacific-Northwest outside Oregon map area; the 5 holders selected from the first and second groups, 405 acres on Oregon map area, and 15,094 acres in Pacific-Northwest outside Oregon map area; the 5 holders selected from the third and fourth groups, 3,500 acres on Oregon map area, and 113,105 acres in Pacific-Northwest outside Oregon map area.

Though the above tabular statement shows a very large amount of timber owned by a few selected holders, it should be understood that these selected holders are not the largest holders in the Pacific-Northwest, for this selection does not include the very large holders who have no timber on the Oregon map; for example, the Northern Pacific, T. B. Walker, and the Chicago, Milwaukee & St. Paul Railway Co. interests.

TIMBER OWNED IN LAKE STATES AND SOUTHERN PINE REGION BY HOLDERS PLATTED ON OREGON MAP.—The total-strength tables given above (Tables 13 and 14) cover the Pacific-Northwest. But there are 16 of these same 68 holders who also own timber in the Lake States or in the Southern Pine Region, or both; 8 holders owning 2.9 billion feet of timber in the Lake States standing on 402,762 acres of merchantable-timber land, and 10 holders owning 10.9 billion feet of timber in the Southern Pine Region standing on 1,195,985 acres. The total of the 16¹ in both regions, therefore, amounts to 13.8 billion feet of timber standing on 1,598,747 acres of merchantable-timber land. Adding these holdings to the 9,432,959 timbered acres and 416.1 billion feet of timber owned by the 68 in the Pacific-Northwest one finds their total timber strength in the investigation area, viz, 429.9 billion feet of timber, standing on 11,031,706 acres of merchantable-timber land. Besides, at least 2 of the holders have timberlands outside the investigation area. The Bureau has a report on one of these who owns 24,000 timbered acres in West Virginia with enough timber to raise the grand total to over 430 billion feet.

The following tabular statements will show, by groups, the amounts of timber just referred to as owned in the Lake States and also in the Southern Pine Region by holders platted on the Oregon map. The 8 holders who own in the Lake States are blocked in two groups of 4 holders each. The first group of 4 is made up of one member of the group of 3 platted holders, one member of the group of 8, and two members of the group of 17. The second group consists of 4 holders from the group of 38 platted holders.

¹ Two of those in the Lake States own also in the South so that though there are 8 in one region and 10 in the other, the total is only 16.

TABLE 16.—TIMBER ACREAGE¹ AND TIMBER OWNED ON OREGON MAP AND IN LAKE STATES BY 8 HOLDERS PLATTED ON OREGON MAP.

Holders platted on Oregon map.	On Oregon map.		In Lake States.	
	Timber acreage.	Timber.	Timber acreage.	Timber.
4 holders from first, second, and third groups of platted holders.....	<i>Acres.</i> 376,756	<i>Billion feet.</i> 27.9	<i>Acres.</i> 195,270	<i>Billion feet.</i> 1.6
4 holders from fourth group of platted holders.....	78,226	4.6	207,492	1.8
Total, 8 holders.....	454,983	32.5	402,762	2.9

¹ The figures in this table include 13,070 acres reported as timber rights as follows: The 4 holders of first, second, and third groups, 1,490 acres in western Oregon, and 1,160 acres in Lake States: The 4 holders of fourth group, 10,420 acres in Lake States.

The 10 holders who own in the Southern Pine Region are also thrown into two groups. The first group comprises 4 holdings. In one of these (a holding of less than 1 billion feet) the Southern Pacific has an interest; the other 3 are owned by two members of the group of 8 platted holders, and one member of the group of 17. The second group comprises 6 members of the group of 38 platted holders.

TABLE 17.—TIMBER ACREAGE¹ AND TIMBER OWNED ON OREGON MAP AND IN SOUTHERN PINE REGION BY 10 HOLDERS PLATTED ON OREGON MAP.

Holders platted on Oregon map.	On Oregon map.		In Southern Pine Region.	
	Timber acreage.	Timber.	Timber acreage.	Timber.
4 holders.....	<i>Acres.</i> 1,798,144	<i>Billion feet.</i> 71.0	<i>Acres.</i> 672,123	<i>Billion feet.</i> 6.1
6 holders.....	79,618	5.3	523,892	4.8
Total, 10 holders.....	1,865,762	76.3	1,195,965	10.9

¹ The figures in this table include 46,744 acres reported as timber rights as follows: On Oregon map, the 4 holders, 405 acres; the 6 holders, 3,900 acres. In Southern Pine Region, the 4 holders, 6,999 acres; the 6 holders, 37,440 acres. The figures for the 6 holders in Southern Pine Region also include 22,201 acres not distinguished between fee and rights.

TOTAL LAND HOLDINGS.—Passing from the total timber of the 68 holders platted on the Oregon map to their total land holdings. This is made up of their merchantable-timber acreage (including a small proportion of timber rights) and their "additional" land in the various timbered portions of the Pacific-Northwest. The "additional" land consists of denuded or burned land, or of open land that has never carried timber. As stated above, the Bureau's figures for

the additional lands are not necessarily complete and are limited to the timber counties.¹

In particular, the figure in the following table for additional land of the Southern Pacific in the Pacific-Northwest does not include several million acres owned by it in southern California in non-timbered counties. What it owns in these non-timbered counties, with its land-grant holding outside the investigation area, amounts to 9,358,000 acres, all of which is excluded from its figure in this table. Its total land-grant holding in the country, timbered and non-timbered, is reported as 13,880,000 acres (see Part I, p. 233), while only 4,522,000 acres fall within the limitations of the table. Also, 485,000 acres belonging to the Oregon & Western Colonization Co. in the non-timbered parts of eastern Oregon are excluded from the table.

Table 18 shows the additional and total acreage owned by all 68 holders platted on the Oregon map in the entire Pacific-Northwest. Only 29 holders out of the 68 were reported as owning additional land. The first acreage column repeats from Table 13 the merchant-able-timber acreage, including timber rights, of the 68 holders; the second shows the additional acreage of the 29 holders owning additional land, and the third shows the total.

TABLE 18.—ACREAGE OF TIMBER (INCLUDING TIMBER RIGHTS) AND ADDITIONAL LAND OWNED IN TIMBERED PORTIONS OF PACIFIC-NORTHWEST BY THE 68 PLATED HOLDERS OF OREGON MAP, BY GROUPS.

Holders platted on Oregon map.	Merchantable-timber acreage. ²		Additional land reported.		Total.
	Number of holders.	Acres.	Number of holders.	Acres.	
Southern Pacific Co.....	1	3,841,813	1	551,005	4,392,821
Weyerhaeuser Timber Co.....	1	1,903,995	1	40,904	1,944,899
First group, 3 holders.....	3	848,210	3	47,800	896,010
Second group, 8 holders.....	8	919,454	5	449,377	968,831
Third group, 17 holders.....	17	1,007,388	6	10,381	1,017,769
Fourth group, 38 holders.....	38	912,096	13	48,905	961,001
Total, 68 holders.....	68	9,432,959	29	745,372	10,178,331

¹ Page 17.

² The figures in this column include 151,733 acres reported as timber rights as follows: The Weyerhaeuser Timber Co., 8,920 acres; the first group, 13,234 acres; the second group, 2,585 acres; the third group, 121,064 acres; the fourth group, 5,910 acres.

³ Several million acres of additional land owned by the Southern Pacific in southern California, as well as the very large amount of land owned by it entirely outside the investigation area, are omitted from this table, and from the tables of this Report generally. The company's total land-grant acreage in the whole country (13,879,932 acres) is stated in Part I, p. 233. The total additional land here shown for the Southern Pacific is therefore incomplete, and all totals which include it are also incomplete.

⁴ Excluding about 485,000 acres of non-timbered lands owned by Oregon & Western Colonization Co. in eastern Oregon.

The distribution among the various regions of the Pacific-Northwest of the 9,432,959 acres of merchantable-timber land has already been given in Table 13. Of the 551,000 acres of additional land shown for the Southern Pacific, 172,000 acres lie in western Oregon,¹ and 379,000 acres in California. Of the additional land of the Weyerhaeuser Timber Co., about 13,000 acres lie in western Oregon,¹ 26,000 in western Washington, and 2,000 in California. Of the 97,000 acres of additional land owned by the first and second groups, 86,000 acres lie in western Oregon,¹ 1,000 in western Washington, and 10,000 in California. Of the 59,000 acres of additional land owned by the third and fourth group about 42,000 acres lie in western Oregon,¹ 12,000 in western Washington, and 5,000 in eastern Washington.

The 10,181,000 acres shown as the total for the 68 holders in the timbered counties of the Pacific-Northwest, are distributed as follows: 4,585,000 acres in western Oregon,¹ 1,714,000 acres in western Washington, 2,880,000 acres in California, and 1,002,000 acres in other parts of the Pacific-Northwest.

The 16 holders tabulated in Tables 16 and 17 as owning timber in the Lake States and the Southern Pine Region, as well as on the Oregon map area, have the total acreage shown in the following statement, their merchantable-timber acreage being repeated from the tables referred to. The groupings of holders in this statement are the same as in those tables.

TABLE 19.—ACREAGE OF TIMBER (INCLUDING TIMBER RIGHTS) AND ADDITIONAL LAND OWNED IN LAKE STATES AND IN SOUTHERN PINE REGION BY HOLDERS PLATTED ON OREGON MAP.

[Not all members of a group own additional land. The number of those owning such land is shown for each group, parenthetically in italics, in the additional land column.]

Holders platted on Oregon map.		Merchantable-timber acreage. ²	Additional land reported.	Total.
		<i>A. cres.</i>	<i>A. cres.</i>	<i>A. cres.</i>
In Lake States:				
4 holders from first, second, and third platted groups.....		136, 270	($\$$) 69, 821	265, 091
4 holders from fourth platted group.....		207, 492	($\$$) 111, 425	318, 917
Total, 8 holders in Lake States.....		402, 762	($\$$) 181, 246	584, 008
In Southern Pine Region:				
4 holders.....		672, 123	(1) 700	672, 823
6 holders.....		523, 862	($\$$) 55, 230	579, 092
Total, 10 holders in Southern Pine Region.....		1, 195, 985	($\$$) 55, 930	1, 251, 915
Grand total, 16 holders in Lake States and Southern Pine Region.....		1, 598, 747	($\$$) 237, 176	1, 835, 923

¹Including the part of Klamath County in eastern Oregon, on Part IV of the Oregon map.

²The figures in this column include 56,019 acres reported as timber rights as follows: In Lake States, the 4 holders from first, second, and third groups, 1,160 acres; the 4 holders from fourth group, 10,420 acres. In Southern Pine Region, the 4 holders, 6,999 acres; the 6 holders, 37,440 acres. The figures for the 6 holders in Southern Pine Region also include 22,201 acres not distinguished between fee and rights.

The 1,835,923 acres owned in the Lake States and the Southern Pine Region by the 68 holders platted on the Oregon map, added to their total in the Pacific-Northwest, 10,181,331 acres, give a grand total of 12,017,254 acres,¹ of which 1,011,548 acres are additional land and the remainder timbered. This represents the amount of land reported by these holders in the timbered portions of the investigation area, and excludes the several million acres of Southern Pacific land in southern California and the 485,000 acres in eastern Oregon held by the Oregon & Western Colonization Co. (See Part III, Chap. II, sec. 4)

If to the 12,000,000 acres here shown, there are added the 485,000 acres of the Oregon & Western Colonization Co. in nontimbered parts of eastern Oregon and the 9,487,000 acres of the Southern Pacific excluded from the tables, it appears that in the country as a whole these 68 holders control practically 22,000,000 acres of land, of which practically 21,800,000 acres are owned in fee. The holdings of these 68 would be enough to give each of the 20,000,000 families in the United States more than an acre of land apiece.

Total land holdings owned in Pacific-Northwest by holders selected from those platted on the Oregon map.—The following tabular statement shows the additional and total acreage in the Pacific-Northwest of the 12 selected holders whose timbered acreage and timber are tabulated on page 69. The groupings are the same. The acreage of merchantable-timber land (which includes some timber rights) is repeated from the former statement.

TABLE 20.—ACREAGE OF TIMBER (INCLUDING TIMBER RIGHTS) AND ADDITIONAL LAND OWNED IN TIMBERED PORTIONS OF PACIFIC-NORTHWEST BY THE 12 SELECTED HOLDERS SHOWN IN TABLE 15.

[Not all members of a group own additional land. The number of those owning such land is shown for each group, parenthetically in italics, in the additional land column.]

Holder selected from those platted on Oregon map.	Merchantable-timber acreage. ²	Additional land reported.	Total in timbered portions of Pacific-Northwest.
Southern Pacific Co.....	<i>Acres.</i> 3,841,816	<i>Acres.</i> (1) 351,005	<i>Acres.</i> 4,392,821
Weyerhaeuser Timber Co.....	1,903,995	(1) 40,904	1,944,899
5 holders selected from first and second platted groups.....	1,292,037	(5) 48,760	1,340,797
5 holders selected from third and fourth platted groups.....	770,810	(2) 18,347	789,157
Total, 12 holders.....	7,808,658	(9) 659,016	8,467,674

¹Of this total, 207,752 acres are reported as timber rights and 22,201 acres not distinguished between fee and rights.

²The figures in this column include 141,024 acres reported as timber rights as follows: The Weyerhaeuser Timber Co., 8,920 acres; the 5 holders from first, second, and third groups, 15,498 acres; the 5 holders from fourth group, 116,605 acres.

³See footnote 3 of Table 18, p. 74.

Taking the 8,467,000 acres of these 12 selected holders in the timbered parts of the Pacific-Northwest and adding the Southern Pacific's 9,487,000 acres owned elsewhere in the country, gives a total for 12 holders of nearly 18,000,000 acres. This means that in the hands of these 12 holders there is the equivalent of five-sixths of an acre of land for each of the families in the United States.

Section 12. Present ownership of lands in Oregon originally granted for railroad and wagon-road construction.

Frequent references have been made to the land grants in Oregon in aid of railroads and wagon roads. A résumé of the present ownership of these granted lands, so far as reported to this Bureau by timber holders, is given in the following tabular statements. The military wagon roads, excepting the Coos Bay & Roseburg road, traversed principally nontimbered country; and this fact explains why so small a proportion of such grants is covered by the Bureau's timber reports. The tabular statements which follow cover the grants without reference to their being on the map area or outside it.

OREGON & CALIFORNIA RAILROAD CO. LAND GRANT.—The following table shows the present ownership of the two grants of the Oregon & California Railroad Co. which is now controlled by the Southern Pacific Co. Both these grants lie entirely in the State of Oregon.

TABLE 21.—PRESENT OWNERSHIP OF GRANTS OF OREGON & CALIFORNIA RAILROAD CO. (NOW CONTROLLED BY SOUTHERN PACIFIC CO.).

[See pp. 5 and 54 regarding title to this land.]

Present holders.	Granted land owned.	Per cent of total granted acreage.	Present holders.	Granted land owned.	Per cent of total granted acreage.
Retained by Southern Pacific Co.....	<i>Acres.</i> 2, 079, 281	72	Transferred to reported timber holders—Contd. A. C. Hopkins..... Avery, Richardson, and Green..... West Coast Timber Co. interests..... Weyerhaeuser Timber Co..... C. K. Spaulding Logging Co..... Northern California Timber Co..... Drew Timber Co..... Oshkosh Land & Timber Co.....	<i>Acres.</i> 15, 862 15, 730 14, 217 13, 223 7, 369 5, 973 5, 497 4, 816	
Transferred to reported timber holders: Booth-Kelly Lumber Co..... A. B. Hammond companies..... T. D. and E. S. Collins interests..... J. and G. K. Wentworth interests..... Whiton Timber Co..... Roach Timber Co..... C. A. Smith interests...	<i>Acres.</i> 68, 629 42, 400 28, 887 24, 680 22, 972 20, 201 19, 772				

TABLE 21.—PRESENT OWNERSHIP OF GRANTS OF OREGON & CALIFORNIA RAILROAD CO., ETC.—Continued.

Present holders.	Granted land owned.	Per cent of total granted acreage.	Present holders.	Granted land owned.	Per cent of total granted acreage.
Transferred to reported timber holders—Contd.	<i>Acre.</i>		Transferred to reported timber holders—Contd	<i>Acre.</i>	
Willamette Lumber Co.	4,440		Crosssett Land & Investment Co.	1,720	
Downs interests	3,968		Forster Lumber Co.	1,476	
Ashland Manufacturing Co.	3,901		Glendale Lumber Co.	1,372	
Keith Oil & Land Co.	3,663		White and Von Platen.	1,280	
Big Bend Milling Co.	3,647		William M. Ladd.	1,280	
Krebs and Pillsbury interests	3,440		Gilbert Gilbertson.	1,245	
Leona Mills Co.	3,240		Elk Creek Lumber Co.	1,160	
Morton and Lewis	3,160		7 other holders.	4,307	
Crater Lake Lumber Co.	3,000		Total.	389,469	13
Simon and Levy	2,883		Total accounted for.	2,448,750	85
Gardiner Mill Co.	2,804		Unaccounted for.	446,545	15
Olean Land Co.	2,676		Total patented under grants.	2,894,295	100
Jacob Rahm	2,560				
Edwin Fowler	1,999				

This table shows that timber owners reported to the Bureau now own all but 15 per cent of the Oregon & California Railroad's land grant. The amount retained by the Southern Pacific is 72 per cent, and the amount transferred to other reported timber holders is 13 per cent. The amount thus transferred to timber holders reported to the Bureau is a very high proportion of all the land alleged to have been sold in violation of the terms of the grant.

Regarding the Government's suit to recover the land still held by the railroad company, see page 5 above, and regarding the compromise of the suits against the purchasers, see page 54.

NORTHERN PACIFIC LAND GRANT.—The Bureau does not have any complete record of the location of the land patented under the Northern Pacific grant in Oregon. It has a record only for that part of the deeded lands and part of the contract lands which lie in timbered regions. The following tabular statement is therefore incomplete. Practically all the land included here is lieu-selection land.

TABLE 22.—PRESENT OWNERSHIP OF NORTHERN PACIFIC GRANT IN OREGON.¹

[Incomplete.]

Present holders.	Granted land owned in Oregon.	Present holders.	Granted land owned in Oregon.
	<i>Acres.</i>		<i>Acres.</i>
Weyerhaeuser Timber Co.....	177,461	Olean Land Co.....	1,680
C. A. Smith Interests.....	12,170	William C. Slatery.....	1,480
T. H. Shevlin Interests.....	10,520	Wallowa Timber Co.....	1,100
Brookings Box & Lumber Co.....	6,400	Frank E. Alley.....	1,080
Stoney-Brecher Lumber Co.....	5,560	33 other holders.....	12,000
A. P. Hammond companies.....	5,140		
Wheeler Interests.....	4,000	Total accounted for.....	245,011
Grand Rapids Oregon Timber Co.....	2,520	Under contract to miscellaneous holders.....	19,509
Rogers-Yeumans Lumber Co. interests.....	2,120		
Alworth-Washburn Co.....	1,720	Total (incomplete).....	264,520

¹ The Northern Pacific still retains the ownership of about 235,000 acres of non timbered land within the limits of its grant in northern central Oregon near the Columbia River. This is not included in the table.

The total acreage patented under the Northern Pacific grant in Oregon up to June 30, 1910, was 577,818. (See Part I, p. 235, where this grant is discussed.) A considerable part of the lands in the above table is unpatented, though the railroad has transferred its rights by contract of sale. Such unpatented lands, therefore, are not included in the total of 577,818.

The foregoing tabular statement covering the present ownership of all classes of Northern Pacific land so far as known to the Bureau should be compared with that of land in Oregon acquired by means of Mount Rainier and Pacific Forest Reserve lieu-scrip selections. This special class of selections constitutes 189,717 acres (see Part I, p. 239) out of the total of 264,520 acres just shown.

ATLANTIC & PACIFIC RAILROAD GRANT.—The present ownership of the forest-lieu selections made under the Atlantic & Pacific Railroad grant (now held by its successor, the Santa Fe Pacific, a subsidiary of the Atchison, Topeka & Santa Fe) has been stated on page 242 of Part I. With the figures for the Santa Fe scrip selections were also given figures for Aztec Land & Cattle Co. scrip, Robert and E. B. Perrin scrip, and for selections by William F. Baker and Saginaw & Manistee Lumber Co. All these lieu selections were based, as explained, on the original Atlantic & Pacific Railroad land grant in New Mexico and Arizona. The total in the State of Oregon of this group of scrip selections based on the Atlantic & Pacific grant amounts to 201,924 acres. Of this amount, 104,480 acres are accounted for in the present ownership of timber holders reported to the Bureau. The principal

owners of these lieu selections, with the amounts owned in Oregon, are here listed.

TABLE 23.—PRESENT OWNERSHIP OF LIEU-SCRIPT SELECTIONS IN OREGON, BASED ON ORIGINAL ATLANTIC & PACIFIC GRANT.

Present holder ¹ .	Lieu-script selections owned in Oregon.	Present holders.	Lieu-script selections owned in Oregon.
William Wente et al. (stockholders in the Saginaw & Manistee Lumber Co., of which William F. Baker was formerly president).....	135,360	Wright-Blodgett Co.....	2,320
C. A. Smith interests.....	14,160	Irvine Family Interests.....	2,280
Brewer-Knapp Co.....	10,400	Willis & Elrod.....	2,080
T. H. Shevlin interests.....	5,920	Western and Chapman timber companies.....	1,160
D. C. Daniels.....	4,760	63 other holders.....	15,280
Band Lumber Co.....	3,000	Total accounted for.....	104,480
Kinzus Lumber Co.....	2,880	Unaccounted for.....	96,744
Weyerhaeuser Timber Co.....	2,480	Total selections in Oregon.....	201,224
Goddard & Storey.....	2,400		

¹ All selected in the name of William F. Baker or Saginaw & Manistee Lumber Co.

OREGON CENTRAL MILITARY ROAD GRANT.—The grant to the Oregon Central Military Road extends from Eugene, Oreg., on the Willamette River, to the eastern boundary of the State, and through a large part of its extent traverses nontimbered country. As to the present ownership, the Bureau has record only of the amount of the timberland reported by the Booth-Kelly Lumber Co. interests, who now control it from Eugene eastward well into Lake County. These interests reported to the Bureau the ownership of 175,000 acres of the granted lands, of which about 135,000 acres are held in the name of the Oregon Land & Livestock Co., and about 40,000 acres in the name of the Booth-Kelly Lumber Co. itself. The amount patented under this grant up to June 30, 1910, was 605,861 acres, and the estimated area of the entire grant, practically all of which will eventually be patented, is 845,536 acres.¹ A large part of the land, therefore, is unaccounted for, but the Bureau's general information is that the Oregon Valley Land Co. bought the eastern part of the grant in eastern Lake County, and also in Harney and Malheur Counties.

THE DALLES MILITARY ROAD GRANT.—The Dalles Military Road grant lies largely in nontimbered country in eastern Oregon. Up to June 30, 1910, there had been patented under it 556,827 acres of land,

¹ The Government's unsuccessful forfeiture suit, in 1889, alleging failure to construct the road as required by law, has been referred to above (p. 58, note).

which practically effects a complete adjustment. The successor of the original grantee is the Eastern Oregon Land Co. The Bureau is informed that this company holds 36,360 acres of timbered land patented under the grant, but is not informed how much nontimbered land it still retains.¹

COOS BAY & ROSEBURG WAGON ROAD GRANT.—The grant to the Coos Bay & Roseburg Wagon Road was originally transferred by the State to the Coos Bay Wagon Road Co. After several intermediate transfers, it was purchased practically in its entirety by the Southern Oregon Co. The previous transfers and the present ownership by the Southern Oregon Co. are alleged to be in violation of the terms of the grant. (See p. 60, above, for Government's pending suit for forfeiture.) The grant is adjusted and closed. The estimated area was 99,819 acres, but 105,240 acres have been patented.

TABLE 24.—PRESENT OWNERSHIP OF GRANT TO COOS BAY WAGON ROAD CO.

[See p. 60 regarding title to this land.]

Present holders.	Granted land owned. <i>Acres.</i>	Present holders.	Granted land owned. <i>Acres.</i>
Retained by Southern Oregon Co	100,678	Manasha Woodenware Co	80
C. A. Smith interests	2,200	Total accounted for	104,978
Simpson Lumber Co. of Coos County	820	Unaccounted for	262
Chambers estate	680	Total patented under grant	105,240
Merchants Land Co	520		

CORVALLIS & YAQUINA BAY WAGON ROAD GRANT.—The grant for the Corvallis & Yaquina Bay Wagon Road extends from Corvallis on the Willamette River to the Pacific Ocean, a distance of 47 miles. It traverses the open country of the Willamette Valley and the region of the great Yaquina Bay burn, where there has been little restocking with second-growth timber. Under it, up to June 30, 1910, there had been patented 81,895 acres. The grant is practically adjusted, though not closed.

Of this total, only 14,400 acres are accounted for in reports made to this Bureau. The largest reported holding is that of L. H. Fish and A. J. Hodges, namely, 4,920 acres. There are two other holdings of more than 2,000 acres each, and three others of as much as 1,000 acres each.

¹ An unsuccessful suit for forfeiture of this grant was brought in 1889 on practically the same grounds as the Oregon Central Military Road grant.

WILLAMETTE VALLEY & CASCADE MOUNTAIN WAGON ROAD GRANTS. Up to June 30, 1910, there had been patented under the grant for the Willamette Valley & Cascade Mountain Wagon Road 861,512 acres and it is adjusted and closed. The successor to the original grant is the Oregon & Western Colonization Co., which in 1910 acquired from Charles Altschul, trustee for Lazard Frères, the 800,000 acres of the grant then retained. This company has since disposed of about 100,000 acres. Much of the grant lies in nontimbered portions eastern Oregon, but the Bureau's report from the former owner shows that about 180,000 acres of the holding is timbered. It is assumed that the 100,000 acres sold by the company are nontimbered.¹

NOTE.

State lands.—The State of Oregon is not an important holder of timber. western Oregon, including that part of Klamath County on the map area, the State now owns less than 4,000 acres of land, of which all but 360 acres is the area of the map. Some 2,000 acres of this lies in Klamath County. For the counties of eastern Oregon the Bureau has no complete information as to the acreage of State lands. In Crook, Grant, Klamath, and Lake Counties the State has considerable holdings, mostly of granted school lands in sections 16 and 36. It appears safe to say, however, that most of the good timber originally here has been sold, and that the State of Oregon owns far less timber than the State of Washington.

Prior to 1903 the sale price was fixed at not less than \$1.25 per acre. In the year the price of indemnity school lands was raised to a minimum of \$2.50 per acre. Indemnity school lands are those which the State has a right to select or indemnify it for lands already disposed of by the Government or otherwise rendered unavailable to the State in the granted sections 16 and 36. In 1903 the price of indemnity school lands was again raised by law to a minimum of \$5 per acre. (The price actually asked by the State in 1910, as seen by the circular quoted below, was \$15 per acre.) The same act fixed the minimum price of school lands (not indemnity), university, agricultural college, and swamp lands at \$2.50 per acre; the former minimum for these lands having been \$1.25 per acre. The price was fixed at \$1 per acre. In February, 1911, all lands except for swamp lands, which were \$1 per acre. In February, 1911, all lands fixing a minimum price were repealed, and the price at which "all classes of lands of the State" are to be sold is left to the discretion of the State Land Board.²

The reason why the school indemnity lands sell at a higher value is that the lands may be selected from any vacant, surveyed, nonmineral public land in the State. Instead of itself making selection as Washington did, Oregon's method under the law amounts to the sale of scrip by the State, the actual selection being made by the purchaser and the formal selection afterwards filed with the General Land Office by the State. The State conveys the land to the purchaser as soon as it itself receives patent from the Federal Government. This is the same method followed by the land-scrip railroads.

¹ The Government also brought an unsuccessful suit in 1889 for forfeiture of this grant on substantially the same grounds as in the cases against the Oregon Central and the Dalles Military Road grants.

² General Laws of Oregon, 1911, p. 105.



WILLIAM WOOD

L I C O C E N

By the present law any legal applicant making the affidavit of good faith is allowed to purchase 320 acres "of each of the following classes of land, to wit: School, indemnity, university, college, swamp, or tide and overflow lands."¹

From the beginning the Oregon statutes regarding the various classes of State lands have restricted the amount that one purchaser could take (usually to 320 acres), with the two exceptions following: (1) In 1870 the State legislature authorized the sale of swamp lands without restriction of amount, but in 1878 this was repealed, and the restriction of 320 acres to each purchaser was substituted. (2) Tide lands were also sold without restriction of amount from 1899 to 1907, but since 1907 only 320 acres of this class of land have been purchasable by any one person.

Two large holders of timber in the Oregon map area (one of them platted in the group of 38) have all their lands in sections 16 and 36.

¹ General Laws of Oregon, 1907, p. 213.

CHAPTER IV.

CONCENTRATION OF TIMBER OWNERSHIP IN NORTHEASTERN CALIFORNIA AND IN THE REDWOOD BELT.

Section 1. Amount and general distribution of timber in California.

California stands third among the States in total amount of privately owned standing timber, having 248.1 billion feet. Of this, 203.6 billion or 82 per cent are within the areas selected for this discussion, viz, northeastern California, and the four redwood counties along the north coast. These areas represent the major portions of the two great private timber regions of the State.

The timber regions of California follow closely the principal mountain ranges, separated for most of the length of the State by the Sacramento and San Joaquin Valleys, but uniting from the neighborhood of Redding northward. The eastern timber belt following the Cascades and Sierras extends considerably farther south than the western belt following the Coast Range, and is practically continuous. In the coast timber belt there is a marked break some distance north of San Francisco, and when the belt appears again to the south it is much narrower and much less important. Toward the south, in the vicinity of Los Angeles, as the coast sweeps toward the east, this timber belt nearly meets the southern limits of the Sierra belt. There is comparatively little privately owned timber along the coast below San Francisco, except in San Mateo and Santa Cruz Counties. The stands are small in southern California, and a large area in the southeastern part of the State is nontimbered. There are also considerable areas in the northeastern part of the State which have little or no timber, in addition to the great open valleys of the Sacramento and San Joaquin already referred to.

The coast timber belt north of San Francisco falls into two very dissimilar parts, the great redwood belt on the west and a pine and fir district on the immediate east. The great bulk of the redwood is confined to a narrow strip, varying from 10 to 30 miles in width, running along the northern coast through Del Norte, Humboldt, and Mendocino Counties, and a part of Sonoma. A comparatively small amount is found in San Mateo and Santa Cruz Counties, and isolated tracts are found in sheltered spots as far south as Monterey County.

Farther east, following the Cascades and Sierra Nevadas and extending south more than half the length of the State, are the heaviest stands of western pine and sugar pine, mixed with a considerable proportion of Douglas and white fir and smaller amounts of spruce and cedar. Douglas fir decreases in importance toward the south, and there is a corresponding increase in the importance of white fir. In the southern Sierras where the Douglas fir grows at high elevations its quality becomes so inferior that it can hardly be considered merchantable.

TWO OWNERSHIP MAPS PRESENTED FOR CALIFORNIA.—For California two maps are presented, the first covering a portion of the western pine and sugar pine region¹ in northeastern California (for convenience printed in two parts), and the other (also in two parts) covering practically in its entirety the great redwood belt along the northern coast. The exact location of these map areas in the State can readily be seen from the key map of the Pacific coast facing page 4. The first of these regions is notable principally for the extent of the Southern Pacific Co.'s railroad-grant holdings; the second is notable not only on account of the remarkable characteristics of the redwood forest itself, but also because the ownership of this timber is concentrated to a higher degree than has been reached in any other species in the investigation area.

CONCENTRATION OF TIMBER OWNERSHIP IN NORTHEASTERN CALIFORNIA.

Section 2. Description of northeastern California map.

Part I of the northeastern California map (facing p. 100) begins at the Oregon-California State line, joining Part IV of the Oregon map. The eastern boundary is the east line of range 12 E., Mount Diablo meridian. The western boundary is the west line of range 10 W., Mount Diablo meridian, and the map extends southward from the State line to the south line of township 27 N. This is an area approximately 130 miles from east to west and 125 miles from north to south.

Part II of the map (also facing p. 100) lies immediately south of the eastern half of Part I, being bounded on the east by the east line of range 14 E., and on the west by the west line of range 2 E. It extends southward to Township 20 N. These boundaries outline an area 80 miles from east to west and 40 miles from north to south. It may be noted that the city of Sacramento is about 65 miles below the southern border of Part II.

¹ Among the minor species are Douglas fir, white fir, and other true firs, cedar, and spruce.

The map is divided into two parts simply for convenience in printing; in the tables and in the discussion the two parts are treated as a single map.

The topographical data, such as the location of swamps, meadows, valleys, lava beds, etc., were taken from the General Land Office map of California. Lakes and railroads were mapped from the same source. The location of the recently built Western Pacific Railroad is not shown. It traverses a heavily timbered part of the map area, and then runs southward to San Francisco.

County lines and national forest boundaries are indicated in the same way as on the Washington and Oregon maps. So far as there is difficulty on account of the platting in following the county and forest boundaries, this may be overcome by consulting the key map facing page 4. It will be observed that most of the central and eastern portion of Part II lies within the national forest. Through whole townships of this reserved area the platted holders have no lands. In other portions of the map, especially the western side of Part I (in the Shasta National Forest), almost every other section in the forest reserve belongs to the Southern Pacific.

On page 15 are given the amount and the percentage of privately owned land within the boundaries of the national forests of the State (June 30, 1909). The national forests partly or entirely included in the northeastern California map are the following: Trinity, Shasta, Modoc, Lassen, Plumas, Tahoe. The percentage of privately owned land in each of these six forests is shown below. Some of these are only partly on the map area so that the percentages cannot be taken as applicable strictly to the portions on the map. They are suggestive, however.

	Per cent of gross area pri- vately owned.
Trinity-----	21.4
Shasta-----	61.8
Modoc-----	12.8
Lassen-----	23.7
Plumas-----	22.1
Tahoe-----	47.5
For the six forests-----	32.9

The Bureau's information as to the amount of nontimbered land on the map area is by townships, but not in such form that its location in the townships can be shown. Hence, the designation "little or no timber" could not be employed, as was done in the southwestern Washington map. In general, the important forested areas may fairly well be judged either by the presence of platted holdings or less certainly by the national forest boundaries. Some of the areas inside the national forests in the northeastern portion of Part I

bear only a sparse growth of juniper, which can not be ranked as merchantable timber.

Two or three "Spanish grants"—old grants of land made before California belonged to the United States—appear along the edge of this map area, marked by a special style of boundary line. These old grants usually are outside the timber belt. The regulations under which they were made seem to point to an intention to grant agricultural or grazing lands rather than timber; and, indeed, in those days timber was far less in demand than agricultural land.

It will be noted, especially on Part I of the map, that there are great stretches of country in which no platted holdings whatever are shown. These, unless within the boundaries of the national forest, are usually open nontimbered regions, or regions whose timber is not merchantable. Thus, in the northwestern portion of Part I, the "Shasta Valley" is an extensive nontimbered region. The unplatted area northeast of Shasta Valley in townships 46 and 47 N., in ranges 1 and 2 W., called Little Shasta Valley, is nontimbered, and is almost solidly owned by the Pacific Improvement Co., which has about 35,000 acres there. The valley of the Sacramento, which runs through the middle of Part I of the map and covers the southwest corner of Part II, is in large part open nontimbered land, though along its upper course the timber comes almost to the river's edge.

SOUTHERN PACIFIC LAND GRANTS IN CALIFORNIA.¹—In California the Southern Pacific Co. holds five Federal land grants, and under them 9,285,802 acres in this State had been patented up to June 30, 1910. The greater part of the area of one of these grants is shown on the northeastern California map. This is the grant originally made to the California & Oregon Railroad Co. (14 Stat., 239), to which the Central Pacific—in effect the Southern Pacific—is now successor. The primary limits run 20 miles on each side of the railroad, and the indemnity limits extend 10 miles farther out on each side, making a total strip 60 miles in width. These limits are shown on the map. The line of "definite location" of the railroad determining the grant between Sacramento and Tehama ran by way of Marysville, but the fast trains now run by way of Davis. Only the railroad line that determines the grant limits is named on the map.

The northern limit of another grant originally made to the Central Pacific itself appears in the southeastern corner of Part II of the map. This grant extended from Sacramento eastward through Nevada and Utah to the junction of the Central Pacific with the Union Pacific. It originally had a primary limit of 10 miles on each side of the track (12 Stat., 489), which was afterward extended to 20 miles (13 Stat., 356). No indemnity provision was

¹ See also Part I, p. 230.

made in this instance. This grant also is now under the control of the Southern Pacific. So far as it lies in the States of Nevada and Utah, it is outside the Bureau's investigation area, except that 75,320 acres of timbered land in Washoe County, Nev., just across the State line, has been carried as part of the company's California holding in all the tables in this report.

The remaining three grants in California controlled by the Southern Pacific do not traverse the map area. They are the grant to the old Western Pacific, and those to the main line of the Southern Pacific and to its branch lines.

There were no Federal land grants in California for the construction of military wagon roads, such as were made in Oregon.

Section 3. Concentration of timber ownership in area of northeastern California map.

On the entire map area there stand 86.9 billion feet of privately owned merchantable timber, or 35 per cent of the total of such timber in the entire State of California. Only 11 separate holdings are platted, namely, the Southern Pacific Co.'s lands and 10 other holdings platted in two groups of 5 holdings each. In these 11 holdings is comprised about three-fourths of all the private timber on the map area.

The amount of land platted on the map to these 11 holders is over 3,330,000 acres, of which over 2,980,000 acres are merchantable-timber land.

Table 25 below shows the amount of privately owned timber on the area of the two parts of the northeastern California map, and the percentages owned by the Southern Pacific and by various groups of holders. The table covers only those holders having lands on the map area. The holders are grouped in the order of the size of their holdings in the State (and not of size on the map area), but the figures given represent strictly the amount they own on the map area, not the amount they own in the State. As a matter of fact, the grouping would be practically the same whether the holders were grouped according to the amount owned in the State or according to the amount owned on the northeastern California map area. In this respect the situation here is quite different from that in the Washington map area, where the holders were grouped according to size of holdings on the map area itself.

Table 25 deals only with merchantable-timber acreage and timber. Table 29 on page 97 shows the total land holdings on the map area owned by holders of 60 million feet and over. The Southern Pacific, for example, as shown by that table, has 331,200 acres of nontimbered land, which is platted on the map without distinction of its timbered land. The distinction between timberlands owned in fee and

lands on which only timber rights are owned is not shown on the map, but is carried in footnotes to the table. The timber rights reported as owned on the map are negligible in amount, being less than 6,000 acres.

State and Government timber holdings are excluded from the tables and discussion, which are concerned only with privately owned timber.

TABLE 25.—TIMBER ACREAGE AND TIMBER OF PLATTED AND UNPLATTED HOLDINGS ON NORTHEASTERN CALIFORNIA MAP, BY GROUPS.

[Timber in billions of board feet. Thus, 24.5 = 24,500,000,000 board feet.]

Holders	Number of holders.	Timber acreage owned on map area.	Timber owned on map area.	
			Billion feet.	Per cent of total.
Platted holders:				
Southern Pacific Co.....	1	1,378,760	24.5	28.2
First group, 5 holders.....	5	1,423,588	36.7	42.2
Second group, 5 holders.....	5	180,533	4.2	4.9
Total, platted holders.....	11	2,982,901	65.4	75.3
Unplatted holders (grouped by size of holding in State):				
4 holders of 250 million feet to 500 million feet each.....	4	152,101	1.4	1.6
5 holders of 125 million feet to 250 million feet each.....	5	* 41,454	1.0	1.1
13 holders of 60 million feet to 125 million feet each.....	13	* 70,667	1.2	1.4
Total, unplatted holders of over 60 million feet each.....	22	164,222	3.6	4.1
Holders of less than 60 million feet each.....		933,560	17.9	20.6
Total, unplatted holders.....		1,097,782	21.5	24.7
SUMMARY.				
Platted holders.....	11	2,982,901	65.4	75.3
Unplatted holders of over 60 million feet each.....	22	164,222	3.6	4.1
Total, holders of over 60 million feet each.....	33	3,147,123	69.0	79.4
Unplatted holders of less than 60 million feet each.....		933,560	17.9	20.6
Total, all holders.....		4,080,683	86.9	100.0

¹ Including 2,840 acres timber rights.

² Including 240 acres timber rights.

³ Including 2,880 acres timber rights.

From the above table it is seen that one holder, the Southern Pacific Co., owns 24.5 billion feet, or over 28 per cent, of the private timber in the region covered by this map. The first group, 5 platted holders, with 36.7 billion feet of timber, owns 42.2 per cent of the total on the map area. A large proportion of this is owned by T. B. Walker. These 5 holdings, added to that of the Southern Pacific Co., amount to 61.2 billion feet, or 70.4 per cent, of the private timber on the map area. The second group, 5 platted

holders, has only one-ninth as much timber as the first group, and owns less than 5 per cent of the entire amount of private timber on the map area. The 11 platted holders together own 65.4 billion feet, or 75.3 per cent of the total. The 22 unplatted holders of over 60 million feet own only 3.6 billion feet of timber, and the unplatted holders of less than 60 million feet own in the aggregate 17.9 billion feet.

The fact that 6 holders own over 70 per cent of the private timber in this great northeastern California region is sufficiently striking, but it should also be borne in mind that the small holders who own less than 60 million feet each, as a class, are not as important a factor as their total holdings might indicate. If a common policy were adopted by these 6, they could exert a high degree of control over the lumber business in this great territory. Or if the Southern Pacific and T. B. Walker were to follow harmonious policies, these two interests alone, controlling half of the timberland of this region, would be in a position of practical dominance.

Section 4. Holding of Southern Pacific on map area. (Map symbol, solid black.)

The most striking feature of the map is the vast holding of the Southern Pacific Co. Each of the solid black squares represents one square mile of land. These squares represent only the land still owned by the company. It should be kept in mind, however, that more than 330,000 acres, or about one-fifth of the Southern Pacific land platted is not timberland. A large acreage of the original grant which has been sold is, of course, not platted to it. A general discussion of this company's holdings has already been given in Part I, in Chapter I of this Part, and also in connection with its holdings on the Oregon map.

From the Bureau's record of the present ownership of timberland in that part of the northeastern California map area which falls within the limits of the railroad grant, it appears that much timberland originally patented to the railroad company is now in the hands of speculators and lumber manufacturers. An investigation of certain areas within the grant limits where the platted holders of the crosshatch and single-diagonal groups have land, shows that out of the grand total of 411,160 acres patented to the railroad company in these specified areas, 158,080 acres are still retained by the company, 221,980 acres have been sold and are now held by members of the two groups of platted holders, 2,720 acres are held by one of the unplatted holders, and 27,900 acres, timbered or nontimbered, are held by owners not separately reported to the Bureau. The extent of land thus acquired from the Southern Pacific by members

of each group of platted holders will be noted in the discussion of those groups.

The character of the Southern Pacific Co.'s holding may be briefly described. It lies altogether in alternate sections. Under the grant the alternate sections had to be taken irrespective of their values. The Southern Pacific has not relinquished lands under the forest-licensing act as did the Northern Pacific, and consequently it has not been able to make selections in the even sections of the more heavily timbered parts of its grant. For these reasons its lands represent a fair average of timber conditions in the whole region which its grant traverses. They therefore average less timber per acre than the selected holdings of the lumber companies who have picked their lands in the best timber.

In general, the lands in odd-numbered sections within the limits of the grant that were disposed of by the Government prior to the date of the railroad's claim, were lands suited to agriculture or grazing rather than timbered lands. Again, the lands sold by the company itself in the earlier years of its management of the grant were also mostly agricultural in character, its sales of timberland being mostly of later date. In Shasta Valley, and in the Sacramento Valley near Redding and Red Bluff, are large open areas in which most of the odd-numbered sections were originally patented to the railroad company, but were sold in accordance with what appears to have been the earlier policy of disposing of the lands for actual settlement or possibly for grazing purposes.

The fact has already been noted¹ that in the Shasta National Forest on Part I the Southern Pacific, in township after township within the reserve, holds half the land. This, of course, is because the grant to the railroad company antedated by many years the establishment of forest reserves. This fact assured to the company the odd-numbered sections within the primary or 20-mile limits of the grant. Moreover, most of the indemnity selections of this grant were made prior to the day of the national forests.

SOUTHERN PACIFIC'S HOLDINGS ON THIS MAP AND ON OREGON MAP.— If the two parts of the northeastern California map are placed below the four parts of the Oregon map arranged in order, and the solid black mile-squares are noted, one gets a fair impression of the enormous extent of the Southern Pacific's power over the timber supply of the great fir, sugar-pine, and western-pine regions of Oregon and California. Its holdings extend practically from Portland to Sacramento. In the area of the six parts of these two maps

¹ Page 84.

this one company holds 21.1 per cent of all the privately owned timber. Its strength as an owner of timber is augmented by its substantial monopoly of transportation in this entire territory, a formidable combination, especially considering how important a factor freight rates are in the cost of lumber delivered at markets.

Section 5. Holdings of first group—five platted holders—on map area.
(Map symbol, heavy crosshatch.)

The 5 members of the first group of holders platted on the northern California map own on the area of that map 1,423,588 acres of merchantable-timber land carrying 36.7 billion feet of timber. This is 42.2 per cent of the total private timber on the map area. The members of this group are T. B. Walker; Wheeler interests (see Part I, p. 104); T. D. and E. S. Collins interests; McCloud River Lumber Co.; and Diamond Match Co. Of these the first mentioned is by far the most important. Though the Wheeler interests have very great holdings in the Pacific-Northwest, the amount owned by them in northeastern California is small as compared with the Walker holding.

HOLDING OF T. B. WALKER.—T. B. Walker has assembled his timberlands rapidly. His holding in California includes a purchase from the Sierra Lumber Co. of some 60,000 acres, constituting a very early selection of timber that was regarded as one of the finest bodies of sugar pine and western pine in the United States. As will be shown in detail later his holding was rapidly enlarged by purchases of large amounts of land originally part of the California & Oregon Railroad Co. grant, and of land originally granted by the Government to the State of California, and by use of forest-licu scrip from the Atlantic & Pacific land grant in Arizona and New Mexico; and it was further enlarged by assembling land taken up by individuals under the timber and stone act.

A rough investigation shows that approximately 39,640 acres of the present Walker holding consist of land originally patented under the California & Oregon Railroad Co. grant, and 127,925 acres, of land originally granted to or selected by the State of California. His holding has also been enlarged by purchase of land scrip: approximately 37,260 acres of forest-licu scrip of the Santa Fe Pacific Railway (successor to the Atlantic & Pacific); 19,900 acres of forest-licu scrip of the Aztec Land & Cattle Co. (assignee of Atlantic & Pacific); and 6,680 acres of land originally on the Land Office records in the name of C. W. Clarke. In addition, he has 57,600 acres of public lands selected in his own name and approved by the General Land Office, besides some 9,200 acres of selections not yet approved,

making a total, in the particular area under consideration, of 66,800 acres standing in his name on the Land Office records. These are probably lands selected in lieu of other lands relinquished by him in the forest reserves.

With other smaller amounts, the figures given above account for 298,685 acres of land obtained directly or indirectly in large blocks from original grantees. Adding the lands purchased from the Sierra Lumber Co. (not duplicated in the figures just given) makes a total of about 360,000 acres from the sources indicated. This reckoning, however, accounts for less than half of the present Walker holding, which reaches a total of over 750,000 acres of sugar-pine and western-pine timberland. The following statement by H. H. Schwartz, formerly chief of field service of the General Land Office, quoted in the Report of the National Conservation Commission, no doubt refers to this particular holding:

I recall a specific instance in the Susanville and Redding districts, California, where a single investor in the course of probably three years acquired approximately 700,000 acres of heavily timbered lands, a large amount of which was secured under the timber and stone act.¹

T. B. Walker is the largest individual (noncorporate) timber owner in the country. His holding is fifth in amount of timber in the investigation area. It gives him a very large degree of control over the lumber supply of northeastern California in the region east of the Southern Pacific (California & Oregon) grant, and the future development of this territory is to a considerable extent in his hands. Though the stand of timber in the sugar-pine and western-pine territory, where his holding lies, is not so dense as the stand of Douglas fir in western Oregon and western Washington, the value per thousand feet is in general higher.

HOLDING OF WHEELER INTERESTS.—Next in importance in the first group on this map are the Wheeler interests, who also have extensive timberlands in the redwood belt and in western Oregon and a smaller holding in western Washington. Their holdings are platted on the ownership maps of all three of these regions as well as on the present map—on the redwood map in the first group; on the western Oregon map in the second group; and on the southwestern Washington map in the group of 33. In redwood, especially, they have a great and growing power. They also have holdings of timberland in Pennsylvania.

OTHER HOLDINGS IN THIS GROUP.—T. D. and E. S. Collins likewise are interested in timberland in Pennsylvania; and they are stockholders in the Bayside Lumber Co., a large holder in California,

¹ S. Dec. No. 676, p. 389, 60th Cong., 2d sess., vol. 3, 1908-9. Quoted at more length in Part I of the Report on the Lumber Industry, p. 265.

which is counted separately. The Collins lands in the investigation area are altogether in the Pacific-Northwest, chiefly in this map area, though they also have important holdings in western Oregon and southwestern Washington. Their lands are platted on the Oregon map in the fourth group, and on the southwestern Washington map in the group of 33. The Diamond Match Co. has timberland in the New England States in addition to its extensive tract on the area of the northeastern California map. The McCloud River Lumber Co. has no other lands than those in this region. Many of the stockholders in this concern, however, are lumbermen with interests in other large companies owning timber in various parts of the investigation area. One of them is a director of the Weyerhaeuser Timber Co.

LANDS ACQUIRED FROM CALIFORNIA & OREGON RAILROAD GRANT BY HOLDERS IN THIS GROUP.—It has been stated that part of the land on the map area owned by the first group—5 platted holders—was originally patented to the California & Oregon Railroad Co. (or its successor, the Central Pacific, controlled by the Southern Pacific Co.), under the land grant. The following amounts of land owned by the different members of the group were originally part of this railroad land grant:

TABLE 26.—LANDS OF CALIFORNIA & OREGON RAILROAD GRANT IN AREA OF NORTHEASTERN CALIFORNIA MAP NOW OWNED BY FIRST GROUP OF PLATTED HOLDERS.

Present holders.	Granted land owned on map area.	Present holders.	Granted land owned on map area.
	Acres.		Acres.
Diamond Match Co.....	70,760	Soper-Wheeler Co.....	1,040
McCloud River Lumber Co.....	52,400		Total.....	166,240
T. B. Walker.....	39,640		
T. D. and E. S. Collins interests.....	2,400		

This statement illustrates the fact that Federal grants of timberland, if sold by the original grantee, have usually been sold in large blocks to timber holders.

STATE LANDS ACQUIRED BY HOLDERS IN THIS GROUP.—Reference has been made above to the State land now included in the Walker holding. The following table shows the amount of State land now owned by T. B. Walker, and also by the other holders of the first group. Distinction is made between selections approved by the Land Office and selections not yet approved. These State lands consisted in part of granted school sections, but chiefly of indemnity and other selections.

TABLE 27.—STATE LANDS¹ IN AREA OF NORTHEASTERN CALIFORNIA MAP NOW OWNED BY FIRST GROUP OF PLATTED HOLDERS.

Present holders.	Approved.		Pending.		Total.	
	Acres.		Acres.		Acres.	
T. B. Walker.....	96,445		29,480		125,925	
T. D. and E. S. Collins interests.....	6,320		16,680		23,000	
McCloud River Lumber Co.....	16,840		6,660		23,500	
Diamond Match Co.....	17,520		3,360		20,880	
Wheeler interests.....	3,200		.....		3,200	
Total.....	142,325		55,180		197,505	

¹ Including some granted school lands in sections numbered 16 and 36.

OTHER LARGE ACQUISITIONS OF PUBLIC LANDS BY CERTAIN HOLDERS IN THIS GROUP.—There were other means of obtaining land in large blocks. Large quantities of Santa Fe railroad scrip and of other scrip derived from the Atlantic & Pacific Railroad Co.'s grant in New Mexico and Arizona were on the market. Both the Santa Fe Pacific Railroad Co. and the Aztec Land & Cattle Co. (in which the railroad company has a minority interest) had succeeded to lands in the original Federal grant to the Atlantic & Pacific. Forest reserves having been established in Arizona over part of the area of the railroad's land grant, the railroad company itself and the Aztec Land & Cattle Co. had forest-lieu-selection rights which they offered for sale in the form of scrip. Moreover, lands originally belonging to the land grant in the region of the Arizona forest reserves had been sold before the creation of the reserves, so that certain other owners of such lands also had lieu-selection rights.¹ Of these owners, those who made selections in that part of the northeastern California map area covered by the two groups of platted holders on the map were the Saginaw & Manistee Lumber Co. and William F. Baker, the president of that company.

Considerable amounts of land (comprising pending as well as approved selections) now held by members of the first group were originally alienated by the Government in large blocks (from 5,000 acres to 67,000 acres) to T. B. Walker, G. Howard Thompson, California & Oregon Land Co., John M. Bemis, C. W. Clarke, and Jacob H. Cook. It is probable that in most cases these parties had previously acquired other lands from various sources, and then, upon the inclusion of those lands in forest reserves, had relinquished them to the Government and selected in lieu the lands now under discussion. This would explain the alienation of lands in such large blocks to these individuals.

The following table shows the amount of approved and pending selections of the kinds described in the last two paragraphs, which are now owned by four members of this group.

¹ See Part I, pp. 229 and 242, and above, p. 77.

TABLE 28.—APPROVED AND PENDING SELECTIONS OF CERTAIN PUBLIC LANDS (OTHER THAN CALIFORNIA & OREGON RAILROAD GRANT AND STATE GRANT) IN AREA OF NORTHEASTERN CALIFORNIA MAP NOW OWNED BY FOUR MEMBERS OF FIRST GROUP OF PLATTED HOLDERS.

Names in which selection was made.	Present holders and amount of these selections owned.				
	T. B. Walker.	Wheeler Interests.	T. D. and E. S. Collins Interests.	McCloud River Lumber Co.	Total on map area.
Santa Fe Pacific:	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Approved.....	36,780	11,520	.....	7,680	55,980
Pending.....	480	.....	.....	120	600
Total.....	37,260	11,520	.....	7,800	56,580
Aztec Land & Cattle Co.:	.....	.....	.....	.....	.....
Approved.....	19,400	240	.....	1,900	21,600
Pending.....	440	.....	.....	.....	440
Total.....	19,800	240	.....	1,900	22,040
T. B. Walker:	.....	.....	.....	.....	.....
Approved.....	57,600	440	.....	.....	58,040
Pending.....	9,200	.....	40	.....	9,240
Total.....	66,800	440	40	.....	67,280
G. Howard Thompson:	.....	.....	.....	.....	.....
Approved.....	320	.....	42,920	.....	43,240
Pending.....	.....	.....	3,840	.....	3,840
Total.....	320	.....	46,760	.....	47,080
California & Oregon Land Co.:	.....	.....	.....	.....	.....
Approved.....	.....	21,400	.....	.....	21,400
Pending.....	.....	.....	.....	.....	.....
Total.....	.....	21,400	.....	.....	21,400
John M. Hemis:	.....	.....	.....	.....	.....
Approved.....	.....	.....	9,100	.....	9,100
Pending.....	.....	.....	.....	.....	.....
Total.....	.....	.....	9,100	.....	9,100
C. W. Clarke:	.....	.....	.....	.....	.....
Approved.....	4,680	.....	.....	200	4,880
Pending.....	2,000	.....	.....	.....	2,000
Total.....	6,680	.....	.....	200	6,880
Jacob H. Cook:	.....	.....	.....	.....	.....
Approved.....	.....	6,120	.....	.....	6,120
Pending.....	.....	.....	.....	.....	.....
Total.....	.....	6,120	.....	.....	6,120
Total:	.....	.....	.....	.....	.....
Approved.....	118,240	39,720	52,080	9,780	219,820
Pending.....	12,720	.....	3,880	120	16,720
Total.....	130,960	39,720	55,960	9,900	236,540

1 Former owner, Pacific Improvement Co.

Two companies forming parts of the T. D. and E. S. Collins interests, namely, the Curtis, Collins & Holbrook Co., and the Pennsylvania Lumber Co., are involved with individual defendants in 97 suits brought by the Government for alleged fraudulent acquisition of land. These suits are now pending. It is alleged by the Government that the defendants carried on a wholesale business of procuring entrymen to make timber and stone entries. The suits cover 15,520 acres on this map area in Lassen County. Some 40 other similar instances of alleged fraudulent acquisition in which these parties are involved are said to be barred by the statute of limitations.

Section 6. Holdings of second group—five platted holders—on map area.
(Map symbol, single light diagonal).¹

The five holders of this group own on the two parts of the northeastern California map 180,553 acres, with 4.2 billion feet of timber. This is a far less important group, both on this map area, and elsewhere, than the first group of five.

Parts of the map holdings of this group were derived from the grant to the California & Oregon Railroad Co. Three members of the group, viz, Weed Lumber Co., Northern California Lumber Co., and Merrimac Land & Lumber Co., have lands aggregating 55,740 acres were originally part of the grant to the railroad. This represents a very considerable proportion of the holdings of the three companies. In other words, a purchase from the railroad company apparently formed the nucleus of each holding, their railroad lands amounting to over 45 per cent of the total holding of each on the map area. Railroad land now held by the Weed Lumber Co. is 30,840 acres; by the Northern California Lumber Co., 14,280 acres; and by the Merrimac Land & Lumber Co., 10,620 acres.

Besides acquiring lands which were originally part of the railroad grant, two members of the second group of five acquired considerable amounts of State land. The Weed Lumber Co. now holds 13,660 acres of land which appear on the Land Office records as selected by the State. Of this, 7,560 acres have been approved and 6,100 acres are still pending approval. The Northern California Lumber Co. also holds 3,780 acres of State land, of which 2,220 acres have been approved and 1,560 acres are pending approval. Besides this, 35,200 acres of approved selections credited on the Land Office records to William F. Baker, president of the Saginaw & Manistee Lumber Co., and 4,840 acres of approved selections credited to the

¹ On Part I of the map the light diagonal runs from right to left, while on Part II it runs from left to right. There is no distinction, however, between the two symbols, both of which should have run in the same direction.

Saginaw & Manistee Lumber Co. itself, are reported as owned by members of this group. With 400 acres of Santa Fe scrip land now held by the Weed Lumber Co., the total secured by members of this group from railroad land grants, the State, and the other large grantees of the Government just noted, amounts to 114,100 acres, or about three-fifths of the acreage of the group on the map.

Section 7. Unplatted holdings on map area.

UNPLATTED HOLDERS OF OVER 60 MILLION FEET EACH.—There are only 22 unplatted holders of over 60 million feet each who have timberlands on the northeastern California map area. These holders are grouped in the table according to the size of their holdings in the State, but the order of grouping would be practically unchanged if they were grouped according to the size of their holdings on the actual map area. These 22 own in this area 164,222 acres of timberland, and 3.6 billion feet of timber, amounting to 4.1 per cent of the total private timber on the map area. They have only about one-tenth as much timber on the map area as the first group of five platted holders, and only a trifle more than one-seventh of the amount of timber held by the Southern Pacific.

UNPLATTED HOLDERS OF LESS THAN 60 MILLION FEET EACH.—About one-fifth of the private timber on the area selected for the northeastern California map is owned by holders of less than 60 million feet each. These holders are largely individuals, owning usually only a quarter section of land. Since such holdings were covered by means of general estimates the Bureau has no record of their number. Their merchantable-timber land amounts to 933,560 acres, on which stand 17.9 billion feet of timber. This group of a very large number of individuals, who have no way of acting together, does not have a power equivalent to that which might be exercised by a single company owning the same per cent of the total timber in this region. Individually, they can not get nearly as high a price for their timber as the great companies get for theirs, and for many reasons their collective total is less important than its size would indicate. The timber of individual claim holders and of small companies is to some extent inferior in quality, or blocked in and controlled by the big holders, or otherwise inaccessible.

Section 8. Additional land owned on map area by timber owners of over 60 million feet each.

The acreage shown in Table 25 is merchantable-timber acreage. Some of the holdings have additional acreage which has been reported to the Bureau. The following table repeats from Table 25 the merchantable-timber acreage and shows also the additional lands and

total acreage reported as owned on the map area by the Southern Pacific and the several groups of holders of over 60 million feet each. It will be seen that except for the Southern Pacific the holdings of additional lands are unimportant.

TABLE 29.—ACREAGE OF TIMBER (INCLUDING TIMBER RIGHTS) AND ADDITIONAL LAND OWNED ON NORTHEASTERN CALIFORNIA MAP BY HOLDERS OF OVER 60 MILLION FEET EACH, BY GROUPS.

[Not all members of a group own additional land. The number of those owning such land is shown for each group, parenthetically in italics, in the additional land column.]

Holders.	Number of holders.	Merchant-able-timber acreage.	Additional land reported.	Total on map area.
Platted holders:		<i>Acre.</i>	<i>Acre.</i>	<i>Acre.</i>
Southern Pacific Co.	1	1,378,760	(1) 331,200	1,709,960
First group, 5 holders.....	5	1,423,583	(1) 4,160	1,427,743
Second group, 5 holders.....	5	180,553	(5) 14,200	194,753
Total, platted holders.....	11	2,982,901	(5) 349,560	3,332,461
Unplatted holders (grouped by size of holding in State):				
4 holders of 250 million feet to 500 million feet each.....	4	152,101	(1) 10,000	62,101
5 holders of 125 million feet to 250 million feet each.....	5	41,454	.....	41,454
13 holders of 60 million feet to 125 million feet each.....	13	70,667	(4) 11,047	81,714
Total, unplatted holders of over 60 million feet each.....	22	164,222	(5) 21,047	185,269
SUMMARY.				
Platted holders.....	11	2,982,901	(5) 349,560	3,332,461
Unplatted holders of over 60 million feet each.....	22	164,222	(5) 21,047	185,269
Total holders of over 60 million feet each.....	33	3,147,123	(10) 370,607	3,517,730

¹ Including 2,840 acres timber rights.

² Including 240 acres timber rights.

³ Including 2,880 acres timber rights.

The total acreage owned on the selected area by the 11 platted holders is 3,332,461 acres. For a very small fraction of this (some 4,000 acres) the Bureau did not secure the definite location. The remainder is platted with the symbols of the Southern Pacific and the two groups of large holdings.

The total acreage of the 22 unplatted holders who each have timber in excess of 60 million feet, is 185,269 acres. Adding this to the 3,332,461 acres owned by the 11 platted holders makes 3,517,730 acres, the total land holdings of 33 owners on this map area.

Section 9. Total timber in Pacific-Northwest of holders platted on northeastern California map.

Up to this point the discussion of the northeastern California map has been confined to the holdings on the map area. The holdings of

some of these concerns extend into other regions as well. The following tables (Tables 30 and 31) state the merchantable-timber acreage and timber owned by the 11 platted holders of the northeastern California map on that area; the holdings of the 5 who own in California outside the map area; the holdings of the 5 who own in western Oregon and western Washington; the holdings of the 3 who own in other regions of the Pacific-Northwest; and finally the holdings of all the 11 in the Pacific-Northwest as a whole. In the western Oregon and western Washington column, 2 holders of the first group of 5 platted holders and 2 of the second group of 5 are combined in order to avoid giving information by which one of two companies could determine the amount of timber owned by the other. Table 31 shows that in addition to their 65 billion feet of timber on the map area these 11 holders own more than 100 billion feet elsewhere in the Pacific-Northwest, making their grand total in this region over 165 billion feet.

Table 30 and Table 31 show the timber acreage and timber, respectively, for the same holders and groups of holders. The amount of timber for any particular group and region in Table 31 stands on the timbered acreage shown for the same group and region in Table 30. The two tables will be discussed together. The acreage is merchantable-timber acreage and includes a negligible amount of timber rights.

TABLE 30.—ACREAGE¹ OF TIMBER OWNED IN PACIFIC-NORTHWEST BY THE 11 PLATTED HOLDERS OF NORTHEASTERN CALIFORNIA MAP, BY GROUPS AND BY REGIONS.

[Only part of the 10 grouped holders own any land outside the northeastern California map area. The number of those who do own in each region is given in the table parenthetically in italics.]

Holders platted on northeastern California map.	In California.				In western Oregon and western Washington.	In other regions of Pacific-Northwest.	Total in Pacific-Northwest.
	Total.	On northeastern California map area.	Outside map area.				
Southern Pacific Co.	<i>Acre.</i> 1, 994, 580	<i>Acre.</i> 1, 378, 760	<i>Acre.</i> 555, 820	<i>Acre.</i> 1, 907, 238	<i>Acre.</i>	<i>Acre.</i> 3, 841, 816	
First group, 5 holders.	(6) 1, 423, 588	(6) 1, 423, 588	(4) 104, 835	(4) 163, 946	(5) 63, 340	(5) 1, 660, 017	
Second group, 5 holders.	(10) 1, 708, 976	(6) 180, 553				(5) 240, 245	
Total, 11 holders.	(11) 3, 643, 556	(11) 2, 982, 901	(5) 660, 655	(5) 2, 071, 180	(5) 63, 340	(11) 5, 778, 078	

¹ The figures in the table include 2,540 acres reported as timber rights as timber rights as follows: The first group of 5 platted holders, 1,860 acres in California outside the map area, and 680 acres in western Washington.

² Including the part of Klamath County, in eastern Oregon, on Part IV of the western Oregon map.

³ Including 75,320 acres of timberland in Washoe County, Nev.

TABLE 31.—TIMBER OWNED IN PACIFIC-NORTHWEST BY THE 11 PLATTED HOLDERS OF NORTHEASTERN CALIFORNIA MAP, BY GROUPS AND BY REGIONS.

[In billions of board feet. Thus, 35.1 = 35,100,000 board feet. Only part of the 10 grouped holders own any timber outside the northeastern California map area. The number of those who do own in each region is given in the table, parenthetically in italics.]

Holders platted on northeastern California map.	In California.		In western Oregon ¹ and western Washing- ton.	In other regions of Pacific- North- west.	Total in Pacific- North- west.
	Total.	On north- eastern California map area.			
Southern Pacific Co.	35.1	24.5	70.5	.....	105.6
First group, 5 holders.	(10) 51.7	(5) 36.7	(4) 8.0	(5) 1.2	(5) 55.4
Second group, 5 holders.		(5) 4.2			(5) 5.5
Total, 11 holders.	(11) 86.8	(11) 65.4	(5) 21.4	(5) 1.2	(11) 106.5

¹ Including the part of Klamath County, in eastern Oregon, on Part IV of the western Oregon owner- ship map.

² Including less than 1 billion feet of timber in Washoe County, Nev.

The total holdings owned in the Pacific-Northwest by the 11 platted holders amount to 5,778,078 acres of merchantable-timber land and 166.5 billion feet of timber. Of this timber the Southern Pacific owns 105.6 billion and the first group of 5 platted holders owns 55.4 billion feet.

The tables show that the Southern Pacific has in California, outside the map area, 555,820 acres and 10.6 billion feet of timber. These figures include the 75,320 acres, carrying somewhat less than 1 billion feet of timber, located in Washoe County, Nev., just over the State line, but carried in all the Bureau's tables as a part of the Southern Pacific's holding in California. The company has no holding in western Washington, so that its acreage and timber shown in the western Oregon and western Washington column are located entirely in western Oregon, including that part of Klamath County which is on Part IV of the Oregon ownership map. It has no holdings in other regions of the Pacific-Northwest.

The 10 holders of the first and second groups platted on the north- eastern California map have 104,835 timbered acres outside the north- eastern California map area. This is owned by only 4 holders out of the 10 in the two groups. Two of these are in the first group of 5, and 2 in the second group of 5. The timber on the 104,835 acres is 10.8 billion feet, the average stand being over 100,000 feet per acre, but by far the greater part of it lies in the redwood belt, where stands of this density are not uncommon. These particular lands are platted on the redwood map, which will be discussed later.

In western Oregon and western Washington, likewise, the holdings of members in the first two groups are combined. The total for both groups in these two regions is 163,946 acres of merchantable-timber land and 8 billion feet of timber. This is owned by 4 holders, 2 from the first group of 5 and 2 from the second group of 5.

Section 10. Total land holdings of the 11 platted holders reported in timbered portions of Pacific-Northwest.

The 11 platted holders whose timbered acreage in the Pacific-Northwest was stated in Table 30 as 5,778,078 acres have in the timbered portions of that region a reported acreage of 617,773 acres of additional land not counted as bearing merchantable timber. This additional acreage is very largely owned by the Southern Pacific Co., as the following table shows:

TABLE 32.—ACREAGE OF TIMBER (INCLUDING TIMBER RIGHTS) AND ADDITIONAL LAND OWNED IN TIMBERED PORTIONS OF PACIFIC-NORTHWEST BY THE 11 PLATTED HOLDERS OF NORTHEASTERN CALIFORNIA MAP, BY GROUPS.

Holders platted on northeastern California map.	Merchantable-timber acreage.		Additional land reported.		Total in timbered portions of Pacific-Northwest.	
	Number of holders.	Acres.	Number of holders.	Acres.	Number of holders.	Acres.
Southern Pacific Co.	1	3,841,816	1	1,551,005	1	5,392,821
First group, 5 holders.....	5	1,696,017	3	22,194	5	1,718,211
Second group, 5 holders.....	5	240,245	4	44,574	5	2,444,819
Total, 11 holders.....	11	5,778,078	8	617,773	11	6,395,851

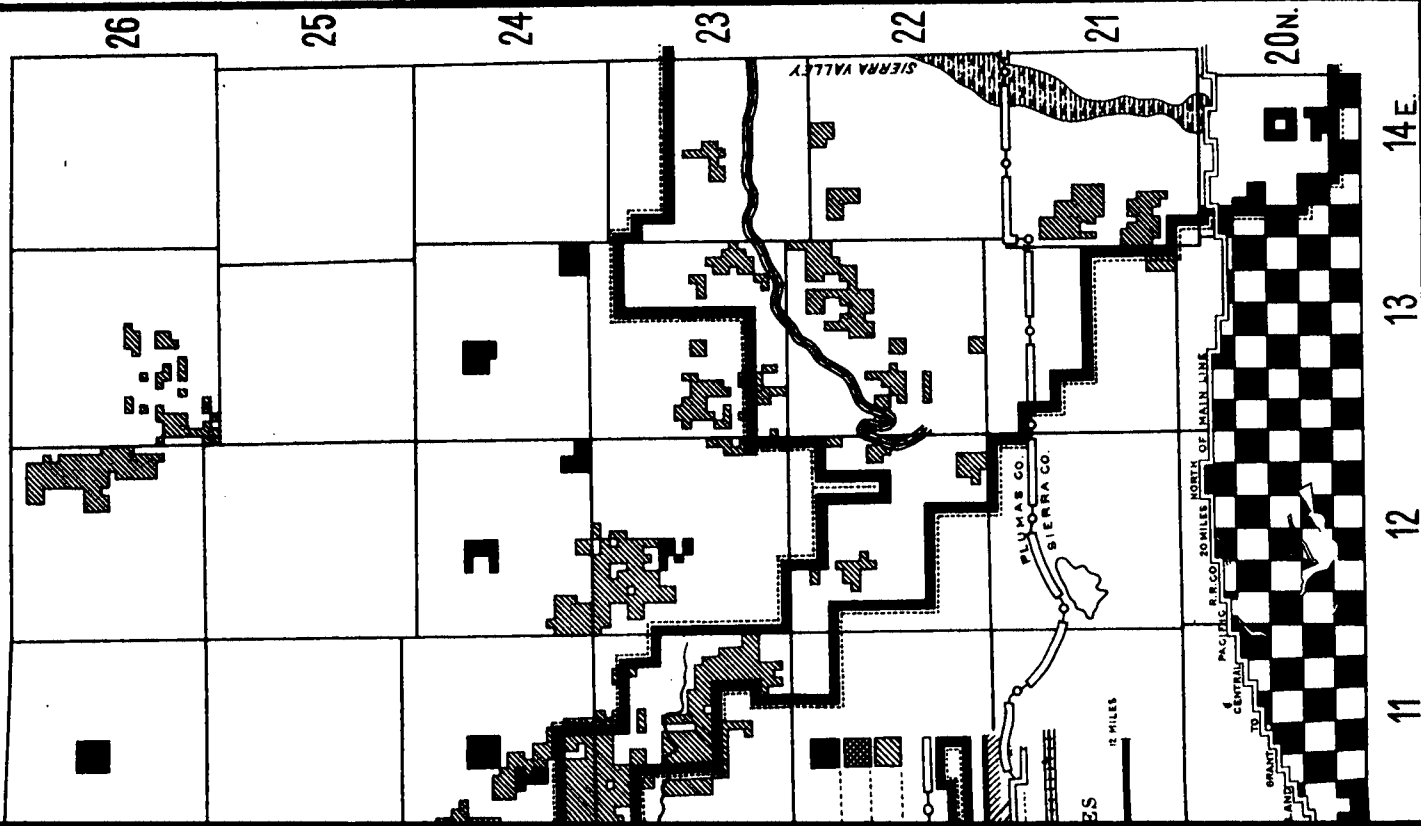
¹ Several million acres of additional land owned by the Southern Pacific in southern California, as well as the very large amount of land owned by it entirely outside the investigation area, are omitted from this table, and from the tables of this Report generally. The company's total acreage in the whole country is 13,879,932 acres. (See Part I, p. 233.) The total additional land here shown for the Southern Pacific is therefore incomplete and all table totals which include it are also incomplete.

² Including 2,540 acres timber rights.

The merchantable-timber acreage shown in Table 32 has already been distributed between the various regions of the Pacific-Northwest in Table 30 (p. 98). The 617,000 acres of additional land are distributed, roughly, as follows: 427,000 acres in California and 190,000 in western Washington and western Oregon.¹ The Southern Pacific has about 379,000 acres of nontimbered land in the timbered counties of northern California, and 172,000 of such lands in western Oregon.¹ The total acreage for the 11 platted holders in the timbered portions of the Pacific-Northwest (incomplete as regards the South-

¹ Including the part of Klamath County, in eastern Oregon, on Part IV of the Oregon map.

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ern Pacific) is 6,395,851 acres. This vast acreage is equivalent to a 160-acre tract apiece for practically 40,000 persons. If to the total shown by the table the remainder of the Southern Pacific's lands in the entire country were added, the total would reach the enormous amount of 15,880,000 acres, or over three-fourths of an acre for every family in the United States in 1910.

CONCENTRATION OF TIMBER OWNERSHIP IN THE REDWOOD BELT.

Section 11. Introduction.

Redwood is a peculiar species of timber found in California, almost all of it in a limited area along the northern coast of the State. The characteristic stand of redwood is very heavy—often 100,000 to 150,000 feet per acre over large tracts and sometimes as high as 1,000,000 feet on particular acres.

There has come about an unusually high degree of concentration in redwood ownership, even higher than in the case of cypress or white pine. About 1901 an attempt was made to merge into a single concern all the important redwood owning companies, but the combination was not carried through.

Ninety-six billion feet of redwood, or 94 per cent of the country's total redwood supply, are found along the north coast of California in the counties of Del Norte, Humboldt, Mendocino, and Sonoma. The two parts of the map of the redwood belt presented herewith (facing p. 112) cover a narrow strip in the western part of the counties just named; and on this strip stands nearly all of the north-coast redwood, though just outside the mapped area there is, in these same counties, a little redwood to the east of the map and a little to the west.

The 6 per cent of the redwood supply that is found outside the four counties named above is scattered in distant parts of the State; the redwood proper being found along the coast south of San Francisco in San Mateo and Santa Cruz Counties and as far down as Monterey, and the sequoia (which is included with redwood in this report) being found on the slopes of the Sierra Nevadas, especially in Tulare and Tuolumne Counties. The amount of sequoia, which is a different species of the same genus as redwood and the lumber of which is sold by the trade under the name of redwood, is relatively limited.

The discussion in this part of the chapter covers the concentration of redwood timber ownership in the entire area of the four north-coast counties, and is not limited strictly to the area of the redwood map. But substantially all of the redwood in the four counties is on the map area, and the holders are grouped on the basis of the amount of redwood owned by each. The tables also include the timber of other species owned by the redwood holders; part of it on the map area,

intermingled with their redwood or standing separately on the eastern part of the map area where the timber is mainly fir, pine, etc.; part of it outside the map area, still farther to the east. The tables also include the timber of many individuals and small concerns who presumably own no redwood, their holdings lying in the somewhat inferior fir and pine region. This method of presentation, while leaving the emphasis on the main point, the concentration of ownership of redwood, gives valuable supplemental information. A further practical reason for including all the timber of the four counties is that these counties, in so far as privately owned timber is concerned, form a separate and complete forest division of the State. The country for a long way to the south of them is nontimbered, while to the east they are shut off by the Coast Range and a wide stretch of national-forest timber, very little of which is privately owned.

Section 12. Description of map.

The map of the redwood belt is printed in two parts (facing p. 112), but the two parts are treated as a unit. Part I extends from the northern boundary of the State southward along the coast through the length of Del Norte and Humboldt Counties, a distance of, roughly, 140 miles. Throughout this distance the width of the map is only four townships, or approximately 24 miles. Part II continues Part I southward through Mendocino County to the lower tip of the redwood forest in the northern townships of Sonoma County. The southern extremity of Part II is about 70 miles northwest of San Francisco. This part is also four townships wide in its widest extent and some 100 miles in length. The exact location in the State of the two parts of the selected redwood areas may be seen on the key map facing page 4.

DETAILS OF MAPPING.—All of the townships on Part I of the redwood map are governed by the "Humboldt meridian" and "Humboldt base line." The meridian and base line are named on the map in the lower left-hand portion. On Part II, at the extreme north of the map, a fractional tier of townships (part of township 5 S.) is also governed by the Humboldt meridian. The remainder of the townships is governed by the Mount Diablo meridian. This situation is made clear on the map. Thus, for example, it will be noticed, in the extreme northeastern corner, that township 5 S., 7 E., of the Humboldt meridian adjoins township 24 N., 14 W., of the Mount Diablo meridian.¹

¹ The small part of Sonoma County which appears at the bottom of Part II of the map is handled as an inset. It adjoins immediately the southern boundary of Mendocino County but juts one range farther to the east. The easternmost range of Mendocino County shown on the map is range 14 W., while the inset goes one range farther eastward, to 13 W. It will be easily seen from the numbering of the ranges that range 14 W., 11 N., on the main map matches exactly with 14 W., 11 N., on the inset.

The boundaries of national forests are indicated by the same kind of line that has been used in the other maps, a heavy black line dotted on the inside. On Part II of the map there is no national forest. On Part I the main body of the national forest shown on the map is in the extreme northeastern corner. There is an area of four sections (2,560 acres) in the national forest in township 5 N., 3 E., opposite Eureka. It will be noticed that the national forest includes very little of the region in which platted holders have lands. As a matter of fact it does not extend far enough toward the coast to take in much, if any, of the redwood belt.

The topographical data, such as the location of swampy areas, are taken from the General Land Office map of the State. The locations of railroads are taken from the same source, but are sometimes obscured by the heavy platting in proximity to the railroad line. Eureka and Crescent City, the two principal ports of this coast, are shown.

The symbols used in platting the lands of timber owners are as follows: (1) Solid black, used for a first group of large holdings, which includes the lands of 6 separate holders; (2) the heavy crosshatch, used for a second group of large holdings owned by 9 separate holders; and (3) a single light diagonal used for a third group of large holdings covering the lands of 8 separate holders.¹

Section 13. Concentration of ownership of redwood in Del Norte, Humboldt, Mendocino, and Sonoma Counties.

The following table shows the marked concentration of the ownership of redwood in the four counties of Del Norte, Humboldt, Mendocino, and Sonoma. It is different from the tables which have been given in connection with the other maps in that the percentage of concentration is based, not on the amount of total timber owned, but on the amount of redwood owned. Moreover, as indicated above, the table shows the timbered acreage and timber owned in the four counties as a whole, instead of simply that on the map area itself. The map does not cover all the timber area in the four counties; indeed, it does not cover quite all the redwood timber area. There is timber of other species lying to the east of the map area, and there is a fringe of redwood forest in places both east and west of it. The map, therefore, shows the location of certain large holdings of redwood timber in an area selected to include substantially all the redwood belt. The tables, however, include all the timber of all species in the four counties, the redwood being shown separately and the table groups being based on the amount of redwood owned.

State and Government lands are excluded.

¹ The single light diagonal, the symbol of the third group, runs from left to right on Part I of this map, and from right to left on Part II. The difference in direction has no significance; on both parts the symbol for the third group should have been identical.

TABLE 33.—TIMBER ACREAGE AND TIMBER OF PLATTED AND UNPLATTED HOLDINGS IN HUMBOLDT, DEL NORTE, MENDOCINO, AND SONOMA COUNTIES, BY GROUPS AND BY SPECIES.

[Timber in billions of board feet.]

Holders in the 4 counties (grouped according to amount of redwood owned).	Number of holders.	Timber acreage owned in the four counties.	Timber owned in the four counties.				Per cent of total redwood owned by each group.
			Redwood.	Douglas fir.	Western pine.	Other species.		Total timber.
		Acre.	Billion feet.	Billion feet.	Billion feet.	Billion feet.	Billion feet.
Platted holders:							
First group, 6 holders.....	6	1,354,291	39.5	2.8	.8	.5	43.6
Second group, 9 holders....	9	2,322,073	24.0	3.6	1.0	.3	28.9
Third group, 8 holders.....	8	163,910	12.3	2.9	.....	.2	15.4
Total, platted holders	23	870,274	75.8	9.3	1.8	1.0	87.9
Unplatted holders:							
9 holders of over 500 million feet each.....	9	90,962	6.2	1.6	.....	.1	7.9
10 holders of 250 million feet to 500 million feet each.....	10	69,169	3.4	.5	.2	.1	4.2
21 holders of 125 million feet to 250 million feet each.....	21	54,444	3.7	.3	.....	.....	4.0
12 holders of 60 million feet to 125 million feet each....	12	120,153	1.1	.1	.1	.....	1.3
Total, unplatted holders of over 60 million feet of redwood.....	52	234,728	14.4	2.5	.3	.2	17.4
Holders of less than 60 million feet of redwood—							
Owning over 60 million feet total timber ⁴	7	13,720	.2	.3	.....	.....	.5
Owning less than 60 million feet total timber ⁵		430,834	5.7	4.0	1.1	.3	11.1
Total.....		464,554	5.9	4.3	1.1	.3	11.6
Total, unplatted holders.....		699,282	20.3	6.8	1.4	.5	29.0
							21.1

¹Including 1,860 acres timber rights.

²Including 160 acres timber rights.

³Including 400 acres timber rights.

⁴In this group are 2 holders having no redwood.

⁵In this group are 14 separately reported holders, of whom 2 do not own any redwood. The 14 have 10,960 acres with 400 million feet of timber, of which 300 million are redwood, and 100 million are Douglas fir, with a trace of western pine. The remaining timber of this group, amounting to 10.7 billion feet, of which 5.6 billion feet are redwood, is in small unenumerated holdings scattered throughout the timbered region of the 4 counties. Many of these small holdings contain no redwood, being east of the redwood belt in the Douglas-fir and western-pine timber.

TABLE 33.—TIMBER ACREAGE, ETC.—Continued.

Holders in the 4 counties (grouped according to amount of redwood owned).	Number of holders.	Timber acreage owned in the four counties.	Timber owned in the four counties.				Per cent of total redwood owned by each group.	
			Redwood.	Douglas fir.	Western pine.	Other species, timber.		Total
SUMMARY.								
Total, all holders of over 60 million feet of redwood.....	75	Acres. 1, 105, 002	Billion feet. 90.2	Billion feet. 11.8	Billion feet. 2.1	Billion feet. 1.2	Billion feet. 105.3	83.9
Total, all holders of less than 60 million feet of redwood.....	.....	464, 554	5.9	4.3	1.1	.3	11.6	6.1
Total, all holders.....	.....	1, 569, 556	96.1	16.1	3.2	1.5	116.9	100.0

Section 14. Holdings of first group—six plated holders—in the four counties. (Map symbol, solid black.)

The timberland owned in Del Norte, Humboldt, Mendocino, and Sonoma Counties by the 6 members of the first group is 384,291 acres, on which stand 39.5 billion feet of redwood, 2.8 billion feet of Douglas fir, 800 million feet of western pine, and 500 million feet of other species, making a total of 43.6 billion feet for all species. Redwood is by far the most important timber—90 per cent of all—in the holdings of the group. Of the total redwood in these four counties, the 6 members of this first group own 41.1 per cent.

The members of this group are: (1) Wheeler interests, principally the Lagoon Lumber Co. (see Part I, p. 104); (2) Pacific Lumber Co.; (3) A. B. Hammond companies (see Part I, p. 104); (4) Union Lumber, Glenn-Blair Redwood, and Mendocino Lumber companies; (5) Del Norte Co.; (6) Standish-Hickey Timber Co. Of these holders the Wheeler interests and the A. B. Hammond companies have extensive areas of timber in other regions. Lands of both these holders are plated on the southwestern Washington map in the group of 33. Lands of the Hammond companies are plated on the Oregon map in the first group, and lands of the Wheeler interests in the second group. On the northeastern California map lands of the Wheeler interests are included in the first group of 5 plated holdings.

The wide-spreading interrelation of great timber holders whose holdings have nevertheless been counted as separate by the Bureau is illustrated by the following facts:

The Hammond interests are connected through a common director with the Southern Pacific, as has been stated on page 105 of Part I.

The vice president of the Pacific Lumber Co. is also interested in the Rupp holding, of the second group of platted holdings. One of the directors of the Standish-Hickey Timber Co. is a director of the Union Lumber Co. and director and secretary, respectively, of two of its allied companies. A director in one of the allied concerns of the Union Lumber Co. is secretary of the Caspar Lumber Co., one of the second group of holders. Three other directors of one or the other of the allied concerns of the Union Lumber Co. are directors of the Pacific Coast Redwood Co., a member of the second group, one being president. In addition the president of one of the Union companies is vice president of the Pacific Coast Redwood Co., and still another director of one of the Union companies is treasurer of the Pacific Coast Redwood Co.

The table shows the correct acreage of timberland owned by members of the first group. There is a discrepancy, however, between the acreage shown in the table and that platted on the map. The items of this discrepancy are stated in the note on p. 111.

Section 15. Holdings of second group—nine platted holders—in the four counties.¹ (Map symbol, heavy crosshatch.)

The 9 holders whose lands are platted with the heavy crosshatch own in Del Norte, Humboldt, and Mendocino Counties 322,073 acres of merchantable-timber land, on which stand 24 billion feet of redwood, 3.6 billion feet of Douglas fir, 1 billion feet of western pine, and 300 million feet of other species, making a total of 28.9 billion feet of all kinds of timber. The redwood, therefore, constitutes about 83 per cent of their total timber. This is a smaller proportion than is found in the holdings of the first group, in which redwood amounts to 90 per cent of the total.

The 24 billion feet of redwood which these 9 holders of the second group own in the four counties under discussion amount to 25 per cent of all the redwood in those counties.

The members of this group are: (1) Hobbs, Wall & Co. and Hotchkiss Timber Co.,² (2) the L. E. White Lumber Co., (3) the C. A. Smith Redwood Co., (4) the Desert Redwood Co., (5) David Ward estate, (6) the Hill-Davis Co., (7) the Caspar Lumber Co., (8) the Pacific Coast Redwood Co., and (9) J. J. Rupp et al. The interests prominent in the first of the above holders are also prominent in the Port Blakely Mill Co., platted on the southwestern Washington map in the group of 33; the lands of the C. A. Smith interests are platted in the first group on the Oregon map; and those of the Rupp interests in the fourth group on the Oregon map.

¹ Members of this group own no timber in Sonoma County.

² This holding also includes the Star Lumber Co.

Section 16. Holdings of third group—eight platted holders—in the four counties.¹ (Map symbol, single light diagonal.)²

The 8 members of the third platted group own in Del Norte, Humboldt, and Mendocino Counties 163,910 acres of timberland and 12.3 billion feet of redwood, in addition to 2.9 billion feet of Douglas fir and 200 million feet of other species, a total of 15.4 billion feet. Of this total, their redwood constitutes about 80 per cent, and is 12.8 per cent of all the redwood in the four counties.

Among the important holders of the third group are the Sage Land & Improvement Co., Thomas Blair, and the Southern Pacific Co. (owning here in the name of the Albion Lumber Co.). The Southern Pacific has no railroad grant extending into the redwood territory, but it recently secured control of the Albion Lumber Co. through purchase of its stock.³

Not all the lands of the third group of platted holders in these four counties lie on the area mapped. There are over 15,000 acres owned by them just off the map area. Besides, some 12,000 acres owned by them could not be shown because the Bureau secured no plats.

Section 17. Holdings of unplatted holders in the four counties.

The holders whose lands have not been platted on the redwood map are grouped into two main divisions: First, holders of over 60 million feet of redwood each, and second, holders of less than 60 million feet of redwood each. Of the first class, there are 52, divided in turn into four groups. The holders in the second class—that is, holders of less than 60 million feet of redwood each—are subdivided into (1) those who have more than 60 million feet of total timber and (2) those who have less than 60 million feet of total timber. There are 7 holders of the first subdivision, each having more than 60 million feet of total timber but less than 60 million feet of redwood, 2 of them, indeed, having no redwood at all. The second subdivision includes 14 separately reported holders of less than 60 million feet of total timber, but the bulk of the timber in this subdivision belongs to the small unenumerated holders, and was covered by general estimates. The total owned by the different groups whose lands are not platted on the map is 699,282 acres of timberland, carrying 20.3 billion feet of redwood, 6.8 billion feet of Douglas fir, 1.4 billion feet of western pine, and half a billion feet of other species, making a total of all

¹ Members of this group own no timber in Sonoma County.

² On Part I of the map this diagonal runs from left to right, while on Part II it runs from right to left. The direction of this symbol should have been the same on both parts of the map.

³ In Part I (p. 97) it was stated that the Southern Pacific and the Atchison, Topeka & Santa Fe controlled this company. Subsequent information shows that it is owned by the Southern Pacific alone.

species of 29 billion feet. The redwood owned by the unplatted holders, 20.3 billion feet, amounts to 21.1 per cent of the total redwood in the four counties under consideration.

It will be recalled that in the case of the platted holders the first group had redwood amounting to 90 per cent of their total timber; the second group had redwood amounting to about 83 per cent; and the third group to about 80 per cent. In the case of the first four unplatted groups (52 holders), the proportion of redwood is also high, ranging from nearly 80 per cent in one group to over 90 in another. But it is in the group of unplatted holders each having less than 60 million feet of redwood that the lowest proportion of redwood is found. In this group it is only 51 per cent (5.9 billion feet of redwood out of 11.6 billion feet of all species). This low proportion is due to the fact that much of the timber in this group is entirely outside the redwood belt in small unenumerated holdings in the fir and pine region east of the redwood territory. It may be noted in this connection that the average stand for this group is only about 25,000 feet per acre, a very much lower average than that of the platted holders, or the other groups of unplatted holders. The explanation is the fact that half the timber of this group is not redwood but of other species whose characteristic stand is much lighter than redwood.

Among the members of the group of 9 unplatted holders of over 500 million feet each is one company which has close association with the T. D. and E. S. Collins interests, but which has not been combined with those interests by the Bureau. The holdings of T. D. and E. S. Collins interests proper in the redwood belt rank them in the group of 10 unplatted holders of from 250 million feet to 500 million feet each. Another holder in the group of 9 unplatted holders of over 500 million feet of redwood also has extensive timberland in the South. One of the individuals controlling this holding is an associate of Mr. Weyerhaeuser in the Virginia & Rainy Lake Lumber Co. in Minnesota.

Section 18. Comparison of groups, and summary of concentration.

By comparing the acreage and total timber owned by the 6 platted holders of the first group with the acreage and timber owned by the 9 platted holders of the second group or by the 8 of the third group, it may be seen that the first group has a higher average stand per acre than the other two groups. Their 43.6 billion feet standing on 384,291 timbered acres mean an average of 113,000 feet per acre, as against an average of about 90,000 feet per acre for the second group, and 94,000 feet for the third. Yet it must not be assumed that over the entire acreage covered by the black symbol the

timber is denser than anywhere in the acreage covered by the other symbols of the map. A tract of over 90,000 acres included in this group has an average stand less than that of several holdings which are included in the second and third groups. The highest stand reported for a given holding is on a comparatively small acreage owned by a member of the third group of platted holders. In general, however, it may be said that the members of the first group have not only the greatest amount of redwood, but also the heaviest stands per acre.

If the percentages in Table 33 were based on the total timber of all species instead of on the amount of redwood alone, it would be found that the first group has 37.3 per cent of the total timber, the second group 24.7 per cent, and the third 13.2 per cent, as against redwood holdings of 41.1 per cent, 25 per cent, and 12.8 per cent, respectively. There is a somewhat greater concentration of redwood than of timber of all other species. Holders having each less than 60 million feet of redwood own only 6.1 per cent of the total redwood, though they have 9.9 per cent of the total timber. The 23 platted holders have 78.9 per cent of the total redwood and 75.2 per cent of the total timber.

As a final summary of the degree of concentration in redwood the following statements are made, segregating the more important owners in each of the three groups of platted holders so as to show the percentages owned by smaller groups than appear in Table 33 on page 104, and indicating cumulative percentages:

Out of the group of 6 platted holders, 3 own 24.8 billion feet of redwood, or one-fourth of that in the great redwood belt. The 6, as shown by the table, have over 40 per cent. The 4 largest redwood owners in the second group of platted holders have 11.6 billion feet of that timber. This, with the holdings of the first group, makes 51.1 billion feet of redwood—over half the total—owned by 10 platted holders. The 15 holders of the first and second platted groups have nearly two-thirds of the total redwood in the four counties; and these, with 3 selected from the third platted group, make 18 holders having 68.9 per cent.

In no other species of timber than redwood do the holders of 60 million feet and over own so high a percentage of the total amount of the species. While 93 per cent of all the redwood in the country, including sequoia, is in the hands of holders of over 60 million feet each, yet even in the cypress of the South only 72 per cent is owned by such holders, and in the white pine and Norway pine of the Lake States, only 80 per cent.

Section 19. Additional land owned in the four counties by holders of over 60 million feet of redwood each.

The figures already given for acreage in Table 33 covered only merchantable-timber acreage. Some of the holders in the four great redwood counties, however, have additional lands not counted as bearing merchantable timber. The following table repeats from Table 33 the acreage of timberland for each group of the holders of over 60 million feet of redwood each, and states the additional land and total acreage by groups. The purpose of these figures is to call attention to the concentration of ownership of land as distinct from timber. For, after the timber has been cut, the land remains, and may prove valuable for agriculture or rich in minerals.

If the total acreage in this table for the three platted groups is compared with the amount of land platted on the map to them, some small discrepancies appear. The table gives the true acreage so far as reported to the Bureau, while, for various reasons, not all is shown on the map. These discrepancies and the reasons therefor are explained in the note following the table.

TABLE 34.—ACREAGE OF TIMBER (INCLUDING TIMBER RIGHTS) AND ADDITIONAL LAND OWNED IN DEL NORTE, HUMBOLDT, MENDOCINO, AND SONOMA COUNTIES BY HOLDERS OF OVER 60 MILLION FEET OF REDWOOD EACH, BY GROUPS.

[Not all members of a group own additional land. The number of those owning such land is shown for each group, parenthetically in italics, in the additional land column.]

Holders in the four counties (grouped according to amount of redwood owned).	Number of holders.	Merchantable-timber acreage.	Additional land reported.	Total.
Platted holders:		<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
First group, 6 holders.....	6	1 384, 291	(5) 68, 437	452, 728
Second group, 9 holders.....	9	* 322, 073	(1) 15, 000	337, 073
Third group, 8 holders.....	8	163, 910	(<i>?</i>) 7, 682	171, 592
Total, platted holders.....	23	870, 274	(6) 91, 119	961, 393
Unplatted holders:				
9 holders of over 500 million feet each.....	9	90, 962	(<i>?</i>) 12, 000	102, 962
10 holders of from 250 million feet to 500 million feet each.....	10	69, 169	(4) 15, 540	84, 709
21 holders of from 125 million feet to 250 million feet each.....	21	54, 444	(5) 7, 800	62, 244
12 holders of from 60 million feet to 125 million feet each.....	12	* 20, 153	(1) 4, 532	24, 685
Total, unplatted holders owning over 60 million feet of redwood each.....	52	234, 728	(15) 39, 872	274, 600
SUMMARY.				
Platted holders.....	23	870, 274	(6) 91, 119	961, 393
Unplatted holders of over 60 million feet of redwood each.....	52	234, 728	(15) 39, 872	274, 600
Total, holders owning over 60 million feet of redwood each.....	75	1, 105, 002	(16) 130, 991	1, 235, 993

* Including 1,890 acres reported as timber rights.

* Including 160 acres reported as timber rights.
 † Including 400 acres reported as timber rights.

NOTE.

First group—6 *platted holders*.—The platting of lands to this group on the map is at variance with the acreage shown for the group in the above table as follows: Members of this group have off the area of the map and within the timber belt of the four counties approximately 2,000 acres. Besides, plats were not obtained by the Bureau for about 20,000 acres of land belonging to one of the members of this group. This amount is in the acreage of the table, but, of course, not on the map. On the other hand, in land platted with the symbol of this group, members of other groups own undivided interests equivalent to 24,210 acres in all, reckoning a half interest in 2 acres as equivalent to 1 acre, the equivalent of 19,630 acres being held by members of the second group of platted holders, the equivalent of approximately 3,480 acres by a member of the third group of platted holders, and the equivalent of 1,100 acres by an unknown holder.

Second group—9 *platted holders*.—About 200 acres owned by members of this group are outside the limit of the map; for 1,500 acres no plats were furnished; and 19,630 acres are owned by members of this group in the form of partial interests in lands platted to members of the first group, as explained in the preceding paragraph.

Third group—8 *platted holders*.—Over 15,000 acres are owned by members of this group just off the map area; for 12,000 acres or more no plats were furnished; and 3,480 acres (constituting a partial interest in a holding the balance of which is owned by a member of the first group) are platted with the symbol of the first group, as explained above.

The table shows that the total land owned in the four counties by the 75 holders of over 60 million feet of redwood is 1,235,998 acres, of which 130,991 acres are classed as additional, not bearing merchantable timber. This additional land amounts to about 11 per cent of the total. As indicated in connection with other map discussions, however, the complete acreage of additional land was perhaps not in all cases reported to the Bureau. (See p. 17.)

Section 20. Land frauds in redwood belt.

That 75 holders own nearly a million and a quarter acres of land indicates an unusually high degree of concentration, when it is considered that it has been attained without the presence in this region of any Federal land grant, such as tended to strengthen the concentration in northeastern California, western Oregon, and southwestern Washington. This seems to have been done chiefly under the Federal land laws despite their initial restriction of 160 acres to the person. A passage from the report of the Public Lands Commission of February 21, 1880, indicates how the spirit of the law was violated:

The commission visited the redwood-producing portion of the State of California and saw little huts or kennels built of "shakes" that were totally unfit for human habitation, and always had been, which were the sole improvements made under the homestead and preemption laws, and by means of which large areas of redwood forests, possessing great value, had been taken under pretense of settlement and cultivation which were

the purest fictions, never having any real existence in fact, but of which "due proof" had been made under the laws.

In some sections of timber-bearing country where there should be, according to the "proofs" made, large settlements of industrious agriculturists engaged in tilling the soil, a primeval stillness reigns supreme, the solitude heightened and intensified by the grandeur of high mountain peaks, where farms should be accorded to the proofs made, the mythical agriculturist having departed after making his "final proof" by perjury, which is an unfavorable commentary upon the operation of purely beneficent laws.¹

A more definite statement covering extensive frauds by which a large timber firm attempted to acquire 100,000 acres of choice wooded lands in the Humboldt district is found in the Report of the Commissioner of the General Land Office for 1886.²

This case shows that the ramifications of the fraud extended into the General Land Office at Washington, and also shows some of the difficulties encountered by special agents when their discoveries implicate wealthy and influential persons. In 1883 a special agent of this office reported that this company had procured a large number of fraudulent entries, amounting, according to his estimates, to not less than 100,000 acres. The agent's report disclosed the scheme of fraud in all its details, and was supported by specific evidence in many cases. He also informed this office that he had been offered a bribe of \$5,000 to suppress the facts and abandon the investigation, which he declined. This agent was subsequently suspended from duty and afterwards dismissed from the service at the instance, as understood in this office, of great influence brought against him from the Pacific coast and in Washington.

* * * * *

A new agent was appointed, who reached his field of operations about the first of January last and entered upon the discharge of his duties. The agents of the company soon discovered his presence and business and attempted to defeat the investigation. Some of the witnesses were spirited out of the country; others were threatened and intimidated; spies were employed to watch and follow the agent and report the names of all persons who conversed with or called upon him; and on one occasion two persons who were about to enter the agent's room at his hotel for the purpose of conferring with him in reference to the entries were knocked down and dragged away. Notwithstanding this the agent proceeded with his investigation and succeeded in obtaining a large amount of evidence. He found 90 of the entrymen and procured their affidavits as to the frauds and the manner in which they were induced to make the applications and affidavits. This testimony embraced 47 of the patented cases. Several employes of the company gave sworn statements

¹ Report of Public Land Commission, Ex. Doc. No. 46, 46th Cong., 2d sess., Feb. 21, 1880, Quoted in The Public Domain, Misc. Doc. No. 45, p. 543, pt. 4, 47th Cong., 2d sess.

² Ex. Doc. No. 1, pt. 5, pp. 93-95, 49th Cong., 2d sess., vol. 9.



of their connection with the illegal transactions and of facts within their knowledge. Affidavits were also made by citizens of Eureka and other reliable persons, among which are the affidavits of sixteen business men, who were asked to make entry applications in the interest of the company and offered \$50 each, but who declined to do so. It appears that the persons composing this company went to work systematically and on an extensive scale, and to enable them to carry through their scheme they took into their association several wealthy men, who furnished the necessary means. Expert surveyors and men well informed in regard to the character and value of timber were employed to locate and survey the lands. Others were then hired to go upon the streets of Eureka and elsewhere and find persons who could be induced to sign applications for land and transfer their interests to the company, a consideration of \$50 being paid for each tract of 160 acres so secured. The company's agent received \$5 for each applicant obtained. No effort seems to have been made to keep the matter secret, and all classes of people were approached by agents and principals of the company and asked to sign applications. Sailors were caught while in port and hurried into a saloon or to a certain notary public's office and induced to sign applications and convey the lands to a member of the firm. Farmers were stopped on their way to their homes, and merchants were called from their counters and persuaded to allow their names to be used to obtain title to the lands. The company's agent presented the applications to the register and receiver in blocks of as many as 25 at one time; paid the fees; had the proper notices published; hired men to make the proofs; paid for the lands and received the duplicate receipts; yet the register and receiver and some of the special agents appear to have been the only persons in the vicinity who were ignorant of the frauds.

Section 21. Total holdings in Pacific-Northwest of holders platted on redwood map.

Many of the holders platted on the redwood map own no timberlands in the Pacific-Northwest outside the redwood counties. Since only one or two holders would appear in such a table for a given group and a given region, it is impossible to give a table of total holdings in the Pacific-Northwest by regions, as was done in connection with other maps, without revealing the amount of timber owned by certain holders. It seems best, therefore, simply to state the total amount of timberland and timber owned by the 23 platted holders of the redwood map in the Pacific-Northwest as a whole. Their timbered acreage in the Pacific-Northwest is 5,503,012 acres, and the timber thereon is 237.9 billion feet. These figures, of course, include the holdings of the Southern Pacific Co., which totals in the Pacific-Northwest 3,841,816 acres of merchantable-timber land and 105.6 billion feet of timber.

As regards total land holdings, it is sufficient to state that the 23 platted holders own in the Pacific-Northwest 5,503,012 acres of merchantable-timber land, and 676,686 acres of additional land, making a total of 6,179,698 acres. Of this amount, 3,844,816 acres of merchantable timber, and 551,005¹ acres of additional land, a total of 4,392,821¹ acres, are held by the Southern Pacific.

NOTE.

State lands.—The State of California retains the ownership of only about 8,700 acres of land in Humboldt, Del Norte, and Mendocino Counties. All of this is to the east of the redwood belt. Besides, there are over 26,500 acres of land within the forest reserve, lying in sections 16 and 36, which the State has offered to the Federal Government as "base" for other lands which it has selected in lieu. These lieu selections not having been approved by the Secretary of the Interior, the lands offered as base can not as yet be said to have been relinquished by the State. The Bureau has no record of lands which the State may own in Sonoma County.

The foregoing statement makes it clear that the State of California owns very little if any redwood timber in the four counties under discussion. The Bureau has made no inquiry in the redwood region to determine whether any large amount of State land scrip was used by timber owners in securing large holdings, as was done in northeastern California.

¹ See note 1 of Table 32, p. 100 for several million acres of non timbered land owned by the Southern Pacific but excluded from this figure.

CHAPTER V.

CONCENTRATION OF TIMBER OWNERSHIP IN NORTH CENTRAL IDAHO.

Section 1. Amount and general distribution of timber in Idaho.

The total amount of privately owned standing timber in Idaho is 50.4 billion feet. While this is much less than that in any of the States of the Pacific-Northwest thus far discussed, a considerable portion of the State is nevertheless heavily timbered. There are two principal timber belts, the white pine and the western or yellow pine. Each of these species of pine is practically unmixed with the other, but each is accompanied by a considerable proportion of other timber, such as fir, larch, spruce, etc. The white-pine belt extends all the way across the northern end of the State and southward along the eastern border to a point well below the middle of the State. The western-pine belt lies west and south of the white-pine section, broadening out as it extends southward to the neighborhood of Boise. From Boise southward there is little merchantable timber other than that included in national forests. And in the eastern part of the State below the Panhandle there is likewise little privately owned timber of merchantable size. The chief counties for timber in Idaho are Bonner, Kootenai, Shoshone, Latah, Nez Perce, Idaho, Washington, and Boise. Of these, Idaho County, though timbered, is inaccessible, mostly unsurveyed, and contains little privately owned timber.

The selected map area for Idaho covers probably the heaviest portion of the white-pine belt. It also takes in a part of the western-pine district. Before passing to the detailed discussion of the timber in this selected area, mention should be made of the general location and character of the important privately owned timber regions of the State outside this map. One of the most important of these outside areas lies in the extreme northern portion of the State. This embraces the greater part of Bonner County and the northern portions of Shoshone and Kootenai Counties. In the northern part of Kootenai County there is a stretch of prairie land (the Spokane Valley) running to the southwest and broadening from a narrow valley at the north to many miles in width as it approaches the State boundary on the west. To the north of this prairie section in Kootenai and in southern Bonner County there is a good growth of western pine, and to the south of it a region of mixed species.

There is also a large area of land timbered mainly with white pine and Douglas fir in the national forests to the east of the map area. In certain townships in this section considerable selections of land have been made by means of Northern Pacific lieu scrip, but a great part of it is still in the hands of the Government. Just to the southwest of the map area is the former Nez Perce Indian Reservation, a considerable portion of which is timbered with western pine. Lumber companies have just begun to acquire holdings in this region. The only other regions of Idaho where there are important private holdings of standing timber are in Washington and Boise Counties in the southwestern part of the State.

Section 2. General description of map area.

The Idaho ownership map (facing p. 130) covers what is known as the St. Joe country, the St. Mary's country, and the Clearwater country—these regions being named after the principal streams—and the Potlatch country. The map extends, roughly, from the neighborhood of Coeur d'Alene Lake and of Wallace on the north to the latitude of Lewiston on the south, and covers an irregular area approximately 85 by 65 miles in extreme. The exact position of this area in the State is shown by the key drawn on the lower part of the map itself. The northern boundary is the north line of township 47 N. The city of Wallace is just north of the northern boundary of the map in range 4 E., and the southern tip of Coeur d'Alene Lake is shown in the northwestern part, where the greater part of Coeur d'Alene Indian Reservation also appears.

This reservation has only recently been opened for settlement, filings having commenced in May, 1910. Certain townships in the west, central, and south central parts are nontimbered, but a large area of the reservation bears a good growth of western pine. None of this timber is counted as privately owned in this discussion or in the report as a whole.

On the southwest the map extends to the open prairie region about the city of Moscow, stopping at the south line of township 40 N. On the east it follows the white-pine timber farther south, to the southern boundary of Nez Perce County in township 34 N. A rough approximation of the division between the white-pine and the western-pine belts on the map area might be made by following the east boundary of the Coeur d'Alene Reservation to its southeast corner, thence running a line in a southeasterly direction to the Boise meridian at about township 40 N., thence southward about two townships, thence eastward in tier 37 N. through range 4 E., and southward to the map boundary.

The map covers all of the well-timbered region of the county of Latah and part of the timber in the counties of Kootenai, Shoshone,

and Nez Perce. On the east the map is bounded by the east line of range 6 E. Beyond this to the Idaho-Montana State line all the country is embraced within national forests, the western boundaries of which are shown on the map. Some lands in these national forests, as said, have been selected by means of Northern Pacific lieutenants, but the territory as a whole is unsurveyed Government land. In the west central part of the map is shown the boundary of the old Palouse National Forest, which is now a part of the Coeur d'Alene National Forest.

It will be observed that within the boundaries of this old Palouse National Forest a considerable proportion of the land is owned by platted holders. The only national forests touching on the map area are the Coeur d'Alene (including the former Palouse National Forest) and the Clearwater. The main bodies of these forests lie to the east of this map where little land has passed into private ownership. The gross area of the Coeur d'Alene National Forest is 1,543,844 acres, of which 18.9 per cent had passed into private ownership before the reserve was created; and that of the Clearwater is 2,687,860 acres, of which 6.9 per cent had gone into private hands before the reserve was created.

NONTIMBERED AND BURNED AREAS ON MAP.—There is considerable nontimbered or burned territory on the map area. The descriptions in this paragraph of the burned areas do not cover areas burned in the Idaho forest fires of the summer of 1910, which were subsequent to the Bureau's field work. The situation prior to 1910, however, may be stated roughly. As regards Nez Perce County, the Bureau's information is not such as to enable it to locate exactly the nontimbered or burned-over portions of the various townships. For the other parts of the map the Bureau has detailed information, but the nontimbered or burned lands are scattered among the platted holdings in such a way that it is impracticable to represent such areas graphically.

It should be pointed out that the blank space on the map in the northern part of 38 N., 6 E., and in the southern part of 39 N., 6 E., is not an untimbered area, but instead is good timberland, owned almost solidly by one of the more important unplatted holders. Similarly, the blank space in the northern part of 46 N., 2 E., is well timbered, and is almost solidly occupied by some of the larger unplatted holdings. In the blank space in 47 N., 2 E., however, there are practically no timber holdings. There is a burn covering a considerable part of 42 N., 2 E., and there is a tract more or less burned or cut over in 42 and 43 N., 1 E.

The nontimbered area in the west, central, and south central parts of the Coeur d'Alene Indian Reservation has been already noted. Outside the reservation, along the southeast boundary, is a rather

limited region in which the timber is of little value. In the extreme western ranges of township 40 N. there is open country in the agricultural region about Moscow. Considerable logging has been done in the timber tracts easily accessible to the St. Joe, the St. Mary's, and the Palouse Rivers, and there are cut-over lands in many parts of the map.

RAILROAD GRANT LIMITS.—The limits of the Northern Pacific Railway Co.'s grant appear in the central part of the map. The main line of the Northern Pacific, by which the grant limits were determined, runs through Sand Point, well to the north of the map area, so that the three limit lines on the south side of the railroad are the only ones which appear here. Between Missoula, Mont., and Spokane, Wash., the main line of the railroad makes a long sweep to the northwest and then to the southwest, a fact which explains the pyramidal form of the grant limits on the map. In Idaho and Montana the railway company has not only a primary, or 40-mile limit, and a first indemnity limit, 50 miles from the main line, but also a second indemnity limit of 10 miles additional (16 Stat., 378). This second indemnity limit is therefore 60 miles from the main line.

The branch lines of the railway shown on the map have no relation to the position of the grant limits. In this connection, it should be noted that the location of the new Chicago, Milwaukee & Puget Sound Railway (owned by the Chicago, Milwaukee & St. Paul Railway Co.) is not indicated on the map. It crosses the Bitterroot Mountains by St. Regis Pass, and follows down the St. Joe, tapping the great white-pine belt in the region where the Milwaukee Land Co., also a subsidiary of the Chicago, Milwaukee & St. Paul, has large holdings.

MAP SYMBOLS.—The lands still owned by the Northern Pacific are platted on the map (symbol, heavy crosshatch), including unpatented or unsurveyed lands claimed by the railway under its grant. The map also shows a group of 3 holders platted in solid black, and a second group of 3 holders platted in a light diagonal. The State lands are indicated by the letter S. The Bureau's report on State lands in Latah and Kootenai Counties is not authoritative. It is possible that there are other lands in Latah County owned by the State on which it has not sold timber rights, and part of the lands platted to the State in Kootenai County may have been sold. In all, there are platted with the symbol S on the Idaho map area about 155,000 acres of State lands. The Bureau has no complete estimate of the amount of timber on these lands.

Section 3. Concentration of timber ownership in area of Idaho map.

In the area of the Idaho map there are 29.8 billion feet of private timber, or approximately three-fifths of the private timber in the

State. Only 7 private holdings of timber are platted. The following table shows the acreages of timberland and the amounts of merchantable timber owned by these 7 holders on the map area, and also by the unplatted holders.

The acreage in this table is merchantable-timber acreage. A later paragraph (p. 125) will show a small amount of "additional" lands not carrying merchantable timber. A considerable amount of timbered acreage on this map area is held in the form of "timber rights" without ownership of the land in fee. Footnotes to the table show the amount of such acreage held by the various groups.

State timber and timber owned by the Federal Government are not included in the table, and, as above noted, the timber in the recently opened Coeur d'Alene Indian Reservation is not included.

TABLE 35.—TIMBER ACREAGE AND TIMBER OF PLATTED AND UNPLATTED HOLDINGS ON IDAHO MAP, BY GROUPS.

[Timber in billions of board feet. Thus, 1.6=1,600,000,000 board feet.]

Holders.	Number of holders.	Timber acreage owned on map area.	Timber owned on map area.	
			Acres.	Billion feet.
Platted holders:				
Northern Pacific Ry. Co.	1	108,403	1.6	5.4
First group, 3 holders.....	3	1,508,778	16.1	54.0
Second group, 3 holders.....	3	118,406	3.4	11.4
Total, platted holders.....	7	735,587	21.1	70.8
Unplatted holders (grouped by size of holding in State):				
4 holders of over 250 million feet each.....	4	39,225	1.3	4.4
3 holders of 125 million feet to 250 million feet each.....	3	23,553	.6	2.0
3 holders of 60 million feet to 125 million feet each.....	3	9,239	.2	.7
Total, unplatted holders of over 60 million feet each.....	10	72,017	2.1	7.1
Holders of less than 60 million feet each.....		405,864	6.6	22.1
Total, unplatted holders.....		477,881	8.7	29.2
SUMMARY.				
Platted holders.....	7	735,587	21.1	70.8
Unplatted holders of over 60 million feet each.....	10	72,017	2.1	7.1
Total, holders of over 60 million feet each.....	17	807,604	23.2	77.9
Unplatted holders of less than 60 million feet each.....		405,864	6.6	22.1
Total, all holders.....		1,213,468	29.8	100.0

¹ Including 92,212 acres reported as timber rights.

² Including 13,962 acres reported as timber rights.

³ Including 10,400 acres reported as timber rights.

⁴ Including Northern Pacific lands under contract to unidentified holders, amounting to 4,375 acres and 100 million feet.

⁵ Including 1,969 acres reported as timber rights.

Section 4. Holding of Northern Pacific Railway Co. on map area. (Map symbol, heavy crosshatch.)

The holding of the Northern Pacific Railway Co. on the Idaho map area amounts to 108,403 acres of timberland, carrying 1.6 billion board feet of timber. This is 5.4 per cent of the total private timber on the map area. There are nontimbered lands of this company platted on the map which bring the total of all lands (as distinct from timberlands only) up to 119,692 acres. It will be observed that a considerable part of the Northern Pacific land lies in the northeastern part of the map, more or less away from the holdings of other companies. A very considerable acreage of lands platted to the other two groups of holdings was originally acquired from the Northern Pacific (see p. 126), and part of the lands so acquired is still under contract, the railway company not having secured the patent from the Government. On the map and in the table, of course, these contract lands are not credited to the Northern Pacific, but to the contract holders. In the case of contracts covering 4,375 acres on the map area, the Bureau does not know the names of the contract holders. This tract of 4,375 acres with the timber on it has, therefore, been included in the table in the group of unplatted holders of 125 million to 250 million feet, without making any addition to the number of holders in that group. It is not platted to the Northern Pacific nor credited to it in the table.

A considerable proportion of the Northern Pacific's land in that part of Kootenai County shown on the map is poorly timbered, most of the well-timbered lands of the railroad grant in this part of the map having been disposed of to lumber companies. The railway's lands in the northeastern part of the map and in Nez Perce County are more heavily timbered. The Nez Perce County lands are selections made by the Northern Pacific with forest-lieu scrip, and have not been contracted to others.

MUCH OF NORTHERN PACIFIC'S LAND SUBJECT TO RECLASSIFICATION.—The status of the Northern Pacific's claim to considerable areas of land is now uncertain. This is due to the fact that the grant excluded mineral lands, and the determination of what lands are mineral is still unsettled.

In the early administration of the grant there was no adequate system for determining the mineral or nonmineral character of the lands. In 1895 Congress passed an act providing that commissioners appointed by the President should classify the odd-numbered sections in the limits of the grant where it traversed the chief mineral regions of Montana and Idaho. There has been much dissatisfaction with the classifications under this act, and informal charges of fraud, to the effect that odd-numbered sections desired by the railroad for timber or other value were classified by the com-

missioners as nonmineral—which gave them to the railroad—and odd-numbered sections not desired by the railroad were classified as mineral—which meant that the Government kept them, and the railroad made indemnity selections of valuable land elsewhere within the indemnity strip. Lands classified as mineral by the commissioners have in many cases subsequently been taken up by homesteaders and timber and stone claimants under acts which also exclude mineral lands, their affidavits that the lands were actually nonmineral having been accepted by the General Land Office regardless of the classification by the commissioners. That is, the classification by the commissioners is regarded under the law as conclusive as to the railroad company but as of no effect as to individual claimants.

In 1901 the work on the mineral classification was discontinued on account of the exhaustion of the appropriation and on account of local protests alleging that the classifications were merely perfunctory and in many cases were erroneous. Approximately 268,000 acres remained still unclassified. In 1910 Congress appropriated \$30,000 for the completion of the work. The railroad company itself has asked for the reexamination of certain lands which had been classified as mineral and has agreed that in return other lands previously classified as nonmineral should also be reexamined. The new field examinations have been made by the Geological Survey; but about 258,000 acres, the classification of which was formerly made but never approved, are being reexamined by special agents of the General Land Office.

Section 5. Other platted and unplatted holdings on map area.

FIRST GROUP, THREE PLATTED HOLDERS. (MAP SYMBOL, SOLID BLACK.)—The holdings platted in this group are: (1) Those of the Potlatch Lumber Co.; (2) those of the Clearwater Timber Co.; and (3) those of the Milwaukee Land Co., which is owned by the Chicago, Milwaukee & St. Paul Railway Co. Though members of the Weyerhaeuser family are among the controlling forces in the Potlatch Lumber Co. and the Clearwater Timber Co., the Bureau has counted these holdings as separate from each other as well as from the Weyerhaeuser Timber Co.

The combined holdings of these three companies on the area of the map amount to 508,778 acres of timberland and 16.1 billion feet of timber, which is 54 per cent of the total private timber on the map area. This indicates a very marked degree of concentration, especially in view of the close connection between two of the holders. Of the merchantable-timber acreage of these three holders, 416,566 acres, are owned in fee; on the remaining 92,212 acres timber rights are owned, but not the fee.

In one tract of 18,165 acres owned in fee by the State, 3 companies have an undivided interest in the timber only, as follows: A one-half interest is owned by a member of the first platted group, a one-fourth interest by another member of the same group, and the remaining one-fourth interest by a member of the second platted group. On the map this tract has all been platted with the solid black symbol of the first group, but in the table the acreage and the timber are divided between the two groups.¹

Of the Potlatch Lumber Co.'s holding over 80,000 acres were acquired from the State, almost all of it in the form of timber rights. The interests controlling the Potlatch Lumber Co. also control another company, the Payette Lumber & Manufacturing Co., which owns 130,000 acres in Idaho far to the south of the map area. Again, the interests controlling the Clearwater Timber Co. also control the Humbird Lumber Co., and both companies have practically the same officers. The Humbird Lumber Co. is the dominant owner of timber in that part of Idaho to the north of the map area, owning about 194,000 acres in northern Kootenai County and in Bonner County. A large proportion of this land was obtained from the Northern Pacific grant. It is admitted that there is a tacit understanding with the Northern Pacific by which the Humbird Lumber Co. will eventually acquire all it may desire of the Northern Pacific's remaining timberlands in Bonner County, amounting to 150,000 acres. The Clearwater Timber Co. obtained over 100,000 acres of its timber holdings from the Northern Pacific, part being already deeded to it by the railroad, and part being still under contract, to be deeded when patented by the Government. It has on the map area alone some 83,000 acres obtained thus from the Northern Pacific. Of this amount, 11,320 acres are unpatented land.

The Chicago, Milwaukee & St. Paul Railway Co. has purchased its western timber holdings within the past few years in connection with the recent extension of its railroad from South Dakota to Puget Sound. What may be regarded as the nucleus of its Idaho holdings was formed by the purchase of a large block of excellent timberland which had been assembled some time before by another company. Lands were also assembled for it by the Monarch Timber Co. and were afterwards transferred to the Milwaukee Land Co., in whose name the Idaho timber holdings of the railroad now stand. The Milwaukee Land Co. also has some lands that were originally part of the Northern Pacific grant, about 4,000 acres having been obtained in this way. It also holds some 8,000 acres of timber rights acquired from the State.

¹ These 3 owners appear to have since sold the tract to the Blackwell Lumber Co., a member of the second group of platted holders.

SECOND GROUP, THREE PLATTED HOLDERS. (MAP SYMBOL, SINGLE LIGHT DIAGONAL.)—The members of this group are (1) the Edward Rutledge Timber Co., (2) the Blackwell Lumber Co., and (3) the Coeur d'Alene Lumber Co. The three holders of this group have on the area of the map 118,406 acres of timberland and 3.4 billion feet of timber, or 11.4 per cent of the total timber on the map. Most of their lands lie in the central and northern portions of the map area.

Members of the Weyerhaeuser family are prominent in the Edward Rutledge Timber Co. and also in the Bonner's Ferry Lumber Co., which owns timber off the map area in Bonner County, Idaho, in Montana, and across the Canadian border. Members of this family also control an important timber company having 90,000 acres in Wisconsin. It is to be noted that the companies which the Weyerhaeuser family are known to control are not combined, in the Bureau's tabulations, with the Weyerhaeuser Timber Co., nor with the Potlatch, Payette, Humbird, or Clearwater concerns.¹

Of the Edward Rutledge Timber Co.'s holding on the map area a very considerable part (21,160 acres) was obtained from the Northern Pacific Railway Co. Part of this land is still under contract of sale, title not having passed to the timber company because patent has not yet issued from the Government. The company is one of those referred to on page 122 as owning a part interest with two other companies in the timber on certain State lands. Its proportion of these timber rights would amount to something over 4,500 acres.²

The Blackwell Lumber Co. has also become an important holder in Kootenai and Shoshone Counties. It purchased the lands of the B. R. Lewis Lumber Co., and took over the selected timber holdings of Charles R. Smith and the Menasha Woodenware Co. in these counties, of which about 8,000 acres had been purchased as timber rights from the State.³ The Menasha Woodenware Co. is still an important owner in Bonner County, Idaho, and in southwestern Oregon, and is closely connected with the Blackwell Lumber Co. The president of the Blackwell Lumber Co. is also president of the Panhandle Lumber Co., which owns 100,000 acres of timber in northern Kootenai and southern Bonner Counties, Idaho, and in the adjoining portions of Spokane and Stevens Counties, Wash.—much of it acquired from the Northern Pacific grant. The Bureau has counted the Blackwell and the Panhandle companies as separate holders.

The Coeur d'Alene Lumber Co.'s holding was largely formed by purchase of Northern Pacific granted lands. It owns on the map area

¹ For the timber holdings of the concerns in which Frederick Weyerhaeuser and his close associates are interested, see p. 6, footnote.

² See, however, note on p. 122, to the effect that the timber rights on the entire tract appear to have been subsequently sold to the Blackwell Lumber Co.

³ This is a different tract from that referred to in the note on p. 122 as recently bought by the Blackwell Lumber Co.

about 35,000 acres that were thus obtained. The interests controlling the company also control companies owning some timber in Montana.

UNPLATTED HOLDERS.—Table 36 shows only 10 unplatted holders having more than 60 million feet each. These are arranged in three groups according to the amount of timber they own in the State.

The last group of unplatted holders—those owning less than 60 million feet each—is made up largely of individual claim owners, with a few who have perhaps got together several quarter sections of land. The number of persons in this group can not be stated, since the Bureau's information as to holdings of this character is in the shape of general estimates. This group totals 405,864 acres and 6.6 billion feet of timber, which is between one-fifth and one-fourth of the total privately owned on the map area. It will be noted that these small holders have a very much lower average stand than the holders of over 60 million feet, having only 16,000 feet per acre as against the larger holders' average of 29,000 per acre.

The strength of these unplatted holders, especially those owning less than 60 million feet each, is by no means proportionate to the amount of timber they own as a group. As already explained, the timber of small holders, especially where their holdings are widely scattered and surrounded by those of larger interests, is to a considerable extent at the mercy of such large holders. This is especially true where, as in the case of the Idaho map area, the degree of concentration of ownership by large interests is exceptionally high. In other words, even the high percentages already given for the groups of platted holders do not really state the full strength of these owners.

SUMMARY OF CONCENTRATION.—There are altogether only 17 holders of 60 million feet and over on the entire map area. Of these, 7 whose lands are platted own no less than 70.8 per cent of the total timber, 10 whose lands are unplatted own 7.1 per cent, and the 17 taken together own 77.9 per cent—over three-fourths—of all the privately owned timber in the region covered by the map, a region which contains three-fifths of the privately owned timber in the State of Idaho. While the area covered by this map is very much smaller than that covered by several of the other maps discussed in this part, the degree of concentration here shown is exceptionally high. Moreover, out of the 7 platted holders 3 are closely connected, respectively, with 3 other important timber companies elsewhere in the State: The Potlatch, with the Payette; the Clearwater, with the Humbird; the Edward Rutledge, with the Bonners' Ferry. The Weyerhaeuser family is interested in all these 6 companies.

Certainly the Idaho white-pine belt is so largely in the hands of these 7 holders, or so largely under their control, that an outsider would find it difficult to assemble at the present time a holding of as much as 250 million feet of white pine against their opposition. This

is especially significant in view of the fact that 3 of these 7 holders are interrelated by minority interests in such a way as to make probable a common policy.

In western pine, which is less valuable and has not been so eagerly sought, the concentration is less marked. In fact, the greater part of the timber owned by holders of less than 60 million feet each in Idaho is in the western pine territory.

ADDITIONAL LAND OWNED ON MAP AREA BY HOLDERS OF OVER 60 MILLION FEET EACH.—Very little additional acreage—that is, land not counted as bearing merchantable timber—is owned on the map area by holders of 60 million feet and over. The amount of such additional acreage is only 13,117 acres, of which 11,289 are owned by the Northern Pacific. However, no complete record of the additional acreage of the Northern Pacific on the map area was secured by the Bureau.

Section 6. Land obtained from State of Idaho and from Northern Pacific by large holders.

A rough accounting has been made by the Bureau of all the lands in the Idaho map area which were granted to or selected by the State and of all those granted to or selected by the Northern Pacific, to see how far they are now owned by large timber owners. The lands retained by the State and by the Northern Pacific are also indicated. The tables follow:

TABLE 36.—OWNERSHIP IN 1908 OF GRANT TO STATE OF IDAHO IN AREA OF IDAHO MAP.

Present holders.	Granted land owned or leased on map area.								
	Approved.			Pending.			Total.		
	Fee.	Timber rights.	Total.	Fee.	Timber rights.	Total.	Fee.	Timber rights.	Total.
First group of platted holders:									
Potlatch Lumber Co....	3,000	177,923	80,923	160	960	1,120	3,160	78,883	82,043
Clearwater Timber Co.	80	.....	80	.....	.....	.....	80	.....	80
Milwaukee Land Co....	.....	18,021	8,021	.....	.....	.....	.....	8,021	8,021
Total, first group....	3,080	85,044	89,024	160	960	1,120	3,240	86,904	90,144
Second group of platted holders:									
Blackwell Lumber Co.	440	18,000	8,440	.....	.....	.....	440	8,000	8,440
Edward Rutledge Timber Co.....	.....	4,541	4,541	.....	.....	.....	.....	4,541	4,541
Total, second group.	440	12,541	12,981	.....	.....	.....	440	12,541	12,981

¹ Includes 9,083 acres representing a one-half interest in the tract of 18,165 acres referred to on p. 122 and note.
² Includes 4,541 acres representing a one-quarter interest in the tract of 18,165 acres referred to on p. 122 and note.
³ Does not include the 18,165 acres referred to in the note on p. 122.
⁴ Consists of a one-quarter interest in the tract of 18,165 acres referred to on p. 122 and note.

TABLE 36.—OWNERSHIP IN 1908 OF GRANT TO STATE OF IDAHO IN AREA OF IDAHO MAP—Continued.

Present holders.	Granted land owned or leased on map area.									
	Approved.			Pending.			Total.			
	Fee.	Timber rights.	Total.	Fee.	Timber rights.	Total.	Fee.	Timber rights.	Total.	Total.
3 unplatted holders.....	<i>Acres.</i> 480	<i>Acres.</i> 5, 640	<i>Acres.</i> 6, 120	<i>Acres.</i> 40	<i>Acres.</i>	<i>Acres.</i> 40	<i>Acres.</i> 520	<i>Acres.</i> 5, 640	<i>Acres.</i>	<i>Acres.</i> 6, 160
Total accounted for in private owner- ship.....	4, 000	104, 125	108, 125	200	960	1, 160	4, 200	105, 085	.....	109, 285
Retained by State of Idaho.....	153, 345	.....	153, 345	.....	.....	.....	153, 345	.....	.....	153, 345
Total accounted for.....	157, 345	104, 125	261, 470	200	960	1, 160	157, 545	105, 085	.....	263, 690
Unaccounted for.....	.....	.....	85, 090	.....	.....	5, 920	.....	.....	.....	91, 010
Total.....	.....	.....	346, 560	.....	.....	7, 080	.....	.....	.....	353, 640

TABLE 37.—OWNERSHIP IN 1908 OF NORTHERN PACIFIC GRANT IN AREA OF IDAHO MAP.

Present holders.	Granted land owned on map area.				
	Patented.		Un- patented.		Total.
	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
Northern Pacific Ry. Co.....	.....	70, 092	49, 600	119, 692	.....
First group of platted holders:	.....	.....	.....	.....	.....
Potlatch Lumber Co.....	11, 000	.....	.....	1, 000	.....
Clearwater Timber Co.....	71, 600	11, 320	.....	82, 920	.....
Milwaukee Land Co.....	3, 980	.....	.....	3, 980	.....
Total, first group.....	76, 580	11, 320	.....	87, 900	.....
Second group of platted holders:	.....	.....	.....	.....	.....
Blackwell Lumber Co.....	880	120	.....	1, 000	.....
Edward Rutledge Timber Co.....	15, 560	5, 600	.....	21, 160	.....
Coeur d'Alene Lumber Co.....	34, 550	280	.....	34, 830	.....
Total, second group.....	50, 990	6, 000	.....	56, 990	.....
Total, platted holders.....	197, 662	66, 920	320	264, 882	.....
3 unplatted holders.....	1, 000	.....	.....	1, 320	.....
Total accounted for.....	198, 662	67, 240	.....	265, 902	.....
Unaccounted for.....	23, 128	25, 730	.....	48, 858	.....
Total.....	221, 790	92, 970	.....	314, 760	.....

¹ Includes 400 acres reported as timber rights.

The first table shows that the State originally held in this map area a total of 353,587 acres, of which 346,507 acres consist of approved State selections. The Bureau has accounted for the ownership of 261,417 acres out of the total. The State itself retains 153,345 acres of the land accounted for, and 108,072 acres are held by large timber owners. With reference to the 7,080 acres of pending State selections, 1,160 acres are reported by large timber holders; but of the remaining 5,920 acres the Bureau has no information as to whether the beneficial interest in these selections still belongs to the State; for the State may have contracted to sell the timber on them. It may be added that since the date of the map (1908) the State has selected about 65,000 acres that are still pending. These do not appear on the map, nor are they included in the table. The State may or may not have contracted to sell the timber on them.

It will be observed that the approved State lands held by large timber owners are practically all held in the form of timber rights, the State retaining the fee.

The second table shows that out of a total of about 315,000 acres selected by the Northern Pacific in the map area, about 120,000 acres are still retained by the company and about 145,000 acres are now held by other large timber owners. The chief of these are the Coeur d'Alene Lumber Co., which secured granted lands; and the Clearwater Timber Co. and the Edward Rutledge Timber Co., which secured mostly the Mount Rainier lieu-selection lands.

Out of the 83,000 acres of Northern Pacific lands held on the map area by the Clearwater concern, over 55,000 acres were secured by Mount Rainier lieu selection. The above tabular statement of the ownership of Northern Pacific lands in the Idaho map area should be compared with the tabular statement in Part I (p. 239), which shows the present ownership of the Northern Pacific selections made in Idaho and in other States in lieu of lands relinquished in the Mount Rainier National Park and the former Pacific Forest Reserve. The former table covers the whole of Idaho with respect to a special class of Northern Pacific lands. This table covers all classes of Northern Pacific lands in the limited area of the map.

Since 1908, the date of the map, the Northern Pacific has selected lands in the map area amounting to about 19,000 acres. It may still retain the ownership of these, or it may have contracted to sell its rights in them. They are not included on the map nor in the table.

Section 7. Total holdings in State of Idaho and in Pacific-Northwest of holders platted on Idaho map.

TIMBERED ACREAGE AND TIMBER.—The figures stated here for timbered acreage and timber on the map area are repeated from Table 35. The timber owned on the map area by the 7 platted holders stands in

the name of the Northern Pacific, Potlatch, Clearwater, Milwaukee, Rutledge, Blackwell, and Coeur d'Alene companies mentioned on pages 121 and 123. These companies have the record title. But most of them, as there stated, are respectively controlled by interests which also control other concerns owning timber elsewhere in the State or in the Pacific-Northwest; and all timber owned by companies thus controlled by a single interest is counted as a single holding. In the following table, therefore, the amounts given for the various groups under the columns "State of Idaho" and "Pacific-Northwest" include the entire amount owned in those regions, whether owned by the particular map-area companies or by the other companies controlled by the same interests.

TABLE 38.—TIMBER ACREAGE AND TIMBER OWNED IN IDAHO AND IN PACIFIC-NORTHWEST BY THE 7 PLATTED HOLDERS OF IDAHO MAP, BY GROUPS.

Holders platted on Idaho map.	Num-ber of holders.	On Idaho map area.		In State of Idaho.		In Pacific-North-west.	
		Merchant-able-timber acreage.	Timber.	Merchant-able-timber acreage.	Timber.	Merchant-able-timber acreage.	Timber.
		<i>Acres.</i>	<i>Billion feet.</i>	<i>Acres.</i>	<i>Billion feet.</i>	<i>Acres.</i>	<i>Billion feet.</i>
Northern Pacific Ry. Co.	1	108,403	1.6	324,130	4.5	2,979,023	36.2
First group, 3 holders.....	3	1,698,778	16.1	503,217	21.7	1,110,032	38.5
Second group, 3 holders.....	3	118,406	3.4	151,457	3.8	171,735	4.1
Total.....	7	735,587	21.1	1,278,894	30.0	4,260,780	78.8

¹ Including 92,212 acres timber rights.

² Including 135,958 acres timber rights.

³ Including 140,378 acres timber rights.

⁴ Including 13,862 acres timber rights.

⁵ Including 16,102 acres timber rights.

⁶ Including 18,702 acres timber rights.

The table just given indicates that though the 7 platted holders of the Idaho map have only 21.1 billion feet of timber on this map area, they have in the State as a whole 30 billion feet. In the Pacific-Northwest the amount owned by the 7 is 4,260,780 acres of timber-land, including 159,080 acres of timber rights, and 78.8 billion feet of merchantable timber. Of this timber it will be seen that the Northern Pacific has over 36 billion feet, and the first group of 3 platted holders 38.5 billion feet; that is, out of the 78.8 billion feet, 74.7 billion feet are owned by 4 of the 7 holders. While the second group of 3 platted holders have on the map area over one-fifth as much timber as the first group of 3, yet in the Pacific-Northwest as a whole they have less than one-ninth of the amount owned by the first group of 3. Again, while the second group of 3 have twice as much timber on the map area as the Northern Pacific has, yet in the Pacific-Northwest as a whole they have only a trifle over one-ninth as much.

The Northern Pacific Railway Co. is also a platted holder on the southwestern Washington map; and out of the first group of 3 platted holders one is a platted holder on the Washington map, and one on the Oregon map.¹

ADDITIONAL ACREAGE.—A statement of the additional lands and the total acreage, as well as the merchantable-timber acreage, of these 7 platted holders in Idaho and in the Pacific-Northwest is given in the following table. A division of the timbered acreage between timber rights and fee lands is shown.

The purpose of this table is to indicate the total land holdings of the 7 in the Pacific-Northwest. It is incomplete, however, in that it excludes between 6 and 7 million acres owned by the Northern Pacific in nontimbered portions of the States of Oregon, Washington, Idaho, and Montana. In the case of other companies also the Bureau's figures for additional land may be incomplete. (See p. 17.) Even at that, the table shows an immense acreage of land in the hands of these 7 holders. Quite apart from the concentration of timber, there is here a great concentration in the ownership of land, the fundamental natural resource, which may be rich in other wealth than timber.

TABLE 39.—ACREAGE OF TIMBER (INCLUDING TIMBER RIGHTS) AND ADDITIONAL LAND OWNED IN TIMBERED PORTIONS OF IDAHO AND OF PACIFIC-NORTHWEST BY THE 7 PLATTED HOLDERS OF IDAHO MAP, BY GROUPS.

Holders platted on Idaho map.	Number of holders.	In State of Idaho.				Total.
		Merchantable-timber acreage.		Additional land reported.	Total.	
		Fee.	Timber rights.				Acreage.
Northern Pacific Ry. Co.	1	Acreage. 324,130	Acreage.	Acreage. 69,019	Acreage. 393,149	
First group, 3 holders	3	667,259	138,968	49,637	855,164	
Second group, 3 holders	3	125,355	16,102	.....	151,457
Total	7	1,126,744	152,060	118,656	1,397,460	

¹ The Northern Pacific Ry. Co. also owns timber in the Lake States, and the Weyerhaeuser interests (controlling in Idaho the Edward Rutledge Timber Co. and the Bonner's Ferry Lumber Co. (Ltd.)) also control a company owning a large amount of valuable timber in the Lake States. These holdings of the Northern Pacific and the Weyerhaeuser interests in the Lake States amount to 127,604 acres of timbered land. The Northern Pacific's portion of this acreage is considerable, but it is lightly timbered.

² Owned by only 1 of the 3 holders.

TABLE 39.—ACREAGE OF TIMBER (INCLUDING TIMBER RIGHTS) AND ADDITIONAL LAND OWNED, ETC.—Continued.

Holders platted on Idaho map.	Number of hold-ers.	In Pacific-Northwest.					
		Merchantable-timber acreage.			Additional land re-ported.		Total.
		Fee.	Timber rights.	Total.	Acres.	Acres.	
Northern Pacific Ry. Co.....	1	Acres. 2, 979, 023	Acres.	Acres. 2, 979, 023	Acres. 1 179, 457	Acres. 3, 158, 480	
First group, 3 holders.....	3	869, 654	140, 378	1, 110, 032	61, 570	1, 171, 602	
Second group, 3 holders.....	3	153, 023	18, 702	171, 725	.....	171, 725
Total.....	7	4, 101, 700	159, 080	4, 260, 780	241, 027	4, 501, 807	

¹The figure of 179,457 is incomplete for the Northern Pacific's additional lands in the Pacific-Northwest. It covers probably the greater part of the company's additional lands in the timbered counties investigated by the Bureau, but covers none of its very large holdings in the nontimbered regions of the States of Oregon, Washington, Idaho, and Montana. All totals which include the 179,457 acres are consequently incom-plete. The total land holding of this company in the whole country is 9,949,985, of which all but 110,000 acres are in the Pacific-Northwest. The total is shown separately by States in Part I, p. 286. (See also Part III, Chap. II, sec. 4.)

The merchantable-timber acreage in the above table is, of course, the same as that shown in Table 38. The additional land and total acreage have not been given in the previous table. The only ad-ditional land shown on the map area for these 7 holders is 11,289 acres of the Northern Pacific. In the State as a whole, however, the Northern Pacific has 69,019 acres of additional land, so far as its additional land has been tabulated by the Bureau; and the first group of 3 have 49,937 acres of additional land. Thus, the 4 holders have lands in Idaho totaling 1,246,303 acres (which include 135,958 acres of timber rights). In the Pacific-Northwest column the table shows the partial figure of 179,457 acres of additional land for the Northern Pacific and 61,570 acres for the first group of 3. Adding the total acres here shown for the Northern Pacific and the first group of 3 would give 4,330,082 acres for 4 holders. The total of acreage for the 7 holders is 4,501,807 acres, of which 4,260,780¹ carry merchant-able timber. Such facts as these are of grave importance.

Section 8. Manner of acquisition of timberland in portions of Idaho questioned.

A resolution introduced in the House of Representatives in 1910 (H. Res. 807, 61st Cong., 2d sess.) charged fraud in the acquisition of public lands by lumber companies in the State of Idaho, and directed a Congressional investigation of the matter. The territory involved was referred to as "the Marble Creek district in the counties of Shoshone, Kootenai, and Nez Perce," the area covered being given as approxi-

¹ Including 169,080 acres timber rights.

mately 14 townships. The proposed resolution alleged, in general, that the Edward Rutledge Lumber Co. and other companies operating in the district had formed an unlawful combination, and were affiliated "in what is commonly known as the Weyerhaeuser Lumber Syndicate," and were acting together in fraudulently acquiring title to the public lands referred to, and in manufacturing and disposing of the lumber products of these lands. It further charged that many settlers then living upon these lands were being forcibly and fraudulently interfered with by this alleged syndicate, and that the market value of the white-pine timber of this region had been forced down to not more than \$5,000 per quarter section, when the actual value of many quarter sections was \$35,000. It also alleged specific acts of fraud, conspiracy, and intimidation in acquiring or attempting to acquire these lands. Certain officers and agents of the State of Idaho were involved in the charges.

The resolution further recited that Northern Pacific scrip bought by the syndicate was filed on lands already occupied by settlers; that claim jumpers were employed, and contests entered in the local land office. Of the companies referred to in the resolution as comprising the "Weyerhaeuser Lumber Syndicate" only two were named, the "Edward Rutledge Lumber Co." and the "Potlatch Association."

The resolution was referred to the Committee on Rules, but was never reported out of committee, and no further action was taken.

CHAPTER VI.

CONCENTRATION OF TIMBER OWNERSHIP IN WEST CENTRAL LOUISIANA.

Section 1. Amount and general distribution of timber in Louisiana.

Louisiana contains more timber than any other State, except the three Pacific Coast States. The total timber in Louisiana is about 120 billion feet, which is nearly 19 per cent of the total reported for the Southern Pine Region. It exceeds by about 25 per cent the entire amount reported for the State of Mississippi, which ranks next to Louisiana. Louisiana contains nearly 18 per cent of the total yellow pine, nearly 23 per cent of the total longleaf yellow pine, and nearly 39 per cent of the total cypress. It contains about 10 per cent of the total shortleaf yellow pine and about 17 per cent of the total hardwoods in the Southern Pine Region.

The timber of Louisiana is divided by species as follows:

Species.	Billion feet.	Per cent.	Species.	Billion feet.	Per cent.
Longleaf pine.....	52.5	43.8	Cypress.....	15.7	13.1
Shortleaf pine.....	15.2	12.7	Hardwoods.....	36.4	30.4
Total yellow pine.....	67.7	56.5	Total timber.....	119.8	100.0

The State is especially characterized by its extremely heavy stands of longleaf yellow pine and cypress, which grow here to their greatest perfection. There are two longleaf-pine regions in the State, one lying west of the Mississippi River and the other east of it. The most important of these lies west of the Mississippi and runs diagonally across a large part of the State from the southwest to the northeast, covering the timbered portions of the parishes (or counties) of Calcasieu, Vernon, Rapides, and Grant, practically all of Winn and Natchitoches, and considerable areas in St. Landry, Sabine, Catahoula, Caldwell, Jackson, and Bienville. On the west this region extends into Texas. This longleaf belt is divided into two parts by the Red River Valley. From the neighborhood of the Red River northward shortleaf pine is found mixed with the longleaf until the boundary of the shortleaf district proper is reached. In Calcasieu, Vernon, and western Rapides Parishes, the longleaf grows in practically pure stands, 15,000 to 20,000 feet per acre over considerable areas

being not at all uncommon. There is considerable hardwood in the creek and river bottoms of this longleaf district, particularly in the valleys of the Red, Sabine, and Calcasieu Rivers. A large part of the longleaf belt just described has been mapped. The map faces page 154. A description of it is given on page 134.

The other longleaf-pine district, east of the Mississippi River, lies in Washington, St. Tammany, Tangipahoa, Livingston, and St. Helena Parishes, and is really an extension of the longleaf district of the State of Mississippi.

Generally speaking, the main body of shortleaf pine in Louisiana is found in the uplands in the northwestern part of the State, a region extending southward about one-third of the length of the State, and eastward till it meets the hardwood belt that stretches from 30 to 50 miles in width along the Mississippi River. Considerably south of the main body of the shortleaf pine are narrow arm-like strips of shortleaf timber reaching down from the west and the east in such a way as to partially embrace that portion of the longleaf-pine belt which is north of the Red River. There is also a small area of shortleaf pine in that part of the State which lies east of the Mississippi River. Small amounts of loblolly pine are found along the streams in the longleaf regions and also in the shortleaf district itself, but no distinction between loblolly and shortleaf was made by the lumbermen in their reports.

Hardwoods often occur more or less mixed with shortleaf pine, and a considerable proportion (18 per cent) of the total hardwood reported in the State is found in the shortleaf-pine district, especially along the creek and river bottoms where the timber is almost pure hardwood. The principal hardwood district of the State, however, is a strip from 30 to 50 miles wide following, roughly, the course of the Mississippi River southward to the point where the great cypress district is encountered. Much of this land is subject to overflow during certain seasons of the year. Only in recent years have the possibilities of the timber of this region been realized even by large investors.

Most of the cypress of Louisiana is found in a comparatively limited area covering the river and delta parishes in the southern part of the State, especially in the great swamps. Some cypress is found along the streams all through the State, but in relatively small amounts in any particular region, outside the great cypress district just mentioned.

The largest single area in Louisiana which is nontimbered is in the extreme south central and southwestern part of the State. A considerable part of Calcasieu and St. Landry, and practically the whole of Acadia and Lafayette Parishes is prairie land. Cameron Parish is almost entirely marsh land, while Vermilion is divided between marsh and prairie.

Section 2. General description of west central Louisiana map.

Of the 119.8 billion feet of timber in the State of Louisiana, about 41 billion feet, or one-third, stand on the area in west central Louisiana selected for mapping.

LOCATION OF MAP AREA.—The Louisiana map area, which embraces the best longleaf-pine district of the State, extends from the vicinity of the city of Lake Charles on the south to that of Natchitoches on the north, and from the vicinity of Alexandria on the east to the Sabine River (the boundary between Louisiana and Texas) on the west. More exactly, in terms of the Government survey, it covers the territory from township 9 S. to 8 N. and from the Louisiana meridian westward to the State boundary, an area about 100 miles north and south by from 65 to 85 miles east and west. It includes all of Vernon Parish (or County), all the timbered area of Calcasieu Parish; parts of Sabine, Natchitoches, Grant, Rapides, and St. Landry Parishes; and a nontimbered corner of Acadia Parish. The exact location of the selected area is shown by a key drawn in the margin of the map.

MAPPING DETAILS.—The base line runs from east to west through the middle of the map, but on account of the heavy platting there was no room to name it except at the western extremity. The tiers of townships are numbered north and south from it. The Louisiana meridian forms the east boundary of the map, so that the ranges shown are 1 W. to 14 W. The sample township in 6 S., 1 W., illustrates what is frequently found in this part of Louisiana; namely, old grants made before the acquisition of the territory by the United States. These irregularly shaped grants interrupt the uniformity of the rectangular survey, as indicated by the ones numbered 37 and 38 in the sample township. Evidence of such irregularly shaped grants may be seen in various places on the map; for example, in 7 and 8 N., 7 W.; in 8 N., 12, 13, and 14 W.; and to the southwest of Alexandria.

STREAMS AND RAILROADS.—The Sabine River on the west and the Red River crossing the northeastern corner are the chief streams of this area, though it is also watered by the Calcasieu River in the southern part and by many creeks and bayous. Railroads are not shown on the map.¹

¹The Southern Pacific crosses the extreme southern part of the selected area; the Colorado Southern crosses the central part of Calcasieu Parish; the Atchison, Topoka & Santa Fe operates a line crossing northern Calcasieu and southern Vernon Parishes; the St. Louis, Iron Mountain & Southern traverses a lightly platted part of the map from Alexandria south and then southwesterly along the Calcasieu River to Lake Charles; the Texas & Pacific (formerly the New Orleans Pacific, a land-grant railroad) runs in a northwesterly direction from Alexandria, along the Red River; and the Louisiana Ry. & Navigation Co.'s road follows the east side of the Red River. The other chief railroads of the district are (1) the Kansas City Southern, running north and south through Many, Leesville, and De Quincy, and thence southwesterly to Port Arthur, Tex., on the Gulf, with a line also from De Quincy to Lake Charles; (2) the Chicago, Rock Island & Pacific, running north and south along the eastern edge of the mapped area.

LIMITS OF LAND GRANT TO NEW ORLEANS PACIFIC RAILROAD Co.—The New Orleans, Baton Rouge & Vicksburg Railroad, by act of Congress of March 3, 1871 (16 Stat., 573), was granted lands along the line of its road from New Orleans to Baton Rouge and thence by way of Alexandria to connect with the Texas Pacific Railroad at its eastern terminus at Shreveport, La. The grant included odd sections within 20 miles on each side of the road with indemnity limits extending 10 miles farther on each side.

This grant, by an amendatory act of February 8, 1887 (24 Stat., 391), was confirmed to the New Orleans Pacific Railroad Co., though the portion from White Castle, La., eastward was forfeited. The area patented under it was 1,001,017 acres. The grant is practically adjusted and it is unlikely that any further lands will be patented.

The limits of this grant are not shown on the map. They may, however, be roughly located as follows:

The railroad from which the limits of the grant are calculated is the present Texas Pacific, which runs through Alexandria along the Red River to about the middle of township 7 N., 6 W.; thence, leaving the river, runs northwesterly and goes out of the map area at the northwest corner of township 8 N., 9 W. All the map area at the north and east of the Texas Pacific Railroad is within the limits of the land grant. In fact, the 20-mile or primary limit crosses the extreme northeastern corner of the map and, of course, the indemnity limit extends 10 miles farther to the northeast. To the south of the railroad line the 20-mile or primary limit runs from a point between townships 3 and 4 S. on the eastern boundary of the map northwesterly to a point near the northeast corner of township 1 N., 4 W., and thence more westerly than north to the extreme northwest corner of the map. The indemnity limit runs parallel to the primary limit just described, and 10 miles farther south, being located 30 miles to the south of the road itself. It marks the extreme limit to the south within which the railroad company could select lands. It extends from about section 36 of the sample township in 6 S., 1 W., northwesterly till it cuts the base line at a point between ranges 5 and 6 W.; thence it veers more to the westward, passing just above the name of Leesville, until it reaches the State line at the Sabine River, between townships 4 and 5 N. Hence, one may judge roughly with the eye that the railroad company had an opportunity to select lands throughout practically half the map area.

Though the railroad lands were originally granted in odd-numbered sections, each 1 mile square (one-sixth of an inch on the scale of the map), little of the checkerboard effect of the alternate squares is now seen on the map. This is because purchasers of railroad lands have often "filled in" with lands in the even-numbered sections. In some places, however, the odd-numbered sections, formerly railroad

lands, stand out distinctly; for example, in 3 N., 5 W., several are platted in solid black, and in 1 N., 5 and 6 W., they are platted with the cross hatch.

Of the 1,001,017 acres originally patented to the New Orleans Pacific, 657,685 acres lie on the area of the map. The present ownership of this land, which is now largely held by great timber owners, is stated in Table 42, page 146, and its significance is there discussed.

MAP SYMBOLS.—The legend shows the symbols used in platting the lands of three groups of timber owners. Each group consists of a number of separate owners whose lands are platted with a single symbol.

In the case of each of the other maps the holders are grouped according to the amount of timber owned on the map area or in the State. But in this case the holders are assigned to their groups according to the amount of timber each owns in the entire Southern Pine Region. The first group (platted in solid black) consists of 14 separate holders, each owning over 1 billion feet of timber in the Southern Pine Region. The second group (platted with a heavy crosshatch) consists of 25 separate holders, ranging from 250 million feet of timber to 1 billion feet each in the Southern Pine Region. The third group (platted with a single light diagonal) consists of 35 separate holders, each owning less than 250 million feet of timber in the Southern Pine Region. These groups will be discussed in later sections.

Section 3. Concentration of timber ownership in area of Louisiana map.

Table 40 on page 137 has three purposes. It is designed to show (1) how thoroughly the Bureau's investigation covered the timber on the Louisiana map area; to show (2) the timbered acreage of the three groups of holdings platted on the map, and the timber thereon; and, especially, to show (3) the degree of concentration of ownership of the timber owned on this area by holders of over 60 million feet each. For these purposes there is shown the total timbered acreage and timber owned in this area by all *separately reported* holders (105 in number); that by all *platted* holders (74 in number); and that by all holders of *over 60 million feet* (62 in number). There were 105 holders separately reported; of these, there were 74 whose reports showed the location of their lands so that they could be platted; and of the 74, in turn, there were 62 who own over 60 million feet each. Of the 105 separately reported holders 31 could not be platted on the map and 43 of the 105 have less than 60 million feet each.

The following outline of the grouping in Table 40 shows how many separately reported holders own over 60 million feet each; how many, less than 60 million; how many are platted; and how many unplatted:

Separately reported holders.

	No. of holders.	
Over 60 million feet.....	First group, platted.....	Total platted..... 74
	Second group, platted.....	
	Third group, platted.....	
	Total holders of over 60 million feet.....	62
Less than 60 million feet..	Third group, platted.....	Total unplatted... 31
	Third group, unplatted.....	
	Total holders less than 60 million feet.....		43
Total separately reported holders.....	105	105

TABLE 40.—TIMBER ACREAGE AND TIMBER ON LOUISIANA MAP IN HOLDINGS OF OVER 60 MILLION FEET EACH, AND PER CENT BASED ON TOTAL TIMBER IN SUCH HOLDINGS; ALSO PLATTED HOLDINGS AND SEPARATELY REPORTED HOLDINGS BY GROUPS.

[Timber in billions of board feet. Thus, 21.8=21,800,000,000 board feet.]

Holders.	Number of holders.	Timber acreage ¹ owned on map area.	Timber owned on map area.	
			Billion feet.	Per cent based on total timber in holdings of over 60 million feet each.
First group, 14 platted holders.....	14	<i>Acres.</i> 1,453,147	21.8	66.5
Second group, 25 platted holders.....	25	652,361	8.4	25.6
Third group of 66 holders:				
(1) 23 platted holders of over 60 million feet each.....	23	238,040	2.6	7.9
(2) 12 platted holders of less than 60 million feet each....	12	21,160	.2	.....
(3) 31 unplatted holders of less than 60 million feet each.....	31	65,061	.5	.....
Total, third group.....	66	324,261	3.3	.....
Total separately reported holders.....	105	2,429,769	33.5	.....
SUMMARY.				
Total, holders of over 60 million feet each.....	62	2,343,548	32.8	100.0
Total, holders of less than 60 million feet each.....	43	86,221	.7	.....
Total, separately reported holders.....	105	2,429,769	33.5	.....
Total, platted holders.....	74	2,364,708	31.0	.....
Total, unplatted holders.....	31	65,061	.5	.....
Total, separately reported holders.....	105	2,429,769	33.5	.....

¹ Including 195,881 acres reported as timber rights, as follows: The first group, 84,880 acres; the second group, 59,377 acres; and the third group, 51,574 acres, of which 50,474 acres belong to the 23 platted holders of over 60 million feet and 1,100 acres to the 31 unplatted holders of less than 60 million feet. In addition there are in the first group about 4,000 acres of not-distinguished lands which may be timber rights.

By "separate report" is meant a report covering a particular owner and giving the amount of timber and acreage held, and in most cases its exact location. These separate reports on enumerated holdings are distinguished from the general or lump estimates by which it was necessary to cover the small holdings owned by important companies and individuals—hundreds upon hundreds in number, but constituting in the aggregate only a minor part of the total.

Attention should be called to the fact that many of the holders in the groups listed in the present table also have nontimbered lands. A later table states the additional lands reported as owned on this map area by these holders.

The table itself shows that the 105 separately reported holders own 33.5 billion feet of timber standing on 2,429,769 acres of timbered land. This is approximately 80 per cent of the total timber on this map area and about the same per cent of the timbered land.¹ In other words, for four-fifths of the timber on this area, the Bureau is informed not only as to its amount but as to its ownership in detail and its exact or its approximate location. On the map area there are, all told, somewhere in the neighborhood of 670,000 acres of timbered land (much of it hardwoods) which were covered by means of general estimates, instead of by separate reports, so that their ownership could not be platted. This is less than one-fourth of the timbered area of the map.

The completeness with which this particular area, containing a third of the timber in Louisiana, was canvassed is but a sample of the fashion in which the whole work of the investigation was done.²

The importance of separate reports showing the amount and location of the timber owned by various companies and large holders is obvious. They were of especial value, throughout the investigation, in enabling the Bureau to arrive at the amount of timber with

¹ See p. 139, for approximation of total timbered acreage and timber on the map area.

² It has been emphasized in previous chapters that the ownership maps for other regions have shown the lands of only a comparatively few of the holders owning in the region, the purpose there being to show graphically what a large proportion of the total area was in the hands of these relatively few large holders. Attention was called in the discussion at the beginning of Part II to the fact that in all the map areas the exact location of nearly every one of the more important "unplatted holders" is known to the Bureau. In the case of the maps hitherto presented, such holdings were not platted because the purposes of the maps did not demand that they should be. It was done here for the purpose of indicating how thoroughly the investigation went into details. For most holdings of 60 million feet and over throughout the greater part of the investigation area the Bureau has the definite location, had it desired to plat such lands, though of course, on every map area there is a considerable amount of smaller holdings, many of them in the hands of individual claim owners, which have been covered by means of general estimates without attempting to secure the ownership or location of the land in detail. This map is, therefore, a sample of what might be shown for any of the heavily timbered regions included in the investigation area, excepting those States where the absence of the regular Government survey made it difficult to secure plats of the exact location of holdings.

far more accuracy than could have been attained merely by general estimates.

CONCENTRATION OF TIMBER OWNERSHIP AMONG HOLDERS OF OVER 60 MILLION FEET EACH.—In the other map discussions tables are given showing the total amounts of timber privately owned in the various map areas, and percentages of ownership are based on those totals. In the present case, however, it is difficult to state with exactness the amount of timber standing on the area of the map. The reason is that the general estimates secured in certain parishes were not given separately by townships. Consequently, when only part of a parish was included in the map it was not always possible to determine with precision the amount of timber covered by general estimates in that part of the parish. The best approximation that can be made of the total timber on the map area places the merchantable-timber acreage at about 3,100,000 acres and the timber at about 41 billion feet. This timber figure may be too great or too small by possibly 500 million feet. In the present discussion, therefore, the percentages of concentration are based on the amount of timber owned by holders of over 60 million feet, a figure subject to far less likelihood of error.¹

The 62 holders who each own over 60 million feet have, on this map area, 2,243,548 acres of merchantable-timber land on which stand 32.8 billion feet of timber. This is about 80 per cent of the rough total of 41 billion owned by all holders on the map area. On account of the roughness of that total, no percentages have been based on it in the table. Instead, the basis used is the 32.8 billion owned by the 62 holders of over 60 million feet. With this as 100 per cent the percentage column shows, in effect, what proportion of the amount held by the larger timber owners—those who may be said to be in the timber business—is own by each particular group. The first two groups are discussed from this point of view in the following subsections. Regarding the 23 holders who constitute those of the third group who own over 60 million feet each, it is only necessary to point out that they own only about 8 per cent of the total held in the map area by all owners of over 60 million feet.

Holdings of first group—14 platted holders—on map area. (Map symbol, solid black.)—The first group consisting of 14 platted holders has in the area selected for mapping 1,453,147 acres of timber-land and 21.8 billion feet of timber. Their timber amounts to two-thirds of the total owned on this map area by holders of over 60

¹ To a limited extent a similar necessity for approximation was experienced with reference to timber owned by holders of over 60 million feet. It was not always possible to divide the holding of a company so as to be sure of the exact amount of timber on the map area and off the map area. Nevertheless, the amount of timber for which such approximation had to be made was only about 10 per cent of the total. In 90 per cent no approximation was necessary. The error in the approximation of the remaining 10 per cent would probably not amount to more than 1 per cent of the total.

million feet each, and to more than one-sixth of all the timber in the State. For these 14 holders it will be observed the average size of holding of timberland and timber rights on the map area is over 100,000 acres. The timbered acreage of single holdings of individual members of the group varies from a minimum (with one exception) of 35,000 acres to over 250,000 acres. For the 14 the *average* amount of timber owned by each on the map area is over a billion and a half board feet. In the Southern Pine Region as a whole *each* member of this group owns over a billion feet, and with one exception over a billion and a half each. The figures in Table 40 cover only their holdings on the map area itself. Later tables will set forth the holdings of the first platted group and part of the second in the State and in the Southern Pine Region.

Among the largest timber owners in this first group of 14 are (1) Calcasieu Pine and Southland Lumber companies; (2) Frost-Johnson Lumber Co., including its subsidiary the Union Sawmill Co., which has a large amount of timber in Arkansas and off the map area in Louisiana; (3) Long-Bell Lumber Co. interests; (4) a number of companies under the management of William Buchanan (timber on this map area in the name of Grant Land & Lumber Co.); (5) Lutzer-Moore interests; (6) Chicago Lumber & Coal Co. interests; (7) Missouri Lumber & Land Exchange (timber on this map area in the name of Louisiana Longleaf Lumber Co.); and (8) the Kirby Lumber Co. (which bought the timber on the lands of the Houston Oil Co.). The Kirby Lumber Co. has comparatively little timber on the map area, but has very extensive holdings across the Sabine River in Texas, which make it the largest single holder of timber in the Southern Pine Region.

The Weyerhaeuser family and their associates are interested in the Calcasieu Pine Co. and the Southland Lumber Co., F. E. Weyerhaeuser being president of the latter. F. S. Bell, secretary of the former, is also vice president of the Weyerhaeuser Timber Co., and secretary of the Potlatch Lumber Co. (a large timber owner in Idaho).

Other of the large timber holders of the Louisiana map area are connected with each other, as well as with large holders in other regions. Some of the more important of these interrelations are stated here as an illustration of the weaving together of interests which is common in almost every important timber territory of the country, through individual minority stock interests, or through common officers and directors. Thus, the Central Coal & Coke Co. and Chicago Lumber & Coal Co. have a common director who is also an important stockholder in the chief constituent company of the Frost-Johnson Lumber Co. Two other directors of the Chicago Lumber & Coal Co. are stockholders in the Weyerhaeuser Timber Co. These same two directors are important stockholders in certain companies allied with the Missouri Lumber & Land Exchange (Louisiana Central and

Louisiana Longleaf Lumber Cos.). The Long-Bell Lumber Co. is connected through individuals with the Bradford-Kees Lumber Co. (a holder of the third group) and it in turn with the Big Pine Lumber Co. (of the second group) and Iatt Lumber Co. (of the third group). This is not a complete statement of the connections of the holders within the map area. The real degree of concentration is probably understated, therefore, by the figures given in the tables.

Since the Bureau's tabulations were completed, information has been received that one of the holders of the first group on the Louisiana map area has purchased 28,128 acres of timberlands from another member of the same group. Even after the sale of this tract the selling holder has enough timber left to rank as a member of the first group, so that the transfer would make no difference in the group totals throughout this discussion.

Holdings of the second group—25 platted holders—on map area. (Map symbol, heavy crosshatch.)—The group of 25 platted holders has on the map area 652,361 acres of timberland and 8.4 billion feet of timber. This amounts to 25.6 per cent of the total amount of timber owned on this area by holders of over 60 million feet each. The lands of these 25 holders are platted on the map with a single symbol, the heavy crosshatch.

The 25 members of this group were selected for plating on the basis of the amount of timber owned by each in the Southern Pine Region as a whole, each (with the exception of 2 or 3) having from 250 million feet to 1 billion feet in that region.

Among the holdings in this group is one in which the Southern Pacific Co. has an interest. Another of the holders has lands platted in the second group on the redwood map (California) and in the fourth group on the western Oregon map. A holding of the Atchison, Topeka & Santa Fe Railway Co. is also included here. In New Mexico and Arizona, outside the investigation area, this railway company has about 9,500,000 acres of land, part of which is timbered, originally granted to the Atlantic & Pacific Railroad, to which the Atchison, Topeka & Santa Fe is successor through the Santa Fe Pacific Railway Co.

An important sale has been recently made by which a large amount of excellent timber on lands in Calcasieu Parish held by trustees of the estate of William Rice for the benefit of William Rice Institute of Houston, Tex., becomes the property of the newly formed American Lumber Co., which is controlled nominally by Mr. Sam Park, but really by Atchison, Topeka & Santa Fe interests back of him.¹ This timber is carried in the Bureau's tables in the name of William

¹ Press reports of a later date indicate that Mr. Park's connection with the American Lumber Co. was terminated on account of his recognition of the Brotherhood of Timber Workers in the mills of the company. Southern Industrial and Lumber Review (Southwest), Nov., 1912, p. 23.

Rice Institute, the information having been received too late to make any change. The holding is in the group of 25 platted holders. Mr. Park also has a strong minority interest in the Industrial Lumber Co., one of the holders in the group of 14 platted on the map. The timber involved in the sale of the William Rice Institute holding is said to be approximately 1.1 billion feet, and the sale price to be in the neighborhood of \$5,000,000, or upwards of \$4.50 per thousand feet. The land is not included, only the timber rights, with 20 years in which to cut. Of the 49,000 acres involved in this sale, Mr. Rice purchased about 46,000 acres from the Government in 1882 for less than \$60,000. (See p. 148.)

Summary of concentration.—Four members of the group of 14 platted holders own over half of the timber held on the map area by that group. The 4 holders are the Calcasieu Pine Co. and Southland Lumber Co.; the Long-Bell Lumber Co. interests; the Chicago Lumber & Coal Co. interests; and the Litcher-Moore interests. They have on the map area 802,181 acres of merchantable-timber land with a stand of 12.3 billion feet of timber. This is 37.5 per cent of the timber held on this area by owners of over 60 million feet each.

Four other owners in the group of 14 hold on this area 361,175 acres of merchantable-timber land carrying 6 billion feet of timber, or 18 per cent of the amount held on the map by owners of over 60 million feet each. Thus, 8 members of the group of 14 holders have on this map area 18.3 billion feet, or more than 55 per cent of the timber of all the 62 holders. The entire group of 14 own 66.5 per cent of that owned by the 62 holders.

These 14 members of the first group with 7 holders selected from the second group, own well over 80 per cent of all the timber on the map area owned by holders having over 60 million feet each.

Finally, the 39 separate holdings comprised in the first two groups of platted holders aggregate 30.2 billion feet of timber out of the 32.8 billion feet of over 60 million feet each, or 92.1 per cent of the total.

Section 4. Concentration especially marked in longleaf pine.

One more fact should be emphasized in connection with the concentration of timber ownership in the area mapped, the big owners have the best timber—the valuable longleaf pine—while the hardwoods, at present considered of comparatively little value, are held mostly by small owners.¹ For the map area it is difficult (because of the form in which some estimates were reported) to make an exact division of the timber of all holders by species. However, out of the 21.8 billion feet of the group of 14 holders 18.8 billion feet, or more than 85 per cent, can be divided into species accurately with reference to the map area, and for the other two groups a still higher proportion.

¹ This condition is clearly shown for the State as a whole in Part I, p. 141.

Of the 18.8 billion feet of the timber of the first group that can be divided by species, 97.9 per cent is longleaf pine, and only 1.6 per cent is hardwood. It is probable that the undivided remainder of 3 billion feet, if divided among the species, would not very much change these percentages. The map shows that the lands of this group lie almost altogether away from the river bottoms where the hardwoods mainly grow.

For the second group 94 per cent of their timber on the map area is divisible into species. Their longleaf pine amounts to 93.7 per cent of their total divisible by species; shortleaf pine, 1.3 per cent; cypress, a negligible per cent; and hardwoods, 5 per cent. Here we have still a very high proportion of longleaf pine indicated. While hardwoods form a higher proportion than in the case of the first group of 14, they are still relatively insignificant.

For the 23 holders of over 60 million feet in the group of 66, on the other hand, the per cent of longleaf pine is much lower—only about 70 per cent—while the shortleaf is 11.5 per cent, and the proportion of hardwoods—practically 15 per cent—is very much higher than it was in the case of the first two groups. A considerable proportion of their land lies along the river valleys, and especially along the Sabine, the Calcasieu, and the Red River.

Section 5. Additional land owned on map area by separately reported holders.

About one-seventh of the total acreage platted on the Louisiana ownership map consists of land reported as not bearing merchantable timber. This additional land has not appeared in the Louisiana map tables already given, for they are concerned only with timbered land and timber. Table 41 shows by groups the amount of additional land held on the map area by timber owners separately reported, and their total acreage. The figures for merchantable timber land are repeated from Table 40 and include a considerable amount of timber rights. The purpose of this section is to state numerically for this area the concentration of ownership of land and timber rights which has already been graphically told by the map itself with its preponderant masses of solid black and its hatched symbols.

Large regions are owned by a few holders, and whatever value these regions now have or may develop (whether for timber, for agriculture, or for minerals), a large part will belong to a very few, if the present ownership of large tracts is continued. In using the map or the table, however, it should be borne in mind that there is considerable acreage platted and tabulated (195,000 acres) which is held in the form of timber rights, not in fee.

The holders in the total-acreage table, which follows, are the separately reported holders of Table 40, with a subdivision of the

third group in such a way as to show the totals for holders of over 60 million feet each, and for platted holders, as well as for separately reported holders.

TABLE 41.—ACREAGE OF TIMBER (INCLUDING TIMBER RIGHTS) AND ADDITIONAL LAND OWNED ON LOUISIANA MAP BY HOLDERS OF OVER 60 MILLION FEET EACH, BY PLATTED HOLDERS, AND BY SEPARATELY REPORTED HOLDERS, BY GROUPS.

[Not all members of a group own additional land. The number of those owning such land is shown for each group, parenthetically in italics, in the additional land column.]

Holders.	Num-ber of holders.	Merchantable-timber acreage.			Additional land reported.	Total on map area.
		Fee.	Timber rights.	Total.		
First group, 14 platted holders.....	14	<i>Acrea.</i> 1,368,287	<i>Acrea.</i> 84,880	<i>Acrea.</i> 1,453,147	<i>Acrea.</i> (8) 235,086	<i>Acrea.</i> 1,688,183
Second group, 25 platted holders.....	25	592,984	69,377	662,361	(8) 145,644	788,005
Third group, 66 holders: (1) 23 platted holders of over 60 million feet each.....	23	187,566	50,474	238,040	(6) 8,382	246,422
(2) 12 platted holders of less than 60 million feet each.....	12	21,160	.....	21,160	(6) 11,040	32,200
Total, platted holders, third group.....	35	208,726	50,474	259,200	(10) 19,422	278,622
(3) 31 unplatted holders of less than 60 million feet each.....	31	63,961	1,100	65,061	(1) 3,000	68,061
Total, third group.....	66	272,687	51,574	324,261	(11) 22,422	346,683
Total, separately reported hold-ers.....	105	2,233,938	195,881	2,429,769	(27) 403,102	2,832,871
SUMMARY. ¹						
Total, holders of over 60 million feet each.....	62	2,148,817	194,731	2,343,548	(21) 389,062	2,732,610
Total, platted holders.....	74	2,169,977	194,731	2,364,708	(26) 400,102	2,764,810
Total, separately reported holders.....	105	2,233,938	195,881	2,429,769	(27) 403,102	2,832,871

¹ The totals in the summary of the table are arrived at as follows: (1) Total holders of over 60 million feet, by addition of first group of 14, second group of 25, and the first division (23 holders) of the third group; (2) total platted holders, by addition of 12 platted holders of less than 60 million feet each to the 62 holders of over 60 million feet each, all of whom are platted; (3) total separately reported holders 1; the grand total, including the 31 unplatted holders of less than 60 million feet each.

This table shows that the first and second groups of platted holders have a very high percentage of additional lands. These are mainly lands that have been cut over or denuded by those members of these groups who are operators of large sawmills.

It should be noted that the plats furnished by the platted holders do not appear to cover as much land as the acreage they reported owning. A count of the plats furnished by the second group of 25 and by the third group of 35 platted holders shows only approxi-mately 944,000 acres, while the acreage they reported owning is 1,076,627 acres. In other words, these two groups reported something like 132,000 acres that can not be accounted for on the plats they

furnished. Part of this difference may be due to the fact that some sections counted on the plats as 640 acres perhaps contain by the actual survey more than 640 acres. These 132,000 acres, taken with the 68,000 acres of the 31 separately reported holders of the third group who furnished no plats at all, make a total of about 200,000 acres separately reported to the Bureau, but not shown on the map. There is nothing to indicate how much of the 132,000 acres is timbered; of the 68,000 acres, 65,000 are timbered and 3,000 nontimbered.

The 1,603,303 acres held in fee on this area by 14 holders are the equivalent of nearly 70 solid townships, a township being 6 miles square and appearing on the map as 1 inch each way. Again, their total holding is equivalent to over 10,000 "quarter sections" such as an individual is allowed under the homestead act. The second group of 25 holders with their total of 738,628 acres fee on the map has an average fee holding of nearly 30,000 acres. The 145,644 acres of additional land shown for the group are owned by 8 holders out of the 25. The 8 own in fee merchantable-timber land on the map area amounting to 202,929 acres, giving them a total fee on the map of 348,573 acres, of which the 145,644 acres of cut-over land constitutes over two-fifths.

The total fee acreage owned on the map area by holders of over 60 million feet is 2,537,879 acres. The corresponding total for all platted holders is 2,570,079 acres. Of this, the 5 largest fee holders on the map would be found to have 981,966 acres, and the next 3 to have 336,096 acres, making for the 8 largest a total of 1,318,062 acres. This is 51 per cent of the total fee acreage of the platted holders in this area.

In addition to their fee lands, the 74 platted holders have about 195,000 acres of timber rights—lands over which their leases give them control, in many cases, for 15 to 20 years.

Section 6. Effect of New Orleans Pacific Railroad grant on ownership in map area.

The part which the Federal land grant to the New Orleans Pacific Railroad played in furthering this concentration of land ownership has been referred to on pages 135-136.

The total acreage of lands originally patented to this railroad was 1,001,017 acres. In the area of the map the lands patented to it are found to be 657,685 acres, and of this amount, 596,206 acres, or over 90 per cent, are now owned by various large timber owners and are platted to them on the map.

The history of the railroad-grant lands in this particular region of Louisiana is like that found in the other States where inquiry has been made, namely, large grants of timberland, so far as not retained in the original ownership, have usually been disposed of in very large blocks. This is a natural economic result. The Government's land-grant policy, if it contemplated the distribution of the public domain

to small holders through the medium of the railroad grantees, has failed so far as the grants covered timberlands. So far as the grants covered agricultural lands there has no doubt been a much wider distribution.

The New Orleans Pacific Railroad was a road financed by Jay Gould. The Jay Gould estate, whose holdings are platted on the map in the first group of 14, owns 123,750 acres of timberland in the State, practically all on the map area. Of this, 93,529 acres consist of lands originally patented to the railroad company.

The following tabular statement shows in detail the amounts of land on this map area which were originally patented to that railroad and are now held by the timber owners of the three map groups. A relatively insignificant part is held in the form of timber rights.

TABLE 42.—PRESENT OWNERSHIP OF NEW ORLEANS PACIFIC RAILROAD CO. GRANT IN AREA OF LOUISIANA MAP.

Present holders.	Granted land held (in fee or by timber rights) on map area.	Per cent of total grant in map area.	Present holders.	Granted land held (in fee or by timber rights) on map area.	Per cent of total grant in map area.
First group of platted holders:			Second group of platted holders:		
Calcasieu Pine Co. and Southland Lumber Co.....	133,903		J. P. Underwood.....	21,511	
Jay Gould estate.....	93,529		Jas. A. Bentley interests.	19,606	
Louisiana Longleaf Lumber Co.....	54,960		Florin Glauque.....	14,641	
J. F. Ball & Bro. Lumber Co.....	45,085		Big Pine Lumber Co.....	9,208	
Frost-Johnson Lumber Co.....	30,768		Sabine Lumber Co.....	9,058	
Industrial Lumber Co.....	23,177		Bowman-Hicks Lumber Co.....	6,718	
Long-Bell Lumber Co. interests.....	17,987		D. C. Richardson-Taylor Lumber Co.....	6,436	
W. R. Pickering Lumber Co.....	14,017		Crowell & Spence Lumber Co.....	6,255	
Hackley-Hume Co. (Ltd.).....	13,406		J. J. Rupp et al.....	3,392	
Chicago Lumber & Coal Co. interests.....	11,667		Other members of second group.....	20,963	
Grant Land & Lumber Co.....	6,998		Total, second group.	117,788	18
Other members of first group.....	1,628		Third group of platted holders (various members).....	31,303	5
Total, first group....	447,115	68	Total accounted for.....	586,286	91
			Unaccounted for.....	61,479	9
			Total patented in map area under railroad grant.....	657,685	100

The figures in this column include 14,583 acres reported as timber rights as follows: First group, 2,540 acres; and second group, 12,042 acres. Besides, not distinguished lands aggregating about 15,000 acres in the first group and 2,000 acres in the second group may be timber rights. The following items may also include some timber rights: 1,628 acres for "other members of first group," 20,963 for "other members of second group," and 31,303 acres for the third group.

The first group of platted holders is found to hold in this map area 447,115 acres of land that the Government originally patented to the New Orleans Pacific, or 68 per cent of all the land patented to the railroad on this area. The 447,115 acres constitute over one-fourth of the total holdings of the group on the map area. The chief purchasers of railroad land here have been the Calcasieu Pine Co. and Southland Lumber Co.; the Louisiana Longleaf Lumber Co.; J. F. Ball & Bro. Lumber Co.; and the Frost-Johnson Lumber Co. Over half of the acreage of the Calcasieu Pine Co. and Southland Lumber Co. on this map area consists of the railroad lands. Over one-third of the holdings of the Louisiana Longleaf Lumber Co. was likewise originally part of the railroad grant. Three-fourths of the lands now owned in this area by J. F. Ball & Bro. Lumber Co. were similarly acquired, and nearly nine-tenths of those of the Frost-Johnson Lumber Co.

Members of the second group now hold railroad lands amounting to 117,788 acres in the map area, and members of the third group, 31,308 acres.

It should be noted that this railroad was not built till long after the time set by law for its completion; that the original grantee, after its charter had been repealed, attempted to assign the grant to the New Orleans Pacific; and that, in spite of efforts in Congress in the middle eighties to forfeit the grant, it was finally confirmed to the New Orleans Pacific in 1887. (See H. Repts. Nos. 678 and 1556, pts. 1 and 2, 48th Cong., 1st sess., vols. 3 and 6, 1884; also 24 Stat., 391.)

Section 7. Proportion of platted holdings on map area originally obtained from Government at private entry for \$1.25 per acre.

Investigation was made covering the timbered part of the Louisiana map area to ascertain how important an influence the direct sales of land by the Government at private entry for \$1.25 per acre (see Part I, pp. 256 to 258) have had in bringing about the present concentration of timber and land ownership in this area. For this purpose the records of the General Land Office were consulted and the location of land purchased from the Government under this law by each original purchaser of 1,000 acres or more was determined. The townships in the Red River Valley where there is no platting and the nontimbered townships in the southeastern part of the map were not covered. For the rest of the map area, however, a tabulation was made of all lands purchased under this law by each original purchaser of 1,000 acres or more.

It was found that 65 individuals or partnerships each purchased 1,000 acres or more of this land in the area described. The amount bought by them was approximately 1,021,000 acres. No less than

966,000 acres of this is now in the hands of the platted holders constituting 35 per cent of the entire acreage of platted timber owners on the Louisiana map. Three original purchasers, it appears, bought from the Government tracts of over 100,000 acres each. Eleven others purchased tracts ranging between 20,000 and 60,000 acres.

The table opposite shows the present holders of the cash-sale land originally purchased by the 65 large buyers. The original purchasers are arranged in the stub in order of size, and the lands of each original purchase are distributed to the present holders thereof. The present holders are arranged in the regular map-table groups. Their arrangement within the group is according to the amount of cash-sale land owned. Timber rights are included, but are insignificant in amount.

The table includes 75,000 acres of private-entry cash sales at \$2.50 per acre—lands within the limits of the New Orleans-Pacific grant which by statute were doubled in price by virtue of the grant. It also includes 640 acres of graduated cash land, sold for less than \$1.25 per acre under the graduation act of 1854 (10 Stat., 574), and over 20,000 acres of land obtained on scrip and warrants, which were accepted by the Government as equivalent to cash payment of \$1.25 per acre,¹ the land being patented in the name of the individual presenting the scrip.

Table 43, it will be observed, lists a number of partnership purchases from the Government, as well as individual purchases. In some cases the same person appears as a separate purchaser and as one of a partnership. Thus, William M. Robinson purchased 4,640 acres individually, 24,160 acres with James D. Lacey, and 29,760 acres with E. F. Uhl and George K. Johnson.

In the list of original purchasers are a number of names that are important in the lumber world of to-day either in this particular region or elsewhere. H. J. Lutchter and G. B. Moore were original purchasers of a very large tract which is still retained by the interesters with which they are identified. The names of certain other original purchasers—Charles H. Hackley, Jay Gould, A. G. Van Schaick, George Lock, and C. H. Moore—are represented in the present ownership of the lands bought by them from the Government.

Reference has already been made to the recent sale of the timber of the William Rice Institute (p. 141). This is a case revealing the startling increase in timber values since the Government parted with its timberlands for \$1.25 per acre. It will be seen by the above table that William M. Rice purchased approximately 47,960 acres of land direct from the Government at \$1.25 per acre. The purchase was in 1892. Practically all this very land (about 46,000 acres) was eventually given by Mr. Rice as endowment for the William Rice

¹ See Part I, p. 258.

THE GOVERNMENT

Present holders.

Accounted for.

By per in- ts.	Other holders in group.	Tota
	<i>Acrea.</i>	<i>Acre</i>
920	5,180	240,
		23,
	40	
	1,	1,
	47,	47,
		2,
		32,
	2,280	10,
	200	4,
900	40	
		9,
	40	
		16,
	40	8,
		1,
		14,

Institute, of Houston, Tex. The recent sale by the trustees to the American Lumber Co. covered the timber on 49,000 acres, and included the timber on the identical 46,000 acres that were bought at \$1.25 per acre direct from the Government. Most of the remainder of the tract was originally part of the grant to the State of Louisiana. The consideration received by the William Rice Institute for the transfer of the timber rights on the 49,000 acres (with 20 years in which to cut) was about \$5,000,000. Therefore, the price in 1911 for timber exclusive of land was somewhere near \$100 per acre. This is an apparent increase of about 80 fold (8,000 per cent) in less than 30 years.

Another sale of which the Bureau has information occurred in 1909. It involved about 19,000 acres and the price received was \$1,125,000, or about \$60 per acre. The greater part of this tract (about 15,400 acres) was originally obtained from the Government, mostly in 1881 or 1882, by private entry, at \$1.25 per acre, which would make the cost of this part \$19,250. The remainder was originally granted to the State of Louisiana (about 2,800 acres) or taken up by homesteaders (about 800 acres). The first cost of the entire 19,000 acres was probably not over \$25,000.

Incidentally, it may be stated that the timber holding of another company in this region presents a still more remarkable instance of increase in value of timber and land, though the case was not one of a cash purchase direct from the Government. The company was organized in 1898 and the Bureau is authoritatively informed that a certain stockholder, owning about one-fourth of the capital stock paid in cash for his stock \$59,600; he has received cash dividends of \$171,864 and in addition the present value of his stock (based on the estimated undivided profits of the company) is \$1,060,000. By far the greater part of the company's profits are stated to have been derived from the increase in value of timber and land. The most striking fact about this increase is that it has come about in less than 14 years.

OTHER FORMS OF GRANT AND ENTRY.—The foregoing sections have discussed the railroad lands and private-entry lands in the Louisiana map area, showing that a very large proportion of lands of these classes have come into the hands of the present large timber owners. It may also be said in general that in this area large amounts of land originally patented to the State are now held by the timber holders reported to the Bureau. As already mentioned there are considerable areas of old private grants made before Louisiana was acquired by the United States. Some of these, distinguishable by their irregular outlines, may be seen on the map, platted to timber holders. Other forms of entry common in this region were homestead, and timber and stone; but the Bureau has not determined how far lands taken by these classes of entry are now owned by large timber holders.

Section 8. Total timber strength in Louisiana and in the Southern Pine Region of 27 of the holders platted on Louisiana map.

As stated on page 140, no holders were selected for inclusion in the group of 14 platted holders on the Louisiana map except those owning over a billion feet of timber in the Southern Pine Region, and for the group of 25 platted holders the selection was also on the basis of the amount of timber owned in the South. The purpose of this section is to show the total amount of timberland and timber owned in Louisiana and in the Southern Pine Region by the 14 holders platted in the first group, and by 13 out of 25 in the second group, the 13 being those members of the second group who own over 500 million feet each in the South. The 13 holders picked from the group of 25 have on the map area about three-fourths of the timber which the entire group has on the map area (6.2 billion feet out of a total of 8.4 billion feet). In the Southern Pine Region, they have together about five-sevenths of the amount owned by all 25 (10.2 billion feet out of a total for the 25 of 14.2 billion feet).

It is to be understood that in some cases the holdings here shown as owned in Louisiana and in the Southern Pine Region are not owned by the same holders of record as own the holdings on the map area, but are owned by other holders of record who are combined in the same interest.

The first table (Table 44) states the timbered acreage, and the second table (Table 45) states the timber by species of the same holders. The timber of any entry in Table 45 stands on the timbered acreage of the corresponding entry in Table 44. The two tables will be discussed together. In a separate table the additional acreage of the same holders will be shown for the same regions.

The timber is shown by species. In the columns of the table headed "On map area" and "Outside map area," however, certain entries are made of timber "not divisible" by species. As already suggested on page 139, it was impossible accurately to divide by species the timber of some holdings in parishes partly on the map area and partly off it, since the reports for some companies gave an estimate of the amount owned by the company in the entire parish instead of showing it by townships. Thus, 3 billion feet of timber on the map area owned by the first group could not be classified by species, nor 1.7 billion feet owned by them outside the map area. In the total column for Louisiana and in the column for the Southern Pine Region, all the timber is, of course, divided into species. Hence, while the total for the first group on the map area (21.8) plus that off the map area (10.8) cross adds to their total in the State (32.6), yet the longleaf pine shown as on the map (18.4) plus the longleaf off the map (3.0) does *not* cross add to their total longleaf in the

State (24.0). The reason is that part of the longleaf timber on and off the map area is included in the "not divisible" timber.

TABLE 44.—ACREAGE OF TIMBER OWNED IN LOUISIANA AND IN SOUTHERN PINE REGION BY 27 OF THE HOLDERS PLATTED ON LOUISIANA MAP, BY GROUPS.

Holders platted on Louisiana map.	Number of holders.	In Louisiana.			In Southern Pine Region.
		Total.	On map area.	Outside map area.	
		<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>
First group of platted holders.....	14	2,549,021	1,453,147	1,095,874	4,525,902
13 out of second group of platted holders.....	13	544,742	425,968	118,774	951,646
Total, 27 holders.....	27	3,093,763	1,879,116	1,214,648	5,477,548

¹ Including 1,402,393 acres reported as timber rights as follows: The first group, on the map, 84,890 acres; off the map, 322,965 acres; and in the Southern Pine Region, 1,328,533 acres. The 13 holders of the second group, on the map, 20,460 acres; off the map, 19,074 acres; and in the Southern Pine Region, 73,840 acres.

TABLE 45.—TIMBER OWNED IN LOUISIANA AND IN SOUTHERN PINE REGION BY 27 OF THE HOLDERS PLATTED ON LOUISIANA MAP, BY GROUPS AND BY SPECIES.

[In billions of board feet. Thus, 24.0=24,000,000,000 board feet.]

Holders platted on Louisiana map.	Number of holders.	Species.	In Louisiana. ¹			In Southern Pine Region.
			Total.	On map area.	Outside map area.	
First group of platted holders.....	14	Longleaf pine.....	24.0	18.4	3.0	35.9
		Shortleaf pine.....	5.2	.1	3.5	9.9
		Cypress.....	1.3	.....	1.3	1.3
		Hardwoods.....	2.1	.3	1.0	2.8
		Not divisible.....	.....	3.0	1.7	.....
		Total.....	32.6	21.8	10.8	49.9
13 out of second group of platted holders.....	13	Longleaf pine.....	6.2	5.7	.2	7.0
		Shortleaf pine.....	.5	.....	.4	2.0
		Cypress.....	.....	.....	.....	.1
		Hardwoods.....	.7	.3	.4	1.1
		Not divisible.....	.....	.2	.2	.....
		Total.....	7.4	6.2	1.2	10.2
Total, 27 holders.....	27	Longleaf pine.....	30.2	24.1	3.2	42.9
		Shortleaf pine.....	5.7	.1	4.2	11.9
		Cypress.....	1.3	.....	1.3	1.4
		Hardwoods.....	2.8	.6	1.4	3.9
		Not divisible.....	.....	3.2	1.9	.....
		Total.....	40.0	28.0	12.0	60.1

¹ Though the timber of these holders in the State as a whole is divisible into species, their timber on the map area and outside the map area can only partly be segregated by species, and part of the timber in these columns is therefore noted as "not divisible." Consequently the items for species (so far as divisible) on the map area and outside the map area usually do not cross add to the total for that species in the State, but the figures for the total timber do cross add.

GROUP OF 14 PLATTED HOLDERS.—The above tables show the total holdings in the State for the 14 holders of the first group to be 2,549,021 acres of merchantable-timber land (including 407,875 acres of timber rights) and 32.6 billion feet of timber. As Table 40 has already shown, 21.8 billion feet of this timber and 1,453,147 acres of timberland are located on the area of the ownership map in west central Louisiana. The amount held by them in the State of Louisiana outside the selected map area is 1,005,874 acres of timberland and 10.8 billion feet of timber.

In the Southern Pine Region as a whole the same 14 holders have 4,525,902 acres of timberland (including 1,328,553 acres of timber rights) and 49.9 billion feet of timber.

Not only is this a marked concentration of the ownership of timber, but the timber owned by this group is very largely of the more valuable species. Thus, in Louisiana their total of longleaf, shortleaf, and cypress—all valuable—amounts to 30.5 billion feet out of 32.6 billion. Their hardwoods amount to only 2.1 billion feet, or 6 per cent, against 94 per cent of pine and cypress. Of the total timber in the State of Louisiana the longleaf and shortleaf pines and the cypress constitute only 69.6 per cent, while the hardwoods constitute 30.4 per cent. It is thus seen that the 14 holders here have a much higher proportion of valuable species in their timber than obtains in the timber of the State as a whole.

In the Southern Pine Region, out of 49.9 billion feet of timber owned by the 14, there are 47.1 billion feet of pine and cypress and only 2.8 billion feet of hardwoods. This again is about 94 per cent of pine and cypress against 6 per cent of hardwoods. Taking the entire timber of the Southern Pine Region, however, (Part I, p. 76) the hardwoods amount to not less than 33 per cent, and the pine and cypress to only 67 per cent. In other words, these 14 holders of over a billion feet each have far more than a proportional share of the more valuable species.

This is a natural condition because those assembling large timber holdings naturally seek the more valuable species. Furthermore, the fact that the ownership is thus concentrated increases the value of the holdings.

At the rate of annual consumption in 1909, these 14 holders alone with their 46 billion feet of longleaf and shortleaf could supply the whole market for southern yellow pine for nearly three years.

THIRTEEN OUT OF THE GROUP OF 25 PLATTED HOLDERS.—The above tables show that 13 out of the second group of platted holders have a total timber holding in Louisiana of 544,742 acres of timberland (including 39,514 acres of timber rights) and 7.4 billion feet of timber. Of this, 425,968 acres and 6.2 billion feet of timber are on the map area, and 118,774 acres and 1.2 billion feet of timber are off the map area.

In the Southern Pine Region as a whole the 18 members of this group of 25 platted holders have a total of 951,646 acres of timber-land, on which stand 10.2 billion feet of timber. The amount of timber owned by them outside the State of Louisiana, therefore, is only 2.8 billion feet.

SUMMARY.—The grand totals of the above tables show that the 27 holders under consideration in the State of Louisiana have 40 billion feet of timber on 3,093,763 acres. Of this holding in the State, 28 billion feet are on the map area and 12 billion feet are outside that area. In the Southern Pine Region as a whole these 27 holders have 60.1 billion feet of timber on 5,477,548 acres.

Of their 60 billion feet it will be observed that longleaf pine comprises practically 43 billion feet; shortleaf pine, practically 12 billion; and cypress, not quite one and a half billion. The total of these valuable species owned by the 27 is over 56 billion feet, leaving about 4 billion feet only in hardwoods. That is, between 93 and 94 per cent of their timber is of high stumpage value, while only 6 or 7 per cent consists of the less valuable hardwoods.

Certain of these holders also have 4 or 5 billion feet of timber in the Pacific-Northwest. This figure, of course, does not include the Southern Pacific Co.'s holdings.

Section 9. Total land strength (including timber rights) in Louisiana and in Southern Pine Region of 27 of the holders platted on Louisiana map.

This section states the additional and total acreage of the same 27 holders whose timbered acreage and timber in Louisiana and the Southern Pine Region are discussed in the foregoing section. The table which follows, repeating from Table 44 the merchantable-timber acreage of these holders with their timber rights, shows besides, their additional land—mostly cut-over—and their total acreage.

A large proportion of their merchantable-timber land in the Southern Pine Region is held in the form of timber rights. Out of their total of 5,477,548 acres of merchantable-timber land, no less than 1,402,393 acres, or one-fourth, is timber rights. So far as the fee of these lands is in the hands of small holders, the monopolistic effect of the large holdings is lessened; so far, on the other hand, as the fee is owned by equally large investors, it is not lessened. Of their 1,402,393 acres of timber rights, 690,000 acres are held by the Kirby Lumber Co. on lands the fee of which is owned by the Houston Oil Co. It is likely that other considerable holdings of timber rights are owned in fee by large land holders. The Bureau's investigation, however, did not extend to the matter of the fee ownership underlying the timber rights reported, and consequently no definite statement can be made on this point.

TABLE 46.—ACREAGE OF TIMBER (INCLUDING TIMBER RIGHTS) AND ADDITIONAL LAND OWNED IN LOUISIANA AND IN SOUTHERN PINE REGION BY 27 OF THE HOLDERS PLATTED ON LOUISIANA MAP, BY GROUPS.

[Not all members of a group own additional land. The number of those owning such land is shown for each group, parenthetically in italics, in the additional land column.]

Holders.	In State of Louisiana.				
	Merchantable-timber acreage.			Additional land reported.	Total.
	Fee.	Timber rights.	Total.		
<i>Acrea.</i>	<i>Acrea.</i>	<i>Acrea.</i>	<i>Acrea.</i>	<i>Acrea.</i>	
First group, 14 platted holders.....	2, 141, 146	407, 875	2, 549, 021	(10) 373, 038	2, 922, 059
13 out of second group of 25 platted holders.....	505, 228	39, 514	544, 742	(6) 71, 453	616, 195
Total, 27 holders.....	2, 646, 374	447, 389	3, 093, 763	(16) 444, 491	3, 538, 254
Holders.	In Southern Pine Region.				
	Merchantable-timber acreage.			Additional land reported.	Total.
	Fee.	Timber rights.	Total.		
<i>Acrea.</i>	<i>Acrea.</i>	<i>Acrea.</i>	<i>Acrea.</i>	<i>Acrea.</i>	
First group, 14 platted holders.....	3, 197, 349	1, 328, 553	4, 525, 902	(10) 500, 031	5, 025, 933
13 out of second group of 25 platted holders.....	877, 896	73, 840	951, 646	(7) 105, 203	1, 056, 849
Total, 27 holders.....	4, 075, 155	1, 402, 393	5, 477, 548	(17) 605, 234	6, 082, 782

Section 5 has discussed the concentration of land ownership existing on the map area. In the entire State of Louisiana, the first group has a total of 2,514,184 acres in fee, and in the Southern Pine Region, 3,697,380 acres.¹ This is an average fee holding, in the Southern Pine Region, for these 14, of over 260,000 acres to the holder. The 13 holders selected from the second group of 25 platted holders have a total fee acreage in the State of 576,681 acres, and in the Southern Pine Region a total of 983,009 acres. Taken together, the 27 holders have in the State a total fee acreage of 3,090,865 acres, and in the Southern Pine Region as a whole, 4,680,389 acres. Of this amount, 605,234 acres are "additional" land counted as not bearing merchantable timber. The total fee holding of the 27 averages nearly 175,000 acres.

¹ Made up of the fee timberland and of the additional land, the additional land being all fee.

Part III.—LAND HOLDINGS OF LARGE TIMBER OWNERS.

CHAPTER I.

INTRODUCTION.

Section 1. Reason for publication of material.

Parts I and II of this Report have indicated that the acquisition of large bodies of timber by a comparatively few holders has incidentally resulted in a great concentration of the ownership of land. Part III takes up more fully this aspect of the subject. Concentration of land ownership may come to have even more serious and lasting effects upon the economic, social, and political life of the country than does the control of the timber. The land data obtained by the Bureau are not sufficiently full for a comprehensive study of the land problem as a whole. They cover only one class of owners, namely, the timbermen, and this class is covered only in those regions of the country that are most important for timber. It is believed, however, that the publication of such information as was obtained will serve a useful purpose; so far as it goes, it shows an important degree of concentration, and emphasizes concretely the need of further and more comprehensive inquiry as to conditions and tendencies of land ownership in the United States.

Section 2. Caution against undue inferences from material in this Part.

Though the concentration of the ownership of land by timber owners is extremely important, yet it would be an error to consider the concentration of land ownership among this particular class of holders as typical of the concentration of land holdings of all kinds throughout the country generally. The ownership of land by other classes of holders was not investigated. Concentration of ownership in farming communities, of course, would be found to be by no means so great as in timber regions. The present discussion has, therefore, only a limited bearing on the general question.

The ownership or control of a considerable amount of timber is necessary to insure a mill of the most economical capacity a sufficient supply for its life. Lumbermen would hesitate to put up a large thoroughly equipped mill unless they had or could secure enough

timber tributary to it to last 15 or 20 years. Where the stand of timber is comparatively light, this is likely to involve a holding of several thousand acres. On this account holdings ranging from 5,000 or 10,000 up to 30,000 or 40,000 acres, depending on the stand per acre, may be regarded as normal in the case of timberland; but in the case of farm land, if a tract of equal size were held in a single ownership, the fact would at once excite attention. In other words, under the conditions that prevail, small holdings are normal in agriculture, and relatively large holdings are normal in lumbering.

The essential point to bear in mind in a consideration of the concentration of land ownership is the extent to which concentration exists above the size of holding necessary for the most efficient and economical use of land of a given character. From this point of view, a lower degree of concentration in the ownership of farm land, for example, might be more significant than a higher degree in the case of grazing or timberland.

Section 3. Importance of concentrated land ownership by timber holders.

The fact that what may be called the normal requirement in size of holdings is much greater for lumbering operations than for farming does not lessen the significance or danger of the concentrated ownership of land by timber owners. Nor does this relatively large normal requirement by any means suffice to explain the existing concentration of land ownership shown by the timber investigation. The investigation reveals a marked tendency toward the speculative acquisition and holding of timberlands enormously in excess of the amount needed to protect the economical operation of mills. It should be said, however, that the prime motive was to acquire timber, and the acquisition of the land was usually incidental.

There will ultimately be two entirely distinct phases to this matter of great land holdings by timber holders: (1) The first relates to that part of their land holdings which will be permanently devoted to growing timber—the natural forest land that will be more valuable for timber crops than for agriculture. The control of these great bodies of land which, with the present national forests, will furnish the timber supply of the future, forms one problem. It is the same problem that lies at the root of the discussion in Part I and Part II of this Report. Similar to the problem of the lands that will be permanently valuable for timber is the problem of those that have valuable deposits of ore, oil, gas, or other mineral wealth; striking examples being the iron ore in the Lake States and the petroleum in Texas, discovered on lands originally acquired for their timber. (2) The control of that part of the land holdings of timber holders that is now or will eventually be suitable for agriculture forms a different

problem. If ownership of it is indefinitely retained, a system of tenant farming, or direct farming will develop; if it is held idle for a long period under a low tax rate, the effect will be to make the price of cultivable land in general more dear than need be. Only if it is sold to small holders who will till it, will the problem be rightly solved. To-day, some of this land is being leased, some held, and some sold; the important thing is to ascertain what the main tendency is.

The Bureau has no adequate data as to what proportion of the merchantable-timber land of large timber owners will ultimately be suitable only for reforestation or what proportion will be suitable for agriculture.¹ Nor has it such data as to their land not now bearing merchantable timber. In general, however, it may be said that a considerable part—possibly the greater part—of the present large timber holdings in the Pacific-Northwest consists of lands unsuited for agriculture. Excepting such as may prove to have mineral wealth, their chief value when cut will be for grazing and reforestation. For example, it has been roughly estimated by well-informed timbermen that the immense areas of timberland held by the Amalgamated Copper Co. interests in western Montana are from 80 per cent to 90 per cent natural forest land, i. e., more valuable for growing trees than for agricultural purposes. Again, 60 per cent of that part of the State of Washington that lies west of the Cascade Mountains is estimated by a well-informed timberman to be natural forest land. On the Pacific coast, where the rate of timber growth is rapid and where much of the land is rough and ill suited to other uses, immense tracts of natural forest land now in the hands of a few holders may be retained and managed with a view to a perpetual supply of timber and a perpetual control of that supply. It should be noted, however, that the area of the national forests is capable of developing a far heavier stand of timber, under a wise policy, than it now carries; so that the future relation between the publicly owned and privately owned supply of timber may be very different from what it now is.

On the other hand, the large area of agricultural land held by timber owners in the Pacific-Northwest—that which is now ready for cultivation and that which will be agricultural when the timber is cut—will undoubtedly bear an important relation to the rural development of that region, and will prove to be an important asset for the timbermen. Timbermen in the Pacific-Northwest say that until the last six or eight years timberland was usually bought and sold with sole reference to the amount and quality of the timber. The land itself, in other words, was considered of no value. Yet many of them now emphasize the great value such lands will have for fruit raising, agriculture, grazing, etc.

¹ Only a scientific examination of the land itself would determine these questions even for the present time, and it could scarcely be relied on as definitive of future possibilities.

In a large part of the Southern Pine Region and the Lake States, also, the denuded timberlands will prove valuable for agricultural uses. Already some of these lands are being sold or used for general farming, for cotton, fruit, trucking, etc., and there are several instances where large holders of cut-over lands are making careful experiments to determine the best uses to which they can be put. In general, most of the cut-over areas of the South and the Lake States, except such as are mountainous, will eventually prove susceptible of profitable cultivation. There are large areas of swamplands in these regions but drainage is generally practicable, and will make them among the most valuable for agricultural purposes. In fact, considered areas of such lands have already been, or are now being, drained in several States.

If the present timberlands of large holders are kept uncut for many years till the scarcity value of timber becomes such that it can be cut at the maximum profit, it is probable that the arable portion will then have a high value for agriculture. With the increasing demand for foodstuffs, the timber owners may then continue to hold their arable cut-over lands for considerable periods of time in hope of securing the speculative increase in their value; in which case the settler who wishes to cultivate them will be compelled to pay a relatively high price.

The immense areas of land owned by relatively few large timber holders are, therefore, significant. They indicate problems of continued concentration of control of the timber supply, and, in less degree, concentrated ownership of agricultural land in large sections of the country. This is a particular aspect of the fundamental problem of the distribution of wealth.

Section 4. Outline of material in this Part.

The subject of concentration in the ownership of land was briefly referred to in the Summary of Part I (p. 28). In Chapter IV of Part I the merchantable-timber acreage held by large timber owners, and the additional fee lands owned by them, were stated in tables. Those tables, however, did not go to the question of the concentration of land ownership *per se*, for timber rights as well as fee lands were included without distinction, and the holders were grouped on the basis of the amount of timber owned. In the present Part, the subject of the ownership of land as such by large timber holders is particularly emphasized.

The tables in Chapter II show the amount of land owned in fee in the entire investigation area by the 1,802 holders reported to the Bureau as owners of over 60 million feet of timber each. The grouping of holders is on the basis of the amount of fee land owned (including both fee land bearing merchantable timber and fee land

not bearing merchantable timber). The tables also show the amount of timber rights held by the same owners, and the amount of their land not distinguished in the reports as fee or timber rights.

Chapter III shows the concentration of land ownership among timber holders in the Upper Peninsula of Michigan, with special reference to the effect of the land policy of the Government and the State. Chapter IV shows in a similar way the land situation in Florida. The discussion relating to the Upper Peninsula of Michigan is accompanied by a map showing the land owned by 32 large timber holders.

CHAPTER II.

LAND OWNED IN INVESTIGATION AREA BY LARGE TIMBER OWNERS.

Section 1. Introductory.

The definition of a large timber holder as used in this Part is one who owns 60 million feet, or more, of timber. There are 1,802 such holders reported to the Bureau in the investigation area. The material here presented was mainly gathered during the field work of the timber investigation which was from 1907 to the early part of 1910. The tables and general discussion are therefore of that period, except where other dates are specified.

Title to merchantable timber is commonly held under one of two forms of tenure. It either is held in fee—that is, the timber holder owns both the timber and the land on which it stands—or is held under lease; that is, the timber holder does not own the land, but merely has purchased from the landowner the right to remove the timber within a specified period of years. When a holder thus owns the timber without ownership of the land on which it stands, he is said to have “timber rights” on the land, or to have a “timber lease,” or a “timber deed.” After he cuts off the timber and the lease expires, his interest ceases.

While the Bureau's timber investigation concerned primarily the amount and ownership of timber, information was also obtained as to the acreage on which the timber stood, usually distinguishing timber lands held in fee from those held under timber lease. Incidentally, information was secured from most of the large timber owners as to the amount of fee land not bearing merchantable timber they owned in the timber regions investigated; for example, young growth not yet fit for cutting, denuded land, prairie, etc.

Section 2. Difference between present acreage tables and those in Chapter IV of Part I.

In the timber tables of Chapter III of Part I of this Report the 1,802 holders of over 60 million feet each were grouped in 10 groups on the basis of timber owned, and all the unenumerated holders each owning less than 60 million feet of timber formed a separate group. In the acreage tables of Chapter IV of Part I the holders were grouped on the basis of the amount of timber owned, not on the amount of acreage owned. The merchantable-timber acreage owned in the investigation area by the 1,802 holders included fee land, timber rights, and land not distinguished as to tenure. There was also a

statement, for the 1,802 holders, showing the amount of their fee acreage not bearing merchantable timber. The totals of those acreage tables may be summarized as follows:

	1,802 holders, timber-groups 1 to 10.	Holders, timber-group 11.
Merchantable-timber acreage (including fee, timber rights, and not-distingu- ished), Part I, Table 43.....	79,092,000	75,038,000
Fee acreage not bearing merchantable timber (so far as reported), Part I, Table 43.....	10,652,000	(1)
Total for 1,802 holders.....	89,744,000	

¹ For the great bulk of holders in this group, information was not sought as to their acreage not bearing merchantable timber.

In the present Part, Table 1 (p. 165) shows the same total of 89,744,-000 acres of fee land and timber rights owned in the investigation area by the 1,802 holders, but differs from the acreage tables in Part I in that it groups the holdings on the basis of the amount of total fee acreage owned. The groups range from group 1, consisting of holders each owning over 1,500,000 acres in fee, to group 8, consisting of holders for completeness, timber rights and merchantable timberland not distinguished as to whether it is fee or timber rights. The totals may be summarized as follows:

Fee acreage.....	1,802 holders, acreage-groups 1 to 8. 78,252,000
Fee merchantable timberland.....	67,600,000
Fee land not bearing merchantable timber.....	10,652,000
Timber rights.....	10,520,000
Not-distinguished land.....	972,000
Total for 1,802 holders.....	89,744,000

In this discussion the emphasis is properly on the total fee acreage owned. Hence, though timber rights and not-distinguished land are carried in Table 1, they are omitted from Tables 2 and 3. Table 2 is a cumulative table computed from Table 1 by addition of the groups, but confined to total fee acreage. Table 3 shows the detail of the total fee acreage by holders for the first 3 groups of Table 1. These 3 groups comprise all large timber holders that own in the investigation area over 300,000 acres each in fee.

Section 3. Land in investigation area owned by large timber holders.

LIMITATIONS OF TABLES IN THIS SECTION.—The land tables in this section have certain limitations—some of them already stated—that

it is important to bear in mind. The figures must not be given too wide application.

In the first place they cover the holdings of timber holders only. Moreover, of timber holders, they include only those who own as much as 60 million feet of timber each. They exclude the vast number of timber holdings of less than 60 million feet—holdings that range from several thousand acres down to the single 160-acre claim or less. In the Southern Pine Region, especially, a great many timber holders, separately reported to the Bureau, had acreages ranging from 1,000 acres or less up to 90,000 acres, but did not have as much as 60 million feet of timber. In that region alone such holders aggregate about 8,000 in number, with nearly 13,600,000 acres,¹ part of which is in timber rights. For the Pacific-Northwest and the Lake States the number and acreage of such separately reported holders of less than 60 million feet have not been tabulated, but the number is much less than in the Southern Pine Region. All such holdings, though separately reported, are excluded from the tables.

Secondly, the tables cover only the "investigation area," an area divided into three regions and defined as follows: *Pacific-Northwest*, comprising California, Oregon, Washington, Idaho, and Montana; *Southern Pine Region*, comprising Arkansas, Texas,² Louisiana, Mississippi, Alabama, Florida, and part of the timbered portions of Missouri, Georgia, South Carolina, and Virginia; *Lake States*, comprising Michigan, Wisconsin, and Minnesota. (See Part I, p. 63, for a detailed description of the area.)

Thirdly, even in the investigation area, Tables 1, 2, and 3 do not cover any lands which timber holders, or their subsidiaries, may own in the large stretches of timberless country found in some of the States, as, for example, in Texas, southern California, central Washington, eastern Montana, southern Minnesota, etc. In other words, the Bureau sought information only as to land holdings owned by timber holders in those parts of the investigation area that may be described as within the general boundaries of the timber belts, taking the term "timber belt" in its broadest sense. So far as lands not bearing merchantable timber are included in the tables, they are

¹ Separately reported holders of less than 60 million feet in Southern Pine Region and their acreage (excluded from tables in this section) are shown in the following tabular statement:

Groups.	Number of holders.	Acres reported (including timber rights).
Less than 1,000 acres.....	4,821	1,655,000
1,000 to 5,000 acres.....	2,488	8,499,000
5,000 to 15,000 acres.....	652	6,380,000
Over 15,000 acres.....	46	1,187,000
Total.....	8,007	13,691,000

² Only the timber belt, located in the eastern part of the State, is covered.

lands held in more or less close connection with the merchantable-timber land of their owners. Five important cases have come to the Bureau's attention from published sources where large timber holders concerning whom timber reports were secured own in addition to their timberlands large amounts of land in the timberless portions of the investigation area and in States outside the investigation area. These additional lands have been omitted here in order to keep the tables in this section on as uniform a basis as possible. A later section (pp. 180 to 181) takes up briefly the five holdings thus partly omitted from the main tables.

The importance of the omitted parts of these five holdings is indicated by the fact that they amount to 27,346,000 acres, or over one-third as much as all fee holdings included in the main tables.

Again, it is necessary to have in mind the fact already stated in Part I (p. 162) that in the Bureau's work special emphasis was laid on the acreage of land now bearing merchantable timber, and that though owners were asked to make a separate statement of other land owned many did not report their nontimbered land at all, even that adjoining their merchantable-timber land.¹

Finally, the fee of a considerable part of the 10,520,000 acres of timber rights shown in Table 1 is undoubtedly owned by large corporations, and in so far as it is thus owned the concentration of land ownership is so much greater than is indicated by the table. Often the lumber companies buy up timber rights on a large number of small tracts and individual claims, in which the fee ownership underlying the timber rights is scattered and unimportant for the purposes of a land discussion. On the other hand, great land companies which have succeeded to Government or State grants or which have bought up immense tracts of land for speculation often lease the timber rights to lumber companies, but still retain the fee. The Bureau's investigation did not, in general, go into this matter, though some cases have come to its attention.

For example, the Houston Oil Co. owns² the fee and mineral rights on 690,000 acres in Texas and Louisiana, on which the Kirby Lumber Co. has the timber. These 690,000 acres are included in the tables of this Report as timber rights of the Kirby Lumber Co. But underneath these timber rights is a great land holding, which in a complete study of land ownership in this country would not be

¹ On the other hand, in the lumbering sections, the reports of many holders did not distinguish open, denuded, and young-timber land from that bearing merchantable timber; so that in Tables 1 and 2 there are probably considerable acreages included under fee merchantable-timber land that really do not bear merchantable timber. This is especially the case in the Upper Peninsula of Michigan. This error is of less importance in the present discussion of land holdings as such (since, whether timbered or not, this land is owned in fee) than it was in Part I where the discussion was concerned with the timbered or nontimbered character of the land.

² The present tense is used here and in general throughout the Report, to refer to the facts as reported at the time of the Bureau's field investigation. In this case, the report on the Houston Oil Co.'s holding was obtained in 1908.

obscured as it necessarily is in the present treatment of land ownership by the timber holders.

The information shown here regarding concentration of land ownership, even in the timbered parts of the States in the investigation area, is therefore only partial. A thorough investigation into land ownership in some other parts of these States, to say nothing of the timbered and grazing regions outside the investigation area, would add very greatly to the striking facts shown by these partial data; though, of course, in farming communities a much lower degree of concentration would be found. Great landowning corporations are found in many sections of the country. The largest land owners are railroads, and some of the other large landowning corporations have close relations with railroads, thus strengthening their control. A few timber owners dominate the northern half of California and Oregon and Washington, west of the Cascades; and the railroads in this territory have great land interests. A map in Chapter III shows the extent to which 32 land owners, each having over 40,000 acres, own the Upper Peninsula of Michigan. Wherever there was promise of large profit through timber holding in the South, a great proportion of the area has been acquired by a few interests. In some cases, almost entire counties are dominated by one corporation.

CONCENTRATION OF LAND OWNERSHIP.—The number of holders in each group in the investigation area is shown in italics at the head of the table. The number for the entire investigation area is 1,802; but several of these own in more than one of the regions; and hence the sum of the holders shown for the three regions includes some duplication and therefore is greater than 1,802, the true total.¹ The number of holders in each State is not shown because it would involve many duplications.

To guard against possible misunderstanding as to what constitutes a "holder" in the sense in which the word is used throughout this Report, it is well to repeat here two paragraphs given in Part I, pages 95 and 96, on this point:

There is a remarkable interweaving of interests among owners of timber, individual and corporate. It often happens that only a fraction of the timber under one control is held in any one name. Most of the important owners refused to furnish the information necessary to reveal the great concentration of control through personal and corporate relations. Yet only answers on this point

¹ Sometimes a holder owning in more than one region has only a small proportion of his holding in a given region. If his acreage in that region is less than 15 per cent of the minimum limit of the group in which his holding in the investigation area places him, he has not been counted as a holder *in that region*, though his acreage there is included. This plan tends to prevent unimportant parts of holdings from obscuring the real degree of concentration in a given region. It affects only 20 holders; and the number thus excluded, for each region, with their acreage, is shown in the foot table at the end of Table 1. By subtracting the acreage shown in the foot table for a given region from the amount shown in the main table for the same region, one can ascertain, if desired, the acreage owned in that region by the holders counted; or by adding the number of holders shown for a given region in the foot table to the number shown in the main table, one can ascertain the actual number of holders owning the acreage shown in the main table for that region.

(see question 7 of schedule, p. 275) would reveal the true concentration of the ownership of timber. Persistent effort was made to secure the information on stock holdings from those concerned and from others who might know the facts, and, as is shown below, separate owners of record were consolidated wherever sufficient evidence of one controlling interest was obtained. But nothing short of access to the stock books of all important timber-owning corporations would show the true situation. Therefore the degree of concentration set forth in this report is certainly much below that which actually exists.

Some corporations gave the information regarding stockholders and stock interests in other corporations; some individuals stated, apparently in good faith, their stock holdings in corporations connected with the lumber industry; and from independent sources some specific facts and much general information were gathered. This evidence was carefully considered, and where it was sufficient to show a common control through ownership the separate holdings so controlled were combined and treated as one in the tables of this chapter. Such combinations were not made because of mere common management or harmonious operation. The test was that of actual control through ownership of at least half the stock by the interest in question. If an individual owning timber had at least half the stock of a timber-owning corporation, the two holdings were combined as one. A corporation was combined with others in which it held a majority of the stock. In a number of important cases, the same few individuals appeared in several corporations as holding a majority of the stock in each, and the corporate holdings were therefore combined as one.

The tables follow:

TABLE 1.—LAND HOLDINGS OWNED IN FEE IN TIMBERED PARTS OF THE INVESTIGATION AREA BY TIMBER HOLDERS OF OVER 60 MILLION FEET EACH, GROUPED BY AMOUNT OF TOTAL FEE; TOGETHER WITH THEIR TIMBER RIGHTS AND THEIR LAND NOT DISTINGUISHED AS FEE OR TIMBER RIGHTS.

[In thousands of acres. Thus, 78,262 = 78,262,000 acres. See pp. 161 to 164 for limitations of this table, also p. 181 for 27,246,000 acres owned by 5 of these holders but omitted from the table.]

INVESTIGATION AREA.

Grand total for Pacific-Northwest, Southern Pine Region, and Lake States.

Number of holders.....	1,802	6	9	27	48	184	808	318	755	967	108
Total fee.....	78,252	12,704	7,829	9,911	9,608	12,600	10,604	8,175	71,821	6,731	.....
Fee, merchantable timber.....	67,000	10,971	5,099	8,503	8,460	11,133	9,348	7,281	61,965	6,235	.....
Fee, additional.....	10,452	1,823	2,130	1,408	1,148	1,467	1,256	924	10,156	496	.....
Timber rights.....	10,520	76	56	1,809	780	1,036	1,045	1,389	6,191	2,503	1,826
Not distinguished.....	972	.....	.....	77	40	18	14	4	153	225	594
Total, all groups.....	78,252	12,704	7,829	9,911	9,608	12,600	10,604	8,175	71,821	6,731	.....
Group 1 (holders of 1,500,000 acres, and over).....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Group 2 (holders of 500,000 to 1,500,000 acres, fee).....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Group 3 (holders of 300,000 to 500,000 acres, fee).....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Group 4 (holders of 150,000 to 300,000 acres, fee).....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Group 5 (holders of 75,000 to 150,000 acres, fee).....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Group 6 (holders of 37,500 to 75,000 acres, fee).....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Group 7 (holders of 18,000 to 37,500 acres, fee).....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Group 8 (holders of less than 18,000 acres, fee).....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total, Groups 1-7.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Group 8 (holders of less than 18,000 acres, fee).....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Having fee.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Having no fee.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

TABLE 1.—LAND HOLDINGS OWNED IN FEE IN TIMBERED PARTS OF THE INVESTIGATION AREA BY TIMBER HOLDERS OF OVER 50 MILLION FEET EACH, GROUPED BY AMOUNT OF TOTAL FEE; TOGETHER WITH THEIR TIMBER RIGHTS AND THEIR LAND NOT DISTINGUISHED AS FEE OR TIMBER RIGHTS—Continued.

[In thousands of acres. Thus, 78,252=78,252,000 acres. See pp. 161 to 164 for limitations of this table, also p. 181 for 27,346,000 acres owned by 5 of these holders but omitted from the table.]

Pacific-Northwest.
Total for the 5 States.

	Total, all groups.	Group 1 (holders of 1,500,000 acres, fee, and over).								Group 2 (holders of 500,000 to 1,500,000 acres, fee).		Group 3 (holders of 300,000 to 500,000 acres, fee).		Group 4 (holders of 150,000 to 300,000 acres, fee).		Group 5 (holders of 75,000 to 150,000 acres, fee).		Group 6 (holders of 37,500 to 75,000 acres, fee).		Group 7 (holders of 18,000 to 37,500 acres, fee).		Total, groups 1-7.		Group 8 (holders of less than 18,000 acres, fee).						
		Number of holders.....	23,105	9,487	1,884	2,340	1,594	1,544	1,884	1,544	1,884	1,544	1,884	1,544	1,884	1,544	1,884	1,544	1,884	1,544	1,884	1,544	1,884	1,544	1,884	1,544	1,884	1,544	1,884	
Total fee.....	704	5	2	7	18	22	59	70	155	165	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	205	
Fee, merchantable timber.....	21,416	8,716	1,779	2,247	1,483	1,404	1,741	1,525	1,895	1,514	1,895	1,514	1,895	1,514	1,895	1,514	1,895	1,514	1,895	1,514	1,895	1,514	1,895	1,514	1,895	1,514	1,895	1,514	1,895	
Fee, additional.....	1,689	771	105	93	111	140	143	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151	151
Timber rights.....	448	9	15	155	12	21	85	42	339	104	5																			

California.

Total fee.....	6,074	2,321	768	286	675	444	553	547	5,594	480
Fee, merchantable timber.....	5,398	1,939	768	286	661	401	449	459	4,953	435
Fee, additional.....	676	382	.....	14	43	104	86	86	631	45
Timber rights.....	50	.....	15	.....	.....	.....	6	21	42	6

Oregon.

Total fee.....	6,744	2,472	.....	910	529	371	825	586	5,693	1,051
Fee, merchantable timber.....	6,380	2,288	.....	879	469	358	795	556	5,345	1,015
Fee, additional.....	384	184	.....	31	60	13	30	30	348	36
Timber rights.....	61	.....	.....	2	5	43	2	52	9	.....

Washington.

Total fee.....	6,170	3,145	.....	306	288	636	321	459	5,135	1,035
Fee, merchantable timber.....	5,773	3,009	.....	294	251	554	312	407	4,827	946
Fee, additional.....	397	136	.....	12	37	82	9	32	308	89
Timber rights.....	129	9	.....	2	2	9	25	10	57	68

Idaho.

Total fee.....	1,583	396	4	725	88	59	136	78	1,466	107
Fee, merchantable timber.....	1,469	327	3	675	88	59	136	78	1,366	103
Fee, additional.....	124	69	1	50	.....	.....	.....	.....	120	4
Timber rights.....	176	.....	.....	136	8	5	1	9	156	.....

TABLE 1.—LAND HOLDINGS OWNED IN FEE IN TIMBERED PARTS OF THE INVESTIGATION AREA BY TIMBER HOLDERS OF OVER 80 MILLION FEET EACH, GROUPED BY AMOUNT OF TOTAL FEE; TOGETHER WITH THEIR TIMBER RIGHTS AND THEIR LAND NOT DISTINGUISHED AS FEE OR TIMBER RIGHTS—Continued.

[In thousands of acres. Thus, 78,252=78,252,000 acres. See pp. 161 to 164 for limitations of this table, also p. 181 for 27,246,000 acres owned by 5 of these holders but omitted from the table.]

Pacific-Northwest—Continued.

Montana.

	Total, all groups.	Group 1 (holders of 1,500,000 acres, fee, and over).								Total, groups 1-7.		Group 8 (holders of less than 18,000 acres, fee).	
		Group 2 (holders of 500,000 to 1,500,000 acres, fee).	Group 3 (holders of 300,000 to 500,000 acres, fee).	Group 4 (holders of 150,000 to 300,000 acres, fee).	Group 5 (holders of 75,000 to 150,000 acres, fee).	Group 6 (holders of 37,500 to 75,000 acres, fee).	Group 7 (holders of 18,000 to 37,500 acres, fee).	Group 8 (holders of less than 18,000 acres, fee).	Group 9 (holders of less than 18,000 acres, fee).	Group 10 (holders of less than 18,000 acres, fee).	Group 11 (holders of less than 18,000 acres, fee).	Group 12 (holders of less than 18,000 acres, fee).	
Total fee.....	2,524	1,153	1,112	113	14	34	49	26	2,501	23	23		
Fee, merchantable timber.....	2,416	1,153	1,008	113	14	32	49	25	2,394	22	22		
Fee, additional.....	108	.....	104	.....	.....	2	.....	.....	1	1	1
Timber rights.....	32	.....	15	2	.....	2	10	.....	20	3	3

Southern Pine Region.

Total for the 11 States.

Number of holders.....	855	1	7	16	56	90	156	801	456	560	100
Total fee.....	43,230	1,754	5,137	5,505	6,463	8,945	7,025	5,168	39,997	3,233	.....
Fee, merchantable timber.....	36,790	1,083	3,384	4,535	5,844	8,150	6,226	4,610	33,832	2,958	.....
Fee, additional.....	6,440	671	1,753	970	619	795	799	558	6,165	275	.....
Timber rights.....	8,853	67	6	1,531	657	946	774	1,186	5,167	1,977	1,709
Not distinguished.....	972	.....	.....	77	40	18	14	4	153	225	594

Missouri (part).

Total fee.....	1,255	.....	.....	149	258	596	163	31	1,197	58	.....
Fee, merchantable timber.....	1,212	.....	.....	149	258	585	132	31	1,155	57	.....
Fee, additional.....	43	.....	.....	.....	.....	11	31	.....	42	1	.....
Timber rights.....	31	.....	.....	17	.....	.....	1	.....	18	13	.....

Arkansas.

Total fee.....	4,618	.....	571	246	206	1,275	1,020	779	4,097	521	.....
Fee, merchantable timber.....	4,185	.....	571	226	159	1,186	851	703	3,696	489	.....
Fee, additional.....	433	.....	.....	20	47	89	169	76	401	32	.....
Timber rights.....	599	.....	.....	129	22	96	63	122	432	137	30
Not distinguished.....	166	.....	.....	.....	.....	.....	.....	.....	.....	16	150

TABLE 1.—LAND HOLDINGS OWNED IN FEE IN TIMBERED PARTS OF THE INVESTIGATION AREA BY TIMBER HOLDERS OF OVER 50 MILLION FEET EACH, GROUPED BY AMOUNT OF TOTAL FEE, TOGETHER WITH THEIR TIMBER RIGHTS AND THEIR LAND NOT DISTINGUISHED AS FEE OR TIMBER RIGHTS.—Continued.

[In thousands of acres. Thus, 78,252=78,252,000 acres. See pp. 161 to 164 for limitations of this table, also p. 181 for 37,346,000 acres owned by 5 of these holders but omitted from the table.]

Southern Pine Region.—Continued.

Texas.

	Total, all groups.	Group 1 (holders of 1,500,000 acres, fee, and over).	Group 2 (holders of 500,000 to 1,500,000 acres, fee).	Group 3 (holders of 300,000 to 500,000 acres, fee).	Group 4 (holders of 150,000 to 300,000 acres, fee).	Group 5 (holders of 75,000 to 150,000 acres, fee).	Group 6 (holders of 37,500 to 75,000 acres, fee).	Group 7 (holders of 18,000 to 37,500 acres, fee).	Total, groups 1-7.		Group 8 (holders of less than 18,000 acres, fee).
									Having no acreage.	Having fee reported.	
Total fee.....	3,092	117	697	473	700	271	482	2,800	262	262	
Fee, merchantable timber.	2,784	117	623	441	678	243	397	2,490	285	285	
Fee, additional.....	308		74	32	82	28	85	301	7	7	
Timber rights.....	1,344		747	104	107	43	99	1,100	145	145	99
Not distinguished.....	22								5	5	17

Louisiana.

Total fee.....	6,739	12	28	1,953	1,076	1,182	706	6,021	718	718	
Fee, merchantable timber.	6,013	12	28	1,692	974	981	1,017	687	5,359	684	
Fee, additional.....	726		261	92	95	165	49	662	64	64	
Timber rights.....	1,145		351	133	76	45	144	749	224	224	170
Not distinguished.....	151								98	98	53

Mississippi.

Total fee.....	3,975			565	883	598	788	500	3,304	581	
Fee, merchantable timber.	3,816			565	883	576	748	518	3,200	536	
Fee, additional.....	159					22	40	42	104	55	
Timber rights.....	716		14	56	89	135	92	306	240	240	89
Not distinguished.....	187			25	18	14		87	25	25	105

Alabama.

Total fee.....	3,653		165	334	716	925	781	439	3,350	30	
Fee, merchantable timber.	3,219		165	152	679	839	748	362	2,935	284	
Fee, additional.....	434			182	37	96	33	67	415	19	
Timber rights.....	419		6		1	71	107	55	240	194	6

Florida.

Total fee.....	15,523	1,625	3,784	1,524	2,115	2,779	2,163	1,336	15,336	197	
Fee, merchantable timber.	11,563	954	2,031	1,092	1,815	2,436	1,910	1,178	11,416	147	
Fee, additional.....	3,960	671	1,753	432	300	343	253	158	3,920	50	
Timber rights.....	1,502	67		134	38	168	158	299	884	146	239
Not distinguished.....	166			5				5	5	5	139

LAND HOLDINGS OF LARGE TIMBER OWNERS.

TABLE 1.—LAND HOLDINGS OWNED IN FEE IN TIMBERED PARTS OF THE INVESTIGATION AREA BY TIMBER HOLDERS OF OVER 60 MILLION FEET EACH, GROUPED BY AMOUNT OF TOTAL FEE; TOGETHER WITH THEIR TIMBER RIGHTS AND THEIR LAND NOT DISTINGUISHED AS FEE OR TIMBER RIGHTS—Continued.

[In thousands of acres. Thus, 75,252=75,252,000 acres. See pp. 161 to 164 for limitations of this table, also p. 161 for 27,346,000 acres owned by 5 of these holders but omitted from the table.]

Southern Pine Region—Continued.

Georgia (part).

	Total, all groups.	Group 1 (holders of 1,500,000 acres, fee, and over).							Group 2 (holders of 500,000 to 1,500,000 acres, fee).				Group 3 (holders of 300,000 to 500,000 acres, fee).				Group 4 (holders of 150,000 to 300,000 acres, fee).				Group 5 (holders of 75,000 to 150,000 acres, fee).				Group 6 (holders of 37,500 to 75,000 acres, fee).				Group 7 (holders of 18,000 to 37,500 acres, fee).				Total, groups 1-7.		Group 8 (holders of less than 18,000 acres, fee).			
		1,556	1	248	473	251	509	1,482	74	211	448	198	404	1,322	74	37	25	63	45	160	248	473	251	509	1,482	74	211	448	198	404	1,322	74	37	25		63	45	160
Total fee.....	1,556	1	248	473	251	509	1,482	74	211	448	198	404	1,322	74	37	25	63	45	160	248	473	251	509	1,482	74	211	448	198	404	1,322	74	37	25	63	45	160		
Fee, merchantable timber.....	1,396	1	211	448	198	404	1,322	74	211	448	198	404	1,322	74	37	25	63	45	160	211	448	198	404	1,322	74	211	448	198	404	1,322	74	37	25	63	45	160		
Fee, additional.....	160	1	37	25	53	45	160	10	37	25	53	45	160	10	37	25	53	45	160	37	25	53	45	160	10	37	25	53	45	160	10	37	25	53	45	160		
Timber rights.....	1,296	30	296	56	30	55	457	146	30	296	56	30	55	457	146	30	296	56	30	296	56	30	55	457	146	30	296	56	30	55	457	146	30	296	56	30	55	457
Not distinguished.....	10							10						10												10												

South Carolina (part).

Total fee.....	888	3	4	360	124	131	622	266
Fee, merchantable timber.....	756	2	4	328	105	95	534	222
Fee, additional.....	132	1		32	19	36	88	44
Timber rights.....	997	7	37	283	90	210	627	257
Not distinguished.....								113

North Carolina (part).

Total fee.....	1,697	565	5	434	103	283	163	1,552	145
Fee, merchantable timber.....	1,615	565	5	360	103	274	163	1,470	145
Fee, additional.....	82			74		8		82	
Timber rights.....	839	1				102	140	243	470
Not distinguished.....	221		29	10			4	43	28
Not distinguished.....									150

Virginia (part).

Total fee.....	224	25	29	60			42	156	78
Fee, merchantable timber.....	221	25	29	60			42	156	76
Fee, additional.....	3								3
Timber rights.....	174		101					101	63
Not distinguished.....	49		48					48	1

TABLE 1.—LAND HOLDINGS OWNED IN FEE IN TIMBERED PARTS OF THE INVESTIGATION AREA BY TIMBER HOLDERS OF OVER 60 MILLION FEET EACH, GROUPED BY AMOUNT OF TOTAL FEE; TOGETHER WITH THEIR TIMBER RIGHTS AND THEIR LAND NOT DISTINGUISHED AS FEE OR TIMBER RIGHTS.—Continued.

[In thousands of acres. Thus, 79,252=79,252,000 acres. See pp. 161 to 164 for limitations of this table, also p. 181 for 71,346,000 acres owned by 5 of these holders but omitted from the table.]

Lake States.

Total for the 3 States.

	Total, all groups.							Group 8 (holders of less than 18,000 acres, fee).	
	218	1	7	15	55	63	136	76	6
Number of holders.....	11,917	1,533	2,066	1,551	2,111	1,695	1,331	11,115	802
Total fee.....	9,394	1,172	536	1,721	1,579	1,331	1,116	8,638	756
Fee, merchantable timber.....	2,523	381	272	345	418	532	314	2,477	46
Fee, additional.....	1,219	.....	35	123	111	69	186	685	422
Timber rights.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Group 1 (holders of 1,500,000 acres, fee, and over).	.....	.....	.....	.....	.....	.....	.....	.....	.....
Group 2 (holders of 500,000 to 1,500,000 acres, fee).	.....	.....	.....	.....	.....	.....	.....	.....	.....
Group 3 (holders of 300,000 to 500,000 acres, fee).	.....	.....	.....	.....	.....	.....	.....	.....	.....
Group 4 (holders of 150,000 to 300,000 acres, fee).	.....	.....	.....	.....	.....	.....	.....	.....	.....
Group 5 (holders of 75,000 to 150,000 acres, fee).	.....	.....	.....	.....	.....	.....	.....	.....	.....
Group 6 (holders of 37,500 to 75,000 acres, fee).	.....	.....	.....	.....	.....	.....	.....	.....	.....
Group 7 (holders of 18,000 to 37,500 acres, fee).	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total, groups 1-7.	.....	.....	.....	.....	.....	.....	.....	.....	.....
Having fee reported percentage.	.....	.....	.....	.....	.....	.....	.....	.....	.....
Having no fee acreage.	.....	.....	.....	.....	.....	.....	.....	.....	.....

Michigan.

Total fee.....	6,841	1,515	171	1,261	952	1,280	654	662	6,495	346
Fee, merchantable timber.	5,585	1,134	169	1,109	743	938	596	570	5,259	326
Fee, additional.....	1,256	381	2	153	209	342	58	92	1,236	20
Timber rights.....	287	.....	.....	3	15	42	82	47	189	57
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	41

Wisconsin.

Total fee.....	3,274	.....	2	294	434	739	922	556	2,947	327
Fee, merchantable timber.	2,543	.....	2	140	336	602	726	433	2,239	304
Fee, additional.....	731	.....	.....	154	98	137	196	123	708	23
Timber rights.....	403	.....	.....	.....	13	26	96	57	192	180
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	51

Minnesota.

Total fee.....	1,902	38	635	511	165	92	119	113	1,673	129
Fee, merchantable timber.	1,266	38	365	472	54	39	59	113	1,140	126
Fee, additional.....	536	.....	270	39	111	53	60	.....	533	3
Timber rights.....	529	.....	35	120	83	1	8	57	304	185
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	40

NOTE.

The holders that the above table excludes from the count of "number of holders" in certain regions, with the amounts of their acreage that the table includes in those regions, are indicated in the following foot table. In each case, as explained above

in the footnote on p. 164, the holder excluded from the count of the number has in that region less than 15 per cent of the minimum limit of the group. Thus, the Southern Pacific, a member of the first group of holders of over 1,500,000 acres, has in the Southern Pine Region only 129,000 acres; these 129,000 acres are included in the main table, but being less than 15 per cent of 1,500,000, the Southern Pacific is not counted as a holder in the Southern Pine Region. The one holder counted in group 1 in that region is the Consolidated Land Co., and the 1,754,000 acres of fee land shown in the table for this group in the Southern Pine Region consist of 1,625,000 acres for the Consolidated Land Co. in Florida, and the 129,000 for the Southern Pacific in Texas and Louisiana. The detail in Table 3 shows this clearly. Though not counted in the Southern Pine Region, the Southern Pacific is, of course, counted in the Pacific-Northwest, and in the investigation area.

TABLE 1a.—HOLDERS EXCLUDED FROM COUNT OF NUMBER OF HOLDERS IN TABLE 1 IN REGIONS WHERE THEIR HOLDING IS LESS THAN 15 PER CENT OF THE MINIMUM LIMIT OF THE GROUP, WITH AMOUNT OF THEIR INCLUDED ACREAGE IN THOSE REGIONS.

Pacific-Northwest.

	Group 1.		Group 2.		Group 3.		Group 4.		Group 5.		Group 6.		Group 7.	
	Number of holders.	Thousands of acres.	Number of holders.	Thousands of acres.	Number of holders.	Thousands of acres.	Number of holders.	Thousands of acres.	Number of holders.	Thousands of acres.	Number of holders.	Thousands of acres.	Number of holders.	Thousands of acres.
Total fee.....	10	105	1	6	3	78	1	2	15	2	3	1	2	
Fee, merchantable timber.....	105		6		78		1	15	3		2			
Timber rights.....	15					1			14					

Southern Pine Region.

Total fee.....	3	153	1	129			1	20			1	3		
Fee, merchantable timber.....	153		129				20				3			
Timber rights.....	7						6				1			

Lake States.

Total fee.....	7	106	1	38	1	10	2	41	1	14	1	1		1
Fee, merchantable timber.....	100		38		10		37		14					1
Fee, additional.....	6				4						1			
Timber rights.....	63				36						2			20

TABLE 2.—LAND HOLDINGS OWNED IN FEE IN TIMBERED PARTS OF INVESTIGATION AREA BY TIMBER HOLDERS OF OVER 60 MILLION FEET EACH, BY SIZE GROUPS, SHOWN CUMULATIVELY.

[In thousands of acres. Thus, 12,794=12,794,000 acres. See pp. 161 to 164 for limitations of this table, also p. 181 for 27,346,000 acres owned by 5 of these holders but omitted from the table. This table is computed by adding the "total fee" entries in Table 1. Timber rights and not-distinguished land are omitted. Since 108 holders in group 8 in Table 1 reported only timber rights or not-distinguished land, the omission of these 108 reduces the number of holders in the present table from 1,802 to 1,694.]

Investigation area.....	Group 1 (over 1,500,000 acres, fee).	Groups 1-2 (over 500,000 acres, fee).		Groups 1-3 (over 300,000 acres, fee).		Groups 1-4 (over 150,000 acres, fee).		Groups 1-5 (over 75,000 acres, fee).		Groups 1-6 (over 37,500 acres, fee).		Groups 1-7 (over 18,000 acres, fee).		Total, groups 1-8.
		5	14	41	89	215	415	733	1,694	3	12	24	46		86	165	708
<i>Number of holders.</i>	5	14	41	89	215	415	733	1,694						
Investigation area.....	12,794	20,623	30,534	40,143	52,742	63,346	71,521	78,252						
<i>Number of holders</i> ¹	3	5	12	24	46	86	165	708						
Pacific-Northwest.....	9,457	11,371	13,711	15,305	16,949	18,733	20,400	23,105						
California.....	2,321	3,089	3,375	4,060	4,494	5,047	5,694	6,074						
Oregon.....	2,472	2,472	3,352	3,911	4,292	5,107	5,963	6,744						
Washington.....	3,145	3,145	3,451	3,739	4,375	4,696	5,135	6,170						
Idaho.....	398	400	1,125	1,213	1,272	1,408	1,486	1,583						
Montana.....	1,153	2,295	2,378	2,393	2,426	2,475	2,501	2,524						
<i>Number of holders</i> ¹	1	3	53	53	148	224	455	685						
Southern Pine Region.....	1,754	6,991	12,396	18,859	27,904	34,839	39,997	43,280						
Missouri (part).....	.....	.....	149	407	1,003	1,166	1,197	1,255						
Arkansas.....	.....	571	817	1,023	2,298	3,318	4,097	4,618						
Texas.....	117	117	814	1,267	2,047	2,318	2,800	3,092						
Louisiana.....	12	38	1,991	3,057	4,133	5,315	6,021	6,739						
Mississippi.....	.....	.....	565	1,448	2,046	2,634	3,394	3,975						
Alabama.....	1,625	5,409	6,933	9,048	11,827	13,990	15,326	15,523						
Florida.....	.....	.....	1	249	722	973	1,483	1,556						
Georgia (part).....	1	1	3	7	367	491	622	888						
South Carolina (part).....	.....	.....	565	570	1,004	1,107	1,369	1,697						
North Carolina (part).....	.....	.....	25	54	114	114	114	156						
Virginia (part).....	.....	.....	.....	.....	.....	.....	.....	.....
<i>Number of holders</i> ¹	1	2	9	21	44	85	156	224						
Lake States.....	1,553	2,361	4,427	5,978	8,089	9,784	11,115	11,917						
Michigan.....	1,515	1,686	2,947	3,899	5,179	5,833	6,485	6,841						
Wisconsin.....	.....	2	296	730	1,469	2,391	2,947	3,274						
Minnesota.....	38	673	1,184	1,349	1,441	1,560	1,673	1,802						

¹ For method of counting the number of holders in the separate regions see the note following Table 1, and Table 1a, which apply to Table 2 so far as fee is concerned.

TABLE 3.—LAND HOLDINGS OWNED IN FEE IN TIMBERED PARTS OF INVESTIGATION AREA BY EACH HOLDER OF GROUPS 1 TO 3 IN TABLE 1, BEING LARGE TIMBER HOLDERS EACH OWNING OVER 300,000 ACRES, FEE.
[In thousands of acres. Thus, 4,522=4,522,000 acres. See pp. 161 to 164 for limitations of this table, also p. 181 for 27,346,000 acres owned by 5 of these holders but omitted from the table.]

Groups and holders.	Investigation areas.	Pacific-North-west.	California.	Oregon.	Washington.	Idaho.	Montana.	Southern Pine Region.	Missouri (part).	Arkansas.	Texas.	Louisiana.	Mississippi.	Alabama.	Florida.	Georgia (part).	South Carolina (part).	North Carolina (part).	Virginia (part).	Lake States.	Michigan.	Wisconsin.	Minnesota.		
Group 1 (over 1,500,000 acres, fee):																									
Southern Pacific Co.	4,522	4,393	2,314	2,079				129		117	12														
Northern Pacific Ry. Co.	3,196	3,158			1,612	393	1,153													38				38	
Weyerhaeuser Timber Co.	1,936	1,936	7	393	1,533	3																			
Consolidated Land Co.	1,625							1,625																	
Cleveland Cliffs Iron Co. interests	1,515																			1,515	1,515				
Total, group 1.....	12,794	9,487	2,321	2,472	3,145	396	1,153	1,754		117	12									1,515	1,515			38	
Group 2 (500,000 to 1,500,000 acres, fee):																									
Southern States Land & Timber Co.	1,428							1,428				26													
Empire Land and National Timber companies	1,172																								
Amalgamated Copper Co. interests	1,116	1,116				4	1,112																		
United States Steel Corporation interests	965							166						165						799	171	2		626	

TABLE 3.—LAND HOLDINGS OWNED IN FEE IN TIMBERED PARTS OF INVESTIGATION AREA BY EACH HOLDER OF GROUPS 1 TO 3 IN TABLE 1, BEING LARGE TIMBER HOLDERS EACH OWNING OVER 300,000 ACRES, FEE—Continued.
 [In thousands of acres. Thus, 4,522 = 4,522,000 acres. See pp. 161 to 164 for limitations of this table, also p. 181 for 27,346,000 acres owned by 5 of these holders but omitted from the table.]

Groups and holders.	Investigation area.	Pacific - North-west.	California.	Oregon.	Washington.	Idaho.	Montana.	Southern Pine Region.	Missouri (part).	Arkansas.	Texas.	Louisiana.	Mississippi.	Alabama.	Florida.	Georgia (part).	South Carolina (part).	North Carolina (part).	Virginia (part).	Lake States.	Michigan.	Wisconsin.	Minnesota.
Group 2 (500,000 to 1,500,000 acres, fee)—Contd.	771	762	762																	9			9
T. B. Walker interests																							
Florida Coast Line Canal & Transportation Co. interests.	610						610	610							610								
John Paul interests.	606	6	6				600	600							600								
Norfolk Southern R. R. Co.	590						590	590										565	25				
The Missouri Pacific Ry. Co.	571						571	571		571													
Total, group 2	7,829	1,884	768			4	1,112	5,137		571		26		165	3,784	1		565	25	808	171	2	635
Group 3 (300,000 to 500,000 acres, fee):																							
Missouri Lumber & Land Exchange interests	442	17		17				425	149														
Great Southern Lumber Co. and affiliated companies	433						433	433				233	200										
Model Land Co.	427						427	427															
Blodgett Co. (Ltd.)	409	41					398	398					365							409	302	107	
I. Stephenson interests	409																						

T. H. Shervin interests	406	220	113	4	113														176	176	
Long-Bell Lumber Co. interests	399					399		81	318												
Wheeler interests ¹	396	346	208	129	9														50	50	
Chicago, Milwaukee & St. Paul Ry. Co. interests	395	395		276	119																
Texas Delta Land Co.	391					391			391												
Kirby Lumber Co.	383					383		368	15												
Chicago & North Western Ry. Co.	373																		373	186	187
Keweenaw Association (Ltd.)	373																		373	373	
Southern States Lumber Co.	364					364				225	139										
Wm. Buchanan companies	360					360		30	330												
Frost-Johnson Lumber Co. interests	345					345		68	277												
C. A. Smith interests	344	330	78	249	3														14	14	
Cummer-Diggins interests	343					317					317										
Central Coal & Coke Co. interests	343					343			248	95											
Crossett, Watsak & Gates interests	337	20	16	4		317		148	18	109	42										
Clearwater Timber Co. (Ltd.) and Humbird Lumber Co.	332	332			332																
Booth-Kelly Lumber Co. interests	324	324	324																		
The Michigan Iron & Land Co. (Ltd.)	324																		324	324	

¹ See Part I, p. 104.

TABLE 3.—LAND HOLDINGS OWNED IN FEE IN TIMBERED PARTS OF INVESTIGATION AREA BY EACH HOLDER OF GROUPS 1 TO 3 IN TABLE 1, BEING LARGE TIMBER HOLDERS EACH OWNING OVER 300,000 ACRES, FEE—Continued.

[In thousands of acres. Thus, 4,522=4,522,000 acres. See pp. 161 to 164 for limitations of this table, also p. 181 for 27,346,000 acres owned by 5 of these holders but omitted from the table.]

Groups and holders.	Investigation area.	Pacific North-west.	California.	Oregon.	Washington.	Idaho.	Montana.	Southern Pine Region.	Missouri (part).	Arkansas.	Texas.	Louisiana.	Mississippi.	Alabama.	Florida.	Georgia (part).	South Carolina (part).	North Carolina (part).	Virginia (part).	Lake States.	Michigan.	Wisconsin.	Minnesota.	
Group 3 (300,000 to 500,000 acres, fee)—Contd.																								
Virginia & Rainy Lake Co. interests.	321																			321				321
Dowling Lumber Co.	317							317							317									
Camp Manufacturing, R. J. & B. F. Camp Lumber, Crystal River Lumber, and Disrael Swamp Land companies.	316							316							282			5	20					
Pottatch Lumber, Fayette Lumber & Manufacturing, and Drew Timber companies.	305	305		38		287																		
Total, group 3	9,911	2,340	286	910	306	725	113	5,505	149	246	697	1,963	565	534	1,524		3	5	20	2,066	1,261	204	511	
Total, groups 1 to 3.	30,534	13,711	3,375	3,382	3,451	1,125	2,378	12,396	149	817	814	1,991	565	499	6,963	1	3	570	54	4,527	2,947	296	1,184	

The 1,802 holders of Table 1 consist of 1,694 holders who own fee acreage; and of 108 who were not reported as having any fee, their land being merely timber rights or not distinguished. Within the limitations of this table, the total fee land of the 1,694 holders is 78,252,000 acres. A considerable number of the 1,694 fee holders also own timber rights and not-distinguished land. These, with the 108 for whom nothing but timber rights or not-distinguished land was reported, have 10,520,000 acres of timber rights and 972,000 acres not distinguished. All the not-distinguished land is in the Southern Pine Region, as is the great bulk of the timber rights.

The average fee holding of the 1,694 holders is over 46,000 acres, which is equal to a tract about $8\frac{1}{2}$ miles square. There are 349 holders who own more than this average and 1,345 who own less.

The largest holding is that of the Southern Pacific Co., which has within the limitations of the table 4,522,000 acres, besides many more millions (see p. 181) outside the timber regions and therefore omitted from the table. The five largest holdings (group 1) have 12,794,000 acres in fee, an average of 2,560,000 acres each. In addition to the Southern Pacific Co., this group includes (see Table 3) the Northern Pacific Railway Co., with 3,196,000 acres in the table, and much more not here counted (see p. 181); the Weyerhaeuser Timber Co., with 1,936,000 acres; the Consolidated Land Co., controlled by the Consolidated Naval Stores Co., with 1,625,000 acres; and the Cleveland Cliffs Iron Co. interests, with 1,515,000 acres. The first three of these holders have their lands in the Pacific-Northwest, the Consolidated Land Co. in Florida, and the Cleveland Cliffs in the Upper Peninsula of Michigan.

In group 2, those owning from a half million to a million and a half acres in fee, there are nine holders totaling 7,829,000 acres. As detailed in Table 3, these nine holders, with the location of their holdings, are as follows:

Southern States Land & Timber Co., with 1,428,000 acres, nearly all in Florida; Empire Land and National Timber companies, with 1,172,000 acres in Florida; Amalgamated Copper Co. interests, with 1,116,000 acres, practically all in Montana; United States Steel Corporation interests, with 965,000 acres, practically all in Minnesota, Michigan, and Alabama; T. B. Walker interests, with 771,000 acres, practically all in California; Florida Coast Line Canal & Transportation Co. interests, with 610,000 acres in Florida; John Paul interests, with 606,000 acres, practically all in Florida; Norfolk Southern Railroad Co., with 590,000 acres, mostly in North Carolina; and The Missouri Pacific Railway Co., with 571,000 acres in Arkansas. The holding of the Norfolk Southern is in the name of the John L. Roper Lumber Co., and that of the Missouri Pacific in the name of the St. Louis, Iron Mountain & Southern Railway Co.

No less than 27 timber holders (group 3) in the timbered part of the investigation area each have between 300,000 and 500,000 acres of fee land. The holdings of each member of this group are shown in Table 3. Taking the remaining groups, 48 holders (group 4) each have between 150,000 and 300,000 acres, fee; 124 (group 5) each have between 75,000 and 150,000; 202 (group 6) each have between 37,500 and 75,000; and 318 (group 7) each have between 18,000 and 37,500 acres. The total fee acreage of the seven groups of holders each of whom has over 18,000 acres fee, reaches the immense amount of 71,521,000 acres. This is owned by 733 holders. Thus, there are no less than 733 timber holders in the investigation area whose fee lands *average* nearly 100,000 acres each (to be exact, 97,573 acres).

Nor is this all. There are 961 holders (group 8) who though each owning less than 18,000 acres fee nevertheless own in the aggregate 6,731,000 acres of fee land, or an average for the entire 961 of 7,000 acres. A tract of 7,000 acres is nearly 3 miles by 4 in extent, practically a third of a township, and it is the equivalent of over 40 homesteads of 160 acres each. This indicates the significance of the fact that in the group of the least important holders included in this table there are nearly 1,000 holders each of whom, on the average, owns in fee enough land to furnish such homesteads, at five persons to the family, for more than 200 persons. This illustration is intended merely to give a concrete idea of size, and is not to be taken as implying that the land involved is necessarily suitable for cultivation.

Of the 972,000 acres not distinguished, only 153,000 are held by holders of over 18,000 acres fee (i. e., known fee), and 819,000 by other holders. If all or a considerable part of these 819,000 acres of not-distinguished land should actually prove to be fee, a number of the holders thereof would be classed in groups owning over 18,000 acres fee.¹

Of the three regions, the Southern Pine Region is the most important in amount of total fee holdings. The 43,230,000 acres owned in fee in that region by the 835 holders of fee lands are nearly twice the amount owned by the 702 such holders in the Pacific-Northwest and over three and one-half times that owned by the 212 such holders in the Lake States. In order of the average size of land holdings, timber holders in the Lake States stand first, with an average of practically 56,000 acres; and those in the Southern Pine Region second, with about 52,000 acres. In the Pacific-Northwest, despite the enormous size of some holdings there, the average is not quite

¹ Thus, in the first division of group 8 (those having known fee, but less than 18,000 acres) there are 25 holders who own the 225,000 acres of not-distinguished land. Ten of these holders, owning 146,000 acres out of the 225,000, are holders whose known fee plus their not-distinguished land in each case exceeds 18,000 acres. However, the largest item of not-distinguished land in this total of 225,000 acres is not over 25,000 acres. In the second division of group 8, there are 33 holders who own the 594,000 acres of not-distinguished land; 10 of these, whose holdings in each case exceed 18,000 acres, own, in the aggregate, 316,000 acres out of the 594,000. The largest items of not-distinguished land in this group are one holding of 66,000 acres in North Carolina, and one of 44,000 in Florida.

33,000. If the Southern Pacific Co. and the Northern Pacific were excluded, the average in the Pacific-Northwest would fall to 22,000. The lower average size of holdings in the Pacific-Northwest is coincident with a much higher average stand of timber in that region. A very large timber holding there may stand on a relatively small acreage.

The States in which timber holders of 60 million feet and over own the largest amounts¹ of fee acreage are Florida (15,523,000 acres); Michigan (6,841,000 acres); Oregon (6,744,000 acres); Louisiana (6,739,000 acres); Washington (6,170,000 acres); California (6,074,000 acres); and Arkansas (4,618,000 acres). In no other State in the investigation area do such holders have as much as 4,000,000 acres. In Florida their holdings amount to over two and one-quarter times as much as in Michigan, the next State in rank. Groups 1 to 3 (holders each owning over 300,000 acres, fee) have in Florida 6,933,000 acres of fee land, whereas in no other State is the total fee acreage of all holders of groups 1 to 8 so large as this figure. Table 3 shows that these 6,933,000 acres in Florida are owned by 11 holders, and 6,470,000 acres thereof by only 8 holders.

Table 2 shows that groups 1 to 3 (comprising 41 holders each owning over 300,000 acres, fee) have in the investigation area 30,534,000 acres, or 39 per cent of the 78,252,000 acres owned by all the 1,694 fee holders. If, from Table 2, a calculation is made of the ratio of the amount owned in each State by groups 1 to 3 to the total in each State, and if the number of holders is counted from Table 3, the results, in order of the percentages, are as follows, for the States having the higher ratios:

TABLE 4.—RATIO OF FEE ACREAGE OWNED IN CERTAIN STATES BY GROUPS 1 TO 3, AND BY HOLDERS SELECTED FROM GROUPS 1 TO 3, TO TOTAL FEE ACREAGE OF ALL TIMBER HOLDERS OF 60 MILLION FEET OR OVER IN THOSE STATES.

States.	Number of holders in groups 1 to 8 owning in State.	Total owned in State by holders of 60 million feet or over.	Per cent owned by groups 1 to 3.	Per cent owned by holders selected from groups 1 to 3.
Montana.....	3	2,524	94	90 per cent owned by 2 holders.
Idaho.....	8	1,593	71	70 per cent owned by 4 holders.
Minnesota.....	6	1,802	66	62 per cent owned by 3 holders.
Washington.....	6	6,170	56	55 per cent owned by 3 holders.
California.....	6	6,074	56	54 per cent owned by 3 holders.
Oregon.....	9	6,744	50	49 per cent owned by 6 holders.
Florida.....	11	15,523	45	42 per cent owned by 8 holders.
Michigan.....	8	6,841	43	42 per cent owned by 6 holders.
North Carolina.....	2	1,667	34	33 per cent owned by 1 holder.
Louisiana.....	11	6,739	30	27 per cent owned by 6 holders.

¹ That is, the largest amounts within the limitations of the tables. A large part of the Southern Pacific's holding in California, and of the Northern Pacific's, especially in Washington and Montana, are excluded here.

Some of the intermediate groups have, in the aggregate, very large acreages. In the case of the Louisiana groups 4, 5, and 6, the Arkansas groups 5 and 6, and the Michigan group 5, each group has over one million acres of fee land. In Florida groups 4, 5, and 6 each have well over two million acres, while group 7 has one and a third million. In Oregon and in Washington, where the average stand of timber is very high, many holders have over 60 million feet and yet have comparatively small acreages; in each of these two States the holders in group 8 (less than 18,000 acres) have, in the aggregate, over 1,000,000 acres of fee land.

The situation in Florida and in Michigan as regards the land holdings of timber owners is shown in separate chapters, in more detail than is possible here. In Michigan the discussion covers the Upper Peninsula, where lie 5,999,000 acres out of 6,841,000 owned in the State by holders of 60 million feet of timber or over. A map of the Upper Peninsula shows the location of the holdings of over 40,000 acres each. In Florida the discussion covers the entire State. The Florida tables are on a somewhat different basis from those in the present chapter, in that the holdings are differently grouped and include all reported holdings of timber owners over 10,000 acres in extent and a few large holdings composed entirely of nontimbered land. The tables also contain later data, as of 1912, on part of the holders. These chapters take up briefly the Federal and State land grants for railroads, canals, and drainage, as especial causes of the present concentration of land ownership that has attended the concentration of timber ownership in these States.

Section 4. Further large land holdings of certain timber owners.

It has been made clear that the tables of the foregoing section were limited to the land which large timber holders own in those portions of the investigation area that are, broadly, within the timber belt. In this way the tables were confined to what the Bureau had specifically investigated. But in the case of five large land-grant timber holders the Bureau ascertained, chiefly from published sources, the total amounts of land held, including what they held in timberless portions of the investigation area and outside the investigation area. Part of their lands outside the investigation area are doubtless timbered, but in the main they are not. The totals of these few important holdings are stated in this section, and the acreages owned by them, but excluded from the previous tables, are shown. Though the subject is only incidental to the Bureau's purpose, the excluded acreages are so large in amount that they are of very considerable interest.

The five holders referred to are the Northern Pacific, whose excluded lands are mostly in eastern Oregon, eastern Washington, and central and eastern Montana; Union Pacific and Southern Pacific,

whose excluded lands are mostly in southern California and the central Rocky Mountain States; the Atchison, Topeka & Santa Fe, with very large excluded holdings mainly in Arizona and northwestern New Mexico; the Great Northern Railway Co., with excluded holdings in northwestern Minnesota; and the Oregon & Western Colonization Co., with excluded holdings in eastern Oregon. The total acreage of these five holders, including what has been excluded from the previous acreage tables, is summarized as follows, the figures being in round thousands:

TABLE 5.—TOTAL ACREAGE OF FIVE LARGE LAND-GRANT HOLDERS, INCLUDING ACREAGE NOT COUNTED IN FOREGOING TABLES.

[In thousands of acres. Thus, 9,950—9,950,000 acres.]

Holdings.	Total acreage.	Counted in tables.	Not counted in tables.
Northern Pacific Ry. Co.....	9,950	3,196	6,754
Union Pacific R. R. Co. ¹	14,855	4,522	10,333
Union Pacific R. R. Co.....	975	.....	975
Southern Pacific Co. ²	13,880	4,522	9,358
Atchison, Topeka & Santa Fe Ry. Co.....	9,653	51	9,602
Great Northern Ry. Co.....	257	86	171
Oregon & Western Colonization Co.....	700	214	486
Total.....	55,415	8,069	27,346

¹ On Dec. 2, 1912, the Supreme Court of the United States declared the Union Pacific-Southern Pacific merger illegal.

² In 1909 the total acreage owned by the Southern Pacific was 14,408,217. The acreage stated in the table above is that owned on June 30, 1910. (See Pt. I, p. 233 and note.)

Section 5. Summary of fee holdings of large timber owners.

The summary of the total fee acreage of the 1,694 large timber holders owning lands in fee within the limitations of Table 1 appears in that table on page 165. Their total fee holdings in that table—that is, their fee holdings of timberlands and of lands owned in connection with or in the vicinity of their timberlands—amount to 78,252,000 acres.

If to this acreage there were added the 27,346,000 acres just noted as not counted in the Bureau's tables, it would be found that the fee holdings of these 1,694 holders, so far as known to the Bureau, reach the total of 105,598,000 acres or roundly 105,600,000 acres. The 733 holders each owning over 18,000 acres have 98,867,000 acres. Out of the entire 105,600,000 acres, 43 holders (those of over 300,000 acres each) own more than 57,700,000; that is, 43 own 55 per cent of what all the 1,694 own. The 43 average approximately 1,340,000 acres apiece. There are 16 of these 43 (those of over 500,000 acres each) who own 47,800,000 acres, or an average of almost 3,000,000 acres.

Six of these 16 (those over 1,500,000 acres each) own 39,480,000 acres, or an average of 6,580,000 acres. Finally, 3 holders—the great land-grant railroads, the Southern Pacific (omitting the Union Pacific), the Northern Pacific, and the Santa Fe—have, in round numbers, 33,500,000 acres, the 3 averaging over 11,000,000 acres each.

The immensity of these figures requires illustration. The 33,500,000 acres of the three railroads just mentioned is an area equivalent to that of England, and is sufficient to provide every family in England with 4 or 5 acres of land. These railroad lands lie mainly in the nine States of California, Nevada, Utah, Oregon, Washington, Idaho, Montana, New Mexico, and Arizona, and would provide 15 acres for every male person over 21 years of age in these States. The 47,800,000 acres owned by 16 holders are equivalent to practically ten times the land area of New Jersey. The 43 holders, with their 57,700,000 acres, have nearly the area of the States of New York and Pennsylvania. The 733 holders, with their 98,867,000 acres, have an area greater than Italy and Switzerland combined; or as great as the combined areas of West Virginia, Ohio, Indiana, Kentucky, and one-third of Tennessee. The 1,694 holders, with their 105,600,000 acres, own the equivalent of four-fifths the area of France; or more than the entire State of California. They have more than one-twentieth of all the land in the United States from the Canadian to the Mexican border. Taking only the United States and parts of States in the investigation area, and those States into which the great railroad holdings extend, one finds that these 1,694 holders own one-tenth of the land in the immense area in those States and parts of States.

Or, if one reverts to the 78,252,000 acres of fee land that the 1,694 own within the limitations of Table 1, and takes for comparison, not the total investigation area, but simply the total area of the 900 or more counties in which lies the timber covered by the Bureau's investigation, ruling out those counties of the investigation area in which there is no private timber, he will find that out of a total of 541,588,000 acres in those counties (154,130,000 acres timbered¹ and 387,458,000 nontimbered) the 1,694 timber holders have no less than one-seventh.

Section 6. Power resulting from concentration of land ownership.

That a substantial control of the land situation and of transportation throughout a large timber region gives a far-reaching power over the industrial development of the territory hardly needs argument. Such control of the land even without the support of a transportation monopoly, though less powerful than with such support, is of great

¹ Part I, p. 163.

significance. The effect of such control may be to unduly retard the development of the lumber industry within its territory, and to unduly influence other economic activities. Moreover, those who exercise economic control in this fashion are likely to seek also political control in order to make their position more secure.

Some indication of the power resulting from land monopoly in a large part of western Oregon, the most important timber region in the United States, is given by the following facts: In this region the Southern Pacific has not only 1,907,236 acres of land bearing merchantable timber, but also 172,045 acres of additional land, and 293,000 acres of unpatented land claimed. In 1907 the legislature of Oregon presented a memorial to Congress complaining that the terms of the land grant to the Oregon & California Railroad Co. (controlled by the Southern Pacific) had been violated by refusal to sell lands to settlers in 160-acre tracts, and stating as the result of this illegal policy that "the development and material prosperity of the State is retarded." In the Government's argument in the suit instituted as a result of this memorial the following statement is made on this point:

On or about January 1, 1903, all of these unsold lands were withdrawn from sale, and the railroad company has since refused to sell any part thereof to actual settlers or otherwise, although thousands of applications to purchase have been made by parties desiring to use the lands applied for, for the purpose of actual settlement. * * * In this manner, ever since the 1st day of January, 1903, a land monopoly has been maintained for the selfish uses and purposes of the Southern Pacific Co., enabling it, among other things, to control the commercial and industrial development of the territory tributary to said railroad, and thereby prevent the establishment of competing lines of railroad. *A monopoly of transportation has become entrenched by a virtual monopoly of production.* The normal commercial and industrial development of the territory in which the unsold lands are situated has been seriously retarded, if not completely checked.¹

Quite apart from the alleged illegality of the Southern Pacific's management of its land grants there is no question that by its land and transportation monopoly it exercises tremendous power over the commercial development of the timber and other natural resources in a great part of western Oregon. The same thing is true in California, where the Southern Pacific is commonly alleged to have for years controlled politics.

¹ U. S. v. Oregon & California R. R. Co., et al. on hearing of demurrers of defendants, Oregon & California R. R. Co., Southern Pacific Co., and Stephen T. Gage, trustee. Argument on behalf of the United States. (In the circuit court of the United States for the district of Oregon. Ninth judicial district. In equity, No. 3340. p. 23.)

The ownership of a large proportion of the land, especially in alternate sections, is bound to give opportunity for monopoly. In Washington and Idaho the Weyerhaeuser Timber Co. and several other timber companies which Mr. Weyerhaeuser and his close associates control have a formidable land power; and if taken together with the Northern Pacific Railway Co., from which a large part of their lands was acquired, they have a substantial monopoly of land in the particular regions where their holdings lie. There seem to be some indications, so far as concerns the important timbered parts of Washington and Idaho traversed by the Northern Pacific, that the railway company and the timber companies referred to follow land policies entirely in harmony with each other.

OFFICIAL CRUISES OF TIMBERLANDS FOR TAXATION PURPOSES.—An invasion of the political field by powerful landed interests is especially to be feared when it touches the vital matter of taxation. Its effect is felt in various phases of taxation, but illustrations may be conveniently shown from the taxation of timber.

It is notorious among timbermen and timber cruisers of Oregon that timberlands in that State have been very much underestimated for taxation; and that when official county cruises of timber were made for the purpose of taxation, though the result increased greatly the previous assessments, yet the true amount of timber was far more than the amount shown by the official cruises—frequently two or three times the amount. In Washington, where in the last six or seven years official cruises have been made in almost all of the timbered counties, the cruises are not so far under the truth as in Oregon, but in most counties even in Washington the official cruises fall much below the real amount of timber.

The Bureau has made careful comparisons in a large number of cases in both Washington and Oregon between the amount of timber reported to the Bureau by the large timber owners themselves, and the amount shown for the same lands by the county cruise. Since each timber owner reported to the Bureau the date when his cruise was made, it was possible to compare the county cruise with the cruises of owners who had up-to-date estimates. The following table shows the broad results of these comparisons in the State of Washington. The first column shows the number of holdings on which comparisons of any extent were made; the second column shows what percentage of the total county cruise was compared with the recent private cruises reported by timber owners. The third and fourth columns show the actual comparisons with these recent cruises, the amounts of timber on identical lands according to the county cruise and according to the timber owners themselves. The last column shows the ratio which the recent private cruises bear to the official cruise.

TABLE 6.—COMPARISON OF RECENT TIMBER CRUISES BY OWNERS AND THOSE MADE BY COUNTY OFFICERS ON IDENTICAL LAND IN 10 COUNTIES OF WASHINGTON.

[In thousands of feet, log scale. Thus, 1,840,829 M feet=1,840,829,000 board feet.]

Counties.	Number of holdings compared.	Per cent of total county cruise covered by comparisons.	Amount of timber on holdings compared.—		Ratio of owners' cruise to county cruise.
			According to county cruise.	According to owners' cruise.	
			M feet. ¹	M feet. ¹	
Cowlitz.....	10	14.5	1,840,829	2,988,578	1.62
King.....	8	13.4	1,452,890	2,478,373	1.71
Lewis.....	7	14.8	2,895,573	3,837,748	1.31
Pacific.....	3	3.3	359,375	635,963	1.50
Pierce.....	4	8.4	918,856	1,546,138	1.68
Skagit.....	13	20.2	2,339,268	3,627,339	1.55
Snohomish.....	11	8.9	842,510	1,748,703	2.08
Thurston.....	2	8.0	131,192	276,124	2.11
Wahakum.....	4	12.1	377,991	704,860	2.15
Whatcom.....	8	17.3	584,841	1,261,217	2.16
Total.....	70	12.5	11,734,825	19,002,942	1.62

¹ Log scale.

In the 10 counties covered (and they are among the most important timbered counties of the State) the up-to-date private cruises of owners (so far as compared) vary from 31 per cent higher to 116 per cent higher than this county cruise. In Lewis County, for example, the cruise of the private holders is not quite one-third more than the county cruise. In Whatcom County, on the other hand, the cruises of private holdings compared amount to more than twice the county cruise on the same land. The average in the 10 counties is 62 per cent higher than the county cruises.

At first glance it might appear that the comparison here given has too slight a base (12.5 per cent of the total) to give broad value to the result; but the comparison embraces almost all the most important companies who reported up-to-date cruises to the Bureau in these counties.¹ The table covers one-eighth of the entire official cruise

¹ Old cruises on part or all of their holdings were furnished by several of the largest holders in Washington, including among others the Weyerhaeuser Timber Co., Northern Pacific Ry. Co., Puget Mill Co., Sound Timber Co., St. Paul & Tacoma Lumber Co., etc., but they proved so far out of date that the Bureau sought information from outside sources for present-day estimates on them. (For Weyerhaeuser Timber Co., and Northern Pacific Ry. Co., see Part I, pp. 59-60.) Comparisons excluded from the above table on this account would cover not far from 50 per cent of the total official cruise in the 10 counties. Besides, no comparison was possible for the Bureau between the county cruise on small unenumerated holdings and any private cruises on the same. For these reasons, it should be clearly understood that the detailed comparisons with recent cruises in this table, though in the total amounting to only 12.5 per cent, yet form a very large proportion of all that the Bureau could possibly have made.

In Pacific County only 3 per cent of the total county cruise was compared with recent cruises of timber owners. This was due to the fact that at the time comparison was made the county had cruised only about half the timber in the county. The Bureau's reports of private cruises usually cover all the timber owned by a given holder in the entire county, and for this reason it was impossible to make comparisons in most cases except where the county had at that time cruised all the land of a given holder. Hence, the comparisons for Pacific County in this table amount to only about 6 per cent even of the cruise then available, and only 3 per cent of the completed cruise. The same general situation prevailed in Thurston County, since only part of the county was cruised in such manner that comparisons could be made.

of these 10 counties; and on this one-eighth the cruise of the owners themselves is over 60 per cent higher than the cruise of the county officers. This comparison, it should be observed, is on the basis of log-scale estimates. For the holdings compared, the mill output of lumber would be greater by about 20 per cent. (See Part I, p. 61.) Thus, the mill output of the 70 holdings compared would be about 95 per cent higher than the log-scale county cruise.

The following table shows, for the counties included in Table 6, above, the assessed value of timberland in 1910, the actual value in 1908, as estimated by the State Board of Tax Commissioners, and the ratio of the latter value to the former:

TABLE 7.—ASSESSED VALUE OF TIMBERLAND IN CERTAIN COUNTIES OF WASHINGTON IN 1910, ESTIMATED ACTUAL VALUE IN 1908, AND RATIO OF THE LATTER TO THE FORMER.

Counties.	Assessed value, 1910. ¹	Estimated actual value, 1908. ²	Ratio of estimated actual value to assessed value.
Cowlitz.....	\$4,161,819	\$11,508,430	2.76
King.....	5,242,900	14,274,506	2.72
Lewis.....	8,190,600	21,668,411	2.65
Pacific.....	4,708,145	15,252,767	3.24
Pierce.....	7,802,600	18,868,004	2.42
Skagit.....	3,220,595	13,808,200	4.29
Snohomish.....	5,955,910	12,163,344	2.04
Thurston.....	2,158,427	11,296,136	5.23
Wahkiakum.....	1,014,996	2,906,843	2.86
Whatcom.....	1,835,520	3,758,250	1.94
Total.....	44,391,112	125,499,891	2.83

¹ From Third Biennial Report of the State Board of Tax Commissioners of Washington, Appendix B, p. 90.

² From Second Biennial Report of the State Board of Tax Commissioners of Washington, Appendix A, p. 96. The method of arriving at these values is given as follows in Third Biennial Report of the State Board of Tax Commissioners of Washington, pp. 10, 11: "The tax commission first caused a list of tracts to be made in each county, describing the property conveyed therein during the preceding twelve months, giving the names of grantor and grantee and showing the consideration. These lists formed the basis for the interrogation of witnesses examined concerning the value of property. Sessions of the Board were held in each county, and all told eight hundred and eighty-five witnesses were examined under oath as to the actual price paid for property changing hands during the preceding twelve months. Stenographic records were made of this testimony, from which lists describing the property concerning which testimony was taken were made and forwarded to the county auditors, who were required to certify the assessed value of each description as equalized by county boards. Upon the return of these lists the actual values as shown by sworn testimony were extended on them and the ratio of assessed to actual values were computed."

In a general way the conclusions of the State Board of Tax Commissioners confirm those of the Bureau. The differences of result are due in part to the fact that the Bureau considered only the underestimates of the quantity of timber, while the board of tax commissioners considered total value. Their correction covered both underestimates of quantity and underassessments of value per thousand.

Their estimate of true value in 1908 was 2.83 times the assessed value in 1910, for the counties in question, while the Bureau's table indicates a quantity of timber 1.62 times as great as that assessed.

Even the assessed values, beginning with 1908, have been much larger than those of earlier years, apparently because of the county cruises and the activity of the State Board of Tax Commissioners. The average assessment of timberland in 1910 was \$13.59 an acre, and in 1908 \$12.91 an acre. The board states that the latter amount is "113 per cent over the assessed valuations of timbered land for the preceding year," and that, according to the best determination the board can make, the average in 1905 was \$4.88 an acre.¹

The facts stated in the present section are not intended as a discussion of the taxation of timber, but merely as an illustration of the tendency to undertaxation that is found as one of the evils accompanying great concentration in the ownership of land. At the time of the Bureau's inquiry probably none of the States in the investigation area had done nearly as much as the State of Washington in trying to ascertain the true amount and value of its taxable timber, and even in that State both the official cruises and the valuations still appear to be much too low.

SUMMARY.—The holding of timberland and other land in immense blocks far beyond the amount necessary for economy in the development of its resources has injurious effects that go much deeper than the mere evading of just taxation. It retards the natural development of great timber regions in some of our States till the time when development (not merely the lumbering, but other or subsequent industrial growth) may be directed to the greatest profit of the large owners. It is only as a means to this end that they seek to keep taxation at the lowest possible point in order that they may not be forced to put their land into use before the point of greatest profit is reached. Individual initiative and energy are thus checked in many communities, and opportunities that would naturally open on every side are closed to the man of average means. When development is allowed to take place, the power afforded by the great landholdings gives their owners advantages that enable them, in effect, to tax the development itself and to still further increase the inequalities of the distribution of wealth.

¹ Second Biennial Report of the State Board of Tax Commissioners, pp. 26, 27. Third Biennial Report of the State Board of Tax Commissioners, p. 12.

CHAPTER III.

CONCENTRATION OF LAND OWNERSHIP IN UPPER PENINSULA OF MICHIGAN.

Section 1. General description of Upper Peninsula of Michigan and of ownership map.

The total land surface of the Upper Peninsula of Michigan is over 10,680,000 acres. About 56 per cent of this area is held by 90 timber owners. Thirty-two owners hold 47 per cent of the area; 13 hold 37 per cent; and 1 holds 14 per cent.

There is more timber left in the State of Michigan than in any of the other Lake States, and much the greater part lies in the Upper Peninsula. The Upper Peninsula, however, has passed the point of its greatest lumber production, though it probably will long continue to supply a moderate amount of timber. A very large proportion of the peninsula has been cut over for pine timber; and a considerable proportion has been cut over again for hemlock and hardwoods. There still remain stands of hemlock and hardwoods as heavy as 8,000 to 10,000 feet or more per acre over large tracts, and these species now command very high stumpage prices.

The copper and iron deposits of the Upper Peninsula are probably more important resources than the timber. The "copper range," which forms the backbone of the Keweenaw peninsula, is the region where the great copper mines are located. Iron mining is carried on extensively in the three great iron ranges in the western half of the Upper Peninsula—The "Marquette range," for which Marquette is the shipping port; the "Menominee range," for which Escanaba is the chief shipping port; and the "Gogebic range," in the extreme west, for which Ashland, Wis., is the shipping port. The copper and iron ranges were originally covered with timber, and to a considerable extent are still timbered. Altogether, the Upper Peninsula furnishes a striking illustration of concentration of the ownership of land attending the acquisition of such special resources as timber and ore.

Opposite page 216 is an ownership map which covers practically the entire Upper Peninsula, stretching east and west over 300 miles.

The Keweenaw peninsula which projects into Lake Superior is shown as an inset and placed in the lower left-hand corner. The map does not cover Drummond Island, lying to the east in the waters between Lake Huron and Lake Superior; Isle Royale, lying far to the north in Lake Superior; nor the southern point of Menominee County (from township 35 N. southward) between Green Bay and Menominee River. The scale of the map is the same as those given in Part II. The Michigan meridian crosses the peninsula near the eastern end.

The solid black symbol on the map represents the lands of the Cleveland Cliffs Iron Co. and its various subsidiaries. The crosshatch represents lands of a group of 12 timber owners each of whom has over 100,000 acres in the Upper Peninsula. The double light diagonal indicates the holdings of a group of 19 timber holders each of whom owns lands in the Upper Peninsula ranging in amount from 40,000 acres to 100,000 acres.¹

The map is primarily a map of land holdings owned or leased by timber owners. The first tables will be devoted to acreage only. The timber owned by the same groups of holders is set forth in a later table (p. 215).

As a matter of fact many of the larger tracts in the Upper Peninsula are owned by companies chiefly interested in holding ore deposits or in mining. With these companies the timber is of secondary importance, having been acquired with the surface of the ore lands, or for a timber reserve in connection with mining operations as much as for commercial exploitation.

Section 2. Concentration of ownership of land by important timber holders in Upper Peninsula.

The following table shows the total land holdings (including timber rights) held in the Upper Peninsula by the 90 timber owners who have as much as 60 million feet of timber each, and the percentage of the total area of the Upper Peninsula held by the various groups into which these 90 holders are divided. The acreage of timber rights is relatively insignificant, and the fee under these timber rights is in many cases owned by large landholders. The grouping in the table is based on the size of land holdings (both fee and timber rights) in the Upper Peninsula. The definition of "important timber owners," as used in the section head above, is timber owners who have each as much as 60 million feet of timber in the investigation area. The smaller holdings included in this classification range upwards from

¹ One concern having somewhat less than 40,000 acres in the Upper Peninsula was included in this group because, with its lands in the Lower Peninsula, its aggregate holding in the State is over 55,000 acres.

7,000 acres, this minimum being equivalent to about one-third of a solid township. To take the opposite extreme—if the holding of the Cleveland Cliffs Iron Co. and its subsidiaries were in the form of a solid square, it would cover nearly 66 townships and the distance around it would be nearly 195 miles.

TABLE 8.—TOTAL LANDHOLDINGS (INCLUDING TIMBER RIGHTS) HELD IN UPPER PENINSULA OF MICHIGAN BY TIMBER OWNERS OF OVER 60 MILLION FEET EACH AND BY ALL OTHERS.

Landholders.	Number of holders.	Total acreage owned in Upper Peninsula. ¹	Per cent of total area of Upper Peninsula.
(1) Holders of over 60 million feet of timber each (grouped according to size of landholding, including timber rights, in Upper Peninsula):			
Platted holders—			
Cleveland Cliffs Iron Co.....	1	1,515,392	14.2
First group, 12 holders of over 100,000 acres each.....	12	2,413,794	22.6
Second group, 19 holders of from 40,000 to 100,000 acres each.....	19	1,065,497	10.3
Total, platted holders.....	32	5,024,683	47.1
Unplatted holders—			
27 holders of from 15,000 to 40,000 acres each.....	27	625,274	5.8
31 holders of less than 15,000 acres each and over 60 million feet of timber each.....	31	340,069	3.3
Total, unplatted holders.....	58	974,343	9.1
Total, all holders of over 60 million feet of timber each.....	90	5,999,026	56.2
(2) All other landholders in Upper Peninsula.....		4,683,214	43.8
Total area of Upper Peninsula.....		10,682,240	100.0

¹ The figures in this column include 244,977 acres reported as timber rights as follows: Members of first group of 12 platted holders, 96,103 acres; second group of 19 platted holders, 84,511 acres; the two groups of unplatted holders of over 60 million feet of timber, 62,363 acres.

The foregoing table shows the proportion of the entire land area of the Upper Peninsula in the hands of 90 large timber holders, viz, 5,999,026 acres out of 10,682,240. The following table shows what percentage of the 5,999,026 acres held by the 90 holders is held by each of the groups going to make up the 90:

TABLE 9.—TOTAL LANDHOLDINGS IN UPPER PENINSULA OF MICHIGAN HELD BY TIMBER OWNERS OF OVER 60 MILLION FEET EACH.

Holdings of over 60 million feet of timber each (grouped according to size of landholding, including timber rights, in Upper Peninsula).	Number of holders.	Total acreage owned in Upper Peninsula ¹	Per cent of this total owned by each group.
Platted holders:			
Cleveland Cliffs Iron Co.	1	1,515,392	25.3
First group, 12 holders of over 100,000 acres each.	12	2,413,794	40.2
Second group, 19 holders of from 40,000 to 100,000 acres each.	19	1,086,487	18.3
Total, platted holders.	32	5,024,683	83.8
Unplatted holders:			
27 holders of from 15,000 to 40,000 acres each.	27	625,274	10.4
31 holders of less than 15,000 acres each and over 60 million feet of timber each.	31	349,098	5.8
Total, unplatted holders of over 60 million feet of timber each.	58	974,343	16.3
SUMMARY.			
Platted holders.	32	5,024,683	83.8
Unplatted holders of over 60 million feet of timber each.	58	974,343	16.3
Total, all holders of over 60 million feet of timber each.	90	5,999,026	100.0

¹ The figures in this column include 244,977 acres reported as timber rights as follows: Members of first group of 12 platted holders, 98,103 acres; second group of 19 platted holders, 84,511 acres; the two groups of unplatted holders of over 60 million feet of timber, 62,363 acres.

The above tables show the reported acreage of the "platted holders" in the Upper Peninsula, but not all this acreage appears on the map. In those parts not covered by the map (see p. 189) the platted holders have lands amounting to about 25,000 acres. Besides, in cases amounting to approximately 49,000 acres no plats were secured for part of a company's holdings in some one county. Again, there are cases, aggregating about 96,000 acres, where the plats furnished by a company, when counted up, were found to fall far short of the acreage which the company stated it owned. The total amount reported by the platted holders but not appearing on the map is about 170,000 acres, distributed as follows among the three groups of platted holders:

	Acres.
Cleveland Cliffs Iron Co.	85,000
First group of platted holders.	16,000
Second group of platted holders.	69,000
Total.	170,000

Section 3. Holding of Cleveland Cliffs Iron Co. interests in Upper Peninsula. (Map symbol, solid black.)

The Cleveland Cliffs Iron Co., with its subsidiary companies, owns in the Upper Peninsula 1,515,392 acres. This is 14.2 per cent of the total area of the Upper Peninsula and 25.3 per cent of the acreage

held in the Upper Peninsula by timber owners of over 60 million feet each.

The various companies and holdings combined in the above figures for the Cleveland Cliffs Iron Co. interests comprise the Cleveland Cliffs Iron Co., the Upper Peninsula Land Co., and 12 other subsidiary companies and holdings. Hereafter when the Cleveland Cliffs Iron Co., or the Cleveland Cliffs, is spoken of, unless the contrary is specified, the name should be understood to mean the interests of this company including the Upper Peninsula Land Co. and the various subsidiaries just referred to.

Emphasis should be laid upon the fact that the map and the tables credit all acreage on which timber rights are owned to the owner of the timber rights, not to the owner of the fee. The Cleveland Cliffs Iron Co. is reported as owning the fee to certain lands on which other companies report themselves as owning the timber rights. Besides, it is reported as owning the fee to certain lands which are also reported by other holders as owned by them in fee, or as timber rights, or not clearly distinguished as between fee and timber rights. (These holders of not-distinguished lands reported the ownership of given acreages of fee and of timber rights; but did not distinguish, on the plats furnished, which lands were fee and which timber rights.) In making the tabulation the Bureau has treated the fee or the timber rights on these lands as if sold to the other companies, and the land is credited to them instead of to the Cleveland Cliffs. The amount thus in conflict in the three classes just referred to is 136,493 acres, and its distribution is shown in the following table:

TABLE 10.—LANDS REPORTED AS OWNED IN FEE BY CLEVELAND CLIFFS IRON CO. INTERESTS BUT CREDITED TO OTHER HOLDERS.

Holders to whom credited, by groups.	Reported by holder to whom credited—			Total
	As fee.	As timber rights.	Without distinction of tenure.	
	<i>Acres.</i>	<i>Acres.</i>	<i>Acres.</i>	
Platted holders:				
First group of 12.....	21,940	.....	3,240	25,180
Second group of 19.....	57,564	.....	10,540	68,104
Unplatted holders:				
Of over 60 million feet.....	12,920	21,449	.....	34,369
Of less than 60 million feet.....	480	7,980	.....	8,460
Total.....	92,904	29,809	13,780	136,493

The amount here shown as credited to the first and second groups of platted holders (about 94,000 acres) is platted to them on the map and not to the Cleveland Cliffs.

On the other hand, it should be stated that the Cleveland Cliffs Iron Co. since the date of its original report has sold in fee to the I. Stephenson interests, a member of the first group of 12 platted holders, about 43,000 acres which the Bureau had no way of distinguishing from the company's unsold lands. Consequently, these 43,000 acres are platted on the map with the solid black symbol of the Cleveland Cliffs. In the tables, however, they have been credited to the first group, and not to the Cleveland Cliffs.

CHARACTER OF CLEVELAND CLIFFS IRON CO.'S HOLDING.—Much of the company's timbered land has no doubt been cut over for pine. Over 270,000 acres of its holding do not at present bear any merchantable timber, but consist of mining properties and a large acreage of burned, cleared, and barren lands. In addition, the Upper Peninsula Land Co. (Ltd.), which is controlled by the Cleveland Cliffs Iron Co. interests, owns a considerable amount of cut-over land. In this subsidiary's report to the Bureau, however, practically no distinction was made between cut-over land and merchantable-timber land. Though the Cleveland Cliffs land as a whole bears a relatively light stand of timber per acre, yet its ownership by one interest is of great importance, not only because it constitutes the largest single timber holding in the Lake States, but also because almost all of it is suitable for the reproduction of timber and because part of it is of value as mineral land. The control of timber-land which will furnish the necessary supply of mining timbers is of importance in connection with the ownership of ore properties.

Section 4. Holdings of first group—12 platted holders—in Upper Peninsula. (Map symbol, heavy crosshatch.)

The first group of 12 platted holders consists of holders each owning 100,000 acres or over in the Upper Peninsula. Their aggregate total there (including timber rights¹) is 2,413,794 acres. This is 22.6 per cent of the total area of the Upper Peninsula, and 40.2 per cent of the amount owned in the Upper Peninsula by the 90 timber holders of over 60 million feet each. The largest of these 12 holdings is 365,000 acres. Their average size would be about 200,000 acres, an area equivalent to 312½ square miles, or about 9 solid townships, a square slightly less than 18 miles each way.

The members of this group are The Keweenaw Association (Ltd.); The Michigan Iron & Land Co. (Ltd.); I. Stephenson interests (I. Stephenson Co. and Ford River Lumber Co.);² J. M. Longyear et al.; Detroit, Mackinac & Marquette Railroad Co.; Chicago & North Western Railway Co.; estate of J. C. Ayer; United States Steel Cor-

¹ 96,103 acres. See Table 8, p. 190.

² In Wisconsin, the I. Stephenson interests control the N. Ludington Co.

poration (holding here in the name of the Oliver Iron Mining Co.); Calumet & Hecla Mining Co. and subsidiaries; Bay de Noquet Co. (a subsidiary of the Oconto Co., which has holdings in Wisconsin); Worcester Lumber Co. (Ltd.); and Lake Superior Iron & Chemical Co. INTERRELATIONS.—Three of the largest of these holders, the Keweenaw Association (Ltd.), the Michigan Iron & Land Co. (Ltd.), and J. M. Longyear et al., though counted as separate by the Bureau, are nevertheless closely connected in the sense that Mr. Longyear is land agent of the Keweenaw Association and chairman and one of the managers of the Michigan Iron & Land Co. (Ltd.). Mr. Longyear is also an officer of or agent for a number of other holders counted as separate. These are "The Albany Pool," one of the members of the second group of 19 platted holders; and the following unplatted holders: The Kimberly Iron Co., Gogebic Land & Iron Co., The Newport Land Co., and Porcupine Land Association (Ltd.). The total area owned in the Upper Peninsula by the separate holders with which Mr. Longyear is thus associated is no less than 965,000 acres. Frederick Ayer of the Ayer estate is owner with Mr. Longyear of 31,431 acres included in the holding of J. M. Longyear et al.

The subsidiaries controlled by the Calumet & Hecla Mining Co. through its ownership of a majority of their stock are as follows:¹ Frontenac Copper Co., Centennial Consolidated Mining Co., Dana Copper Co., Gratiot Mining Co., La Salle Copper Co., Manitow Mining Co. (including New Jersey mine), St. Louis Copper Co., Superior Copper Co., Laurium Mining Co., and Seneca Mining Co.

Besides, the Calumet & Hecla Mining Co. owns a strong minority stock interest in the Tamarack copper mining concerns,¹ comprising the Tamarack Mining Co., Ahmeek Mining Co., Osceola Consolidated Mining Co., and Isle Royale Copper Co. These four Tamarack companies are closely allied to each other, and they constitute one of the holders in the second platted group of 19. The officers and directors in these Tamarack companies are also in most cases the officers and directors of the Calumet & Hecla Mining Co. and its subsidiaries.

The Calumet & Hecla also owns 42.9 per cent of the stock of the Allouez Mining Co., with about 3,000 acres of land. All but one of the officers and directors of the Allouez are also officers and directors of the Calumet & Hecla. In the tables the Allouez is not included with either the Calumet & Hecla or the Tamarack and its land is not platted on the map.

In 1911 a merger was proposed of the various Calumet & Hecla and Tamarack properties, including also the Allouez; but proceedings in equity were instituted to prevent the consummation of the plan, and the proposal for the formal merger of the properties was finally withdrawn by the management.

¹ Moody's Manual, 1910, p. 3222.

FREE HOLDINGS ON WHICH TIMBER RIGHTS HAVE BEEN SOLD.—It has been seen that the Cleveland Cliffs apparently owns the fee of a considerable acreage credited on the map and in the tables to other companies. The same situation seems to prevail as regards some of the companies in the first group of platted holders. For instance, the Keweenaw Association owns the fee of 30,176 acres of land on which it has sold the timber to the Calumet & Hecla. Though the Bureau's reports are not explicit on the point, the indications are that in addition to the lands credited to them some of the companies in this group retain the fee of other lands on which timber rights have been sold. In part of these cases, however, the fee itself may have been sold.

It is highly probable that a careful investigation of the fee tenure in the Upper Peninsula would reveal an appreciably greater degree of concentration of land ownership than appears from the Bureau's tables, which are based on fee tenure modified by ownership of timber rights. In view of the valuable mineral character of much of the land in this region, the retention of the fee has special significance. The Detroit, Mackinac & Marquette Railroad, in addition to the land mapped to it and counted to it in the tables, has retained the mineral rights in 98,719 acres in Marquette County¹ of which it has sold the surface, or at least the timber; and the Keweenaw Association likewise has 8,470 acres of such mineral rights.

Only 3 of the 12 holders in this group are actively engaged in manufacture of lumber. These 3 are the Isaac Stephenson companies, the Bay de Noquet Co., and the Worcester Lumber Co. (Ltd.). In this connection it should be noted by the list of members of this group that at least 4 out of the 12 members are actively engaged in mining or own iron or copper properties.

The 43,000 acres which the I. Stephenson interests have recently bought from the Cleveland Cliffs, but which are platted on the map to the Cleveland Cliffs, have already been referred to (p. 193).

The Calumet & Hecla Mining Co. owns one tract of 35,857 acres (lying in the eastern part of the peninsula, mostly in townships 48, 49, and 50 N., ranges 6 and 7 W.) for which the Bureau obtained no plats of exact location. The bulk of this company's land, however, lies in the western part of the Upper Peninsula and is platted on the map.

Section 5. Holdings of second group—19 platted holders—in Upper Peninsula. (Map symbol, double light diagonal.)

The second group of platted holders consists of 19 separate holders owning from 40,000 to 100,000 acres each in the Upper Peninsula. These 19 own (including timber rights²) 1,095,497 acres in the Upper

¹ Moody's Manual, 1911, p. 2925.

² 84,511 acres. See Table 8, p. 190.

Peninsula. This is one-tenth of the entire area of the peninsula and nearly one-fifth of the amount owned by all the 90 holders of over 60 million feet each. The 12 members of the first group own more than twice as much land as the 19 of the second, and the Cleveland Cliffs Iron Co. alone has nearly 40 per cent more than all 19. The average size of holding in the second group is between 57,000 and 58,000 acres. One of the holders, as explained above, has somewhat less than 40,000 acres in the Upper Peninsula, but has been included because of having 55,000 acres in the State.

The group is made up of the following holders: St. Mary's Mineral Land Co.; Sawyer-Goodman interests; G. F. Sanborn Co.; South Shore Land Co. (Ltd.); Wisconsin Land & Lumber Co.; Northwestern Cooperage & Lumber Co.; Escanaba Lumber Co.; Tamarack Mining Co. and subsidiaries; S. Crawford & Sons; Chicago Lumbering Co. of Michigan (with which the Wheeler interests, owning very large amounts of timber in the Pacific-Northwest, are prominently identified); Hull-Longnecker Lumber Co., Smith & Hull Co., and Oval Wood Dish Co.; Charles Hebard & Sons (Inc.); E. Richardson Co. and W. A. Avery; Chesbrough Lumber Co.; Van's Harbor Land & Lumber Co.; United Logging Co.; estate of Thomas Nestor; The Albany Pool; and Tindle & Jackson.

The officers of the Wisconsin Land & Lumber Co. and of the Northwestern Cooperage & Lumber Co. are intimately associated in several important companies in the Pacific-Northwest, and one company in Mississippi, in all of which there are indications of a common control. If the Upper Peninsular holdings of these two companies had been combined into one, it would have taken a place on the map in the first group of platted holders with well over 100,000 acres. The Northwestern Cooperage & Lumber Co. also appears to have some sort of contract interest, together with four other companies, in the timber cut by the United Logging Co. Interrelations between certain members of this group and of the first group have already been stated on page 194.

The South Shore Land Co. (Ltd.) is a subsidiary of the Duluth, South Shore & Atlantic Railway, which, in turn, is controlled by the Canadian Pacific Railway Co. The St. Mary's Mineral Land Co. controls the King Philip Copper Co., whose holding of 1,040 acres is credited to it; it also has a half interest in the Champion Copper Co., which owns 1,240 acres, none of which has been counted to the St. Mary's concern.

The holders of this group, with the exception of St. Mary's Mineral Land Co., G. F. Sanborn Co., the South Shore Land Co., the Tamarack companies, and the Albany Pool, are operating concerns engaged in the manufacture of lumber. A considerable fraction of the

acreage held by these operating companies, as already noted, is in conflict with the lands reported by the Cleveland Cliffs (p. 192) and by some of the companies of the first group of 12 (p. 195). This conflicting acreage has regularly been credited and platted to the operating companies.

Section 6. Holdings of unplatted holders of over 60 million feet each in Upper Peninsula.

There are 58 holders of over 60 million feet of timber each in the Upper Peninsula whose lands are not platted on the map because they do not own as much as 40,000 acres in this region. They hold altogether (including timber rights¹) 974,343 acres of land. This amounts to 9.1 per cent of the entire area of the Upper Peninsula and to 16.2 per cent of the aggregate acreage of all Upper Peninsula holdings of over 60 million feet each. These unplatted holders are divided into two groups, 27 holders of between 15,000 and 40,000 acres each, and 31 holders of less than 15,000 acres but over 60 million feet of timber each. The average stand on several of the holdings of the group of 27 is greater than that on some of the larger acreages owned by platted holders, and in some cases their total timber is greater.

The 31 holders just mentioned aggregate 349,069 acres in this region, which would make the average size of holding in this lowest group not far from 11,300 acres. These 31 own only 3.3 per cent of the total area of the Upper Peninsula, as against 47.1 per cent owned by the 32 platted holders. Yet with their average holding of 11,300 acres, or about 18 square miles, even the 31 can scarcely be called small holders.

Section 7. Conditions leading to concentration of land ownership in Upper Peninsula.

The assembling of large tracts of land in single ownerships in the Upper Peninsula was greatly facilitated by several Federal grants in aid of railroad, wagon-road, and canal construction, and also by the direct sale of lands by the Government at \$1.25 per acre in unlimited amounts. Besides, large areas of land which the Federal Government granted to the State of Michigan were disposed of by the State at low prices, or were given by the State as aid to railroads, and eventually became part of the great land holdings now concentrated in a few hands. It was mainly because the granted lands contained timber and valuable ore deposits that they have tended to be transferred in relatively large bodies. Had they been chiefly valuable for agriculture, they would no doubt have been far more widely distributed in

¹ 62,363 acres. See Table 8, p. 190.

ownership by now. Or had these same lands been taken up by individuals in 160-acre tracts, it is certain that, though the economic utilization of the resources would have required a considerable degree of concentration, there would have been by no means so great a concentration as has actually come about. For there is much more difficulty in assembling many small holdings than in dealing directly with the owners of a land grant.

FEDERAL GRANTS FOR RAILROADS, WAGON ROADS, AND CANALS.—The amounts of land in the Upper Peninsula patented by the Government on account of the various Federal railroad, wagon-road, and canal grants just referred to, together with the statute references, are summarized in the following statement:

TABLE II.—TOTAL ACREAGE OF FEDERAL LAND GRANTS IN UPPER PENINSULA OF MICHIGAN FOR RAILROADS, WAGON ROADS, AND CANALS.

	Granting act.			Miles of road or canal constructed.
	Date.	Volume of U. S. Statutes.	Page.	
(1) Grants for railroad companies:				
Marquette, Houghton & Ontonagon—				
Marquette, Houghton & Ontonagon.....	{ June 3, 1856	11	21	305,930
	{ Mar. 3, 1865	13	520	
Bay de Noquet & Marquette.....	{ June 3, 1856	11	21	128,301
Ontonagon & Brule River.....	{ June 3, 1856	11	21	34,227
Chicago & North Western.....	{ June 3, 1856	11	21	518,065
	{ Mar. 3, 1865	13	520	
Total for railroads.....				986,523
(2) Grant for wagon road:				
Fort Wilkins, Copper Harbor, to State line.....	{ Mar. 3, 1863	12	797	221,013
(3) Grants for canals:				
St. Mary's River.....	{ Aug. 26, 1852	10	35	1,262,710
Portage Lake and Lake Superior.....	{ Mar. 3, 1865	13	519	
Lac La Belle.....	{ July 3, 1866	14	81	400,081
	{ July 3, 1866	14	80	100,012
Total for canals.....				762,803
Grand total.....				1,970,339

¹ The total area of the St. Mary's Canal tract was 750,143 acres, of which approximately 262,710 acres were selected in the Upper Peninsula and the balance in the Lower Peninsula. The canal as built was 5,400 feet (1.02 miles) in length, 100 feet in width, and 12 feet in depth.

The 1,970,339 acres granted by Congress for the construction of railroads, wagon roads, and canals in the Upper Peninsula make between one-fifth and one-sixth of the entire area of the peninsula.

The Marquette, Houghton & Ontonagon, successor to the Marquette & Ontonagon and the Bay de Noquet-grants, received patents for about 462,000 acres, sold some 60,000 acres reserving mineral rights, and then in 1881 sold the remaining 402,000 acres and the reserved mineral rights in the 60,000 acres to the Michigan Land & Iron Co. (Ltd.). The price was \$2,500,000.¹ This concern was reorganized in 1901 as a limited partnership association with practically the same ownership, and the name was changed to The Michigan Iron & Land Co. (Ltd.). To-day, of the land bought 30 years ago, this company still holds over 320,000 acres in fee. The Bureau is not informed as to the extent of its additional acreage of mineral rights.

The grant for the road from Ontonagon southward 75 miles to the Wisconsin State line was originally transferred by the State to the Ontonagon & State Line Railroad Co. The grant for this route is an interesting example of the failure of a land grant to attain the object proposed. The original act of 1856 provided that the road should be built within 10 years. In 1880, over 24 years after the grant, no work of any kind had yet been done. In June, 1881, the legislature of Michigan declared the grant forfeited and conferred it on the newly organized Ontonagon & Brule River Railroad Co., but attached certain conditions to the grant. Only the first 20 miles were ever built. This 20-mile stretch was accepted by the governor as "completed" in February, 1882. The Public Lands committee of the House² in 1886 investigated the matter and reported their conclusion that the construction of the road was only "colorable." Affidavits and photographs were put before the committee showing that the road was not properly built. According to the affidavits of men who did the work, the ties and the track for much of the last 4 of the 20 miles were laid on top of a foot of snow, and the governor's trip of inspection was over track so laid. The committee recommended that Congress declare the entire grant forfeited. This was not done, though the next Congress passed a bill forfeiting all lands opposite the 55 miles not built. The amount of granted lands finally available for the 20 miles completed was only about 35,000 acres.

CANAL LAND GRANTS—*St. Mary's Ship Canal*.—The first of the Federal land grants to aid the construction of canals in Michigan was that for the St. Mary's Ship Canal, at Sault Ste. Marie, to make a

¹ H. Rept. No. 1928, Views of minority, p. 4, 49th Cong., 1st sess., vol. 7, 1886-6. The *Statement Showing Land Grants* gives the area patented to these railroads as follows: Marquette & Ontonagon, 305,930 acres; Bay de Noquet & Marquette, 128,301 acres. The total is nearly 30,000 acres less than the 462,000 acres mentioned here by the House committee.

² H. Rept. No. 721, 49th Cong., 1st sess., 1886.

passage between Lake Superior and Lake Huron available for ships. In 1870 the United States Government undertook the enlargement of the canal. This work was completed in 1881, when the State of Michigan relinquished control to the Government. To meet the increasing demands of commerce an additional and larger lock was constructed, and completed in 1896. The Government has a second canal here known as the Sault Ste. Marie Canal, completed in 1895, and is constructing a third.

The original canal company by the act of August 26, 1852 (10 Stat., 35), received a grant of 750,000 acres. The land was to be selected anywhere in the State of Michigan, without limitation as to location or character, except that the lands selected were to be such as were subject to private entry. The company took approximately 490,000 acres of its lands in the Lower Peninsula and 260,000 acres in the Upper Peninsula.

The following tabular statement shows the high proportion of the St. Mary's Ship Canal lands now held by a few timber owners reported to the Bureau:

TABLE 12.—PRESENT OWNERSHIP OF LANDS IN UPPER PENINSULA OF MICHIGAN ORIGINALLY GRANTED FOR CONSTRUCTION OF ST. MARY'S SHIP CANAL.

Present owners.	Approximate amount of the original grant now owned.	Percent of total grant.
Platted holders:		
St. Mary's Mineral Land Co.....	94,610	38.0
Cleveland Cliffs Iron Co. interests.....	47,800	18.2
Bay de Noquet Co.....	13,480	5.1
Calumet & Hecla Mining Co.....	7,680	2.9
Van's Harbor Land & Lumber Co.....	4,040	1.6
Tamarack Mining Co.....	3,680	1.4
J. M. Longyear et al.....	3,400	1.3
Other platted holders.....	1,240	.4
Total, platted holders.....	175,930	68.9
Unplatted holders:		
Copper Range Consolidated Co.....	4,210	1.6
Other unplatted holders reported to Bureau.....	9,640	3.7
Total, unplatted holders.....	13,850	5.3
Total accounted for.....	189,780	72.2
Unaccounted for.....	72,930	27.8
Grand total.....	262,710	100.0

The seven platted holders named in the table have 174,690 acres out of a total of 262,710 acres, or two-thirds of it. Certain other holders bring the total of this grant now in the hands of large timber owners to nearly 190,000 acres, or more than 72 per cent of the entire grant in the Upper Peninsula.

Portage Lake and Lake Superior Canal.—The grant for the Portage Lake and Lake Superior Canal amounted to 400,000 acres. The canal was 2½ miles in length, and it connected Lake Superior with the waters flowing into the northwestern arm of Portage Lake. Its location is in 56 N., 34 W. (See inset on map.) At first 200,000 acres were granted, to be selected in odd-numbered sections "nearest the location of the canal." This was by act of March 3, 1865 (13 Stat., 519). By act of July 3, 1866 (14 Stat., 81), 200,000 acres more were granted, 150,000 acres to be selected from odd-numbered and 50,000 from even-numbered sections in the Upper Peninsula. Both acts excluded "lands designated as mineral by the United States before the passage of this act."

Of the 400,000 acres granted, three concerns now own 373,660 acres, or 93.4 per cent. The table is as follows:

TABLE 13.—PRESENT OWNERSHIP OF LANDS IN UPPER PENINSULA OF MICHIGAN ORIGINALLY GRANTED FOR CONSTRUCTION OF PORTAGE LAKE AND LAKE SUPERIOR SHIP CANAL.

Present owners.	Approximate amount of the original grant now owned.	Per cent of total grant.
<i>Platted holders:</i>		
The Keweenaw Association (Ltd.).....	306,220	76.5
J. M. Longyear et al.....	57,040	14.3
Calumet & Hecla Mining Co.....	10,400	2.6
Oliver Iron Mining Co.....	4,580	1.1
Tamarack Mining Co.....	1,200	.3
Other holders.....	1,160	.3
Total, platted holders.....	380,600	95.1
Unplatted holders.....	1,160	.3
Total accounted for.....	381,760	95.4
Unaccounted for.....	18,321	4.6
Grand total.....	400,081	100.0

Regarding this canal grant, charges were made before Congress in 1885 to the effect that the canal had not been properly constructed, that the company had not selected its lands from those "nearest to

canal" as required by the grant, and that it had thereby illegally obtained supposed copper lands of great value. The House Committee on Public Lands investigated these charges. The majority reported its opinion that the canal had "never been completed in the manner contemplated by the acts of Congress," and was "so defective as to be practically a fraud upon the intention of Congress"; that "certainly over 150,000 and probably over 280,000 acres, and of immense value, were illegally selected"; that official Government and State maps published prior to the date of the grant show that "200,000 acres selected by the canal company [100,000 acres illegally selected] almost exactly cover this supposed copper-bearing country, while the territory which they ought to have selected is shown by the same maps to be 'granite' or other rock formations of little value." The majority did not recommend the forfeiture of the entire grant because the granting act left the acceptance of the work with the State and the State authorities had certified its satisfactory completion and acceptance, thus leaving the United States without remedy. It did recommend, however, the institution of suits to recover the illegally selected land. The minority reported that the canal had been properly constructed; that in any event the grant was not forfeitable; and that it would be inequitable and useless to institute the suits recommended by the majority.

The Commissioner of the General Land Office, reporting on the matter,² found that over 93,000 acres, of the first 200,000 granted, had not been selected "nearest the location of the canal." He recommended, however, that no suit be brought, since the intervening lands nearer the canal had meantime all been taken by private parties and, if the Government should regain the illegally selected lands by suit, the regained lands themselves would thereupon become "the nearest" public lands and the canal company, he feared, could reselect them as such. As to mineral lands, he found that 68,000 acres of the lands selected by the canal company had been previously designated as mineral in proclamations by the President of the United States offering them for sale at public auction pursuant to law, though they had not been designated as mineral in the geological survey made under the authority of the act of Congress of March 1, 1847 (9 Stat., 146), an act providing for a classification of the lands of the Lake Superior region as to mineral character. He urged a

¹ H. Rept. No. 2631, 48th Cong., 2d sess., 1885.

² Printed in Annual Report of Secretary of Interior for 1886, H. Ex. Doc. No. 1, pt. 5, 46th Cong., 2d sess., pp. 318-325.

suit to recover the 68,000 acres. Apparently this suit was not brought till 1896, when it was instituted in the United States district court for the western district of Michigan just before the statute of limitations would have barred action. The case was decided adversely to the United States on the ground that the survey made under the authority of act of 1847, which did not classify them as mineral, was the only "designation by the United States" within the meaning of the grant, and that the subsequent proclamations by the President were merely executive and could not change the nonmineral classification impressed on the lands by the survey authorized by Congress. The opinion, filed June 19, 1900, was not reported. No appeal was taken.

Lac La Belle Canal.—The third canal grant in the Upper Peninsula was that for the Lac La Belle Canal, less than a mile long, connecting the waters of Lac La Belle, on the eastern point of the Keweenaw peninsula, with Lake Superior. This is between 57 and 58 N., 29 W. (see inset on map). The amount granted was 100,000 acres, to be selected in odd-numbered sections "nearest the location of the canal." The grantee of the State was the Lac La Belle Harbor Improvement Co. Three timber owners now hold 97.3 per cent of the granted lands, as follows:

TABLE 14.—PRESENT OWNERSHIP OF LANDS IN UPPER PENINSULA OF MICHIGAN ORIGINALLY GRANTED FOR CONSTRUCTION OF LAC LA BELLE SHIP CANAL.

Present owners.	Approximate amount of original grant now owned.	Per cent of total grant.
<i>Platted holders:</i>		
Lake Superior Iron & Chemical Co.	77,560	77.6
Tindie & Jackson.....	11,320	11.3
Chicago Lumbering Co. of Michigan.....	8,400	8.4
Other platted holders.....	680	.7
Total, platted holders.....	97,960	98.0
Unaccounted for.....	2,052	2.0
Grand total.....	100,012	100.0

Summary.—Bringing together in a single tabular statement the present ownership of all three of the canal grants, one finds that out of the 762,803 acres covered by the canal grants in the Upper Peninsula of Michigan, 669,500 acres, or 88 per cent, have been accounted for as now in the hands of timber owners reported to the Bureau,

over 300,000 acres being owned by a single holder, the Keweenaw Association. The summary statement is as follows:

TABLE 15.—PRESENT OWNERSHIP OF LANDS IN UPPER PENINSULA OF MICHIGAN ORIGINALLY GRANTED FOR CONSTRUCTION OF SHIP CANALS.

[All figures, except the grand totals, are approximate, being based on a count of plats not showing exact survey acreage.]

Present owners.	St. Mary's grant.		Portage Lake and Lake Belle Superior grant.		Lac La Poudre grant.		Total.
	Acrea.	Acrea.	Acrea.	Acrea.	Acrea.	Acrea.	
Platted holders:							
The Keweenaw Association (Ltd.)	40	306,220					306,260
St. Mary's Mineral Land Co.	94,610						94,610
Lake Superior Iron & Chemical Co.			77,560				77,560
J. M. Longyear et al.	3,400	57,040					60,440
Cleveland Cliffs Iron Co.	47,800		680				48,480
Cahumet & Hecla Mining Co.	7,680	10,400					18,080
Bay de Nocquet Co.	13,480						13,480
Tindle & Jackson					11,320		11,320
Chicago Lumbering Co. of Michigan		80			8,400		8,480
Tamarack Mining Co.	3,680	1,200					4,880
Oliver Iron Mining Co.		4,580					4,580
Van's Harbor Land & Lumber Co.	4,040						4,040
Other holders	1,200	1,080					2,280
Total, platted holders	175,930	380,000	97,960				654,490
Unplatted holders:							
Ontonagon Lumber & Cedar Co.	5,920						5,920
Copper Range Consolidated Co.	4,210	240					4,450
Other holders reported to Bureau	3,720	920					4,640
Total, unplatted holders	13,850	1,160					15,010
Total accounted for	189,780	381,760	97,960				669,500
Unaccounted for	72,930	18,321	2,052				93,303
Grand total	262,710	400,081	100,012				762,803

FORT WILKINS, COPPER HARBOR, AND STATE LINE WAGON-ROAD GRANT.—A land grant was made for the construction of a wagon road from Copper Harbor, on the Keweenaw peninsula, to the Michigan-Wisconsin State line, where it was to meet a corresponding road running from Green Bay, Wis. The length of the road in Michigan was 125 miles, and for this distance the grant allowed three sections per mile, the indemnity limits being 15 miles on each side of the road. Mineral lands were not excepted. The road was so located as to follow the backbone of the copper range, known for its immense mineral wealth, and to run thence southward to the State line. In this case the road was fortunate enough to receive all of the possible maximum of its grant, 221,000 acres.

The Bureau has ascertained the present ownership of the lands in this grant. In the southern part of it, and wholly included in it, are the holdings now owned by the estate of J. C. Ayer, 174,000 acres. In the northern part of the grant, where it traverses the copper range region, the wagon-road lands are practically all owned by three great copper owning and mining concerns—the Keweenaw Association, the Calumet & Hecla interests, and the Tamarack interests. A tabular statement of the present ownership follows:

TABLE 16.—PRESENT OWNERSHIP OF LANDS IN UPPER PENINSULA OF MICHIGAN ORIGINALLY GRANTED FOR CONSTRUCTION OF FORT WILKINS, COPPER HARBOR, AND GREEN BAY WAGON ROAD.

Present owners.		Approximate amount of original grant now owned.	Per cent of total grant.
		<i>Acres.</i>	
Platted holders:			
Estate of J. C. Ayer.....		174,000	78.7
The Keweenaw Association (1,464.).....		21,310	9.7
Calumet & Hecla Mining Co. interests.....		20,410	9.2
Tamarack Mining Co. interests.....		2,360	1.1
Other holders.....		880	.4
Total accounted for.....		218,960	90.1
Unaccounted for.....		2,053	.9
Grand total.....		221,013	100.0

FEDERAL SWAMP-LAND GRANT OF 1850.—The Federal swamp-land grant of September 28, 1850, is discussed here only because a very considerable part of the millions of acres patented to the various States under this grant was timberland, much being now held by large timber owners, and because there has been a marked failure on the part of most of the States, in disposing of the land, to observe or enforce the condition of drainage and reclamation attached to the original grant.

The grant gave to the various public-land States all swamp and overflowed lands within their borders. The condition referred to provided that—

The proceeds of said lands, whether from sale or by direct appropriation in kind, shall be applied exclusively, as far as necessary, to the reclaiming said lands, by means of levees and drains. (Sec. 2480, R. S.)

The theory and purpose of the grant was that the lands should be drained and reclaimed by the States, or the vendees of the States, and that thus the agricultural area would be increased and sanitary conditions and the public health would be improved. Under this grant there had been patented to various States up to June 30, 1910,

over 63,000,000 acres. There have been many charges of fraud regarding the selection of nonswamp lands as well as swamp lands under this act, and regarding the methods followed by the States in disposing of the lands to private parties. (See "The Public Domain," p. 220.)¹ Moreover, the real swamp lands, granted on condition of drainage, are, in general, still undrained.

In view of this situation and its bearing on the title to parts of many large timber holdings, it is pertinent to give here briefly certain facts as to the methods adopted by the State of Michigan in disposing of its swamp lands, so far as they might affect the validity of the present title to them; and to note the decisions of the Supreme Court interpreting the force of the condition. The swamp-land situation in Florida, which State received over 20,000,000 acres of swamp lands, is taken up on pages 223 to 236 of the following chapter.

Michigan's disposal of its swamp lands.—To Michigan, up to June 30, 1910, patents had been given for 5,655,570 acres of swamp lands. The State's methods of disposing of these lands² has largely favored the concentration of their ownership without securing any appreciable measure of drainage or reclamation. They were offered for sale at public auction at not less than \$1.25 per acre, the unsold lands to be thereafter subject to private entry at \$1.25 per acre. Those chiefly valuable for timber could be bought in unlimited quantities for cash at that price. The net receipts from the disposition of the swamp lands were constituted a *primary school fund*, but the State recognized the Federal requirement for drainage by imposing on the purchaser the obligation to drain, as appears from the following provision:

all such sales shall be made subject to drainage and reclamation by the purchaser, in accordance with the act of Congress granting such land to the state.³

In 1859 the legislature announced the policy of granting the swamp lands to aid the construction of State highways; and set aside not more than 400,000 acres, to be sold or granted for such highways, between points designated by the legislature, at the rate of not more than 640 acres per mile in the Lower Peninsula and 1,280 acres per mile in the Upper Peninsula.⁴ Part of the land (200,000 acres) was appropriated for draining and reclaiming swamp lands by means of levees and ditches.⁵

In several instances Michigan granted swamp lands to aid the construction of railroads, the grants ranging from 3,200 acres to 10,240 acres per mile. Such grants for railroads in the Upper Peninsula

¹ The Public Domain (H. R. Misc. Doc. No. 45, pt. 4, 47th Cong., 2d sess.), Washington, 1883.

² See Michigan Compiled Laws, 1897, vol. 1, pp. 535-548.

³ Laws of Michigan, act of Feb. 4, 1858.

⁴ See Michigan Compiled Laws, 1897, vol. 1, p. 530.

⁵ *Ibid.*

were made in 1861, 1873, and 1875. The grant of 1861 was for a road to be built from Marquette to the mouth of the Menominee River.¹

As a condition precedent to this grant, the State required the company to—

construct, on each side of their line of road bed, ditches from two to three and a half feet in depth, below grade, of such widths as to give a perfect drainage and not permit any standing water, and at all water-ways sufficient space shall be left for the unobstructed passage of water, and at all points of the lines of the roads aforesaid, when side ditches can be cut that will carry off the surface water, they shall be constructed by the company constructing said line of railroad.

It is obvious that this requirement was inadequate to secure the drainage of more than a small fraction of the land granted.

In some of Michigan's swamp-land grants, the granting act declared it was made "to secure the early construction of a railroad, * * * and for the purpose of drainage and reclamation." But there was either no provision enacted for this purpose² or merely a general provision giving the Board of Control of State Swamp Lands "full power and authority over said lands, the reservations necessary and the limitations and privileges requisite in the application of such lands to such purpose."³

Supreme Court decisions on the condition in the Federal swamp-land grant.—The United States Supreme Court's decisions construing the effect of the condition attached to the Federal swamp-land grant of 1850 have been given in cases arising from the method of disposal of swamp lands adopted by Iowa, California, and Louisiana, whose swamp-land legislation was different in various respects from that of Michigan.

Iowa having transferred its swamp lands to the counties and permitted the counties to "devote the lands or the proceeds thereof, either in whole or in part," to other purposes than drainage, the case of *Emigrant Co. v. County of Wright* arose, in which the county sought to have a contract for the sale of its lands set aside because fraudulently procured, and because it contemplated a divestment of the proceeds from the purpose of drainage and reclamation in violation of the terms of the original grant by Congress. The Supreme Court, in deciding that the contract was void (97 U. S., 339), emphasized the evidence of fraud and stated that in order to reach the decision it was

¹ *Laws of Michigan, 1861, p. 417.* Congress in 1865 (13 Stat., 520) changed the route for a Federal railroad grant previously made so that it should correspond to the route of the State grant of 1861. The Chicago & North Western Ry. built the road, about 125 miles in length, and received both grants, 3,640 acres per mile from the State, and 6,400 acres per mile from the Federal Government. The unsold portions of these grants still retained by the Chicago & North Western constitute it one of the holders of over 100,000 acres on the map.

² *Laws of Michigan, 1875, p. 272.*

³ *Ibid.*, p. 220.

not necessary to hold that the contract was void because contemplating a diversion of the grant; and that it was not decided to be void for that reason alone. Nevertheless, the court expressed the opinion that the purchaser of the lands must be held to know that they were "impressed with an important public trust," and gave as one reason for its decision the fact that the contract provided "for a diversion of the fund" to other purposes. This was in 1877. In 1879, in *Emigrant Co. v. County of Adams* (100 U. S., 61) a similar question came before the court. In this case it was decided that there was not sufficient proof that the contract was procured by fraud. The opinion added that by the act of 1850 the swamp lands—

were granted to the several States * * * for a purpose expressed on the face of the act; and that purpose was "to enable the State to construct the necessary levees and drains to reclaim them." * * * Our first view was, that this trust was so explicit and controlling as to invalidate the scheme finally devised by the legislature of Iowa for the disposal of the land, and under which the contract in question was made. But on more mature reflection, after hearing additional argument, we are satisfied that such a result did not necessarily follow. * * *

The argument against the validity of the scheme is, that it effects a diversion of the proceeds of the lands from the objects and purposes of the congressional grant. * * * The proviso of the second section of the act of Congress declared that the proceeds of the lands, whether from sale or direct appropriation in kind, should be applied exclusively, as far as necessary, to these purposes. This language implies that the State was to have the full power of disposition of the lands; and only gives direction as to the application of the proceeds, and of this application only "as far as necessary" to secure the object specified. It is very questionable whether the security for the application of the proceeds thus pointed out does not rest upon the good faith of the State, and whether the State may not exercise its discretion in that behalf without being liable to be called to account, and without affecting the titles to the lands disposed of. At all events, it would seem that Congress alone has the power to enforce the conditions of the grant, either by a revocation thereof, or other suitable action, in a clear case of violation of the conditions. And as the application of the proceeds to the named objects is only prescribed "as far as necessary," room is left for the exercise by the State of a large discretion as to the extent of the necessity. In the present case it is not shown by allegations in the bill, or otherwise (if such a showing would be admissible), that any necessity existed for devoting the proceeds of the lands in question to the purposes of drainage. No case is shown as the basis of any complaint, even on the part of the general government, much less on the part of the county of Adams, which voluntarily entered into the arrangement complained of. Our conclusion, therefore, is that this objection to the validity of the contract cannot prevail.

In 1882, in *Mills County v. Railroad Companies* (107 U. S., 557), referring to the earlier cases, the court said:

Upon further consideration of the whole subject, we are convinced that the suggestion then made, that the application of the proceeds of these lands to the purposes of the grant rests upon the good faith of the State, and that the State may exercise its discretion as to the disposal of them, is the only correct view. It is a matter between two sovereign powers, and one which private parties can not bring into discussion. Swamp and overflowed lands are of little value to the Government of the United States, whose principal interest in them is to dispose of them for purposes of revenue; whereas the state governments, being concerned in their settlement and improvement, in the opening up of roads and other public works through them, in the promotion of the public health by systems of drainage and embankment, are far more deeply interested in having the disposal and management of them. For these reasons, it was a wise measure on the part of Congress to cede these lands to the States in which they lay, subject to the disposal of their respective legislatures; and although it is specially provided that the proceeds of such lands shall be applied, "as far as necessary," to their reclamation by means of levees and drains, this is a duty which was imposed upon and assumed by the States alone, when they accepted the grant; and, whether faithfully performed or not, is a question between the United States and the States, and is neither a trust following the lands nor a duty which private parties can enforce as against the State.

In 1883, in *Hagar v. Reclamation District* (111 U. S., 701, 713), a case arising in California, this interpretation of the act of 1850 was confirmed, the court saying that the appropriation of the proceeds of the sale of the lands rested solely in the good faith of the State; and that its discretion in disposing of them was not controlled by the condition mentioned in the act, as neither a contract nor a trust following the lands was thereby created.

In 1887, in *United States v. Louisiana* (127 U. S., 182, 191), a case involving a claim by Louisiana for about \$43,000, arising in part under the swamp-land act of 1850 and the supplementary act of March 2, 1855, the United States claimed a set-off.

The Court of Claims had ruled that the funds in the Treasury of the United States due to Louisiana as swamp-land indemnity under the act of 1855 were trust moneys to be transferred to the State for the special purpose of drainage, that Congress had not disavowed or annulled the trust, and that therefore the United States, when it set off against the amount due to the State in this fund a counterclaim of the United States for moneys due it from the State, had diverted the trust fund without authority of law. The Supreme Court, however, reversed this ruling, and declared that the swamp-land indemnity fund was not a property trust to be applied only for purposes of

drainage, but could be used by the State for general purposes; and that therefore the United States could properly claim the set-off. The opinion then went on to say:

Under the act of 1850, the swamp lands are to be conveyed to the State as an absolute gift, with a direction that their proceeds shall be applied exclusively, as far as necessary, to the purpose of reclaiming the lands. The judgment of the State as to the necessity is paramount, and any application of the proceeds by the State to any other object is to be taken as the declaration of its judgment that the application of the proceeds to the reclamation of the lands is not necessary. By the 2d section of the act of 1855, it is provided that the purchase money received by the United States for the swamp lands sold by them shall be paid over to the State. There is nothing in these provisions of the character of a property trust, and nothing to prevent the application by the State of the swamp-land fund to general purposes. If the power exists anywhere to enforce any provisions attached to the grant, it resides in Congress and not in the court.

The Bureau does not assume to suggest that Congress follow the intimation here given by the court; but the legal rights of Congress in the matter and the public policy involved are questions which should receive careful consideration. The distinction should be kept clear between instances in which the States or counties sold the swamp land without attaching any condition (as in the cases above cited), and instances in which they sold it with the condition that the purchaser should drain it, or in which they granted it "in kind" in return for drainage work or for the construction of railways.

The whole situation takes on new interest in the light of recent proposals for the Federal Government itself undertaking the work and expense of draining great areas of these same swamp lands. (Newlands bill, S. 2739, 63d Cong., 2d sess., Jan. 31, 1914.) While the drainage of these areas would be of great indirect benefit to the public, the prime benefit would go to the private corporations and persons who own the lands.

From an economic point of view it seems fairly plain that the act of 1850, which had the object of increasing the agricultural area and improving sanitary conditions, was a premature attempt to accomplish these important ends. The States were not then far enough developed to undertake such a vast work of drainage for the mere sake of the public health, nor was the importance of such work sufficiently realized in the sanitary science of that day. Moreover, there was no immediate economic incentive to drain the lands for agriculture. An abundance of public lands and cheap private lands which did not need drainage was still available, and the pressure of population upon the agricultural resources of the country had not begun to be felt.

Swamp-land grant to Detroit, Mackinac & Marquette Railroad Co.—
In 1873 the State of Michigan made a grant of swamp lands for the

early construction of a railroad in the eastern part of the Upper Peninsula from the Straits of Mackinaw to Marquette, a distance of about 150 miles.¹ This grant expressed a purpose of drainage and reclamation and gave the State Board of Control power over the lands in the loose terms quoted on page 207 (middle). The Detroit, Mackinac & Marquette Railroad Co. built the road, completing it in 1881, and acquired the grant.

The following statement regarding these granted lands is taken from a financial manual:

In 1881 the Detroit, Mackinac & Marquette R. R. received from the State of Michigan a land grant of 1,326,688 acres in the upper peninsula covering the counties of Chippewa, Mackinac, Marquette and Schoolcraft, Mich. These lands, under certain conditions, were pledged as security for * * * land-grant bonds * * * and when the Detroit, Mackinac & Marquette R. R. Co. was sold under foreclosure on Oct. 20, 1886, and acquired and reorganized by the syndicate which constructed the Duluth, South Shore & Atlantic Ry., the holders of the land-grant bonds retained their lien upon the lands. On Jan. 1, 1911, there remained unsold 176,681 acres, besides mineral rights reserved on 98,719 acres sold in Marquette County, Mich.²

The fee land of this holding is credited in the Bureau's tables to the Detroit, Mackinac & Marquette; but the 98,719 acres of mineral rights are not credited to this holder in the tables or on the map. Part of the land on which mineral rights are owned may, perhaps, be included in some of the timber holdings platted and counted to other holders, but as the Bureau did not have the exact location of the mineral rights, it could not determine this point. The Upper Peninsula Land Co. (Ltd.), part of the Cleveland Cliffs Iron Co. interests, apparently acquired practically all of its great holding of over 700,000 acres from the Detroit, Mackinac & Marquette Railroad; and the records of the General Land Office show that practically all the Upper Peninsula Land Co.'s holdings were originally part of the swamp-land grant. Moreover, the Upper Peninsula Land Co. has sold tracts, or the timber on tracts, amounting to something like 82,000 acres (at any rate, that amount of lands reported by it is in conflict with lands reported by other timber holders³), and practically all these tracts were originally part of the swamp-land grant.

Present ownership of swamp lands in certain counties of Upper Peninsula.—The following table shows the present ownership of all

¹ Laws of Michigan, 1873, p. 37. The amount of the grant and time for completion were extended by amendments in 1874, 1875, 1877, and 1879.

² Moody's Manual, 1911, p. 2925.

³ These lands have been credited in the Bureau's tables to the other holders reporting them and not to the Upper Peninsula Land Co. This figure of 82,000 acres is included in the 136,493 acres of such conflicts referred to on p. 192 as deducted from the Cleveland Cliffs Iron Co. interests. It does not include the 43,000 acres sold by the Upper Peninsula Land Co. to the I. Stephenson interests.

swamp lands granted to the State in Chippewa, Mackinac, Schoolcraft, and Marquette Counties, and in part of Luce County, in the Upper Peninsula. With the exception of Luce County, these are the counties in which, according to the quotation given above, the grant from the State to the Detroit, Mackinac & Marquette was located. Swamp lands were granted to the State in many other counties not included in this tabulation.

TABLE 17.—TOTAL ACREAGE OF SWAMP LANDS GRANTED TO STATE OF MICHIGAN IN CHIPPEWA, MACKINAC, MARQUETTE, AND SCHOOLCRAFT COUNTIES AND IN PART OF LUCE COUNTY, WITH PRESENT OWNERSHIP THEREOF.

[All figures are approximate, being based on a count of plats not showing exact survey acreage.]

Present owners.	Swamp lands owned in counties specified.	Present owners.	Swamp lands owned in counties specified.
Platted holders:			
Cleveland Cliffs Iron Co. interests—			
Upper Peninsula Land Co. (Ltd.).....	676,160	Platted holders.—Continued.	
Cleveland Cliffs Iron Co., including other subsidiaries.....	54,470	Second group (from 40,000 to 100,000 acres each in Upper Peninsula).—Continued.	
Total.....	730,630	United Logging Co.....	1,120
		5 other holders.....	1,120
First group (over 100,000 acres each in Upper Peninsula)—		Total.....	58,920
Detroit, Mackinac & Marquette R. R.....	87,760	Total, platted holders.....	982,110
Worcester Lumber Co. (Ltd.).....	26,520		
I. Stephenson interests.....	23,830	Unplatted holders:	
Chicago & North Western Ry. Co.....	14,400	Of over 60 million feet each—	
J. M. Longyear et al.....	3,360	Jerry Madden Shingle Co.....	21,440
Olive Iron Mining Co.....	2,680	William Mueller Co.....	13,310
Lake Superior Iron & Chemical Co.....	1,920	F. F. Chesbrough.....	6,400
The Michigan Iron & Land Co. (Ltd.).....	1,050	Central Paper Co.....	4,560
2 other holders.....	1,040	Morley & Merston.....	4,080
Total.....	162,560	D. N. McLeod Lumber Co....	2,240
		The Kimberly-Clark Iron Co..	1,440
Second group (from 40,000 to 100,000 acres each in Upper Peninsula)—		L. Jensen.....	1,280
Escanaba Lumber Co.....	45,040	Embury-Martin Lumber Co....	1,200
Tindle & Jackson.....	3,120	M. D. Olds.....	1,040
Van's Harbor Land & Lumber Co.....	3,000	5 other holders.....	2,540
Chesbrough Lumber Co.....	2,080	Total.....	59,550
Chicago Lumbering Co. of Michigan.....	1,800		
Wisconsin Land & Lumber Co.....	1,640	Of less than 60 million feet each—	
		Hudson Lumber Co.....	9,880
		J. H. Hunter.....	1,460
		S. H. Embury.....	1,320
		7 other holders.....	2,320
		Total.....	14,980
		Total, unplatted holders....	74,510
		Total accounted for.....	1,026,620
		Unaccounted for.....	329,400
		Grand total.....	1,356,020

The part of Luce County covered in the table consists of townships 45 and 46 north in each of ranges 8, 9, 10, and 11 west, and township 45 north, range 12 west.

Of the 1,356,000 acres granted to the State as swamp land in these four counties and the southern part of Luce County, approximately 1,025,000 acres, or 75 per cent, are now held by timber owners reported to the Bureau. About 935,000 acres, or nearly 70 per cent, are now in the hands of only six holders, and over 730,000 acres, or about 54 per cent, in the hands of only one holder, the Cleveland Cliffs Iron Co. interests. The Detroit, Mackinac & Marquette Railroad has in this region only 87,700 acres of fee swamp lands. In other counties of the Upper Peninsula it has about 90,000 acres more granted it by the State out of the Federal grant.

The following statement segregates, by holders, the 82,000 acres of conflicting swamp land referred to above as reported both by the Upper Peninsula Land Co. and by other holders:

TABLE 18.—CONFLICTING SWAMP LANDS INCLUDED IN TABLE 17.

Holder to whom credited.	Acres.	Holder to whom credited.	Acres.
Escanaba Lumber Co.....	29,980	Van's Harbor Land & Lumber Co.....	2,120
Jerry Madden Shingle Co.....	21,050	8 other holders	2,820
Detroit, Mackinac & Marquette R. R. . . .	9,920	Total.....	82,150
I. Stephenson interests.....	8,920		
Hudson Lumber Co.....	7,360		

FORM IN WHICH LANDS NOW HELD BY CLEVELAND CLIFFS IRON CO. WERE ORIGINALLY ALIENATED BY UNITED STATES.—Table 17 accounts for nearly one-half the entire Cleveland Cliffs acreage as originally swamp lands. A further inquiry was made to determine by what form of grant or entry the remaining lands of the Cleveland Cliffs were originally alienated by the Government. On comparing the plats of the company's lands with the records of the General Land Office, it was found that in addition to its swamp lands in the foregoing table, the Cleveland Cliffs has about 160,000 acres more of such lands in other parts of the Upper Peninsula, making its total swamp lands about 890,000 acres. Aside from this immense acreage of swamp-grant lands the company's holding consists chiefly of lands originally alienated (1) under agricultural college scrip and military-bounty land warrants at \$1.25 per acre, and (2) by cash sale at private entry at \$1.25 per acre.¹ Less important amounts were originally alienated under canal grants, railroad grants, and grants to the State for educational purposes. The following table covers the entire holdings of the Cleveland Cliffs, including the 730,600 acres of its swamp land in Table 17. It shows separately the Upper Peninsula Land Co. (Ltd.), because that is the most important subsidiary of the

¹ Both these classes of land were \$2.50 per acre within the railroad grant primary limits after date of grant.

Cleveland Cliffs interests in point of acreage. The figures are approximate, being based on a count of "forties."

TABLE 19.—FORM OF ORIGINAL GRANT OR ENTRY OF LANDS NOW OWNED BY CLEVELAND CLIFFS IRON CO. INTERESTS.

[All figures are approximate, being based on a count of plats not showing exact survey acreage.]

Forms of grant or entry.	Upper Peninsula Land Co. (Ltd.).	Cleveland Cliffs Iron Co., including other subsidiary series.	Total Cleveland Cliffs Iron Co. interests.
	Acrea.	Acrea.	Acrea.
Swamp land.....	1,676,160	213,980	1,890,090
Agricultural-college scrip and military-bounty land warrants.....	160	260,260	260,420
Cash sale at \$1.25 per acre ¹	530	201,560	202,090
Canal grant.....		48,480	48,480
State educational grant.....		36,530	36,530
Railroad grant.....	240	25,420	25,660
Homestead entry.....	1,880	6,500	8,380
Timber and stone entry.....	160	4,200	4,360
Miscellaneous (forest-ten selection, Indian allotment, preemption entry, lighthouse selection, etc.).....			
Total.....	2,000	5,260	7,260
	681,130	792,140	\$1,473,270

¹ Includes part or all of the 43,000 acres sold to the I. Stephenson Lumber Co. (See p. 193.)

² \$2.50 per acre within railroad grant primary limits after date of grant.

³ Includes the 43,000 acres mentioned in note 1, but excludes about 85,000 acres of Cleveland Cliffs land for which the Bureau has no plats. This explains the difference between this total and the total shown for the company in Table 8, p. 190. The 136,480 acres of conflicting lands referred to on p. 192 are omitted here, as in other tables. Of these 136,480 acres, about 90,000 acres were swamp-grant lands and 21,000 were railroad-grant lands.

All the items in the above table, except the last three, represent methods of obtaining land without necessity for individual entrymen, and without the trouble of assembling many individual tracts. The swamp lands were evidently handled by the State in large blocks. Agricultural-college scrip could be bought in large quantities from the State, and the military-bounty land warrants of individual soldiers and officers were commonly assembled by brokers and bought in large blocks by land speculators. Cash purchases at \$1.25 per acre were unlimited in amount. Canal lands, State lands, and railroad lands could be had in any desired quantity. From all these sources land could be purchased at wholesale, so to speak; and of the 1,473,000 acres of Cleveland Cliffs land shown in the table, over 98 per cent came through such channels.

This company's holding, therefore, illustrates the fact that the great governmental grants, the scrip rights, and the selling of land at private entry have tended directly to the formation of large holdings.

Section 8. Concentration of timber ownership in Upper Peninsula.

The following table states the amount of timber owned by the holders of over 60 million feet each in the Upper Peninsula, with division between groups of platted and groups of unplatted holders. The holders and their division into groups is the same as in the acreage tables (pp. 190 and 191); that is, the grouping in this timber table is based on the number of acres owned in the Upper Peninsula, not on the amount of timber. The timber of the Cleveland Cliffs Iron Co. interests is not stated separately, but is blocked with that of the first group of 12 platted holders. The acreage shown is total acreage, including nontimbered as well as timbered land:

TABLE 20.—TOTAL ACREAGE AND MERCHANTABLE TIMBER OWNED IN UPPER PENINSULA OF MICHIGAN BY HOLDERS OF OVER 60 MILLION FEET EACH.

[Timber in billions of board feet. Thus, 11.4=11,400,000 board feet.]

Holders of over 60 million feet (grouped according to total acreage owned in Upper Peninsula).	Number of holders.	Land owned. ¹	Timber owned.	
			Billion feet.	Per cent. based on total timber in holdings of over 60 million feet each.
Platted holders:				
Cleveland Cliffs Iron Co.....	1	<i>Acres.</i> 1, 515, 392		
Group of 12 holders of over 100,000 acres each.....	12	2, 413, 794	11.4	47.3
Group of 19 holders of from 40,000 to 100,000 acres each.....	19	1, 095, 497	4.9	20.3
Total, platted holders.....	32	5, 024, 683	16.3	67.6
Unplatted holders:				
Group of 27 holders of from 15,000 to 40,000 acres each.....	27	625, 274	4.8	19.9
Group of 31 holders of less than 15,000 acres and over 60 million feet each.....	31	349, 000	3.0	12.5
Total, unplatted holders.....	58	974, 343	7.8	32.4
Grand total.....	90	5, 999, 026	24.1	100.0

¹ Including 244,977 acres reported as timber rights. For distribution by groups, see Table 8, p. 190.

From this table is seen the absolute amount of timber owned by all holders of over 60 million feet each in the Upper Peninsula (24.1 billion feet), and the amount and percentage of this total owned by each group. The Cleveland Cliffs and the first group of 12 platted holders have 11.4 billion feet of timber together. This is nearly half the total in the table. Though the amount of timber owned by the Cleveland Cliffs Iron Co. interests is not stated separately, it is one of the largest holders in "group 4," in the classification used in Part I (p. 94); that is, the group of those owning between 3.5 and 5 billion

feet. The second group of 19 platted holders has, in the aggregate, 4.9 billion feet of timber.

The 32 platted holders taken together own 16.3 billion feet of timber in the Upper Peninsula. This is more than two-thirds of all the timber in this area owned by holders of over 60 million feet each.

A comparison of the percentages in the above table of timber owned, with those in the table of acreage owned (p. 191), shows that though the 32 platted holders have 83.8 per cent of the total acreage held in the Upper Peninsula by owners of over 60 million feet, they have only 67.6 per cent of timber held by such owners. The 58 unplatted holders, though they own only 16.2 per cent of the total acreage, nevertheless have 32.4 per cent of the timber; that is, their proportion of the timber is twice as great as their proportion of the land. This is due to the fact that they own less nontimbered land than the platted holders, and that their timbered land has, in the case of many, a heavier average stand per acre.

Section 9. Total holdings owned in Michigan, in Lake States, and in other regions by the 32 platted holders of Upper Peninsula map.

The Cleveland Cliffs Iron Co. has no holdings outside the Upper Peninsula. In the first group of 12 platted holders there are 4 who own timber elsewhere in the Lake States. These 4 have 948,531 acres of land in Wisconsin and Minnesota, of which 524,567 acres are reported as timbered. The timber amounts to 1.8 billion feet. Adding these amounts of land to the totals for the group in the Upper Peninsula, the total acreage of all 12 holders in the Lake States is 3,362,325 acres, of which 2,633,516 acres are classed as bearing merchantable timber. As has been seen, the timber owned in the Upper Peninsula by the Cleveland Cliffs and the first group of 12 together amounts to 11.4 billion feet. Hence, their total in the Lake States is 13.2 billion feet. None of the 12 holders have any holdings in lower Michigan.

A small amount of timber is owned in lower Michigan by members of the second group of 19 holders. In Wisconsin and Minnesota 3 members of the group own 182,659 acres, of which 143,174 acres are timbered. The total acreage in the Lake States owned by these 19 holders is 1,310,516 acres.

Outside the Lake States, in the Southern Pine Region and the Pacific-Northwest, only 5 of the 32 platted holders own timberland. These 5 own 612,508 acres in the South and the Pacific-Northwest, with 22.1 billion feet of timber.



CHAPTER IV.

LARGE LAND HOLDINGS IN FLORIDA.

Section 1. Introductory.

The figures in Table 1 of Chapter II for land owned in fee by timber holders in Florida, showed that owners of over 60 million feet of timber had in that State no less than 15,523,000 acres in fee (p. 168). These figures, as those for the other States in that table, were for the period of the Bureau's field investigation of timber. In the case of Florida this was made from 1907 to the summer of 1908.

In 1912, for the purpose of completing its office records of the location of the land of timber holders in Florida, the Bureau sent out letters to a number of concerns that had furnished estimates of their timber but had not furnished plats of their holdings during the period of field work. These letters requested the location of the lands and timber rights owned by these holders in 1912. The replies showed in several cases, as was expected, that there had been sales, or acquisitions, or sometimes an entire change in ownership. These were traced out by further correspondence. The inquiry was solely as to lands, and did not seek revised estimates on the amount of timber.

The opportunity was also taken to learn the amount and location of certain large holdings of nontimbered Everglades lands that the Bureau had not covered in its field work. These were holdings referred to, or located by full legal description, in the published Minutes of the Trustees of the Internal Improvement Fund of Florida.

In these ways the Bureau secured, by correspondence and from the Minutes, the location, correct in the main for 1912, of 30 large holdings, aggregating between 3 and 4 million acres, of which about 1 million were comprised in 8 or 9 holdings of nontimber owners in the Everglades or in other timberless parts of the State. There have been changes in the ownership of many other Florida holdings since the date of the field work, but if the Bureau had secured satisfactory plats of the holdings during the field work of 1907 or 1908, no attempt was made to bring them up to date, unless the correspondence with other concerns happened to point to changes in their holdings.

Section 2. New Florida data of 1912 added to those of 1907-8.

With this new material at hand office plats were made covering practically all the reported holdings in the State, about four-fifths of the acreage being as of 1907-8, and about one-fifth as of 1912. By this platting it was possible to eliminate substantially all possible duplications, the conflicts being credited to one holder or the other according to the evidence available. On the basis of the material thus secured and verified a table has been prepared which shows partly of 1907-8 and partly of 1912, gives additional more detailed information as to the land situation in Florida than given in the tables of Chapter II. While, as stated, the holdings of a few nontimber owners are included, the table in the main is confined to timber owners and can not in any sense be taken as a complete statement of large land holdings in Florida. Indeed, timber rights are credited to the owner of the timber, not to the owner of the land. If, as sometimes happens, pine rights on a tract are owned by one holder, cypress rights by another, and the land by a third, the acreage is credited to the owner of the pine rights.

Table 21 below shows the total acreage held in Florida by each of 8 groups of holders, the largest group comprising holdings of 600,000 acres to 1,730,000 acres each, and the smallest comprising holdings of from 10,000 to 18,000 acres each. All told, there are included in this table 290 holders who each own 10,000 acres or more of land in the State. The figures show a total of 18,949,000 acres, of which 1,329,000 acres are timber rights. A footnote indicates the amount of timber rights included in the figures for each group. Table 22 shows the cumulative totals of the groups, which are shown separately in Table 21. All acreages are rounded to thousands.

TABLE 21.—TOTAL ACREAGE OF LAND (INCLUDING TIMBER RIGHTS)¹ HELD IN FLORIDA BY TIMBER OWNERS OF OVER 10,000 ACRES EACH, AND BY A FEW OTHER OWNERS NOT REPORTED AS TIMBER OWNERS, BY GROUPS, 1907-8 AND 1912.

Groups.	Number of holders.
Group 1 (600,000 to 1,730,000 acres each).....	5
Group 2 (270,000 to 475,000 acres each).....	6
Group 3 (130,000 to 240,000 acres each).....	13
Group 4 (75,000 to 125,000 acres each).....	28
Group 5 (50,000 to 75,000 acres each).....	36
Group 6 (30,000 to 50,000 acres each).....	47
Group 7 (18,000 to 30,000 acres each).....	66
Group 8 (10,000 to 18,000 acres each).....	89
Total.....	290

¹ The figures in this table include 1,329,000 acres reported as timber rights, as follows: First group, 320,000 acres; second group, 147,000 acres; third group, 120,000 acres; fourth group, 320,000 acres; fifth group, 250,000 acres; sixth group, 111,000 acres; seventh group, 97,000 acres; and eighth group, 122,000 acres.

TABLE 22.—HOLDINGS IN TABLE 21 SHOWN CUMULATIVELY, BY GROUPS.

Groups.	Number of holders.	Acres.
Group 1 (over 60,000 acres each).....	6	5,283,000
Groups 1 and 2 (over 270,000 acres each).....	11	7,883,000
Groups 1 to 3 (over 130,000 acres each).....	24	9,742,000
Groups 1 to 4 (over 75,000 acres each).....	52	12,430,000
Groups 1 to 5 (over 50,000 acres each).....	88	14,605,000
Groups 1 to 6 (over 30,000 acres each).....	135	16,331,000
Groups 1 to 7 (over 18,000 acres each).....	201	17,810,000
Groups 1 to 8 (over 10,000 acres each).....	290	18,949,000

Attention is called to the high proportion of the total land area of Florida that is owned or leased by the few holders shown in Table 21 and summarized cumulatively, by groups, in Table 22. The land area of the State is 35,111,040 acres.¹ Of this no less than 18,949,000 acres, or 54 per cent, is held by 290 holders, ranging from 10,000 acres to 1,730,000 acres apiece. No less than 16,331,000 acres, or 46.5 per cent, is held by the 135 holders who have upwards of 30,000 acres each. The 24 holders of over 130,000 acres each have an aggregate of 9,742,000 acres, or 27.7 per cent of the area of the State. The five largest, with their 5,283,000 acres, hold over one-seventh of that area. When it is considered that there must be a number of holdings of very considerable size owned by holders who have no timber and who were not canvassed by the Bureau, it is clear that even the very great concentration shown by these tables is not the full measure of the concentration of land ownership in this State.

FIRST GROUP, FIVE HOLDERS (600,000 TO 1,730,000 ACRES EACH).—The first group consists of five holders having in the State of Florida from 600,000 to 1,730,000 acres each. These holders are as follows: (1) Consolidated Land Co., which is controlled by the Consolidated Naval Stores Co., 1,730,000 acres;² (2) Southern States Land & Timber Co., with 1,402,000 acres; (3) Empire Land³ and National Timber companies, with 941,000 acres; (4) Florida Coast Line Canal & Transportation Co. interests, with 610,000⁴ acres; (5) John Paul and East Coast Lumber Co., with 600,000 acres. The average size of these five holdings, it may be noted, is over 1,000,000 acres.

The officers, directors, and several of the important stockholders of the Consolidated Land Co. are officers or directors of a very con-

¹ Abstract of the Thirtieth U. S. Census, p. 29.

² Including 67,000 acres reported as timber rights, but excluding 154,000 acres on which cypress only is owned, the fee and pine rights on which are owned by other holders included in lower groups of Table 21.

³ The Empire Land Co. was one of the companies from which information was obtained in 1912. Its holding at that time was 734,000 acres; that of the National Timber Co., in 1907-8, was 207,000 acres.

⁴ Minutes of the Trustees of the Internal Improvement Fund, Vol. IX, 1913, pp. 364-365, 377, show that about 18,000 acres of this land has recently been disposed of by the company.

siderable number of other important timber-owning and land-owning companies included in the lower groups of the table. These relationships are not known to amount in any case to a majority control of the companies referred to, but they do indicate an important degree of community of interest. The holders are counted as separate.

The companies included as subsidiaries of the Florida Coast Line Canal & Transportation Co. are Boston & Florida Atlantic Coast Land Co., Land & Trust Co. of Florida, Walker Land & Trust Co., and New River Land Trust Co.

SECOND GROUP, SIX HOLDERS (270,000 TO 475,000 ACRES EACH).—The second group consists of six holders having from 270,000 to 475,000 acres each in Florida. The holders of this group are as follows: (1) R. J. Bolles, with 474,000 acres of nontimbered land in the Everglades; (2) R. J. & B. F. Camp Lumber Co. and Crystal River Lumber Co., with 375,000 acres;¹ (3) Model Land Co., with 355,000 acres;² (4) Cummer Lumber Co., with 318,000 acres;³ (5) Dowling Lumber Co. (including stockholders), with 305,000 acres; and (6) Hillman-Sutherland Co., with 273,000 acres.⁴

The holdings of R. J. Bolles consist entirely of swamp lands tracted for from the trustees of the internal improvement fund. Title to a very large part of these has already passed by deed. Report on this holding was obtained in 1912. Reports for 1912 were also secured from the Crystal River Lumber Co., and from the Model Land Co.

The interests controlling the Model Land Co. have important holdings in the Florida East Coast Railway Co., which formerly title to much of the land now held by the Model Land Co. Minutes of the Trustees of the Internal Improvement Fund, IX, 1913, pages 598-619, show that the trustees on December 1912, decided to the Florida East Coast Railway Co. approximately 210,000 acres of Everglades land in compromise of claims of the company for 2,674,692 acres alleged to be due under old land grant railroads to which the Florida East Coast is successor. This land is not the same as that shown here for the Model Land Co., and included in tables 21 or 22.

THIRD GROUP, 13 HOLDERS (130,000 TO 240,000 ACRES EACH).—The third group consists of 13 holders having from 130,000 to 240,000 acres each in Florida. These holders are as follows: (1) P.

¹ Including 133,000 acres reported as timber rights.

² This is the figure reported by the company in 1912. It excludes 60,000 acres owned in fee credited to other holders who reported the ownership of timber rights on this land. The timber holders are members of lower groups in the table, excepting the Cummer Lumber Co., which timber rights on between 4,000 and 5,000 acres of this tract.

³ Includes between 4,000 and 5,000 acres reported as timber rights, fee of which is owned by Model Land Co.

⁴ Includes 9,000 acres reported as timber rights.

Lumber Co., with 238,000 acres; (2) Aripeka Sawmill Co., with 232,000 acres;¹ (3) Myakka Land Co., with 193,000 acres; (4) Florida Land & Timber Co., with 189,000 acres; (5) Stearns & Culver Lumber Co., with 189,000 acres; (6) St. Joseph Land & Development Co., with 184,000 acres; (7) Southern Timber & Naval Stores Co., Florida Land Co., and affiliated companies, with 182,000 acres;² (8) J. P. Williams and J. P. Williams Land Co., with 177,000 acres; (9) B. Beacham, with 177,000 acres; (10) Wilson Cypress Co., with 164,000 acres;³ (11) Hodges, O'Hara & Russell interests, with 155,000 acres;⁴ (12) B. Parker et al., with 146,000 acres; and (13) McLeod Timber and Duluth Timber companies, with 133,000 acres.

The holdings in this group, on which reports were secured in 1912, are the Southern Timber & Naval Stores Co. (but not its affiliated companies) and the Wilson Cypress Co.

In connection with the holding of J. P. Williams and J. P. Williams Land Co., it may be noted that the Minutes of the Trustees of the Internal Improvement Fund, Vol. IX, 1913, pages 643-647, show the following facts: That, on December 27, 1912, the trustees passed a resolution that they would, without delay, convey to the Carrabelle, Tallahassee & Georgia Railroad Co. approximately 22,000 acres of Everglades land as a compromise for the residual claim of the company or its assigns to 513,005 acres alleged to be due it under a land grant. Representatives of the assignee of the company, being representatives of the Georgia, Florida & Alabama Railroad Co. and of J. P. Williams, president of the Georgia, Florida & Alabama Railroad Co., appeared before the trustees, and it was agreed that a contract, embodying the proposition in the resolution, should be executed between the trustees and the assignee as soon as evidence of the assignment by the Carrabelle, Tallahassee & Georgia Railroad Co. was produced. This tract of 22,000 acres is not part of the land here shown for J. P. Williams and J. P. Williams Land Co., nor is it included at all in Tables 21 or 22.

¹ Including 28,000 acres reported as timber rights. Also included in the company's holding of 232,000 acres is a tract of 24,000 acres, on which the Aripeka Sawmill Co. has sold the cypress rights to F. E. Muller, but has retained the pine timber and fee.

² Includes 14,000 acres reported as timber rights and excludes 8,000 acres owned in fee on which timber rights have been sold to a holder in one of the lower groups.

³ Including 18,000 acres reported as timber rights and 38,000 acres of cypress rights. The Bureau is not informed as to the ownership of the pine, if any, on these 38,000 acres, nor does it know the fee holder. The figure of 164,000 acres excludes 109,000 acres of cypress rights credited to other holders in the table who own the other timber on this land. Of the 109,000 acres, 44,000 is reported as owned in fee by the Dowling Lumber Co., 41,000 as owned in fee by John Paul, and 22,000 as timber rights owned by F. & H. A. Hodges.

⁴ Including 22,000 acres reported as timber rights, on which, however, the Wilson Cypress Co. is reported as owning the cypress, and excluding 38,000 acres of fee land on which timber rights are reported by E. P. Reutz Lumber Co., a member of the fourth group.

Section 3. Concentration of land ownership in Florida due chiefly to land grants.

The Bureau has not in the case of Florida done the tedious work of tracing out the present ownership of Federal and State grants, as was done in the Upper Peninsula of Michigan and in the map areas of Part II. But the general facts as to the grants in Florida are such as to make it practically certain that they were the chief cause of the concentration of land ownership and timber ownership now found.

FEDERAL LAND GRANTS.—The general subject of the Federal land grants to States has been explained briefly in Part I. Florida received under the congressional act of September 4, 1841, 500,000 acres as its quota for internal improvements.¹ Then under the swamp-land act of September 28, 1850 (sec. 2480, Rev. Stat.), it received from the Federal Government (up to Jan. 1, 1911) the immense amount of 20,207,723 acres of swamp and overflowed lands,² or practically three-fifths of its own area. In absolute acreage this was over twice as much swamp land as Congress placed at the disposal of any other State. For its common schools it had, as other States administered before 1848, every section 16, if unappropriated, within its borders; and 92,160 acres as a grant for a State university (act of Mar. 3, 1845).³ It also had 90,000 acres in scrip under the agricultural-college grant (act of July 2, 1862).⁴ Besides, there was a small public-buildings grant in 1845.

In addition to these grants Congress granted lands, nominally to the State, but really for railroad construction between specified points in the State merely designating the companies that were to build the roads and acquire the lands. The Federal grants received by Florida for these railroads amounted to 2,206,941 acres. Some of the present large timber holdings consist in great part of lands originally included in the grants. The railroad companies, and the acreages they originally received from the Federal Government, were as follows:*

Florida Central & Pensinsular.....	Acres. 738, 000. 56
Florida & Alabama.....	166, 691. 08
Pensacola & Georgia.....	1, 273, 145. 50
Florida, Atlantic & Gulf Central.....	29, 103. 74
Total.....	2, 206, 940. 88

* The Public Domain, p. 255.

¹ Eleventh Biennial Report of the Commissioner of Agriculture of the State of Florida, 1909-10, p. 228.

² The Public Domain, p. 228.

³ *Ibid.*, p. 250.

⁴ Eleventh Biennial Report of the Commissioner of Agriculture of the State of Florida, 1909-10, p. 228. According to the records of the United States General Land Office, up to June 30, 1913, the patents to the Florida Central & Pensinsular 731,711.77 acres; to the Florida & Alabama Railroad 166,691.08 acres; to the Pensacola & Georgia Railroad, 1,273,236.70 acres; and to the Florida, Atlantic Central Railroad, 29,384.18 acres, making the total grant on that date 2,207,023.73 acres.

Up to January 1, 1911, there had been patented to Florida, under the various kinds of grants above referred to, 24,076,184 acres, as follows:

	Acres.
Internal-improvement grant, 1841.....	500,000
Swamp-land grant, 1850.....	20,207,723
School grant (sections 16), 1845.....	1,974,240
University grant, 1845.....	92,160
Public-buildings grant, 1845.....	5,120
Agricultural-college grant (scrip), 1862.....	90,000
Railroad land grants, 1856.....	2,206,941
Total.....	24,076,184

Thus, slightly more than two-thirds of the State's land area was in the control of the State government for such disposition as it saw fit to make within the terms set by Congress in the grants.

FLORIDA'S DISPOSAL OF ITS SWAMP LANDS.—By far the greatest of the grants that the State of Florida had at its disposal was the swamp-land grant. The drainage proviso attached to this grant and the Supreme Court's interpretation of it in cases arising in other States have been noted in the foregoing chapter (pp. 205 to 210). In the present section, facts as to Florida's disposition of its swamp lands are given chiefly with reference to their bearing on the title of some of the large timber holdings comprised of swamp lands still undrained.

"Internal Improvement Fund."—The State of Florida, by act of legislature January 5, 1855, created an "internal improvement fund" for the purpose of encouraging a liberal system of internal improvement. Devoted to this fund were (1) the 500,000 acres for internal improvements granted by act of Congress September 4, 1841,¹ and (2) the swamp lands granted by act of Congress September 28, 1850. The title to the lands in the internal improvement fund was irrevocably vested by the legislature in the trustees of the fund, the trustees being the governor and other State officers serving ex officio. The act creating the fund declared certain railroads and a certain canal proper objects to be aided from the fund. So far as railroads were concerned, it was provided that a grant be made of 6 sections of these lands per mile to railroads to be constructed over specified routes; that bonds be issued for these roads to the extent of \$10,000 per mile, interest to be advanced by the State out of the internal improvement fund; and that the same railroads should have, in addition, any lands that the United States might grant the State for railroad construction. The following year Congress, by act of May 17, 1856, (11 Stat., 15) granted 6 sections of public lands per mile for railroads to be constructed within a time limit of 10 years, mainly

¹ Estimated by General Land Office.

² Effective upon admission as a State of the Union, Mar. 3, 1845.

over the same routes that had been specified by the State in its act.¹ The State's act further granted 6 sections of State land per mile to railroads that might subsequently be chartered to construct lines over other routes. It also provided for a canal from St. John's River to Indian River to be paid for in cash from the internal improvement fund, not to exceed \$4,000 per mile; and in lands, to the extent of 4,000 acres per mile.

Provision was also made in the act for the sale of swamp lands at prices fixed by the trustees, and for settlement on them, a settler being allowed to preempt no more than 640 acres.²

That the aiding of railroads was conceived to be the main object of the internal improvement fund is shown by an act of the Florida Legislature approved December 22, 1859. This act authorized trustees of the fund to pledge enough of the swamp lands on a canal river, or their value in money, to secure the drainage of the contiguous swampy areas, "Provided that the same does not conflict with the main object of the trust, the interest of the several railroads now built in the State, and the interest of the holders of the internal improvement bonds."

Forfeiture of grants for uncompleted portions of railroads.—In 1881 part of the Florida railroads included in the Federal act of 1856 were not yet built. In that year the previous grantee failed to build the branch road from Ocala to Tampa, about 100 miles, the State granted to the Tropical Peninsular Railroad Company the right to build it, together with the subsidy of six sections per mile previously made in 1855, and 10,000 acres per mile additional. The act brought the total grant for this 107 miles up to 13,840 acres per State lands per mile, besides the Federal grant of 3,840 acres per mile. The State also gave to the Pensacola & Atlantic Railroad Company the right to construct the 161 miles of road yet unbuilt from Pensacola to Apalachicola River, and granted it not only the original State grant of six sections per mile, but also 20,000 acres per mile additional, making a total of 23,840 acres per mile, besides the 3,840 acres per mile granted by the Federal Government. On this state of facts the House Committee on Public Lands⁴ in 1886 recommended the forfeiture of the Federal grants (1) opposite the 161 miles between Pensacola and Apalachicola River, which had been completed in 1881 and 1886, some 15 to 20 years after the required time limit of the 20 miles which had been completed after time, in 1873.

¹ Both the State and Federal grants provided for railroads from Jacksonville to Pensacola, Amelia Island to Tampa Bay, with a branch to Cedar Key. The State grant further provided for branches on the Jacksonville-Pensacola route, and the Federal grant provided for a line from northward to the Alabama boundary, for which line the State by a subsequent act also made provision.

² Laws of Florida, 1855, p. 40.

³ *Ibid.*, 1861, p. 153.

⁴ H. Rept. No. 2437, 49th Cong., 1st sess., vol. 8, 1885-6.

opposite the 150 miles from Waldo to Ocala and Ocala to Tampa,¹ of which 60 or more miles was even then uncompleted. The amounts forfeitable under the bill reported by the committee were estimated at about 695,000 acres on the Pensacola line and 576,000 on the Tampa line. The committee's position was that the right to forfeit clearly existed, and that, with such large grants from the State, the Federal grant was not necessary. Congress, however, refused to declare these grants forfeited, and consequently for these portions of the subsidized routes of Florida the railroads were entitled to receive 17,680 acres and 27,680 acres, respectively, per mile. The State, however, by act of May 30, 1889,² forfeited all swamp lands granted for railroad or canal construction lying opposite portions of the railroads or canals then uncompleted.

Failure to fulfill condition as to drainage.—The Minutes of the Trustees of the Internal Improvement Fund, published in several volumes, give the history of the attempts of the trustees and the State to administer the fund and the grants thereunder; of prolonged litigation with the railroads; of State receiverships for railroads defaulting to the State on their State guaranteed bonds; of vast drainage projects which largely failed to drain and served only to dissipate the grant; of canal digging in the Everglades by the State itself and the continuance of the work by private contractors. The legal status of the remnant of the grant, complicated by the fact that railroad grants of doubtful validity were made by the legislature without knowing whether the State had received, or ever would receive land enough to satisfy them, is also explained in the later volumes of the Minutes.³

Before presenting the tables showing in detail the State's disposition of the swamp-land grant, it is desirable to give two extracts from the Minutes of the Trustees, which give a general idea of the policies under which this vast grant was managed and the results thereof, and which show how far the administration of the grant has been from accomplishing the object expressed in the condition of the Federal act of 1850. One of these, in the nature of a defense of the management of the grant, was written by the trustees in office in 1888; the other, written 20 years later by the general counsel of the trustees, was a criticism of the early policy of the management of the grant as failing to attain the purposes of the trust.

The 1888 statement was occasioned by the fact that a subcommittee of the Committee on Public Lands of the United States Senate had telegraphed the governor of Florida inquiring whether he wished to be heard in the matter of an allegation "concerning fraudulent

¹ On definite location of this line, see S. Doc. No. 91, 48th Cong., 1st sess., vol. 5, 1885-4.

² Florida Rev. Stat., 1892, sec. 442.

³ Cf. especially Minutes of Trustees of Internal Improvement Fund, Vol. VII, 1909, pp. 519-548.

conveyances of public land in the State of Florida," a matter then before the subcommittee. In response to this telegram the trustees of the internal improvement fund, in the course of a communication to the subcommittee, under date of September 5, 1888, said: ¹

The Swamp Lands granted to the State by the Act of Congress^s of Sept. 28, 1850, were by the Statute of Florida of January 6, 1855, vested in the Trustees of the Internal Improvement Fund, the Governor, Comptroller, Treasurer, Attorney General, and Commissioner of Lands and Immigration being ex-officio such Trustees. The trusts to which the lands are devoted by the original act and all amendatory acts are all in the direction of drainage and reclamation of the lands, but may be divided into the means by which that end is to be accomplished into three classes, viz: (1) Internal improvements by railroads and canals, (2) drainage by works devoted immediately to that purpose, (3) reclamation by the management of actual settlement of and cultivation of said lands by allowing pre-emptions not exceeding one section to a settler. See Secs. 1, 2, 19, 40, McClellan's Digest Laws Secs. 16, 29, of original act. A number of the railroad companies in the State have special land grants from this fund, varying in quantity, but subject to the general trusts of the act creating said Fund and its amendments; and every railroad or other company incorporating under the general incorporation act of the State becomes entitled to receive the alternate sections of land within six miles of its line, and indemnity within six miles, as the road or canal is completed in sections of six miles, as approved by Chapter 3166 Acts of 1879. Prior to the outbreak of the war, a line of railroad was built from Fernandina on the Atlantic coast to Cedar Keys on the Gulf Coast, and a line was built from Jacksonville in the direction of Pensacola as far as Quincy, a road from Tallahassee to St. Marks, in all about 400 miles. The interest on the bonds of these roads was, under the Statutes, guaranteed by said fund including said swamp lands — during and after the war default in payment of such interest was made by the railroads and the said Internal Improvement Fund; in 1871 suit was begun on behalf of bondholders in the United States Circuit Court, in process of which a receiver of these lands was appointed, and they remained subject to the control of the court, although managed by the Trustees with the approval of the court, until relieved by the Disston sale as hereinafter stated—Vose vs. Reed et al Trustees, 1 Woods U. S. Cir. Ct. 647; Vose vs. Trustees I. I. Fund of Fla. 2 Id. 647. The coupons with interest amounted to considerably more than a million of dollars, and the ordinary sales of the lands did not suffice to keep the debt from increasing, but the fund was been eaten up by compound interest, costs, receivers allowances, and other expenses of litigation, and it was obvious that only by making a sale of a considerable quantity of the lands at once could the fund be saved. After endeavoring for several years both in the United States and in Europe, without success,

¹ Minutes of Trustees of Internal Improvement Fund, Vol. III, 1904, pp. 508-514.

make such a sale, the Trustees finally succeeded in 1881, in selling four million acres of these lands, with the approval of the United States Circuit Court, to Hamilton Disston, of Philadelphia, for one million dollars. By this sale nearly all the debts of the fund were paid, the remaining lands were released, liberal provisions were made for settlers as hereinafter stated, contracts were made for extensive works for drainage and reclamation of such lands, and about fifteen hundred miles of railroads have been since built in the State, all aided from said fund and the most of them chiefly on the credit of lands received from said fund, in addition to the roads previously built by the aid of the fund. By these means transportation has been opened through all sections of the State, immigration has been brought in, the settlement of the country greatly facilitated, the value of the remaining State lands and of the United States lands increased, and much drainage and reclamation of these swamp lands accomplished. By these means in large part, the assessed property for taxation in the State has increased in value from about thirty million dollars in 1881, to about eighty-six million dollars in 1887, and the taxes of the people have been greatly reduced. In addition to facilitating drainage by opening up the country, furnishing transportation and increasing settlement, the specifications for construction of all railroads receiving lands from the fund contain requirements as to ditches, and these hundreds of miles of ditches do accomplish some drainage of such lands. It has been held by the Supreme Court of the United States that the grant of swamp lands was in present, that no trust attached to the lands, and that title to them derived from the State is not affected by the manner in which the State has performed her obligation as to drainage and reclamation of them—*Mills County vs. R. R. Cos.* 107 U. S. 557; *Wright vs. Roseberry*, 121 U. S. 488. But the Supreme Court of Florida has decided that the construction of railroads is a legitimate means of drainage and reclamation of these lands—*St. Johns Railway Co. vs. Trustees I. I. Fund*, 16 Fla. 531. A large quantity of the swamp lands have been expended specifically in the drainage of such lands and the Trustees of said fund have from time to time, through the whole course of the management of such fund, made contracts and expended portions of such swamp lands in drainage of such lands, the largest of such contracts being with the Atlantic and Gulf Coast Canal and Okeechobee Land Company, wherein over a million acres of such lands have been expended in drainage, and with which company said Trustees now have a contract for the prosecution of the work of drainage by the expenditure of over three hundred and thirty thousand dollars.

In 1908, Hon. W. S. Jennings, general counsel for the trustees, and formerly governor of Florida and a member of the board, in discussing the relative advantages of a policy of State reclamation and drainage of the Everglades as compared with reclamation and drainage under a private-contract system, gave the following account of how the State deeded great areas of swamp lands to railroads and

drainage companies without securing any appreciable degree of drainage or reclamation: ¹

Among the early contracts entered into by the Trustees of the Internal Improvement Fund of much magnitude, was [that] entered into in the early part of April, 1881, growing out of a proposition made by Hamilton Disston ² for the drainage and reclamation of the lands overflowed by the waters of and adjacent to Lake Okeechobee and the Kissimmee River, Vol. 2, folio 432, Printed Minutes, Contract 463 ib. 437, ib. 480 ib. and 503 ib.

In this contract it was agreed, among other things in effect that Disston and his associates undertake at their own expense and charge, to drain and reclaim by drainage all overflow lands of the State of Florida, practicable and lying south Township Twenty-three and east of Peace Creek, belonging to the State of Florida, or said Internal Improvement Fund, and subject to overflow by Lake Okeechobee, the Kissimmee River and its branches, and the lakes contiguous to said river, which waters now flow into River or Lake Okeechobee, or into the Caloosahatchee River, or Miami River, or other outlets, by cuts or canals, including both those already patented, as well as those that may hereafter be patented to said State by the United States, the said lands to be reclaimed and drained are rendered *fit for cultivation by permanently lowering and keeping reduced the waters of Lake Okeechobee*, and thereby permanently lowering and keeping reduced the high water level of said river and by thus lowering the waters of said lake, creating an increased current in said river, and by the increased current thus created causing the bed of said river to cut or wash out, and by the means and by cutting off bends in said river to further increase the current of said river and permanently confine the water-flow of said river within its natural banks, and *thereby effectually and permanently prevent the overflow of said banks; it being understood and agreed that the drainage, reduction or lowering of the waters of Lake Okeechobee may be made by a series of cuts or canals from the waters of said lake to the Caloosahatchee River on the west, and by cuts and canals from said lake eastwardly to the waters of the St. Lucie, or other available points, and also by cuts or canals southwardly to some streams or streams through the Everglades, and also by cuts or canals to the southeast side of the Everglades to the Miami River and any small stream heading or rising in the Everglades; provided, however, that no canals or cuts shall be made, dug or constructed unless the same be necessary to reduce the waters of said Lake Okeechobee, to effect the said object of drainage and permanently reclaiming said lands.* Vol. 2, page 464-465.

The Trustees of the Internal Improvement Fund effect upon their part and their successors to pay, grant, convey and deed the alternate sections of land, before the State or to their Fund now patented, or that may hereafter be acquired, within the limits of this contract, which

¹ Minutes of the Trustees Internal Improvement Fund of the State of Florida, Vol. V, page 50.
² This drainage proposition by Hamilton Disston was distinct from his purchase of 4,000 acres from the trustees, and involved different lands.—Bureau of Corporations.

reclaimed and thus rendered fit for cultivation; such lands to be conveyed in such quantities and at such times as may be justified by the progress of the work, and will be equitable and just to the said parties hereto, it being mutually agreed that the policy of the Board of Trustees will at all times be such as not to pay in excess of the work done, and yet to such extent and at such times as will facilitate and aid the faithful performance of the covenants of the parties of the first part. Vol. 2, page 466, Printed Minutes.

It will be observed from the provisions of this contract that it embraces as a drainage district an area approximating 9,000,000 acres of land.

THE EVERGLADES INCLUDED.

The lands commonly referred to as the "Everglades" since described and patented to the State of Florida by the United States, it will be seen is a part of the land included in the foregoing contract, and to be drained and reclaimed under the provisions thereof.

* * * * *

PROGRESS AND RESULT.

Meager information may be gathered from the Minutes of the Trustees of the Internal Improvement Fund touching the progress of the work and the result thereof, which, coupled with extraneous information to be supplemented by a personal observation and knowledge of a general character, justify the estimation that approximately 90 miles of canal were constructed.

THE KISSIMMEE CANALS.

Under the provisions of the foregoing contract and amendments and supplements thereto, canals and cuts were made * * * making an approximate total of 90 miles of canals cut, 70 miles of which being in the vicinity of the town of Kissimmee, connecting certain lakes on the Kissimmee River in the Kissimmee Valley, a distance of approximately 300 miles northwest of Lake Okeechobee, and upon an elevation and more than 100 feet above the level of Lake Okeechobee, the nearest cut to Lake Okeechobee being more than 90 miles distance therefrom, resulting in a greater increased water flow into Lake Okeechobee, instead of *permanently lowering the waters therein*, as provided for in the contract.

It will be observed that there is no reference in said contract to the Kissimmee River, nor to the lakes in the vicinity of the Town of Kissimmee, connecting with the Kissimmee River in the Kissimmee Valley, neither is the direction in which said canals have been cut within the provision and plan of drainage to *reduce and lower the waters of Lake Okeechobee*, nor the connecting of the lakes in the Kissimmee Valley with the Kissimmee River, the result of the work in the Kissimmee Valley had the effect of temporarily reclaiming a few acres of lands under favorable weather conditions when there was a comparatively

slight overflow, but without permanency, or permanently reclaiming any considerable acreage of said territory making it permanently fit for cultivation.

THE CALOOSAHATCHEE CANALS.

Some progress was made by the cutting of a shallow, narrow canal from a point on the Coloozahatchee River, beginning at the falls, near Fort Thompson, extending through Lake Firt and from Lake Hicpochee extending into Lake Okeechobee, which, however, have been a failure under the provisions of said contract, inasmuch as they have not been the means of permanently reclaiming and draining and rendering fit for cultivation any known acreage of the swamp and overflowed lands mentioned in said contract, neither has it lowered nor kept permanently reduced the waters of Lake Okeechobee or reduced the water level of said river.

THE SOUTH CANAL.

There is evidence of another effort on behalf of the contracting parties under the provisions of said contract, and amendments and supplements thereto, to cut a canal southerly, mentioned in the contract to some stream or streams through the Everglades. Their purpose appears to have been to cut a canal beginning at a point south of Lake Okeechobee, near the range line, dividing ranges 35 and 36, extending southward about 10 miles in length, 40 feet wide and 8 feet deep, but this canal has no outlet, and otherwise ineffectual in lowering the water of Lake Okeechobee or to the reclaiming of an acre of land, even temporarily; therefore it follows that no known or considerable acreage, exceeding by estimation 25,000 acres in the entire area of 9,000,000 acres embraced in said drainage district and contract has been reclaimed by means of said canals, moreover, from the best information obtainable at this writing, the statement is justified that the waters in Lake Okeechobee and in the Everglades have not been permanently lowered or reduced by the cutting of said canals, as evidenced by the fact that the waters in Lake Okeechobee have been for some years past, and are at the present time equally high as during any period of high water at or before the date said contract was entered into in the early part of the year 1881.

LANDS DEEDED.

Notwithstanding, it is a matter of common knowledge that 1,652,711.80 acres of lands have been decided by the Trustees of the Internal Improvement Fund under said contract to the drainage contractors, or the Atlantic and Gulf Coast Canal, Okeechobee Land Company, the accepted successor of Hambleton and his associates under said contract, and in addition thereto, suits have been instituted in the State Courts to compel you as Trustees of the Internal Improvement Fund to pay 347,288.20 acres of land claimed by the successor to the named company under said contract, and amendments thereto and other reservations made incident thereto by Trustees prior to the year 1901.

FLORIDA COAST LINE CANAL AND TRANSPORTATION COMPANY.

* * * * *

Section 1 of Chapter 3641, Laws of 1885, reads as follows: "That the State of Florida hereby grants to the Florida Coast Line Canal and Transportation Company a sufficiency of lands to make up the deficiency of the grants heretofore made to it of 3,840 acres per mile, caused by and on account of Spanish and other grants contiguous, and the water of the Atlantic Ocean adjacent to it on the east interfering, the said deficiency to be determined by the Trustees of the Internal Improvement Fund, and the amount found to be due said company to be selected by said company from even and odd numbered sections lying nearest to its line of improvements, not to exceed ten miles, for making navigable for an extended commerce at all seasons and stages of water the lagoons and creeks and rivers, for their whole length, by dredging the shallow places or oyster and sand bars, which now prevent it." This grant was extended from time to time to 1905, when the act purporting to extend said grant was vetoed by Governor Broward.

It appears from the Minutes of the Trustees of the Internal Improvement Fund, that these Legislative land grants were presented from time to time, together with their acceptance, to the Trustees of the Internal Improvement Fund for approval and compliance therewith, as also with other questions, such as was presented in the communication as of the 14th of March, 1889, in which the Trustees were requested to pass upon the question as to whether said company under said legislative land grant of February 6, 1885, will be entitled to lands for the entire distance between the terminal points of its canal, including the natural waterways already navigable which it will connect, or only to lands for the mileage of actual work done in opening channels over flats and shoals, widening and deepening creeks and rivers, and cutting out land divides between such natural waterways so as to connect them. Vol. 4, page 20, Printed Minutes.

Upon the consideration of this question, it was resolved by the Trustees that the canal company would only be entitled to lands on a computed mileage of constructed canal, natural waterways not to be included, which resolution, however, was afterwards rescinded, leaving the question open and undetermined, March 9, 1886, and further reference was made to the same proposition March 26, 1889. * * * What was the purpose of this canal? If for commerce and transportation, according to the acts of the Legislature, and many references thereto in the Minutes of the Trustees, it was clearly outside of the scope and purpose of the grant under Act of Congress of September 28, 1850, granting the swamp and overflowed lands within the State of Florida to the State for the purpose of drainage and reclamation. * * *

RESULTS.

The result of this work extending over a quarter of a century, notwithstanding the cutting of several lagoons, cuts and canals, which for the purposes of this opinion may be admitted to be successful for transportation of light draft craft for the transpor-

tation of nonperishable freight and for small pleasure craft, it must likewise be admitted that for the purposes of drainage and reclamation of swamp and overflowed lands, it stands unexcelled as a failure, for with the exception of a very few hundred acres, in the immediate vicinity of and abutting the canal, no lands have either been drained or reclaimed by it.

LANDS DEEDED.

For the work upon these canals, and presumably under the acts of the Legislature aforesaid, the Trustees of the Internal Improvement Fund, from time to time, prior to 1901, deeded to said canal company 595,778.69 acres of swamp and overflowed lands of said Fund.

* * * * *

RAILROAD LAND GRANT CONTRACTS.

Several acts of the Legislature were passed, making land grants to railroads and canal companies, which I shall not undertake to enumerate here, all of which are to be found in the printed laws and easily accessible, a few instances may be cited, however, in this connection.

Among the early legislative enactments purporting to grant swamp and overflowed lands to railroad companies of the domain granted to the State of Florida under Act of Congress of September 28th, 1850, was contained a provision, amongst others, to the effect that the State of Florida grants to the said railroad * * * ten thousand (10,000) acres of land for each mile of road which it may construct, of lands granted to the State under Act of Congress September 28th, 1850, subject, however, to all of the trusts to which said fund is applicable and subject under the act approved January 6, 1855. (Sec. 5, Chapter 3170) (Sec. 7, Chapter 3171) (Sec. 11, Chapter 3173.) And a similar provision in apparently all of the enactments or laws touching on the subject, either in the acts themselves or by the General Statutes on the subject enacted 1881, Chapter 3326, Section 240, Revised Statutes of Florida.

The main trust referred to in the Act of 1855 referred to in these smaller land grants, was the plan to reclaim and make fit for cultivation the swamp and overflowed lands belonging to the Internal Improvement Fund, such provision is followed by one of these various acts granting alternate sections of land lying on each side and within six miles of the railroad to be constructed by said company, etc., "Provided, that said company comply with the provisions of an Act providing for the encouragement of a liberal system of Internal Improvement in this approved January 6th, 1855, and the amendments thereto in the manner of constructing the road and drainage." Similar provisions could be cited, but these are sufficient to show that such enactments must have been upon the theory that these legislative grants were in aid of the drainage and reclamation of the swamp and overflowed lands of the State within the meaning of the Act of Congress of September 28, 1850, and the provisions of Chapter 610, Laws of Florida, vesting title to the lands in the Trustees of the Internal Im-

Fund and their successors in office with an expressed trust to be performed under the powers granted and duties prescribed, the main trust being the drainage and reclamation of the swamp and overflowed lands of the State of Florida.

CONTRACTUAL FORCE.

The evident observance by the then Trustees of some contractual force of such legislative land grants to railroad companies for the purpose, as expressed in said grants, "to aid in constructing said railroads and drainage," is apparent.

PROGRESS AND RESULTS.

Thereupon, certain railroad companies proceeded to construct many miles of railroad, apparently under the provisions of these legislative grants of land, and received deeds to a large area of the swamp and overflowed lands of the Internal Improvement Fund by the Trustees thereof, aggregating approximately 8,000,000 acres of land leaving a balance claimed by the railroads and their assignees in 1900 of upwards of 5,500,000 acres of land which was approximately that acreage in excess of the total acreage then patented to the State.

CERTIFICATES.

In addition to the lands heretofore granted to the various railroad companies referred to, as having been deeded, certain certificates were issued from time to time, about the year 1888, of which there remained outstanding at the close of the year 1900 upwards of 700,000 acres so contracted in aid of said railroads. The standard form of these certificates being to recite in the preamble to the various acts of the Legislature as heretofore referred to, granting said acres of lands to said railroad companies, that in consideration of the premises and in conformity with the Act of the Legislature aforesaid, do hereby certify that said railroad company (naming it) is entitled to said lands, particularly describing the same therein, whenever the same shall have been patented by the United States under Act of Congress of September 28, 1850, and that upon receipt of such patent by the State the said Trustees will convey said lands to the said company, its successors and assigns, etc.

RESULTS.

The result of these undertakings by the railroads under these grants of aid to the feature of drainage and reclamation of swamp and overflowed lands under the grants cited, has been so diminutive that no record has been made that I have ever been able to find.

LITIGATION.

You are not unmindful of the fruitful source of litigation that followed these contractual undertakings herein above cited, it has not only been prolonged and expensive to the Fund, but has at times the appearance of imperiling the entire Fund.

SUMMARY.

Without further inquiry or citation, it would appear that under the first policy named, and apparently under the provisions of the contracts entered into by the Legislature of the State of Florida and the Trustees of the Internal Improvement Fund looking to the drainage and reclamation of the swamp and overflowed lands under the provisions of said acts and Federal and State laws and amendments thereto, the accomplishment and cost thereof may be summarized as follows:

- (a) That there have been constructed approximately 90 miles of unsuccessful drains and canals.
- (b) That temporary or partial drainage and reclamation of an area of land not exceeding 100,000 acres of land under the contractual system during a quarter of a century.
- (c) That the Internal Improvement Fund has contributed under said contractual instruments by duly executed deeds to said railroad and canal companies upward of 10,000,000 acres of land not including 700,000 acres or more held in certificates issued to said railroad companies.

Since the date of the above quotation the State itself and contractors under its direction have dug many miles of canals in an effort to reclaim the Everglades.

Tabular statements showing disposition of Florida swamp lands.— In the administration of 1901-1905 the trustees, in connection with the publication of the Minutes of the Trustees from the beginning, made an exhaustive search of the records, and as a result of these labors published tables showing the complete status of the lands of the fund and of the grants. These tables have since been kept up to date. Thus, the tables in the biennial report, issued in 1911 by the Florida State Commissioner of Agriculture, who is ex officio a member of the trustees, summarize the State's disposition of its vast swamp-land grant, as follows (Tables 23, 24, and 25):

TABLE 23.—STATEMENT SHOWING THE STATUS OF ALL SWAMP AND OVERFLOWED LANDS PATENTED TO THE STATE [OF FLORIDA] PRIOR TO JANUARY 1, 1911, UNDER ACT OF CONGRESS OF SEPTEMBER 28, 1850.¹

[This table does not indicate present owners, but the original grantees of the State.—Bureau of Corporations.]

Number of acres patented to the State.....	20, 20
Number of acres conveyed to railroad companies.....	8, 787, 661.33
Number of acres deeded to canal & drainage companies.....	2, 779, 772.08
Number of acres deeded to N. R. Dickerson in 1867 for coupons of Florida R. R. bonds, which fell due prior to 1866.....	248, 602.98
Number of acres deeded to Wm. Jackson in 1868 for coupons of Florida, Alabama and Gulf Central R. R. bonds.....	113, 064.80
Wells & Randolph, agents of this State to select swamp and overflowed lands, under contract with the Governor of Florida of Nov. 8, 1851, received the proceeds from sale of about.....	100, 000.00
Number of acres deeded on account of L. G. Dennis, agent of the State to procure and receive patents for swamp and overflowed lands at Washington, under contract with the Governor of Florida of Nov. 10, 1875 (see orders of trustees of July 5, 1881, and April 14, 1883).....	5, 800.2

¹ Eleventh Biennial Report of the Commissioner of Agriculture of the State of Florida

Number of acres decided on account of Williams & Swann, agents of the State to select swamp and overflowed lands, under contract with the trustees of the Int. Imp. Fund of March 5, 1871.....	39,490.77
(Other lands were decided on account of W. & S., under above contract, belonging to the Int. Imp. Fund proper, embracing 4,837.98 acres, are not embraced in this statement, as they were not swamp and overflowed lands.)	
Number of acres decided on account of Williams, Swann & Corley, agents of the State to select swamp and overflowed lands under contract with the trustees of the Int. Imp. Fund of May 18, 1873.....	13,542.61
(Other lands were decided on account of W., S. & C., under above contract, belonging to the Int. Imp. Fund proper, amounting to 15,163.56 acres which are not embraced in this statement, as they were not swamp and overflowed lands.)	
Number of acres decided on account of Sydney I. Wales, agent of the State to procure patents for swamp and overflowed lands at Washington, under contract with the trustees of the Int. Imp. Fund of April 13 and Oct. 19, 1878.....	224,562.90
Number of acres decided on account of John A. Henderson, agent of the State to select swamp and overflowed lands under contract with the trustees of the Int. Imp. Fund of March 15, 1884.....	164,124.68
Number of acres decided on account of S. W. Teague, agent of the State to select swamp and overflowed lands under contract with the Trustees of the Int. Imp. Fund of March 22, 1902.....	5,778.37
Number of acres decided in Disston sale.....	4,000,000.00
Number of acres decided to all other persons.....	2,345,070.81

Total disposed of..... 18,927,461.70

Leaving balance on hand Jan. 1, 1911..... 1,380,261.08

The railroads and the canal and drainage companies who were the original grantees, respectively, of the 8,787,661 acres and the 2,779,773 acres shown in Table 23 are listed, together with the acreage received by each, in the following tables (Tables 24 and 25):

TABLE 24.—STATEMENT SHOWING ALL SWAMP AND OVERFLOWED LANDS CONVEYED TO RAILROADS [BY THE STATE OF FLORIDA] TO JANUARY 1, 1911.

[This table does not indicate present owners, but the original grantees of the State.—Bureau of Corporations.]

Name of railroad.	Acres.
Alabama and Florida (from Pensacola to Georgia line).....	27,613.32
East Florida Railway Company (Jacksonville to St. Marys River).....	15,781.29
Fernandina and Jacksonville Railway Co.....	23,649.98
Florida, Atlantic and Gulf Central (Jacksonville to Lake City).....	164,568.21
Florida Railroad (Fernandina to Cedar Key and from Waldo to Tampa).....	505,144.14
Florida Midland Railway Company.....	12,856.79
Green Cove Springs and Melrose Ry. Co.....	7,781.48
Jacksonville, St. Augustine and Halifax River Railroad Company.....	56,782.15
Jacksonville and Atlantic R. R. Company.....	21,501.62
Jacksonville, Mayport, Pablo Railway and Navigation Company.....	10,837.88
Live Oak and Rowlands Bluff R. R. Company.....	3,253.21
Orange Belt Railway Company.....	88,687.92
Pensacola and Georgia Railroad (Lake City to Tallahassee).....	66,561.77
St. Johns and Lake Earle Railroad.....	14,725.90
Sandford and Indian River Railroad Co.....	6,192.88
St. Augustine and Halifax Railroad, changed to St. Johns and Halifax River Railroad Co.....	41,510.29
St. Augustine and Palatka Railway Co.....	42,815.16
St. Johns Railway Company.....	4,002.44
Tavares, Orlando and Atlantic Railroad Co.....	2,655,482.68
Western Railway of Florida (lands not reconveyed).....	1,474,120.30
Florida Southern Railway, formerly Gainesville, Ocala and Charlotte Harbor R. R.....	363,600.29
Jacksonville, Tampa and Key West Railway, formerly Tampa, Peace Creek and St. Johns River Railroad.....	2,211,024.37
Silver Springs, Ocala and Gulf Railroad.....	479,671.84
Palatka and Indian River Railway.....	
Pensacola and Atlantic Railroad.....	
Carabelle, Tallahassee and Georgia Railroad, formerly Augusta, Tallahassee and Gulf Railroad; formerly Thomsville, Tallahassee and Gulf Railroad.....	183,970.30
Blue Springs, Orange City and Atlantic Railroad.....	118,498.99
South Florida Railroad (from Sanford to Kissimmee).....	72,428.55
Total.....	8,787,661.33

NOTE.—In conveyance to Florida Railroad there are embraced 23,273.58 acres Internal Improvement lands proper.

1 Eleventh Biennial Report of the Commissioner of Agriculture of the State of Florida, 1911; p. 643.

TABLE 26.—STATEMENT OF SWAMP AND OVERFLOWED LANDS CONVEYED TO CANAL AND DRAINAGE COMPANIES [BY THE STATE OF FLORIDA] TO JANUARY 1, 1911.

[This table does not indicate present owners, but the original grantees of the State.—Bureau of Corporations.]

Name of company.	Acres.
H. L. Hart for removing obstructions from Ocklawaha River.	23,356.18
Atlantic and Gulf Coast Canal and Okechobee Land Company.	1,721,550.40
Florida Coast Line Canal and Transportation Company.	1,030,559.63
Etowah Canal and Drainage Company.	4,326.47
Total.	2,779,772.68

¹ Eleventh Biennial Report of the Commissioner of Agriculture of the State of Florida, 1911; p. 644.

These tables show that out of 18,827,462 acres disposed of by the State, 8,787,661 have gone to railroads; 2,779,773 acres to canal and drainage companies; 4,000,000 in a single sale to Hamilton Disston in the 80's; 553,289 to the State land agents for selecting the land and securing patents; and only 2,706,739 in all other ways. The Disston sale was at a price of only 25 cents an acre. The land sold to Disston, and much of the land sold in smaller amounts, was disposed of to meet the interest charges on defaulted railroad bonds guaranteed by the State. It is to be observed that these tables show merely the original disposition of the land by the State. The railroads, canal companies, and other original grantees have very largely transferred their holdings to other parties.

This is not the place to discuss the legal complications that have involved the administration of the grant, nor the question of the force and continuing validity of the provision as to drainage and reclamation laid down by Congress in 1850, nor the effect of the payment of drainage taxes by holders in certain districts, nor the results of the many miles of Everglades canals dug in recent years by the State and its contractors. But it is certain that, however title to these lands was obtained, a large proportion of them, on investigation, would now be found, more than 60 years after the grant, still owned in vast blocks by timber owners reported to the Bureau—either railroad or canal companies, drainage companies, timber investment concerns, or operating lumbermen—and still undrained. The holdings of the Consolidated Land Co., the Southern States Land & Timber Co., the Empire Land and National Timber Companies, the Florida Coast Line Canal & Transportation Co. in the R. J. Bolles, the Model Land Co., and many others were or are without doubt in very large part land-grant lands.

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